IRON ORE
KUMBA IRON ORE LTD

SISHEN IRON ORE COMPANY (PTY) LTD

INFRASTRUCTURE AND ACTIVITIES ASSOCIATED WITH KOLOMELA MINE NEAR POSTMASBURG, NORTHERN CAPE

SCOPING REPORT

DMRE REFERENCE: NC069MR

DATE: 21/06/2021

DRAFT FOR PUBLIC COMMENT

SOLUTIONS | PROGRESS | PARTNERS

SISHEN IRON ORE COMPANY (PTY) LTD

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SCOPING REPORT

DRAFT

NAME OF APPLICANT: Sishen Iron Ore Company (Pty) Ltd – Kolomela Mine

TEL NO: 053 313 9139

FAX NO: 078 560 5600

POSTAL ADDRESS: Private Bag X3003, Postmasburg, 8420

PHYSICAL ADDRESS: Kolomela Mine, Farm Strydfontein, Postmasburg

REF NUMBER: NC069MR

SUBMITTED FOR AUTHORISATION IN TERMS OF:

LISTED ACTIVITIES UNDER THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT

LISTED ACTIVITIES UNDER THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT

PREPARED BY: EXM Environmental Advisory (Pty) Ltd

DATE: 21/06/2021

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Company Reg: 2014/189068/07

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Name	**Designation**	**Signature**	**Date**
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

	Definition
BID	Background Information Document
DMRE	Department of Mineral Resources and Energy
DMS	Dense Media Separation
DSO	Direct Shipping Ore
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GNR	Government Notice Regulation
HME	Heavy Mining Equipment
IAP	Interested and Affected Party
IWWMP	Integrated Water and Waste Management Plan
KS	Kapstevel
LDV	Light Driving Vehicles
LOM	Life of Mine
mamsl	Metres above mean sea level
Mt	Million Tonnes
MPRDA	Mineral and Petroleum Resources Development Act
MW	Megawatt
NDCR	National Dust Control Regulations
NEMA	National Environmental Management Act
NEM:AQA	National Environmental Management Air Quality Act
NEM: BA	National Environmental Management Biodiversity Act
NEM: WA	National Environmental Management Waste Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NIA	Noise Impact Assessment
PM	Particulate Matter
PV	Photovoltaic
ROM	Run of Mine
SIOC	Sishen Iron Ore Company
SACNASP	South African Council for Natural & Scientific Professionals
SAHRA	South African Heritage Resource Agency
SANS	South African National Standards
SIOC	Sishen Iron Ore Company (Pty) Ltd
SLP	Social Labour Plan
TOPS	Threatened or Protected Species
TSF	Tailings Storage Facility
WRD	Waste Rock Dump
WUL	Water Use Licence

1. EXECUTIVE SUMMARY

1.1 Project overview

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south west of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province. The Minister of Mineral Resources granted a mining right for the mining of iron ore at Kolomela Mine on 5 May 2008, {Ref: (NC) 069 MR} and is valid until 17 September 2038, unless cancelled or suspended.

Kolomela mine operates as a conventional open cast mine where ore is extracted by means of drilling, blasting, loading and hauling. Ore extracted from the pits is transported to a direct shipping ore (DSO) plant which involves the crushing and screening of recovered ore material into stockpiles of 'lump' and 'fines'. The processed iron ore is loaded onto an internal railway line which is connected to a direct rail link to Transnet's Sishen-Saldanha railway line from where the iron ore is transported to the Port of Saldanha for export. Kolomela Mine also utilises a Modular Dense Media Separation (DMS) Processing Plant for the processing of low grade ore not suitable for processing at the DSO plant. Kolomela produced 10.8 million tonnes during its first full year of production in 2013 and currently produces 13-14 million tonnes per annum (Mtpa) facilitated by enhanced stripping techniques and processing of 1-3 Mtpa of lower grade of ore at the Tierbult DMS Modular Plant.

Iron ore is currently extracted from three opencast pits, namely Klipbankfontein, Leeuwfontein and Kapstevel North. Kolomela is in the process of developing the Kapstevel South Pit which is required to sustain the mining production at approximately 14 Mtpa (Mtpa) until 2031. The current the Life of Mine (LoM) including the Kapstevel South Pit currently stands at 2032, but with the potential to be extended in future with the development of the Ploegfontein, Tierbult and Heuningkranz ore bodies, the mining of which are already authorised.

Kolomela proposes to expand and amend some of the existing activities and also develop new infrastructure to support continued and future production at the mine. This includes:

- Expansion of the Kapstevel South Pit footprint area.
- Expansion of the Kapstevel Waste Rock Dumps and haul roads.
- Expansion of Kapstevel Evaporation Ponds and stormwater management infrastructure.
- Additional park-up, laydown and ore stockpile areas.
- Development of new DMS tailings management infrastructure
- A new Photovoltaic Solar Facility.
- A new Waste Tyre Management Facility.
- A conveyor and railway line to transfer material to and from the DMS plant.

- Expansion to the future Kapstevel DMS conveyor footprint to facilitate widened haul roads.
- Expansion of Kapstevel Waste Rock Dumps and Additional Waste Rock Dumps.
- Additional Low Grade Ore Storage Areas.
- New radio masts.
- Provision for an area of relaxation and safety berms around pits.

The existing and planned infrastructure at Kolomela mine are show in (Figure 5-1 and 5-2).

Authorisation is thus being sought from the Department of Mineral Resources & Energy (DMRE) for activities listed under the National Environmental Management Act (No. 107 of 1998) and the National Environmental Management: Waste Act (No. 59 of 2008) as well as amendment of the environmental management programme in terms of Section 102 of the Minerals & Petroleum Resources Development Act (No. 28 of 2002). The authorisation will cover existing and proposed footprints. This will be supported by a Scoping Study and an Environmental Impact Assessment (EIA).

1.2 Environmental Authorisations

1.2.1 Environmental Impact Assessment Process

The expansion of mining related activities at Kolomela mine triggers various activities listed in Listing Notices 1 (GN R. 324 of 2017), 2 (GN R. 325 of 2017) and 3 (GN R. 327 of 2017) published in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA). The expansion activities also trigger activities listed in Category B of GNR 921 (Waste Management Activities) published in terms of the National Environmental Management Waste Act (No. 59 of 2008). Therefore, a full Environmental Impact Assessment and Scoping process must be undertaken in terms of the EIA regulations (GNR 326 of 2017) to obtain Environmental Authorisation (EA) for the proposed expansion activities. The Northern Cape Department of Mineral Resources and Energy (DMRE) is the Competent Authority (CA) for the EIA process.

EXM Environmental Advisory (Pty) Ltd ("EXM") has been appointed as the independent Environmental Assessment Practitioner (EAP) to facilitate the EIA as well as the supporting public consultation process. This scoping report has been developed according to the requirements of the EIA regulations to verify and assess the scope of work that will be undertaken during the impact assessment phase.

1.2.2 Water Use Licence Application

A separate Integrated Water Use Licence (IWUL) will be undertaken for the following activities listed in Section 21 of the National Water Act (Act No. 36 of 1998):

TABLE 1-1: WATER USE ACTIVITIES

Section 21 Listed Activity	Related activities
c&i (water courses – pans and stream)	Construction/amendment of infrastructure • Haul roads (widening and new) • Conveyors to and from DMS plant. • Railway from DMS plant. • Kapstevel Waste Rock Dump • Waste Tyre Storage Area
g (waste disposal)	Construction/amendment of infrastructure • Kapstevel Evaporation Dams • Kapstevel Waste Rock Dumps • TSF on Leeuwfontein WRD • Paddock facility • Return Water Dam for TSF

An application will be undertaken to obtain an IWUL from the Northern Cape Department of Water and Sanitation (DWS) for the above listed activities, concurrent to the EIA process.

1.3 Key Potential Impacts

1.3.1 Biodiversity and Surface Water Resources

The establishment of the project footprints will result in the removal of vegetation which will cause impacts on biodiversity, both in terms of physical disturbance and habitat fragmentation. The extent and significance of the disturbance will be assessed by an Ecological Impact Assessment.

Several pans will be potentially disturbed by the expansion footprint. The expansion footprint will be located in relatively close proximity to the "Welgevondenspruit" a tributary of the Soutloop River (non-perennial river, only flows during heavy rainy period), that flows through Kolomela mine as well as other drainage features within the mine boundary.

Runoff from disturbed areas, including stockpiles and Waste Rock Dumps, and increased runoff volumes from artificial surfaces during operations may also result in erosion and sedimentation of downstream water courses. An Aquatic Impact Assessment will be undertaken to assess potential impacts on surface water resources.

1.3.2 Visual

The expansion activities will increase the cumulative visual appearance of Kolomela which will result in a larger visual intrusion for surrounding receptors.

1.3.3 Air quality

The disturbance related to the expansion activities and the establishment of additional stockpiles and WRDs has the potential to contribute to dust generation and increase the cumulative air quality impacts associated with Kolomela. An updated Air Quality Impact Assessment will be undertaken to provide input to the EIA.

1.3.4 Heritage resources

The establishment of the project footprint may result in the disturbance of sites of archaeological, palaeontological, cultural or heritage importance. A Heritage Impact Assessment will be undertaken to evaluate impacts on heritage resources.

1.3.5 Soil and groundwater

The project will entail the management of hazardous substances. Spillages may result in contamination of soil and seepage to groundwater. The establishment of the TSF on the Leeuwfontein WRD may also result in potential interaction with groundwater.

1.3.6 Socio-economics

The activities that will be implemented as part of the Kolomela expansion project is essential for the efficient and sustained operations of the mine. The associated projects will have some additional positive outcomes for local communities and society in general. The construction and operations associated with the projects are expected to result in increased employment opportunities with time.

A number of the expansion activities are essential for the development of the Kapstevel South project and associated socio economic benefits, including the additional park-up area, amended stormwater infrastructure, widening and amendment of haul roads, development of two WRDs, expansion of the Kapstevel At-Pit facility as well as larger pit footprint (creation of Job opportunities during construction period).

Employment opportunities associated with the Kapstevel south project as well as other infrastructure development related to the expansion activities may lead to community expectations and result in an influx of people to the area. This may result in increased pressure on municipal services.

1.4 Specialist studies to be undertaken

It is proposed that the following specialist studies will be undertaken to provide input to the EIA:

Specialist study	Summary
Geohydrology assessment, including geochemistry.	Conduct an assessment of the cumulative (overall) impact of Kolomela on groundwater resources in terms of groundwater availability due to dewatering activities and potential contamination.
Hydrology assessment	This assessment will focus on the delineation of floodlines and to determine the potential impacts of activities at Kolomela on the area's hydrology. The study will also include an updated stormwater management plan.

Specialist study	Summary
Water course assessment	Assessment of potential impacts on water courses including wetlands and streams.
Hydropedeological assessment.	Assessment of impacts on sub surface flow of water and interaction with wetlands.
Visual Impact Assessment.	To determine the cumulative visual intrusion of Kolomela in terms of current footprint and future development.
Biodiversity Impact Assessment.	Assess impacts that expansion activities will have on fauna (animals) and flora (plants) as well as the ecology of the area.
Updated Noise Impact Assessment.	Update noise model for Kolomela mine based on current activities and expansion projects. Updated baseline noise monitoring will be conducted.
Updated Air Quality Impact Assessment.	Update air quality model for Kolomela mine based on current activities and expansion projects.
Financial Provisioning.	Assessment of financial provisioning that will be required for expansion activities.
Heritage and Palaeontological Impact Assessment.	Assess potential impacts of expansion activities will have on heritage resources.

1.5 Public Participation Process

A public participation process is conducted in terms of the Chapter 6 of the National Environmental Management Act and the EIA regulations. The purpose of the public participation process is to inform all the identified Interested and Affected Parties (IAPs) of the proposed development and associated application process and allow them to raise comments/concerns.

The draft Scoping report is available for a 30 day commenting period after which the comments will be incorporated and the final scoping report will be submitted to the Competent Authority (CA) for approval. Proof of distribution of scoping report and notifications will be included in the final Scoping which report will also be distributed to the IAPs.

2. DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

2.1 Details of EAP

2.1.1 The Environmental Assessment Practitioner (EAP) who prepared the report

Name of The EAP: EXM Environmental Advisory (Pty) Ltd

Tel No.: 010 007 3617

Fax No.: 086 527 4619

e-mail address: trevor@exm.co.za

TABLE 2-1: EXPERTISE OF THE EAP.

EAP	Qualification	Years' experience
Trevor Hallatt	B.Sc. Geography and Zoology (NWU) B.Sc. (hons) Environmental Management (NWU) M.A. Environmental Management (NWU)	10 Years
	South African Council for Natural Scientific Professions (SANASP) Registration no.: 300123/15	

CV with experience is attached as Appendix A.

3. DESCRIPTION OF THE PROPERTY

Farm Name:	Farm Leeuwfontein No. 488 Remaining Extent Farm Strydfontein No. 614 Plaas No. 476 Farm Ploegfontein No. 487 Remaining Extent Farm Klipbankfontein No. 489 Remaining Extent Farm Kapstevel No. 541 Portion 1 Remaining Extent Farm Kapstevel No. 541 Portion 3 Farm Kapstevel No. 541 Portion 2 Farm Kapstevel No. 541 Remaining Extent Plaas No. 485 Plaas No. 486 Farm Kappies Kareeboom 540
Application area (Ha	The mining right area covers 18 466 ha, of which 4340 ha is already disturbed or will be disturbed by mining infrastructure footprints.
Magisterial district:	The Hay Magisterial District (Tsantsabane Local Municipality) ZF Mgcawu District Municipality
Distance and direction from nearest town	8 km south west of Postmasburg

21-digit Surveyor General Code for each farm portion	Farm Leeuwfontein No. 488 Remaining Extent	C03100000000048800000
	Farm Strydfontein No. 614	C03100000000061400000
	Plaas No. 476	C03100000000047600000
	Farm Ploegfontein No. 487 Remaining Extent	C03100000000048700000
	Farm Klipbankfontein No. 489 Remaining Extent	C03100000000048900000
	Farm Kapstevel No. 541 Portion 1 Remaining Extent	C03100000000054100001
	Farm Kapstevel No. 541 Portion 3	C03100000000054100003
	Farm Kapstevel No. 541 Portion 2	C03100000000054100002
	Farm Kapstevel No. 541 Remaining Extent	C03100000000054100000
	Plaas No. 485	C03100000000048500000
	Plaas No. 486	C03100000000048600000
	Farm Kappies Kareeboom 540	C03100000000054000000
Locality map	Figure 4-1.	

4. LOCALITY MAP

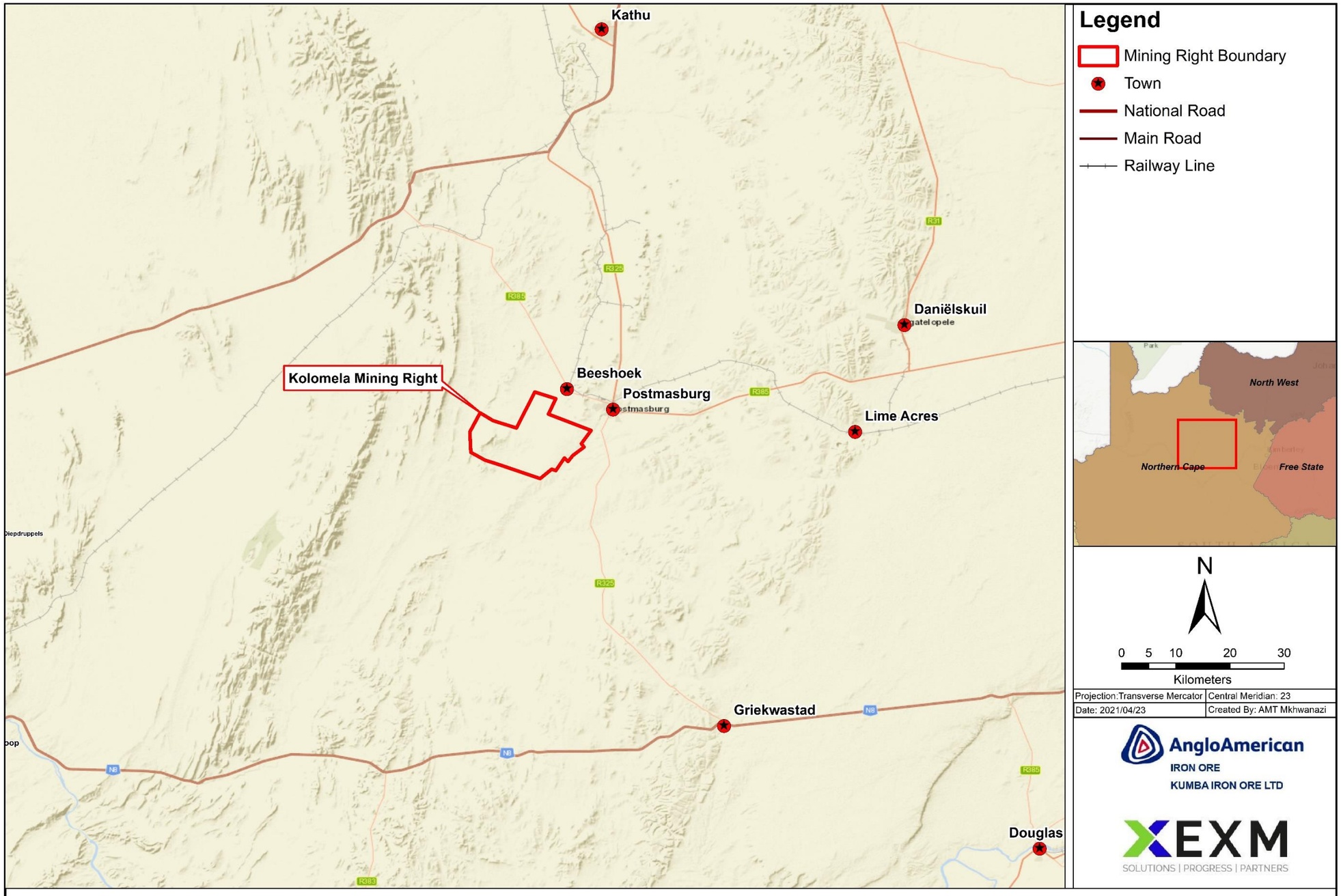

FIGURE 4-1: REGIONAL LOCALITY MAP

5. DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY

5.1 Background and introduction

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south west of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province. The Minister of Mineral Resources granted a mining right for the mining of iron ore at Kolomela Mine on 5 May 2008, {Ref: (NC) 069 MR} and is valid until 17 September 2038, unless cancelled or suspended.

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- Development of new DMS tailings management infrastructure
- A new Photovoltaic Solar Facility.
- A new Waste Tyre Management Facility.
- A conveyor and railway line to transfer material to and from the DMS plant.

- Expansion to the future Kapstevel DMS conveyor footprint to facilitate widened haul roads.
- Expansion of Kapstevel Waste Rock Dumps and Additional Waste Rock Dumps.
- Additional Low Grade Ore Storage Areas.
- New radio masts.
- Provision for an area of relaxation and safety berms around pits.

The existing and planned infrastructure at Kolomela mine are show in (Figure 5-1 and 5-2).

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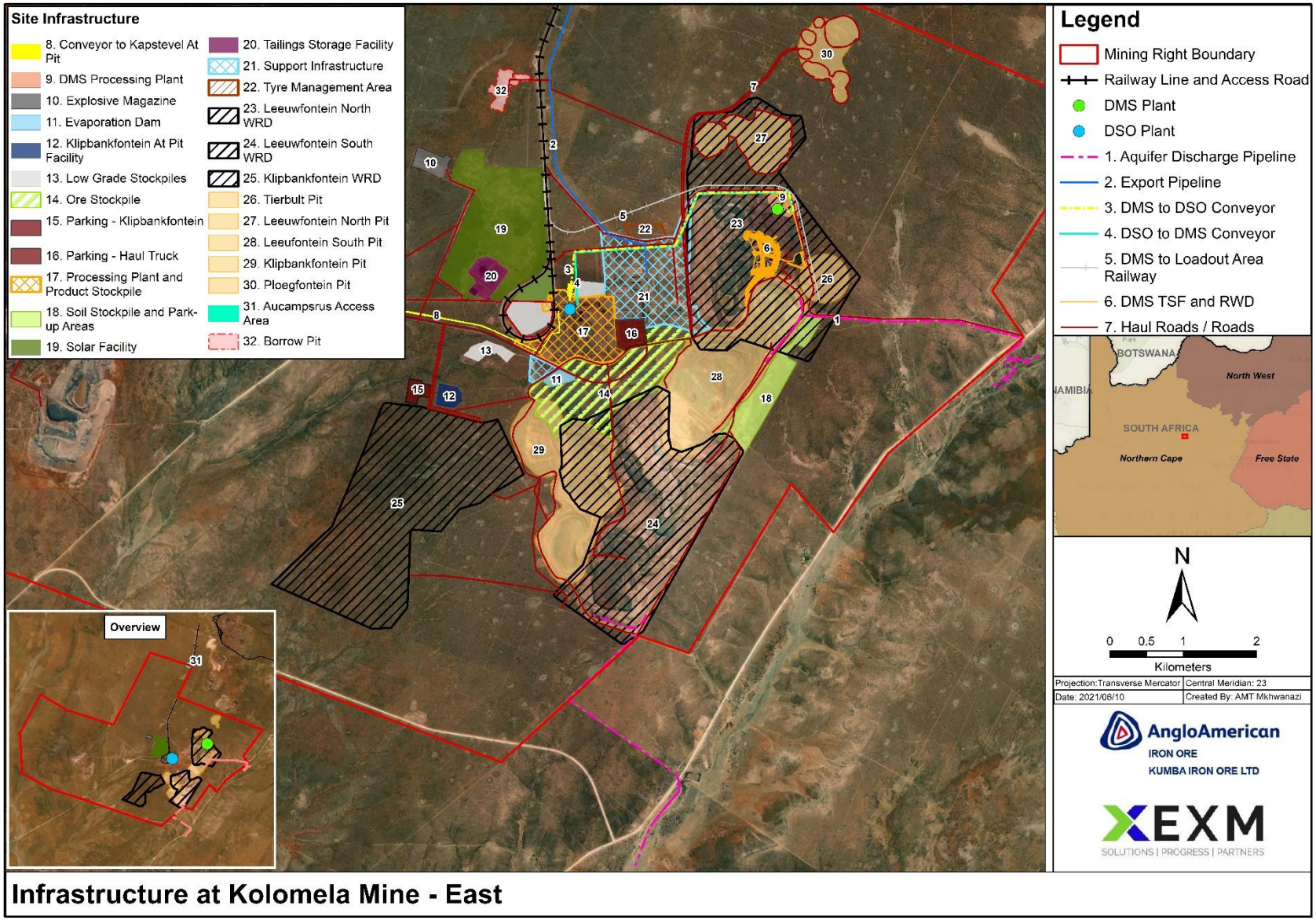


FIGURE 5-1: INFRASTRUCTURE ASSOCIATED WITH KOLOMELA – EASTERN SECTION

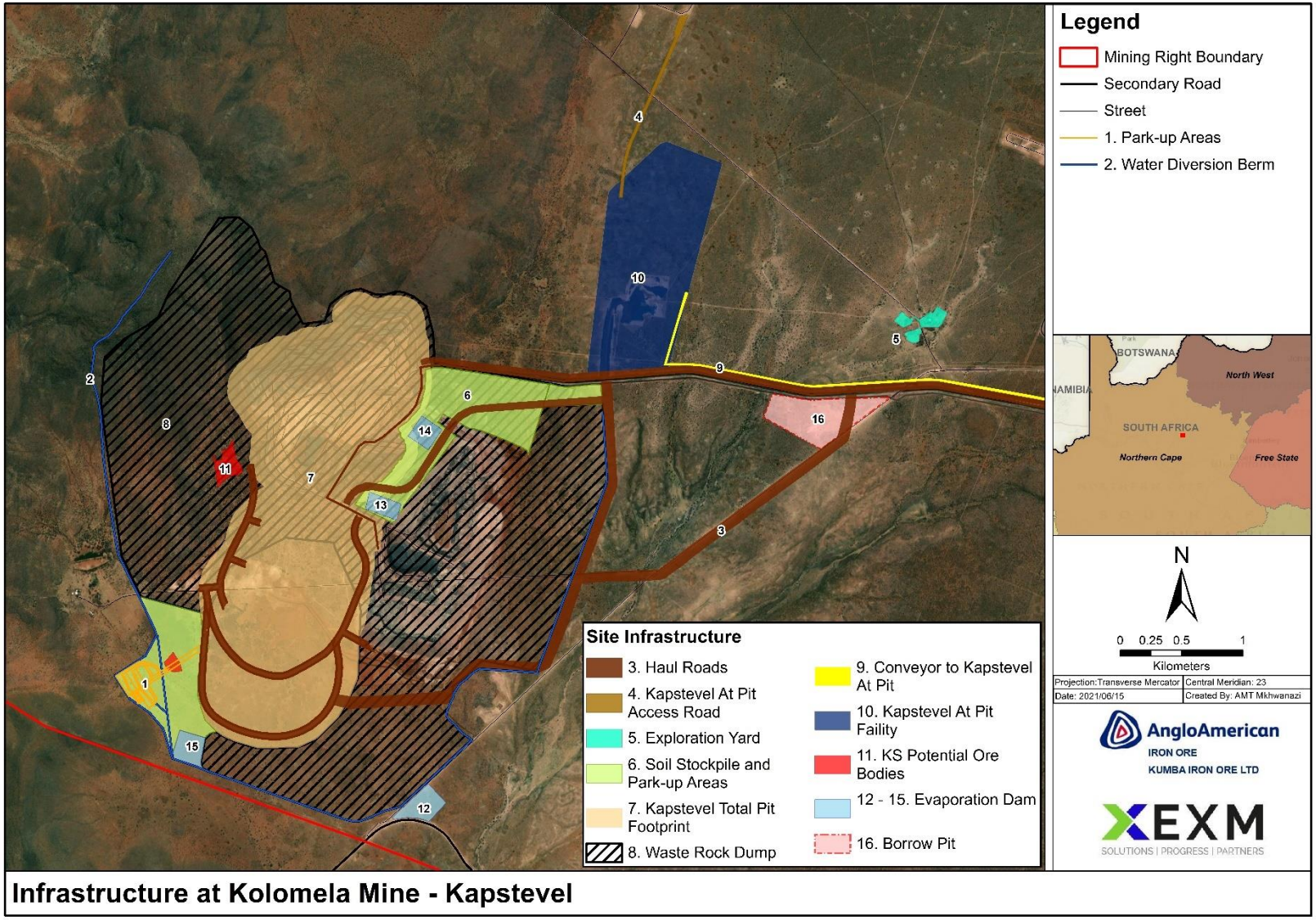


FIGURE 5-2: INFRASTRUCTURE ASSOCIATED WITH KOLOMELA - KAPSTEVEL

5.2 Listed and Specified activities

Activity	Applicable Listing Notice
(1) Haul roads	
a. Kolomela Access Road	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 24** Development of a road **Activity 56** The widening of a road by more than 6 metres **GNR 629** **Activity 12** Clearance of vegetation within a CBA. **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
b. Perimeter fence and road	
c. Haul roads and secondary roads	
d. Kapstevel Atpit Facility Access road	
e. Haul roads to Klipbankfontein Pit and Leeuwfontein South WRD.	
f. Kapstevel haul roads.	
(2) Other linear infrastructure	
a. Sishen South Pipeline and Reservoir	**GNR 627** **Activity 9** Pipelines **Activity 27** Vegetation clearance for pump station
b. Railway Line to Beeshoek	**GNR 627** **Activity 24** Development of a road **Activity 27** Vegetation clearance
c. DMS to DSO conveyor	**GNR 627** **Activity 12** Infrastructure within a watercourse **Activity 27** Vegetation clearance **GNR 629** **Activity 8** Development of conveyor within (or within 100 m) of a watercourse
d. DMS to load out station railway	**GNR 627** **Activity 12** Infrastructure within a watercourse
e. DSO to DMS conveyor	**GNR 627** **Activity 12** Infrastructure within a watercourse **Activity 27** Vegetation clearance **GNR 629** **Activity 8** Development of conveyor within (or within 100 m) of a watercourse
f. Artificial aquifer discharge pipeline	**GNR 627** **Activity 12**

Activity	Applicable Listing Notice
	Infrastructure development within a water course
g. Kapstevel DMS conveyor	**GNR 627** **Activity 12** Infrastructure within a watercourse **GNR 629** **Activity 8** Development of conveyor within (or within 100 m) of a watercourse **Activity 12** Clearance of vegetation within a CBA. **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(3) Storage and management of hazardous substances	
a. Fuel Depot – Diesel and Lubricants	**GNR 628** **Activity 4** Storage and handling of a dangerous goods > 500m^3 **GNR 627** **Activity 34** Fuel storage expansion – need for Atmospheric Emissions Licence **Activity 51** Fuel storage expansion > 80 m^3.
b. Other fuel storage tanks i. Loco refuelling station. ii. LDV refuelling. iii. Kapstevel South Workshop Refuelling area	**GNR 628** **Activity 4** Storage and handling of a dangerous goods > 500m^3
c. Explosives magazine	**GNR 627** Activity 14 Storage of dangerous goods > 80m^3 **Activity 27** Vegetation clearance **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(4) Tailings Management Infrastructure	
a) DMS Tailings Management Infrastructure i. TSF on WRD. ii. Pipelines. iii. Return water dam for TSF. iv. DMS return water dam. v. Paddocks.	• **TSF** None • **Pipeline** **GNR 627** **Activity 9** Pipelines. • **Return Water Dam** **GNR 627** **Activity 13** Water storage **GNR 628 (2017) – LN2** **Activity 6** Activity requiring WUL **GNR 921** **Category B** **Activity 10**

Activity	Applicable Listing Notice
	Construction of a waste management activity listed in Category B of this Schedule. **Activity 7** The disposal of any quantity of hazardous waste to land. **Activity 11** Residue stockpiles or residue deposits.
b) Slimes dam for receiving material from the DSO plant	**GNR 627** **Activity 24** Development of a road **Activity 27** Vegetation clearance **GNR 628** **Activity 16** Development of a dam with a wall > 5m **GNR 628 (2017) – LN2** **Activity 6** Activity requiring WUL
(5) Supporting Infrastructure	
a. Supporting infrastructure i. Offices. ii. Security centre. iii. On-boarding centre. iv. Parking for support staff and haul roads. v. Workshops/laydown areas. vi. Warehouses.	**GNR 628** **Activity 15** Vegetation clearance > 20ha
b. Construction village – currently used for offices.	**GNR 627** **Activity 27** Vegetation clearance **Activity 28** Transformation of land
c. Kapstevel At Pit Facility	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 13** Storage of water > 50 000m^3 **Activity 24** Development of a road **GNR 628** **Activity 6** Activity which requires a WUL (PCD) **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
d. Parking at Klipbankfontein	**GNR 627** **Activity 27** Vegetation clearance

Activity	Applicable Listing Notice
e. Park Up and Soil Stockpile Areas	**GNR 627** Activity 14 Storage of dangerous goods > 80m^3 **Activity 24** Development of a road **Activity 27** Vegetation clearance
f. Solar PV Facility	**GNR 628** **Activity 15** Vegetation clearance > 20ha **GNR 629** **Activity 12** Clearance of vegetation within a CBA.
g. Aucampsrus Access Gate Area	N/A
h. Welgevonden exploration core yard	N/A
(6) Processing Plants and Supporting Infrastructure	
a. DSO plant and product stockpile areas	**GNR 628** **Activity 15** Vegetation clearance > 20ha
b. DMS Processing Plants (Kapstevel and Tierbult)	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 13** Storage of water > 50 000m^3 **Activity 24** Development of a road **GNR 628** **Activity 6** Activity which requires a WUL (PCD) **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(7) Opencast Pits	
a. Opencast Pits i. Leeuwfontein ii. Ploegfontein (North and South) iii. Klipbankfontein iv. Tierbult **v.** Kapstevel (North and South)	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 13** Storage of water > 50 000m^3 **Activity 24** Development of a road **Activity 56**

Activity	Applicable Listing Notice
	The widening of a road by more than 6 metres **GNR 628** **Activity 6** Activity which requires a WUL (evaporation ponds) **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(8) Waste Management Activities	
a. Waste Rock Dumps i. Leeuwfontein North and South ii. Klipbankfontein iii. Kapstevel	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 24** Development of a road **Activity 56** The widening of a road by more than 6 metres **GNR 628** **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse. **GNR 921** **Category A: Activity 13** The expansion of a waste management activity. **Category B** **Activity 7** The disposal of any quantity of hazardous waste to land. **Activity 11** Residue stockpiles or residue deposits.
b. Use of plant discard and waste rock for construction of roads and other infrastructure	**GNR 921** **Category B** **Activity 2** The reuse or recycling of hazardous waste
c. Waste Tyre Management Facility	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 27** Vegetation clearance
d. Co-disposal of tailings with waste rock (backfilling and on WRDs)	**GNR 627** **Activity 9** Pipelines.

Activity	Applicable Listing Notice
e. Backfilling of waste rock (Leeufontein, Klipbankfontein and Ploegfontein Pits)	**GNR 921** **Category B** **Activity 7** The disposal of any quantity of hazardous waste to land. **Activity 11** Residue stockpiles or residue deposits.
(9) Kapstevel Stormwater Infrastructure	
a. Kapstevel Evaporation dams	**GNR 627** **Activity 13** Storage of water > 50 000m^3 **Activity 27** Vegetation clearance
b. Amended Kapstevel diversion berm	N/A – linear activity
(10) Sewage Management	
a. Sewage Treatment Works	**GNR 627** **Activity 12** Infrastructure within a watercourse. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(11) Stockpile areas	
a. Ore Stockpile Area	**GNR 628** **Activity 15** Vegetation clearance > 20ha
b. Low Grade Product Storage Areas	**GNR 627** **Activity 12** Infrastructure within a watercourse **GNR 628** **Activity 15** Vegetation clearance > 20ha
(12) Exploration sites	
a. Exploration sites	**GNR 628 (2017) – LN2** **Activity 15** The clearance of an area of 20 hectares or more of indigenous vegetation.

5.3 Description of existing and proposed activities

5.3.1 Opencast Pits

Current opencast mining activities take place within the Leeuwfontein, Klipbankfontein and Kapstevel North Pits. The Kapstevel South Pit is being developed with the first ore to be extracted in 2024 and required to sustain ore production at 14 Mtpa until 2031. Future pits planned and authorised include the Tierbult Pit and the Ploegfontein and Ploegfontein South Pits (Table 5-1). The Kapstevel South Pit layout is being changed from previously approved in order to facilitate a change in mine planning at the pit.

The current approved footprints for the Kapstevel South and North Pits are 147 ha and 140 ha, respectively. Exploration data has revealed larger ore bodies at the Kapstevel South and North pits and the pit footprints will be extended with the north pit being 165 hectares and the south pit being 200 ha. Figure 5-3 shows the approved Kapstevel north and south footprints compared to the amended pit footprint (Kapstevel Total Pit Footprint).

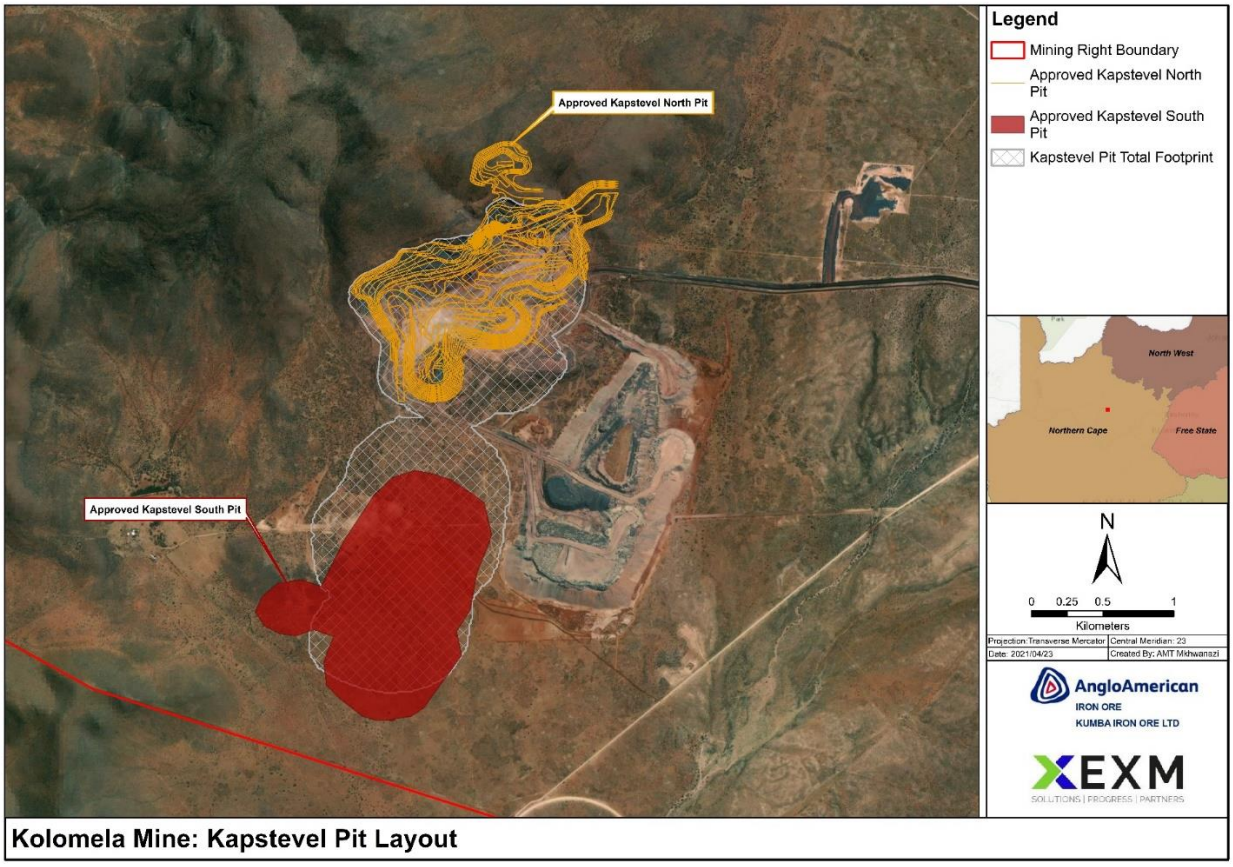


FIGURE 5-3: KAPSTEVEL APPROVED FOOTPRINT COMPARED TO AMENDED FOOTPRINT

Kolomela is increasingly investigating strategies for the backfilling of waste rock into the opencast pits and have already commenced with the backfilling of the Leeuwfontein Pit. The footprint of the approved Leeuwfontein Waste Rock Dump (WRD) will result in the complete backfilling of the Tierbult Pit and Ploegfontein South Pit areas and the northern section of the Leeuwfontein Pit. The establishment of the approved Kapstevel WRD will result in the backfilling of the Kapstevel North Pit. It is proposed to extend the backfilling footprint to incorporate the remaining section of the Leeuwfontein Pit and the Klipbankfontein Pit.

TABLE 5-1: KOLOMELA OPENCAST PITS

Opencast Pit	Surface Area	Description
Leeuwfontein Pit	165 ha	Existing pit, backfilling in process and to be completely backfilled.
Klipbankfontein Pit	131 ha	Existing pit to be partially backfilled by Leeuwfontein South WRD.
Ploegfontein Pit	128 ha	Future authorised pit development.

Opencast Pit	Surface Area	Description
Ploegfontein South Pit	75 ha	Future authorised pit development to be backfilled by Leeuwfontein North WRD.
Tierbult Pit	35 ha	Future authorised pit development to be backfilled by Leeuwfontein North WRD.
Kapstevel North Pit	165 ha	Existing pit to be completely backfilled with waste rock from Kapstevel South Pit.
Kapstevel South Pit	200 ha	Pit development in process.

5.3.2 Pit Abandonment Berms

A possible method to minimise the risk of inadvertent public access to open pit voids involves the construction of an abandonment berm around the perimeter of the open pit after mining has been completed at all the respective pits. A geotechnical assessment was conducted to predict long-term failback zones around the perimeter of the pits in order to ensure long-term sustainability of abandonment berm as a mitigation measure. The footprint associated with the failback zones and abandonment berms has thus been included as future areas adjacent to the pits. Figure 5-4 below provides an illustration of the area of relaxation and abandonment berms.

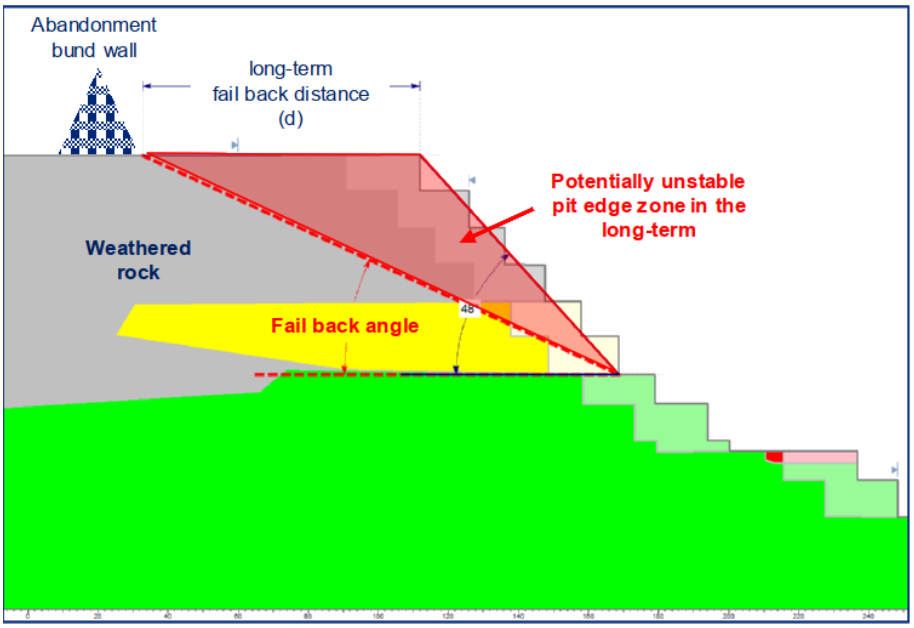


FIGURE 5-4: AREA OF RELAXATION AND ABANDONMENT BERM ILLUSTRATION

5.3.3 Waste Rock Dumps

Kolomela existing and proposed WRDs are given in Table 5-3.

TABLE 5-2: SUMMARY OF WASTE ROCK DUMPS

Waste Rock Dump	Surface Area	Description
Leeuwfontein North WRD	608 ha	Existing, includes backfilling of Leeuwfontein North Pit and future Ploegfontein South and Tierbult Pits.

Waste Rock Dump	Surface Area	Description
Leeuwfontein South WRD	469 ha	Existing, includes backfilling of the Klipbankfontein Pit.
Klipbankfontein WRD	485 ha	Proposed future development.
Kapstevel WRDs	833 ha	Waste from Kapstevel North and South Pits.

The footprint of the Leeuwfontein North WRD will result in the complete backfilling of the Tierbult Pit and Ploegfontein South Pit areas once developed. Leeuwfontein South WRD will result in the partial backfilling of the Klipbankfontein Pit.

The Kapstevel WRD has been revised from that originally approved. This is due to exploration data having revealed potentially viable ore bodies located within the existing approved footprint of the western section of the dump footprint area. Kolomela thus proposes to now establish two WRDs to the south and east of the existing WRD footprint to avoid the ore bodies should they be deemed feasible to be mined in the future. The newly proposed southern WRD will cover approximately 115 ha and the eastern WRD will cover approximately 220 hectares, of which 27 ha are located on the approved Kapstevel WRD footprint. The original approved footprint has also been amended to the north of Kapstevel North Pit avoid heritage resource of high significance in that area.

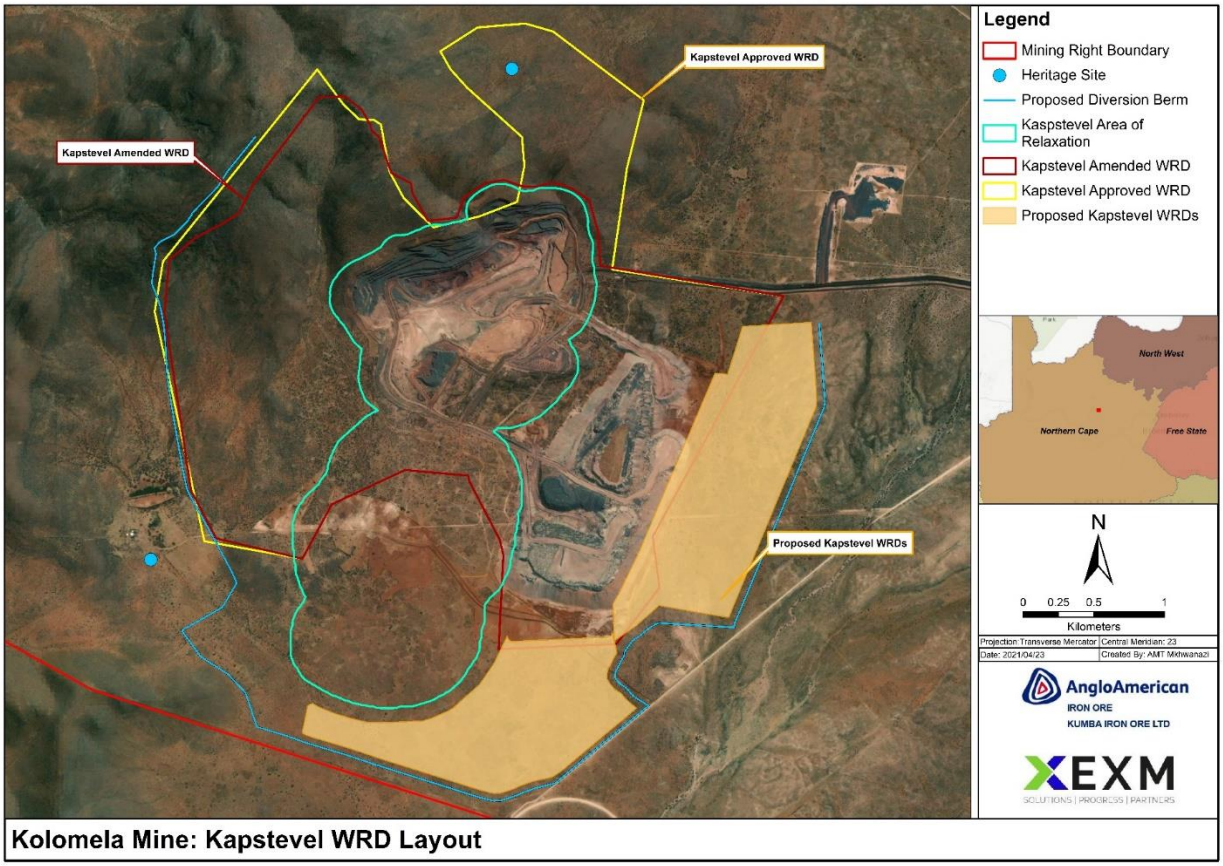


FIGURE 5-5: KAPSTEVEL SOUTH REVISED FOOTPRINT

A 50 m buffer area has now also been allocated around all of the approved Kolomela WRDs.

This additional proposed disturbance footprint is to allow for the sloping of the waste rock dumps as part of the rehabilitation.

5.3.4 Stormwater Management Infrastructure at Kapstevel

The footprint and route of the approved clean and dirty water diversion berms at Kapstevel have also been amended in line with recent survey data in order to optimally use the natural topography for water conveyance. Trenches will be constructed on both side of the berm to convey clean water runoff from the environment on one side and dirty water runoff from the WRD on the other. The diversion berm will be approximately 7.7 km in length. Figure 5-6 illustrates the layout of the amended stormwater infrastructure for Kapstevel.

Run-off that collects within the pits during rainfall events is pumped to evaporation ponds in order to allow for safe mining activities continue within the pits. There are existing evaporation ponds at Leeuwfontein and Klipbankfontein but no ponds have been developed at Kapstevel to date. The approved evaporation pond of 38 ha was never developed and the planning has been revised to provide for 4 smaller evaporation ponds (see Figure 5-6). The proposed expansion activities and new amended infrastructure layout at Kolomela will require multiple dams at strategic locations at Kapstevel.

Kolomela proposes to develop evaporation dams at Kapstevel south and north pits that will be used to evaporate rain water pumped from the pits. The two dams on the south eastern section will also used to capture runoff conveyed by the dirty water diversion canals. The dams will cover a combined surface area of approximately 18 hectares.

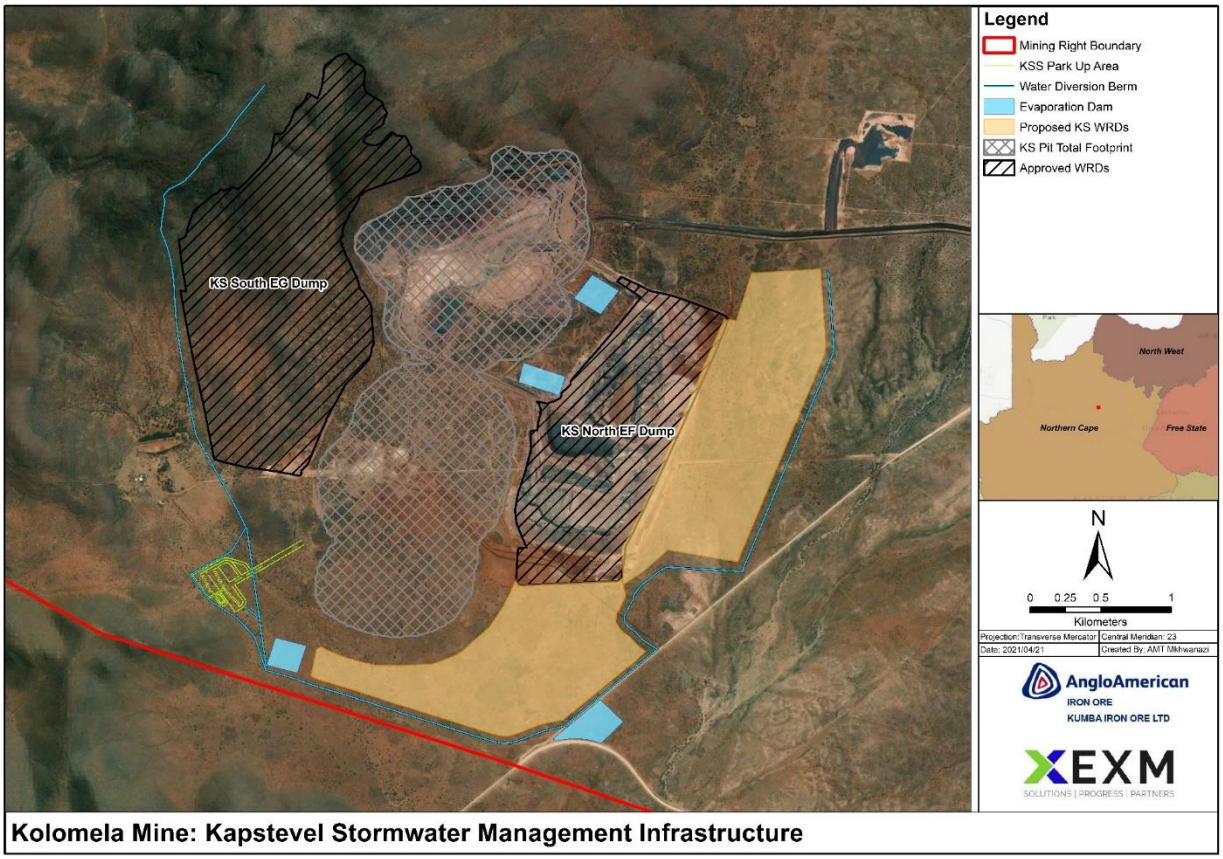


FIGURE 5-6: PROPOSED STORMWATER MANAGEMENT INFRASTRUCTURE FOR KAPSTEVEL

Run-off collected in the Ploegfontein Pits area will be pumped also be pumped to an evaporation pond which is included in previous authorisations.

5.3.5 Haul Roads

Haul roads for the Leeuwfontein Pit and WRD area and Klipbankfontein Pit as well as roads that connect infrastructure within Kolomela operations were constructed as part of the original Kolomela mine development. The roads are approximately 30 m wide and have a combined length of 44 km. Four new Haul Roads have been constructed to facilitate movement of haul trucks between the run of mine (ROM) stockpile area, the Klipbankfontein Pit and the Leeuwfontein South WRD. The haul roads have a width of 30 m and will cover a distance of approximately 3.3 km.

Kolomela has identified the need to partially shift towards Autonomous Haul Trucks to optimise mining from the Kapstevel South Pit. The simultaneous operation of autonomous haul trucks together with the current haul truck fleet and Light Duty Vehicles (LDV) requires wider haul roads due to safety requirements. It is proposed to widen the existing Kapstevel haul roads and to establish additional haul roads.

Due to the changes in infrastructure layouts (especially the Kapstevel WRD and pits), the haul roads previously approved to facilitate mining of the Kapstevel South Pit are no longer

practical as indicated in Figure 5-7. New haul road positions are proposed to accommodate the updated layouts with sufficient width to allow simultaneous operation of autonomous haul trucks and the current haul truck fleet. A haul road will also be constructed to gain access to the Ploegfontein pits which will be 4.7 km in length and 30 m wide. This will only be developed once the mining of Ploegfontein commences.

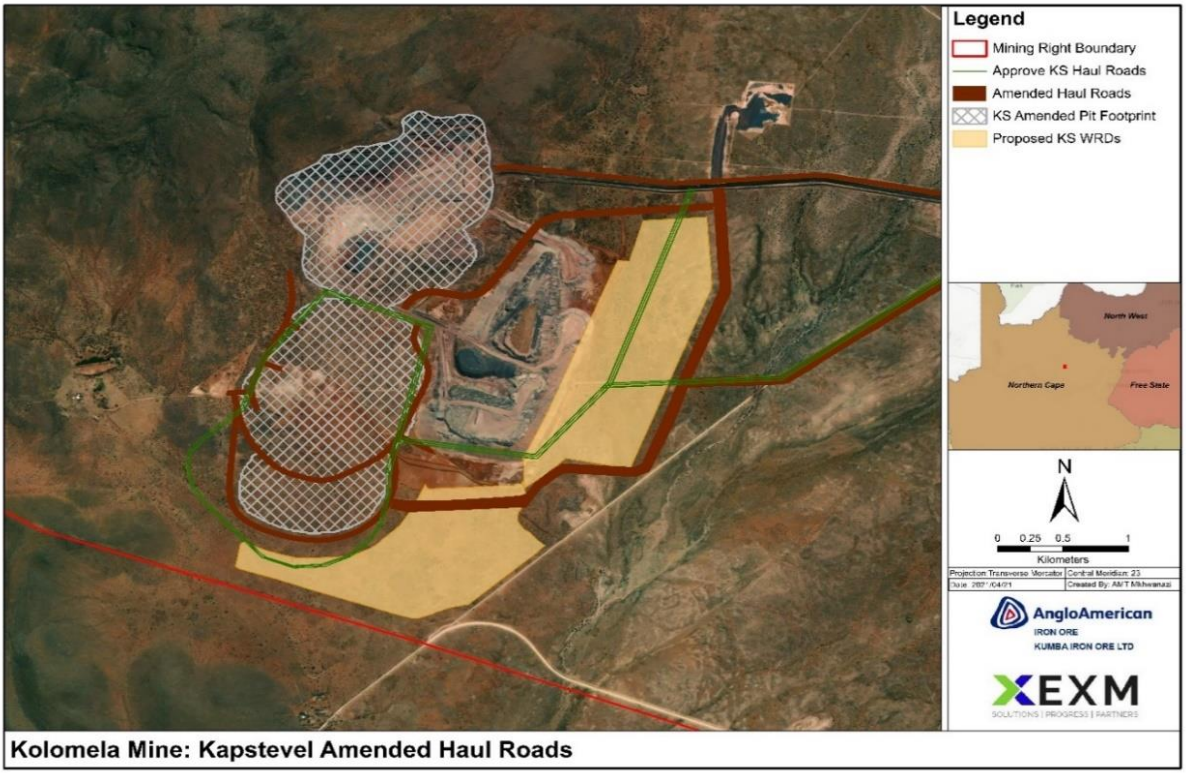


FIGURE 5-7: AMENDED KAPSTEVEL HAUL ROADS COMPARED TO APPROVED HAUL ROADS

5.3.6 Park Up and Soil Stockpile Areas

Due to safety considerations, no vehicles are allowed within a 500 m radius from the pits during blasting and must therefore be moved outside this perimeter. Kolomela has also identified the need to develop additional areas for the stockpiling of topsoil that is stripped during the development of the pits. Therefore, Kolomela proposes to develop three areas that will serve a dual purpose for the parking of trucks during blasting and the stockpiling of topsoil (demarcated and separate from parking area). Three such areas are proposed as indicated in Figure 5-1 and 5-2**.** The first two areas will be located at the Kapstevel North Pit and west of the Leeuwfontein Pit. These areas will cover a total area of 140 ha of which 93 ha will be located on existing authorised/disturbed areas.

The Kapstevel South Pit will be located a considerable distance from any areas dedicated to park vehicles. Kolomela therefore proposes to establish an area south of the Kapstevel South Pit to park mining vehicles during blasting events or during shift changes. A portion of this area will also be used for the stockpiling of soil. The facility will cover approximately 53 ha. Runoff from the facility will be diverted to one of the Kapstevel Evaporation Dams.

5.3.7 DSO Processing Plant

Kolomela operates a Direct Shipping Ore (DSO) facility which includes primary, secondary and tertiary crushers. A screening plant has also been developed to screen material from the secondary crusher to diver material larger than 25 mm to the tertiary crusher. Screened material reports to the blending beds where the ore is stacked and reclaimed before being conveyed to the load out station for deposition onto the wagon trains. The DSO, including the stockpile areas cover approximately 60 hectares on existing disturbed areas.

Ore is stockpiled in an area of approximately 44 ha south of the DSO Processing Plant. Kolomela is proposing to expand the storage capacity on already approved footprints, which forms part of this application process. The expanded stockpile areas will cover approximately 145 hectares and will be situated on existing disturbed and approved footprints (Figure 5-7). No new listed activities are triggered.

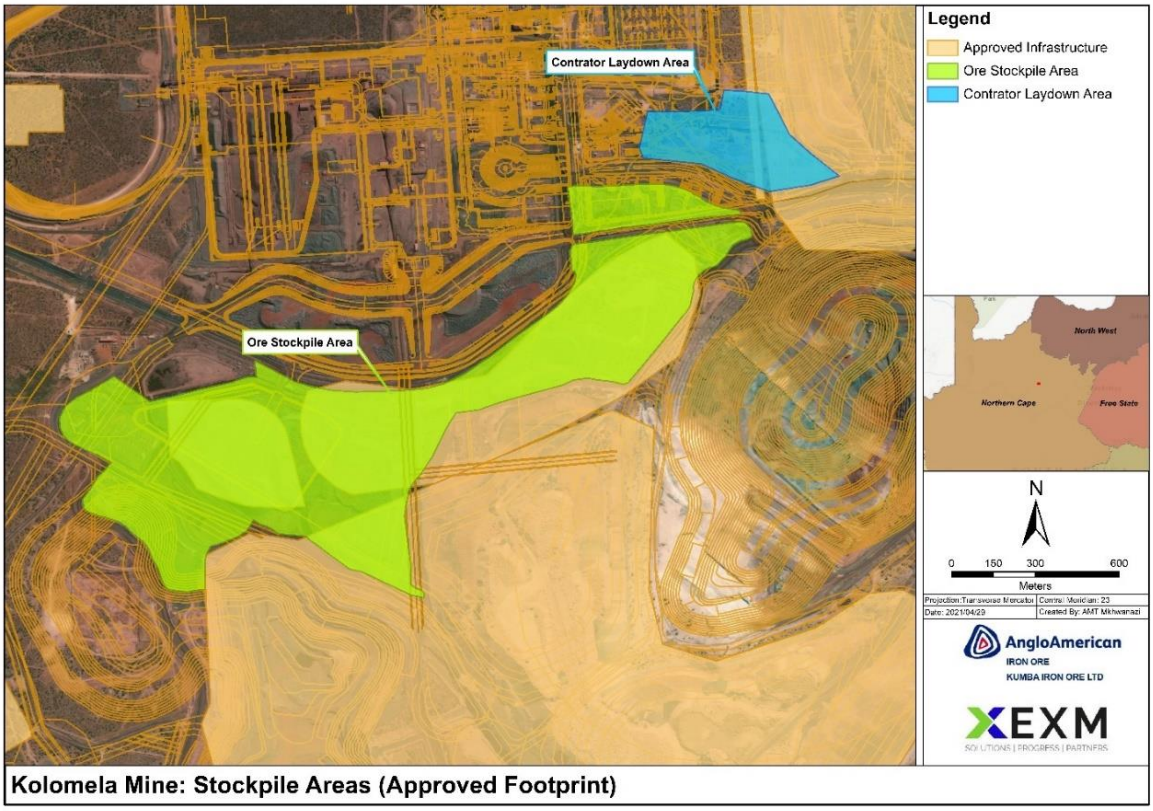


FIGURE 5-8: EXPANDED ORE STOCKPILE AREAS AT DSO PLANT

5.3.8 DMS Processing Plants

Kolomela mine currently utilises a Modular Dense Media Separation (DMS) Processing Plant (referred to as the Tierbult DMS Plant) for the processing of 1-3 Mtpa of low grade ore. The DMS plant is used for the processing of low grade ore not suitable for processing at the DSO plant. Two additional DMS plants were authorised to be constructed: one at the new Kapstevel at Pit Facility and one close to the Klipbankfontein Pit that will be developed in

future according to market demand and the mine's development.

Kolomela is authorised to establish a conveyor to transport product (processed low grade ore) from the Kapstevel DMS Plant once developed to the product load out area at the DSO plant. However, due to the widening of the haul roads (as described above) the footprint of the conveyor will have to be moved/moved slightly to the north as indicated in Figure 5-9. The conveyor will be 5.5 km in length and 20 meters wide.

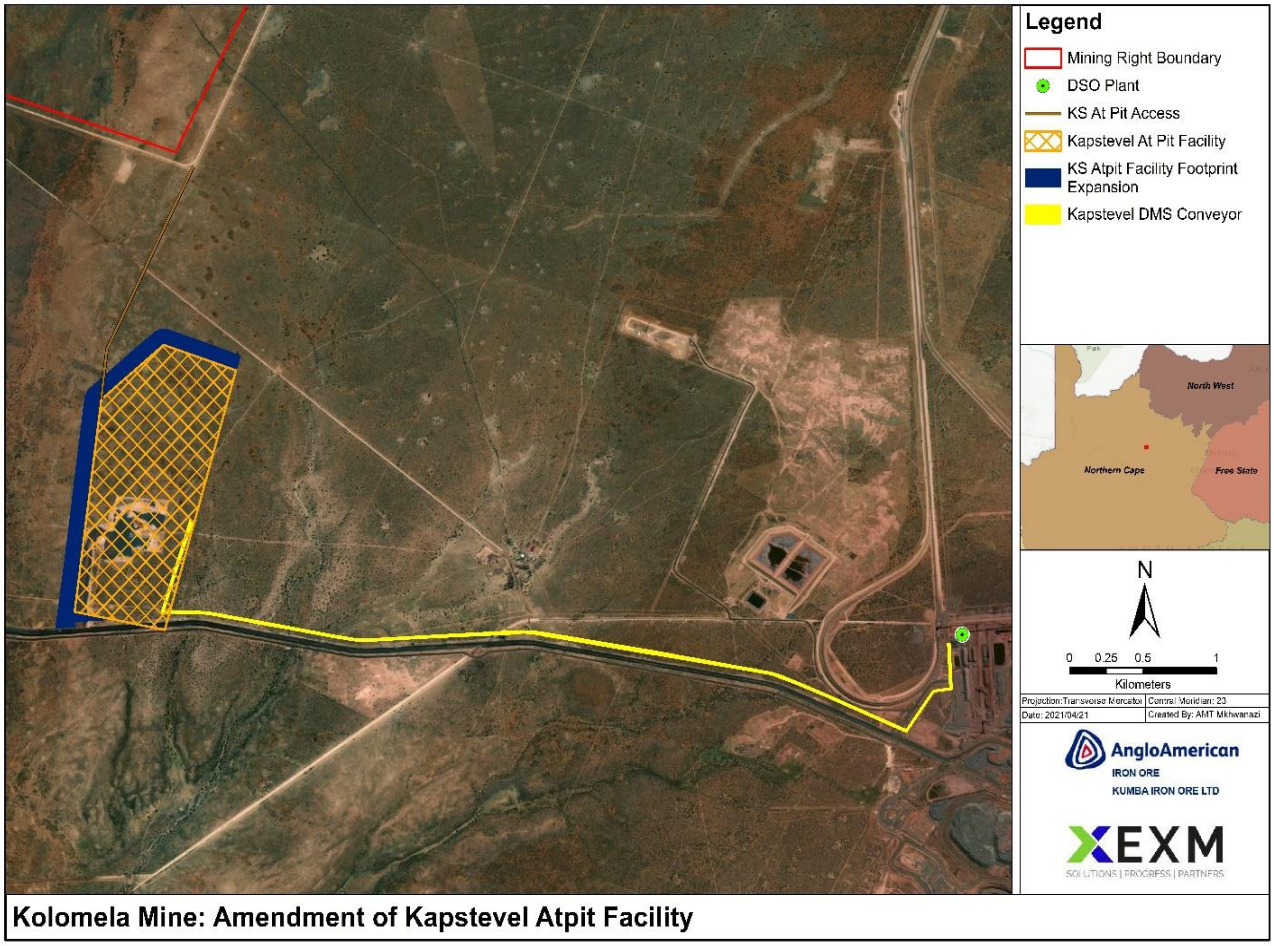


FIGURE 5-9: KAPSTEVEL AT PIT FACILITY AND DMS CONVEYOR

5.3.9 DSO Tailings Storage Facility

Kolomela has developed a Tailings Storage Facility (TSF) for the deposition of slimes emanating from the wet scrubber system to remove the excess dust from the crushing and screening processes at the DSO Processing Plant. This enables the settlement and consolidation of the solid particles and the recovery and re-use of the overflow/supernatant water. The TSF covers approximately 14 ha and is located north-east of the DSO plant.

Water from the TSF enters a RWD with a capacity of 427 500 m^3, the water is recycled for us at the processing plant. There are no planned changes to the DSO TSF.

5.3.10 DMS Tailings Storage Facility

Slimes currently produced at the DMS plant are temporarily stored and conditioned at the DMS plant prior to blending with waste rock prior for final co-disposal at WRDs. Kolomela proposes to develop a TSF on the existing Leeuwfontein WRD to dispose of slimes produced at the DMS plant (Figure 5-10). The facility will cover approximately 24 ha. The TSF will comprise of four tailings containment cells with a volumetric airspace (cumulative) of 1,445,000 m^3 and an estimated tailings disposal capacity: 2,890,000. The containment cell walls will be constructed by using compacted waste rock. The total quantity of waste rock required is 1,011,000 m^3 or 1,819,800 tonnes with a crest height of waste rock containment walls: 17.5 m.

Disposal will involve deposition of "Wet cake" tailings in the containment cells, in thin (less than 300 mm deep) dozer spread layers, to maximize solar drying, desiccation and strength gain of the tailings product. The "Wet cake" will be stockpiled along the inner crest of the containment walls and allowed to sundry before it is pushed/spread into the containment cells. Current initial tailings rates-of-rise (ROR) will be approximately 1.8 m / year (150 mm per month), reducing to 1.0 m / year (85 mm per month) towards the end-of-life of the facility.

Storm water run-off from the TSF cells will be collected and attenuated at a fixed location in each of the cells and diverted to a central Return Water Dam which will cover approximately 3 ha. A minimum freeboard of 0.8 m will be catered for above the maximum predicted water level in each of the cells, when based on the 1 in 50 year, 24 hour storm event. Collected storm water run-off will be pumped to the pollution control dam facilities at the DMS Plant site for reuse.

Tailings with poor handleability, trafficability and stability characteristics will be conditioned (dried) in paddocks at the DMS plant, before rehandling and onward disposal at the TSF. The facility will comprise of four (4) drying paddocks with a cumulative volume of 42,500 m^3 and will have an estimated tailings conditioning capacity of 85,000 tonnes (approximately 5 months tailings production). The paddock walls will have a height of 2 m. Dirty storm water run-off and bleed water collection facilities (dams) will be constructed on both sides of the paddocks.

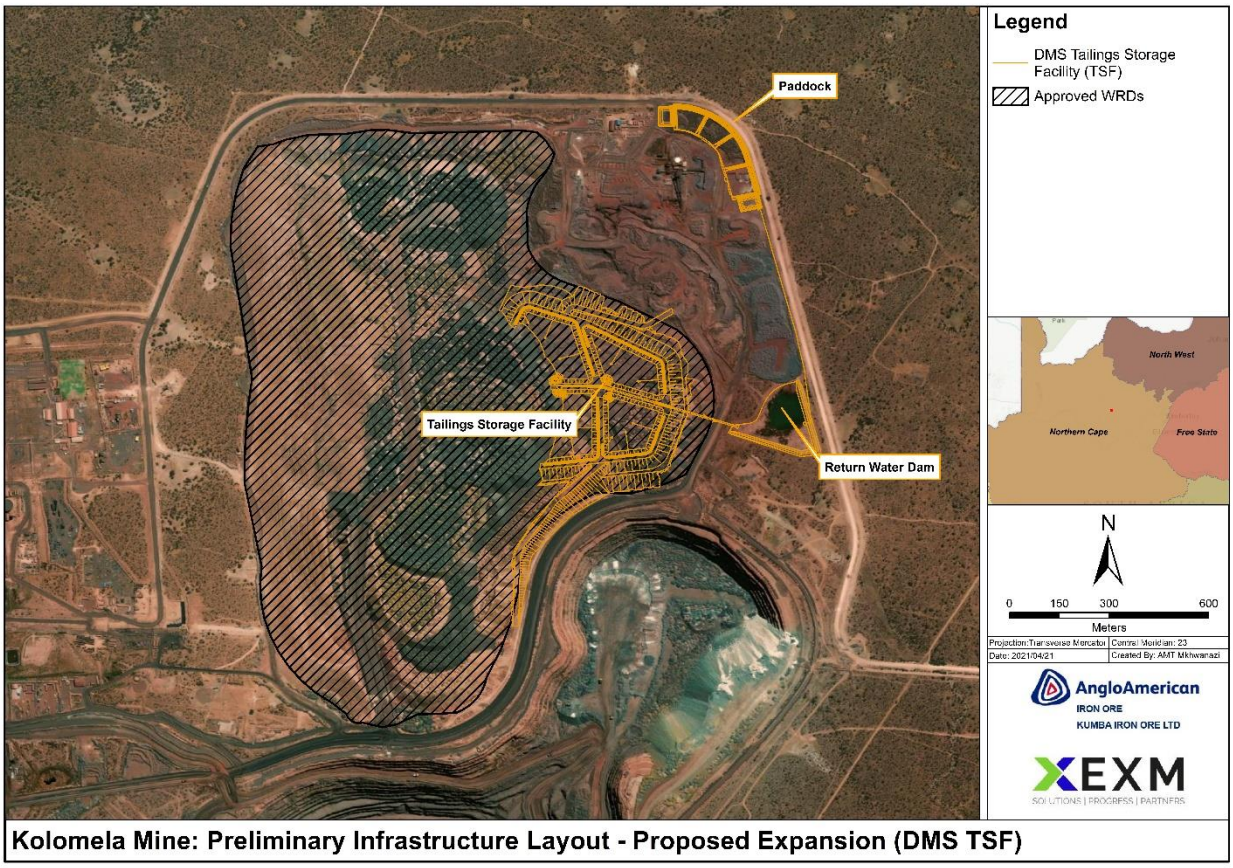


FIGURE 5-10: DMS TAILINGS MANAGEMENT INFRASTRUCTURE

Clean water will be diverted around the DMS plants by means of soil berms and drains. Dirty water run-off from the Kapstevel DMS plant area is to be collected in a pollution control dam (PCD). This system will comprise a sediment trap and oil separator as appropriate. The water from the PCD will be recycled back into the process. The stormwater system at the DMS plant will be upgraded, including the enlargement of the PCD. Dirty water run-off from the Klipbankfontein and Tierbult DMS Plant areas will be contained in evaporation dams (i.e. water will not be recycled for re-use). These dams will have a capacity approximately 14 200 m^3 and 15 267 m^3, respectively. Water management systems will be designed so as to accommodate a 1 in 50 year storm event.

5.3.11 Conveyor and Railway Line from Tierbult DMS Plant

Kolomela has identified the need to pursue a high grade product strategy, which means that the material from the Tierbult DMS Plant will no longer be deposited onto the DSO conveyors as this will blend the future higher grade and lower grade material. Two strategies (see Figure 5-11) have been identified to separate the low grade material from the high grade product.

5.3.11.1 DMS to DSO conveyor

Construct stockpiles (bunkers) to the north of the DSO plant with a conveyor from the DMS plant to the 4 stockpiles (Low grade and high grade lump and fine). These stockpiles would typically be reinforced earth bunkers with a central tunnel under the stockpiles fed by feeders,

with the conveyor ending up on the load out conveyor.

5.3.11.2 DMS to DSO railway line

The second strategy will entail a new rail siding / spur from the main line, towards the DMS plant. This will entail a direct railway shipment of the material and will include a loading mechanism onto the rail trucks.

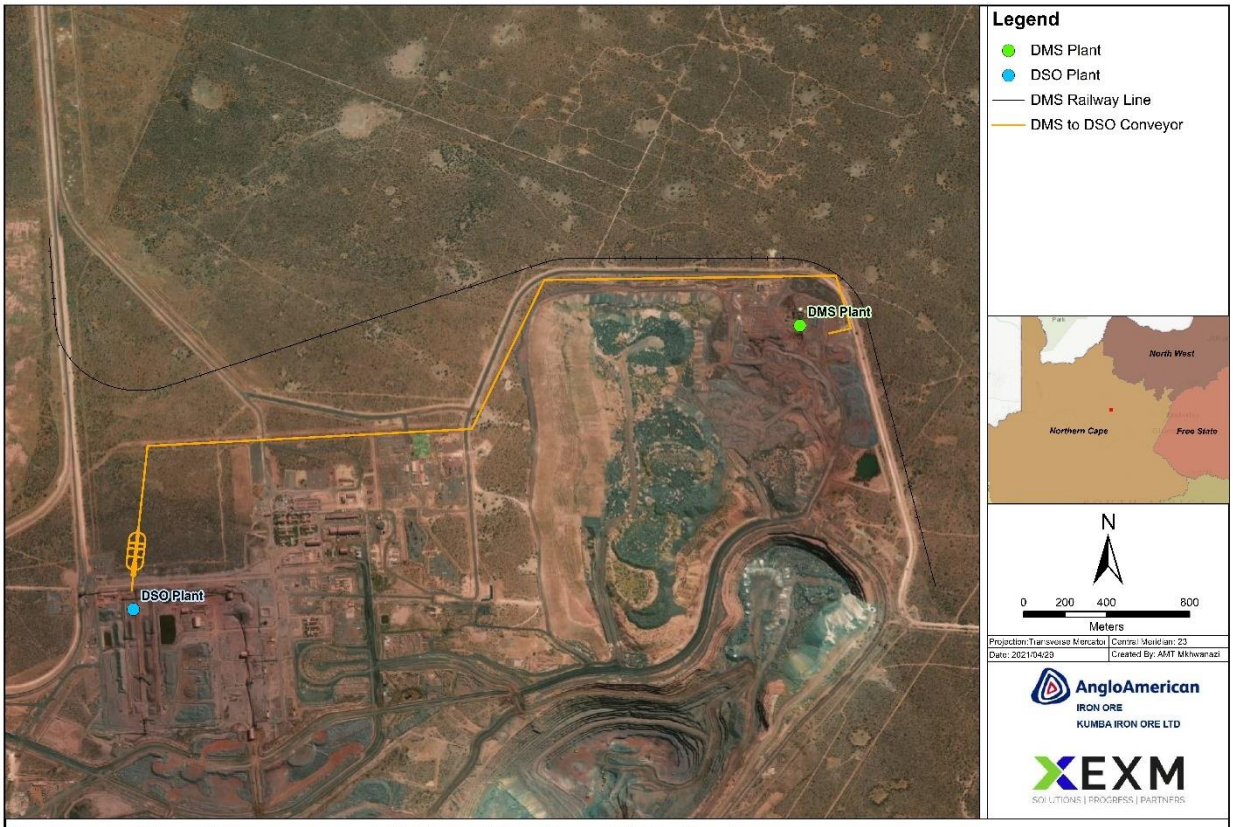


FIGURE 5-11: CONVEYOR AND RAILWAY LINE FROM DMS PLANT

5.3.12 Main Administration, Offices and Workshops

Supporting infrastructure was constructed as part of the Kolomela Mine development, including offices (administrative and other support functions), security centre, on-boarding centre, parking for support staff and haul roads, workshops/laydown areas and warehouses. The mine support infrastructure covers approximately 90 hectares within the existing disturbed area.

A construction village was constructed as part of the Kolomela mine development. The buildings have been converted and is currently also used as offices.

Kolomela proposes to allocate an area west of Leeuwfontein North Pit for the use as additional contractor laydown areas (Figure 5-7). The area will cover approximately 13 hectares and will be situated on existing disturbed and approved footprints. No new listed activities are triggered.

5.3.13 At Pit Facilities

5.3.13.1 Kapstevel At Pit Facility

Kolomela is in the process of developing the Kapstevel At Pit Facility due to the need for support infrastructure closer to the Kapstevel Pit area. The At Pit Facility includes a haul truck parking and fatigue area for accommodating off-shift workforce. Provision is also made for workshops for the maintenance of haul trucks, a washbay, a small sewage treatment plant (which will also service the future Kapstevel DMS Plant) and a refuelling area, including facilities for the storage of 1 million litres of diesel (1 000 m^3) and also petrol and lubricants.

Clean water will be diverted around the dirty areas and collected in a PCD which will comprise a sediment trap and oil separator as appropriate. The water will be recycled for re-use at the plant or workshop areas as required or used for dust suppression on roads. Clean water will be diverted around the facility using drains.

Kolomela proposes to expand the footprint of the At Pit facility slightly to allow for the establishment of stormwater infrastructure and fencing. The current approved footprint is 110 ha and will be amended by an additional 25 ha to allow for the additional infrastructure (Figure 5-9).

5.3.13.2 Kapstevel At Pit Access Road

An access road is required for construction vehicles travelling to the Kapstevel At Pit Facility

which the negates the need for such vehicles to travel through mining areas at Kolomela mine. As indicated in Figure 5-12, the existing farm access roads to the north of the facility will be used and only a small section for the new road will be required. The road will be approximately 1.6 km in length and will be 30 m wide with a reserve of 20 meters.

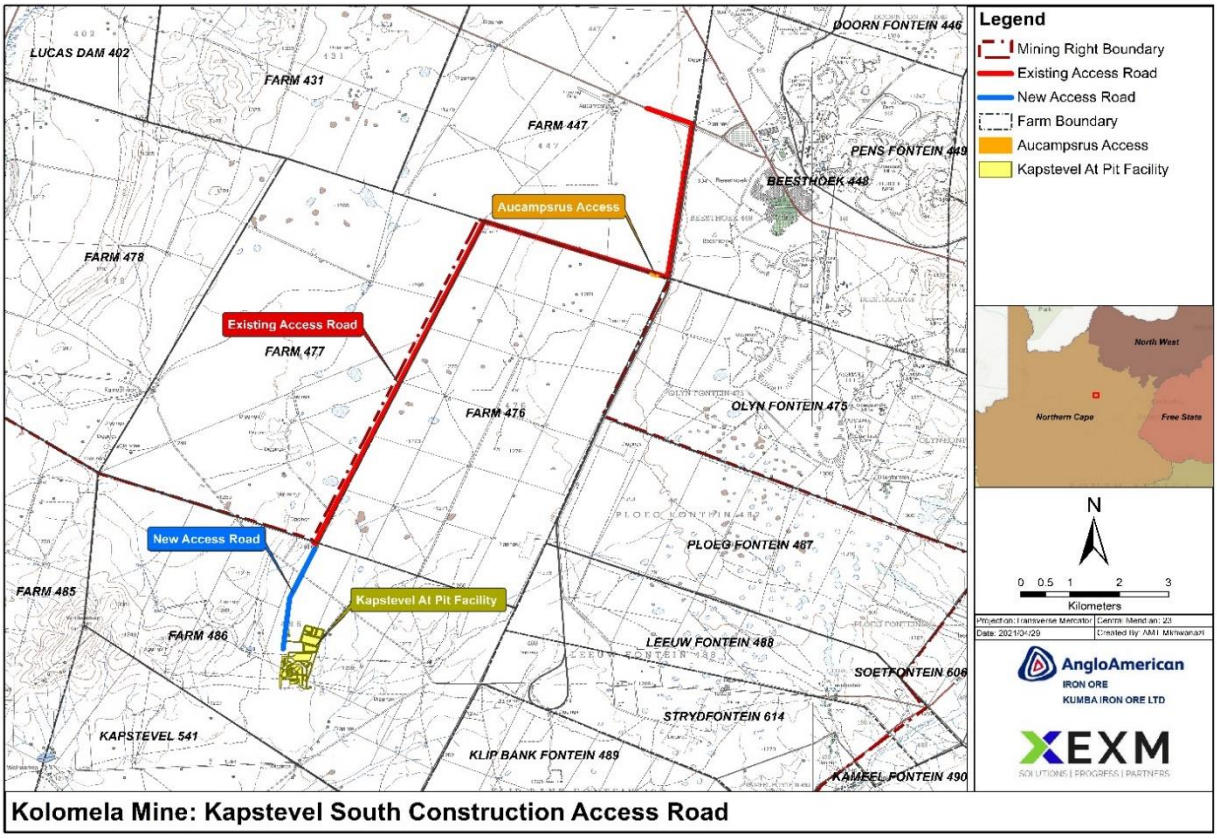


FIGURE 5-12: KAPSTEVEL AT PIT FACILITY ACCESS ROAD ROUTE

5.3.13.3 Klipbankfontein At Pit Facility

Kolomela is also authorised to develop an At Pit Facility close to the Klipbankfontein operations which will include a haul road, haul truck parking, a fatigue centre, workshops, wash bay and refuelling area. A conservancy tank will be used for the management of sewage at this facility. There will be two PCDs established to collect run-off, one from the haul truck parking area with a capacity of 105 885 m^3 and one from the workshop area with a capacity of 101 783 m^3. A parking area will also be developed adjacent to the Klipbankfontein At Pit facility which will cover approximately 8 ha. There are no proposed changes to the approved infrastructure.

5.3.14 Water Export Pipeline and Pump Station

Kolomela has developed a pipeline of approximately 14 km in length for the conveyance of excess water (not used in the operations) that originates from the dewatering operations. The water is pumped to the Beeshoek Reservoir from where the water is conveyed via a pipeline to supplement the Vaal-Gamagara Water Scheme. There are no proposed changes to the export water pipeline infrastructure.

5.3.15 Railway Line to Beeshoek and Access Road

Kolomela has constructed a railway spur which included a balloon at the loading section and a single electrified line linking to the Sishen-Saldanha export line. The total length of the railway spur is 14 km. A road was built parallel to the railway line which serves both as the main access road to the mine and as the service access road for the rail line. The total width of the access road and railway line is approximately 100 m. There are no proposed changes to the railway and access road infrastructure.

5.3.16 Bulk Hydrocarbon Storage

Kolomela has developed a bulk fuel depot which has the combined capacity to store 2000 m^3 of fuel and 40 m^3 of lubricants (gear oil, degreaser, greases and coolants). Fuel is delivered to the Total Bulk Dispensing 3 km north of the fuel depot from where it is conveyed via aboveground pipelines to the fuel depot for storage. The bulk fuel depot has bunding in place with a capacity to capture 110% of the volume of the largest tank. A sump has been installed and the contents of the sump is piped to an oil separator located at the mine's wash bay. The recovered water is reused at the main vehicle wash bay area.

5.3.17 LDV and Loco Refuelling Areas

A locomotive refuelling facility is also in place to refuel diesel locomotives at the railway spur. The facility has a total capacity to store 122 000 litres of diesel. Refuelling depots are in place to refuel light vehicles at various locations at the mine (multipurpose vehicles, cars and small machinery). There is a combined storage of 600 m^3 for both the locos and LDVs on site.

5.3.18 Explosives Magazine

Kolomela has developed an explosives magazine and is authorised to expand the facility or the storage of explosive adjacent to the existing site. The total combined surface will cover approximately 13 hectares. The current planning shows that Kolomela will commence in the 2021 with the construction of the additional explosives magazine adjacent to the existing facility.

5.3.19 Perimeter Fence and Maintenance Road

Part of the development of Kolomela, a boundary fence and perimeter road was developed for access control. The fence and road are approximately 62 km long around the mining right area.

5.3.20 Artificial Aquifer Discharge Pipeline

Kolomela abstracts water as part of the mine's dewatering operations of which a portion is provided to the Vaal-Gamagara Water Scheme. However, the water abstracted exceeds

the water requirements of the Water Scheme and has to be managed to prevent discharge into the environment. Kolomela is authorised and is in the process to develop a pipeline system for the artificial recharge of an aquifer associated with the Groenwaterspruit catchment. Kolomela is authorised to develop two separate pipelines and associated discharge boreholes, namely the Leeuwfontein (LF) and Kappies Karee (KK) pipelines. The LF project has been completed and the KK project is being developed. The LF pipeline is linked to 11 boreholes and the KK pipeline will be connected to 8 boreholes. There are no proposed changes to the aquifer recharge infrastructure.

5.3.21 Low Grade Stockpile Areas

Various smaller iron ore mines are located in relatively close proximity to Kolomela. A large portion of the ore extracted at these mines are low grade which requires specialised processes to optimally refine the material. The processing plants at Kolomela is designed to process lower grade ore into saleable product. However, insufficient stockpiling space prevents Kolomela from obtaining larger quantities of low grade ore from the surrounding mines. SIOC proposes to develop low grade stockpile areas to place ore received from surrounding mines. Three stockpile areas will be developed with a combined surface are of 33 hectares (Figure 5-13).

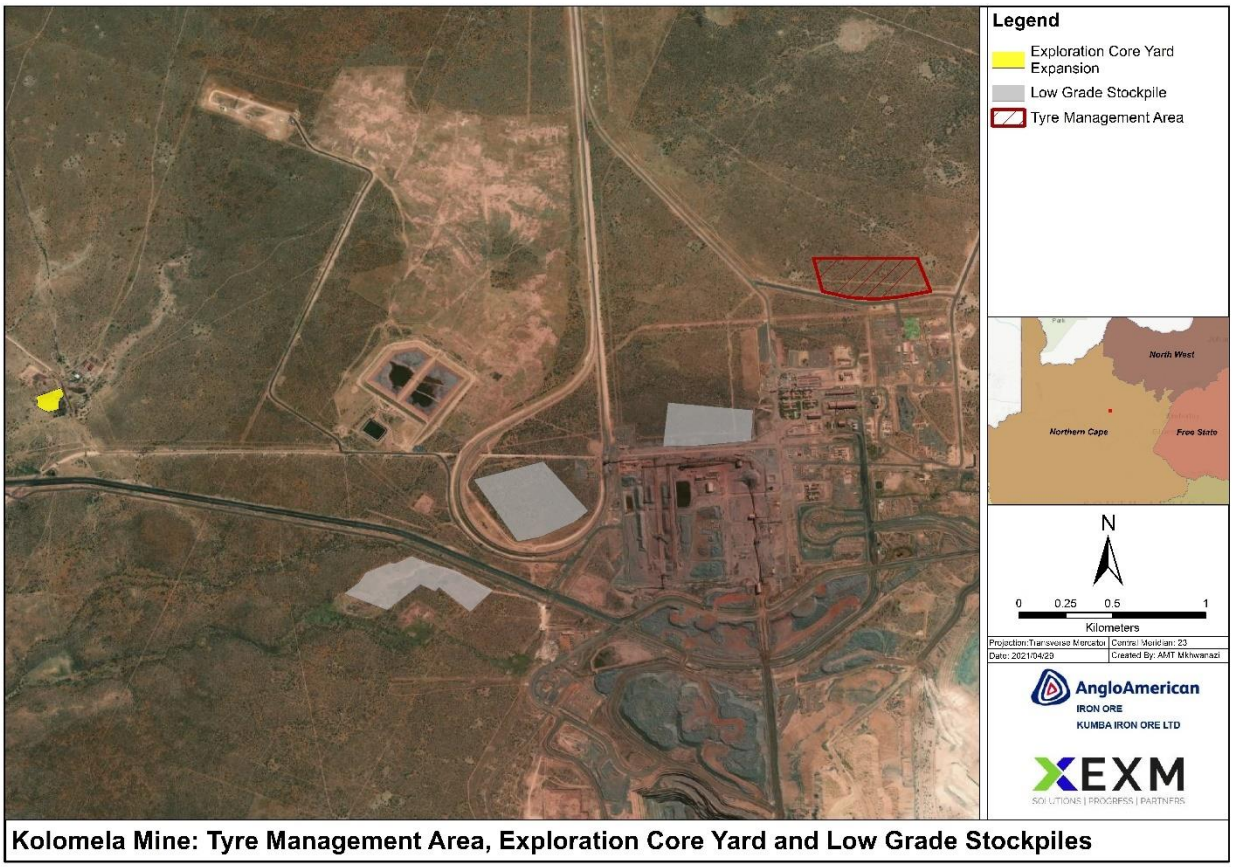


FIGURE 5-13: LOW GRADE ORE STOCKPILE AREAS AND TYRE MANAGEMENT FACILITY

5.3.22 Waste Tyre Management Facility

Kolomela proposes to develop a waste tyre manage facility to receive waste tyres produced by the operations. The development of a dedicated tyre management facility will form part of SOIC's overall waste tyre management strategy to source an effective solution for the waste stream which will potentially involve a future pyrolysis plant. The waste tyre manage facility will cover approximately 10.2 ha.

5.3.23 Waste Management Facilities

A bioremediation facility is in place for the remediation of soils contaminated with hydrocarbons. The facility will not be amended. Kolomela also has a temporary hazardous waste storage and a recycling station. There is no plan to amend these facilities.

5.3.24 Sewage Treatment Works

Kolomela mine is authorised to operate a sewage treatment works with a treatment capacity of 200m^3/day with an expanded capacity of another 200 m^3/day which was authorised in 2017. The expansion of the sewage treatment works is being undertaken. The sewage treatment works is a Becon Watertech Bio-Filter Plant or equivalent. The purification process comprise of a primary combined settlement tank and anaerobic digester, secondary aerobic process, humus tank and a disinfection process. The quantity of treated water that will be released to the outflow pond depends on the actual usage of the sewage system but the maximum discharge that the system can handle is 200 kl/day.

Following treatment in the Bio-filter plant, all treated effluent will be pumped to a PCD where it will be re-used during for operational water (mainly for dust suppression and plant make-up) once the mine's processing plant is commissioned. Sewage sludge originating from the plant (20m^3 per annum) will be taken to the municipal sewage works on an annual basis.

5.3.25 Exploration Sites

Kolomela is authorised to conduct exploration activities on the properties within the mining right. Exploration activities will continue throughout the life of mine in order to ascertain the extent of the geological resources. Drill sites comprise a barricaded area of approximately 10 m x 15 m and the cumulative area covers more than 20 ha. Exploration takes place throughout the mining right area, so the activity is authorised to take place anywhere on the site.

Exploration involves the drilling of holes to access and investigate geological cores. Each drill site includes a drill rig, mobile drill sludge units, waste receptacles, soil stockpile area, mobile toilets, chemical and waste storage area with storage bins, an operator cabin. Plastic sheets are placed under these components. Concurrent rehabilitation is conducted according to a

predetermined schedule which include the *in-situ* remediation of any residue, ripping of the sites, shaping (if required), and revegetation.

5.3.26 Exploration Core Yard Expansion

Exploration activities at Kolomela results in the production of geological cores which must be stored prior to processing. The current core yard does not have sufficient capacity to store the cores that are produced. Additional area of approximately 1 hectares is require and the yard will be developed adjacent to the existing facility on previously disturbed land.

5.3.27 Radio Masts

Kolomela has established communication towers within the mining right area. Kolomela has initiated a process to migrate their analogue communication systems to a digital radio technology to comply with the requirements of the Independent Communications Authority of South Africa.

5.3.28 Photovoltaic Solar Facility

Kolomela proposes to establish a Photovoltaic (PV) Solar Facility to supplement the Eskom grid power supply. Generation of electricity at the PV Solar Facility will provide a reliable and cost effective source of power, especially during periods of power interruptions/load shedding. The utilisation of solar energy will also decrease dependency on fossil fuel powered energy and lower Kolomela's carbon footprint. The PV Solar Facility will cover a total footprint of approximately 227 ha on of which most of the area have been previously disturbed and will only require additional vegetation clearance of 72,7 ha. The PV plant will have an estimated power generating capacity of 120 Mega Watt.

5.3.29 Mobile Crushers

The construction of the haul roads at Kapstevel will require building material. Kolomela will use mobile crushers as part of the construction process to crush larger material, including waste rock and plant discard, as well as other inert material to be used for construction purposes. The mobile crushers will be situated on the existing disturbed areas at Kapstevel and at the eastern section adjacent to the WRDs.

6. POLICY AND LEGISLATIVE CONTEXT

This document (Scoping Report) has been developed strictly in accordance with the requirements of the National Environmental Management Act (NEMA) (No. 107 of 1998) and the EIA Regulations (GNR 326 of 2017). This section outlines the key legislative requirements applicable to the Kolomela Mine expansion project.

6.1 Mineral and Petroleum Resources Development Act (No. 28 of 2002)

The MPRDA regulates the requirements for a mining right in order to mine a mineral and undertake associated activities. Mining can either include removal of an underground mineral or mineral occurring in a residue deposit or residue stockpile. The Minister of Mineral Resources granted a mining right, for the mining of iron ore at Kolomela Mine on 5 May 2008, {Ref: (NC) 069 MR}. The mining right is valid until 17 September 2038, unless cancelled or suspended. The Environmental Management Programme (EMPr) (as amended in 2010) for Kolomela was approved as part of the mining right application and a subsequent EMPr was approved as part the 2017 expansion EIA process.

Section 102 of the MPRDA regulates the amendment of an EMPr due a change of activities related to a specific mining right. The proposed activities including the expansion of mining and association activities at are not included in the existing approved Kolomela EMPr or any amendment thereto. The EMPr thus requires amendment to include:

- A description of the additional/amendment activities to take place including;
- A description of the baseline environment to be affected by the expanded footprint areas;
- A description of additional impacts because of the expanded activities; and
- Identification of additional mitigation measures required.

SIOC will submit an EMPr amendment application in terms of Section 102 of the MPRDA.

6.2 National Environmental Management Act (No. 107 of 1998)

Section 24 of NEMA provides for the Minister of Environmental Affairs to publish activities that require Environmental Authorisation (EA) prior to commencement. This has resulted in the promulgation of Listing Notices 1 (GN. 327), 2 (GN. 325) and 3 (GN. 324) with the Environmental Impact Assessment (EIA) Regulations (GN. 326) of 2017. Activities included in Listing Notices 1 and 3 require a Basic Impact Assessment to be undertaken and activities included in Listing Notices 2 require a scoping and full EIA process to be undertaken in order to obtain EA prior to commencement.

From the initial review, activities under Listing Notice 1, 2 and 3 are triggered and thus the application EA requires the completion of a scoping and EIA process.

Regulation 36 of the EIA Regulations relates to the amendment of an EMPr where an amendment to the impact management outcomes (or objectives) of an EMPr is required. The Kolomela EMPr will be amended with the existing and proposed activities as part of this application process. The EMPr amendment will also be subject to the relevant requirements, including public consultation.

Authorisation is being sought for activities applicable to the Kolomela Mine Expansion project in terms of the EIA Listing Notices 1, 2 & 3.

6.2.1 NEMA Financial Provision Regulation

Financial provision and its updates were previously regulated under the Mineral and Petroleum Resources Development Act (MPRDA) and its Regulations (GN R. 527 of 2004). In September 2014, all provision related to environmental management in the MPRDA was removed and included in section 24 of the National Environmental Management Act (No 107 of 1998) (NEMA). In November 2015, the Minister of Environmental Affairs promulgated regulations in terms of NEMA pertaining to the Financial Provisioning for Prospecting, Exploration, Mining or Production (NEMA Financial Provisioning Regulations).

Regulation 10 of the NEMA financial provision regulations states that an EA applicant must-

> "*(a) ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation.*"

Regulation 6, as referred to above, states that an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for -

1. *Annual rehabilitation, as reflected in an annual rehabilitation plan;*
2. *Final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and*
3. *Remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.*

Kolomela has developed closure reports (Final Closure, Annual Rehab and Risk Report) and has determined financial provisioning for the current infrastructure in terms of the NEMA Financial Provision Regulations. An update of the financial provision and the associated reports will be conducted for the expansion activities.

6.3 National Environmental Management: Waste Act (No. 59 of 2008)

In terms of the National Environmental Management: Waste Act (NEM: WA) (No. 59 of 2008)), waste management activities that are listed in regulations published under NEM: WA may not be undertaken without a Waste Management License (WML). The listed activities for which a WML is required are contained in Government Notice (GN 921). Category A activities require a WML and a Basic Impact Assessment (BA) process must be conducted, and Category B activities require a WML and a full Scoping and EIA process must be conducted. In terms of Schedule 3 of NEM: WA, mining waste (residue stockpiles and deposits) are defined wastes falling under Category A – Hazardous Wastes of NEM: WA which includes waste rock.

The establishment of the new WRDs at Kapstevel and the development of the TSF on the Leeuwfontein WRD will trigger Activities 10 (*construction of a waste management activity*) and 11 (*residue stockpiles or residue deposits*) under Category B of GNR 921.

The project will require a Waste Management Licence in term of NEM: WA

Kolomela proposes to develop a waste tyre storage area of approximately 10.2 ha. An application to register the waste tyre storage area will be submitted in terms of Regulation 5 of the Waste Tyre Regulations (GN 12257 of 29 September 2017) and must be managed according to the requirements thereof.

The waste tyre storage area will require registration in terms of Waste Tyre Regulations

6.4 National Environmental Management Act: Air quality Act (No. 39 of 2004)

The National Environmental Management: Air Quality Act (NEMA: AQA)(No. 39 of 2004) controls and regulates atmospheric emissions and provides for Listed Activities (GN. 893, November 2010) which have or may have a significant effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage. Any activity captured under this list require the person undertaking the activity to apply for an Atmospheric Emission Licence (AEL).

Kolomela Mine was issued an AEL on the 18th of March 2019 (NC/AEL/SIY/KOL1/2012). AEL was issued in terms of section 41(1)(a) of the NEM: AQA in respect of Listed Activity: Category 2: "*Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass subcategory*"; Sub-category 2.4: "*Storage and Handling of Petroleum Products.*". The AEL does not include the future storage of diesel at the Kapstevel At Pit facility and will therefore require a variation of the AEL which will be submitted to the Northern Cape Department of Environment and Nature Conservation. An updated Air Quality Impact Assessment is being undertaken as part of this application which will provide input to the variation application.

A variation of the Kolomela AEL will be required for the storage of diesel at the Kapstevel At Pit Facility.

6.4.1 National Dust Control Regulations (GN. 827 of 1 November 2013)

The purpose of the National Dust Control Regulations published in terms of the NEM: AQA is to prescribe general measures for the control and monitoring of dust fall in all areas. Kolomela has a dust management plan in place which provides measures undertaken by the mine to manage activities that may result in dust generation. Dust fall monitoring is conducted on a monthly basis at strategic location in respect of activities and sensitive receptors. The proposed expansion activities will be incorporated in the current dust management and monitoring measures.

6.5 National Environmental Management: Biodiversity Act (No. 10 of 2004)

Section 57 of the National Environmental Management Biodiversity Act (NEMBA) (No. 10 of 2004) restricts certain activities involving threatened and protected species (as listed in Regulation GN. 151 and 152, February 2007) without a permit. Restricted activities applicable to the project are limited to the potential removal of Threatened or Protected Species (TOPS) and plants during the clearance of vegetation.

6.6 National Forests Act (No. 94 of 1998)

Sections 12 and 15 of the National Forests (No.94 of 1998) requires any person who damages, cuts, destroys, prunes or relocates a nationally protected tree (as listed in Regulation GN. 690, September 2017) to apply for a permit from the Department of Agriculture, Forestry and Fisheries (DAFF) to do so.

An application will be submitted for the removal of protected species if any such plants are identified during the Biodiversity Impact Assessment.

6.7 Northern Cape Nature Conservation Act (No. 9 of 2009)

Section 49 and 50 of the Northern Cape Nature Conservation Act (No. 9 of 2009) requires any person that intends to undertake a restricted activity in respect of protected plants and animals as set out in Schedule I and Schedule II of the Act to apply for a permit from the Northern Cape Department of Environment and Nature Conservation. Application will need to be made for the necessary permits prior to the commencement of site clearance in areas where protected plants are present. The permit applications will be supported by an Ecological Impact Assessment specialist study.

An application will be submitted for the removal/disturbance of protected species if any such plants are identified during the Biodiversity Impact Assessment.

6.8 National Water Act (No. 36 of 1998)

The purpose of the National Water Act (NWA) (No. 36 of 1998) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled. Section 21 of the NWA contains a list of activities that require a WUL prior to commencement. The Department of Water and Sanitation (DWS) issued Kolomela Mine with an Integrated Water Use License (IWUL) (License No. 10/D73A/ABCEGIJ/4125) that allows the mine to use water in terms of section 21(a); (b); (e); (g); (i) and (j) of the National Water Act, 1998 (Act No. 36 of 1998). The proposed amendment to authorised activities and new activities will trigger the Activities c&i and Activity g as summarised below.

TABLE 6-1: SECTION 21 WATER USES TO BE INCLUDED IN THE WULA

Section 21 Listed Activity	Related activities
c&i (water courses – pans and stream)	Construction/amendment of infrastructure • Haul roads (widening and new) • Conveyors to and from DMS plant. • Railway from DMS plant. • Kapstevel Waste Rock Dump • Waste Tyre Storage Area
g (waste disposal)	Construction/amendment of infrastructure • Kapstevel Evaporation Dams • Kapstevel Waste Rock Dumps • TSF on Leeuwfontein WRD • Paddock facility • Return Water Dam for TSF

A WUL application process is being undertaken in terms of the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR. 267 of 2017). An updated Integrated Water and Waste Management Plan (IWWMP) compiled in accordance with the requirements of GNR. 267 will be submitted in support of the application.

The project will require a Water Use Licence from the DWS Provincial Authority

6.9 National Heritage Resources Act (No. 25 of 1999)

The National Heritage Resources Act controls and regulates the interaction with heritage, archaeological, and paleontological artefacts and structures. Sections 34, 35 and 36 require that no person may demolish or alter any structure which is older than 60 years without a permit issued by the relevant provincial heritage resources agency. The NHRA further requires any person that disturbs any archaeological site, paleontological site or grave cannot do so without a permit.

An updated Heritage and Impact Assessment will be undertaken in order to identify any heritage sites within the expansion project footprint area. Should any site need to be altered or destroyed, a permit will need to be obtained in terms of the NHRA. The South African Heritage Resources Council (SAHRA) will be consulted in terms of Section 38 of the Act. A Palaeontological Assessment has been conducted for the entire Kolomela and the study will

be updated to reflect proposed expansion activities.

7. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

According to the Guideline on Need and Desirability in term of the Environmental Impact Assessment (EIA) Regulations, 2010 (GN. 891 of 2014), the consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the proposed amendment along with the broad societal needs and the public interest.

7.1 Socio-economic contribution of Kolomela

Kolomela mine has contributed significantly to socio-economic improvements in Tsantsabane as the biggest employer and investor in community development and municipal support. The mine has built strong and robust relationships with political and community leaders and other stakeholders in Tsantsabane (Quantify Research, 2019).

It is estimated that approximately 14,581 of the 42,608 residents of the Tsantsabane area are currently dependent on Kolomela mine for their livelihoods in one way or another – whether through direct, indirect or induced employment. The number translates to 34% of the population depending on Kolomela mine for their livelihoods. As much 31% of employed adults in Tsantsabane work for Kolomela mine, with a further 21% employed by Kolomela contractors. More than half of the employed individuals in Tsantsabane support their families by means of income generated from Kolomela, either directly or indirectly (Quantify Research, 2019).

The following provides a summary of Kolomela's socio-economic contribution (as per Quantify Research, 2019):

- Kolomela provides direct employees to 3969 people and indirect employment to 638 people (numbers for 2019).
- Kolomela spent approximately R5m between 2014 and 2019 for human skill development and 839 individuals benefited.
- Kolomela invested R48,290,636 in community development in 2019 (SLP projects plus CSI and donations) in terms of Education Health and social infrastructure, Youth development and Enterprise development
- Municipal capacity support programme – Tsantsabane Local Municipality
- Rates and taxes to Tsantsabane Local Municipality
- Rent-in of private houses from homeowners in Tsantsabane
- Three year localised procurement spend by Kolomela mine (2016 – 2018): R466,000,000

The activities that will be implemented as part of the Kolomela expansion project is essential

for the efficient and sustained operations of the mine. The associated projects will have some additional positive outcomes for local communities and society in general. The construction and operations associated with the projects are expected to result in increased employment opportunities with time.

7.2 Socio-economic contribution of the Kapstevel South Project

A number of the expansion activities is essential for the development of the Kapstevel South project, including the additional park-up area, amended stormwater infrastructure, widening and amendment of haul roads, development of two WRDs, expansion of the Kapstevel At-Pit facility as well as larger pit footprint.

A Social and Human Rights Impact and Risk Analysis (SHIRA) was undertaken in 2020 by Quantify Research for the Kapstevel South project. Production from Kapstevel South has been included in Kolomela mine's production and Life of Mine (LOM) planning since 2015 to create a LOM of 13 years. Without Kapstevel South the LOM is shortened by approximately three years, and production will decline significantly from 2023 onwards, meaning that employee numbers would have to be reduced substantially, even before mine closure. Against this background, the Kapstevel South project represents a key development for Kolomela mine, but also for the Tsantsabane community. The Figures below shows the projected contribution of the Kapstevel South project to production at Kolomela.

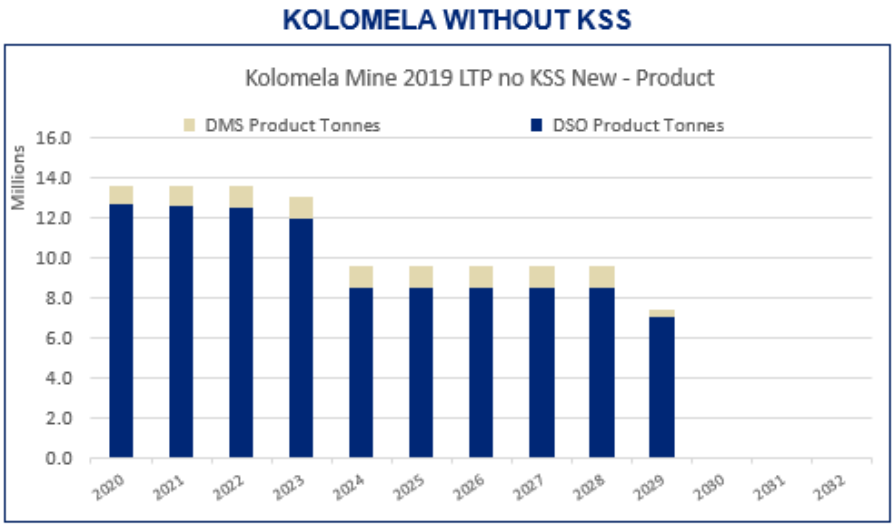


FIGURE 7-1: PRODUCTION WITHOUT KAPSTEVEL SOUTH

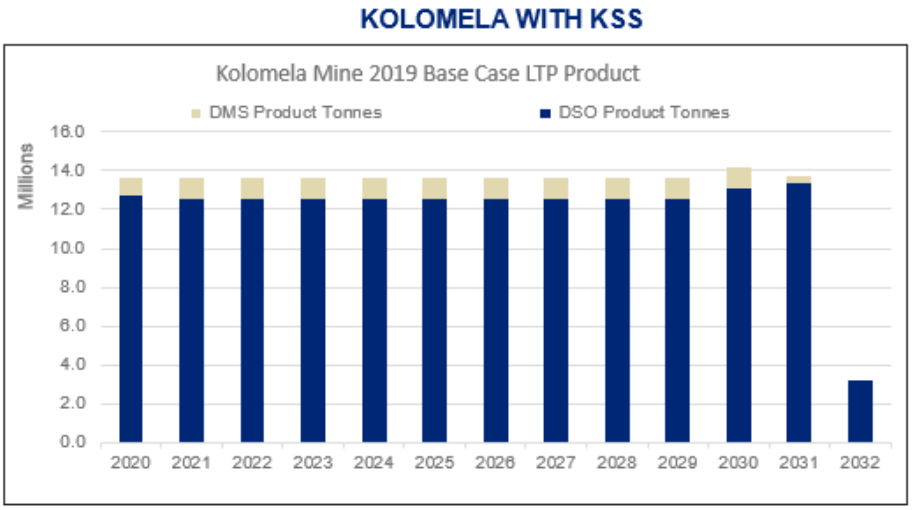


FIGURE 7-2: PRODUCTION WITH KAPSTEVEL SOUTH

The KSS development has been planned to create significant socio-economic benefits for the Tsantsabane community, especially by means of employment, business opportunities, training and skills development. KSS mining will allow for mining at 14 Mtpa which will mean that jobs at Kolomela will be sustained. With KSS going ahead, more time will be available for Kolomela mine to address the current dependency of the community on the mine and to work with other stakeholders to prepare for mine closure, even if it only happens in 13 or 20 years' time.

Since the SHIRA was undertaken the following additional labour requirements were identified for the KSS project:

- Due to an increased 18 Heavy Moving Equipment (HME) requirement from the mining side as compared to the original LOM Plan, there will be a total of 95 additional persons now required as part of Owner Mining Team. Consequently, there will be less input required by Contractor Mining.
- In terms of the Organisational Capability requirement, the number of New and Additional Roles will increase from approximately 48 to 143 due to the change in the Mine Plan. As Kolomela mine is aimed at the continues development of individuals, individuals within teams, teams themselves and the Organisation this change will have a positive impact on the following initiatives:
    - Accelerated Development opportunities in line with Employment Equity Strategies and Targets.
    - Increase in Development opportunities for members from the Local Community of Tsantsabane in relevant Skills and Education to improve the employability of the Local Community.

7.3 PV Solar Plant

Renewable energy has become a viable and economical source of electricity generation

and represents a sustainable alternative to fossil fuels. In addition to being an inexpensive source of electricity, solar energy developments participate to the reduction of air pollution and to the mitigation of climate change while contributing to industrial development and job creation. The transition to clean, sustainable and safe energy use is important for South Africa which is one of the top 20 largest emitters of greenhouse gases in the world and the largest in Africa. The South African Government's commitment to roll-out renewable energy development is evolving through the Integrated Resource Plan (IRP2010) and the Renewable Energy Independent Power Producer Procurement Programme (REI4P). As stated by the Department of Energy, solar energy is the most readily accessible resource in South Africa and one of the highest in the world.

Generation of electricity at the PV solar facility will provide a reliable and cost effective source of power, especially during periods of power interruptions. The utilisation of solar energy will also decrease dependency on fossil fuel powered energy and lower Kolomela's carbon footprint.

8. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Kolomela Mine LOM currently stands at 2032 with the potential for future expansion if further ore bodies become feasible to mine due to exploration activities. The mining right is valid until 2038.

9. DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES

9.1 Site location alternatives

The site on which the future infrastructure will be established is dependent on the existing Kolomela infrastructure layout, no site alternatives have therefore been assessed other than for the TSF and PV Solar Facility.

9.1.1 Tailings Storage Facility

Kolomela proposes to develop a TSF on the footprint of the existing Leewfontein WRD (Alternative 1) for the disposal of slimes from the DMS plant. Alternative 1 will not entail the removal of indigenous vegetation and the existing evaporation dam will be upgraded to use as a Return Water Dam (RWD). The facility is located in close proximity to the DMS plant and will not require the establishment of long distance slimes pipelines.

Three other alternative site locations have been identified for the establishment of the TSF. Alternative 2 entails the expansion of the existing Kolomela TSF to the northern section. Apart from the development of the pipeline, this alternative will not entail the disturbance of undeveloped areas and no vegetation will be disturbed. The existing RWD can be used. This

option may incur significant financial implications due to the establishment of infrastructure for the conveyance of slimes. Alternative 1 and 2 will be further assessed during the EIA phase.

Alternatives 3 and 4 entail the establishment of a TSF east and south east of the DMS plant, respectively. These alternative locations are situated in close proximity to the DMS plant and will not require investment for new, long distance pipelines. However, the footprints are situated in an area not previously disturbed and will entail the removal of indigenous vegetation. Wetland pans will also be affected by the footprint of these alternative sites. Alternative 4 is situated in the footprint of a future pit (Tierbult) and is therefore not feasible. A new RWD for each of these alternatives will be required. Alternatives 3 and 4 are not desirable in terms of environmental impacts and feasibility, and is therefore excluded for further assessment.

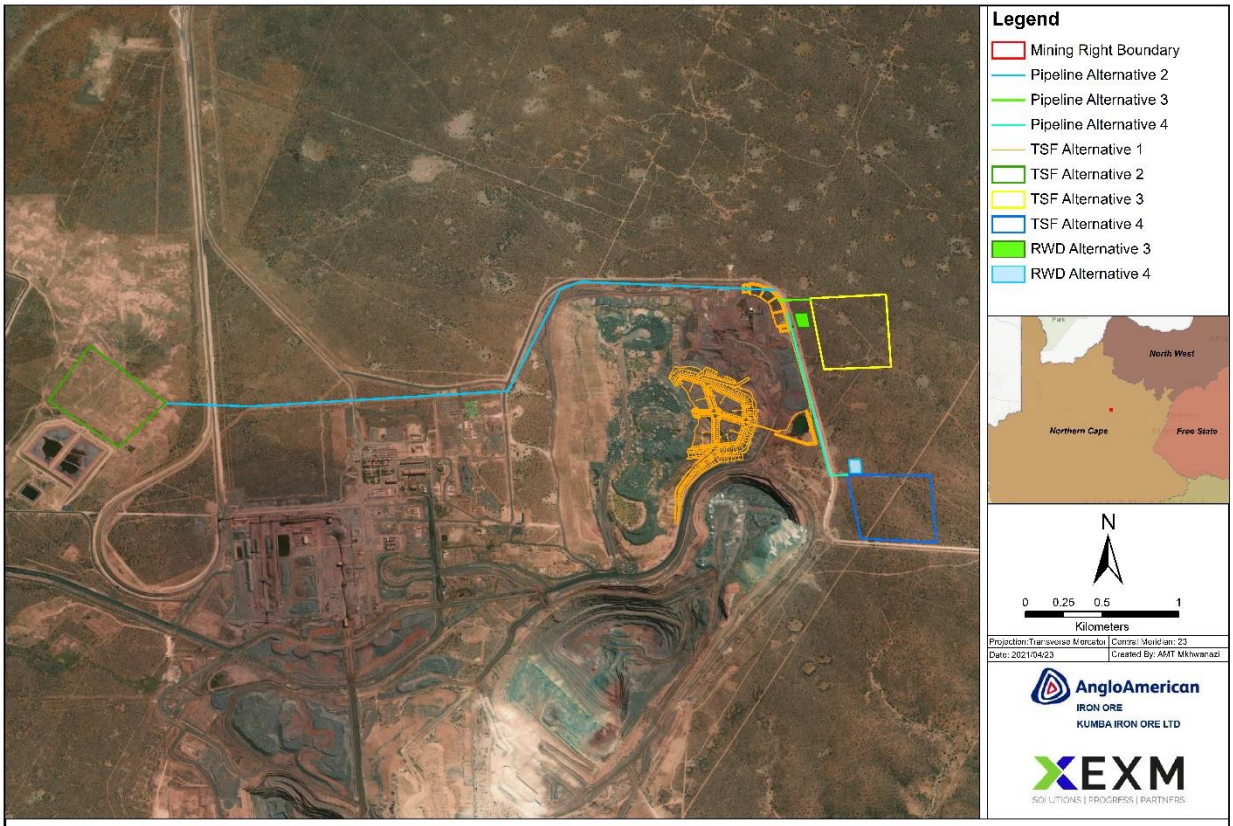


FIGURE 9-1: TSF ALTERNATIVE SITE LOCATIONS

9.1.2 Solar Plant

Site location alternatives were identified for the development of the PV solar plant as indicated in the Figure 9-2. Alternative 1 is located mostly on the existing disturbed footprint of a historical borrow pit. The PV Solar Facility will cover a total footprint of approximately 227 ha on of which most of the area have been previously disturbed and will only require vegetation clearance of 72,7 ha. Only a very small portion will be located in a designated Critical

Biodiversity Area (CBA). Alternative 1 is also located close the Kolomela substation which will prevent long distance transmission lines.

Alternative 2 is located to the west of Alternative 1 and will cover approximately 238 ha. A large portion of the site is located within a CBA and the Soutloop River (a NFEPA river) will be impacted. The entire footprint area is currently undisturbed and will require the removal of indigenous vegetation and potentially protected plant species. The site is also located further from the substation and will require longer distance transmission cables. This option is not favourable as it will result in severe environmental impacts and cost implications.

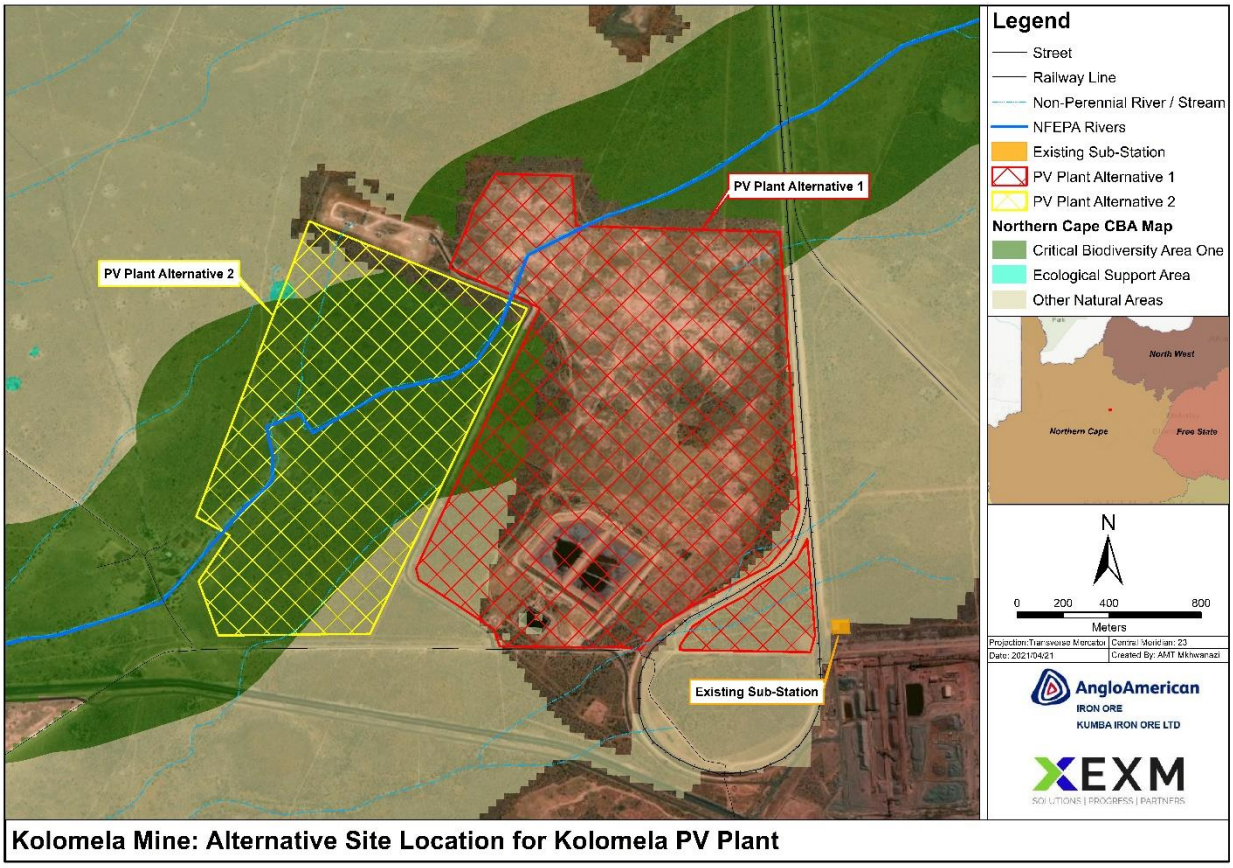


FIGURE 9-2: PV SOLAR PLANT SITE LOCATION ALTERNATIVES

9.2 Technology Alternative

Kolomela currently implements technology associated with the DSO facility which includes primary, secondary and tertiary crushers for the processing of ore prior to shipment via a rail system. Kolomela also utilises a DMS Processing Plant for the processing of low grade ore not suitable for processing at the DSO plant. No alternative technology have been assessed as part of this application.

9.3 The Type of Activity to be Undertaken

The type of activity for the Kolomela Expansion project is iron ore mining. This is the activity currently undertaken at the site and this activity will not change as a result of the amendment. Therefore, different activity alternatives were not considered at the site, as there is only one

activity option for the expansion of Kolomela mine, and that is to continue with the activity of iron ore mining.

9.4 Site Layout Alternatives

9.4.1 Kapstevel Waste Rock Dump layout alternatives

Site layout alternatives were assessed for the WRDs at Kapstevel. The original unmitigated layout alternative for the south eastern Kapstevel WRD encroached on the "Welgevondenspruit" which is a tributary of the Soutloop River and designated NFEPA wetland as well as other drainage lines. The footprint also extended across two ridges that have been identified as sensitive areas due to the prevalence of habitat to support species of conservation importance. The footprint was amended and will not extend across the Witsand road towards the NFEPA wetland and sensitive area to the east. A 50 m buffer was created around the sensitive area to the north and the WRD footprint was amended accordingly. The footprint of the south eastern WRD was reduced by approximately 44 ha to avoid the sensitivities. An additional area of 23 ha have been added to the northern section of the eastern WRD to compensate for the large area excluded. This area is not characterised by drainage or sensitive areas, which will be confirmed by the specialist studies.

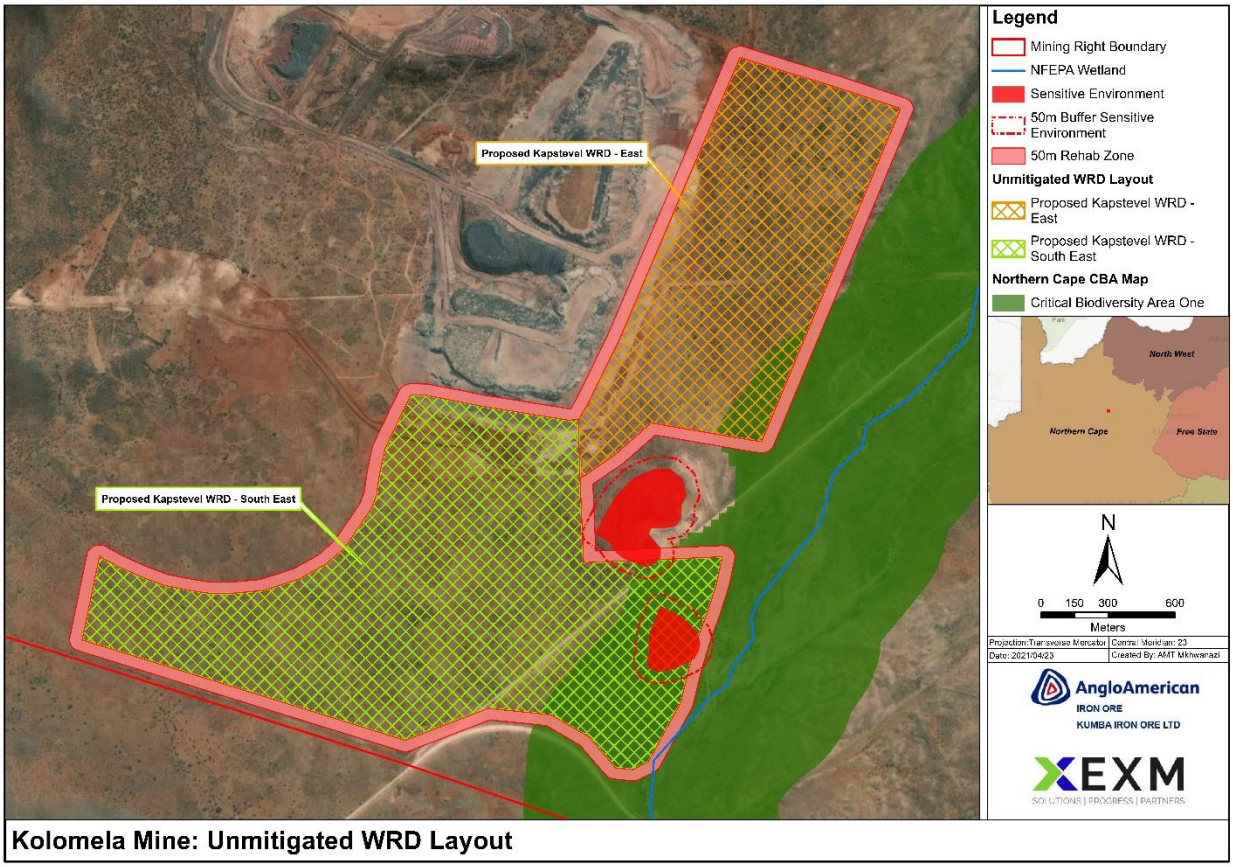


FIGURE 9-3: UNMITIGATED WASTE ROCK DUMP LAYOUT

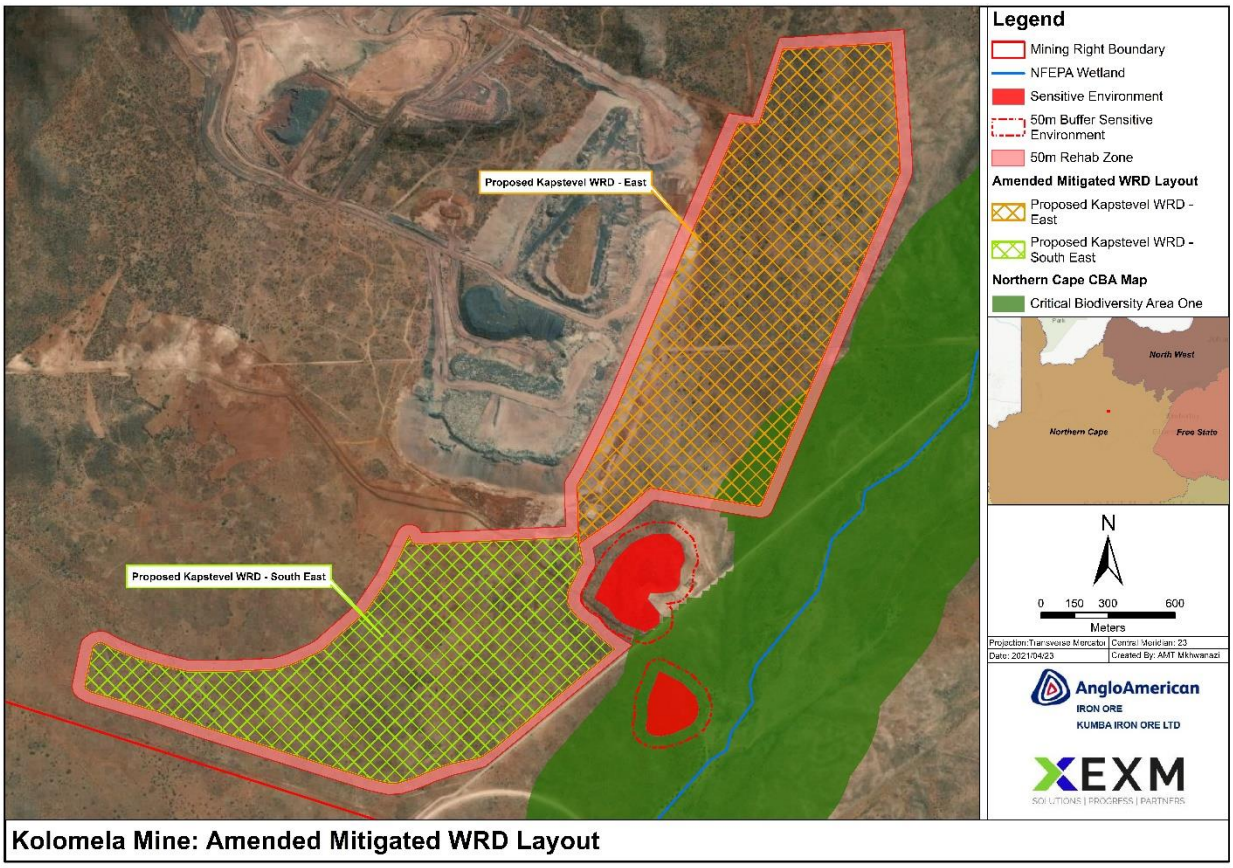


FIGURE 9-4: MITIGATED WASTE ROCK DUMP LAYOUT

9.4.2 Haul roads layout alternatives

Layout alternatives for the haul roads were considered as indicated in the Figure 9-5. The original unmitigated layout would extend to the south. This would encroach a large section of the "Welgevondedspruit" and the CBA 1 and cause significant disturbance in these areas. The layout was amended to cross only a small section of the Welgevonded spruit where disturbance have already occurred. The mitigated layout will minimise impacts on a NFEPA and the CBA 1. The layout of the road will further be assessed and amended during the EIA phase according to the outcome of the specialist studies.

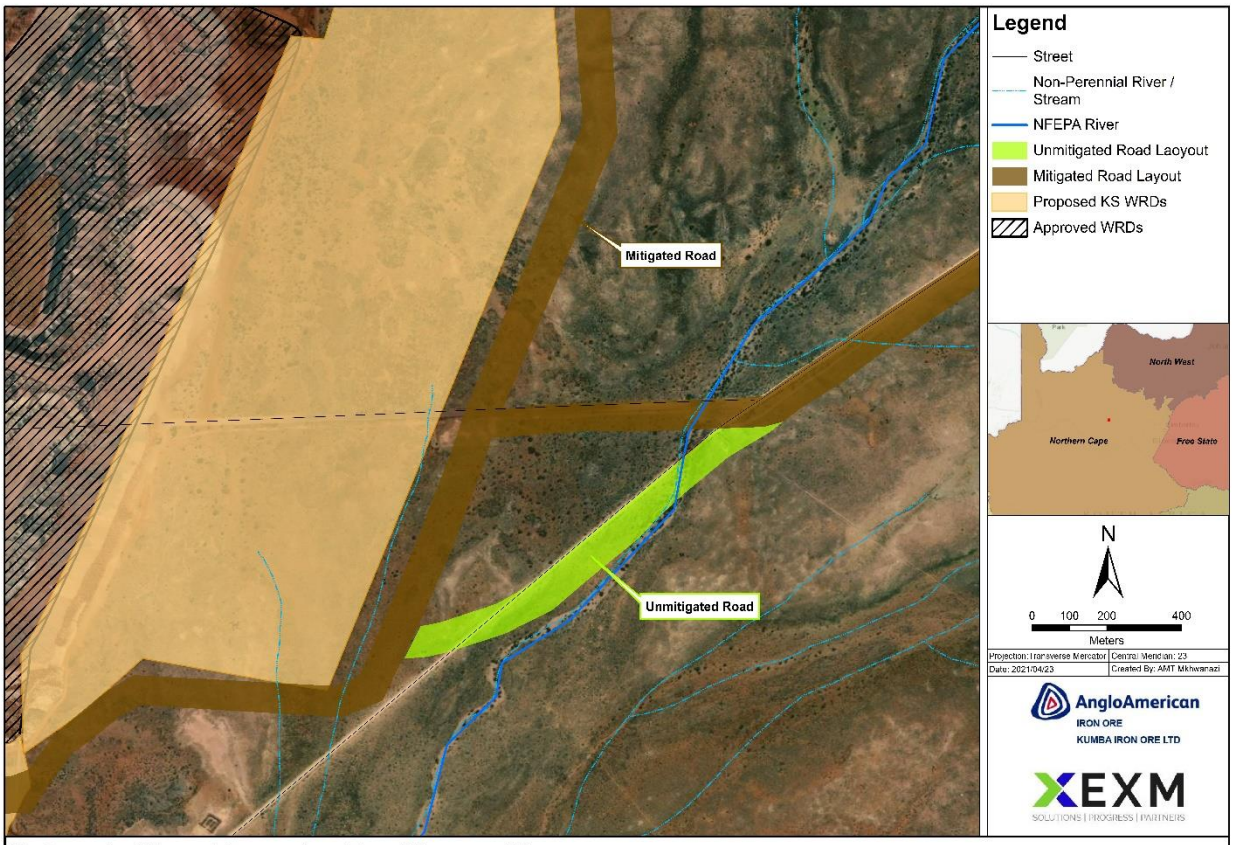


FIGURE 9-5: ALTERNATIVE HAUL ROAD LAYOUT

9.4.3 Alternative Routes for the DSO to DMS Conveyor

Three alternative layouts have been considered for the conveyor from the DSO to the DMS plant as indicated in Figure 9-6 below. Alternative 1 will entail the disturbance of vegetation to the north and then follow the existing disturbed footprint to the east. This option will be the most feasible and practicable alternative as the route will not run through the operational area where infrastructure is situated. Alternative 2 will entail the establishment of the conveyor through the operational area to the east of the DSO plant. Although no new vegetation clearance on unauthorised footprints will be required, this option will be very costly and not practicable to implement. Alternative 3 will entail the establishment of the conveyor towards the north and the entire route will be across undisturbed areas and wetland pans. This option is not favourable from an environmental point of view and has been excluded for further assessment. Alternatives 1 and 2 will be included for further assessment during the EIA phase.

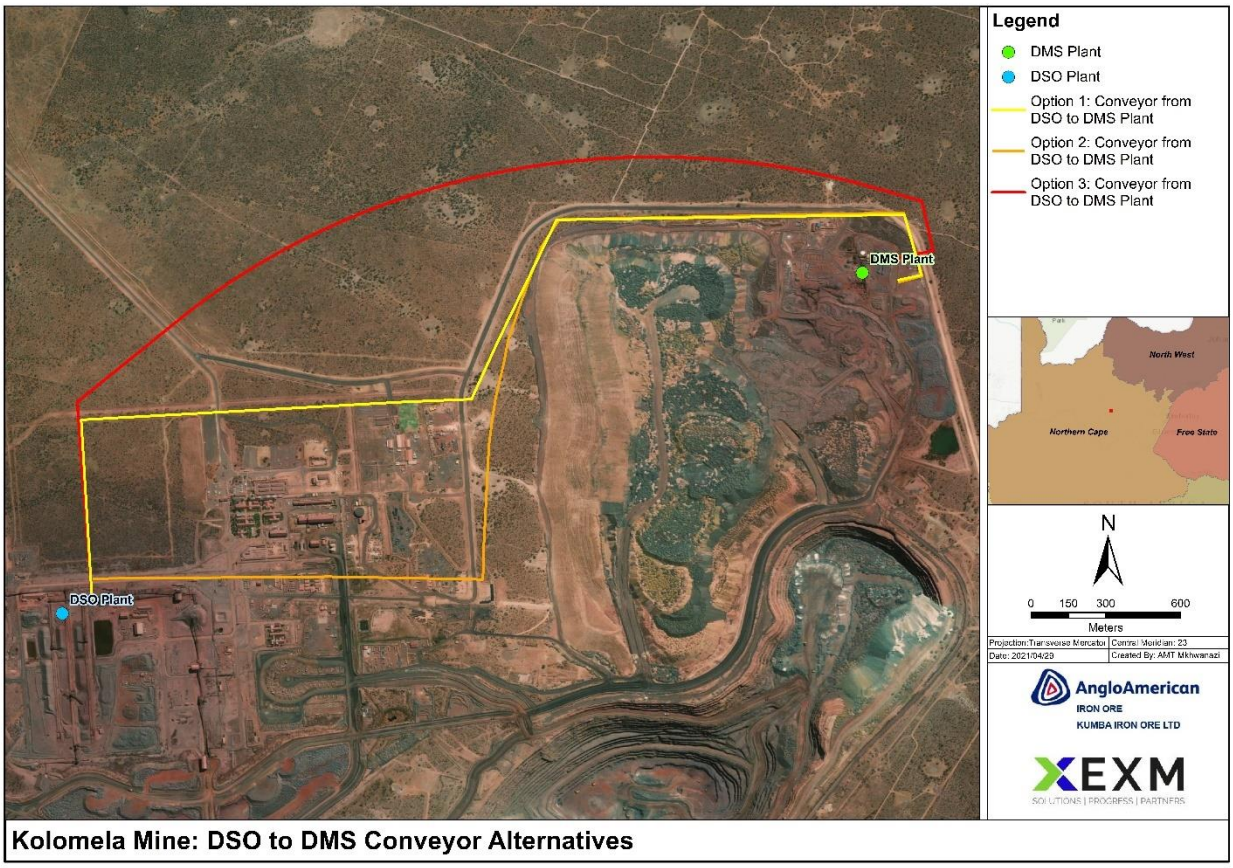


FIGURE 9-6: ALTERNATIVE ROUTES FOR THE DSO TO DMS CONVEYOR

9.5 The Operational Aspects of the Activity

9.5.1 Management of slimes from DMS plant

The below alternatives are considered for the management of slimes from the DMS and will be included in the EIA for further assessment based on the outcome of the specialist studies.

9.5.1.1 Alternative 1: Co-disposal of slimes and waste rock

Slimes currently produced at the DMS plant are temporarily stored and conditioned prior to blending with waste rock prior to final disposal at the Leeuwfontein WRD. As previously mentioned Kolomela intends to prioritise backfilling into the pits and the mine proposes to commence with the backfilling of the blended material (waste rock and slimes). This alternative will entail the development of new slimes conveyance pipelines on disturbed areas and will not require the development of a new TSF.

9.5.1.2 Alternative 2: Development of a TSF on the Leeuwfontein TSF

The development of a TSF on the Leeuwfontein WRD which will replace the need for co-disposal of slimes and waste rock. It will entail the development of a TSF, the conversion of the existing evaporation pond to a RWD and the establishment of paddocks at the DMS plant. No natural vegetation will be disturbed.

9.5.1.3 Alternative 3: Development of a TSF combined with co-disposal of slimes and waste rock

Co-disposal, either via backfilling or on a WRD, of waste rock and tailings material will be conducted in conjunction with the development of the TSF to allow for sufficient capacity.

9.6 Option of Not Implementing the Activity

In accordance with the NEMA Regulations, the no-go alternative is required to be investigated and assessed. The no-go alternative would entail the non-continuation of the proposed expansion project. This would mean that Kolomela will not be able to conduct essential supporting functions for the mine, especially for the Kapstevel South project which holds significant socio-economic benefits.

The *status quo* will remain and the no-go alternative would prevent any potential negative environmental impacts associated with the proposed expansion project, including the disturbance of surface water resources, removal of vegetation and associated biodiversity impacts, potential contribution to dust and noise generation, soil erosion, etc. The actual biophysical impacts will be investigated as part of EIA phase of the project and appropriate mitigation will be proposed.

10.DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

A public participation process is conducted in terms of the Chapter 6 of NEMA and the EIA regulations. The purpose of the public participation process is to inform all the identified Interested and Affected Parties (IAPs) of the proposed development and associated EA application process and allow them to raise comments/concerns. The following provides a summary of the engagement that is conducted.

10.1 Identification of Interested and Affected Parties

Existing IAP databases were updated for the purposes of this project. Potential IAPs were identified based on the definition in the EIA regulations. This includes:

- Landowners or tenants adjacent to or within 100 m from the proposed study area. For the purposes of this study all neighbouring landowners have been identified and notified.
- Tsantsabane Rate Payers Association
- Representatives of the local municipality/ward councillor with jurisdiction in the area.

  This definition was expanded for the purposes of the assessment to include the mayor, councillors of the local council as well as members of the district municipality. This included representatives of:

  - Tsantsabane Local Municipality
  - ZF Mgcawu District Municipality

- Authority or organs of state having jurisdiction in respect of any aspect of the activity, including. The following organs of state have been notified:
    - Department of Water and Sanitation (Northern Cape)
    - Northern Cape Department Agriculture Land Reform And Rural Development (Northern Cape)
    - Department of Agriculture, Forestry and Fisheries (Northern Cape)
    - Department of Mineral Resources (Northern Cape)
    - Department of Environment and Nature Conservation (Northern Cape)
    - Department of Economic Development and Tourism (Northern Cape)
    - Department of Roads and Public Works (Northern Cape)
    - Department of Social Development (Northern Cape)
    - South African Heritage Resources Agency
    - Northern Cape Department: Co-operative Governance, Human Settlements and Traditional Affairs
- Persons who respond to the Background Information Document (BID), press advertisements and site posters.

A list of all parties that have been identified thus far is included as **Annexure B1**

10.2 Notification of Interested and Affected Parties

In accordance with Section 41(2)(b) of Chapter 6 of the EIA Regulations (GN. 982 of 4 December 2014, as amended), written notification (including BID document) was provided to all persons on the IAP database.

- Site notices (Afrikaans and English) have been placed at the access roads to the site as well as at public areas in Postmasburg (**proof to be included in the final scoping report**)
- Email notifications have been sent to the identified I&APs (**proof to be included in the final scoping report**)
- SMS notification have been sent to the identified I&APs (**proof to be included in the final scoping report**)
- Advertisements have been placed in two newspapers (local and regional), one in English and one in Afrikaans which are distributed in the Postmasburg area (Noordkaap Bulletin and the Kathu Gazette) (**proof to be included in the final scoping report**)

A copy of the BID (Afrikaans and English) provided in **Annexure B2.** Proof of distribution of the BID will be included in the final Scoping Report.

10.3 Distribution of draft Scoping report for comment:

The Scoping Report is distributed for a period of 30 days to the identified IAPs by means of the following methods:

- An electronic link has been provided to the identified IAPs with access to email. Two platforms will be used including OneDrive and Dropbox to ensure access.
- Other IAPs for whom only cell phone number are available have been notified of the availability of the reports and provided the opportunity to request access to the documents.
- Hard copies of the Scoping Report will be placed at a venue which is accessible to the public (e.g. public library and Kumba Public Affairs Offices), only if the IAPs that cannot access the electronic documents request access to a hard copy. No such requests were received.
- Hard copies was sent to the competent authority, if requested.

Proof of distribution will be included in the final scoping report.

10.4 Public meeting

A public meeting will be conducted as part of the scoping phase as well as the EIA phase. Proof will be included in the final scoping report and Environmental Impact Report (EIR).

10.5 Comments and responses

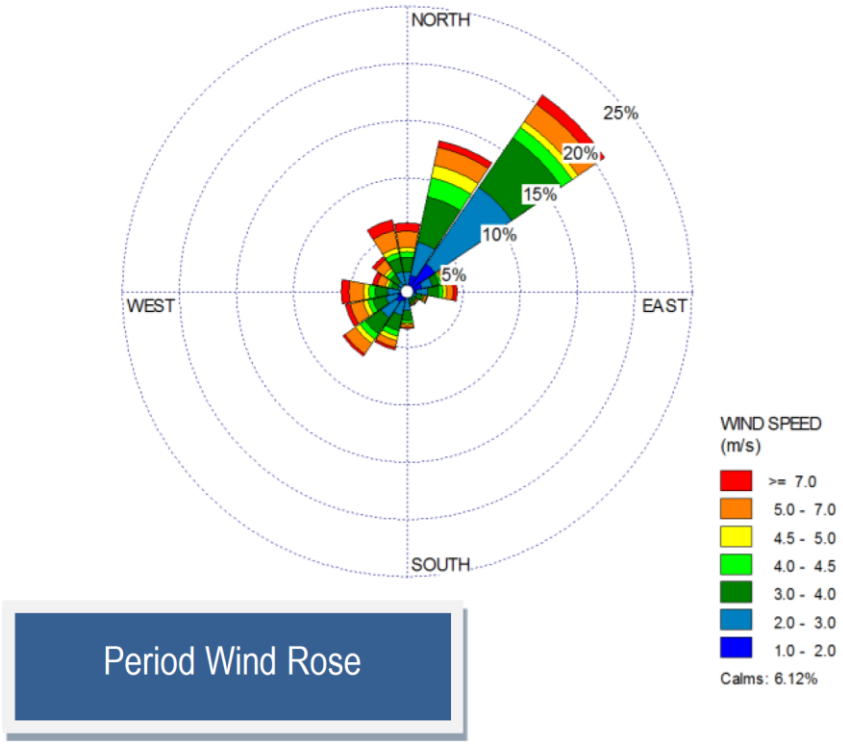
No comments have been received to date. Comments on the draft scoping report will be incorporated in the final report.

11.THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH KOLOMELA MINE

11.1 Climate

11.1.1 Wind

According to the Air Quality Impact Assessment for Kolomela Mine (Airshed, 2015), the wind field is dominated by winds from the north-east (see Figure 11-1). The strongest winds (>6 m/s) were also from these directions. Calm conditions occurred only 6% of the time, with the average wind speed being 3.6 m/s. During the day the predominant wind direction are from the north-north east and north east. At night winds tender to blow from the south west and west south west. Strong winds in excess of 6 m/s occurred most frequently during winter and spring months. Calm conditions occur most frequently during autumn months. Figures 11-1 and 11-2 contains the wind roses for Kolomela.



Source: Air Quality Impact Assessment for Kolomela Mine (Airshed, 2015)

FIGURE 11-1: PERIOD AVERAGE WIND ROSE FOR KOLOMELA MINE 2011-2014

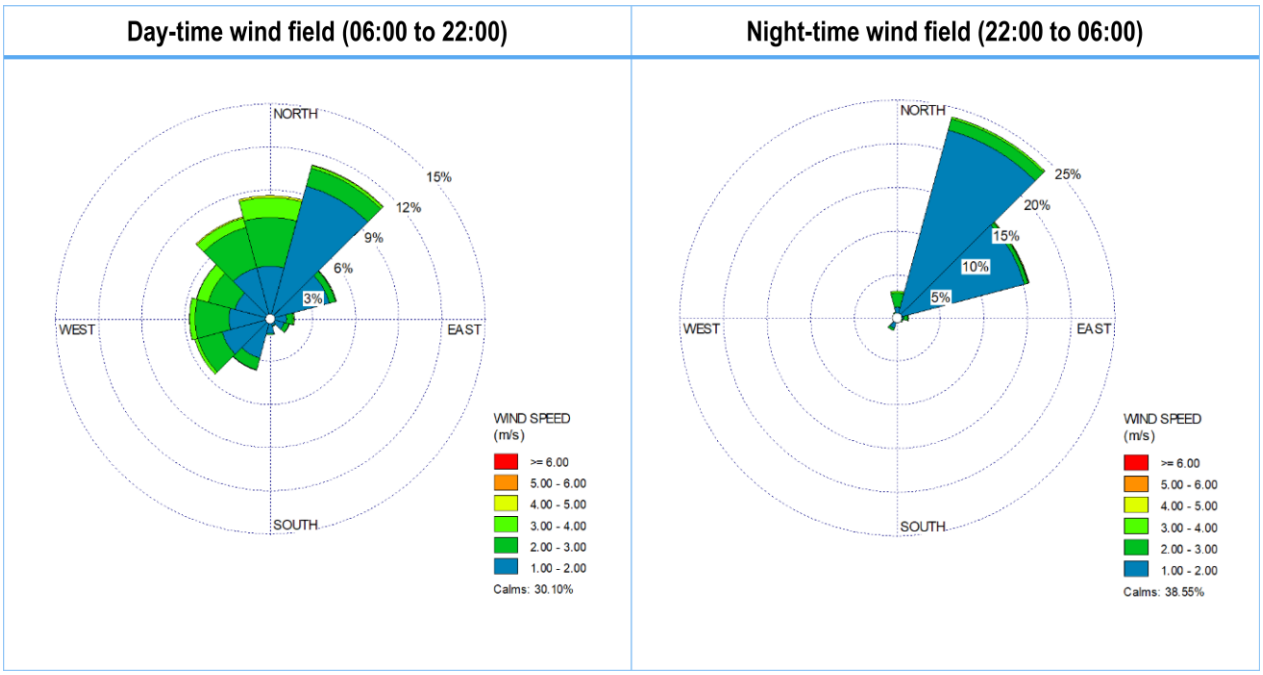


FIGURE 11-2: DAY- AND NIGHT-TIME WIND FIELD (OCTOBER 2014 TO AUGUST 2017)
Source: Noise Impact Assessment for Kolomela Mine (Airshed, 2018)

11.1.2 Temperature

Monthly mean and hourly maximum and minimum temperatures are given in Table 11-1. Temperatures range between -7.2 °C and 40 °C. The highest temperatures occur in December and the lowest in July.

TABLE 11-1: MONTHLY TEMPERATURE SUMMARY

Hourly Minimum, Hourly Maximum and Monthly Average Temperatures (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum	9.0	8.0	5.1	1.9	-5.0	-6.0	-7.2	-6.0	-5.0	1.0	2.0	6.0
Maximum	26.7	25.2	22.7	17.1	14.6	10.1	10.3	12.7	16.3	20.1	23.6	24.4
Average	40.0	39.0	38.0	33.0	32.2	27.0	28.2	32.0	38.1	36.0	38.0	40.0

11.1.3 Rainfall and evaporation

Postmasburg is located within a low rainfall area (see Figure 11-3) with a mean annual rainfall of approximately 285 mm. Rainfall is highly unpredictable with most rainfall occurring between November and April. The rainfall usually falls as a result of thunderstorms when tropical thunderstorm activity extends southwards over the Kalahari. Mean annual evaporation (2 450mm) is higher than annual rainfall (374 mm), which results in a major net moisture deficit of over 2 000 mm throughout the year.

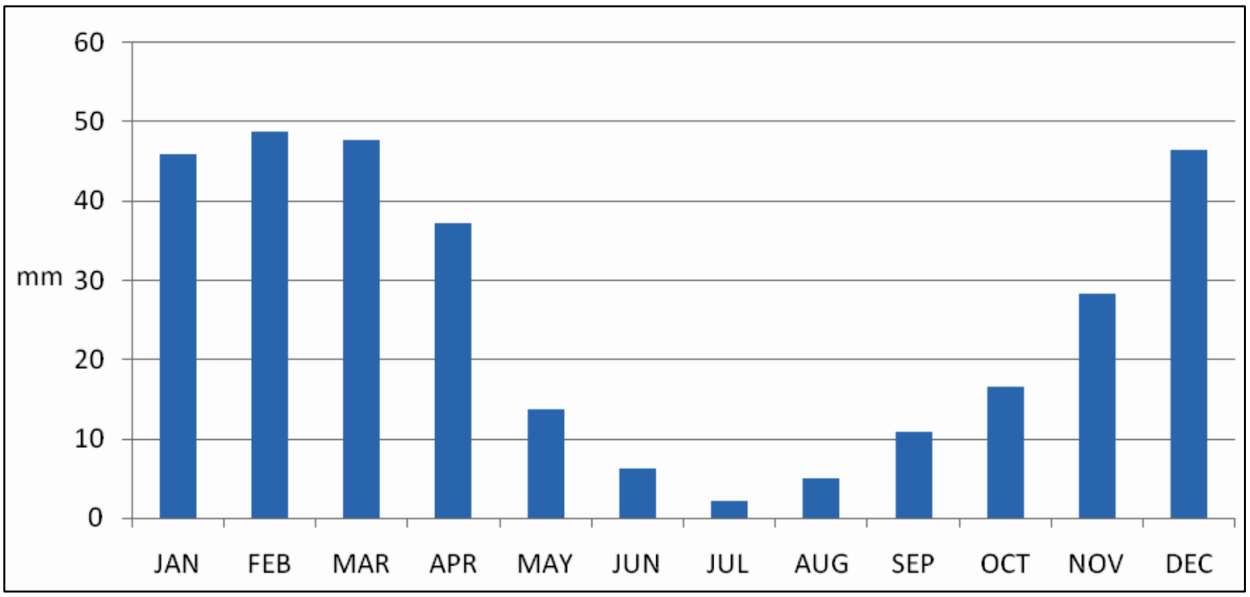


FIGURE 11-3: RAINFALL STATISTICS (POSTMASBURG WEATHER STATION)

11.2 Topography

Surface topography of the mining area is relatively flat with an ephemeral stream, the Groenwaterspruit, incising a dendritic drainage pattern up to 40 m deep along the eastern border of the Kolomela mining right area. The majority of the area slopes gently to the south west from the Ploegfontein area (approximately 1 290 masl) to Welgevonden (1 220 masl) with several drainage courses converging to the south of the mining area into a small spruit, which has generally been referred to as the Welgevondenspruit and is a tributary of the Soutloop River. A second tributary of the Soutloop River flows in a southerly direction along the eastern sections of the Floradale and west of Kolomela Mine boundary, the proposed area for Aquifer Recharge. Figure 11-4 illustrates the topography of the Kolomela mining right.

Numerous topographic depressions and pans distributed across the flat-lying, central portions of the area collect and hold rainwater for short periods after the seasonal rains. A prominent hill, Wolhaarkop (1 448 masl), rises above the plains on the south-western portion of the project area.

The topography of the area has already been altered as a result of the mining operations at the mine, the most significant being the development of the Kapstevel, Leeuwfontein and Klipbankfontein pits and associated WRDs.

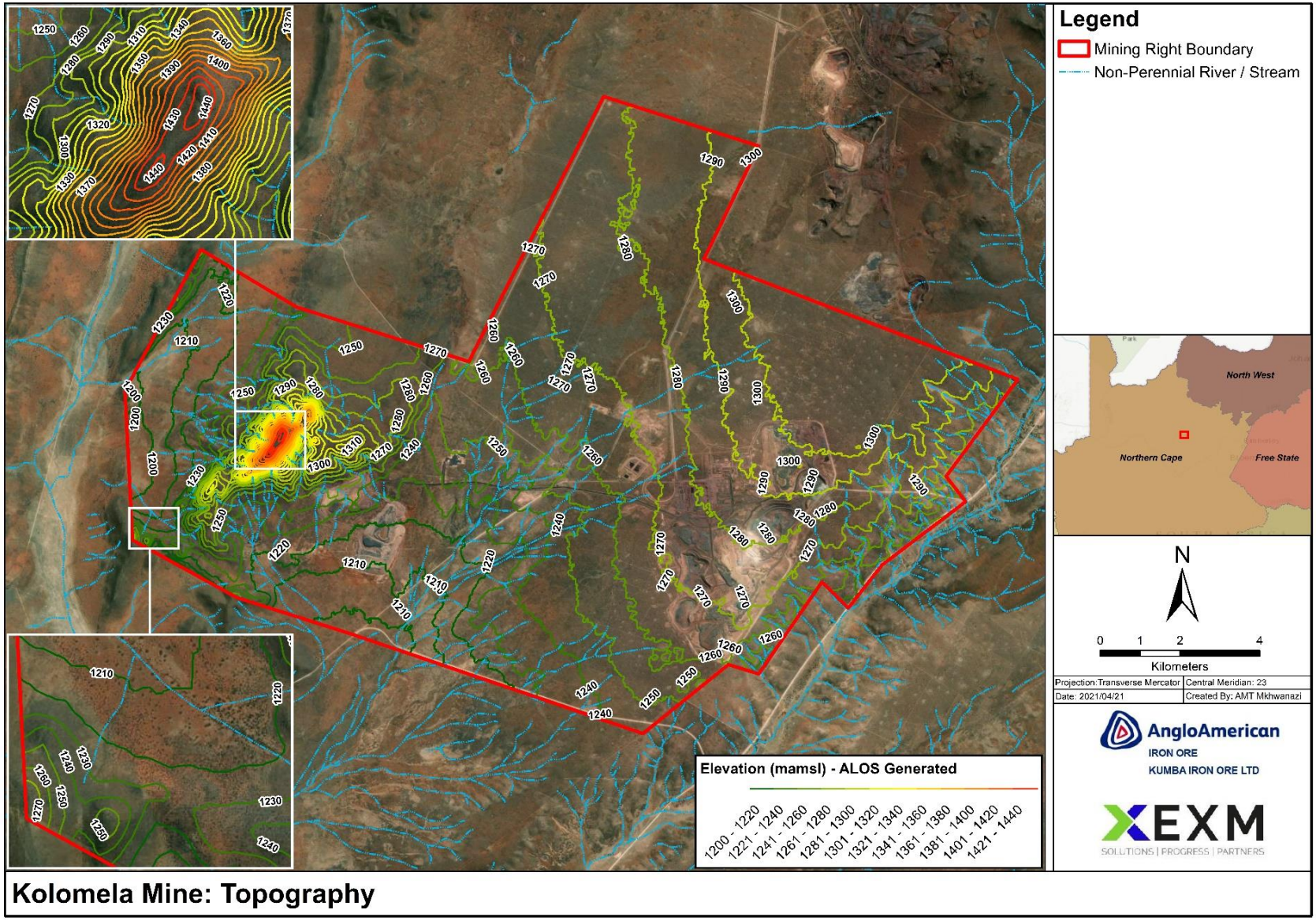


FIGURE 11-4: LOCAL TOPOGRAPHY

11.3 Soil

The dominant soil types in the mining area are Augrabies, Coega and Mispah. The Augrabies soil type is characterised by an Orthic A-Horizon overlying Neo-carbonate B-Horizon material which overlies unspecified material. The Coega soils comprise an Orthic A-Horizon overlying a Hard Carbonate B-Horizon and the Mispah soil is characterised by an Orthic A-Horizon overlying rock.

In the Wolhaarkop and Welgevonden sections of the mining area, Mispah soils are dominant and have an average depth of less than 300 mm. The Ploegfontein, Leeuwfontein and Klipbankfontein areas are dominated by Coega soil with an average soil depth also less than 300 mm. Augrabies soils are present on a portion of Wolhaarkop and also some sections of Kapstevel. These soils are deeper (< 1200 mm). Figure 11-5 shows the dominant soil on the Kolomela mining right.

The agricultural potential of the Augrabies, Coega and Mispah soils are considered to be low under dryland conditions and medium to high under irrigation conditions (>10- 15mm/week 33-1,500 kPa plant available water) in areas where soil depth exceeds 600 mm. The mining area can generally be described as suitable for livestock grazing purposes. The agricultural potential of the dominant soils present at the sites investigated is summarised in Table 11-2. The low plant biomass on account of the dry climate limits the volume of organic material that enters the soil profile, further reducing the agricultural potential of the soil.

TABLE 11-2: AGRICULTURAL POTENTIAL OF DOMINANT SOILS ON THE KOLOMELA MINE

Soil Form	Effective Depth (mm)	Agricultural Potential (Dryland)	Agricultural Potential (Irrigated)
Mispah	<300	Low	Low
Coega	<300	Low	Medium
Augrabies	<1200	Low	High

Soil samples were collected in areas typical of the soil form in question and chemically analysed. These analyses revealed that the soil is of neutral pH with low electrical conductivity levels indicating that there are no signs of soil salinisation. Low sodium levels indicate that there is a low risk of erosion due to dispersion of clay particles by sodium ions. No determinants are present at levels that would inhibit plant growth.

The soil is chemically and physically suitable for rehabilitation. However, due to their shallow effective depth in this area, limited topsoil is available to be stripped and stockpiled for rehabilitation purposes and it is likely that there may be a shortfall of soil for use in rehabilitation.

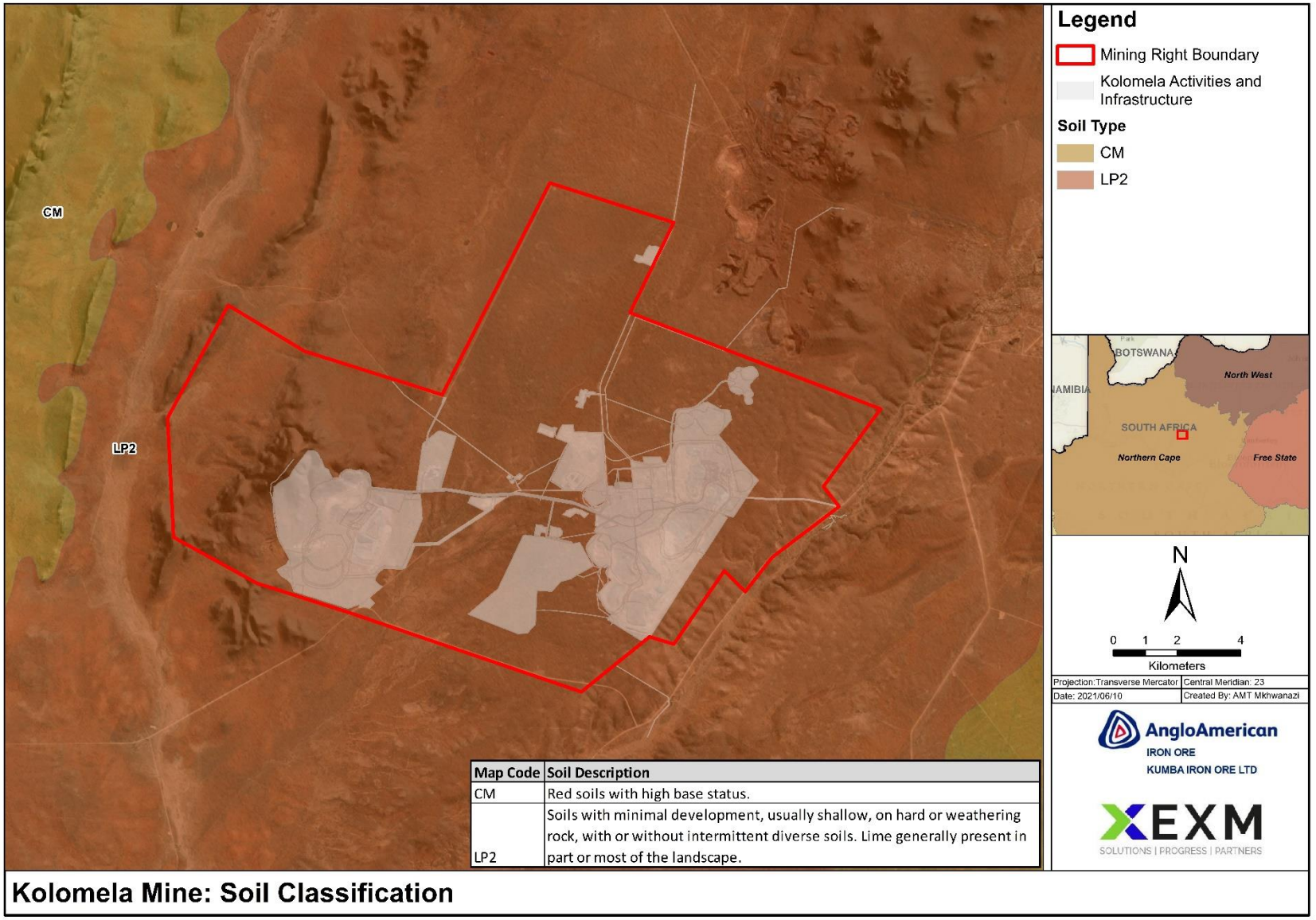


FIGURE 11-5: SOIL MAP

11.4 Air Quality

A specialist Air Quality Impact Assessment was undertaken in support of the EIA (Airshed, 2015) for the Kolomela Expansion EIA. A summary of the baseline air quality as per Airshed (2015) and updated monitoring reports is provided below. An updated Air Quality Impact Assessment will be undertaken as part of this application and included in the EIR.

11.4.1 PM10 and PM2,5

The following was derived from the Kolomela annual air quality report for 2019. PM (particulate matter) 10 describes all particulate matter in the atmosphere with a diameter equal to or less than 10 µm while PM2.5 describes all particulate matter with a diameter equal or less than 2.5 µm. PM monitoring is conducted at 4 stations as indicated in the Table below. The results of monitoring will inform Kolomela of the general quality of air in the vicinity of the mine and determine whether air quality is compliant with National Ambient Air Quality Standards (NAAQS).

The PM10 exceedances recorded historical from 2014 are listed in the Table 11-3. It is clear from the data the number of exceedances of the limit value of the 24-hour NAAQS for PM10 at Postmasburg Primary School have been increasing. A decreasing trend is noted at the Heuningkranz station, with 19 exceedances in 2015. An increasing trend is notable in Kapstevel and Kappies Karee (uMoya-NILU Consulting, 2020).

TABLE 11-3: HISTORICAL PM10 EXCEEDANCES 2014 – 2019

Source: Annual Air Quality Monitoring Report for Kolomela Mine 2019 (uMoya-NILU Consulting, 2020).

Year	Kappies Karee	Kapstevel	Heuningkranz	Postmasburg Primary School
2014	0	-	-	-
2015	3	1	19	5
2016	5	2	3	9
2017	1	5	0	11
2018	1	1	0	11
2019	9	11	3	36

The PM2.5 exceedances recorded historical from 2014 are listed in the Table below. It is noted that Kappies and Heuningkranz stations were in non-compliance in 2016, while other stations were in compliance. All stations average concentrations are slightly higher in 2016 than any other year. The primary school monitoring station is non-compliance with NAAQS while all other stations are in compliance with NAAQS in 2019 (uMoya-NILU Consulting, 2020).

TABLE 11-4: HISTORICAL PM2.5 EXCEEDANCES 2014 – 2019

Source: Annual Air Quality Monitoring Report for Kolomela Mine 2019 (uMoya-NILU Consulting, 2020).

Year	Kappies Karee	Kapstevel	Heuningkranz	Postmasburg Primary School
2014	0	-	-	-
2015	2	0	0	0
2016	7	3	6	0
2017	3	1	0	0
2018	2	0	0	1
2019	0	0	0	41

11.5 Fall out dust

Dust fall monitoring is conducted on a monthly basis at numerous locations on Kolomela and surrounding areas. The results are compared against the Acceptable Dust Fall Rates (Table 11-5) as per the National Dust Control Regulations, 2013. An updated Air Quality Assessment will be conducted which will include a full analysis and interpretation of the monitoring results.

TABLE 11-5: ACCEPTABLE DUST FALL RATES – NATIONAL DUST CONTROL REGULATIONS, 2013.

Restriction Areas	Dustfall rate (D) (mg/m2/day) – averaged over 30 days.	Permitted frequency of exceeding dust fall rate
Residential area	D < 600	Two within a year, not sequential months.
Non-residential area	D < 1200	Two within a year, not sequential months.

According to the annual dust fall out monitoring report for 2020 (Dustwatch), 21 of the 38 monitoring locations were compliant and 17 were non-compliant with the NDCR. The report also compared the results with those obtained for 2019.

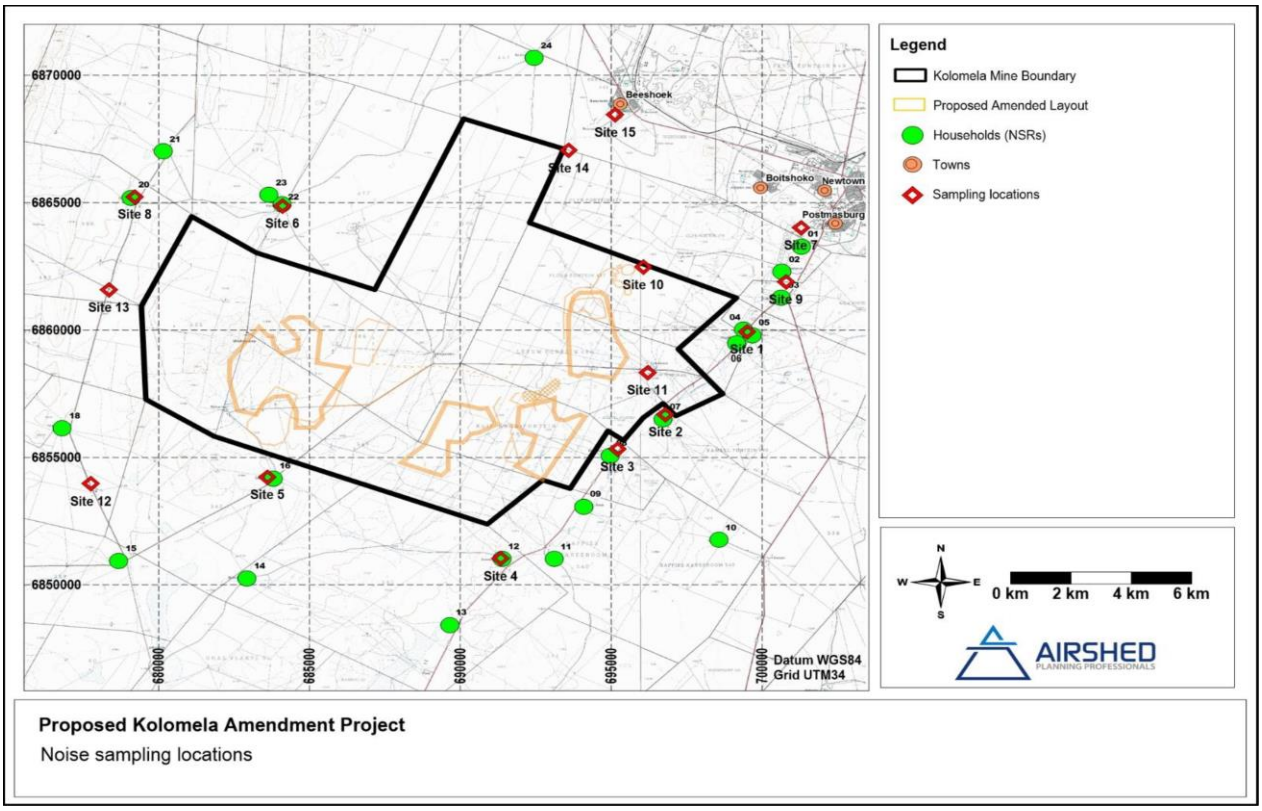
The monitoring results for 2020 showed that the number of dust buckets that yielded less months above the limits of the NDCR compared to the previous year is 19. This indicates an improvement in 19 areas. This achievement with the low rainfall in 2020 is an excellent achievement. The previous year's improvement was at 14. Number of units with no change in the months above the limit, is 12. This indicates that dust levels in 12 of the areas remained the same. This is 4 more than 2019.

Number of dust buckets that yielded more months above the limit compared to the previous year is 8. This indicates that the dust levels have increased and the results in these areas are worse compared to 2019.

11.6 Noise

A Noise Impact Assessment (NIA) (Airshed, 2018) was conducted in 2018 to document the current noise levels associated with Kolomela and to determine the potential impact on the acoustic climate given the LOM plan for Kolomela Mine. An updated NIA will be conducted as part of this application to assess impacts related to the expansion activities.

A map of likely Noise Sensitive Receptors (NSRs) is included in the Figure below. These include single homesteads and towns. The closest NSRs are situated east of the mine boundary along the public gravel road (R383). Day- and night-time noise measurements were conducted at the eight locations as indicated in the Figure 11-6.



Source: Noise Impact Assessment (NIA) (Airshed, 2018)

FIGURE 11-6: NOISE MONITORING POINTS AND NOISE SENSITIVE RECEPTORS

As indicated in the simulation models below (Figures 11-7 and 11-8), the operational phase related noise due to the Kolomela mine is not predicted to exceed the selected noise guidelines at NSR surrounding the Kolomela Mine with an increase above the baseline of less than 3 dBA at all identified NSR (with the exception of NSR 8 with a change in day-time noise levels of 4.7 dBA). For a person with average hearing acuity an increase of less than 3 dBA in the general ambient noise level is not detectable. According to SANS 10103 (2008); 'little' reaction with 'sporadic complaints' may be expected from the community for increased noise levels up to 10 dBA. With the conservative approach adopted for the assessment the predicted increase in noise levels is expected to result in 'little' reaction from the community due to the Kolomela Mine.

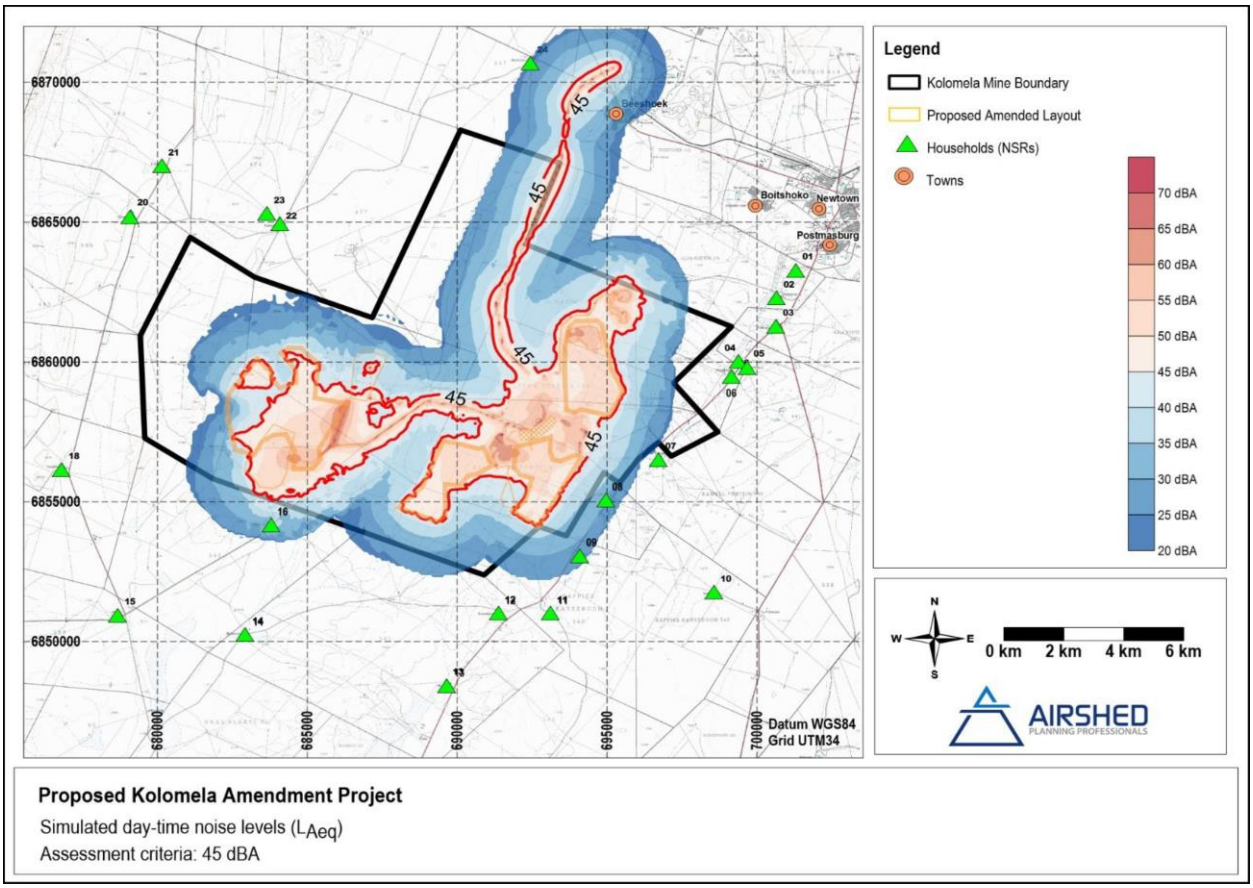


FIGURE 11-7: SIMULATED EQUIVALENT CONTINUOUS DAY-TIME RATING LEVEL (LREQ,D) FOR KOLOMELA MINE ACTIVITIES

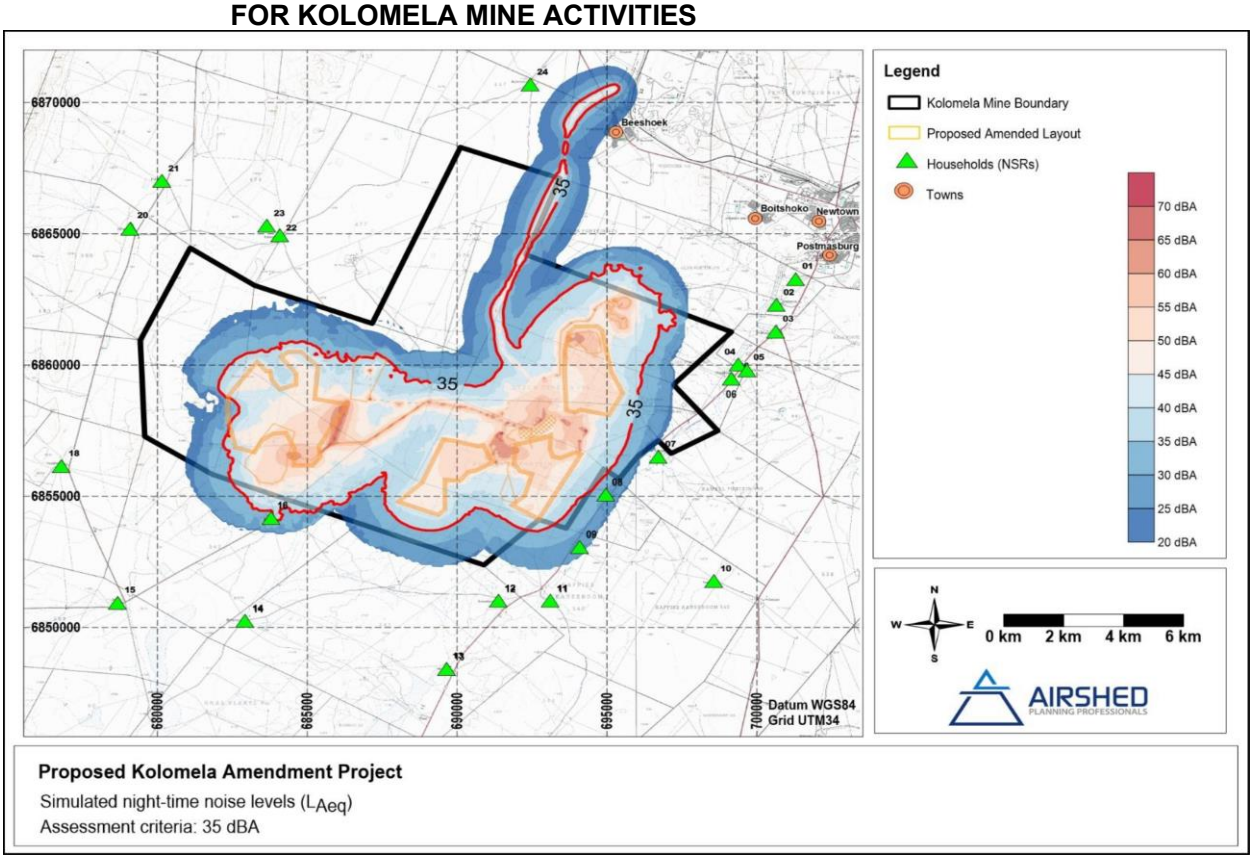


FIGURE 11-8: SIMULATED EQUIVALENT CONTINUOUS NIGHT-TIME RATING LEVEL (LREQ,N) FOR PROPOSED KOLOMELA MINE ACTIVITIES

11.7 Biodiversity

The following provides an overview of biodiversity related to the Kolomela area in general. An Ecological (Fauna and Flora) Impact Assessment will be undertaken to assess potential impacts on biodiversity as a result of the expansion activities and to propose mitigation measures to minimise/prevent potential impacts.

11.7.1 General vegetation

Kolomela is located in the Savanna Biome in the Eastern Kalahari Bushveld Bioregion. It falls within the Kuruman Mountain Bushveld (SVk10) and Postmasburg Thornveld (SVk 14). The Groenwaterspruit at Leeuwfontein falls within the Postmasburg Thornveld and the Southern Kalahari Salt Pans (Azi4) vegetation type is represented at Ploegfontein (Mucina & Rutherford 2006). Although a number of endemic or near-endemic plant species occur in these vegetation types, they are not regarded as veld types needing protection.

11.7.2 Vegetation types

Eight vegetation types identified at Kolomela mine (Zietsman, 2019), as show Figure 11-9 below.

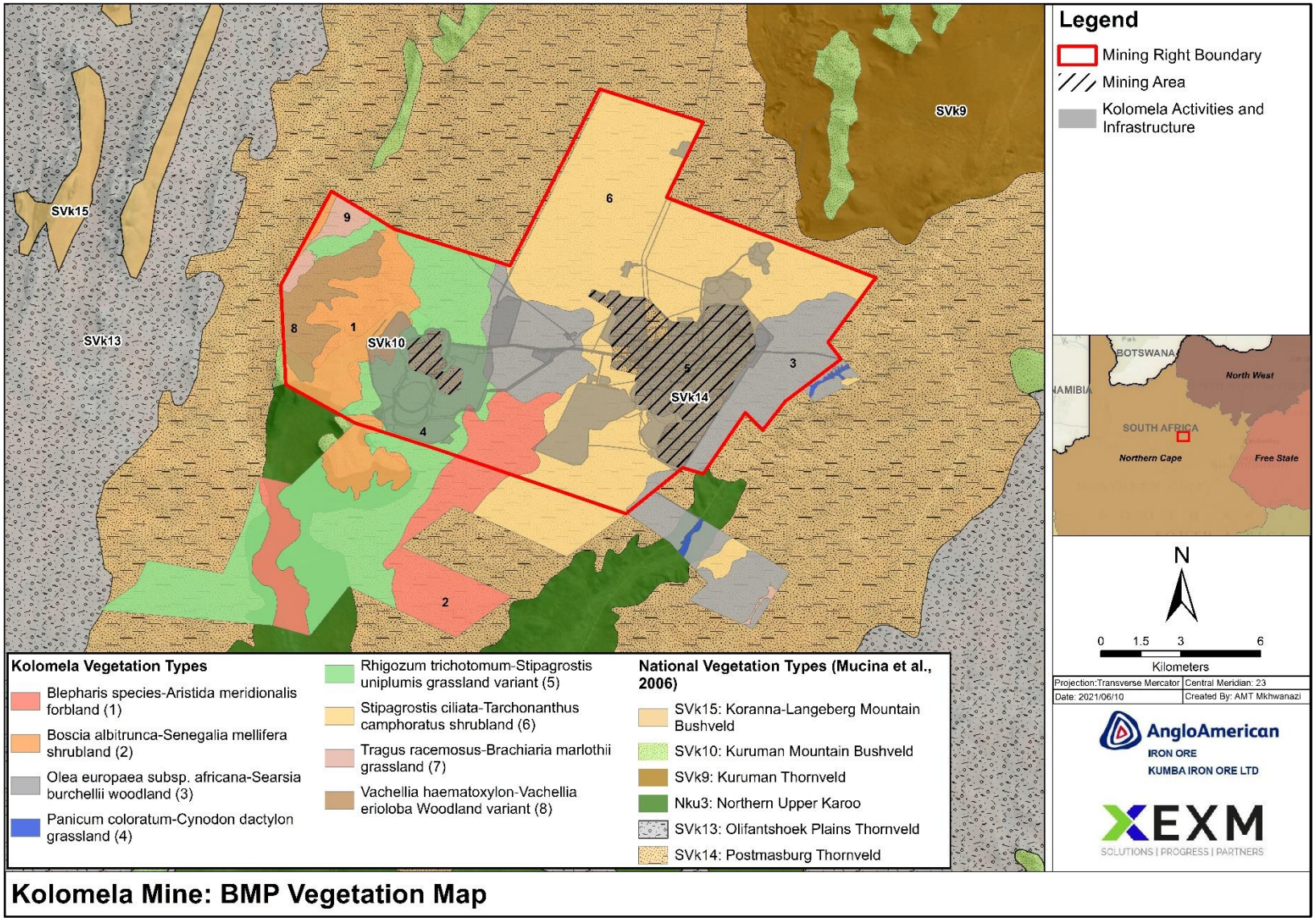


FIGURE 11-9: KOLOMELA VEGETATION TYPES

11.7.3 Sensitive Biodiversity

The centre of the Kolomela mining right has been classified as a Critical Biodiversity Area (CBA) One in terms of the Northern Cape CBA map as illustrated in the map below. The CBA is associated with the "Welgevondenspruit" that is also classified as a National Freshwater Ecosystem Priority Areas (NFEPA) as discussed in the following section. As per the below project layout, it is not anticipated that the development will have a direct impact on the CBA except for a small section of the proposed Kapstevel WRD.

Critical Biodiversity Areas (CBAs) are areas required to meet biodiversity targets for ecosystems, species, and ecological processes.

CBA1 are areas in which ecosystems and species remain fully intact and undisturbed. These are areas with high irreplaceability or have low flexibility in terms of meeting biodiversity pattern targets.

CBA2 are near-natural landscapes where ecosystems and species are largely intact and undisturbed. These are areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets.

Ecological Support Areas (ESAs) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. CBAs and ESAs may be terrestrial or aquatic.

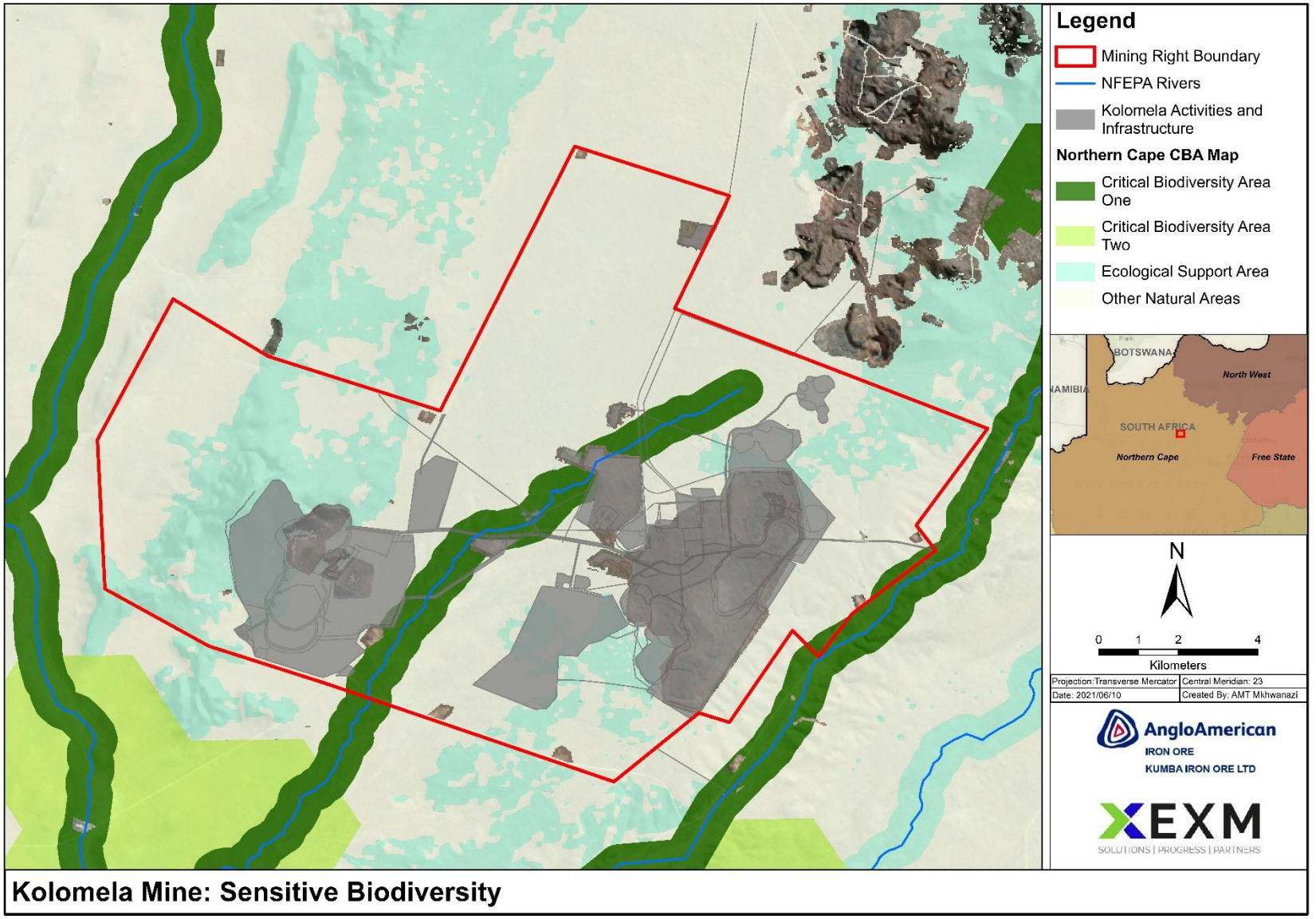


FIGURE 11-10: CRITICAL BIODIVERSITY AREAS ASSOCIATED WITH KOLOMELA

11.7.4 Sensitive areas within Kolomela and associated species

Several sensitive areas have been identified on Kolomela in terms of the characteristic of the biodiversity in the area. The information in this section is an abstract obtained from the reports on the vegetation diversity assessment that forms part of the Kolomela biomonitoring programme. The sensitive areas are illustrated in Figure 11-11 below and described the following sections.

11.7.4.1 Nananthus community

All plant species belonging to the mesem-family (vygies), as well as all Anacampseros species (Hasiekos, family Portulacaceae), are protected in the Northern Cape. The typical habitat of Nananthus aloides (vygie) quite often houses Hasiekos species as well. The Nanathus community is situated on the calcrete banks between the Groenwaterspruit and the floodplain.

11.7.4.2 Boophone disticha – Mesem community

This community, situated in the south-western corner of Leeuwfontein, has the highest concentration and diversity of protected plants of all plant communities. This is the only community in which Bushman poison bulb (Boophone disticha) was observed. Boophone disticha is a medicinal plant and under severe threat in other parts of the country. Three vygie species of the family Mesembryanthemaceae, namely Prepodesma orpenii, Ruschia calcarea and a Trichodiadema species were observed. Nerine laticoma is also present in this plant community.

11.7.4.3 Lithops aucampiae subsp. aucampiae community

Lithops aucampiae subsp. aucampiae, a very rare mesem species that is endemic to the Ghaap Plateau, occurs in the Dwarf Karroid Shrubland east of Kapstevel. The habitat is characterised by extremely shallow soil and exposed limestone outcrops and no cover from shrubs or trees, which creates an extremely very harsh micro-environment (Cole 1988). Titanopsis calcarea, also a protected mesem, occurs in this area as well.

11.7.4.4 Euphorbia wilmaniae and Prepodesma orpenii

A number of scarce and protected species were observed and collected on the calcrete bank at Ploegfontein and along the bank of the Groenwaterspruit west of the Witsand road. This area is part of the Wild Olive Woodland. The succulent *Euphorbia wilmaniae* is endemic to the Ghaap Plateau. *Prepodema orpenii* (mesem) is a protected species endemic to the Northern Cape and *Avonia papyracea* is a protected spesies.

11.7.4.5 Pachypodium succulentum

One of the biggest and densest populations of *Pachypodium succulentum* (Dikvoet) at Kolomela occurs on the quartzite outcrop just north of the old Witsand road, south of the existing Kapstevel pit. The outcrop continues across the road towards the south. The latter area is disturbed and, although not in the same pristine state as the population north of the road, there is also a fairly large population of Dikvoet individuals on this part of the outcrop.

11.7.4.6 Nerine community

Nerine laticoma (Vleilelie) is a common geophytic species and is often associated with areas that are seasonally waterlogged. They are common around the pans. A very dense population occurs on the calcrete banks along the Groenwaterspruit. Although *Nerine laticoma* is a protected species in the Northern Cape, it can easily be relocated as part of rehabilitation activities.

11.7.4.7 Groenwaterspruit community

This community consists primarily of sedges associated with wet conditions, but not with open water, such as *Scirpus* and *Juncus* species. The river forms a well-defined channel at Kappies Kareeboom with a clear floodplain. This community is well managed at Kappies Kareeboom and almost no *Prosopis glandulosa* individuals were noted in the riverbed. At Leeuwfontein it is dominated by sedges (*Juncus, Schoenoplectus* and *Scirpus* species).

There is virtually no riparian vegetation except for the bush clumps on the western bank of the Groenwaterspruit. Except for a few isolated bush clumps on the edge of the floodplain, the eastern bank is dominated by *Senegalia mellifera* (Swarthaak).

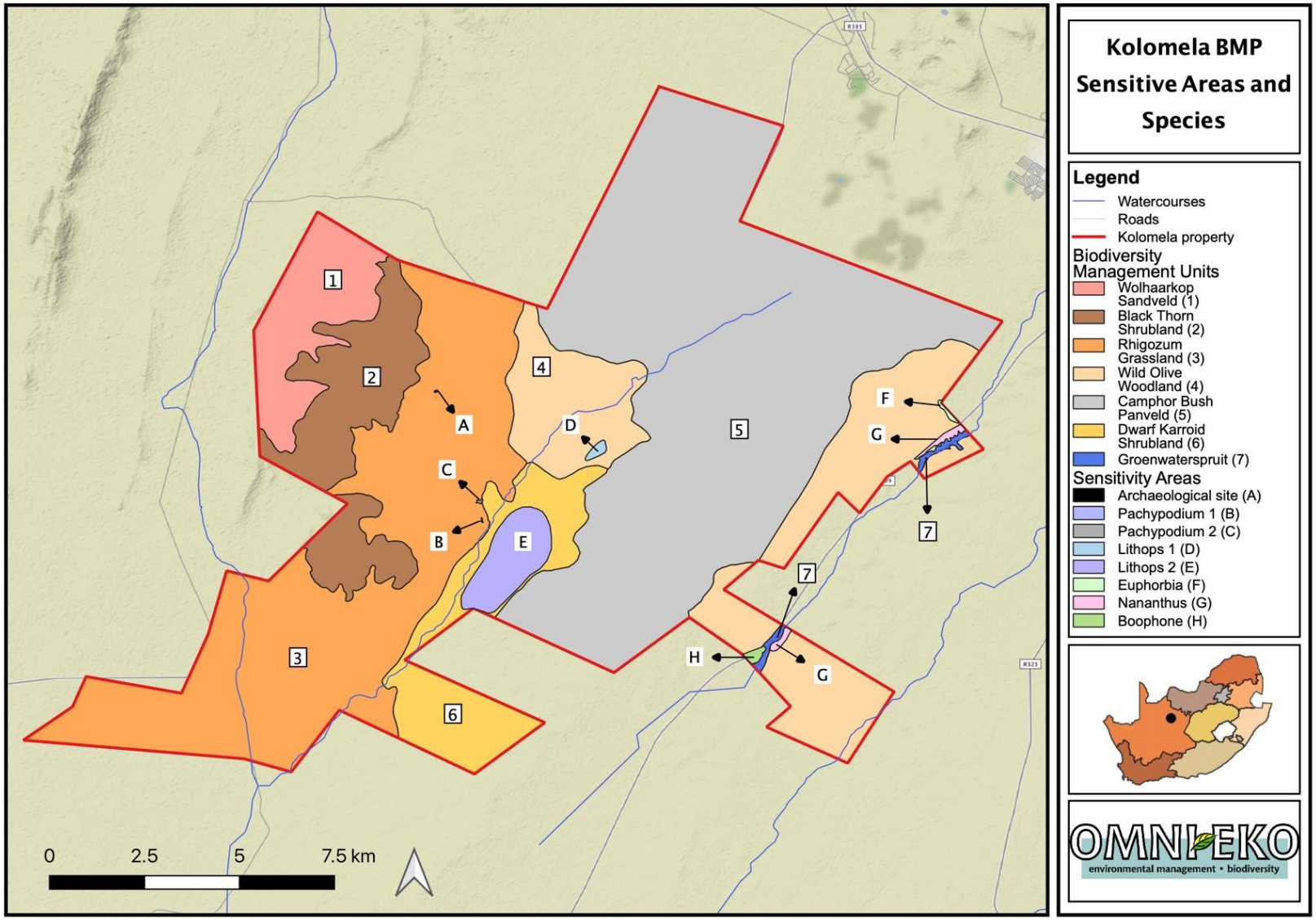


FIGURE 11-11: SENSITIVE AREAS ASSOCIATED WITH SIOC OWNED PROPERTIES

11.8 Hydrology

Kolomela is located in Quaternary catchment D73A of the Orange River Primary Drainage Region. The hydrology of Kolomela is illustrated in Figure 11-12. The general area is considered flat, with a few ephemeral rivers traversing the mining boundary. The main stream in the vicinity of the mine are the Groenwaterspruit which flows along the eastern boundary of the mine. Tributaries of the Soutloop River flow from the north east to south western sections of the mining area which is referred to as the "Welgevondenspruit". A tributary of the Soutloop River also flows from north to south through the Farms Floradale.

According to SAS (2015), the Groenwaterspruit River and the tributaries of the Soutloop River are ephemeral systems classified as a Resilient and fall into Class B (largely natural) rivers.

TABLE 11-6: SUMMARY OF THE ECOLOGICAL STATUS OF QUATERNARY CATCHMENT D73A BASED ON KLEYNHANS

Catchment	Resource	EIS	PESC	DEMC
D73A	Endorheic - Postmasburg	Low/Marginal	Class B	D: Resilient System

The Groenwaterspruit River, the Soutloop River and its tributaries including the "Welgevondenspruit" are classified as NFEPAs. River NFEPAs have been defined in order to achieve biodiversity targets for river ecosystems and were identified in rivers that are currently in a good condition (A or B ecological category). Their NFEPA status indicates that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources.

There are also many runoff flow paths in the flat environment that act as water courses during rainfall events, directing water to a number of pans in the immediate area. The functionality of a pan is typically driven by a combination of surface water and groundwater inflows. The extent to which its functionality is driven by either surface water or ground water is dependent on the proportion of each that it receives on an annual and a seasonal basis. Hardpan calcrete underlies the entire site. With the exception of the gravel layers within the calcrete the hardpan calcrete is considered to have a very low permeability. As a result a very shallow, perched aquifer may be present on top of the hardpan calcrete. Due to the very shallow depths this aquifer is expected to only contain water after rain events. As a result the pans are also solely sustained by surface water (Jones & Wagener, 2015).

11.9 Wetlands

Scientific Aquatic Services (2015) has undertaken a specialist Wetland Assessment for Kolomela mine. An updated study will be undertaken to assess the impacts associated with the proposed expansion activities. The following information provides a summary of the findings in terms of the baseline wetland environment.

Two wetland types were identified within Kolomela, namely Valley Bottom Wetlands and Wetland Pans (see Figure 11-12). Terrestrial Pans and Drainage Lines also occur but are not classified as wetlands (see SAS, 2015).

TABLE 11-7: WETLANDS ASSOCIATED WITH KOLOMELA

Valley Bottom Wetland	Wetland Pan
	

11.9.1 Valley Bottom Wetlands

Valley Bottom Wetlands have been identified within the Groenwaterspruit River, one tributary of the Groenwaterspruit River that flows through the eastern portion of the study area and the western tributary of the Soutloop River located on the farm Floradale 230 in the area identified for aquifer recharging. The lack of flowing water within the Valley Bottom Wetland features decreases the importance in terms of stream flow regulation, flood attenuation and water supply. However, the systems are considered to be of some importance in terms of sediment trapping due to the sandy nature of soil with evidence of erosion in some areas.

According to SAS, the Valley Bottom Wetlands fall within Category A/B in terms of the Present Ecological Status (PES) i.e. largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.

11.9.2 Wetland Pans

Wetland Pans show characteristics of a wetland temporary zone in which soil is saturated for a short period of the year, but are saturated for a sufficient period, under normal circumstances, to allow for the formation of hydromorphic soils and the growth of wetland vegetation. These pans are considered to be of increased Ecological Importance and Sensitivity for aquatic and terrestrial species which rely on these systems for parts of their life cycles.

Many of the terrestrial pans identified were small and the associated endorheic catchments

of the systems very small. As such these systems do not collect sufficient volumes of water to support wetland conditions. When soils were assessed in these areas it was also observed that the soils contained less moisture than soils within the wetland pans further supporting the observations that soils in the Terrestrial Pans do not retain high levels of moisture for sufficient periods of time to support facultative or obligate wetland vegetation or to lead to the formation of hydromorphic soils. Terrestrial Pans are however considered to be of some importance in terms of biodiversity maintenance.

The study area is located approximately 7 km from the nearest town and due to the low grazing value of vegetation; farms tend to extend over much larger areas when compared to other regions used for grazing within South Africa. Both these aspects have resulted in minimal impact on most of the Wetland Pans due to anthropogenic activities such as water quality modification, roads and pipelines traversing wetlands, developments, surface runoff as well as trampling and overgrazing of wetlands by livestock. As a result SAS (2015) suggest that the Wetland Pans fall into Category A (unmodified, natural) in terms of the Present Ecological Status (PES).

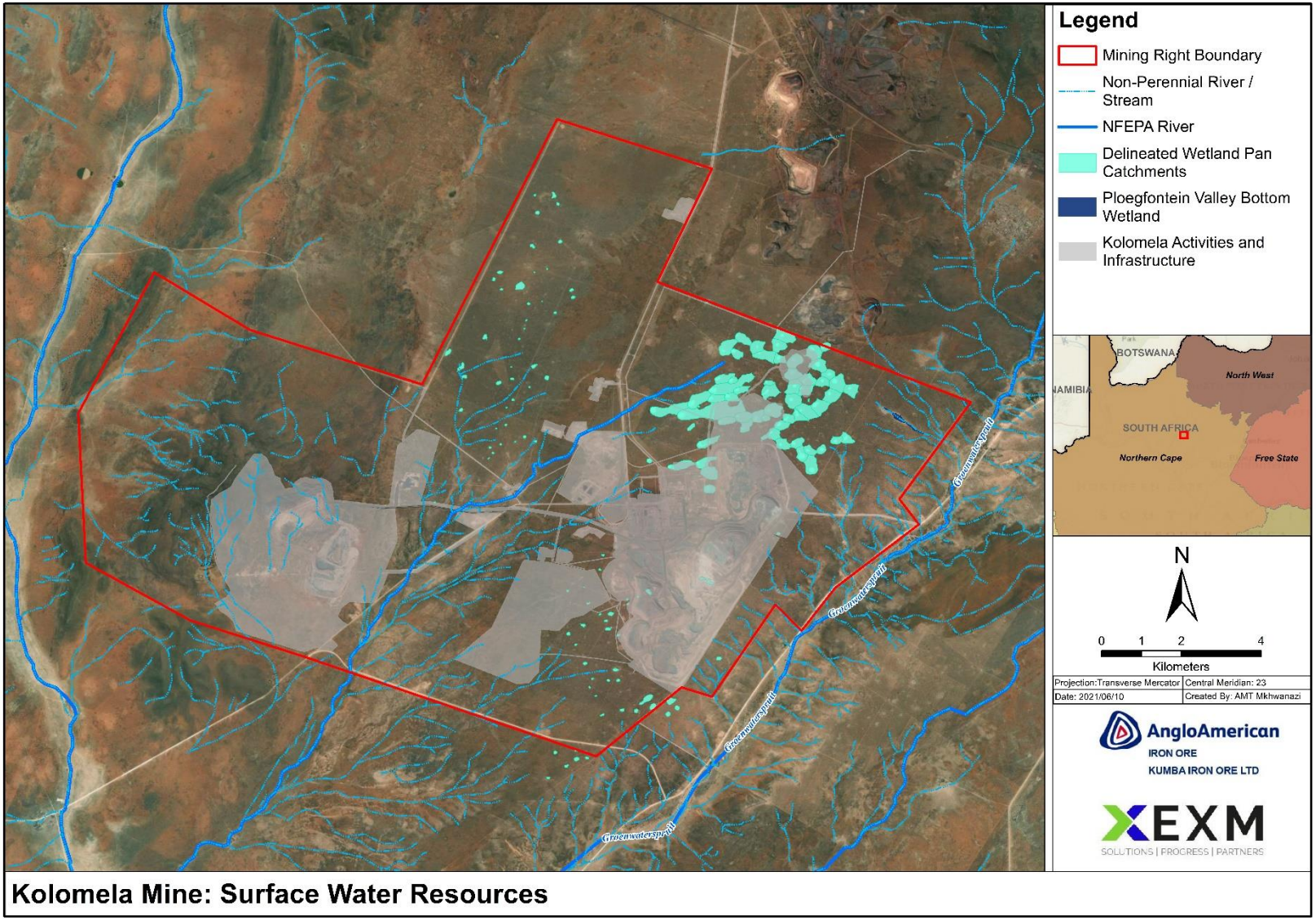


FIGURE 11-12: SURFACE WATER RESOURCES ASSOCIATED WITH THE STUDY AREA

11.10 Geology

The local geology associated with Kolomela is illustrated in Figure 11-13. The Transvaal Supergroup lithologies have been deposited on a basement of Archaean granite gneisses and greenstones, and/or lavas of the Ventersdorp Supergroup. In the Kolomela – Postmasburg region, the oldest rocks of the Transvaal Supergroup form a carbonate platform sequence (i.e., dolomites with minor limestone, chert and shale) known as the Campbell Rand Subgroup. The upper part of the Transvaal Supergroup comprises a banded iron formation unit (i.e. the Asbestos Hills Subgroup), which has been conformably deposited on the carbonates. The upper portion of the banded iron formations has in places, been supergene-enriched to ore grade. The iron ore / banded iron formation zone is often referred to as the Kuruman Formation. The ores found within this formation comprise the bulk of the higher-grade iron ores in the region.

Iron ore at the Kolomela deposit is preserved in chemical and clastic sediments of the Proterozoic Transvaal Supergroup. These sediments define the western margin of the Kaapvaal Craton in the Northern Cape Province. The stratigraphy has been deformed by thrusting from the west and has also undergone extensive karstification. The thrusting has produced a series of open, north to south plunging, anticlines, synclines and grabens. Karstification has been responsible for the development of deep sinkholes. The iron ore at Kolomela has been preserved from erosion, within these geological structures.

FIGURE 11-13: GEOLOGY MAP

11.11 Groundwater

11.11.1 Aquifers

The geohydrological regime in the study area is made up of two main aquifer systems. The first, the upper, unconfined to semi-confined aquifer occurs in the calcrete that cover most of the surface area of Kolomela. The aquifer is usually developed on the contact between the calcrete and underlying clay formations of Kalahari age or in localised pebble horizons within the calcrete. Although relative low yields occur in this aquifer, it is developed widely throughout most of the region and has been the sole reliable source of water supply to most of the farms in the area for more than a century. Yields of up to 2 litres per second occur in this aquifer with shallow water table and spring formation common in especially the lower-lying topography.

The second aquifer is associated with fractures, fissures, joints and other discontinuities within the consolidated bedrock and associated intrusive of the Transvaal/Griqualand West Sequences. The aquifer occurs at depths from 40 to more than 200 meters below surface in the area. It is semiconfined and has greatly varying yields that are directly associated with the geology and geological structure. Yields of the aquifer are as high as 40 litres per second in mainly the chert breccia and banded iron formation and iron ore formations. Contrary to general beliefs, the dolomite in the mining area is not a significant groundwater yielding area and yields of no more than 2 to 4 litres per second have been recorded in dolomite formations during the exploration drilling program. The dolomite is however considered to have good storage properties for groundwater.

In the Postmasburg area, static groundwater levels vary from zero meters (springs flowing out at surface), usually in the topographically lower lying areas, to a maximum of approximately 75 meters below surface to the north-east of Postmasburg. In the mining area, static groundwater levels vary from 35 m below surface in the Welgevonden area, about 12 m on Ploegfontein, 8 m on Leeuwfontein and 5 m on Klipbankfontein, which is the lowest lying area. Groundwater moves in secondary, fractured rock aquifers which occur over the entire area, with groundwater moving through the fissures and fractures within the geology. This means that static groundwater levels can vary significantly, even on a localised scale, depending at what depth a fissure or fracture is intersected by a borehole. The overall transmissivity of the chert breccia and the banded iron formation is very high, meaning that high groundwater flow rates occur.

The natural groundwater flow direction generally mimics surface topography, with groundwater moving in a south-south-easterly direction. Both the abstraction of groundwater for irrigation within the Groenwaterspruit valley and the mine dewatering taking place at the

Beeshoek mine to the north of the site affect the natural groundwater flow direction significantly.

The effective recharge to the aquifer is considered to be as high as 10% of rainfall and even higher in certain areas. A significant part of surface precipitation infiltrates through cracks, fissures and weathered zones in the calcrete surface cover or through the permeable sand that has gathered in surface depressions. Once infiltration from the open surface has taken place, evaporation losses are minimised and only limited transpiration losses occur. The surface area covered by the groundwater zone is approximately 350 km2. If a conservative recharge estimate of 4% of MAP is assumed, the annual aquifer recharge to the maximum affected groundwater zone is in the order of 5 300 000 m^3/y.

11.11.2 Groundwater abstraction

Kolomela conducts dewatering of groundwater from numerous boreholes to allow for the continuation of mining activities. A portion is used for operational purposes. The remaining portion is provided to the Vaal-Gamagara Water Scheme. However, the water abstracted exceeds the water requirements of the Water Scheme and has to be managed to prevent discharge into the environment. Kolomela is authorised to artificially recharge the remaining portion of the water into an aquifer associated with the Groenwaterspruit catchment.

The average dewatering rate for 2018 through 2020 was 1,351 cubic meters per hour (m^3/hr) for Leeuwfontein and 267 m^3/hr for Kapstevel North and Kapstevel South. The maximum current total dewatering rate over the life of the mine is predicted to be 1,300 m^3/hr for Leeuwfontein and Klipbankfontein and 750 m^3/hr for Kapstevel North and Kapstevel South. Kolomela abstracted 13 393 575 m^3 groundwater in 2020 of which 8 703 343 m^3 was supplied to the Vaal-Gamagara Water Scheme and 4 800 119 m^3 was artificially discharged into the aquifer.

The dewatering operation at Kolomela (and Beeshoek) is conducted at a higher rate than the aquifer recharge, which has an effect on the aquifer(s) in the area. The area influenced by the abstraction and associated water level decline/impact is referred to as the cone of depression. The depth and extent of the cone of depression is determined by the type, geometry and hydraulic properties of the aquifer. A Geohydrological Impact Assessment will be conducted as part of this application to determine the extent of the cone of depression over the Kolomela LOM and assess impacts (if any) on water users in the area.

The main aquifer of the area is a secondary fractured rock system with a high heterogeneity that is very much structurally (geologically) controlled. In the secondary, fractured rock aquifers, flow occurs by preference through open, transmissive fractures among the solid rock matrix. The major structures in the Kolomela area trends roughly north-south and follows the

trend of the Maremane dome (anticline). The distribution of transmissivity values together with the structural trends on which the values are based are indicated in Figure 11-14 below:

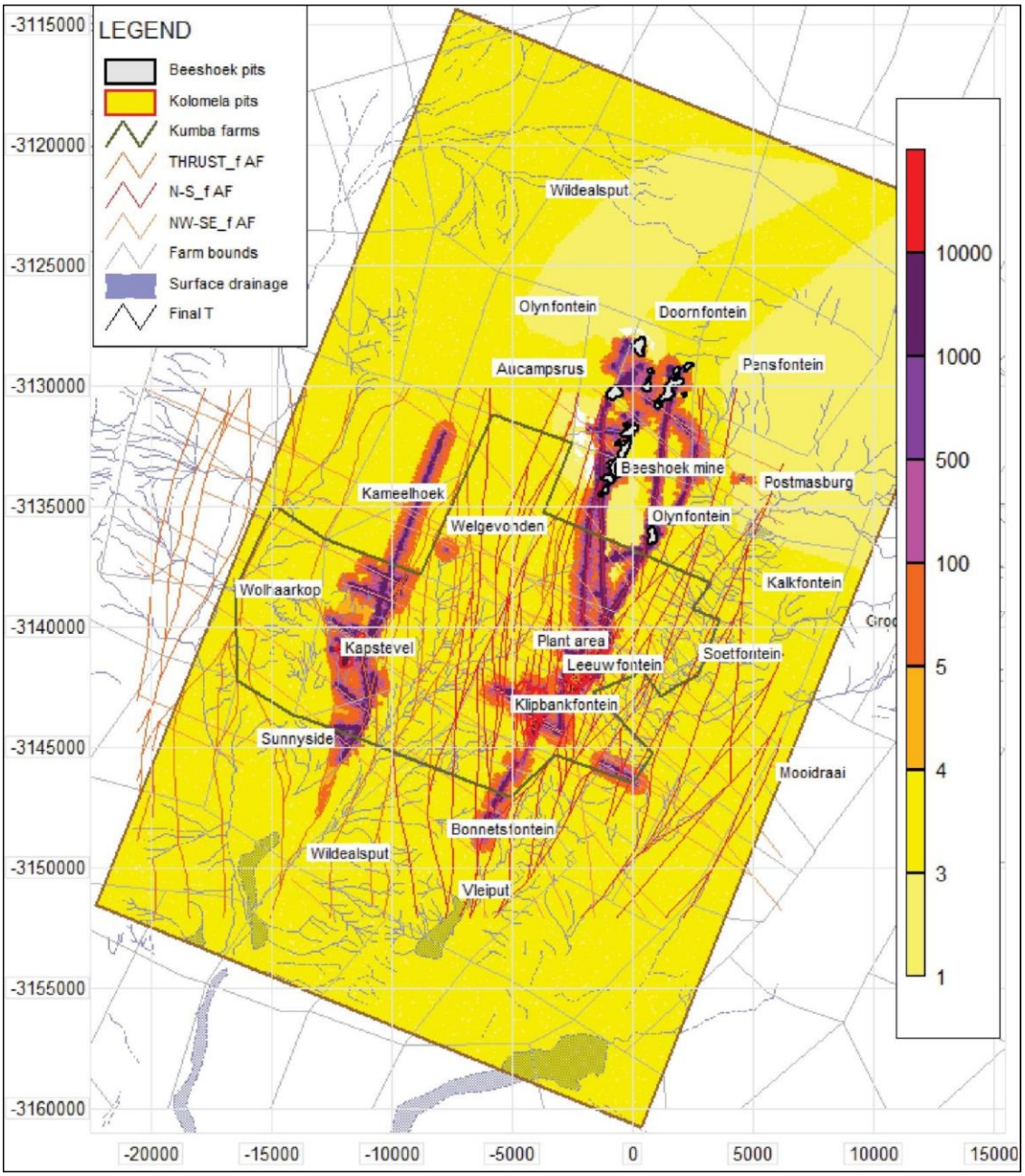
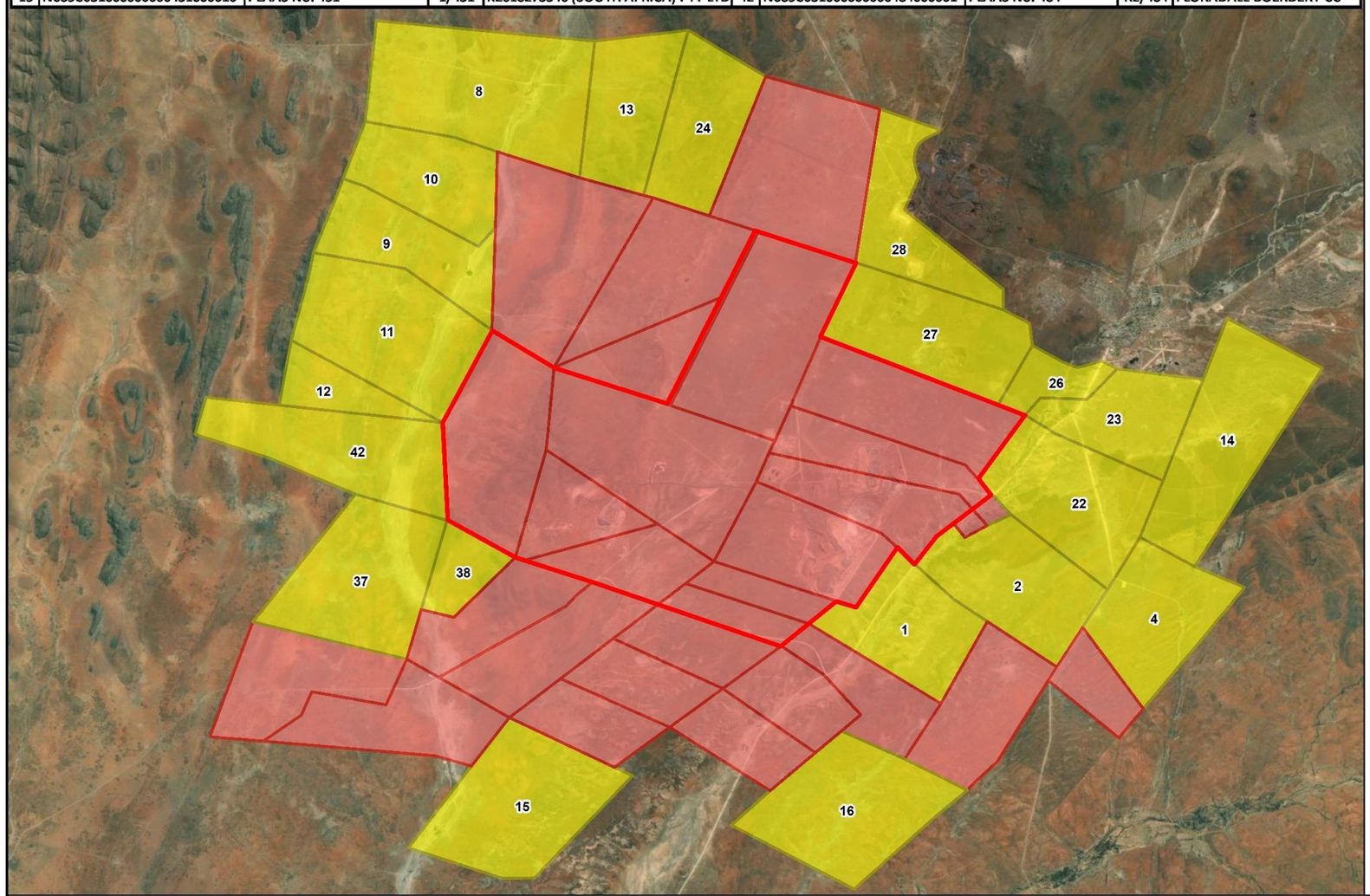


FIGURE 11-14:

11.12 Land Tenure

The Figure below shows the properties associated with the Kolomela mining right as well as the surrounding properties.

FID	SG Code	Farm Name	Portion	Owner	FID	SG Code	Farm Name	Portion	Owner
1	N085C03100000000607000000	KLIP BANK FONTEIN No. 489	607	Mev Baby Bredenkamp	16	N085C03100000000544000001	PLAAS No. 544	RE/544	HENQUE 4362 CC
2	N085C03100000000490000001	KAMEEL FONTEIN No. 490	RE/490	Johan van Zyl	19	N085C03100000000061000001	GRAS VLAKTE No. 61	RE/61	TJAART JOHANNES SNYMAN
3	N085C03100000000606000000	SOETFONTEIN No. 606	606	VILJOEN FAMILIE TRUST	23	N085C03100000000474000001	KALKFONTEIN No. 474	RE/474	Dries van der Walt
4	N085C03100000000538000001	PLAAS No. 538	RE/538	JOHANNES C. VAN DER MERWE	24	N085C03100000000431000001	PLAAS No. 431	RE/431	ISEBEL MARITZA VAN WYK
8	N085C03100000000402000001	LUCAS DAM No. 402	RE/402	LUCASDAM BOERDERY PTY LTD	26	N085C03100000000475000020	OLYNFONTEIN No. 475	2/475	Charl Viljoen
9	N085C03100000000479000001	PLAAS No. 479	RE/479	BENJAMIN PHILIPPUS BREDENKAMP	27	N085C03100000000475000040	OLYNFONTEIN No. 475	4/475	ASSMANG PTY LTD
10	N085C03100000000479000010	PLAAS No. 479	1/479	BENJAMIN PHILIPPUS BREDENKAMP	28	N085C03100000000448000001	BEESTHOEK No. 448	RE/448	ASSMANG PTY LTD
11	N085C03100000000480000001	PLAAS No. 480	RE/480	RPB ANERI TRUST	37	N085C03100000000230000001	PLAAS No. 230	RE/230	FLORADALE BOERDERY CC
12	N085C03100000000483000001	PLAAS No. 483	RE/483	RPB ANERI TRUST	38	N085C03100000000542000010	PLAAS No. 542	1/542	FLORADALE BOERDERY CC
13	N085C03100000000431000010	PLAAS No. 431	1/431	K2018273546 (SOUTH AFRICA) PTY LTD	42	N085C03100000000484000001	PLAAS No. 484	RE/484	FLORADALE BOERDERY CC



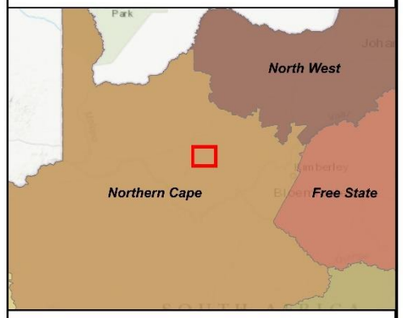
Legend

Mining Right Boundary

Land Tenure

Other Properties

SIOC Owned Properties



N

0 2 4 8

Kilometers

Projection:Transverse Mercator	Central Meridian: 23
Date: 2021/04/26	Created By: AMT Mkhwanazi

AngloAmerican
IRON ORE
KUMBA IRON ORE LTD

EXM
SOLUTIONS | PROGRESS | PARTNERS

Kolomela Expansion: Land Tenure

FIGURE 11-15: LAND OWNERSHIP

11.13 Cultural Heritage

The heritage resources associated with Kolomela have been identified and evaluated in various specialist studies previously undertaken. Current and future activities at the mine has the potential to cause impacts on heritage resources. A heritage sensitivity map as illustrated in Figure 11-16 has been generated and incorporates the findings of the studies. The map has been generated to facilitate a practical yet risk-cautious management guideline in terms of heritage sensitivity at specific areas on site. An updated Heritage Impact Assessment will be undertaken in support of the application to assess potential heritage impacts associated with the expansion activities.

FIGURE 11-16: HERITAGE SENSITIVITY MAP

Table 11-9 contains a summary of the heritage resources that have been assessed for Kolomela. Numerous other sites have been identified, but are not located in close proximity to the mining activities that may cause impacts.

TABLE 11-8: HERITAGE RESOURCES ASSESSED FOR KOLOMELA MINE

Source: Kolomela Heritage Resources Management Plan 2020

Site	Description	Significance
KOL 1 Shallow pan	Represents a number of shallow pans located on the farms Leeuwfontein and Ploegfontein. These pans are all roughly 100 to 200 m in diameter. The stone artefacts are mainly of Middle Stone Age typology.	A **Low-Medium Significance** has been assigned to this site in view of the relative densities of the lithics.
KOL 2 Stone Age Site	KOL 2 is a Stone Age site on the Remainder of the farm Kapstevel. The site comprises a scatter of possibly LSA artefacts observed on a colluvial fan in one of the valleys.	Morris did not provide an assessment of significance of this site. Van der Ryst (2011) provided a general significance assessment for the low-density or isolated occurrences of stone tools on the plains. The areas were assessed to be of **Low Significance.**
KOL 3 Historic Mine	The open-mine workings of haematite consist of a narrow trench with two stopes on the highest section. It has been estimated that 3 000 to 4 000 tons of haematite ore could have been removed. The backfilling of the excavation obscures details such as possible tunnels (van der Ryst, 2011).	The site is of **High Significance**. The mine is an important feature that documents the history of mining and ore extraction within the study area as well as within the broader region.
KOL 4.1 Farmyard	The farmyard comprises a main dwelling, a wagon shed, kitchen with bakery extension, a school, a power generation shed, a cold room and various early 20th century farming tools. The original dwelling, barn and outer kitchen were built at the beginning of the 20th century. During the 1920s the main house was extended and it would appear that the	As it comprises structures older than 60 years, **the farmyard enjoys general protection under the provision of Section 34 (1) of the NHRA**. Furthermore, sections of the farmyard are also believed to be older than 100 years and as a result these buildings are defined as archaeological sites and as such are protected by Section 35 (4).

Site	Description	Significance
	school was added at this time.	
KOL 4.2 Cemetery	A cemetery of the Bredenkamp family is located roughly 160 m east of the farmyard. The graves are divided into parallel rows and are all covered by formal dressings and all have inscribed headstones. The cemetery comprises the graves of 12 members of the Bredenkamp family. One of the oldest graves in the cemetery dates to 1893.	All graves are automatically assigned a **High Significance** as they are protected by general legislation regarding human remains, as well as the National Heritage Resources Act. This High significance is emphasised by the fact that the cemetery is associated with the historical owners of the farm as well as the fact that graves inherently have high levels of emotional, historic, religious and scientific value.
KOL 4.3 Valley dams	The main landscape features associated with the farmyard are situated to the north-east of the dwelling and comprise two generations of valley dams that are typical of water storage in this region, together with associated irrigation fields.	The significance of these features is related to the fact that they form part of a larger overall farmstead complex, the individual components of which have been retained from the nineteenth century to the present day. The significance is assessed as being **Medium-High**.
KOL 4.4 Cemetery	A cemetery which can be associated with nearby farm worker accommodation was identified south-east of the farmyard. It consists of approximately 30 graves.	All graves are automatically assigned a **High significance** as they are protected by general legislation regarding human remains, as well as the National Heritage Resources Act.
KOL 5-8	KOL 5-8 represent cluster pans identified 2011. Most of these pans have been impacted by mining activities or will be impacted by authorised expansions	These pans can be assumed to have similar significance to that noted by both Morris (2005) and van der Ryst (2011) for the pans that were investigated during the fieldwork for their respective reports. All of these pan localities are assigned a **Low to Medium Significance.**

11.14 Palaeontology

An update Palaeontological Impact Assessment (PIA) was undertaken for the entire Kolomela in 2019. According to Butler (2019), the Kolomela mine is situated in the Griqualand West Basin and is largely underlain by the Cretaceous to Tertiary Kalahari Group as well as surface limestone and alluvium. The Vaalian age Ghaap Group, Koegas Subgroup, Postmasburg and Olifantshoek Groups (Transvaal Supergroup) are also represented in the northern and western areas in the development fohotprint. Dolomite deposits of the Ghaap Group are associated with café breccias (Butler, 2019).

A very high palaeontological sensitivity has been allocated to the Ghaap Group, while important early Hominin remains could also occur in carbonaceous breccias. The highly sensitive dolomites are overlain by surface limestones, which are known to contain important Quaternary plant and animal fossils. Sediments of the Ghaap Group are known for the presence of stromatolites. A Moderate Palaeontological Sensitivity has been allocated to sediments of the Koegas Subgroup, Postmasburg, Olifantshoek and Kalahari Groups, as well as the alluvium deposits (Groenewald et al, 2014).

A site visit conducted as part of the PIA (Butler, 2019) revealed no visible evidence of fossiliferous outcrops was found. For this reason, an overall low palaeontological sensitivity is

allocated to Kolomela.

11.15 Socio-Economic Environment

Kolomela mine is located in the Tsantsabane Local Municipality within the ZF Mgcawu District Municipality. According to Naude (2020), mining and agriculture have been coexisting in the Tsantsabane area for many years as the main economic sectors, although mining has become more prominent in recent years. The Kolomela and Beeshoek Iron Ore mines are the most prominent mines in the immediate area. Some of the smaller, newer mines close to Postmasburg have also recently been developed.

The energy sector is becoming more prominent with at least three major green energy projects being established in the Tsantsabane municipal area – Redstone Solar Thermal Power, Jasper Solar Energy and Lesedi Solar Park.

The nearest large business centre is Kimberley, approximately 200 km away, but with a number of newly built shopping centres in Kathu, Tsantsabane residents do most of their business in Kathu which is 92 km away. Many persons working in Postmasburg also have chosen to reside in Kathu and commute to Postmasburg. This is motivated by better recreational opportunities and access to retail outlets, restaurants, health care and schools Kathu.

11.15.1 Public Services and Infrastructure

There is distinct lack of facilities and amenities in Tsantsabane (for sport, recreation, leisure, healthcare) which results in residents having to frequently travel to other towns and cities in the region. Access to basic services in Tsantsabane has improved gradually since 2001. However, between 2014 and 2019 there was a drop in the percentage of households with access to the services displayed below. The lower number can be attributed to a sharp increase in informal settlements (as explained earlier), as well as service delivery pressures on the Tsantsabane Local Municipality.

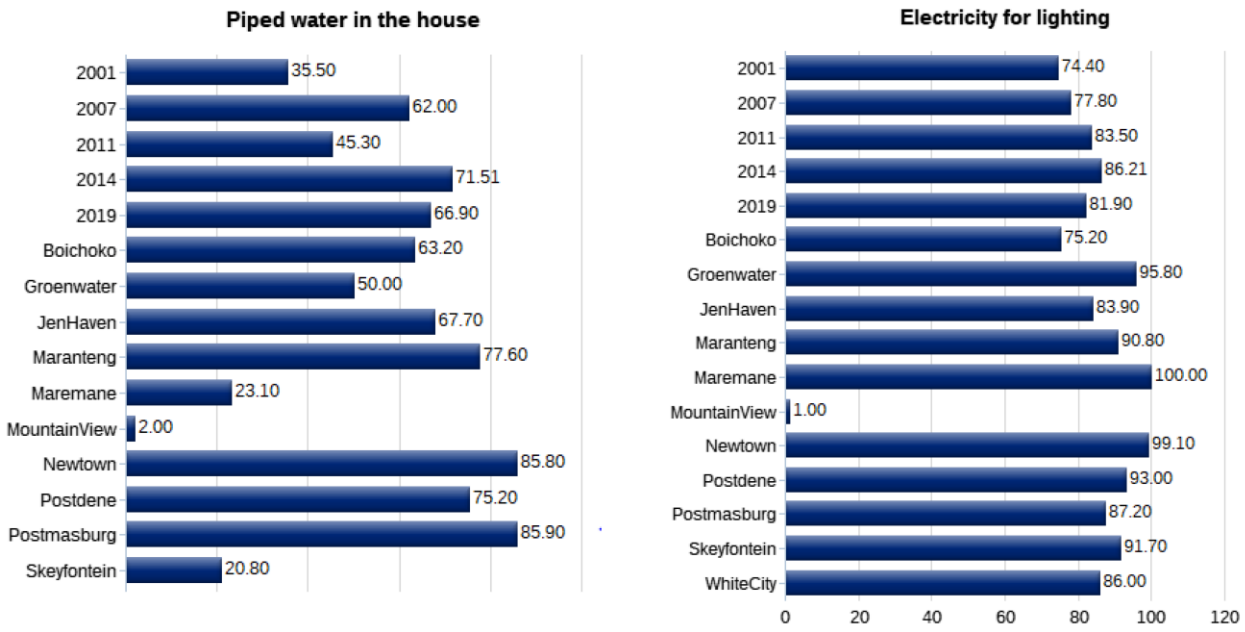


FIGURE 11-17: PIPED WATER IN HOUSES AND ELECTRICITY FOR LIGHTING PER AREA

11.15.2 Access to basic services

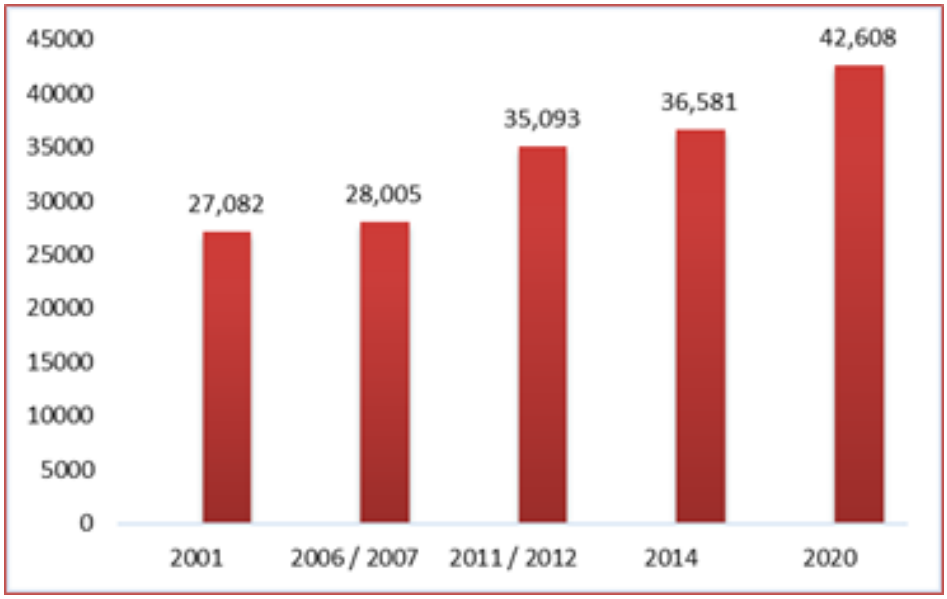
Access to basic services in Tsantsabane has improved gradually since 2001. However, between 2014 and 2019 there was a drop in the percentage of households with access to the services. The lower number can be attributed to a sharp increase in informal settlements, as well as service delivery pressures on the Tsantsabane Local Municipality. Rural areas such as Groenwater, Maremane, Skeyfontein and Jen Haven do not have access to proper refuse removal services many households do not have access to proper sanitation.

Infrastructure in Tsantsabane is in a poor condition. Tar roads are full of potholes and gravel roads are not being maintained. Bulk infrastructure is old and not able to endure the pressure of a rapidly increasing population. Water and electricity interruptions happen frequently.

11.15.3 Population and demographics

The population in the Tsantsabane municipal area has increased significantly since 2001. The population estimate for 2020 according to Stats SA, is 57% higher than in 2001. The population increase can be attributed to the increased economic activity due to mining development.

Even though Kolomela mine's presence is not the only contributing factor to population growth, the mine is generally viewed as the biggest "pull factor" for job seekers. Almost three quarters of participants in the 2019 community baseline survey (73%) indicated that Kolomela mine is seen as a key reason for rapid population growth in Tsantsabane. Any project undertaken by Kolomela mine will result in community expectations of employment by the growing population. There is also the increased potential for site-induced migration.

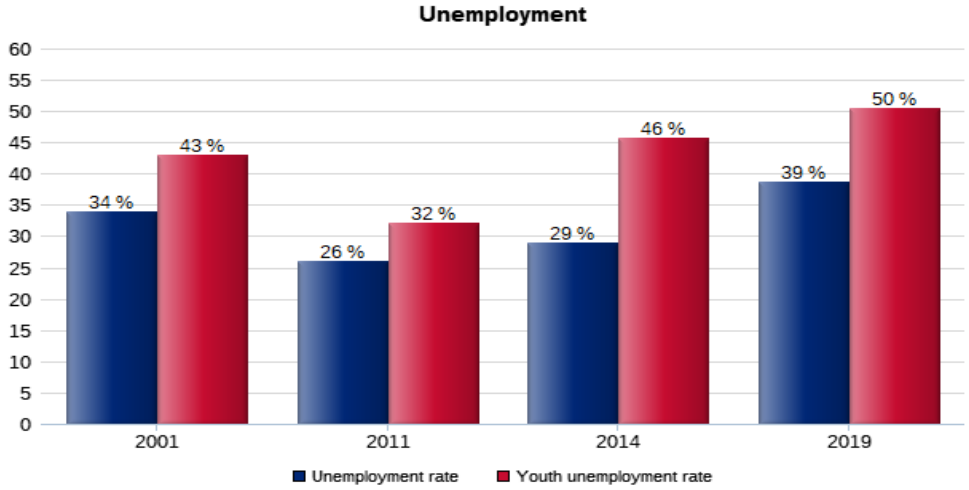


(Source: Social Impact Assessment (Naude, 2020))

FIGURE 11-18: TSANTSABANE POPULATION GROWTH

11.15.4Unemployment

The employment rate for adults is low, with only 33% employed full-time, 16% part-time and 2% self-employed, bringing the employment rate to 51%. The unemployment rate is at 39%, which is significantly higher than the national average of 29%. Low education and skills levels among adults described earlier, contribute to a low employment rate for the area.



(Source: Social Impact Assessment (Naude, 2020))

FIGURE 11-19 COMPARISION OF UNEMPLOYMENT OVER TIME FOR ADULTS AND YOUTH IN TSANTSABANE

The unemployment rate declined between 2001 and 2011, with the arrival of Kolomela mine. But from 2014 the unemployment rate started to rise again, as a result of an influx of job seekers to the area and with the construction of the mine coming to an end in 2012. Youth unemployment (adults of 35 years old or younger) showed the same trend, but at much higher rates. The youth unemployment rate was at 50% in 2019, a very concerning statistic, especially given the low number of learners who passed Grade 12 at one of the high schools and the lack of post-school training among the youth. The national youth unemployment rate was at an all- time high in the third quarter of 2019, at 58.2% - which provides some perspective on the unemployment rate among the Tsantsabane youth.

11.15.5 Education and skills

Education and skills levels in Tsantsabane is low. Only 53% of the Tsantsabane adult population have passed Grade 12. A skills audit was conducted in the community in 2020. Approximately two-thirds of skills audit participants (65%) have some form of post-school training or education – in most instances on the job training (60% of all participants who have undergone training or education). The high percentage of job seekers with on the job training is in stark contrast with the small percentage who have university or university of technology qualifications – only 3%. Most participants received training or were educated in the skills category for mining, engineering and construction skills (49%).

11.16 Description of current land uses

11.16.1 Land use within mining right area

Table 11-10 contains the current and future land use activities conducted on the properties within the Kolomela mining right area for which authorization has been obtained.

TABLE 11-9: LAND USE WITHIN KOLOMELA MINING RIGHT

Property	Owner	Current Land Use
Mining Right Area		
Ploegfontein 487	SIOC	Livestock Farming, Game Farming, Dewatering Pipeline, Railway, Access Road, Power Line (supplying Kolomela), Prospecting Laydown Area, Prospecting.
Rem Leeuwfontein 488	SIOC	Leeuwfontein Pit, Tierbult DMS Plant, Leeuwfontein North Waste Rock Dump, Haul Roads, Access Road, Dewatering Pipeline, Power Line, Railway Line, Stormwater Management Infrastructure, Groenwaterspruit Aquifer Recharge, Game Farming.
Strydfontein 614	SIOC	Leeuwfontein Pit, Leeuwfontein North WRD, DSO Processing Plant, Workshops, Offices, Parking, Fuel Storage, Product Stockpile Area, Pollution Control Dams, Water Supply Dams, Construction Village, Sewage Treatment Works, Bioremediation Facility, Waste Disposal Site, Waste Storage Site, Slimes Dam, Borrow Pits, Haul Roads, Internal Roads, Stormwater Management Infrastructure,

Property	Owner	Current Land Use
		Game Farming.
Rem Klipbankfontein 489	SIOC	Klipbankfontein Pit. Leeuwfontein Pit, Leeuwfontein South WRD, Haul Roads, Klipbankfontein WRD, Prospecting, Stormwater Management Infrastructure, Excess Water Discharge, Game Farming.
Kapstevel 541	SIOC	Kapstevel Pit, Kapstevel WRD, Haul Roads, Stormwater Management Infrastructure, Prospecting, Livestock Farming, Game Farming, Residence (land manager), Access Roads.
Wolhaarkop 476	SIOC	Livestock Farming, Game Farming.
Welgevonden 486	SIOC	Explosives Magazine, Haul Roads, Kapstevel Pit, Borrow Pits, Game Farming.
Welgevonden 476	SIOC	Borrow Pits, Livestock Farming, Game Farming.

11.16.2 Land use on adjacent properties

Table 11-11 gives a description of land uses on each of the neighbouring properties. Surrounding Land Uses are also illustrated in Figure 11-20.

TABLE 11-10: LAND USE WITHIN KOLOMELA MINING RIGHT

Property	Local Name	Residences	Owner	Land Use
Olynfontein 475	Beeshoek Mine	none	Assmang	Iron Ore Mine
Olynfontein 475	Koeispeen	01	Me Malie Karsten	Livestock & Game Farming, Health Care Services (Netcare 911)
Olynfontein 475	Olienfontein	02	Charl Viljoen	Livestock & Game Farming
Kalkfontein 474	Kalkfontein	03	Dries van der Walt	Livestock & Game Farming
Soetfontein 491	Soetfontein	04 & 06	Albertus Viljoen	Livestock & Game Farming
Soetfontein 491	Soetfontein	05	Johan Viljoen	Bed and Breakfast, Livestock & Game Farming
Kameelfontein 490	Kameelfontein	07	Johan van Zyl	Livestock & Game Farming
Klipbankfontein 489	Klipbankfontein	08	Mev Baby Bredenkamp	Livestock & Game Farming
Unknown	Wag 'n Bietjie	09	Chris Bredenkamp	Livestock & Game Farming
Kappies Kareeboom 540	Kappies Kareeboom	10 & 11	SIOC	Groenwaterspruit Aquifer Recharge, Prospecting, Livestock & Game Farming

Property	Local Name	Residences	Owner	Land Use
Grootpan 543 RE	Vleiput	12	De Klerk Family	Regional Road 383, Prospecting, Livestock & Game Farming
Grootpan 543 Portion 1	Unknown	none		Prospecting. Livestock Farming
Grootpan 543 Portion 4	Witboom	13	De Klerk Family	Regional Road 383. Prospecting, Livestock Farming
Sunnyside 542 Portion 2	Grasvlakte	14	Tjaart Snyman	Prospecting, Livestock Farming
Bermolli 583	Bermolli	15	SIOC	Prospecting, Livestock Farming
Sunnyside 542 Portion 2	Sunnyside	16	SIOC	District Road DD3303, Livestock Farming
Floradale 230	Floradale	18	Coenraad Kotze	Livestock Farming
Voelwater 480	Voelwater	20	Francois Cloete	Livestock Farming
Broomlands 479	Broomlands	21	Bennie Bredenkamp	Livestock Farming
Kameelhoek 477	Kameelhoek	22	Rassie Erasmus	Livestock Farming
Kameelhoek 477	Kameelhoek	23	Rudi Erasmus	Livestock Farming
Aucampsrus 447	Aucampsrus	24	Van Wyk	Regional Road Small-scale Iron Ore Mining, Livestock Farming

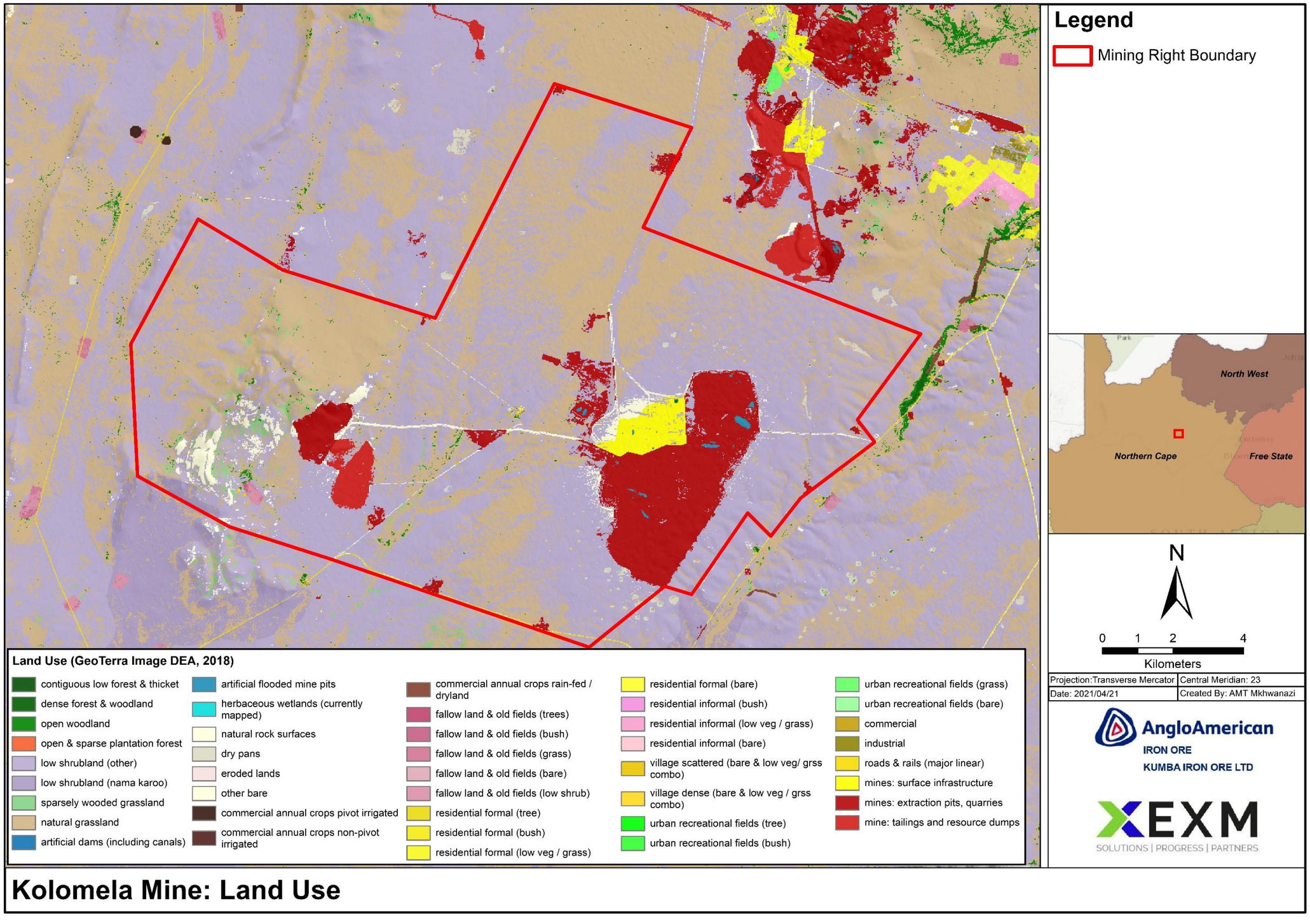


FIGURE 11-20: LAND USE MAP

12.PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

12.1 Impacts identified

A scoping level identification of potential environmental impacts (physical, biological, social and economic) associated with the authorised activities in terms of the 2017 EA as well as the proposed project are listed in Table 12-1. A framework for further work during the EIA phase is also provided.

TABLE 12-1: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

IMPACT	IMPACT SOURCE	SIGNIFICANCE/COMMENT	SCOPE OF WORK FOR EIA / FURTHER WORK
AIR QUALITY			
Increase in ambient dust levels.	Dust emission due to earthmoving activities during construction. Vehicle movement on unprepared surfaces. Material (product and low grade material) conveyance on conveyor belts. Product stockpiles Drilling and blasting	Increased dust levels may contribute to cumulative dust fall.	An Updated Air Quality Impact Assessment will be conducted to evaluate the cumulative significance of the air quality impacts associated with the current and proposed expansion activities. Mitigation measures will be incorporated in the Environmental Management Programme that are relevant to the project and anticipated impacts.
Increase in exhaust emissions	Moving equipment Generators	Release of air pollutants from exhausts.	Significance determination during EIA. Mitigation measures will be incorporated in the Environmental Management Programme that are relevant to the project and anticipated impacts.
Climate change	Release of greenhouse emissions from moving equipment, generators, electricity consumption (indirect)	Contribution of operations to greenhouse gas emissions and climate change.	Significance determination during EIA. Mitigation measures will be incorporated in the Environmental Management Programme that are relevant to the project and anticipated impacts.
NOISE			
Increase in ambient noise levels	Increased noise levels due to the	An assessment needs to be undertaken to	An Updated Noise Impact Assessment will

IMPACT	IMPACT SOURCE	SIGNIFICANCE/COMMENT	SCOPE OF WORK FOR EIA / FURTHER WORK
	operation of earth moving and other machinery during construction phase. No additional blasting will be conducted, only current drilling and blasting.	determine whether the cumulative noise levels from current and the expansion activities will affect receptors.	be conducted to evaluate the significance of the potential noise related impacts associated with current and the proposed expansion activities. Mitigation measures will be incorporated in the Environmental Management Programme that are relevant to the project and anticipated impacts.
BIODIVERSITY			
Loss of systems, habitats or species of conservation importance	Current on-going development pits and WRD. Clearance of vegetation for the development of the infrastructure. Secondary impacts related to habitat fragmentation due to the linear nature of roads and conveyors.	Significance of impacts to be determined by biodiversity specialist study.	Sensitive habitats and species to be disturbed due site clearance must be identified. The risk of secondary impacts related to habitat fragmentation must be quantified. Mitigation measures must be identified and implemented. A Biodiversity (Ecological) Specialist Study is required.
SURFACE WATER			
Disturbance of surface water resources	Disturbance of wetland pans due to site clearance including barriers to hydropedological systems that contribute to pans (if applicable).	Several wetland pans are situated in the study area that may be impacted by current Kolomela activities and the expansion.	Aquatic Ecological Impact Assessment Specialist Study to be undertaken to assess impact on aquatic environment. A Hydropedological Assessment will also be conducted to assess potential impacts on sub-surface flow.
	Disturbance of water courses (streams) due to infrastructure development.	Widening of the haul roads and amended haul road/conveyor footprints will be undertaken in close proximity to the Welgevonden Spruit.	Aquatic Ecological Impact Assessment Specialist Study to be undertaken to assess impact on aquatic environment.
Pollution of surface water resources.	Incorrect or insufficient stormwater management.	Dirty water run-off from stockpiles, the TSF and WRDs must be managed and prevented from entering into the surrounding environment.	A surface water hydrology assessment will be undertaken, including the development of a stormwater management plan, which will include the new TSF and RWD.

IMPACT	IMPACT SOURCE	SIGNIFICANCE/COMMENT	SCOPE OF WORK FOR EIA / FURTHER WORK
			Stormwater management measures must be incorporated in the EMPr to prevent dirty water runoff from entering the environment.
	Storage, handling and accidental spillage of hazardous chemicals	The management of hazardous substances including hydrocarbons has the potential to result on spillages and potential impacts on clean water run-off.	Spill management procedures must be developed and implemented to ensure that surface water resources are protected.
GROUNDWATER			
Impact on groundwater availability as a result of dewatering activities.	Dewatering of open cast pits to enable the continuation of mining activities.	Dewatering requirements and significance of impacts to be assessed by Geohydrological Impact Assessment.	A Geohydrological Impact Assessment will be undertaken to assess impacts on groundwater users as a result of dewatering.
Pollution of groundwater resources	Development of TSF on Leeuwfontein waste rock dump.	Leachate from the TSF and WRD may increase contaminant in the groundwater regime.	
Pollution of groundwater resources	Storage, handling and accidental spillage of hazardous chemicals.	The management of hazardous substances during the construction as well as the operational phase has the potential to result in contamination of soils and groundwater if not designed and managed properly to ensure the protection of these environmental features.	
CULTURAL HERITAGE			
Disturbance of sites of archaeological, palaeontological, cultural or heritage importance	On-going current development of WRDs and pits Site clearance for the development of expanded/new infrastructure.	The presence of heritage resources is to be confirmed at all areas to be disturbed by development.	A Heritage Impact Assessment (including an updated Palaeontological assessment) is to be undertaken in accordance with the requirements of the Natural Heritage Resources Act. SAHRA is to be consulted in accordance with Section 38 of the Act.
LAND USE AND INFRASTRUCTURE			
Disturbance of current land use	Change in land use.	Although the projects will be developed	Include in EIA and EMPr.

IMPACT	IMPACT SOURCE	SIGNIFICANCE/COMMENT	SCOPE OF WORK FOR EIA / FURTHER WORK
activities		on the Kolomela mining right area, the expansion activities will change the current characteristics of the land.	
VISUAL ENVIRONMENT			
Disturbance of natural views and sense of place.	Cumulative visibility of current Kolomela footprint and expansion activities.	The current and expanded mining activities will potentially be visible from receptor points including traffic along the R383 regional road and surrounding residents.	A Visual Impact Assessment will be undertaken to determine impacts associated with the proposed expansion project. Consideration is to be given to the cumulative impact on the visual environment.
SOCIO-ECONOMICS			
Contribution to local economy	Opportunities for procurement and employment as a result of the development.	The proposed amendment is essential for the development of the Kapstevel South project and the associated socio-economic benefits.	Incorporate projects in the Kolomela Socio-economic Development Plan for the project focussing on maximising the benefit to local communities.
In migration of job seekers	The potential for employment may attract additional job seekers to the area.	Increased in migration into the area places increasing pressure on municipal and social resources in the area already characterised by growing informal communities. Associated with this is increasing social ills.	Existing data related to socio-economic impacts to be incorporated in EIA.

12.2 Methodology used in determining the significance of environmental impacts

An initial indication of the potential impacts is described in Table 12-1. This is based on an understanding of the baseline environment, existing information and the details currently available for the project areas. The nature and significance of impacts will be confirmed in the EIA phase of the project. Where required, specialist input will be obtained (as identified in this Scoping Report) to assist with determining the significance of the impacts and to identify mitigation measures to address such impacts.

Further information regarding the methodology for assessing the significance of impacts in the EIA Phase is provided in Section 13.3.

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

The current approved activities as well as the proposed expansion project has the potential to cause environmental impacts. The potential significant negative impacts will relate to biodiversity, surface water resources, noise and air quality. The magnitude and extent of such impacts related to the current operations and proposed expansion activities will be determined in the EIA phase and will be evaluated with input from various specialist studies. The layout planning will be informed by the outcome of the EIA and specialist studies to minimise impacts to sensitive environmental features, including terrestrial biodiversity, surface water resources and cultural resources.

12.4 The possible mitigation measures that could be applied and the level of residual risk.

A scoping level description of the impacts, possible mitigation measures and level of residual risk is described in Table 12-2.

TABLE 12-2: PROJECT IMPACTS, MITIGATION MEASURES AND THE LEVEL OF RESIDUAL RISK

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
PLANNING	Biodiversity	Incorrect planning of currently approved infrastructure and expansion activities may lead to the destruction of protected species/habitats.	The site layout must incorporate the outcome of the Biodiversity (Fauna and Flora) Specialist Study to be undertaken. Site layout alternatives to be assessed during EIA phase to minimise impacts. Alternatively, relevant permits must be obtained if impacts are unavoidable.	Medium – The establishment of the project footprint will result in the removal of natural vegetation. The footprint can potentially be changed (if required) to protect sensitive environments and species. There could be a loss of some individual species of conservation importance (permits required) To be determined by specialist study.
	Surface water resources	Incorrect planning of currently approved infrastructure and expansion activities may lead to the destruction of surface water resources such as prominent drainage features and pans	Site layout must incorporate the outcome of the Aquatic Ecological Impact Assessment. Site layout alternatives to be assessed during EIA phase to minimise impacts. Obtain Water Use Licence.	Medium – The establishment of the project footprint will potentially result in the disturbance of water resources including wetland pans. The footprint can potentially be changed (if required) to protect sensitive environments. To be determined by specialist study.
	Heritage resources	Incorrect planning of currently approved infrastructure and expansion activities may lead to the destruction of heritage resources.	The site layout must incorporate the outcome of the Heritage Impact Assessment to be undertaken. Site layout alternatives to be assessed during EIA phase. Alternatively, relevant permits must be obtained if impacts are unavoidable.	Incorporate finding of existing specialist studies. To be determined by specialist study for expansion activities.
CONSTRUCTION	Biodiversity	Site clearance resulting in the disturbance of vegetation, habitats and/or sensitive environments/ species. Fragmentation of habitat with linear development (conveyor, railway line and roads)	Biodiversity (Fauna and Flora) Specialist Study to be undertaken to identify sensitive habitats and species. Construction limited to demarcated area. Site layout planning to ensure protection of areas of high sensitivity where practicable. Site clearance procedure.	Medium – The establishment of the project footprint will result in the removal of natural vegetation. The footprint can potentially be changed (if required) to protect sensitive environments and species. There could be a loss of some individual species of conservation importance (permits required) To be determined by specialist study.

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		Establishment of roads and conveyors resulting in habitat fragmentation.	Biodiversity (Fauna and Flora) Specialist Study to be undertaken to identify sensitive habitats and species. Site layout planning to ensure protection of areas of high sensitivity where practicable. Offsets to consider loss of additional biodiversity / sensitive species due to additional expansions.	Low – The footprint will result in habitat fragmentation. There could be a loss of some individual species of conservation importance (permits required) To be determined by specialist study.
	Surface water resources	Site clearance resulting in the disturbance of surface water resources, including non-perennial pans and drainage lines.	An Aquatic Ecological Impact Assessment Specialist Study to be undertaken to assess impact on aquatic environment. A Hydropedological Assessment to be undertaken to determine the contribution of the vadozone to the functioning of wetland pans. Construction limited to demarcated area Site layout planning to ensure protection of areas of high sensitivity where practicable.	Medium – The establishment of the project footprint will potentially result in the disturbance of water resources including pans. The footprint can potentially be changed (if required) to protect sensitive environments. To be determined by specialist study.
		Storage and use of hazardous substances, including hydrocarbon material – spillages that may lead to contamination of surface water resources.	Implement appropriate containment (bunding) measures at designated storage areas. Spill response procedures and equipment.	Medium – risk can be managed though the implementation of appropriate mitigation measures
		Runoff from disturbed areas resulting in soil erosion and sedimentation/ siltation of downstream water sources.	Establish buffers, where possible, from drainage lines and other streams. Rehabilitate disturbed areas not allocated for development as soon as practicable. Visual inspections of the site to proactively identify erosion problems. Implement additional controls if erosion problems are detected.	Medium – The site is relatively flat and situated in an area with low annual rainfall. However, high rainfall events could result in erosion and sedimentation of water courses.
	Soil	Runoff from disturbed areas resulting in soil erosion and loss of topsoil.		

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
			Soil stockpiles to be situated in a demarcated area with stormwater control measures in place. Additional measures to be included in EMPr.	
		Loss of soils and land capability.	Soils to be removed and protected for use in rehabilitation.	Moderate – Soils can be salvaged and used in rehabilitation/landscaping.
	Soil/ groundwater	Pollution of soil and groundwater due to spillage and seepage of contaminants used during construction.	Establish appropriate containment measures. Implement measures to protect soil and groundwater resources.	Low – risk can be managed though the implementation of appropriate mitigation measures
	Air quality	Increased dust fall from the following sources: • Earthworks. • Vehicle movement on exposed surfaces.	Watering of exposed surfaces, i.e., by using a water bowser. Maintain a complaints register. Conduct dust fall monitoring in terms of the National Dust Control Regulations. Implement additional measures if required.	Moderate – expansion activities may contribute to cumulative dust fall. Risk can be managed though the implementation of appropriate mitigation measures.
		Exhaust emissions – release of Greenhouse Gas Emissions	Only use vehicles in good working order.	Low
	Noise	Increased noise levels from the following sources: • Earth moving equipment. • Vehicle movement.	Use will be made of the existing Kolomela public grievance process. Limit construction to the daytime, if possible.	Low – the activities are situated relatively far from receptors that can be impacted by increased noise levels.
	Heritage and palaeontology	Site clearance resulting in the disturbance of heritage and palaeontology resources.	Identify heritage resources through a Heritage Impact Assessment and indicate on layout planning. Implement Chance Find Procedure. Revise layout to protect heritage resources, if required.	Low – Should heritage resources be identified these can be protected with buffer zones. A destruction permit will have to be obtained from SAHRA if required.
	Waste management	Incorrect management of hazardous and general waste. Environmental pollution and nuisance conditions due to littering.	Conduct waste management according to relevant legal requirements and procedures.	Low

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Traffic	Traffic impacts due to movement of construction vehicles and contractors. It is not anticipated that the construction activities will result in significant increase in traffic volumes.	Engage with contractors.	Low
	Visual	Cumulative visual intrusion of current and future infrastructure.	Visual Impact Assess to determine mitigation required. Concurrent rehabilitation.	To be determined by Visual Impact Assess.
	Socio-economic	Contribution to local economy – job creation and purchasing of goods and service	Local Economic Development Plan for the project	Impacts will be temporary only associated with the construction phase.
OPERATIONS	Biodiversity	On-going development of WRD and pits – vegetation removal.	Development of footprint according to demarcated footprints. Avoid sensitive areas. Biodiversity (Fauna and Flora) Specialist Study to be undertaken.	Moderate – to be determined by specialist study.
		Animal/bird strikes on haul roads	Speed limits. Training of drivers.	Moderate – to be determined by specialist study.
		Encroachment of alien invasive plants	Implement follow up measures to identify and eradicate alien invasive plants	Medium – follow up and maintenance must be undertaken to identify and eradicate alien and invasive plants
	Surface water resources	On-going development of WRD and pits – encroachment of water courses.	Development of footprint according to demarcated footprints. Avoid sensitive areas.	Moderate – to be determined by specialist study.
		Storage of hazardous substances, including bulk hydrocarbon (fuel) storage – spillages that may lead to contamination of surface water resources.	Implement appropriate containment (bunding) measures at storage areas. Spill response procedures. Training. Implement hazardous substances management procedure. Develop and implement stormwater management plan.	Low – bulk fuel storage can be easily managed with the implementation of appropriate mitigation measures.

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		Spillages during refuelling and from vehicles leaking oil.	Site inspections Spill response procedures and equipment.	Low
		Pollution of water courses due to sewage spills.	Maintenance of septic tank system. Establish containment measures. Regular removal of sludge.	Low – system to be maintained by trained operators.
		Pollution of water courses due to spillages from dirty water containment facilities.	Implement stormwater management system	Low – system to be maintained by trained operators.
		Increased runoff volume and velocity from acritical surfaces – siltation and sedimentation of downstream water courses	Implement stormwater management plan.	Low - The runway will be relatively flat which will decrease runoff velocity.
	Visual	Cumulative visual intrusion of current and future infrastructure. On-going development of WRDs and pits.	Visual Impact Assess to determine mitigation required. Concurrent rehabilitation.	To be determined by Visual Impact Assess.
	Noise	Increased noise levels	Conduct Noise Impact Assessment to determine noise related impacts. Conduct thorough public participation process during EIA	To be determined by specialist study.
	Waste management	Incorrect management of hazardous and general waste. Environmental pollution and nuisance conditions due to littering.	Conduct waste management according to relevant legal requirements and Kolomela procedures.	Low
	Resource consumption	Abstraction of groundwater to supply water requirements – impact on local aquifer and groundwater users.	Abstraction to be conducted in line with WUL limits. Implement water conservation strategy. Awareness among employees and passengers. Report water wastage.	Medium – impact on groundwater reserve to be determined by specialist study.
	Resource consumption	Electricity consumption – resource consumption and indirect	The following measures can be considered to manage energy	N/A

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		Greenhouse Gas Emissions.	consumption: • Installation of low energy light bulbs. • Use of gas in kitchens. • Awareness training.	
	Resource consumption	Reduced dependency on non-renewable energy as a result of solar PV plant.	Optimise solar energy generation.	Moderate.
	Socio-economic	Contribution to local economy – sustained job at Kolomela and purchasing of goods and service.	Focus on local procurement.	High
		Influx of people into the area	Support to Tsathabane Local Municipality, community based organisations, employment of local persons, stakeholder engagement – this is all part of what Kolomela re currently doing. You have discussed this in the baseline section	Moderate.
DECOMISSIONING AND REHABILITATION	Socio-economic	Job losses and discontinuation of local spending	Pro-active consultation with employees and community. Initiatives to increase the sustainability for the community post Kolomela – this is a positive of the increased LoM as more time to plan to put things in place.	Moderate
	Waste management	Incorrect management of hazardous and general waste. Environmental pollution and nuisance conditions due to littering.	Conduct waste management according to relevant legal requirements.	Low
	Erosion	Unsuccessful rehabilitation and vegetation growth may lead to erosion and siltation of downstream water courses.	Unsuccessful rehabilitation and vegetation growth may lead to erosion and siltation of downstream water courses.	Medium – follow up and maintenance of the rehabilitation must be undertaken to ensure sustained vegetation growth and to monitor the site for residual erosion.
	Land use	Unsuccessful rehabilitation and vegetation growth may prevent establishment of beneficial land use post closure.	Implement rehabilitation and closure plan. Establish appropriate land use for all areas at Kolomela.	Low
	Biodiversity	Encroachment of alien invasive plants	Implement follow up measures to identify and eradicate alien invasive plants	Medium – follow up and maintenance of the rehabilitation must be undertaken to identify and eradicate alien and invasive plants

PHASE	IMPACT CATEGORY	POTENTIAL IMPACTS	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Biodiversity	Rehabilitation of the site will reinstate the disturbed area to provide habitat for species in the area.	Rehabilitate the area to achieve functional end land use.	Medium – follow up and maintenance of the rehabilitation must be undertaken to ensure sustained vegetation growth and the functioning of ecosystems.
	Visual	Improved aesthetic character of the area.	Rehabilitate the area to achieve functional end land use.	High – visual appearance will permanently change if rehabilitation measures are successfully implemented.

12.5 The outcome of the site selection - Final site layout plan

The site layouts will be investigated in the EIA phase of the project. Impacts on sensitive sites, including heritage, biodiversity, surface water resources including wetlands will be identified and the layout revised as required and where practicable to minimise impacts.

An alternative layout aimed at minimising such impacts will be developed as an outcome to the EIA for implementation by SIOC.

12.6 Motivation where no alternative sites were considered

Alternative layouts and positioning of infrastructure will be considered as part of the EIA Phase based on the outcomes of specialist studies and in consultation with SIOC.

12.7 Statement motivating the preferred site

The expansion infrastructure will be developed in terms of the current approved infrastructure within the Kolomela mining area. The current and future infrastructure is interdependent, therefore no alternative sites for the expansion activities have been identified. and therefore the no alternative sites have been identified except for the development of the TSF which will be further assessed during the EIA phase.

13.PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

13.1 Description of Alternatives to be considered including the Option of Not Going Ahead with the Activity.

The following alternatives will be considered as part of the EIA process:

13.1.1 No-Go alternative

The no-go alternative (not proceeding with all or part of the proposed activities) will be further considered in the EIA phase of the project. Should the impacts of the entire or parts of the proposed project be considered to be unacceptable, even with mitigation then the no-go alternative could be considered.

13.1.2 Layout alternatives

The current proposed layout for the development of the respective infrastructure (i.e. WRDs, haul roads, conveyors, railway line, stockpiles, PV plant) will be further revised based on the outcomes of the specialist studies and EIA process. This will be done in consultation with SIOC to ensure that the impacts of the project are kept to a minimum.

The sensitivity of water resources, CBAs, presence of species of conservation importance and heritage resources in the area to be disturbed by the project footprint will be confirmed. Where possible, sensitive sites will be avoided in an updated layout. If this is not possible the recommendations of the relative specialists will be implemented and the necessary

licences/permits will be obtained if such sites cannot be avoided.

13.1.3 Site location alternatives

Four site location alternatives have been identified for the development of the TSF. These sites included two green field areas, the expansion of the existing TSF and the development of the TSF on the Leeuwfontein WRD. The latter two alternatives will be further assessment during the EIA.

13.1.4 Type of activity alternative

Two alternative methods have been identified for the management of tailings from the DMS, including the development of a TSF on the existing WRD and the other includes the co-disposal/backfilling of tailings mixed with waste rock. These two alternatives will be further assessed during the EIA phase.

13.2 Description of the aspects to be assessed as part of the environmental impact assessment process (including aspects to be assessed by specialists)

Where the EAP does not have sufficient expertise or information in a particular field to adequately determine the baseline environmental conditions or to assess the impacts, specialists in those fields will be appointed to provide the necessary information required to facilitate the EIA.

The requirements for further work have been identified in the scoping phase (see Table 9-7). This forms the terms of reference for the EIA phase of the project.

The following outlines the scope of work for specialist studies to inform the EIA and EMPr. Should it become apparent during the EIA phase that additional specialist studies are required, the terms of reference will be drawn up and these will then be included in the EIA report.

Specialist reports will be structured in terms of *GNR 982 Appendix 6, as amended*. The specialist studies identified thus far are discussed below.

13.2.1 Freshwater Ecological Assessment

Scientific Terrestrial Services will undertake a specialist investigation of the freshwater aquatic environment to be impacted by the proposed development.

The study will include:

- A desktop study of available databases and previous work done at the site and in the area;
- Delineation of the watercourses within the study area;
- Delineation of watercourses within 500m of the study area;
- All watercourses identified during the field assessment will be mapped;

- Watercourse classification assessment;
- Applicable buffer zones and/or zones of regulation according to relevant legislation or provincial guidelines will be delineated around the watercourses;
- The watercourse Present Ecological State (PES) will be assessed according to relevant indices;
- Provision of recommendations on management and mitigation measures (including opportunities and constraints) with regards to the development/operation of the proposed development; and
- Compilation of report to incorporate the study findings.

13.2.2 Biodiversity

Scientific Terrestrial Services will undertake a specialist investigation of the terrestrial biodiversity (fauna and flora) that will be impacted by the proposed development.

13.2.2.1 Floral Assessment

- A desktop study will be conducted of available databases and previous work done at the site and in the area;
- A description of each habitat type based on conservation importance and present ecological state;
- Vegetation communities will be identified and mapped.
- Species lists and dominant species associated with each vegetation community will be compiled;
- Focus will also be given to identifying areas of severe alien and invader encroachment and Category 1, 2 and 3 species;
- Veld condition will be assessed and will also be compared to the typical vegetation for the vegetation type of the area;
- Sensitive areas will be mapped where detail will be given of the ecological aspect of concern in each sensitivity zone; and
- Recommendations on management and mitigation measures.

13.2.2.2 Faunal Assessment

- Determining the ecological importance and sensitivity of the study area according to the relevant conservation databases;
- Visual observations of actually occurring species;
- Identification of evidence of occurrence, e.g. call spoor, droppings etc
- The reports produced will include sensitive habitat types (which will be mapped) and impacts from habitat disturbance, faunal assemblages at risk and an assessment of impacts on migratory routes;

- An assessment of cumulative impacts on faunal assemblages in the region will also be made, with specific emphasis on avifauna
- Recommendations on management and mitigation measures.

The biodiversity study will be updated to reflect the change in scope of work associated with the project.

13.2.3 Hydropedological Assessment

Zimpande Research Collaborative (Pty) Ltd will conduct a Hydropedological Assessment to assess the impacts that the proposed development will have on unsaturated flow processes and wetlands.

The study will include:

- Desktop review of existing soil, geohydrological data and/or reports, where available;
- Conduct a soil survey to verify current soil conditions on site;
- Subsurface soil observations will be made by means of a standard hand auger method, and soil in the vicinity of the investigated wetland features will be classified according to the South African Soil Classification System (Soil Classification Working Group, 2018);
- Field data will include a description of physical soil properties including the following parameters.
- Hydrological hillslope classification using the Le Roux, et al. (2015) method;
- Collect selected verification samples for textural analysis at an accredited analytical laboratory;
- Identify the potential impacts of the proposed development on the unsaturated flow
- processes and wetlands;
- Quantify hydropedological losses (%) that will occur as a result of the proposed project;
- Determine a scientific buffer taking into consideration important wetland recharge soils;
- Recommend suitable mitigation and management measures to alleviate the identified
- impacts on the wetland hydropedological conditions; and
- Compile a brief report on the conceptual hydropedological regime of the investigated wetlands based on the identified soil types under current conditions
- Estimate the hydraulic conductivity according to soil texture according to the FAO method (FAO, 1980).

13.2.4 Noise Impact Assessment

Airshed Planning Professionals will assess the noise related impacts associated with the proposed expansion activities. The following tasks are considered necessary for the assessment:

- Baseline night and day noise measurements will be conducted according to the South African National Standards (SANS 10103:2008)
- Impact Assessment
    - Compilation of noise source levels incl. the identification and quantification of all noise sources associated with the project.
    - The propagation of noise will be simulated using CadnaA software for industrial applications.
    - Noise impacts will be calculated both in terms of total ambient noise levels as a result of the project as well as the effective change in ambient noise levels. Impacts will be calculated and assessed according to local guidelines and guidelines provided by the International Finance Corporation (IFC).
    - The findings of the noise assessment will inform recommendations of noise management measures, including mitigation and monitoring (if necessary).
- Recommendations on mitigation and management measures; and
- Report compilation.

13.2.5 Air Quality Impact Assessment

Airshed Planning Professionals will assess the noise related impacts associated with the proposed expansion activities. The following tasks are considered necessary for the assessment:

- A review and identification of legal requirements pertaining to air quality;
- A desktop study of the receiving atmospheric environment (baseline) including:
    - the identification of air quality sensitive receptors;
    - an analysis of regional climate and site specific atmospheric dispersion taking into account local meteorology, land-use and topography; and
    - and analysis and assessment of existing (baseline) ambient air quality.
- The establishment of the facility's emissions inventory;
- Atmospheric dispersion simulations of the operational phase of the facility;
- A human health risk and nuisance impact screening assessment based on dispersion simulation results;
- An Air Quality Impact Assessment (AQIA) in the prescribed specialist report format.

13.2.6 Heritage Impact Assessment and update of the Kolomela Palaeontological Assessment

PGS Heritage will undertake a heritage study and update the existing Palaeontological Assessment that was conducted for the entire Kolomela. The heritage study will incorporate:

- Desktop study and review of previous studies done in the area;

- Identification of sites of heritage importance at all development areas;
- Classification of resources according to cultural and heritage significance;
- Assessment of impacts in accordance with SAHRA's requirements;
- Photographic evidence of sites; and
- Mitigation.

Heritage resources will be mapped, and the site layout revised to avoid impacts on resources, where practicable.

13.2.7 Hydrogeological Impact Assessment

Gradient Consulting (Pty) Ltd will undertake Hydrogeological Impact Assessment in support of the application. The study will include the following factors:

- Establish site baseline and background conditions and identify sensitive environmental receptors.
- Determine the current status quo of the regional groundwater system including aquifer classification, aquifer unit delineation and vulnerability.
- Develop a numerical groundwater flow and mass transport model to be applied to quantify and qualify the proposed impact of mining activities on the groundwater environment.
- Hydrogeological impact assessment and risk matrix.
- Recommendations on best practise mitigation and management measures to be implemented.
- Compilation of an integrated groundwater monitoring network and protocol.

13.2.8 Hydraulic assessment, Water Balance and Stormwater Management Plan

Design Point Consulting Engineers will undertake a Hydraulic assessment, Water Balance and Stormwater Management Plan in support of the application. The study will include the following factors:

13.2.8.1 Hydraulic assessment

- Build GIS base for mapping and flood modelling in order to produce flood lines up to a 1:100
- year flood event.
- Baseline flood maps showing flow paths, depths, velocities and risk areas for 1 in 50, 100 and 200 year flood events.

13.2.8.2 Critical stormwater mine areas

- Design stormwater mitigation infrastructure in and around the DMS plant area

- Design stormwater mitigation infrastructure in and around the Ploegfontein
- Concept layouts and designs associated with WUL application
- Designs only done to concept level except for DMS plant area

13.2.8.3 Stormwater master plan review and update

- Review existing stormwater master plan
- Review clean and dirty water areas according to GN704 requirements
- Update master plan drawings if required
- Review classified areas based on future scenarios
- Supply information to be part of overall environmental assessment

13.2.9 Visual Impact Assessment

EXM Environmental Advisory (Pty) Ltd will undertake Visual Impact Assessment in support of the application. A Geographic Information System (GIS) will be used to create a model which will show the combined visual intrusion of the existing and planned infrastructure and assess the impact on sensitive receptors. A report will be developed with a description of the baseline visual characteristics, impact prediction methodology and results of the impact assessment.

13.2.10 Financial Provision and Closure Costing

EXM Environmental Advisory (Pty) Ltd will undertake a Financial Provision and Closure Costing in support of the application. The study will include the following factors:

- Review current financial provisioning to determine infrastructure included.
- Determine closure costing in terms of the NEMA financial provision regulations for the additional infrastructure included in the EMPr amendment.
- Develop summarised reports (Final Closure, Annual Rehab and Risk Report) which will be attached as Annexures to the NEMA reports (currently being developed). The information contained in these report will only relate to the additional activities, excluding generic info contained in main report.

13.3 Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

13.3.1 Impact ranking criteria

The impact assessment method takes into account the current environment, the details of the proposed project and the findings of the specialist studies. Cognisance will be given to both positive and negative impacts that may result from the development. The significance of the impact is dependent on the consequence and the probability that the impact will occur.

impact significance = (consequence x probability)

Where:

consequence = (severity + extent)/2

and

severity = [intensity + duration]/2

Each criterion is given a score from 1 to 5 based on the definitions given in Table 13-1. Although the criteria used for the assessment of impacts attempts to quantify the significance, it is important to note that the assessment is generally a qualitative process and therefore the application of this criteria is open to interpretation. The process adopted will therefore include the application of scientific measurements and professional judgement to determine the significance of environmental impacts associated with the project. The assessment thus largely relies on experience of the environmental assessment practitioner (EAP) and the information provided by the specialists appointed to undertake studies for the EIA.

Where the consequence of an event is not known or cannot be determined, the "precautionary principle" will be adhered to and the worst-case scenario assumed. Where possible, mitigation measures to reduce the significance of negative impacts and enhance positive impacts will be recommended. The detailed actions, which are required to ensure that mitigation is successful, will be provided in the EMPR, which will form part of the EIA report. Consideration will be given to the phase of the project during which the impact occurs. The phase of the development during which the impact will occur will be noted to assist with the scheduling and implementation of management measures.

TABLE 13-1: CRITERIA FOR ASSESSING THE IMPACT SIGNIFICANCE

SEVERITY CRITERIA

INTENSITY = MAGNITUDE OF IMPACT	**RATING**
Insignificant: impact is of a very low magnitude	1
Low: impact is of low magnitude	2
Medium: impact is of medium magnitude	3
High: impact is of high magnitude	4
Very high: impact is of highest order possible	5

DURATION = HOW LONG THE IMPACT LASTS	**RATING**
Very short-term: impact lasts for a very short time (less than a month)	1
Short-term: impact lasts for a short time (months but less than a year)	2
Medium-term: impact lasts for the for more than a year but less than the life of operation.	3
Long-term: impact occurs over the operational life of the proposed extension.	4
Residual: impact is permanent (remains after mine closure)	5

EXTENT = SPATIAL SCOPE OF IMPACT/ FOOTPRINT AREA / NUMBER OF RECEPTORS	**RATING**

Limited: impact affects the project site	1
Small: impact extends to the boundaries of the mining area	2
Medium: impact extends to neighboring properties	3
Large: impact affects the surrounding communities	4
Very Large: The impact extends beyond the neighbouring communities	5

PROBABILITY

PROBABILITY = LIKELIHOOD THAT THE IMPACT WILL OCCUR	**RATING**
Highly unlikely: the impact is highly unlikely to occur	0.2
Unlikely: the impact is unlikely to occur	0.4
Possible: the impact could possibly occur	0.6
Probable: the impact will probably occur	0.8
Definite: the impact will occur	1

IMPACT SIGNIFICANCE

NEGATIVE IMPACTS

≤1	Very low	Impact is negligible. No mitigation required.
>1≤2	Low	Impact is of a low order. Mitigation could be considered to reduce impacts. But does not affect environmental acceptability.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts. Mitigation should be implemented to reduce impacts.
>3≤4	High	Impact is substantial. Mitigation is required to lower impacts to acceptable levels.
>4≤5	Very High	Impact is of the highest order possible. Mitigation is required to lower impacts to acceptable levels. Potential Fatal Flaw.

POSITIVE IMPACTS

≤1	Very low	Impact is negligible.
>1≤2	Low	Impact is of a low order.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts.
>3≤4	High	Impact is substantial.
>4≤5	Very High	Impact is of the highest order possible.

CUMULATIVE IMPACTS

Cumulative impacts are defined as: "*the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area*". Taking into consideration the above definition, the cumulative impacts for the project will be assessed by considering the potential impacts in relation to the current status of the environment which includes existing impacts from surrounding activities.

MITIGATION MEASURES

A **no net loss** approach will be adopted in terms of the management of impacts at the project.

- **Avoidance** – impacts are to be avoided where practicable e.g. through the implementation of alternatives.
- **Mitigation** – should it not be possible to avoid all impacts the remaining impacts are to be mitigated to acceptable levels.
- **Offset** – should it not be possible to avoid and mitigate all impacts to acceptable levels it will be necessary to offset the remaining impacts. Suitable offsets will need to be identified.

Mitigation measures for significant impacts which cannot be avoided will be identified. The impacts will be ranked before and after the implementation of the mitigation measures. Consideration will also be given to the confidence level that can be placed on the successful implementation of the mitigation level as follows:

- **High Confidence:** mitigation measure easy and inexpensive to implement.
- **Medium Confidence:** mitigation measure expensive or difficult to implement.
- **Low Confidence:** mitigation measure expensive and difficult to implement.

Where mitigation is not sufficient to reduce the impact to acceptable levels offsets will need to be considered.

PROJECT PHASES

The environmental impacts for the project will be assessed over the five phases of the project i.e. the planning and design, construction, operation, decommissioning and post-closure phase.

13.3.2 The proposed method of assessing duration significance

The method for assessing duration and significance is included above.

13.4 Stages at which the competent authority will be consulted

The competent authority is the Northern Cape Environmental Affairs and Nature Conservation for the environmental authorisation application. The following specific consultations will be included:

- Application Consultation – application submitted with scope of work
- Authority Site Visit – still to be completed
- Consultation on approval of Scoping Report (follow-up on approval and comments from the CA on Scoping Report)
- Consultation after submission of the EIA – follow up as required. Provide additional

information if required

The scoping, EIA and EMP reports will be submitted to the CA for review

13.5 Particulars of the public participation process with regard to the impact assessment process that will be conducted

13.5.1 Steps to be taken to notify IAPs

All persons registered as IAPs will be given an opportunity to comment on the EIA Report. Note that the notification and registration of additional IAPs will continue throughout the process. IAPs will be contacted regarding the availability of the report via email, registered mail or bulk SMS.

13.5.2 Details of the engagement process to be followed

13.5.2.1 Public Review of the Scoping Report

The draft Scoping Report is made available for public review for 30 days. The report is circulated to the public and commenting authorities. Any issues raised during review of the Scoping Report will be incorporated in the final scoping report which will be submitted to DENC.

The following processes will be used with respect to the circulation of the draft Scoping Report:

- An electronic link have been provided to the identified IAPs with access to email. Two platforms will be used including OneDrive and Dropbox to ensure access. Electronic versions on a memory stick or can also be couriered if needed.
- Other IAPs for whom only cell phone number are available have been notified of the availability of the reports and provided the opportunity to request access to the documents.
- Hard copies of the Scoping report will be placed at a venue which is accessible to the public (e.g. public library and Kumba Public Affairs Offices), only if the IAPs that cannot access the electronic documents request access to a hard copy.
- Hard copies and/or electronic copies will be sent to the commenting authorities, if requested.

13.5.2.2 Proof of distribution will be included in the final Scoping reportFeedback Meeting/s during EIA

On completion of the EIA Report, public or focus group meetings via electronic platforms (zoom, teams or skype) may be arranged to present the results of the specialist studies and the identified environmental and social impacts of the development.

13.5.2.3 Public Review of the EIA Report

The EIA report will be made available for public review for a period of 30 calendar days. The same process will be used to ensure that IAPs have access to the report for review.

13.6 Description of the tasks that will be undertaken during the environmental impact assessment process

The scope of work for the EIA phase of the project is detailed in Section 13.2. The following tasks must still to be completed:

- Conduct public consultation and respond to comments on draft Scoping report;
- Submit final amended scoping report (incorporating public and commenting authority comments);
- Address public and authority comment and modify scope of work to EIA as required;
- Completion of specialist studies and collation of additional information;
- Identification of additional mitigation and environmental management requirements for incorporation into the project;
- Assess impacts and revise as required;
- Compile Draft EIA Report;
- Compile Draft EMPr
- Public Review of Draft EIR and EMPr Report
- Address public comment
- Finalise EIA Report and EMPr
- Consult with DENC and address queries as required.

A description of the tasks that will be undertaken during the EIA phase is provided below in Table 13-2.

TABLE 13-2: EIA TASKS AND TIMING

Phase	EAP activity	Opportunities for Consultation and Participation		SCHEDULE
		Competent Authorities	IAPs, State Departments and Organs of State	
	Submit application form to DMRE (Electronic & Hard Copy)	DMRE acknowledgement of receipt of application	-	May 2021
Scoping	Notification IAPs Inform persons of the amended project	Register interest, concerns and questions	IAPs to register interest, concerns and questions	May 2021
	Submit draft scoping to public and commenting authorities	Draft support submitted	IAPs to provide comments	May 2021
	Submit scoping report to DMR and acceptance	Authority to accept scoping report OR refuse (43 days of receipt)	IAPs comments are in the final scoping report	June 2021
Specialist Assessments and	EAP to manage specialist activities and collate information for EIA.	-	-	May – August 2020
EIA Phase	Assess environmental impacts. Compile draft EIA and EMP report	-	-	September 2021
	Arrange meetings and consultations	Meetings if required.	Public feedback meeting/. Focused consultation with IAPs or commenting authorities if required.	September/ October 2021
	Submit draft EIA report to IAPs authorities.	Review of draft EIA report (30 days). Comments to EAP	Review of draft EIA report (30 days). Comments to EAP	
	Address public comment and finalise EIA and EMPr reports			
	Final EIA report to authority (106 days from acceptance of scoping).	Authority acknowledge receipt of EIA report (10 days).		November 2021
Authority review and Authorisation	-	Environmental Authorisation Granted / Refused (107 days).	-	March/April 2022
	Notifications to I&APs regarding environmental authorisation (granted or refused).		-	April 2022
Appeal Phase	EAP to provide guidance regarding the appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations	As required

13.7 Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Refer to Table 12-2.

14. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

14.1 Impact on the socio-economic conditions of any directly affected person.

Socio-economic impacts will be assessed in the EIA Phase.

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

The impacts on heritage will be assessed in the EIA Phase and impacts avoided as far as practicable based on revised layout planning and the outcome of the Heritage Impact Assessment.

15. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

None applicable at this stage.

16.UNDERTAKINGS BY THE EAP

I, Trevor Winston Hallatt, the Environmental Assessment Practitioner responsible for compiling this report, undertake that:

- the information provided herein is correct;
- the comments and inputs from stakeholders and I&APs has been correctly recorded;
- information and responses provided to stakeholders and I&APs by the EAP is correct; and
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.

The undersigned declares that this report represents an independent and objective assessment of the risks associated with the proposed development.

Name	Affiliation	Designation	Signature	Date
Trevor Hallatt	EXM Environmental Advisory (Pty) Ltd	Pr.Sci.Nat. Senior Environmental Scientist		18/06/2021

17.REFERENCES

Airshed Planning Professionals. March 2015. Air Quality Specialist Report for the Proposed Kolomela Amendment Project. Report No. 13SLR22.

Airshed Planning Professionals. March 2015. Noise Impact Assessment for the Proposed Kolomela Amendment Project. Report No. 13SLR23.

Golder Associates. January 2016. Sishen Iron Ore Company Pty Ltd. Kolomela Mineral Waste Streams Assessment and Mining Residues Facilities Impact Report. Report Number 1527024-299063-1.

Jones & Wagener. February 2015. Hydrological Assessment of the Pan Clusters Potentiall Affected by the Kolomela Mine Expansion Project. Report No. JW206/14/E581-Rev 2.

Omni-Eko. March 2015. Fauna and Flora Report. Proposed Amendment at Kolomela Mine.

Scientific Aquatic Services. January 2015. Wetland Impact Assessment as Part of the Environmental Assessment and Authorisation Process for the Kolomela Amendment., Northern Cape Province.

SLR. 2016. Environmental Impact Assessment Report and Environmental Management Programme Report Kolomela Mine Amendment: Expansion of Activities at Kolomela Mine

Appendix A: EAP CV

Surname:	Hallatt
Names:	Trevor Winston
Position:	
Nationality:	RSA
Experience:	10 years environmental consultant in mining and industrial sectors
Professional Registration/Affiliations:	South African Council for Natural Scientific Professions (Reg nr: 300123/15).
Qualification:	MA Environmental Management (*cum laude*)
	North West University

Trevor Hallatt has more than 10 years of environmental management experience in mining, power generation, industrial and local government sectors. His duties entail the planning and execution of projects related to environmental management, including Environmental Impact Assessments (EIA), Water Use Licence Applications and IWWMPs, ISO 14001: 2004 and legal compliance audits, Financial Provisioning, Compilation of Environmental Management Programmes, Environmental Risk Assessments and Environmental Management Systems. Trevor also has extensive experience in the application of Geographic Information Systems (GIS) in environmental projects. Trevor is a registered Natural Science Professional with the South African Council for Natural Scientific Professions (Reg nr: 300123/15).

KEY AREAS OF EXPERTISE

- Environmental Impact Assessments;
- Water Use Licence Applications;
- Atmospheric Emissions Licence Applications;
- Geographic Information Systems;
- Environmental Audits (Legal and EMS);
- Environmental Control Officer: and
- Public Consultation.

SUMMARY RECENT PROFESSIONAL EXPERIENCE RELATED TO ENVIRONEMTNAL IMPACT ASSESSMENT

Client	Designation	Description
Zinoju Coal	EAP and Project Manager	BA and WUL application for the refurbishment of the old Balgray Colliery near Dundee
Vereeniging Refractories	EAP and Project Manager	Vereeniging Refractories Hammanskraal Clay Quarry Waste Management Licence and EMPr amendment Environmental Legal Audits ECO Functions
Izazi Mining Services	EAP and Project Manager	Three Prospecting Right Applications and Basic Impact Assessment Processes
Aquarella Investment	Specialist	Prospecting Right Application and Basic Impact Assessment Process
Sishen Iron Ore Mine	EAP	Kolomela Airport
Sishen Iron Ore Mine	Environmental specialist	Lylyveld Expansion EIA;
Ceramic Industries	EAP	Warehouse Development Basic Impact Assessment. Atmospheric Emissions Licence and full EIA for Phoenix Factory. WUL Applications (Pegasus and Phoenix Factories) Environmental Legal Audits
Barberton Mines	Environmental specialist	IWWMPs review 2019/2020
Evander Gold Mines	Auditor	EMP Performance Assessments
Kolomela Iron Ore Mine	Project Manager EAP	Various external audits Various EIA'/ EMP's for expansion projects Various mining permit applications
Canyon Coal	Environmental specialist	BA for a coal siding development near Bronkhorstspruit EIA Review and PPP for Prospecting Right Applications
Kangra Coal	Environmental specialist	IWWMP for Kusipongo Project
Ceramic Industries	EAP	Warehouse Development Basic Impact Assessment. Atmospheric Emissions Licence and full EIA for Phoenix Factory. WUL Applications (Pegasus and Phoenix Factories) Environmental Legal Audits
ArcelorMittal	EAP and Environmental specialist	EIA and Scoping as well as BAR for the decommissioning of the Existing Metallurgical Disposal Site and the Construction of a New Class B Disposal Site Galvanising Line Conversion to Combi-Line Basic Impact Assessment. Environmental Legal Audits
Universal Oil Solutions	EAP and Environmental specialist	Waste Management Licence Application Environmental Legal Audits ECO Functions
TerraNova Ceramics	EAP and Environmental specialist	Atmospheric Emissions Licence and full EIA;
Columbus Stainless	Environmental specialist	Basic Assessment for the Storage of Hazardous Substances.
Bumatech	Environmental specialist	Expansion Project Basic Impact Assessment Process. Environmental Legal Audits ECO Functions
AfriSam SA	Environmental specialist	Environmental Legal Audits ECO Functions

RECENT EMPLOYMENT RECORD

2019-current	**EXM Advisory Services** Senior Environmental Scientist
2015 – 2019	**Zantow Environmental Consulting Services** Senior Environmental Scientist
2010 – 2014	**Centre for Environmental Management (North-West University)** Junior Environmental Scientist

Appendix B1

List of IAPs

NEIGHBOURS AND AFFECTED PARTIES								
NAME		**INTEREST**	**AFFILIATION/FARM**	**EMAIL**	**CELL**	**PHONE**	**FACSIMILE**	**POSTAL ADDRESS**
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Appendix B2

Copy of Background Information

SISHEN IRON ORE COMPANY (PTY) LTD

ATTENTION: INTERESTED AND/OR AFFECTED PARTY

NOTICE OF A FULL ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION NEW AND EXPANDED ACTIVITIES AT KOLOMELA MINE NEAR POSTMASBURG, NORTHERN CAPE

1. Introduction

Notice is hereby given that Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to develop new activities and expand some existing activities in support of mining at t Kolomela mine located approximately 8 km south-east of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape.

An application will be submitted for Environmental Authorisation in terms of:

- Section 102 of the Minerals and Petroleum Resources Development Act (No. 28 of 2008) for the amendment of the Environmental Management Programme (EMPr).
- Listing Notices 1 (GN R. 327 of 2017), 2 (GN R. 325 of 2017) and 3 (GN R. 324 of 2017) of the Environmental Impact assessment (EIA) regulations published in terms of the National Environmental Management Act (No. 107 of 1998).
- Waste Management Activities published under Regulation GN. 921 of 29 November 2013, under National Environmental Management: Waste Act (No. 59 of 2008).

A full Scoping and Environmental Impact Assessment process must be undertaken in terms of the EIA regulations (GNR 326 of 2017) to obtain Environmental Authorisation (EA) for the proposed expansion project. The Northern Cape Department of Mineral Resources and Energy is the Competent Authority (CA) responsible for administration of the process.

An application will also be submitted for the licensing of water use activities in terms of Section 21 (c, g and i) of the the National Water Act (No. 36 of 1998):

A public participation process must be undertaken in terms of the regulatory requirements for both the EIA and water use licensing process. This letter serves to **notify you as a landowner, lawful occupier, interested or affected party of the EIA and WUL application processes that are being undertaken.**

EXM Environmental Advisory (Pty) Ltd ("EXM") has been appointed as the Independent Environmental Assessment Practitioners (EAP) responsible for administrating the abovementioned application process:

PURPOSE:	**YOUR ROLE:**
This document serves to: ➢ Notify you of the environmental application processes. ➢ Describe the application processes. ➢ Inform you as to how you can provide input into the processes.	As an interested and affected party, your role is to: ➢ Ask questions, raise issues and concerns. ➢ Review and provide comment on environmental reports.

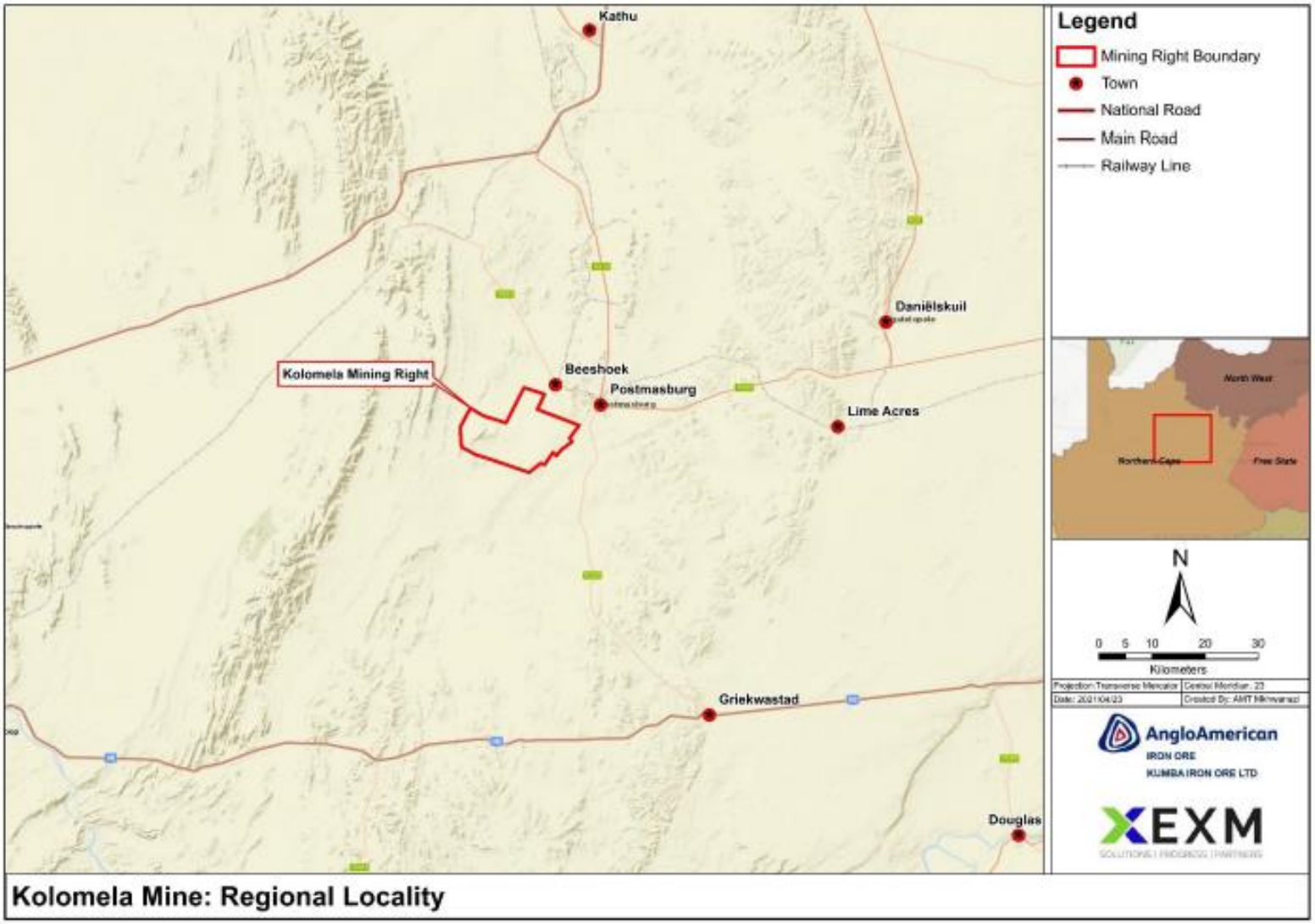


FIGURE 1: GENERAL LOCATION OF KOLOMELA MINE

2. Preliminary Overview of the of the proposed Kolomela expansion activities

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south east of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province.

SIOC proposes to develop new and expand existing activities to facilitate mining at Kolomela mine. The following new and expanded activities are proposed at Kolomela mine:

- A new Photovoltaic Solar Facility to support electricity supply to the mine..
- New Low Grade Ore Storage Areas for the storage of ore transported for processing at Kolomela from surrounding mines.
- New infrastructure for the management of tailings from the existing DMS Plant:
  - New Tailings Storage Facility on the existing Leeuwfontein Waste Rock Dumps.
  - Paddocks for the temporary storage of tailings adjacent to the existing DMS plant.
  - A return water dam for the management of water from the TSF for re-use at the plant.
- A new Waste Tyre Management Facility.
- A new Conveyor and railway line to transfer material to and from the DMS Plant.
- A new Haul Truck Parking area at Kapstevel South Pit.
- Widening and amendment of the Kapstevel Haul roads.
- Amendment to Kapstevel DMS conveyor (to be built in the future) position to allow for expanded haul roads.
- Amendment of Kapstevel Waste Rock Dumps including new facilities to allow for disposal to accommodate changes in mine planning and protection of potential future ore reserves.
- Operational changes to existing disturbed footprints layout.
- Additional soil stockpile and park up areas.
- Stormwater management infrastructure at Kapstevel Waste Rock Dumps and Kapstevel At Pit Facility including evaporation dams and diversion berms.
- Access road to facilitate construction of infrastructure at the Kapstevel At Pit Facility.
- Expansion of waste rock dump footprint areas to allow for reshaping during rehabilitation.

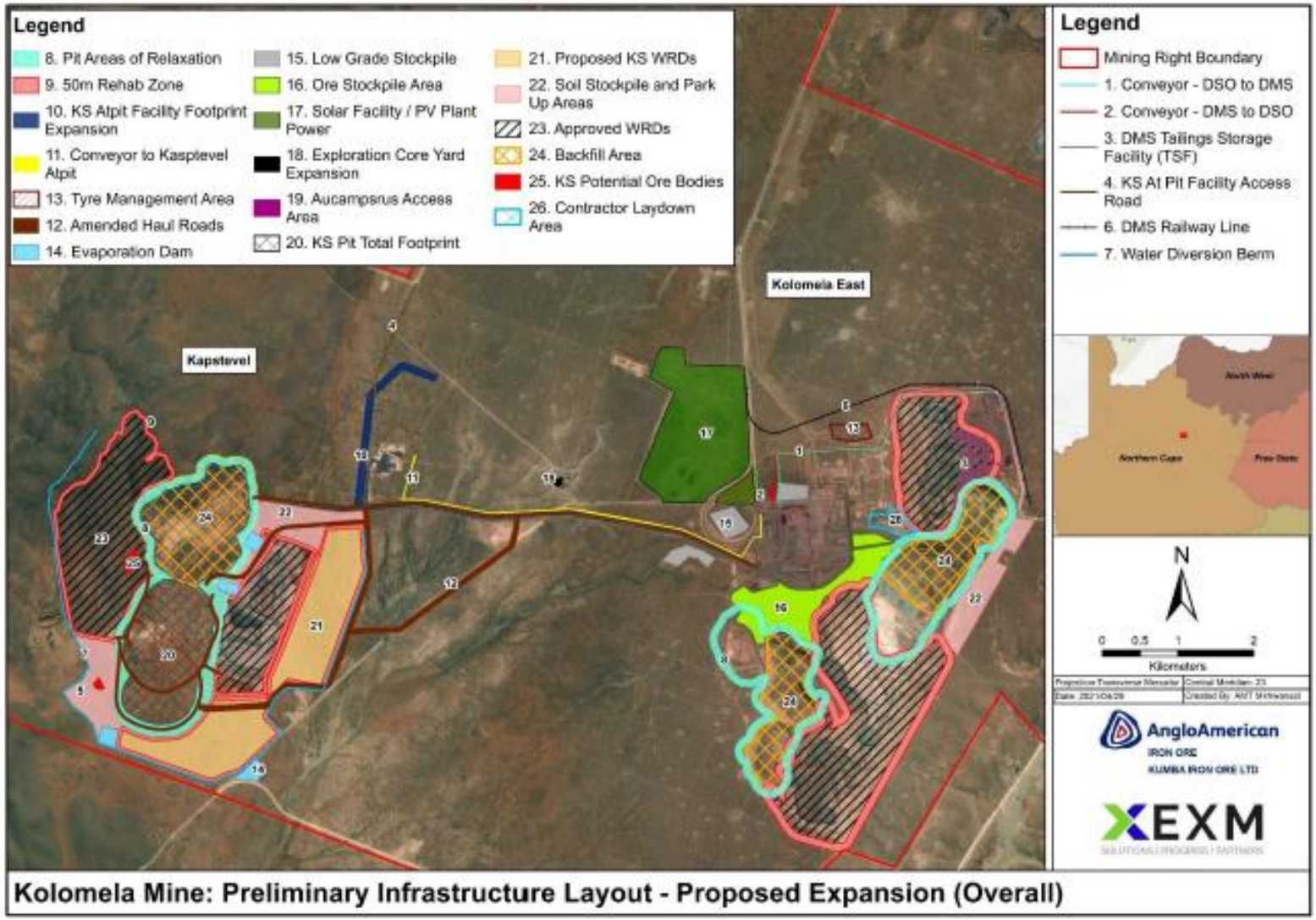


FIGURE 2: INITIAL CONCEPTUAL LAYOUT OF EXPANSION ACTIVITIES

3. Environmental Approvals Required

3.1 Minerals & Petroleum Resources Development Act (No. 28 of 2008)

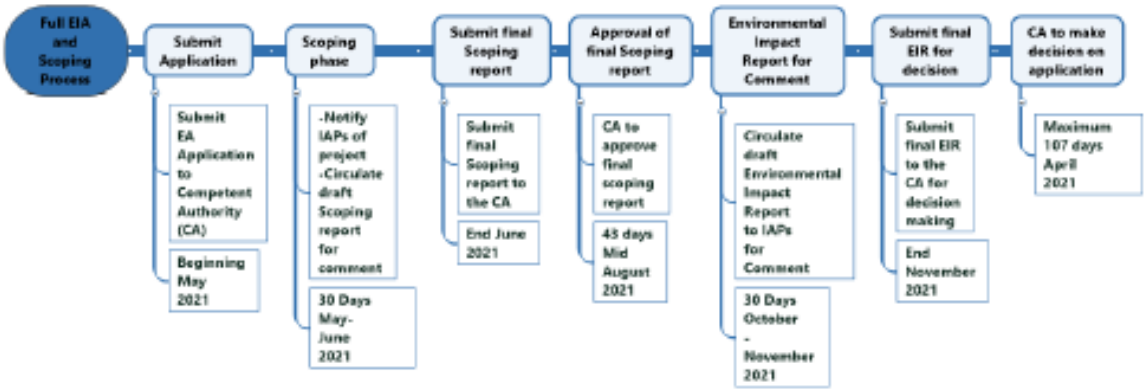
Section 102 of the Minerals & Petroleum Resources Development Act (MPRDA) regulates the amendment of an EMPr due a change of activities related to a specific mining right. The proposed activities including the expansion of mining and association activities at are not included in the existing approved Kolomela EMPr or any amendment thereto. The EMPr thus requires amendment to include the new and changed infrastructure at Kolomela.

3.2 National Environmental Management Act (No. 107 of 1998) (NEMA)

The expansion of mining related activities at Kolomela mine triggers various activities listed in Listing Notices 1 (GN R. 327 of 2017), 2 (GN R. 325 of 2017) and 3 (GN R. 324 of 2017) published in terms of the National Environmental Management Act.

Activities triggered in terms of Listing notice 2 require an environmental authorisation which needs to be supported by a full EIA and Scoping process that must be conducted in terms of the NEMA EIA regulations (GNR. 982 of 2014, as amended). Activities triggered in terms of Listing notices 1 and 3 require an environmental authorisation which needs to be supported by a Basic Impact Assessment, however a full EIA will be required due to the triggering of activities in listing Notice 3.

According to the EIA Regulations, the competent authority for submission of the application for environmental authorisation is the Minister responsible for mineral resources i.e. the Northern Cape Department of Mineral Resources and Energy (DMRE). The regulated timeframes for the completion of the EIA process, as provided in the EIA Regulations, are provided in Figure 3.



3.3 National Environmental Management: Waste Act (No. 59 of 2008)

In terms of Section 19 of the National Environmental Management: Waste Act, a list of waste management activities that is likely have a detrimental effect on the environment was promulgated through Regulation GN. 921 (November 2013). The listed activities were amended by GN. 633 of 24 July 2015 to include the development of mine residue dumps. Note that in terms of Schedule 3 of the Act, all mineral residue deposits are also regarded as Hazardous Waste.

An application needs to be made to the DMRE for a Waste Management Licence to allow for the development or expansion of waste rock dumps and the development of a Tailings Storage Facility. The application is to be supported by a Scoping and EIA Process, Category B activities are triggered.

Table 2: Waste Management Activities

Activity No	Description
Category B	
7	The disposal of any quantity of hazardous waste to land i.e. mineral residue (waste rock and tailings) at Kolomela
10	Construction of a waste management activity listed in Category B of this Schedule.
11	The establishment of a residue deposit resulting from mining activities at Kolomela.
13	The expansion of a residue deposit resulting from mining activities at Lylyveld

3.4 National Water Act (No. 36 of 1998) (NWA)

The proposed expansion activities will include water uses as defined in terms of Section 21 of the National Water Act (Act 36 of 1998). These proposed water uses are provided in Table 2 below.

Table 3: Section 21 water uses to be included in the Water Use Licence Application

Section 21 Listed Activity	Related activities
c&i (water courses – pans and stream)	Construction/amendment of infrastructure • Haul roads (widening and new) • Conveyors to and from DMS plant. • Railway from DMS plant. • Kapstevel Waste Rock Dump • Waste Tyre Storage Area
g (waste disposal)	Construction/amendment of infrastructure • Kapstevel Evaporation Dams • Kapstevel Waste Rock Dumps • TSF on Leeuwfontein WRD • Paddock facility • Return Water Dam for TSF

Authorisation of the abovementioned water uses will require an application for an Integrated Water Use Licence (IWUL) in terms of the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR. 267 of 2017).

The IWUL application will be supported by a Technical Report compiled in accordance with the

4. Public Participation Process

A public participation process is being undertaken as part of the applications. The process is conducted in terms of the NEMA EIA regulations (GNR. 326 of 2017) and the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR 267 of 2017) promulgated under the National Water Act, 1998 (Act No.36 of 1998). Stakeholders are offered the opportunity to be informed about the application, raise comments, issues or concerns and provide input into the application and reports.

Interested & affected parties (I&APs) are invited to participate in the environmental process. You can provide input by:

- Registering as an interested & affected party (IAP);
- Asking questions and raising initial concerns by completing and returning the response sheet (attached);
- Reviewing and providing comment on reports.

I&APs will be informed when all the documents will be available for review.

Should you have questions or require more information, **please contact**:

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