Lebalelo Water User Association

SE2 Pipeline and associated infrastructure

Final Environmental Management Programme

DFFE Reference Number: 14/12/16/3/3/1/2442

July 2022

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Lebalelo Water User Association

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Final Environmental Management Programme

July 2022

Project Ref: 131-001

Prepared by: Suzanne van Rooy

VERSION CONTROL

Alta van Dyk Environmental cc

Version: Final

Approved by: Alta van Dyk

Signed:

Position: Environmental Specialist

Date: July 2022

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Abbreviations

BAR	Basic Assessment Report
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
LWUA	Lebalelo Water User Association
NEMA	National Environmental Management Act
NWA	National Water Act
ORWRDP	Olifants River Water Resource Development Project
SAHRA	South African Heritage Resources Agency
SE1	Southern Extension 1
SE2	Southern Extension 2

1 INTRODUCTION AND BACKGROUND

An Environmental Management Programme (EMPr) is a site-specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation.

A site-specific EMPr has been prepared for the management of all activities associated with the development of Lebalelo Water User Association's (LWUA) proposed Southern Extension 2 (SE2) pipeline and associated infrastructure in order to confirm the likely environmental issues that may arise from the activities, the likely harm that these activities may pose on the surrounding environment and how these activities will be managed as to minimise any harm to the environment.

This EMPr includes the findings of the pre-construction walkdown survey undertaken by The Biodiversity Company. Refer to Annexure C. The findings of the walkdown survey concluded that the no fatal flaws are evident for the proposed SE2 pipeline and associated infrastructure project. It is the opinion of the specialist that the EMPr may be favourably considered for authorisation. All prescribed mitigation measures by the biodiversity specialist were included in the EMPr.

1.1 Introduction

An EMPr is a plan or programme that sets out guidelines that describe how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored and subsequently achieve a required operational and/or end state.

The purpose of the EMPr is to provide for preventative, corrective and best practice measures to ensure that activities are undertaken in an environmentally responsible manner and that such activities are sustainable in the long term. The primary objectives of the EMPr, include, but are not limited to the following:

- Describe actions that when implemented will achieve mitigation of environmental impacts, or result in approved management of activities thereby reducing the probability of impacts occurring;
- Define organisational and administrative arrangements for environmental management and monitoring, including defining the responsibilities of staff and co-ordination, liaison and reporting procedures;
- Ensuring that discussions are held with the site supervision staff, regarding pro-active environmental management, such that potential problems can be identified and mitigation measures adopted prior to any work being carried out;
- Define the procedures to be followed as to ensure environmental control, in the event of pollution occurring that may require actions.

1.2 Content of the Environmental Management Programme

The EMPr has been structured in accordance with the requirements as specified in Appendix 4 of the National Environmental Management Act (Act No. 107 of 1998 (NEMA) Environmental Impact Assessment (EIA) Regulations. Refer to Table 1:1.

Table 1:1: Requirements of an EMPr

No	Description	Reference
1	An EMPr must comply with Section 24N of the Act and include-	
a)	details of: (i) the EAP who compiled the EMPr; and (ii) the expertise of the EAP to prepare an EMPr, including a Curriculum Vitae;	Chapter 2 Annexure A

No	Description	Reference
b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Chapter 3
c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Figure 3:1 Figure 3:2 Section 3.7 Figure 3:3 Figure3:4 Figure 3:5 Figure 3:6 Figure3:7
d)	a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including– (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and in the case of a closure activity, closure; and (v) where relevant, operation activities;	Chapter 5 Table 5.1 Table 5.2
f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; and (iii) comply with any applicable provisions of the Act regarding closure, in the case of a closure activity	Chapter 5 Table 5.1 Table 5.2
g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Table 5:1 Table 5:2
h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapter 10
i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Chapter 4 Table 5:1 Table 5:2
j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Table 5.1 Table 5.2
k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Chapter 10
l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Chapter 10
m)	an environmental awareness plan describing the manner in which— (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Chapter 9

No	Description	Reference
n)	any specific information that may be required by the competent authority.	The DFFE requested that the rehabilitation plan be included in the EMPr. Refer to Chapter 8.

2 ENVIRONMENTAL ASSESSMENT PRACTIONER

Table 2:1 provides the details of the Environmental Assessment Practitioner (EAP) for the SE2 pipeline and associated infrastructure project.

Table 2:1: Details of the Environmental Assessment Practitioner

Environmental Assessment Practitioner	Suzanne van Rooy
Company	Alta van Dyk Environmental Consultants cc
Qualifications	MPhil Environmental Management (University of Stellenbosch)
Professional Registrations	Pr.Sci.Nat (Reg nr.400378/11)
Postal Address	Postnet Suite # 745 Private Bag X 1007 Lyttelton 0140
Telephone number:	012 940 9457
Fax number:	086 634 3967
Email address	suzanne@avde.co.za

2.1 Expertise of the Environmental Assessment Practitioner

Suzanne is a senior environmental scientist and has 13 years' experience as an environmental assessment practitioner, having worked largely in South Africa's mining sector. She is a professionally registered environmental scientist with the South African Council of Natural Scientific Professionals (registration number 400378/11). Her field of expertise includes the compilation of environmental impact assessments and environmental management programmes, environmental auditing and stakeholder engagement.

Refer to Annexure A for the Curriculum Vitae of the EAP.

3 PROJECT DESCRIPTION

3.1 Background to LWUA

The LWUA was established to supply raw water to mines along the Eastern Limb of the Bushveld Igneous Complex. The main aim of the project was to supply raw water to a number of existing and planned new mines in the area, and as a spin-off, to provide additional capacity in the water supply scheme to meet the requirements of the rural population in the area. Only raw water is provided by LWUA, and the responsibility of treatment to drinking water standards lies with the distributing authority. The water is abstracted from the Olifants River via the Flag Boshielo Dam and abstracted at the Havercroft weir. The users receiving the water from the pipeline make up the LWUA. The Lebalelo water supply forms part of the Olifants River Water Resource Development Project (ORWRDP). The water is currently sourced from the Olifants River via the Flag Boshielo Dam, with abstraction at the Havercroft weir, and in future will be from the Steelpoort River via De Hoop Dam.

3.2 Proposed SE2 pipeline project

LWUA is proposing a new raw water pipeline between the Spitskop Pump Station and Mototolo Mine, near Steelpoort in the Limpopo Province. This project is also referred to as the SE2 pipeline. There is an existing raw water pipeline running from LWUA's Havercroft Pump Station to Borwa Pump Station, referred to as Southern Extension 1 (SE1). The new pipeline (SE2) will be located within the current pipeline's (SE1) servitude. The purpose of the new pipeline (SE2) is to provide raw water to several mines and industries located along the pipeline route. The current pipeline's capacity is not sufficient for the growing water demand from LWUA's members.

The following is proposed for the new pipeline (SE2) project:

- New pump station at existing Spitskop Pump Station (within fenced area of existing Spitskop Pump Station);
- Solar panels (75 x 75m) to be constructed within fenced area of existing Spitskop Pump Station. This is for a 0,5MW solar panel generation plant;
- New 500mm pipeline 15 km in length from Spitskop Pump Station to Dwarsrivier Pump Station (within the current pipeline servitude);
- New concrete reservoir to be constructed near the Dwarsrivier Pump Station (10 Mℓ);
- New pump station adjacent to the current Dwarsrivier Pump Station; and
- New 300 or 350 mm pipeline 9 km in length from the new Dwarsrivier Pump Station to Mototolo Mine (within current pipeline servitude).

The proposed SE2 pipeline will provide raw water to the following entities:

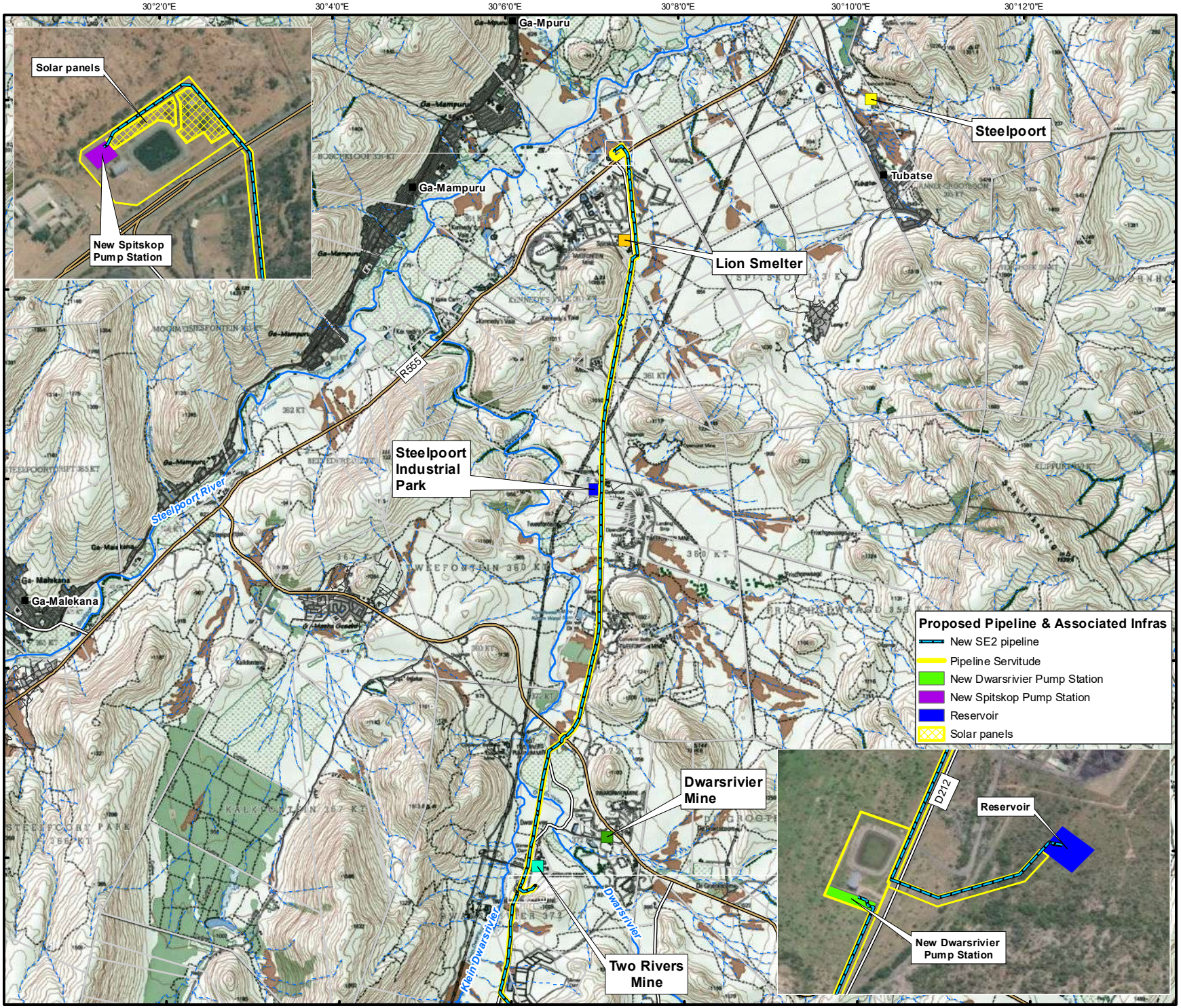
- Lion Smelter (Glencore South Africa);
- Dwarsrivier Mine (Assore);
- Two Rivers Mine (African Rainbow Minerals);
- Mototolo Mine (Anglo American Platinum); and
- Steelpoort Industrial Park (Freedom Property Fund) (potentially).

3.3 Locality

The proposed project is located near Steelpoort in the Limpopo Province. Table 3:1 Project location details outlines the details relating to the location of the proposed project. Refer to Figure 3:1 and Figure 3:2 for the locality maps.

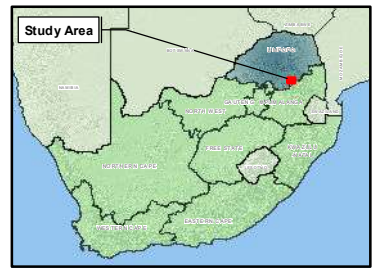
Table 3:1 Project location details

Site specific details	Description	
Municipal jurisdiction	Fetakgomo Tubatse Local Municipality Sekhukhune District Municipality	
Ward number	Ward 27	
Nearest town	The proposed SE2 pipeline starts approximately 5 km west from Steelpoort, Limpopo Province, from where it runs in a southerly direction to Mototolo Mine.	
Site coordinates	**Latitude**	**Longitude**
New Spitskop Pump Station	24°48'36.25"S	30° 7'14.65"E
Solar panels	24°48'33.73"S	30° 7'20.34"E
SE2 Pipeline – Spitskop Pump Station to Dwarsrivier Pump Station (new reservoir): Start	24°48'37.68"S	30° 7'17.04"E
SE2 Pipeline – Spitskop Pump Station to Dwarsrivier Pump Station (new reservoir): End	24°56'19.63"S	30° 6'17.57"E
New Dwarsrivier Pump Station	24°56’23.18”S	30° 6’2.78”E
Reservoir	24°56’19.26”S	30° 6’18.66”E
SE2 Pipeline: Dwarsrivier Pump Station to Mototolo Mine: Start	24°56'23.19"S	30° 6'3.70"E
SE2 Pipeline: Dwarsrivier Pump Station to Mototolo Mine: End	25° 0'33.07"S	30° 6'46.16"E



Legend

- Dwarsrivier Mine
- Two Rivers Mine
- Lion Smelter
- Steelpoort
- Steelpoort Industrial Park
- Farm Portion
- Village
- Secondary Road
- Tertiary Road
- Street/Road
- Perennial River Centre line
- Non-Perennial River Centre line



SCALE: 1: 100 000

0 1 2 3 4 Kilometers

N

TITLE:

Figure 3:1 Locality map of the proposed SE2 pipeline and associated infrastructure: Spitskop Pump Station to Dwarsrivier Pump Station

CLIENT:

Lebalelo Water User Association

DATE: Dec 2021	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP: SE2_Pipeline_Locality_A3_Fig1.1.mxd REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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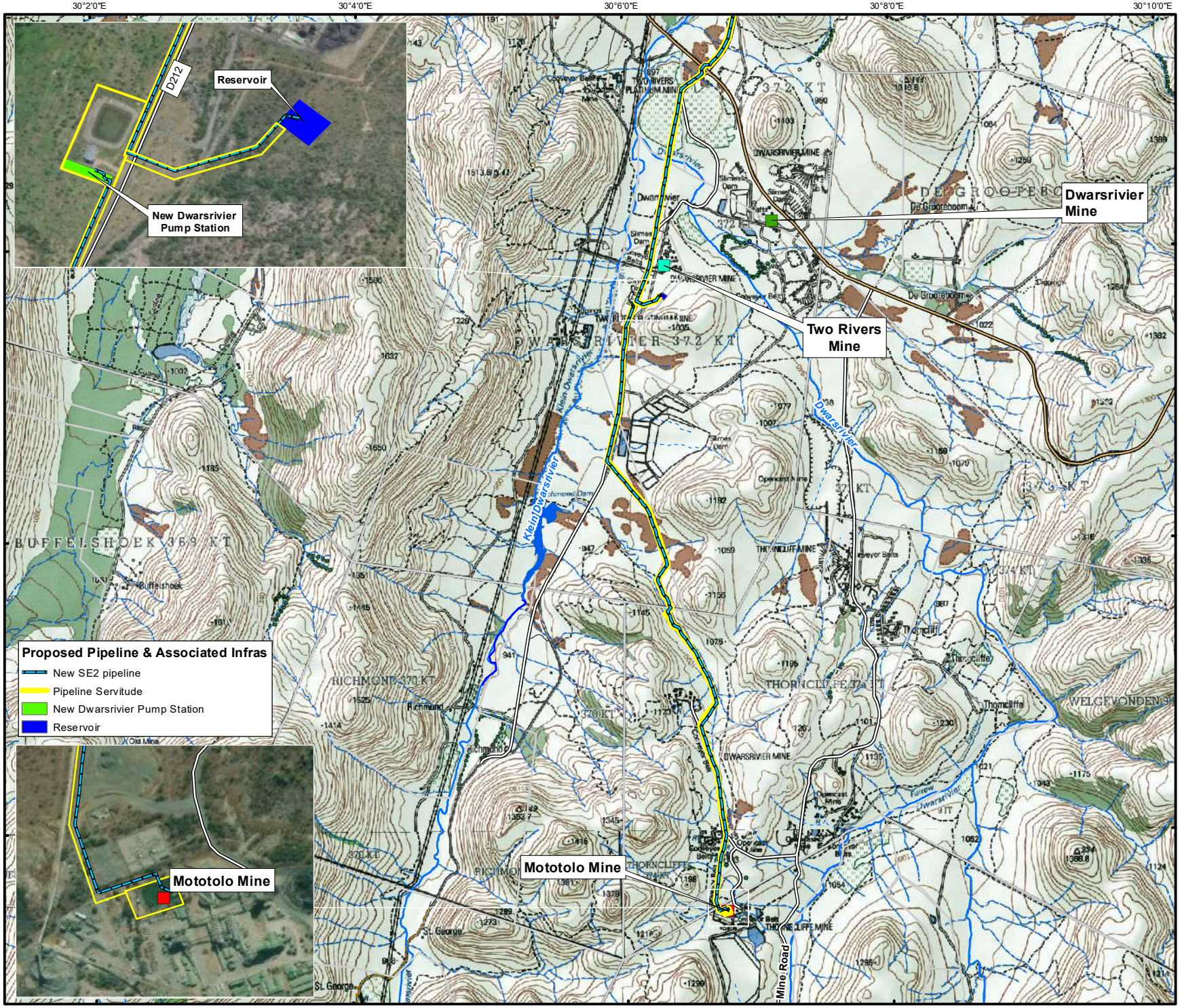
Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

Path: C:\GIS_PROJECTS_PVT\AVD_ENVIRO\SE2_PIPELINE\MAPPING\MXD\SE2_Pipeline_Locality_A3_Fig1.1.mxd



Legend

- Dwarsrivier Mine
- Two Rivers Mine
- Mototolo Mine
- Farm Portion
- Secondary Road
- Tertiary Road
- Street/Road
- Track
- Perennial River Centre line
- Non-Perennial River Centre line
- Water Areas

SCALE: 1: 65 000

0 500 1 000 1 500 2 000

Meters

N

TITLE:

Figure 3:2 Locality map of the proposed SE2 pipeline and associated infrastructure: Dwarsrivier Pump Station to Mototolo Mine

CLIENT:

Lebalelo Water User Association

DATE: Dec 2021	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP	REV:
SE2_Pipeline_Locality_A3_Fig1.2.mxd	2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

Path: C:\GIS_PROJECTS_PVT\AVD_ENVIRO\SE2_PIPELINE\MAPPING\MXD\SE2_Pipeline_Locality_A3_Fig1.2.mxd

3.4 Construction of new infrastructure

3.4.1 New pump station at Spitskop Pump Station

A new pump station will be constructed next to the existing Spitskop Pump Station within the existing Lebalelo servitude. The existing connection point at the pump station will be used to abstract water from the existing DWS pipeline between the De Hoop Dam and the Steelpoort Pump Station. Excavations will be done by mechanical means and by hand and the excavated material stockpiled on the site and used for backfilling. Any surplus material will be spread and finished off in the area around the pump station in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as per the relevant drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete will preferably be obtained from a ready-mix plant within the area.

Once the concrete has reached sufficient strength, the shutters will be stripped off, the concrete finished and the backfilling around the structure done.

The pump station walls will consist of steel columns with filled in brick.

The above work will be carried out by hand making use of people with the required skills under management and supervision of the Contractor.

3.4.2 Raw water pipeline (Spitskop Pump Station to Dwarsrivier Pump Station)

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid. Vehicle movement, trench excavation and parallel stockpiling of excavated material will take place within a corridor of approximately 25m (including the 15m servitude), except for where the pipeline crosses wetlands areas, where construction activities will be limited to the servitude, as per the recommendation of the wetland specialist.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. This work will all be done in accordance with the levels as per the relevant drawings.

After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment.

The pipeline crosses the R555 and the road D1261_010 (adjacent to the Lion Smelter) and the road to Mashishing (D1212_05). The three pipeline crossings will be done by means of pipe jacking a sleeve underneath the roads and position the steel pipe though the sleeve. The ends of the sleeve will be closed off once the pipe is in position.

The total length of the pipeline is approximately 15 000m.

3.4.3 Concrete reservoir

A new 10ML reservoir will be constructed near the existing Dwarsrivier Pump Station. The work entails the following:

Excavations will be done by mechanical means and the excavated material will be spread and finished off in the area around the reservoir in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as shown on the drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete for the floor slab will preferably be obtained from a ready-mix plant within the area. The walls and roof of the reservoir utilise pre-fabricated modules to speed up the construction process and to limit construction activities on site.

The above work will be carried out by mechanical means and by hand making use of people with the required skills under management and supervision of the Contractor.

3.4.4 New pump station at Dwarsrivier Pump Station

A new pump station will be constructed next to the existing Dwarsrivier Pump Station.

Excavations will be done by mechanical means and by hand and the excavated material stockpiled on the site and used for backfilling. Any surplus material will be spread and finished off in the area around the pump station in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as per the relevant drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete will preferably be obtained from a ready-mix plant within the area.

Once the concrete has reached sufficient strength, the shutters will be stripped off, the concrete finished and the backfilling around the structure done.

The pump station walls will consist of steel columns with filled in brick. The above work will be carried out by hand making use of people with the required skills under management and supervision of the Contractor.

3.4.5 Raw water pipeline (Dwarsrivier Pump Station to Mototolo Mine)

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid. Vehicle movement, trench excavation and parallel stockpiling of excavated material will take place within a corridor of approximately 25m (including the 15m servitude), except for where the pipeline crosses wetlands areas, where construction activities will be limited to the servitude, as per the recommendation of the wetland specialist.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. This work will all be done in accordance with the levels as per the relevant drawings.

After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment.

The total length of the pipeline is approximately 8 500m.

3.4.6 Valve chambers

Concrete valve chambers will be constructed at approximately 200m intervals along the pipeline. Such valve chambers are mainly used for maintenance purposes.

At the positions of the valve chambers the trench excavations will be widened to provide working space for the workers. The floor area of the valve chambers will be trimmed and compacted using hand tools after the concrete blinding layer will be constructed to provide a clean working area. This will be followed by the fixing of the steel reinforcement and erection of the shuttering.

Once the reinforcement has be inspected and approve the shuttering will be erected in accordance with the details on the drawings and the concrete cast using concrete from a ready-mix plant within the area.

After the concrete has gained sufficient strength, the shutters will be removed, the concrete finished off and the backfilling around the structures done and compacted and the areas finished off neatly. Any excess material will be spread over the area round the structures and finished off.

LWUA is also considering using pre-cast chambers, should it be a more viable option.

3.5 Maintenance activities during the operational phase

Once the SE2 pipeline is operational, several activities will be undertaken in order to main the pipeline in a working condition. Although the SE2 pipeline will mainly be buried, at certain watercourse crossings an overland structure may be utilised. Table 3:2 outlines the general maintenance activities that are planned for the SE2 pipeline.

Table 3:2 General maintenance activities for the SE2 pipeline (SRK, 2018)

Maintenance activity	Actions
Site inspections of the pipeline	Undertake regular inspections to ensure that: • The pipeline structure remains structurally intact; • The watercourses crossed are not blocked with sediment or debris; • No erosion is occurring along river banks, at culverts and pipeline crossings; • No new alien vegetation is encroaching • Erosion structures (gabion and reno mattresses) remain intact
Removal of alien vegetation and establishment of indigenous vegetation at the watercourse crossings, culverts and erosion protection structures	• Remove alien vegetation encroaching around pipeline
Removal of sediment, debris or nuisance vegetation at watercourse crossings	• All sediment, debris, overgrowth of vegetation and waste rock from erosion control structures should be removed from the watercourse and pipeline crossings
Repair to erosional structures (such as gabions and reno mattresses)	• Erosional structures such as gabions and reno matters must be repaired in a timeously manner to prevent erosion from occurring.
Erosion Protection along the watercourse crossings	• Areas along the watercourse and pipeline crossings that have been eroded should be backfilled with sediment or erosion protection structures • Embankments along the watercourse should be stabilised and sloped
Encasing the pipeline at watercourse crossing	• Disturbance to the local vegetation may occur during the concreting of the pipeline.

Maintenance activity	Actions
	• Disturbance to the river banks due concreting the pipeline may occur. • There is potential for the contamination of wetlands resources if the concrete is spilled while mixing.

3.6 Environmental related permits required

Triggered listed activities in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) 2014 Environmental Impact Assessment (EIA) Regulations (as amended in 2017) are shown in Table 3:3 below. Activities in Listing 1 and 3 are triggered by the proposed development, and therefore a Basic Assessment environmental authorisation process is followed.

Table 3:3: Listed activities triggered by the SE2 pipeline project

List and activity number	Listed activity	Description of activity
Listing 1 Activity 9	The development of infrastructure exceeding 1 000 meters in length for the bulk transportation of water or storm water – (i) with an internal diameter of 0.36 meters or more; or (ii) with a peak throughput of 120 litres per second or more,	The development of the SE2 raw water pipeline between Spitskop Pump Station and Dwarsrivier Pump Station is 15 km in length with an internal diameter of 500mm (0.5m), and therefore triggers this activity. The development of the SE2 raw water pipeline between Dwarsrivier Pump Station and Mototolo Mine is 9 km in length with an internal diameter of 300/350mm (0.3/0.35m), and therefore does not trigger this activity.
Listing 1 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 SE2 raw water pipeline crosses several watercourses and earthworks will be required within these watercourses to construct the proposed pipeline.
Listing 1 Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation,	Clearance of indigenous vegetation will take place for the proposed SE2 pipeline, but as it is a linear activity, this listed activity does not apply. However, the following areas will also be cleared: Solar panels (0.5 ha) New Spitskop Pump Station (0.16 ha) New reservoir at Dwarsrivier Pump Station (0. 53ha) New Dwarsrivier Pump Station (0.2 ha) The cumulative clearance of indigenous vegetation is more than 1 ha.
Listing 3 Activity 2	The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres. <u>Limpopo:</u> ii. Outside urban areas:	A concrete reservoir with a capacity of 10Mℓ will be developed outside an urban area, within an Ecological Support Area as per the Limpopo Conservation Plan (LCP).

List and activity number	Listed activity	Description of activity
	(dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	
Listing 3 Activity 12	The clearance of an area of more than 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. <u>Limpopo:</u> i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; or	The proposed SE2 pipeline and associated infrastructure will require the clearing of more than 300m^2 of indigenous vegetation, within in areas listed as Critical Biodiversity areas and Ecological support areas as per the LCPv2. The project area overlaps predominantly within an ecosystem that is listed as Least Concern, with a portion of the northern extent of the SE2 pipeline located in and endangered ecosystem.
Listing 3 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; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; <u>Limpopo:</u> i. Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plan adopted by the competent authority or in bioregional plans;	The proposed SE2 pipeline crosses watercourses outside an urban area, within areas considered as Priority Focus Areas as per the National Protected Area Expansion Strategy and areas listed as Critical Biodiversity areas and Ecological support areas as per the LCPv2.

In addition, a Water Use Licence Application will be submitted in terms of the National Water Act (Act No. 36 of 1998) (NWA) as Section 21 water uses are triggered by the proposed development.

Table 3:4 list the water uses that require authorisation in terms of Section 21 of the National Water Act for the proposed development.

Table 3:4 List of Section 21 Water Uses to be applied for

Section 21 Water Use	Activities which require the Water Use Licence
(c) – impeding or diverting the flow of water in a watercourse (i) – altering the bed, banks, course or characteristics of a watercourse	• Watercourse crossing by SE2 pipeline • Activities to be undertaken with a horizontal distance of 100m from the edge of the watercourse and within 500m of a delineated wetland.

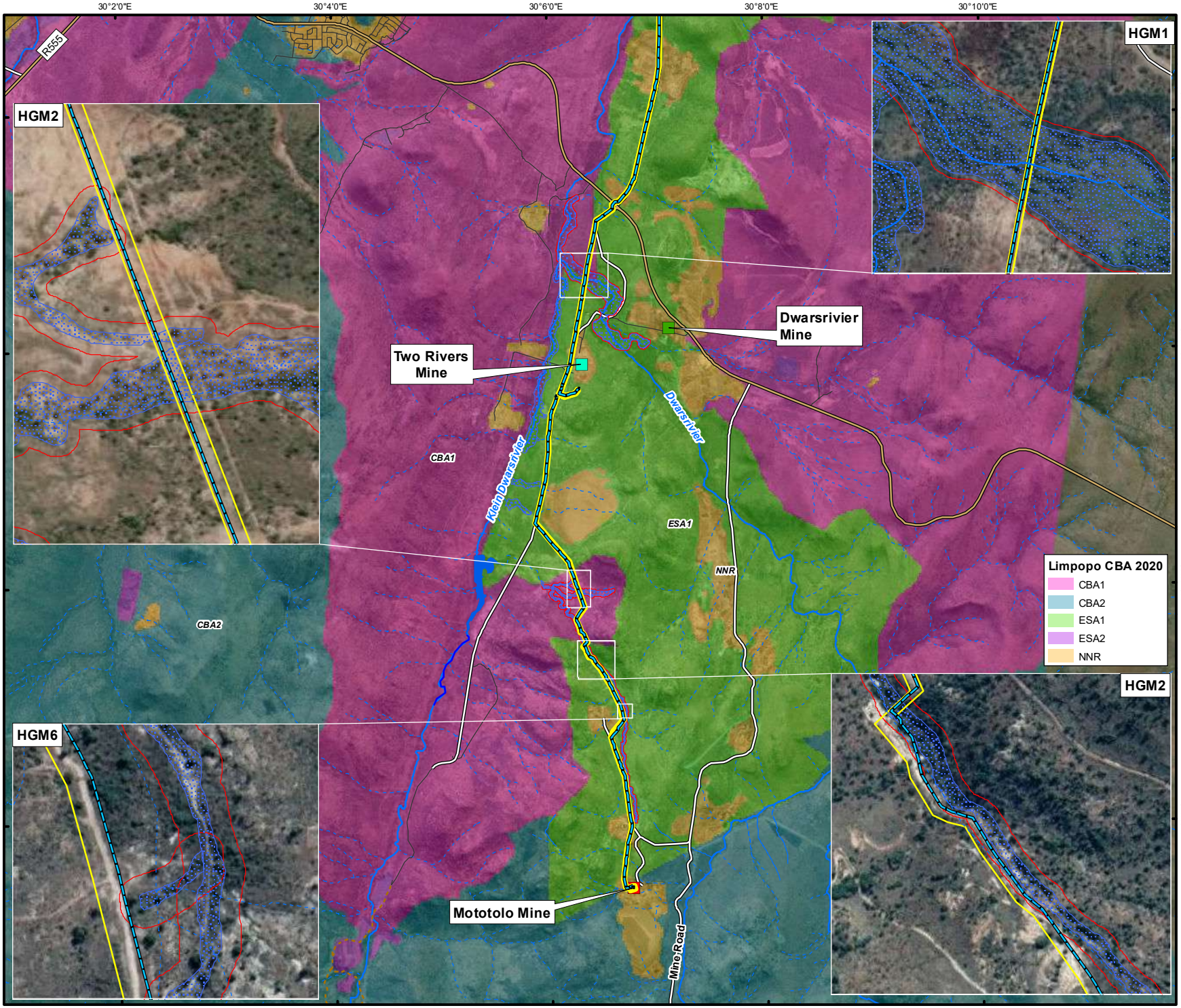
A General Authorisation in terms of the NWA was issued on 12 October 2021 for the proposed project.

3.7 Sensitive areas

The following sensitive areas in proximity of the proposed SE2 pipeline and associated infrastructure have been identified:

- Delineated wetlands and watercourses;
- CBA areas;
- Heritage sites.

Refer to Figure 3:3 to Figure 3:7 for sensitive wetland areas around the SE2 pipeline route, and Figure 3:8 for heritage features identified along the SE2 pipeline route.



Legend

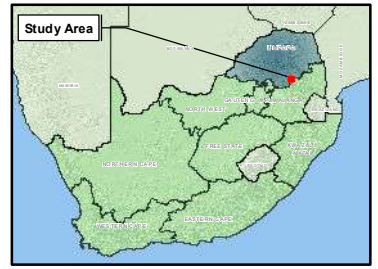
Proposed Pipeline & Associated Infras

- New SE2 pipeline
- Pipeline Servitude

- Dwarsrivier Mine
- Two Rivers Mine
- Mototolo Mine

- Secondary Road
- Tertiary Road
- Street/Road
- Track
- Perennial River Centre line
- Non-Perennial River Centre line

- Wetland Areas
- Intersecting Wetlands (15m Buffer)



SCALE: 1: 100 000

0 1 2 3

Kilometers

N

TITLE:

Figure 3:3
SE2 pipeline and
Intersecting Wetlands

CLIENT:

Lebalelo Water User Association

DATE: Jan 2022	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP: SE2_Pipeline_Intersecting_Wetlands_FigXX.mxd

REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - LM - CplanV2
NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

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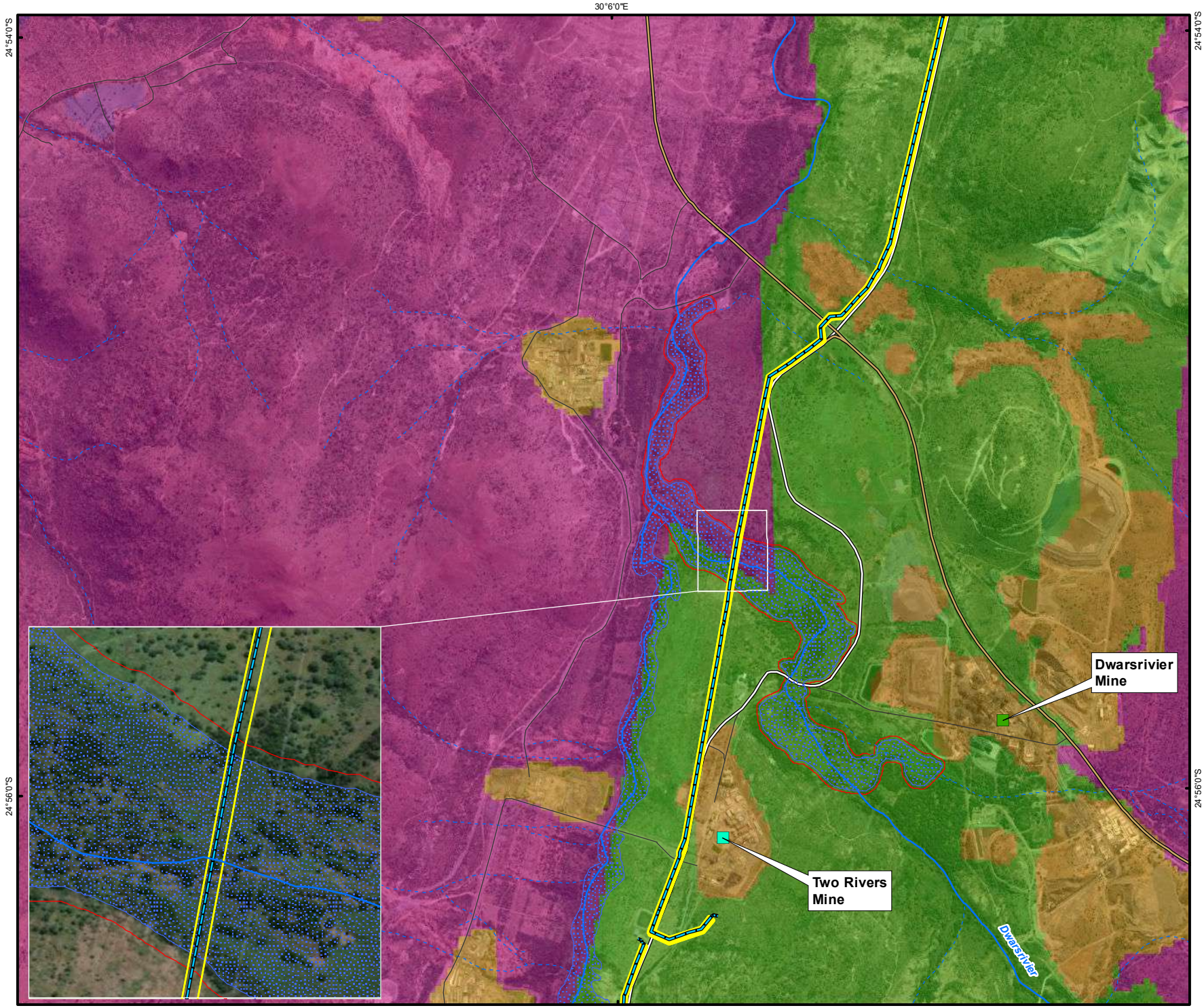


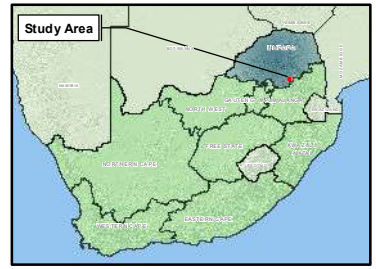
Legend

Proposed Pipeline & Associated Infras

- New SE2 pipeline
- Pipeline Servitude
- Dwarsrivier Mine
- Two Rivers Mine
- Secondary Road
- Tertiary Road
- Street/Road
- Perennial River Centre line
- Non-Perennial River Centre line
- Wetland Areas
- Intersecting Wetlands (15m Buffer)

Limpopo CBA 2020

- CBA1
- ESA1
- ESA2
- NNR



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Meters

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TITLE:

Figure 3:4
SE2 pipeline and
Intersecting Wetlands - HGM1

CLIENT:

Lebalelo Water User Association

DATE: Jan 2022	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP: SE2_Pipeline_Intersecting_Wetlands_HGM1.mxd

REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - LMP - CBA - 2018
NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

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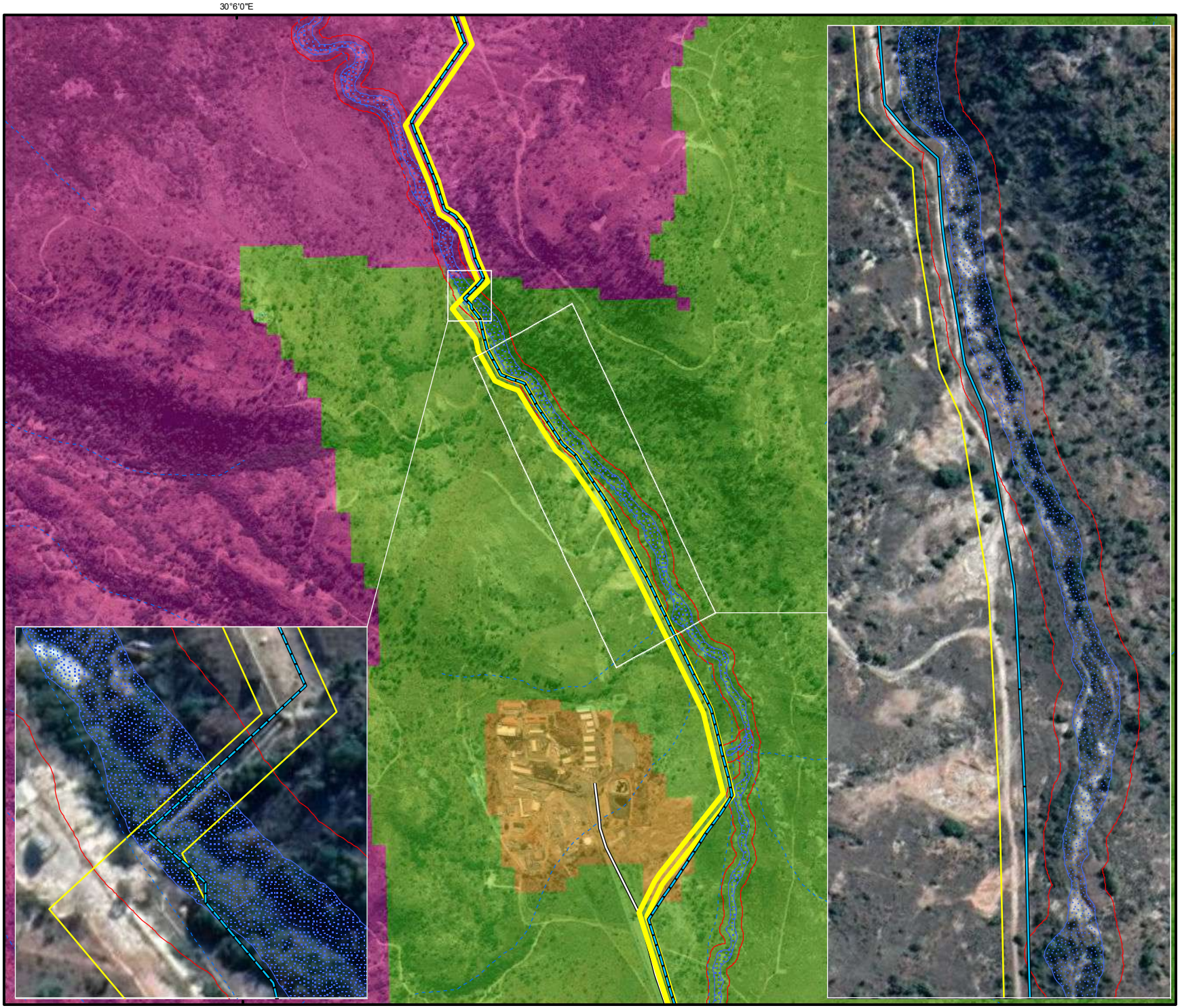


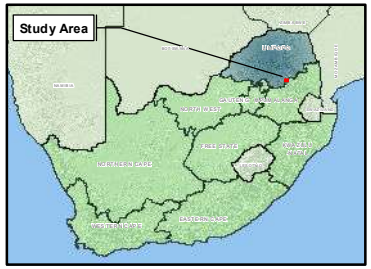
Legend

Proposed Pipeline & Associated Infras

- New SE2 pipeline
- Pipeline Servitude
- Tertiary Road
- Perennial River Centre line
- Non-Perennial River Centre line
- Wetland Areas
- Intersecting Wetlands (15m Buffer)

Limpopo CBA 2020

- CBA1
- ESA1
- NNR



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Meters

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TITLE:

Figure 3:5
SE2 pipeline and
Intersecting Wetlands - HGM2

CLIENT:

Lebalelo Water User Association

DATE: Jan 2022	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP: SE2_Pipeline_Intersecting_Wetlands_HGM2.mxd

REV: 2

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Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - LM - CplanV2
NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

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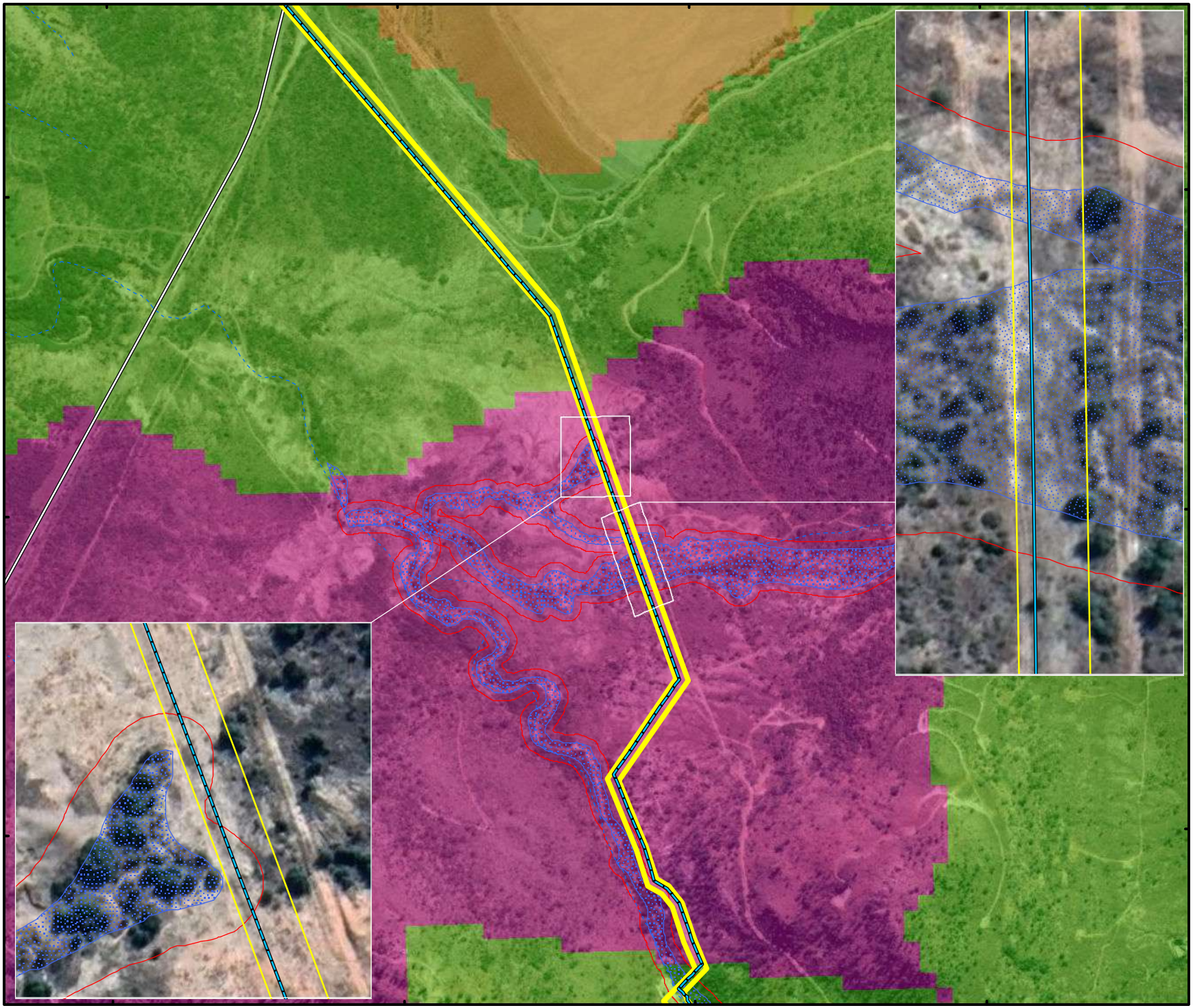


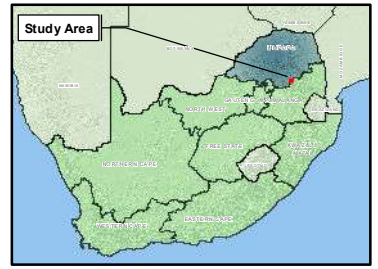
Legend

Proposed Pipeline & Associated Infras

- New SE2 pipeline
- Pipeline Servitude
- Tertiary Road
- Perennial River Centre line
- Non-Perennial River Centre line
- Wetland Areas
- Intersecting Wetlands (15m Buffer)

Limpopo CBA 2020

- CBA1
- ESA1
- NNR



SCALE: 1: 10 000

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Meters

N

TITLE:

Figure 3:6
SE2 pipeline and
Intersecting Wetlands - HGM3

CLIENT:

Lebalelo Water User Association

DATE: Jan 2022	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR
MAP: SE2_Pipeline_Intersecting_Wetlands_HGM3.mxd	REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - LM - CplanV2
NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

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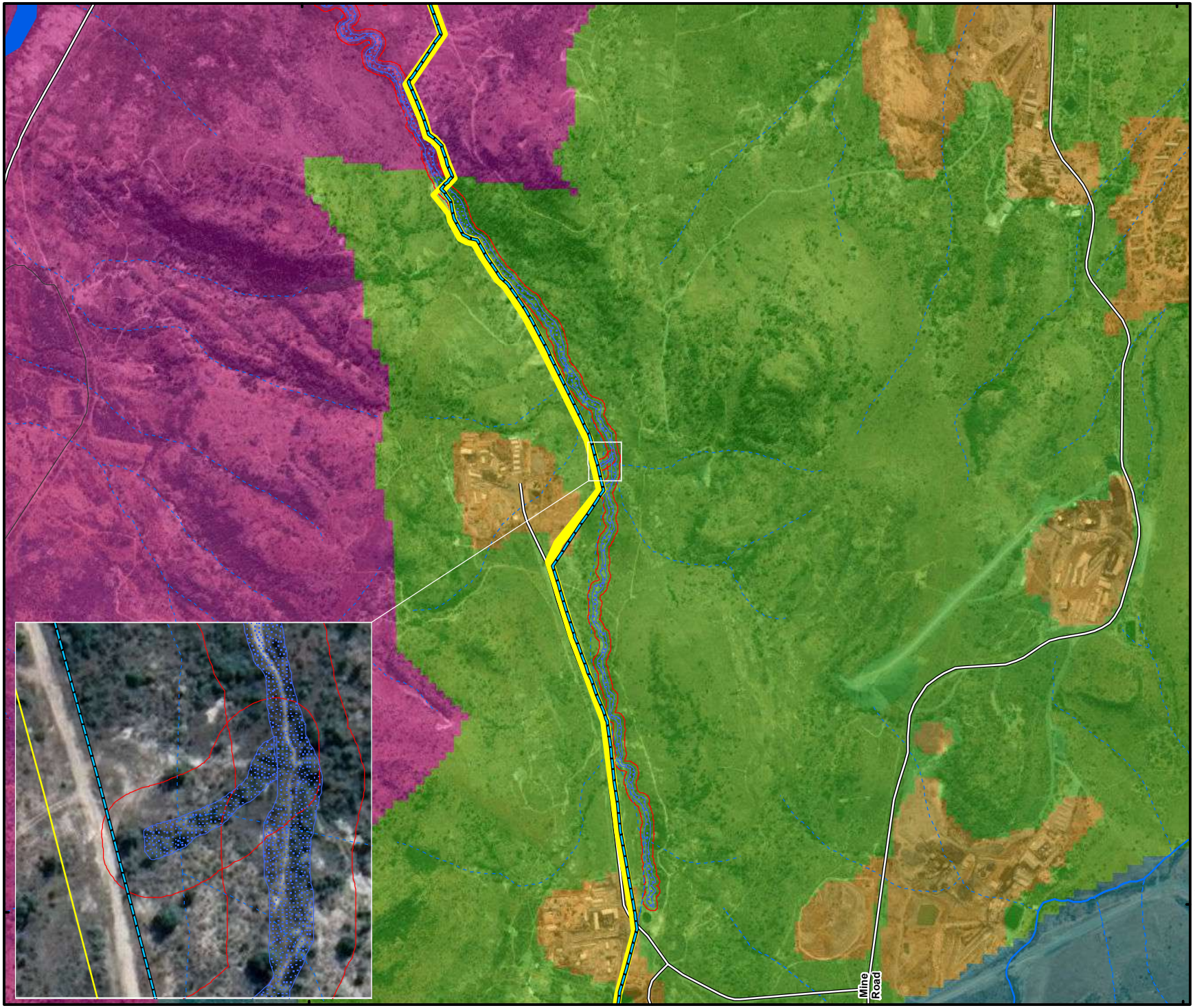


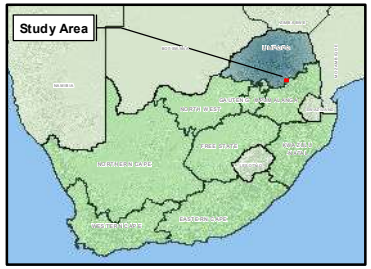
Legend

Proposed Pipeline & Associated Infras

- New SE2 pipeline
- Pipeline Servitude
- Tertiary Road
- Street/Road
- Perennial River Centre line
- Non-Perennial River Centre line
- Wetland Areas
- Intersecting Wetlands (15m Buffer)
- Water Areas

Limpopo CBA 2020

- CBA1
- CBA2
- ESA1
- NNR



SCALE: 1: 12 000

0 250 500

Meters

N

TITLE:

Figure 3:7
SE2 pipeline and
Intersecting Wetlands - HGM6

CLIENT:

Lebalelo Water User Association

DATE: Jan 2022	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP: SE2_Pipeline_Intersecting_Wetlands_HGM6.mxd

REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - LM - CplanV2
NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

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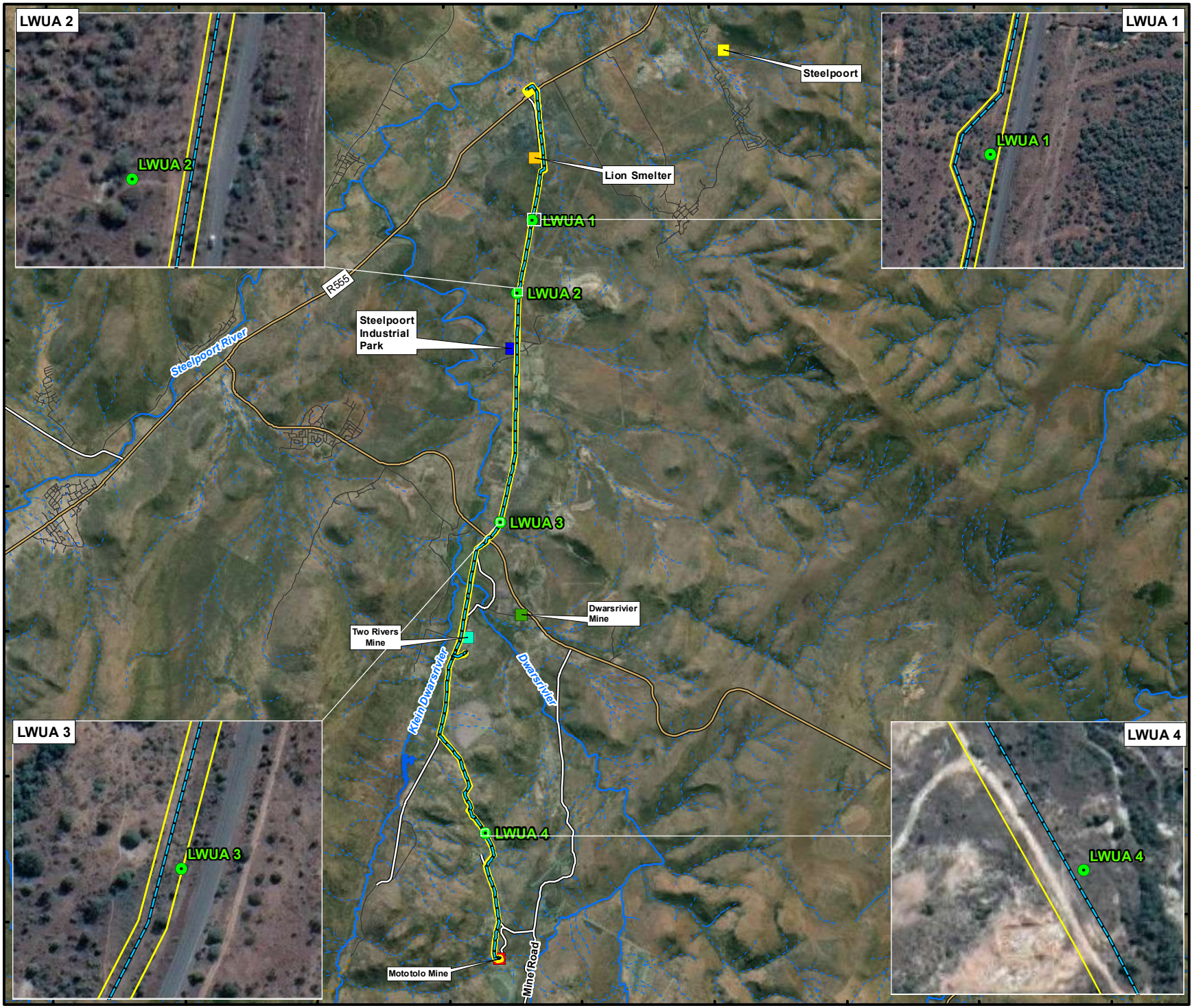
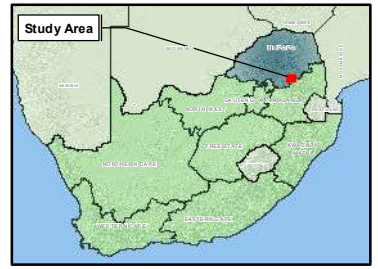


Legend

Proposed Pipeline & Associated Infras

- New SE2 pipeline
- Pipeline Servitude
- Dwarsrivier Mine
- Two Rivers Mine
- Mototolo Mine
- Lion Smelter
- Steelpoort
- Steelpoort Industrial Park
- Secondary Road
- Tertiary Road
- Street/Road
- Track
- Perennial River Centre line
- Non-Perennial River Centre line
- Heritage Sites



SCALE: 1: 130 000

0 1 2 3 Kilometers

N

TITLE:

Figure 3:8
SE2 pipeline and
Heritage Sites

CLIENT:

Lebalelo Water User Association

DATE: Jan 2022	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR
MAP: SE2_Pipeline_heritage_Map.mxd	REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)
VAT No: 4630259952
Tel: 012 940 9457
Fax: 086 634 3967
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Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - LM - CplanV2
NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

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4 ROLES AND RESPONSIBILITIES

The roles and responsibilities indicate which team member(s) are responsible for implementation of the identified mitigation measures, management plan and monitoring. The following parties will have roles and responsibilities in the implementation of this EMPr.

- Applicant (LWUA);
- Construction Contractor;
- Environmental Control Officer; and
- Operator (LWUA).

The roles and responsibilities of each party is described in the sections below.

4.1 Applicant

LWUA is the applicant and will therefore be the entity monitoring the implementation of the EMPr and compliance with the authorisation. The following roles and responsibilities are assigned to the applicant:

- Ensure compliance with the conditions in the EMPr and environmental authorisation during all phases of the project;
- Ensure that contractors and operators undertake to adhere to all the provisions of the EMPr;
- Ensure that environmental monitoring takes place;
- Ensure that independent environmental audits are undertaken;
- Ensure that all monitoring and audit reports are submitted to the competent authority.

4.2 Construction Contractor

During the construction phase, the construction contractor will:

- Be responsible to have the EMPr available on site at all times;
- Appoint an Environmental Control Officer for the construction phase
- Ensure that all mitigation measures for which they are responsible, are implemented as described in this EMPr; and
- Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

4.3 Environmental Control Officer

During the construction phase, the Environmental Control Officer (ECO) will:

- Inspections/audits of environmental protection requirements by employees and sub-contractors;
- Sampling and data capture in accordance with the environmental monitoring program and analysis of results; and
- Assistance with the preparation of environmental monitoring reporting and permit applications.

4.4 Operator

During the operational phase, the operator (LWUA) will:

- Be familiar with the contents and commitments documented in the EMPr;
- Will adhere to the management obligations;
- Ensure that all problems identified during inspections, are addressed, and rectified as soon as reasonably possible.
- Implement LWUA Management policies, procedures, and management plans;
- Review and analysis of monitoring results and preparation of reports to management and stakeholders;
- Planning of and carrying out environmental training programs for employees and contractors;
- Obtaining and maintaining all necessary environmental permits in liaison with the legal manager; and
- Management of the environmental related components of the grievance mechanism.

5 MITIGATION AND/OR MANAGEMENT MEASURES

A variety of potential impacts are associated with the construction and operational related activities for this project. These impacts can be categorised as general construction related impacts as well as construction impacts specifically related to this site. The construction phase is expected to last 18 months. The SE2 pipeline and associated infrastructure will be a permanent facility, and therefore no mitigation for the closure phase have been included.

General best practice rules during construction should be followed at all times. In addition to this the specific mitigation measures and recommendations as highlighted by the Basic Assessment Report (BAR) and various specialists studies for this specific site are included.

5.1 Construction related impacts

During the construction phase, the following possible impacts may occur:

- Loss of soils to compaction and erosion;
- Contamination of soils due to spilled concrete or hydrocarbons;
- Destruction, fragmentation and degradation of habitats;
- Loss of protected plant and tree species;
- Spread and/or establishment of alien and/or invasive species;
- Introduction of nuisance vectors (pests) such as flies, rodents and baboons;
- Direct loss, disturbance and degradation of wetlands;
- Increased bare surfaces, runoff and potential for erosion and resulting sedimentation of the wetlands;
- Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation;
- Increased sediment loads to downstream reaches;
- Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste;
- Disruption of wetland soil profile and alteration of hydrological regime;
- Impact on graves and cemeteries found along SE2 pipeline route;
- Impact of the ephemeral walling at LWUA 04;
- General rise in ambient noise levels;
- Increased dust fallout around construction areas;
- Benefits resulting from employment and income opportunities created by the construction of the pipelines;
- Influx of people and construction workers leading to increased pressure on social services and infrastructure, social pathologies and disruptions, resulting in spontaneous settlements; and
- Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities.

Mitigation measures to be implemented during the construction phase is presented in Table 5:1.

Table 5:1: Mitigation measures to be implemented during the construction phase of the SE2 pipeline project

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
Site clearing and preparation Trench excavation and installation of pipeline Construction of reservoir	Soils	Conservation of soils a resource	Loss of soils to compaction and erosion	Medium (-)	Low (-)	Stockpile the topsoil and sub-soil separately on either side of the trench and backfill in the correct order.	Construction contractor	Once off	Monthly compliance report
						The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm	Construction contractor	Once off	Monthly compliance report
						The proposed pipeline system must be divided up into 100 m intervals. Each interval's soil must be stockpiled and filled back up (in the correct order) to avoid long periods of stockpiling.	Construction contractor	Once off	Monthly compliance report
						All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds.	Construction contractor	Throughout construction phase	Monthly compliance report
						The amount of stockpiling of surplus soil material must be limited as far as practically possible, to avoid unnecessary handling of soil resources.	Construction contractor	Throughout construction phase	Monthly compliance report
						Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.	Construction contractor	Throughout construction phase	Monthly compliance report
						These designated stockpile areas must be viewed as temporary and kept for backfill material.	Construction contractor	Throughout construction phase	Monthly compliance report
						Maintain soil quality and minimise damage to the soil structure during the time the material is stockpiled.	Construction contractor	Throughout construction phase	Monthly compliance report
						All construction access must make use of the existing roads that can be found in and around the project area.	Construction contractor	Throughout construction phase	Monthly compliance report
						Compacted areas are to be ripped to loosen the soil structure where necessary.	Construction contractor	Throughout construction phase	Monthly compliance report
						Implement appropriate stormwater management measures, including the temporary diversion of upstream run-off from the construction and laydown areas.	Construction contractor	Throughout construction phase	Monthly compliance report
						Concurrent rehabilitation must be carried out rather than full rehabilitation after construction.	Construction contractor	Upon rehabilitation	Construction close-out report
						Ensure topsoil is spread back over trench area on closure of the trench. It is preferred that the trench is created on a needs basis to avoid an excessive excavation. As pipe is laid, the trench must be backfilled and topsoil replaced.	Construction contractor	Upon rehabilitation	Construction close-out report
						Landscape and lightly till (no deeper than 30 cm) denuded areas to encourage vegetation establishment as soon as possible.	Construction contractor	Upon rehabilitation	Construction close-out report
Trench excavation and installation of pipeline	Soils	Conservation of soils a resource	Contamination of soils due to spilled concrete or hydrocarbons	Medium (-)	Low (-)	All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.	Construction contractor	Throughout construction phase	Monthly compliance report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
Construction of reservoir						A hydrocarbon spill management plan must 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.	Construction contractor	Throughout construction phase	Monthly compliance report
						The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.	Construction contractor	Throughout construction phase	Monthly compliance report
						Any fuel, oil or hazardous substance spills must be cleaned-up immediately and discarded correctly.	Construction contractor	As required	Monthly compliance report
						Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.	Construction contractor	Throughout construction phase	Monthly compliance report
Vegetation clearing and site preparation	Biodiversity – Fauna and Flora	Limit the disturbance and destruction of vegetation, fauna and habitat	Destruction, fragmentation and degradation of habitats	Medium – High (-)	Low (-)	Demarcate the footprint area with high visibility plastic fencing.	Construction contractor	Throughout construction phase	Monthly compliance report
						Restrict the disturbance footprint to within the designated pipeline route.	Construction contractor	Throughout construction phase	Monthly compliance report
						Existing access routes, especially roads must be made use of.	Construction contractor	Throughout construction phase	Monthly compliance report
						All laydown, chemical toilets etc. should be restricted to low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. No storage of vehicles or equipment will be allowed outside of the designated project areas.	Construction contractor	Throughout construction phase	Monthly compliance report
						Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. All livestock must always be kept out of the project area, especially areas that have been recently re-planted	Construction contractor	As required	Monthly compliance report
						Progressive rehabilitation as the construction of the pipeline continues as well as any cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank	Construction contractor	As required	Monthly compliance report
						A hydrocarbon spill management plan must 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. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.	Construction contractor	Throughout construction phase	Monthly compliance report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
						It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Construction contractor	Throughout construction phase	Monthly compliance report
						A fire management plan needs to be complied in terms of the National Veld and Forest Fire Act, 101 of 1998, and implemented to restrict the impact fire might have on the surrounding areas. The following preventative measures must be included: • Adherence to the daily fire danger ratings • Must have equipment, protective clothing and trained personnel for extinguishing fires • No lighting, using or maintain a dire in the open air unless in the designated place • Contractors must do everything in their power to stop the spread of veld fires during the installation of water pipes.	Construction contractor	Throughout construction phase	Monthly compliance report
						Reduce the disturbance footprint and the unnecessary clearing of vegetation on either side of the trench as far as possible.	Construction contractor	Throughout construction phase	Monthly compliance report
	Biodiversity – Fauna and Flora	Limit the disturbance and destruction of vegetation, fauna and habitat	Loss of protected plant and tree species	Medium - High (-)	Low (-)	A pre-construction walkdown in the flowering season (October -March) should be conducted as part of a search and rescue operation. A suitable service provider (ie botanist) must be responsible for the removal of the threatened plants after which they must be utilised in the rehabilitation process. • All protected trees identified should be marked and counted, including their seedlings and protected trees in the nearby. • Damaging of protected trees during construction must be avoided. • Relocation/transplanting of protected trees is highly recommended. • Application listing all affected protected tree species and how they are affected by the proposed project, must be made with the Department of Forestry, Fisheries and the Environment (DFFE). • An environmental workshop must be conducted to all contractors working in the project (Environmental Awareness Plan).	Construction contractor	Once off prior to commencement of construction	Botany report
						Any individual of the threatened/protected plants that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. Hi visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. Infrastructure, development areas and routes where protected plants cannot be avoided, these plants many being geophytes or small succulents should be removed from the soil and relocated/ re-planted in similar habitats where they should be able to resprout and flourish again. All protected and red-data plants should be relocated, and as many other geophytic species as possible.	Construction contractor	Once off prior to commencement of construction	Botany report
						Any individual of the nationally protected trees or protected plants that were observed needs a relocation or destruction permit that will be required for any individual that may be removed or destroyed due to the development, alternatively the trees/plants can be relocated within the property without a permit or otherwise left unharmed. High visibility flags must be placed near any protected trees/plants.	Construction contractor	Once off prior to commencement of construction	Issuance of permits if required

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
Vegetation clearing and site preparation Trench excavation and installation of pipeline Construction of reservoir	Biodiversity – Fauna and Flora	Minimise and prevent the spread of alien and/or invasive species	Spread and/or establishment of alien and/or invasive species	Low (-)	Low (-)	Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	Construction contractor	Throughout construction phase	Construction close-out report
						The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.	Construction contractor	Throughout construction phase	Monthly compliance report
						Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	Construction contractor	Weekly	Monthly compliance report
						Compilation of and implementation of an alien vegetation management plan.	Construction contractor	Throughout construction phase	Monthly compliance report
						A pest control plan must be put in place and implemented; it is imperative that poisons not be used. Opt for manual removal.	Construction contractor	Throughout construction phase	Monthly compliance report
Vegetation clearing and site preparation Trench excavation and installation of pipeline Construction of reservoir, solar panels, and new pump stations	Biodiversity – Fauna and Flora	Limit the disturbance and destruction of vegetation, fauna and habitat	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching).	Medium High (-)	Low (-)	A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any SSC should be noted. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.	Construction contractor	Once off prior to commencement of construction	Monthly compliance report
						The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, • Signs must be put up to enforce this	Construction contractor	Throughout construction phase	Monthly compliance report
						The duration of the construction should be minimised to as short term as possible, to reduce the period of disturbance on fauna.	Construction contractor	Throughout construction phase	Monthly compliance report
						Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals	Construction contractor	Throughout construction phase	Monthly compliance report
						No trapping, killing, or poisoning of any wildlife is to be allowed. • Signs must be put up to enforce this	Construction contractor	Throughout construction phase	Monthly compliance report
						Any holes/deep excavations must be dug and planted in a progressive manner and shouldn't be left open overnight; Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in.	Construction contractor	Throughout construction phase	Monthly compliance report
						All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited	Construction contractor	Once off prior to commencement of construction	Monthly compliance report
Vegetation clearing and site preparation	Biodiversity – Fauna and Flora	Limit the disturbance and destruction of	Introduction of nuisance vectors (pests) such as flies, rodents and baboons	Low (-)	Low (-)	Ensure the correct handling, storage and operation of general waste generated on the construction site.	Construction contractor	Throughout construction phase	Monthly compliance report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
Trench excavation and installation of pipeline Construction of reservoir		vegetation, fauna and habitat				A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area	Construction contractor	Throughout construction phase	Monthly compliance report
						The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. Waste management must be a priority and all waste must be collected and stored effectively.	Construction contractor	Weekly	Monthly compliance report
						Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site.	Construction contractor	Throughout construction phase	Monthly compliance report
						Refuse bins will be emptied and secured Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Construction contractor	Weekly	Monthly compliance report
						Remove general waste generated frequently as to prevent the development of a breeding habitat for nuisance pests such as flies, and attracting rodents and baboons.	Construction contractor	Weekly	Monthly compliance report
Vegetation clearing and site preparation Trench excavation and installation of pipeline	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Direct loss, disturbance and degradation of wetlands.	Medium (-)	Low (-)	Restrict all construction related activities to within the designated pipeline route.	Construction contractor	Throughout construction phase	Monthly compliance report
						Use wetland spatial data (shapefiles) to mark out the positions where the pipeline will enter and exit the 15 m buffer on the boundary of a wetland. Indicate delineated wetlands on site layout plans.	Construction contractor	Throughout construction phase	Monthly compliance report
						Adhere to the prescribed wetland buffers for secondary activities. Restrict all secondary activities (e.g. laydown yards, storage areas, cement mixing and equipment to outside of wetlands and their prescribed buffers.	Construction contractor	Throughout construction phase	Monthly compliance report
						Signpost the area beyond the construction footprint where the pipeline traverses the wetlands as an environmentally sensitive area and keep all excavation, soil stockpiling, general access and construction activities out of this area.	Construction contractor	Throughout construction phase	Monthly compliance report
						Demarcate the 15 m buffer zone around wetlands on the ground (e.g. painted wooden poles/high visibility plastic fencing).	Construction contractor	Throughout construction phase	Monthly compliance report
						Reduce the disturbance footprint and the unnecessary clearing of vegetation on either side of the trench as far as possible when traversing wetlands.	Construction contractor	Throughout construction phase	Monthly compliance report
						Consider above ground crossings over wetland areas. Alternatively, open trench crossings are permissible but backfilling and rehabilitation must be undertaken.	Construction contractor	Throughout construction phase	Monthly compliance report
						Load wetland spatial data onto a GPS and use it to mark out the positions where the pipeline will enter and exits the prescribed buffer on the boundary of a wetland. Try to reduce the disturbance footprint and the unnecessary clearing of vegetation on either side of the trench as far as possible when traversing wetlands.	Construction contractor	Throughout construction phase	Monthly compliance report
						All chemicals and toxicants to be used for the construction must be stored in a bunded area	Construction contractor	Throughout construction phase	Monthly compliance report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
						Construct the wetland crossings during winter, if possible, when flow volumes are lowest. This will reduce impacts to wetlands due to soil poaching/sourcing and vegetation trampling under peak saturation levels. Additionally, the risk of vehicles getting stuck and further degrading the vegetation integrity is lowest during this time.	Construction contractor	Throughout construction phase	Monthly compliance report
Vegetation clearing and site preparation	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Increased bare surfaces, runoff and potential for erosion and resulting sedimentation of the wetlands	Medium (-)	Low (-)	Keep the trench excavation neat and tidy.	Construction contractor	Throughout construction phase	Monthly compliance report
						Separate sub-soil and topsoil on either side of the trench.	Construction contractor	Throughout construction phase	Monthly compliance report
						Limit construction activities across the wetlands to the dry season, if possible, when storms are least likely to wash concrete and sand into wetlands.	Construction contractor	Throughout construction phase	Monthly compliance report
						Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.	Construction contractor	Throughout construction phase	Monthly compliance report
						Mixing of concrete must under no circumstances take place in any wetland or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished.	Construction contractor	Throughout construction phase	Monthly compliance report
						Do not situate any of the construction material laydown areas within any wetland or buffer areas.	Construction contractor	Throughout construction phase	Monthly compliance report
						No machinery/equipment should be allowed to be parked in any wetlands or buffer zone areas	Construction contractor	Throughout construction phase	Monthly compliance report
						Ensure topsoil is spread back over trench area on closure of the trench. It is preferred that the trench is created on a needs basis to avoid an excessive excavation. As pipe is laid, the trench must be backfilled and topsoil replaced.	Construction contractor	Upon rehabilitation	Construction close-out report
						Speed limits must be put in place to reduce erosion. • Reducing the dust generated by the listed activities above, especially the earth moving machinery, through wetting the soil surface and putting up signs to enforce speed limit as well as speed bumps built to force slow speeds; • Signs must be put up to enforce this.	Construction contractor	Throughout construction phase	Monthly compliance report
						Where possible, existing access routes and walking paths must be made use of.	Construction contractor	Throughout construction phase	Monthly compliance report
						Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds.	Construction contractor	Upon rehabilitation	Construction close-out report
						A stormwater management plan must be compiled and implemented.	Construction contractor	Throughout construction phase	Monthly compliance report
						Landscape and lightly till (no deeper than 30 cm) denuded areas to encourage vegetation establishment as soon as possible.	Construction contractor	Upon rehabilitation	Construction close-out report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
Vegetation clearing and site preparation	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Medium (-)	Low (-)	Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed.	Construction contractor	Throughout construction phase	Monthly compliance report
						The use of herbicides is not recommended in or near wetlands (opt for mechanical removal).	Construction contractor	Throughout construction phase	Monthly compliance report
						Appropriately stockpile topsoil cleared from the project area. This can be used for rehabilitation of the servitude.	Construction contractor	Throughout construction phase	Monthly compliance report
						Clearly demarcate construction footprint, and limit all activities to within this area.	Construction contractor	Throughout construction phase	Monthly compliance report
						Minimize unnecessary clearing of vegetation.	Construction contractor	Throughout construction phase	Monthly compliance report
						All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”.	Construction contractor	Throughout construction phase	Monthly compliance report
						Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation).	Construction contractor	Throughout construction phase	Monthly compliance report
						No dumping of construction material on site may take place within the wetland or buffer area. All material must be contained in waste skips and removed to designated (and licensed) facilities.	Construction contractor	Throughout construction phase	Monthly compliance report
						All waste generated on site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.	Construction contractor	Weekly	Monthly compliance report
						Landscape and re-vegetate all denuded areas as soon as possible.	Construction contractor	Upon rehabilitation	Construction close-out report
Vegetation clearing and site preparation Trench excavation and installation of pipeline	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Increased sediment loads to downstream reaches	Medium (-)	Low (-)	Implement mitigation for increased bare surfaces, runoff and potential for erosion.	Construction contractor	Throughout construction phase	Monthly compliance report
						Re-instate topsoil and lightly till disturbance footprint.	Construction contractor	Throughout construction phase	Monthly compliance report
						At all crossings install sandbags on downstream side of the footprint to trap sediment until the site has been constructed and vegetation has re-established.	Construction contractor	Throughout construction phase	Monthly compliance report
Vegetation clearing and site preparation Trench excavation and installation of pipeline	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste	Medium (-)	Low (-)	Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.	Construction contractor	Throughout construction phase	Monthly compliance report
						Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering the wetland areas.	Construction contractor	Throughout construction phase	Monthly compliance report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
						Mixing of concrete must under no circumstances take place within the wetland or buffer areas.	Construction contractor	Throughout construction phase	Monthly compliance report
						Regularly maintain stormwater infrastructure, pipes, pumps and machinery to minimise the potential for leaks. Check for oil leaks, keep a tidy operation, install bins and promptly clean up any spills or litter.	Construction contractor	Throughout construction phase	Monthly compliance report
						Provide appropriate sanitation facilities during construction and service them regularly. These must be beyond the wetland and buffer area.	Construction contractor	Weekly	Monthly compliance report
						Monitor and inspect machinery, vehicles and equipment for leaks and spills.	Construction contractor	Throughout construction phase	Monthly compliance report
Backfilling of trench	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Disruption of wetland soil profile and alteration of hydrological regime	Medium (-)	Low (-)	Document the soil profile on removal and check the order in which soil is replaced. Separate the topsoil (including seedbank) from the subsoil layer.	Construction contractor	Upon rehabilitation	Construction close-out report
						Ensure that topsoil is appropriately stored and re-applied during trench backfilling.	Construction contractor	Upon rehabilitation	Construction close-out report
						Ensure that the soil is backfilled and compacted to accepted geotechnical standards to avoid flow canalisation along the trench and the potential for sinkhole formation.	Construction contractor	Upon rehabilitation	Construction close-out report
Site clearing and preparation Trench excavation and installation of infrastructure	Heritage	Protect and preserve heritage resources	Impact on graves and cemeteries found along SE2 pipeline route	Medium-High (-)	Low (-)	All recorded graves and burial sites should be indicated on development plans and avoided with a buffer of 30m.	Construction contractor	Throughout construction phase	Monthly compliance report
						The graves and cemeteries must be accessible at all times during construction.	Construction contractor	Throughout construction phase	Monthly compliance report
						Burial sites (LWUA 1,2,3) must be cleared of vegetation to establish the boundaries of the sites to determine the possibility of unmarked graves.	Construction contractor	Prior to commence of trench excavation	Monthly compliance report
						Implement dust suppression around graves and cemeteries to minimise dust fallout on headstones.	Construction contractor	Daily	Monthly compliance report
						Implement the chance find procedure should an artefact or grave be uncovered during construction.	Construction contractor/LWUA	As required	Monthly compliance report
Site clearing and preparation Trench excavation and installation of infrastructure	Heritage	Protect and preserve heritage resources	Impact of the ephemeral walling at LWUA 04	Medium (-)	Low (-)	Implement the chance find procedure should an artefact or grave be uncovered during construction.	Construction contractor/LWUA	As required	Monthly compliance report
						If it not possible to avoid site LWUA 4, a permit in terms of section 35(4) of the NHRA must be applied from SAHRA prior to the construction phase.	Construction contractor/LWUA	If required	Monthly compliance report
						Submit monitoring reports to SAHRA once the construction phase has been completed	Construction contractor/LWUA	Once construction phase is completed.	Monitoring Report

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
Site clearing and preparation Trench excavation and installation of pipeline Construction of reservoir	Noise	Minimise the generation of noise	General rise in ambient noise levels	Medium (-)	Low (-)	Ensure high level of equipment maintenance, especially intake and exhaust mufflers.	Construction contractor	Monthly	Monthly compliance report
						Replace pure tone (beeping) with broadband (hissing) reversing alarms.	Construction contractor	As required	Monthly compliance report
						Construction activities to take place only during daylight hours.	Construction contractor	Throughout construction phase	Monthly compliance report
Site clearing and preparation Trench excavation and installation of pipeline Construction of reservoir	Air Quality	Minimise atmospheric emissions and dust generation	Increased dust fallout around construction areas	Medium (-)	Low (-)	Apply dust suppressants to gravel roads used.	Construction contractor	Daily	Monthly compliance report
						Set speed limits to 40 km/h to minimise the creation of fugitive dust within the project boundary.	Construction contractor	Throughout construction phase	Monthly compliance report
						Dust-reducing mitigation measures must be put in place and must be strictly adhered to, during the construction phase. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated.	Construction contractor	Throughout construction phase	Monthly compliance report
Construction of SE2 pipeline and reservoir	Social	Maximise employment opportunities and social benefits	Benefits resulting from employment and income opportunities created by the construction of the pipelines	Low (+)	Low (+)	Develop a clear and concise employment policy prioritising local employment	LWUA	Once off	LWUA Employment Policy
						Employ local works if qualified applicants with the appropriate skills are available.	Construction contractor	Throughout construction phase	Stakeholder Engagement Plan
						Purchase goods and services at a local level if available.	Construction contractor	Throughout construction phase	Stakeholder Engagement Plan
Construction of SE2 pipeline and reservoir	Social	Maximise employment opportunities and social benefits	Influx of people and construction workers leading to increased pressure on social services and infrastructure, social pathologies and disruptions, resulting in spontaneous settlements	Medium (-)	Low (-)	Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy.	LWUA	Once off	LWUA Employment Policy
						Identify and support community development programmes that address challenges raised by population influx and spontaneous settlement.	LWUA/ Construction contractor	Throughout construction phase	Stakeholder Engagement Plan
						Support local government capacity for integrated development planning.	LWUA	Throughout construction phase	Stakeholder Engagement Plan
						Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase.	LWUA/ Construction contractor	Throughout construction phase	Stakeholder Engagement Plan
						Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	LWUA/ Construction contractor	Throughout construction phase	Stakeholder Engagement Plan
Construction of SE2 pipeline and reservoir	Social	Maximise employment	Dissatisfaction over employment opportunities and conditions of	Medium (-)	Low (-)	Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy.	LWUA	Once off	LWUA Employment Policy

Construction Phase									
Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential Environmental Impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**	**Method of monitoring**
		opportunities and social benefits	procurement which could potentially lead to community protests and unrests, as well as conflicts within communities			Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	LWUA/ Construction contractor	Throughout construction phase	Stakeholder Engagement Plan
						Monitor and implement the Grievance Management Mechanism.	LWUA/ Construction contractor	Throughout construction phase	Grievance register
						Involve Local Ward Councillors and keep them informed about project developments, and included in all stakeholder engagement processes. Their involvement will assist with the successful development of relationships between the LWUA, the municipality and the communities.	LWUA/ Construction contractor	Throughout construction phase	Stakeholder Engagement Plan

5.2 Operational related impacts

During the operational phase, the management of the SE2 pipeline and associated infrastructure will fall under the responsibility of LWUA. Impacts will be limited to the maintenance of the SE2 pipeline and associated infrastructure.

During the operational phase of the project, the following possible impacts may occur:

- Disturbance to soils around watercourse crossings;
- Contamination of soils due to spilled concrete or hydrocarbons;
- Disturbance to local vegetation, leading to spread and/or establishment of alien and/or invasive species;
- Disturbance to wetlands due to repair work undertaken at watercourse crossings;
- Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste;
- Increased raw water inputs to downstream wetlands;
- General rise in ambient noise levels;
- Increased dust fallout; and
- Water provision to benefitting mines and industries.

Mitigation measures to be implemented during the operational phase are presented in Table 5:2.

Table 5:2: Mitigation measures to be implemented during the operational phase of the SE2 pipeline project

Activity that may cause an impact	Environmental/ Social aspect	Management Outcomes	Potential environmental impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible Person	Frequency and/or time period
General maintenance activities	Soils	Conservation of soils as a resource	Disturbance to soils around watercourse crossings	Medium (-)	Low (-)	All maintenance contractors must access watercourse crossings using existing roads that can be found in and around the project area.	LWUA	During maintenance activities
						Compacted areas are to be ripped to loosen the soil structure where necessary.	LWUA	During maintenance activities
						Monitoring of the pipeline must be undertaken to detect leaks. Monitoring should be undertaken at least once a week.	LWUA	Weekly
						Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	LWUA	During maintenance activities
Encasing the pipeline caused by erosion at watercourse crossings	Soils	Conservation of soils as a resource	Contamination of soils due to spilled concrete or hydrocarbons	Medium (-)	Low (-)	All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.	LWUA	During maintenance activities
						A hydrocarbon spill management plan must 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.	LWUA	Once off
						The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.	LWUA	During maintenance activities
						Any fuel, oil or hazardous substance spills must be cleaned-up immediately and discarded correctly.	LWUA	As required during maintenance activities
						Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.	LWUA	During maintenance activities
						All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.	LWUA	As required during maintenance activities
General maintenance activities	Biodiversity – Fauna and Flora	Limit the disturbance and destruction of vegetation, fauna and habitat	Continued destruction, fragmentation and degradation of habitats and ecosystems And Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration).	Medium (-)	Low (-)	Existing access routes, especially roads must be made use of.	LWUA	During maintenance activities
						Progressive rehabilitation as the construction of the pipeline continues as well as any cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank.	LWUA	During maintenance activities
						Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	LWUA	During maintenance activities
						All structure footprints to be rehabilitated and landscaped after the development is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.	LWUA	During maintenance activities
						It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	LWUA	During maintenance activities
						A fire management plan needs to be complied in terms of the National Veld and Forest Fire Act, 101 of 1998, and implemented to restrict the impact fire might have on the surrounding areas. The following preventative measures must be included: • Adherence to the daily fire danger ratings	LWUA	During maintenance activities

Activity that may cause an impact	Environmental/ Social aspect	Management Outcomes	Potential environmental impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible Person	Frequency and/or time period
						• Must have equipment, protective clothing and trained personnel for extinguishing fires • No lighting, using or maintain a dire in the open air unless in the designated place • Contractors must do everything in their power to stop the spread of veld fires during the installation of water pipes.		
						All maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	LWUA	During maintenance activities
General maintenance activities	Biodiversity – Fauna and Flora	Minimise and prevent the spread of alien and/or invasive species	Disturbance to local vegetation, leading to spread and/or establishment of alien and/or invasive species	Medium (-)	Low (-)	Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	LWUA	As required during maintenance activities
						Implementation of an alien vegetation management plan.	LWUA	During maintenance activities
						Promptly remove all alien and invasive plant species observed during site inspections (i.e. weedy annuals and other alien forbs) must be removed.	LWUA	During maintenance activities
						The use of herbicides is not recommended in or near wetlands (opt for mechanical removal).	LWUA	During maintenance activities
Repair to erosion protection structures at watercourse pipeline crossings	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Disturbance to wetlands due to repair work undertaken at watercourse crossings	Medium (-)	Low (-)	Repair to erosion protection structures should be done by hand.	LWUA	During maintenance activities
						No vehicles should enter the watercourse areas.	LWUA	During maintenance activities
						Undertake repair activities during winter, if possible. This will reduce impacts to wetlands due to soil poaching/sourcing and vegetation trampling under peak saturation levels. Additionally, the risk of vehicles getting stuck and further degrading the vegetation integrity is lowest during this time.	LWUA	During maintenance activities
General Maintenance activities	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Medium (-)	Low (-)	All sediment and debris removed from crossings must not be stored within wetland areas and buffer zones, or within other watercourses and must be deposited at an appropriate waste facility.	LWUA	During maintenance activities
						Mixing of concrete must under no circumstances take place within the wetland or buffer areas	LWUA	During maintenance activities
						Provide appropriate sanitation facilities during maintenance activities and service them regularly. These must be beyond the wetland and buffer area.	LWUA	During maintenance activities
						Monitor and inspect machinery, vehicles and equipment for leaks and spills.	LWUA	During maintenance activities
Operation of raw water pipeline Pipeline leak	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Increased raw water inputs to downstream wetlands	Low (-)	Low (-)	Conduct regular inspections of manholes along both the pipeline routes and fix leaks timeously. Engineers should advise on the frequency of pressure tests to detect leaks.	LWUA	As pe inspection requirements
						Monitor water quality at pump stations.	LWUA	As per requirements of the water use licence/general authorisation
						Install leak detection devices.	LWUA	Once off
General maintenance activities	Noise	Minimise the generation of noise	General rise in ambient noise levels	Low (-)	Low (-)	Ensure high level of equipment maintenance, especially intake and exhaust mufflers.	LWUA	During maintenance activities

Activity that may cause an impact	**Environmental/ Social aspect**	**Management Outcomes**	**Potential environmental impact**	**Significance before mitigation**	**Significance after mitigation**	**Management Measure**	**Responsible Person**	**Frequency and/or time period**
						Replace pure tone (beeping) with broadband (hissing) reversing alarms.	LWUA	During maintenance activities
						Maintenance activities to take place only during daylight hours.	LWUA	During maintenance activities
General maintenance activities	Air quality	Minimise atmospheric emissions and dust generation	Increased dust fallout	Low (-)	Low (-)	Apply dust suppressants to gravel roads used.	LWUA	Daily when maintenance is undertaken
						Set speed limits to 40 km/h to minimise the creation of fugitive dust within the project boundary.	LWUA	During maintenance activities
						Dust-reducing mitigation measures must be put in place and must be strictly adhered to, during the maintenance. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated.	LWUA	Daily when maintenance is undertaken
Operation of raw water pipeline	Social	Maximise social benefits	Water provision to benefitting mines and industries	Medium (+)	Medium (+)	Ensure that the raw water pipeline is in good working order and is regularly maintained.	LWUA	As per inspection requirements

6 MANAGEMENT PLANS

The following management plans are detailed in the sections below:

- Heritage chance find procedure;
- Paleontological chance find procedure;
- Construction camp management;
- Waste management plan;

6.1 Heritage chance find procedure

The possibility of the occurrence of subsurface archaeological finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMPr. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist or palaeontologist, depending on the nature of the finds, for an assessment of the finds. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required, subject to permits issued by SAHRA;
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA.
- If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngqalabutho Madida 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA.

6.2 Paleontological chance find procedure

The following procedure is only required if fossils are seen on the surface and when excavations/drilling commence.

- When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the mining activities will not be interrupted.

- Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. Refer to the Palaeontology study for photos of examples. This information will be built into the EMPr's training and awareness plan and procedures.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the developer/environmental officer/contractor then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered, then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished, then no further monitoring is required.

6.3 Construction Camp Management

The following management measures will be implemented at the construction camp/laydown area:

- Demarcate the construction camp/laydown area.
- Adequate portable ablution facilities for construction crews will be provided by the Construction Contractor and will be located at least 30m from the edge any delineated wetlands.
- All vehicles must make use of the existing roads.
- No uncontrolled discharges from the construction camp shall be permitted.
- Correct storage, handling and operation of the waste handling, management and storage area and laydown areas.

6.4 Waste Management Plan

The following waste management measures will be implemented:

- The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. Waste management must be a priority and all waste must be collected and stored effectively.
- Bins must be clearly marked for ease of management.
- Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris, and builder's wastes generated on the site.
- Monitoring of litter, spills, fuels, chemicals and human waste in and around the project area.
- A minimum of one toilet must be provided per 10 persons during construction. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.
- The Contractor/Operator should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.
- Where a registered disposal facility is not available close to the project area, the Contractor/Operator shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned or buried on site without the necessary approvals.
- General waste generated shall be removed on a frequent basis to prevent the development of a breeding habitat for nuisance pests such as flies and attracting rodents.

- Procedures for firefighting equipment that need to be checked and tested are aligned with the firefighting policy and procedure.

7 ENVIRONMENTAL MONITORING

A monitoring programme will be implemented for the duration of the construction of the SE2 pipeline and associated infrastructure. This programme will include (but is not limited to):

- Establishing a baseline through the taking of photographs of identified environmental aspects and potential impact on the development area;
- Monitoring of the spread of alien invasive species around the site;
- Monitoring of stormwater management structures and the effectiveness thereof;
- Ensuring that re-vegetation is taking place at rehabilitated construction areas; and
- Site inspections during construction activities to monitor the excavation of heritage features by taking photographs of excavated areas

8 REHABILITATION PLAN

The Rehabilitation Plan was obtained from The Biodiversity Company's (TBC) Wetland and Terrestrial Assessment Report for the Proposed Lebalelo Water User Association Spitskop to Mototolo Pipeline Project, December 2021 (Appendix E1 of the Amended Draft Basic Assessment Report).

8.1 Backfill the excavated areas

Excavations will have to be conducted to install the pipeline. The backfilling of excavated areas will be vital to successful rehabilitation.

During the period in which the excavated material is stockpiled, some of the material might be lost due to wind and water carrying lighter particles away. To compensate for the loss of this material, topsoil must be used to completely fill the excavated areas as well as degraded areas that have experienced a loss of soil reserves. It is worth noting that the topsoil material should not be mixed with the excavated material, but rather introduced to the surface. The surface of this topsoil area outside of the delineated wetland must be slightly compacted to compensate for subsidence of this material.

As part of the mitigation measures, the top 30 cm of the excavated soil resources must be stockpiled separately from that below 30 cm. The soil resources must be reintroduced back into the excavated areas according to the order excavated. In cases where stockpiled material has been lost, topsoil must be reintroduced into areas with insufficient material. It is imperative that weed free topsoil be used.

According to Rodriguez (2019), trenches must be backfilled immediately after the completion of the construction process. It is recommended that the pipeline be divided into sections to start and complete sections to decrease stockpiling time.

To summarise;

- Divide the 500 odd metres of pipeline into 100 m sections. These sections must be started and finished (rehabilitated) before starting with the next section;
- Stockpile excavated material according to horizons (the top 30 cm separate from the rest of the material);
- Reintroduce the subsoil into the excavated trench and then gently compact the soil; and
- Reintroduce the topsoil into the excavated trench and then compact the soil gently.

8.2 Reconstruction of Crossings

The crossing areas / structures might be damaged to accommodate the placement of the pipeline. The crossings must either be re-informed or constructed (if need be). It is worth noting that the call will be made by the design engineer in consultation with the environmental practitioner as to the suitable approach.

8.3 Restore Vegetation Cover

Restoring vegetation cover is the first step to successful rehabilitation. Vegetation cover decreases flow velocities, assimilates contaminants, increases biodiversity and minimises erosion, which are all key aspects involved in rehabilitation

8.3.1 Ripping all Compacted Areas

All areas outside of the wetland that will be degraded (by means of vehicles, laydown yards, ablution facilities etc.) must be ripped where compaction has taken place. According to the Department of Primary Industries

and Regional Development (Agriculture and Food) (2017), ripping tines must penetrate to just below the compacted horizons (approximately 300 – 400 mm) with soil moisture being imminent to the success of ripping. Ripping must take place within 1-3 days after seeding, and also following a rain event to ensure a higher moisture content.

To summarise;

- Rip all compacted areas outside of the wetland delineations that have been compacted;
- This must be done by means of a commercial ripper that has at least two rows of tines; and
- Ripping must take place between 1 and 3 days after seeding and following a rainfall event (seeding must therefore be carried out directly after a rainfall event).

8.3.2 Revegetate Degraded Areas

Vegetation within the wetland will be cleared to accommodate the excavation activities coupled with the pipeline. This impact will degrade wetlands, ultimately decreasing functionality, decreasing habitat and increasing erosion. According to Russell (2009), areas characterised by a loss of soil resources should be revegetated by means of vegetation with vigorous growth, stolons or rhizomes that more or less resembles the natural vegetation in the area. According to Russell (2009), the following is crucial when revegetating whole plants;

- The planting of whole plants must take place just before or at the beginning of the wet season;
- Whole plants must be dug up with as much of the root intact as possible;
- Roots must be dug up with the soil around it still intact and undisturbed;
- All plants must be stockpiled in damp or wet bags and be kept in the shade;
- The soil around the revegetated plants must be manually compacted after planting;
- Holes excavated for revegetation must be approximately 50 cm deep;
- Soil must be stockpiled according to relevant horizons and backfilled in the same order prior to revegetation (the first 30 cm must be stockpiled separately from the rest of the soil reserves).

Degradation will also take place outside the delineated wetland, which could prove detrimental to the wetland. It therefore is recommended that all areas surrounding the wetland that have been degraded by traffic, laydown yards etc. must be ripped and revegetated by means of indigenous grass species. Mixed stands or monocultures will work sufficiently for revegetation purposes. Mixed stands tend to blend in with indigenous vegetation species and are more natural. Monocultures however could achieve high productivity. In general, indigenous vegetation should always be preferred due to various reasons including the aesthetical presence thereof as well as the ability of the species to adapt to its surroundings.

Plant phase plants which are characterised by fast growing and rapid spreading conditions. Seed germination, seed density and seed size are key aspects to consider before implementing revegetation activities. The amount of seed should be limited to ensure that competition between plants are kept to a minimum. During the establishment of seed density, the percentage of seed germination should be taken into consideration. *E curvula* is one of the species recommended due to the ease of which it germinates. This species is also easily sown by means of hand propagation and hydro seeding.

8.4 Improve Integrity

It is recommended that the following activities be carried out to ensure a successful and effective rehabilitation plan.

8.5 Remove all Invasive Plant Species

It is recommended that all invasive species ne eradicated within 5 m of the pipeline (on both sides). This is to improve the conditions of the wetland as well as to, most importantly, decrease competition between the revegetated *areas* and alien invasive species.

According to Rand Water (2006), physical removal of alien invasive species must be carried out manually or by means of tools for invasive species. All alien invasive species encountered within the 5 m eradication corridor must be removed. This can be done by taking into consideration the following measures;

- Seedlings must be pulled out manually;
- Any invasives removed must be removed by means of a hand spade to ensure deep roots are removed with the rest of the plant;
- For shrubs and small trees, a tree popper must be used (see Figure 8:1);
- Alternatively, the upper section of the tree can be cut off with the stem and root removed from the soil; and
- Ring barking of trees must be carried out for larger trees (see Figure 8:2).

Figure 8:1: Tree popper

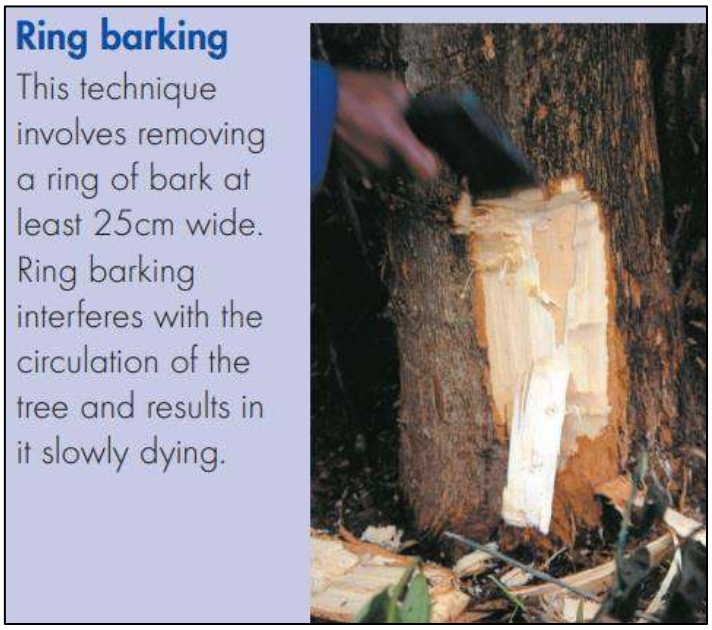

Figure 8:2: Ring barking (Rand Water, 2006)

8.6 Remove Rubble

All anthropogenic material must be cleared from the wetland areas. Care must be taken to not disturb the vegetation growth too badly, by only scouting for refuse from the side of the wetland. Once rubble has been spotted, entrance into the wetland should be permitted. This activity must be undertaken during the dry season. This will ensure less disturbance to the vegetation cover, which will minimise impacts to vegetation and will also improve sight into the wetland for rubble detection

9 ENVIRONMENTAL AWARENESS PLAN

Environmental awareness is an essential part of the implementation of the EMPr during the construction and operational phases of the project. The purpose of environmental awareness is to make contractors and employees mindful of the environmental sensitivities around the site, the potential environmental impacts as well as the mitigation measures that need to be implemented.

9.1 Environmental awareness training

Environmental awareness training must be implemented during the construction and operational phases of the development. The ECO will be responsible for compiling the material required for the training, and should include, as a minimum, the following:

- Environmental legal requirements and obligations;
- Environmental sensitive areas;
- Details regarding plant Species of Conservation Concern, and the procedures to be followed should these be encountered;
- Heritage features and the associated chance find procedure should any archaeological finds be made;
- Details of the waste management procedures
- Emergency procedures; and
- Relevant mitigation measures to be carried out as listed in the EMPr.

All personnel, contractors to undergo environmental awareness training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMPr.

9.2 Basic Rules of Conduct

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid. NOTE: ALL new site personnel must attend an environmental awareness/induction presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

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

DO NOT:

- Do not litter - report dirty or full facilities, i.e. full dustbins and dirty or blocked chemical toilets.
- Do not make any fires.
- Do not enter any fenced off or demarcated areas.
- Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
- Do not litter or leave food lying around.

10 COMPLIANCE WITH THE EMPR

The implementation of the management measures specified in Table 5:1 and Table 5:2 will be monitored as detailed in the following sections.

10.1 Site inspections

During the construction phase, the construction contractor must appoint a suitable qualified person to undertake visual site inspections supported by photographic evidence. The frequency of these visual site inspections must be weekly. The weekly visual inspection findings must be collated into a monthly compliance report to report on the compliance of the construction phase mitigation measures. The monthly site inspection reports should cover the following:

- routine observations of behaviours and practices;
- noting of unusual events, incidents and accidents (natural and human triggered);
- brief statement whether or not conditions of the EMPr are being met; and where it is reportable to authorities;
- possible reasons why conditions are not being met; and
- corrective action plans.

The monthly report should be submitted to the construction contractor and LWUA. Copies of the inspection reports should be kept on site.

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with other records related to this EMPr. If captured in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMPr. Photographic reference of wetlands and relocation related aspects should be included.

10.2 EMPr Performance Assessments

During the construction phase and subsequent rehabilitation phase, monthly EMPr Performance Assessments as per the NEMA EIA Regulations must be undertaken by the independent Environmental Control Officer (ECO). These reports will be approved/signed-off by both the applicant and Construction Contractor. These reports must be summited to the competent authority on a monthly basis.

Once rehabilitation is completed, a close-out EMP Performance Assessment will be undertaken to confirm that all required rehabilitation activities have been met prior to the contractor leaving site.

10.3 Incident Reporting

An environmental incident is an unwanted event that has an actual or potential (near-hit) negative impact on the environment, affecting the quality of air, land or water, fauna or flora, and / or causing stakeholder concern. A causal link must be able to be made between an operational activity and the event. Environmental Incidents is monitored to establish the following:

- Which repeat incidents occur;
- Has the incident been investigated and the root cause been identified;
- Effectiveness of implementation of preventative and corrective actions; and
- To monitor trends to check the effectiveness of the mitigation measures.

Table 10:1: Incident register

Name of person reporting the incident	Information on the incident	Date of incident identified	Actions taken as to address the incident	Date of rectification	Signature

10.4 Emergency Procedures

The purpose of this procedure is to:

- document the mechanism by which potential emergency situations and accidents will be identified during the construction phase that can have an impact on the environment; and
- Provide guidelines on the response to actual emergency situations and accidents to prevent or mitigate associated environmental impacts that may occur.

An environmental emergency situation or accident is an unexpected, sudden occurrence with the potential to endanger people or seriously damage the environment, either immediately or with a delayed effect.

Potential emergencies shall be identified and response plans shall be developed for all identified emergencies. These include the following:

- how potential emergency situations and accidents will be identified;
- a guideline for developing emergency preparedness and response procedures, for use by the construction contractor to address section-specific emergencies, stating how to respond to potential emergencies that might have an impact on the environment;
- the process to be followed in the case where an emergency situation or accident occurs;
- when potential emergency situations or accidents and their associated procedures will be reviewed; and
- The frequency at which the procedures shall be tested.

11 ANNEXURES

ANNEXURE A: CURRICULUM VITAE

Name:	Suzanne	Surname	Van Rooy

CURRICULUM VITAE

Personal Information:	Surname	**Van Rooy**
	First names	**Suzanne**
	Date of birth	1982-05-06
	Gender	Female
	Nationality	RSA
Contact Details:	Telephone number (land line)	012 940 9457
	Cell Number	078 196 6002
	Email Address	suzanne@avde.co.za
Signature:		

Expertise:

Date ***August 2020 to present***	Area of expertise	Project management, environmental authorisations, stakeholder engagement, environmental compliance and performance assessments, environmental feasibility, water use licensing
	Employers Name	Alta van Dyk Environmental Consultants cc
	Employer's locality and contact details	4 Garcia Peak Midlands Estate Centurion 1692 012 940 9457
	Main Activities and Responsibilities	Environmental Assessment Practitioner (EAP) Project Manager Project Planning Project Financing
Date ***1 September 2009 – 31 July 2020***	Area of expertise	Environmental authorisations, stakeholder engagement, environmental compliance and performance assessments, environmental feasibility, water use licensing
	Employers Name	SRK Consulting (South Africa) (Pty) Ltd
	Employer's locality and contact details	265 Oxford Road Illovo 2196 011 441 1111
	Main Activities and Responsibilities	Environmental Assessment Practitioner (EAP) Project Manager Project Planning Project Financing
Date ***7 May 2007 31 August 2009***	Area of expertise	Environmental authorisations, stakeholder engagement, environmental compliance and performance assessments, closure costing, bio-monitoring
	Employers Name	GCS (Pty) Ltd
	Employer's locality and contact details	63 Wessel Road Rivonia 2191 011 803 5726

Name:	Suzanne	Surname	Van Rooy

	Main Activities and Responsibilities	Environmental Assessment Practitioner (EAP) Project Manager Project Planning Project Financing

Years of professional experience

Years of experience as substantiated in the individual CV.

14 Years	Water and Environmental Fields

Qualifications:

Qualification Awarded	**MPhil Environmental Management**
Name of Institution	Stellenbosch University
Date awarded	2013
Qualification Awarded	**Post Graduate Certificate in Education**
Name of Institution	University of Johannesburg
Date awarded	2007
Qualification Awarded	**B.Sc Honours Aquatic Health**
Name of Institution	University of Johannesburg
Date awarded	2005
Qualification Awarded	**B.Sc Natural and Environmental Sciences (Geography and Zoology)**
Name of Institution	University of Johannesburg
Date awarded	2004

Membership of Professional Bodies:

Professional body	**South African Council for Natural Scientific Professions (SACNASP)**
Details of membership	400378/11 Registered as a Professional Natural Scientist
Dates	31 August 2011 to present
Professional body	**Environmental Assessment Practitioners Association of South Africa**
Details of membership	2019/1079 Registered as an Environmental Assessment Practitioner
Dates	February 2022 to present

Language skills: one (1) for low to five (5) for high).

Language	Reading	Speaking	Writing
English	5	5	5
Afrikaans (Mother Tongue)	5	5	5

Computing skills - (1) for low to five (5) for high).

Word	Excel	Power Point	Microsoft Projects
5	5	4	3

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
	Client	**Sibanye-Stillwater**
	Project	K4 Shaft Parking Area
	Responsibility	Environmental Scientist, project manager, Basic Assessment environmental authorisation process, including coordination of specialists and public participation
	Year	2022
	Client	**Glencore South Africa**
	Project	UG1 Opencast project
	Responsibility	Environmental Scientist, project manager, Scoping and Environmental Impact Reporting environmental authorisation process, including coordination of specialists and public participation
	Year	2022
	Client	**De Beers Consolidated Mines**
	Project	Venetia Limpopo Nature Reserve weather tower
	Responsibility	Environmental Scientist, project manager, Environmental authorisation, including coordination of specialists studies
	Year	2021
	Client	**Lebalelo Water User Association**
	Project	SE2 pipeline and associated infrastructure
	Responsibility	Environmental Scientist, project manager, Basic Assessment environmental authorisation process, including coordination of specialists and public participation
	Year	2021
	Client	**Lebalelo Water User Association**
	Project	Clapham Dam upgrades and associated infrastructure
	Responsibility	Environmental Scientist, project manager, Basic Assessment environmental authorisation process, including coordination of specialists and public participation
	Year	2021
	Client	**City of Ekurhuleni**
	Project	Delmore Park Ext 8 Bulk Services
	Responsibility	Environmental Scientist, project manager, Basic Assessment environmental authorisation process, including coordination of specialists and public participation
	Year	2020 – 2021
	Client	**De Beers Consolidated Mines**
	Project	Venetia Limpopo Nature Reserve Lodge

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
	Responsibility	Environmental Scientist, project manager, Basic Assessment environmental authorisation process, including coordination of specialists and public participation
	Year	2020 - 2021
	Client	**Anglo Operations (Pty) Ltd**
	Project	Permitting and Environmental feasibility reporting for the Elders Colliery Project (underground coal mine)
	Responsibility	Environmental Scientist, project manager, compilation of the permitting and environmental chapters in support of the feasibility report
	Year	2020
	Client	**Kudumane Manganese Resources**
	Project	Environmental permitting gap analysis for Kudumane's proposed river diversion
	Responsibility	Project management, environmental and water authorisation gap analysis
	Year	2020
	Client	**AngloGold Ashanti**
	Project	Environmental authorisation for Siguiri Mine's Block 2 project
	Responsibility	Environmental Scientist, project management, specialist coordination compilation of the Environmental and Social Impact Assessment Report
	Year	2019 - 2020
	Client	**GAUFF Engineering**
	Project	Development of an Environmental and Social Action Plan for the proposed Bukasa Port's environmental authorisation
	Responsibility	Project coordinator, assistance in compilation of the Environmental and Social Action Plan
	Year	2019
	Client	**Anglo Operations (Pty) Ltd**
	Project	Permitting and Environmental feasibility reporting for the Elders Colliery Project (underground coal mine)
	Responsibility	Environmental Scientist, project management, compilation of the permitting and environmental chapters in support of the feasibility report
	Year	2019
	Client	**Anglo American Coal**
	Project	Environmental feasibility reporting for the SACE Lifex Complex that entails the open cast mining of previously underground coal mines

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
	Responsibility	Environmental Scientist, compilation of the permitting and environmental chapters in support of the feasibility report
	Year	2019
	Client	**Anglo Operations (Pty) Ltd**
	Project	Environmental authorisation process for the Khwezela Colliery borrow pits project, two borrow pits were required to provide material for construction for reclamation of the Landau 3 Mineral Residue Deposit (MRD)
	Responsibility	Environmental scientist, specialist coordination, compilation of Basic Assessment Reports, project management, public participation
	Year	2018
	Client	**AngloGold Ashanti**
	Project	Specialist environmental and social baseline assessment for Siguiri Gold Mine Block 2, a proposed open cast mine project
	Responsibility	Project management, specialist coordination, compilation of baseline report
	Year	2018
	Client	**Harmony Gold Mining Company**
	Project	Harmony acquiring several assets from AngloGold Ashanti's Vaal River Operations, requiring the compilation of an EMP for the acquired assets
	Responsibility	Environmental Scientist, compilation of EMP
	Year	2017
	Client	**DRA Global**
	Project	Environmental authorisation gap analysis for Sasol's proposed destoning plant
	Responsibility	Environmental scientist, permitting gap analysis
	Year	2017
	Client	**Anglo Operations (Pty) Ltd**
	Project	Environmental authorisation process for the reclamation of the Landau 3 Mineral Residue Deposit (MRD) to facilitate Eskom's powerline relocation
	Responsibility	Environmental scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, project management, public participation
	Year	2017
	Client	**Air Liquide**
	Project	Investigation regarding the feasibility of a phytoremediation plant for Air Liquide's excess water at their plant in eMalahleni
	Responsibility	Environmental scientist, project management

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
	Year	2017
	Client	**DRA Global**
	Project	Feasibility study for Anglo American Platinum's Amandelbult Mine's proposed Merensky chrome recovery plant
	Responsibility	Environmental scientist, report compilation, compilation of the permitting and environmental chapters in support of the feasibility report
	Year	2017
	Client	**Modikwa Platinum Mine**
	Project	Basic assessment process for the upgrade of the Matimatjatji gravel road to tar road at Modikwa Platinum Mine
	Responsibility	Environmental Scientist, compilation of Basic Assessment Report and associated Environmental Management Programme
	Year	2017
	Client	**Southern African Power Pool (SAPP)**
	Project	Environmental and Social Management Framework (ESMF) for SAPP
	Responsibility	Environmental Scientist, development of a generic terms of reference for several specialists for various power producing entities
	Year	2016
	Client	**Anglo Operations (Pty) Ltd**
	Project	Environmental authorisation process for an open cast coal mine (Navigation Pit) and dragline walkway
	Responsibility	Environmental Scientist, compilation of Stakeholder Engagement Plan (SEP) and Government and Social Affairs (GSA) report
	Year	2016
	Client	**Anglo Operations (Pty) Ltd**
	Project	Environmental authorisation process for the Setlabotsha proposed underground coal mine
	Responsibility	Environmental Scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, project management, public participation
	Year	2016
	Client	**Anglo Operations (Pty) Ltd**
	Project	Environmental authorisation process for the Elders Colliery underground coal mine and overland conveyor
	Responsibility	Environmental Scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, project management, public participation

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
	Year	2015 - 2016
	Client	**Falcon Oil and Gas**
	Project	Environmental authorisation process for a petroleum exploration right to undertake a seismic survey
	Responsibility	Environmental Scientist, public participation
	Year	2015
	Client	**Anglo American Platinum**
	Project	Environmental authorisation process for the Der Brochen EMP consolidation and amendment to include an open cast mining and tailings storage facility
	Responsibility	Environmental Scientist, project manager, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, public participation
	Year	2014 - 2015
	Client	**Anglo American Platinum**
	Project	Environmental authorisation process for the raising of the existing Helena tailings storage facility
	Responsibility	Environmental Scientist, project manager, compilation of Scoping Report, EIA/EMP report, public participation, specialist coordination
	Year	2014
	Client	**Anglo American Coal**
	Project	Environmental authorisation process for the construction of a powerline at Kriel Colliery's Block F
	Responsibility	Environmental Scientist, compilation of a Basic Assessment Report
	Year	2013
	Client	**Anglo Operations (Pty) Ltd**
	Project	Environmental authorisation process for the Elders Colliery underground coal mine and associated mini open-pit
	Responsibility	Environmental Scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, public participation, project management
	Year	2012 - 2013
	Client	**Platinum Mile Resources**
	Project	Investigation for a tailings pipeline route for Platinum Mile Resources
	Responsibility	Environmental Scientist, project coordinator, field work, report compilation
	Year	2012
	Client	**Nkomati Mine**

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
	Project	Environmental authorisation process for a sewage treatment plant at Nkomati Mine
	Responsibility	Environmental Scientist, application for basic assessment, public participation, compilation of a Basic Assessment Report
	Year	2011
	Client	**Aquarius Platinum**
	Project	Environmental authorisation process to extend underground mining at the existing K5 Shaft
	Responsibility	Environmental Scientist, compilation of Scoping Report, compilation of EIA/EMP report
	Year	2010
	Client	**Aquarius Platinum**
	Project	Environmental authorisation process for the rehabilitation of the Marikana open pit by depositing tailings material in pit
	Responsibility	Environmental scientist, specialist coordination, public participation
	Year	2010
	Client	**Anglo American Platinum**
	Project	Environmental authorisation process for the K6 shaft to undertake underground platinum mining
	Responsibility	Environmental Scientist, project management, site audits, environmental training, environmental management progress reports
	Year	2010
	Client	**Coca Cola**
	Project	Source vulnerability assessment of freshwater for Coca Cola's factory in Bloemfontein
	Responsibility	Environmental Scientist, research, report compilation
	Year	2009
	Client	**Simmer and Jack**
	Project	Environmental authorisation process for an underground gold mine (historical Rietfontein Mine)
	Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
	Year	2009
	Client	**Simmer and Jack**
	Project	Environmental authorisation process to open cast mining of surface deposits and heap leaching of mined ore (PTDs)
	Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Authorisations		
		Report, specialist coordination, public participation
	Year	2009
	Client	**Simmer and Jack**
	Project	Environmental authorisation process for open cast mining of surface deposits and heap leaching of mined ore
	Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
	Year	2009
	Client	**Simmer and Jack**
	Project	Environmental authorisation process for the underground mining of the historical Beta Mine
	Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
	Year	2008 - 2009
	Client	**Simmer and Jack**
	Project	Environmental authorisation process for open cast mining of surface deposits and heap leaching of mined ore
	Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
	Year	2008
	Client	**Simmer and Jack**
	Project	Environmental authorisation process for the heap leaching of an historical tailings dam (Glynn's Lydenburg)
	Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
	Year	2008
	Client	**Simmer and Jack**
	Project	Environmental authorisation process for the rehabilitation of a historical tailings dams (Elandsdrift) by means of heap leaching
	Responsibility	Environmental Scientist, project management, compilation of EIA/EMP report, specialist coordination, public participation
	Year	2007

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Management Programme and Water Use Licence Audits		
	Client	**Sibanye-Stillwater**
	Project	Baobab Operations Water Use Licence Audit
	Responsibility	Lead auditor, reporting
	Year	2021
	Client	**Sibanye-Stillwater**
	Project	Pandora Mine Water Use Licence Audit
	Responsibility	Lead auditor, reporting
	Year	2021
	Client	**Sibanye-Stillwater**
	Project	Dwaalkop Mine Water Use Licence Audit
	Responsibility	Lead auditor, reporting
	Year	2021
	Client	**Sibanye-Stillwater**
	Project	Doornvlei Mine Water Use Licence Audit
	Responsibility	Lead auditor, reporting
	Year	2021
	Client	**Anglo American Platinum**
	Project	Amandelbult Water Use Licence Audit
	Responsibility	Lead auditor, reporting
	Year	2021
	Client	**Anglo American Platinum**
	Project	Der Brochen EMP Performance Assessment
	Responsibility	Environmental Scientist, lead auditor, reporting, project management
	Year	2016
	Client	**Eskom**
	Project	Lethabo Power Station Water Use Licence Audit
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2012
	Client	**Sasol Nitro**
	Project	Sasol Nitro Phalaborwa Water Use Licence Audit
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2011
	Client	**Aquarius Platinum**
	Project	Kroondal and Marikana Mines EMP Performance Assessment
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2011
	Client	**Aquarius Platinum**
	Project	K6 Shaft EMP Performance Assessment
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2010, 2012

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Environmental Management Programme and Water Use Licence Audits		
	Client	**Impala Platinum**
	Project	Marula Platinum Annual EMP Audit
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2010
	Client	**Anglo American Platinum**
	Project	Polokwane Metallurgical Complex Water Use Licence compliance audit
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2010
	Client	**Aquarius Platinum**
	Project	Kroondal Mine EMP Performance Assessment
	Responsibility	Environmental Scientist, auditor, reporting
	Year	2009

Recent Project Experience: Water Use Licences		
	Client	**Anglo American Platinum**
	Project	Mokopane Waste Water Treatment Plant
	Responsibility	Environmental Scientist, project manager, water use licence application
	Year	2022
	Client	**Glencore South Africa**
	Project	UG1 Opencast project
	Responsibility	Environmental Scientist, project manager, water use licence application
	Year	2022
	Client	**Sibanye-Stillwater**
	Project	K4 Shaft Parking Area
	Responsibility	Environmental Scientist, project manager, water use licence application
	Year	2022
	Client	**Sibanye-Stillwater**
	Project	Kwezi Shaft
	Responsibility	Environmental Scientist, project manager, water use licence application
	Year	2021 - 2022
	Client	**City of Ekurhuleni**
	Project	Delmore Park Ext 8 Bulk Services
	Responsibility	Environmental Scientist, project manager, water use licence application process
	Year	2021 - 2022
	Client	**Lebalelo Water User Association**
	Project	Water use licence amendment
	Responsibility	Environmental Scientist, project manager, water use licence application

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Water Use Licences		
	Year	2021
	Client	**Anglo American Platinum**
	Project	Northam Waste Water Treatment Plant
	Responsibility	Environmental Scientist, project management, Water use licence amendment process
	Year	2021
	Client	**Lebalelo Water User Association**
	Project	Low-level bridge construction
	Responsibility	Environmental Scientist, project manager, water use licence application process
	Year	2021
	Client	**Lebalelo Water User Association**
	Project	SE2 pipeline and associated infrastructure
	Responsibility	Environmental Scientist, project manager, water use licence application process
	Year	2021
	Client	**Lebalelo Water User Association**
	Project	Clapham Dam upgrades and associated infrastructure
	Responsibility	Environmental Scientist, project manager, water use licence application process
	Year	2021
	Client	**De Beers Consolidated Mines**
	Project	Venetia Limpopo Nature Reserve Lodge
	Responsibility	Environmental Scientist, project manager, Water Use Licence Application
	Year	2020 - 2021
	Client	**Isanti Glass**
	Project	Water Use Licence Application for a natural gas pipeline
	Responsibility	Environmental Scientist, project manager, water use licence application process
	Year	2020
	Client	**Anglo Operations (Pty) Ltd**
	Project	Elders Colliery: Drilling of boreholes within wetland
	Responsibility	Environmental Scientist, project manager, water use licence application process
	Year	2019
	Client	**Anglo American Coal**
	Project	General Authorisation for South African Coal Estates (SACE) Lifex Complex
	Responsibility	Compilation of general authorisation report for the drilling of geochemical, geological and geotechnical boreholes
	Year	2019

Name:	Suzanne	Surname	Van Rooy

Recent Project Experience: Water Use Licences		
	Client	**Optimum Coal**
	Project	Updating of the existing Optimum Colliery's Integrated Water and Waste Management Plan
	Responsibility	Environmental Scientist, compilation of an Integrated Water and Waste Management Plan
	Year	2013
	Client	**Imperial Properties**
	Project	Preparation of a Water Use Licence Application for Imperial Properties' Kia Motor Vehicle Dealership
	Responsibility	Environmental Scientist, Compilation of Water Use Licence Application, specialist coordination
	Year	2011

ANNEXURE B: MAINTENANCE MANAGEMENT PLAN

Lebalelo Water User Association

SE2 Pipeline and associated infrastructure

Maintenance Management Plan

DFFE Reference Number: 14/12/16/3/3/1/2442

February 2022

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Alta van Dyk Environmental

Lebalelo Water User Association

SE2 Pipeline and associated infrastructure

Maintenance Management Plan

February 2022

Project Ref: 131-001

Prepared by: Suzanne van Rooy

VERSION CONTROL

Alta van Dyk Environmental cc

Version: Final

Approved by: Alta van Dyk

Signed:

Position: Environmental Specialist

Date: February 2022

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Abbreviations

BAR	Basic Assessment Report
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
LWUA	Lebalelo Water User Association
NEMA	National Environmental Management Act
NWA	National Water Act
ORWRDP	Olifants River Water Resource Development Project
SAHRA	South African Heritage Resources Agency
SE1	Southern Extension 1
SE2	Southern Extension 2

1 INTRODUCTION AND BACKGROUND

1.1 Background

Lebalelo Water User Association (LWUA) is proposing a new raw water pipeline between the Spitskop Pump Station and Mototolo Mine, near Steelpoort in the Limpopo Province. This project is also referred to as the Southern Extension 2 (SE2) pipeline. There is an existing raw water pipeline running from LWUA's Havercroft Pump Station to Borwa Pump Station, referred to as Southern Extension 1 (SE1). The new pipeline (SE2) will be located within the current pipeline's (SE1) servitude. The purpose of the new pipeline (SE2) is to provide raw water to several mines and industries located along the pipeline route. The current pipeline's capacity is not sufficient for the growing water demand from LWUA's members.

The following is proposed for the new pipeline (SE2) project:

- New pump station at the existing Spitskop Pump Station (within fenced area of existing Spitskop Pump Station);
- Solar panels (75 x 75m) to be constructed within fenced area of existing Spitskop Pump Station. This is for a 0,5MW solar panel generation plant;
- New 500mm pipeline 15km in length next to the existing pipeline (within the pipeline servitude) to the new Dwarsrivier Pump Station reservoir;
- New concrete reservoir to be constructed near the existing Dwarsrivier Pump Station (10Mℓ);
- New pump station at the existing Dwarsrivier Pump Station on land directly next to the existing pump station fenced off area;
- New 300 or 350mm pipeline 9km in length next to the existing pipeline in the pipeline reserve from the new Dwarsrivier Pump Station to Mototolo Mine; and
- Valve chambers along pipeline route.

The proposed SE2 pipeline will provide raw water to the following entities:

- Lion Smelter (Glencore South Africa);
- Dwarsrivier Mine (Assore);
- Two Rivers Mine (African Rainbow Minerals);
- Mototolo Mine (Anglo American Platinum); and
- Steelpoort Industrial Park (Freedom Property Fund) (potentially).

Alta van Dyk Environmental Consultants cc (AVDE) has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the required environmental related applications and associated public participation process.

1.2 Purpose of the Report

The purpose of a MMP is to provide guidance to contractors regarding the various routine rehabilitation and maintenance tasks that should be carried out when undertaking repair work along the SE2 pipeline.

2 BACKGROUND TO LEBALELO WATER USER ASSOCIATION

The LWUA is a water management institution established in terms of Section 92 of the National Water Act (Act 36 of 1998) (NWA) and its area of operation and constitution were approved by the Minister of Water Affairs and Forestry (as it was known then) in terms of Section 92 (1) (a) of the NWA as confirmed in Government Gazette Notice No. 89 of 1 February 2002. The area of operation of the LWUA was extended in terms of Section 92 (1) (b) of the NWA by Government Gazette Notice Number 1110 of 18 November 2005 and the amended LWUA Constitution was approved by the then Minister of Water Affairs and Forestry on 4 October 2005.

The LWUA was established with the following mandate:

- To operate and maintain a pipeline scheme to supply bulk raw water from the Olifants River to satisfy the water requirements of its members on the Eastern Limb of the Bushveld Igneous Complex within its licensed conditions;
- To supply bulk raw water from the pipeline and any extension thereof from the Olifants River to satisfy the requirements of other users within its licence conditions;
- As a Corporate Social Responsibility undertaking to continue with its support to the Department of Water and Sanitation (DWS) and the Sekhukhune District Municipality in the operation and maintenance of their potable water schemes, provided that the schemes are situated within the area of operation of the LWUA; and
- To protect the LWUA infrastructure.

3 REGULATORY REQUIREMENTS FOR A MMP

According to the National Environmental Management Act of 1998 (Act No. 107 of 1998) (NEMA) "maintenance" is defined as "actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint." The TPM pipeline repair work can therefore be classified as maintenance. Maintenance activities are excluded from listed activities as per Listing Notice 1 (Government Notice R983), Activity 19 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), which states (items applicable to TPM are noted in bold):

"The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-

(i) a watercourse;

(ii) the seashore; or

(iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater-

but excluding where such infilling, depositing, dredging, excavation, removal or moving-

(a) will occur behind a development setback;

(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or

(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies."

In order to be compliant with the requirements of NEMA, this MMP has been developed to mitigate and manage environmental impacts relating to maintenance work that will need to be conducted once the SE2 pipeline is operational.

The applicant and responsible party for ensuring that maintenance work is carried out according to this MMP is LWUA. Adopting or defining this MMP does not absolve LWUA from complying with any applicable legislation or the general "duty of care" set out in Section 28(1) of the NEMA that states, "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

4 PROJECT DESCRIPTION

4.1 Background to LWUA

The LWUA was established to supply raw water to mines along the Eastern Limb of the Bushveld Igneous Complex. The main aim of the project was to supply raw water to a number of existing and planned new mines in the area, and as a spin-off, to provide additional capacity in the water supply scheme to meet the requirements of the rural population in the area. Only raw water is provided by LWUA, and the responsibility of treatment to drinking water standards lies with the distributing authority. The water is abstracted from the Olifants River via the Flag Boshielo Dam and abstracted at the Havercroft weir. The users receiving the water from the pipeline make up the LWUA. The Lebalelo water supply forms part of the Olifants River Water Resource Development Project (ORWRDP). The water is currently sourced from the Olifants River via the Flag Boshielo Dam, with abstraction at the Havercroft weir, and in future will be from the Steelpoort River via De Hoop Dam.

4.2 Proposed SE2 pipeline project

LWUA is proposing a new raw water pipeline between the Spitskop Pump Station and Mototolo Mine, near Steelpoort in the Limpopo Province. This project is also referred to as the SE2 pipeline. There is an existing raw water pipeline running from LWUA's Havercroft Pump Station to Borwa Pump Station, referred to as Southern Extension 1 (SE1). The new pipeline (SE2) will be located within the current pipeline's (SE1) servitude. The purpose of the new pipeline (SE2) is to provide raw water to several mines and industries located along the pipeline route. The current pipeline's capacity is not sufficient for the growing water demand from LWUA's members.

The following is proposed for the new pipeline (SE2) project:

- New pump station at existing Spitskop Pump Station (within fenced area of existing Spitskop Pump Station);
- Solar panels (75 x 75m) to be constructed within fenced area of existing Spitskop Pump Station. This is for a 0,5MW solar panel generation plant;
- New 500mm pipeline 15 km in length from Spitskop Pump Station to Dwarsrivier Pump Station (within the current pipeline servitude);
- New concrete reservoir to be constructed near the Dwarsrivier Pump Station (10 Mℓ);
- New pump station adjacent to the current Dwarsrivier Pump Station; and
- New 300 or 350 mm pipeline 9 km in length from the new Dwarsrivier Pump Station to Mototolo Mine (within current pipeline servitude).

The proposed SE2 pipeline will provide raw water to the following entities:

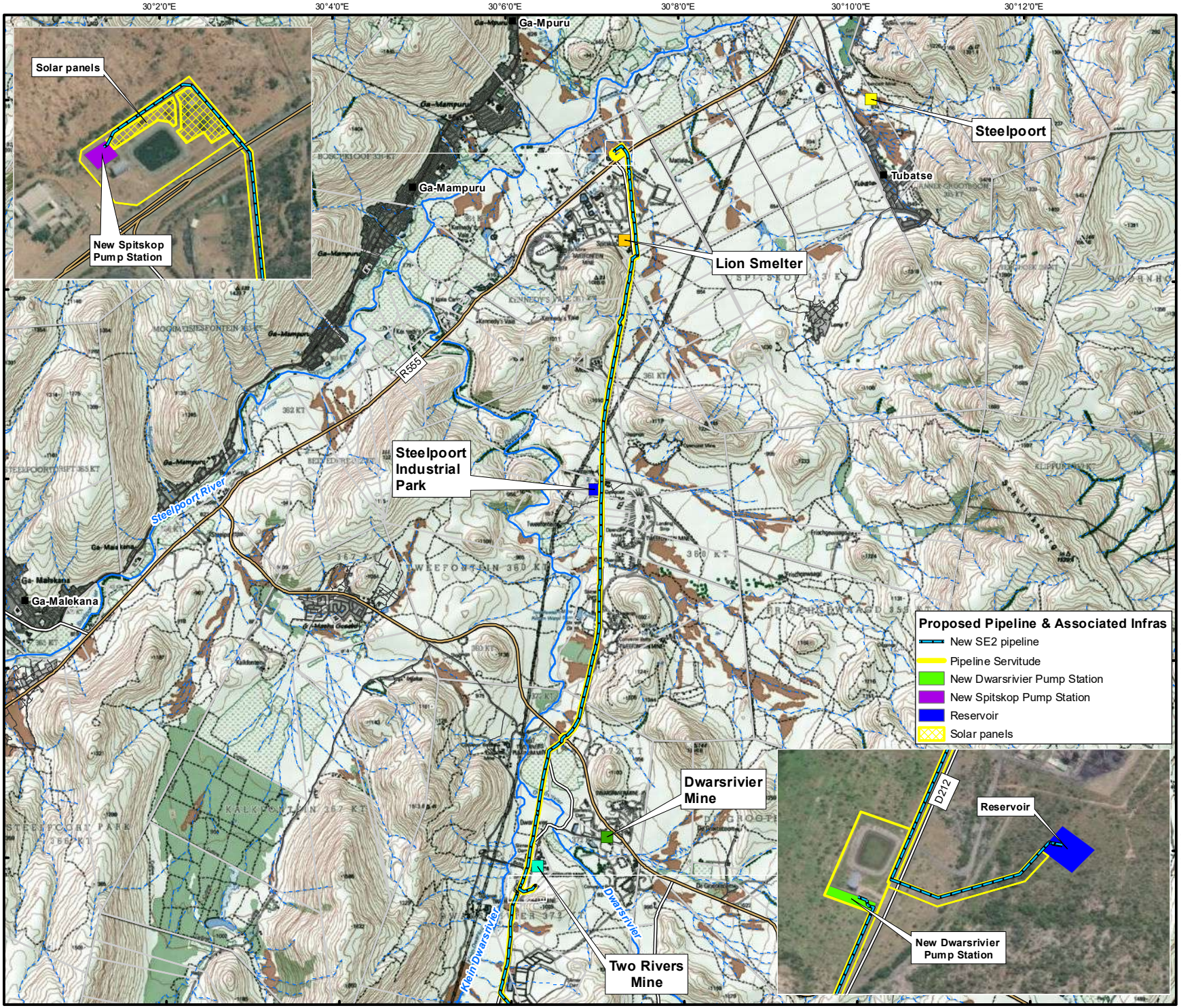
- Lion Smelter (Glencore South Africa);
- Dwarsrivier Mine (Assore);
- Two Rivers Mine (African Rainbow Minerals);
- Mototolo Mine (Anglo American Platinum); and
- Steelpoort Industrial Park (Freedom Property Fund) (potentially).

4.3 Locality

The proposed project is located near Steelpoort in the Limpopo Province. Table 4:1 outlines the details relating to the location of the proposed project. Refer to Figure 4:1 and Figure 4:2 for the locality maps.

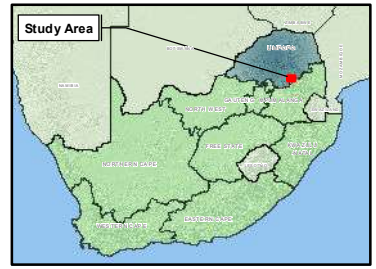
Table 4:1 Project location details

Site specific details	Description	
Municipal jurisdiction	Fetakgomo Tubatse Local Municipality Sekhukhune District Municipality	
Ward number	Ward 27	
Nearest town	The proposed SE2 pipeline starts approximately 5 km west from Steelpoort, Limpopo Province, from where it runs in a southerly direction to Mototolo Mine.	
Site coordinates	**Latitude**	**Longitude**
New Spitskop Pump Station	24°48'36.25"S	30° 7'14.65"E
Solar panels	24°48'33.73"S	30° 7'20.34"E
SE2 Pipeline – Spitskop Pump Station to Dwarsrivier Pump Station (new reservoir): Start	24°48'37.68"S	30° 7'17.04"E
SE2 Pipeline – Spitskop Pump Station to Dwarsrivier Pump Station (new reservoir): End	24°56'19.63"S	30° 6'17.57"E
New Dwarsrivier Pump Station	24°56’23.18”S	30° 6’2.78”E
Reservoir	24°56’19.26”S	30° 6’18.66”E
SE2 Pipeline: Dwarsrivier Pump Station to Mototolo Mine: Start	24°56'23.19"S	30° 6'3.70"E
SE2 Pipeline: Dwarsrivier Pump Station to Mototolo Mine: End	25° 0'33.07"S	30° 6'46.16"E



Legend

- Dwarsrivier Mine
- Two Rivers Mine
- Lion Smelter
- Steelpoort
- Steelpoort Industrial Park
- Farm Portion
- Village
- Secondary Road
- Tertiary Road
- Street/Road
- Perennial River Centre line
- Non-Perennial River Centre line



SCALE: 1: 100 000

0 1 2 3 4 Kilometers

N

TITLE:

Figure 4:1 Locality map of the proposed SE2 pipeline and associated infrastructure: Spitskop Pump Station to Dwarsrivier Pump Station

CLIENT:

Lebalelo Water User Association

DATE: Dec 2021	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR

MAP: SE2_Pipeline_Locality_A3_Fig1.1.mxd REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

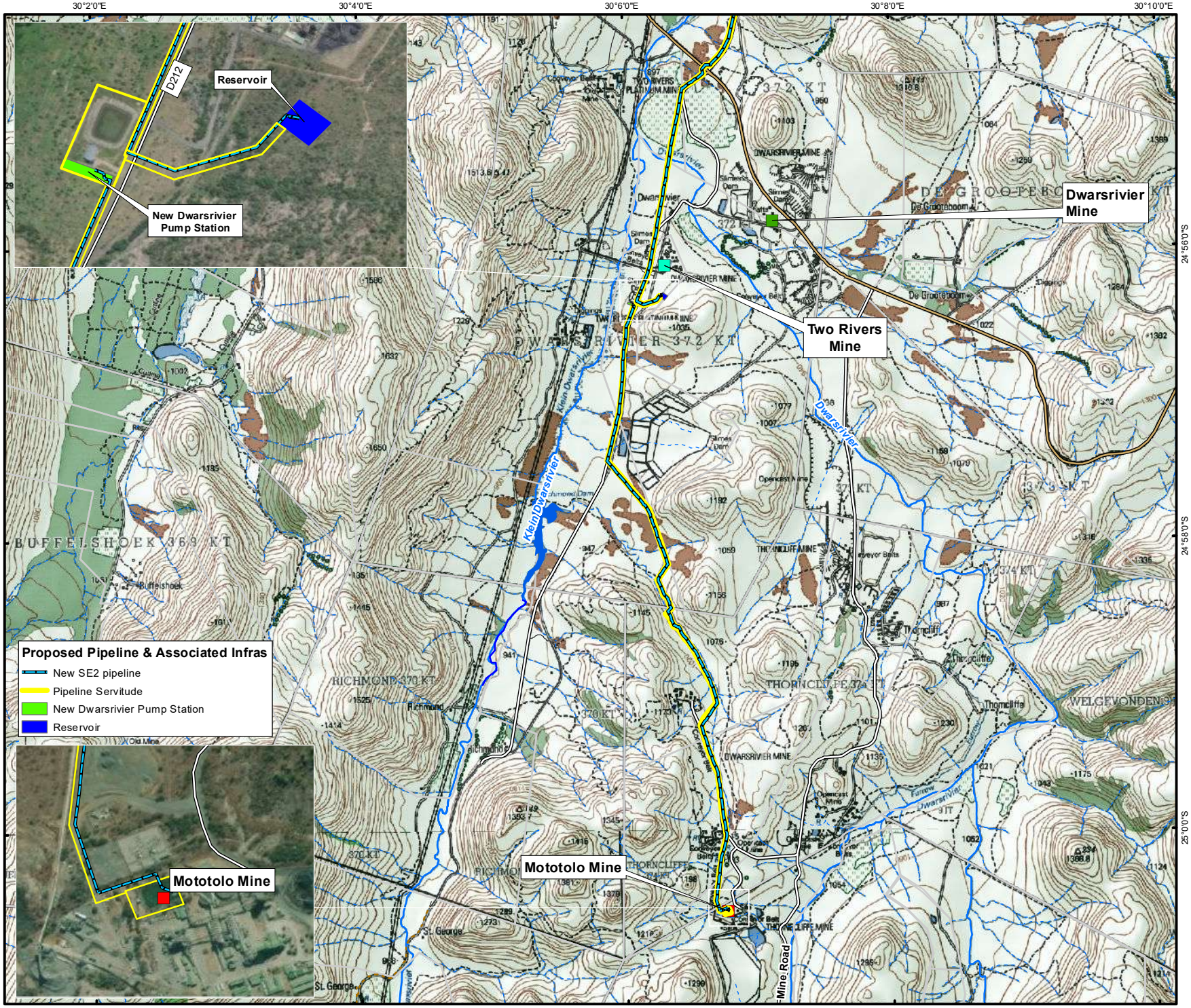
VAT No: 4630259952
Tel: 012 940 9457
Fax: 086 634 3967
Cel: 061 403 2462

Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

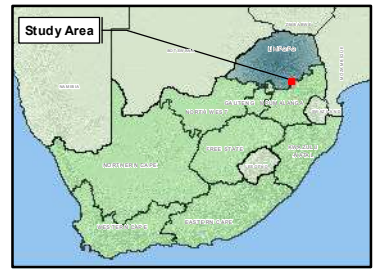
SIZE: A3

Path: C:\GIS_PROJECTS_PVT\AVD_ENVIRO\SE2_PIPELINE\MAPPING\MXD\SE2_Pipeline_Locality_A3_Fig1.1.mxd



Legend

- Dwarsrivier Mine
- Two Rivers Mine
- Mototolo Mine
- Farm Portion
- Secondary Road
- Tertiary Road
- Street/Road
- Track
- Perennial River Centre line
- Non-Perennial River Centre line
- Water Areas



SCALE: 1: 65 000

0 500 1 000 1 500 2 000

Meters

N

TITLE:

Figure 4:2 Locality map of the proposed SE2 pipeline and associated infrastructure: Dwarsrivier Pump Station to Mototolo Mine

CLIENT:

Lebalelo Water User Association

DATE: Dec 2021	PROJECT: SE2_PIPELINE
DRAWN: THURLOW MAPPING	APPROVED: SVR
MAP: SE2_Pipeline_Locality_A3_Fig1.2.mxd	REV: 2

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Alta van Dyk Environmental

Projection: Transverse Mercator CM: 31 Datum:WGS 84
Source: OSM Vector 2021 - NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
Inset: ESRI Data and Maps

SIZE: A3

Path: C:\GIS_PROJECTS_PVT\AVD_ENVIRO\SE2_PIPELINE\MAPPING\MXD\SE2_Pipeline_Locality_A3_Fig1.2.mxd

4.4 Construction of new infrastructure

4.4.1 New pump station at Spitskop Pump Station

A new pump station will be constructed next to the existing Spitskop Pump Station within the existing Lebalelo servitude. The existing connection point at the pump station will be used to abstract water from the existing DWS pipeline between the De Hoop Dam and the Steelpoort Pump Station. Excavations will be done by mechanical means and by hand and the excavated material stockpiled on the site and used for backfilling. Any surplus material will be spread and finished off in the area around the pump station in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as per the relevant drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete will preferably be obtained from a ready-mix plant within the area.

Once the concrete has reached sufficient strength, the shutters will be stripped off, the concrete finished and the backfilling around the structure done.

The pump station walls will consist of steel columns with filled in brick.

The above work will be carried out by hand making use of people with the required skills under management and supervision of the Contractor.

4.4.2 Raw water pipeline (Spitskop Pump Station to Dwarsrivier Pump Station)

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. This work will all be done in accordance with the levels as per the relevant drawings.

After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment.

The pipeline crosses the R555 and the road D1261_010 (adjacent to the Lion Smelter) and the road to Mashishing (D1212_05). The three pipeline crossings will be done by means of pipe jacking a sleeve underneath the roads and position the steel pipe though the sleeve. The ends of the sleeve will be closed off once the pipe is in position.

The total length of the pipeline is approximately 15 000m.

4.4.3 Concrete reservoir

A new 10ML reservoir will be constructed near the existing Dwarsrivier Pump Station. The work entails the following:

Excavations will be done by mechanical means and the excavated material will be spread and finished off in the area around the reservoir in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as shown on the drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete for the floor slab will preferably be obtained from a ready-mix plant within the area. The walls and roof of the reservoir utilise pre-fabricated modules to speed up the construction process and to limit construction activities on site.

The above work will be carried out by mechanical means and by hand making use of people with the required skills under management and supervision of the Contractor.

4.4.4 New pump station at Dwarsrivier Pump Station

A new pump station will be constructed next to the existing Dwarsrivier Pump Station.

Excavations will be done by mechanical means and by hand and the excavated material stockpiled on the site and used for backfilling. Any surplus material will be spread and finished off in the area around the pump station in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as per the relevant drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete will preferably be obtained from a ready-mix plant within the area.

Once the concrete has reached sufficient strength, the shutters will be stripped off, the concrete finished and the backfilling around the structure done.

The pump station walls will consist of steel columns with filled in brick. The above work will be carried out by hand making use of people with the required skills under management and supervision of the Contractor.

4.4.5 Raw water pipeline (Dwarsrivier Pump Station to Mototolo Mine)

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. This work will all be done in accordance with the levels as per the relevant drawings.

After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment.

The total length of the pipeline is approximately 8 500m.

4.4.6 Valve chambers

Concrete valve chambers will be constructed at approximately 200m intervals along the pipeline. Such valve chambers are mainly used for maintenance purposes.

At the positions of the valve chambers the trench excavations will be widened to provide working space for the workers. The floor area of the valve chambers will be trimmed and compacted using hand tools after the

concrete blinding layer will be constructed to provide a clean working area. This will be followed by the fixing of the steel reinforcement and erection of the shuttering.

Once the reinforcement has be inspected and approve the shuttering will be erected in accordance with the details on the drawings and the concrete cast using concrete from a ready-mix plant within the area.

After the concrete has gained sufficient strength, the shutters will be removed, the concrete finished off and the backfilling around the structures done and compacted and the areas finished off neatly. Any excess material will be spread over the area round the structures and finished off.

LWUA is also considering using pre-cast chambers, should it be a more viable option.

4.5 Maintenance activities during the operational phase

Once the SE2 pipeline is operational, several activities will be undertaken in order to main the pipeline in a working condition. Although the SE2 pipeline will mainly be buried, at certain watercourse crossings an overland structure may be utilised. Table 4:2 outlines the general maintenance activities that are planned for the SE2 pipeline.

Table 4:2 General maintenance activities for the SE2 pipeline (SRK, 2018)

Maintenance activity	Actions
Site inspections of the pipeline	Undertake regular inspections to ensure that: • The pipeline structure remains structurally intact; • The watercourses crossed are not blocked with sediment or debris; • No erosion is occurring along river banks, at culverts and pipeline crossings; • No new alien vegetation is encroaching • Erosion structures (gabion and reno mattresses) remain intact
Removal of alien vegetation and establishment of indigenous vegetation at the watercourse crossings, culverts and erosion protection structures	• Remove alien vegetation encroaching around pipeline
Removal of sediment, debris or nuisance vegetation at watercourse crossings	• All sediment, debris, overgrowth of vegetation and waste rock from erosion control structures should be removed from the watercourse and pipeline crossings
Repair to erosional structures (such as gabions and reno mattresses)	• Erosional structures such as gabions and reno matters must be repaired in a timeously manner to prevent erosion from occurring.
Erosion Protection along the watercourse crossings	• Areas along the watercourse and pipeline crossings that have been eroded should be backfilled with sediment or erosion protection structures • Embankments along the watercourse should be stabilised and sloped
Encasing the pipeline at watercourse crossing	• Disturbance to the local vegetation may occur during the concreting of the pipeline. • Disturbance to the river banks due concreting the pipeline may occur. • There is potential for the contamination of wetlands resources if the concrete is spilled while mixing.

5 IMPACTS AND MITIGATION

The maintenance activities may have impacts on the environmental, specifically the watercourses if appropriate management measures are not in place. The identified potential impacts and proposed mitigation measures are presented in Table 5:1.

Table 5:1 Impacts and mitigation for the SE2 pipeline project

Activity that may cause an impact	Environmental/ Social aspect	Management Outcomes	Potential environmental impact	Management Measure	Responsible Person	Frequency and/or time period
General maintenance activities	Soils	Conservation of soils as a resource	Disturbance to soils around watercourse crossings	All maintenance contractors must access watercourse crossings using existing roads that can be found in and around the project area.	LWUA	During maintenance activities
				Compacted areas are to be ripped to loosen the soil structure where necessary.	LWUA	During maintenance activities
				Monitoring of the pipeline must be undertaken to detect leaks. Monitoring should be undertaken at least once a week.	LWUA	Weekly
				Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	LWUA	During maintenance activities
Encasing the pipeline caused by erosion at watercourse crossings	Soils	Conservation of soils as a resource	Contamination of soils due to spilled concrete or hydrocarbons	All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.	LWUA	During maintenance activities
				A hydrocarbon spill management plan must 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.	LWUA	Once off
				The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.	LWUA	During maintenance activities
				Any fuel, oil or hazardous substance spills must be cleaned-up immediately and discarded correctly.	LWUA	As required during maintenance activities
				Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.	LWUA	During maintenance activities
				All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.	LWUA	As required during maintenance activities
General maintenance activities	Biodiversity – Fauna and Flora	Limit the disturbance and destruction of vegetation, fauna and habitat	Continued destruction, fragmentation and degradation of habitats and ecosystems And Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration).	Existing access routes, especially roads must be made use of.	LWUA	During maintenance activities
				Progressive rehabilitation as the construction of the pipeline continues as well as any cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank.	LWUA	During maintenance activities
				Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	LWUA	During maintenance activities
				All structure footprints to be rehabilitated and landscaped after the development is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.	LWUA	During maintenance activities
				It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	LWUA	During maintenance activities
				A fire management plan needs to be complied in terms of the National Veld and Forest Fire Act, 101 of 1998, and implemented to restrict the impact fire might have on the surrounding areas. The following preventative measures must be included: • Adherence to the daily fire danger ratings • Must have equipment, protective clothing and trained personnel for extinguishing fires	LWUA	During maintenance activities

Activity that may cause an impact	Environmental/ Social aspect	Management Outcomes	Potential environmental impact	Management Measure	Responsible Person	Frequency and/or time period
				• No lighting, using or maintain a dire in the open air unless in the designated place • Contractors must do everything in their power to stop the spread of veld fires during the installation of water pipes.		
				All maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	LWUA	During maintenance activities
General maintenance activities	Biodiversity – Fauna and Flora	Minimise and prevent the spread of alien and/or invasive species	Disturbance to local vegetation, leading to spread and/or establishment of alien and/or invasive species	Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	LWUA	As required during maintenance activities
				Implementation of an alien vegetation management plan.	LWUA	During maintenance activities
				Promptly remove all alien and invasive plant species observed during site inspections (i.e. weedy annuals and other alien forbs) must be removed.	LWUA	During maintenance activities
				The use of herbicides is not recommended in or near wetlands (opt for mechanical removal).	LWUA	During maintenance activities
Repair to erosion protection structures at watercourse pipeline crossings	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Disturbance to wetlands due to repair work undertaken at watercourse crossings	Repair to erosion protection structures should be done by hand.	LWUA	During maintenance activities
				No vehicles should enter the watercourse areas.	LWUA	During maintenance activities
				Undertake repair activities during winter, if possible. This will reduce impacts to wetlands due to soil poaching/sourcing and vegetation trampling under peak saturation levels. Additionally, the risk of vehicles getting stuck and further degrading the vegetation integrity is lowest during this time.	LWUA	During maintenance activities
General Maintenance activities	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	All sediment and debris removed from crossings must not be stored within wetland areas and buffer zones, or within other watercourses and must be deposited at an appropriate waste facility.	LWUA	During maintenance activities
				Mixing of concrete must under no circumstances take place within the wetland or buffer areas	LWUA	During maintenance activities
				Provide appropriate sanitation facilities during maintenance activities and service them regularly. These must be beyond the wetland and buffer area.	LWUA	During maintenance activities
				Monitor and inspect machinery, vehicles and equipment for leaks and spills.	LWUA	During maintenance activities
Operation of raw water pipeline Pipeline leak	Surface water and wetlands	Minimise the potential for surface water pollution Limit the disturbance and destruction of delineated wetlands	Increased raw water inputs to downstream wetlands	Conduct regular inspections of manholes along both the pipeline routes and fix leaks timeously. Engineers should advise on the frequency of pressure tests to detect leaks.	LWUA	As pe inspection requirements
				Monitor water quality at pump stations.	LWUA	As per requirements of the water use licence/general authorisation
				Install leak detection devices.	LWUA	Once off
General maintenance activities	Noise	Minimise the generation of noise	General rise in ambient noise levels	Ensure high level of equipment maintenance, especially intake and exhaust mufflers.	LWUA	During maintenance activities
				Replace pure tone (beeping) with broadband (hissing) reversing alarms.	LWUA	During maintenance activities
				Maintenance activities to take place only during daylight hours.	LWUA	During maintenance activities

Activity that may cause an impact	Environmental/ Social aspect	Management Outcomes	Potential environmental impact	Management Measure	Responsible Person	Frequency and/or time period
General maintenance activities	Air quality	Minimise atmospheric emissions and dust generation	Increased dust fallout	Apply dust suppressants to gravel roads used.	LWUA	Daily when maintenance is undertaken
				Set speed limits to 40 km/h to minimise the creation of fugitive dust within the project boundary.	LWUA	During maintenance activities
				Dust-reducing mitigation measures must be put in place and must be strictly adhered to, during the maintenance. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated.	LWUA	Daily when maintenance is undertaken
Operation of raw water pipeline	Social	Maximise social benefits	Water provision to benefitting mines and industries	Ensure that the raw water pipeline is in good working order and is regularly maintained.	LWUA	As per inspection requirements

6 MONITORING

Regular monitoring along the pipeline, especially at river crossings is required especially after the rainy season, and major flood events. Monitoring for structural stability of the pipeline as well as the possibility of erosion and bank stability should be conducted. Regular monitoring will ensure that any repairs required will be attended to in a timeously manner preventing further degradation and environmental damage.

Re-vegetated areas should be monitored every six months following post repair and maintenance activities. The areas should be monitored to ensure that vegetation establishment is occurring, and no new alien species have been introduced to the site.

7 CONCLUSION

Maintenance of the SE2 pipeline and associated infrastructure is important to ensure that the water demands of the area continue to be met. The main challenge of the area is ensuring that erosion remains at a minimum. Vegetation establishment cannot be the only mitigation option and therefore regulation maintenance activities should be undertaken.

Implementation of this MMP will minimise any additional impacts on the environment that may occur due to the necessary maintenance works.

ANNEXURE C: FINDINGS OF THE WALKDOWN SURVEY

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15 June 2022

Department of Forestry, Fisheries and the Environment
Private Bag X 447
Pretoria
001

DFFE Reference: 14/12/16/3/3/1/2442

Attention: Ms Matlhodi Mogorosi

Compiled: Andrew Husted (*Pr Sci Nat 400213/11*)

Email: info@thebiodiversitycompany.com

BOTANICAL WALKDOWN FOR THE LEBALELO WATER USER ASSOCIATION SOUTHERN EXTENSTION 2 (SE2) RAW WATER PIPELINE PROJECT

1. BACKGROUND

The Biodiversity Company was appointed to conduct an ecological (botany) walkdown for the new Lebalelo Water User Association (LWUA) raw water pipeline between the Spitskop Pump Station and Dwarsrivier Pump Station, located near Steelpoort in the Limpopo Province.

This project is also referred to as the Southern Extension 2 (SE2) pipeline. There is an existing raw water pipeline running from LWUA's Havercroft Pump Station to Borwa Pump Station, referred to as Southern Extension 1 (SE1). The new pipeline (SE2) will be constructed within the current pipeline (SE1) servitude. The purpose of this project is to provide raw water to several mines and industries located along the pipeline. The current pipeline's capacity is not sufficient to cater for the growing water demand from LWUA's members, and therefore an additional line is required.

The walkdown was conducted on the on 1st and 2nd of June 2022, as per condition 35 of the environmental authorisation issued on 28 April 2022. This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (No. 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) in terms of NEMA, dated 20 March 2020:

2. FINDINGS

The results of the walkdown are tabulated in Table 2-1 below. Seven species of conservation concern (SCC) were identified within the project footprint.

Table 2-1 Plant species observed

Species	Status	Species	Status	Species	Status	Species	Status
Acokanthera oppositifolia		Canthium gilfillanii		Dodonaea angustifolia		Hippobromus pauciflorus	
Aloe davyana		Carissa bispinosa		Dombeya rotundifolia		Hyparrhenia hirta	
Aloe cryptopoda		Celtis africana		Ehretia rigida		Ipomoea bathycolpos	
Aloe fosteri		Cenchrus ciliaris		Elaeodendron transvaalensis	NT; Protected	Ipomoea crassipes	
Aloe marlothii subsp. marlothii		Chascanum incisum		Elephantorrhiza praetermissa		Ipomoea magnusiana	
Andropogon chinensis		Chionanthus foveolatus		Elionurus muticus		Jamesbrittenia macrantha	NT
Aristida adscensionis		Chloris virgata		Enneapogon cenchroides		Kirkia wilmsii	
Aristida bipartita		Combretum apiculatum		Enneapogon scoparius		Kyphocarpa angustifolia	
Aristida canescens		Combretum erythrophyllum		Eragrostis lehmanniana		Laggera decurrens	
Aristida congesta		Combretum hereroense		Eragrostis racemosa		Lasiosiphon capitatus	
Aristida diffusa		Combretum molle		Eragrostis rigidior		Ledebouria spp.	
Aristida junciformis		Combretum zeyheri		Eragrostis trichophora		Leonotis ocymifolia	
Aristida meridionalis		Commelina africana		Euclea crispa		Leonotis pentadentate	
Aristida rhiniochloa		Commiphora glandulosa		Euclea linearis		Lydenburgia cassinoides	NT; Protected
Aristida scabrivalvis		Commiphora mollis		Euclea racemosa		Melhania rehmannii	
Aristida stipitata		Commiphora pyracanthoides		Euclea undulata		Melia azedarach	
Berchemia zeyheri	Protected	Crotalaria monteiroi		Faurea saligna		Melinis repens	
Berkheya insignis		Croton gratissimus		Felicia clavipilosa		Mimusops zeyheri	
Blepharis subvolubilis		Cussonia paniculosa		Fingerhuthia africana		Mundulea sericea	
Bolusanthus speciosus		Cymbopogon caesius		Geigeria burkei		Olea capensis subsp. inervis	
Boscia albitrunca	Protected	Cymbopogon pospischilii		Grewia flava		Olea europaea subsp. africana	
Boscia foetida subsp. rehmanniana		Cynodon dactylon		Grewia flavescens		Ormocarpum kirkii	
Bothriochloa insculpta		Cyperus obtusiflorus		Grewia monticola		Ormocarpum trichocarpum	
Brachiaria deflexa		Dactyloctenium aegyptium		Grewia vernicosa		Ozoroa sphaerocarpa	
Brachiaria nigropedata		Dactyloctenium giganteum		Gymnosporia buxifolia		Ozoroa spp.	
Brachiaria serrata		Dichrostachys cinerea		Hermannia glanduligera		Panicum maximum	
Bulbostylis hispidula		Dicliptera fruticosa	NT	Hermannia staurostemon		Pappea capensis	
Bulbostylis humilis		Digitaria eriantha		Heteropogon contortus		Peltophorum africanum	
Buxus macowanii		Diheteropogon amplectens		Hibiscus spp.		Petalidium oblongifolium	

Species	Status	Species	Status
Phragmites australis		Tinnea rhodesiana	
Phyllanthus parvulus		Tragus berteronianus	
Polygala hottentotta		Tricholaena monachne	
Rhoicissus sekhukhuniensis		Urochloa mosambicensis	
Rhoicissus tridentata		Urochloa panicoides	
Sarcostemma viminale subsp. viminale		Vachellia exuvialis	
Sclerocarya birrea subsp. caffra	Protected	Vachellia karroo	
Schmidtia pappophoroides		Vachellia luederitzii var. retinens	
Schotia brachypetala		Vachellia nilotica	
Scolopia zeyheri		Vachellia senegal var. leiorhachis	
Searsia engleri		Vitex obovata subsp. wilmsii	
Searsia keetii		Xerophyta schlechteri	
Searsia leptodictya		Ximenia caffra	
Searsia sekhukhuniensis		Ziziphus mucronata	
Searsia tumulicola			
Sebaea spp.			
Senegalia erubescens			
Senegalia mellifera subsp. detinens			
Senegalia senegal var. leiorhachis			
Senegalia senegal var. rostrata			
Setaria lindenbergiana			
Setaria sphacelata var. sphacelata			
Setaria verticillata			
Sporobolus fimbriatus			
Stipagrostis obtusa			
Stipagrostis uniplumis			
Terminalia prunoides			
Thamnosma africana			
Themeda triandra			

Two near threatened herbaceous plants were identified during the survey. They are *Jamesbrittenia macrantha* and *Dicliptera fruticosa*. Both of these species occurred together in relatively high numbers. The *Jamesbrittenia macrantha* was more numerous than the *Dicliptera fruticosa.* The *Jamesbrittenia macrantha* appears to be associated with disturbed areas such as alongside road reserves.

During the field assessment three *Berchemia zeyheri* (Red ivory), one *Boscia albitrunca* (Shepherd's tree), one *Elaeodendron transvaalensis* (Bushveld saffron), 10-50 *Lydenburgia cassinoides* (Sekhukhuni Bushman's Tea) and 50-100 *Sclerocarya birrea subsp. caffra* (Marula) trees were observed inside the

project area The trees observed are protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). In terms of the NFA, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate, or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a license or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Contravention of this declaration is regarded as a first category offence.

A special mention about the *Lydenburgia cassinoides.* This species lives in groves due to its association with the underlying geology in the area. There is a high density of this species within these groves. Most of the trees within these groves are large old specimens which should be preserved as far as possible.

3. CONCLUSION

No fatal flaws are evident for the proposed project. It is the opinion of the specialists that the Environmental Management Programme report (EMPr), may be favourably considered for authorisation All prescribed mitigation measures by the biodiversity specialist were included in the amended Draft and Final Basic Assessment Reports as well as the Amended Draft and Final EMPrs. Mitigation measures described in the final report will assist due diligence in regard to the environment.

3.1. Statement

It can be confirmed that the walkdown was completed for the SE2 pipeline, which will be constructed within the current pipeline (SE1) servitude. This proposed SE2 pipeline route has not been altered and was included in the Final Basic Assessment Report, and the accompanying EMPr. Further to this, the mitigation measures included in the EMPr remain applicable and will result in an acceptable residual impact.

I trust this letter serves to provide sufficient information, for any further comments or questions please contact myself.

Regards,

Andrew Husted
Ecologist

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

WALKDOWN REPORT FOR THE PROPOSED LEBALELO WATER USER ASSOCIATION SPITSKOP TO MOTOTOLO PIPELINE PROJECT . STEELPOORT, LIMPOPO PROVINCE

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	THE BIODIVERSITY COMPANY			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	ANDREW HUSTED			
Specialist Qualifications:	MSc AQUATIC HEALTH			
Professional affiliation/registration:	SACNASP 400213/11			
Physical address:	18 PERIDOT STREET, JUKSKEI PARK			
Postal address:	SAME AS ABOVE			
Postal code:	2188	Cell:	081 319 1225	
Telephone:	081 319 1225	Fax:		
E-mail:	andrew@thebiodiversitycompany.com			

2. DECLARATION BY THE SPECIALIST

I, ANDREW HUSTED, declare that –

- I act as the independent specialist 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 the specialist report relevant to this application, 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 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;
- all the particulars furnished by me in this form are true and correct; 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.

Signature of the Specialist

THE BIODIVERSITY COMPANY

Name of Company:

13/07/22

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, ANDREW HUSTED, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

THE BIODIVERSITY COMPANY

Name of Company

13/07/22

Date

Signature of the Commissioner of Oaths

Date

Certified as a true copy of original

Farai Shadreck Mbirimi BD52805
Minister of Religion / Commissioner of Oaths
391 11th Road, Erand, Midrand 1685

Date 13/07/2022