LIMBERG MINING COMPANY (PTY) LTD: THABA MINE

Draft Scoping Report for the proposed activities at Thaba Mine

Report date: 31 August 2023

Reference: LIM-THA-22-12-07

SHANGONI
Management Services (Pty) Ltd

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Executive summary

Limberg Mining Company (Pty) Ltd (“LMC”) (previously known as Cronimet Chrome Mining SA (Pty) Ltd): Thaba Mine is operating under Mining Right 115 (“MR”) who’s mining right commenced on 17 March 2010 and was issued for 30 years ending 16 March 2040.

Thaba Mine plans to upgrade the existing processing plant to extract both Chrome and Platinum Group Metals (“PGM’s”) from both run of mine as well as from tailings stored at the existing Tailing Storage Facility (“TSF”). Tailings from the TSF and tailings from material processed from the continuation of mining of other opencast pits will be deposited (backfilled) into one of the Opencast Pits (Pit 2 (ML1)). The upgrade of the processing plant will result in additional infrastructure requirements. These include the construction and upgrade of:

- Stormwater channels,
- Clean and dirty water systems,
- Pipelines and a return water dam (“RWD”),
- Process water dam upgrade,
- Affected Stormwater dam at the TSF upgrade (already authorised under the current WUL),
- RWD at the TSF upgrade (if necessary) (already authorised under the current WUL),
- New RWD at the processing plant.
- Drilling of boreholes, including scavenger boreholes,
- Extraction of water directly out of the pits (pit dewatering),
- Dump stockpile area next to existing TSF,
- Dump stockpile area at additional hydro mining station at the plant (next to the new RWD)
- A 26.65 Mega Watt (“MW”) photovoltaic (“PV”) solar power plant to be used at the mine for mining and processing operations. Power production above the power requirements of the mine will be exported to ESKOM, and or third party off takers.

Some of the proposed activities will require authorisation in terms of the Environmental Impact Assessment Regulations Listing Notices of 2014, as amended, and published in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (“NEMA”). Authorisation in terms of section 19 of the National Environmental Management Waste Act (Act No. 59 of 2008) (“NEM:WA”) and the List of Waste Management Activities (“GN.R 921”) dated 29 November 2013, as amended is also required (refer to the legislative section of the report for details).

A summary of the activities associated with the application is given below:

26.65 MWp PV SOLAR POWER PLANT

The existing 1 MWp PV Solar Power Plant will be upgraded to 26,65 MW PV Solar Power Plant and will cover an area of approximately 38 hectares in total (11 ha on the Southern portion and 27 ha on the Northern portion). Power will be used by Thaba Mine for mining and processing purposes, and

power production above the power requirements of the mine will be exported to ESKOM (the application to export to ESKOM is in process), and or third party off takers.

TSF

The tailings at the existing TSF (the TSF is already authorised in the Environmental Authorisation with reference number: LP 30/5/1/2/2/115 (115) EM will be re-treated to extract residual Chrome and PGM's.

IN-PIT DEPOSITION

Tailings from the TSF and the continuation of mining from current and future pits will be deposited (backfilled) into the Opencast Pit 2 (ML1) for an estimated period of 10 years.

DAMS, STORMWATER, PIPLINES, WATER STORAGE AND BOREHOLES

(i) A new Return Water Dam (RWD) near the Plant will be constructed and have HDPE lining.
(ii) At the TSF the existing RWD, which is already lined with a HDPE liner, will be upgraded if necessary and lined (the dam is already licenced in the existing WUL with reference number: 03/A34F/ACGIJ, for up to 10,000 m^3, it is anticipated that this capacity will not be exceeded).
(iii) At the TSF the existing Affected Stormwater Dam will be upgraded to increase the capacity from approximately 8,000m^3 up to 38,000m^3 and a HDPE liner will be added (the dam is already licenced for a capacity of 38,000m^3 and is referred to as a Pollution Control Dam (Stormwater Dam 1) in the existing WUL with reference number: 03/A34F/ACGIJ, this capacity will not be exceeded).
(iv) Upgrading and installing new stormwater channels and pipelines for clean and dirty water (dirty water channels will have a HDPE liner.
(v) Up to 2.5 Megalitres (2,500 m^3) of water will be stored in a process water dam (or potentially a 2.5 ML Hydrex Dam) near the processing plant.
(vi) 5 Scavenger boreholes will be drilled at the TSF to extract groundwater to contain any potential leachates from the TSF, the water will be used in the processing plant.
(vii) 6 Boreholes will be drilled (3 boreholes at the rehabilitated backfilled pit and 3 at the Pit 2 (ML1) where the in-pit deposition of tailings will take place). The purpose of the boreholes is to extract groundwater to contain any potential leachates from the TSF, the water will be used in the processing plant.
(viii) Water will also be extracted directly out of the pit.

PROCESSING PLANT

The tailings re-treatment facility entails upgrading and expanding existing infrastructure and facilities which will include the following:

(i) upgrading the existing chrome recovery plant,
(ii) constructing a new secondary (fine) chrome recovery plant,
(iii) constructing a new PGM concentrator (Milling and Flotation ("MF") 1 MF2 circuits),
(iv) upgrading existing services to support the three process units,
(v) a new tailings load station will be constructed (hydro mining station) whereby approval is required for dump stockpiling on a stockpile area (stock pad) with a footprint of approximately 225m^2.

LISTED ACTIVITES REQUIRING AUTHORISATION

The following listed activities are applied for:

Listed activity	Activity description	Applicability
Listing Notice 1 (GNR 983 of GG 41766 of 13 July 2018)		
21F	*Any activity including the operation of that activity required for the reclamation of a residue stockpile or a residue deposit as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required for the reclamation of a residue stockpile or a residue Deposit.";*	Reclaiming the tailings from the TSF (residue stockpile/ deposit).
36	*The expansion of facilities or structures for the generation of electricity from a renewable resource where—* *(i) the electricity output will be increased by 26 megawatts or more, excluding where such expansion takes place on the original development footprint; or* *(ii) regardless the increased output of the facility, the development footprint will be expanded by 1 hectare or more;* *excluding where such expansion of facilities or structures is for photovoltaic installations and occurs—* *(a) within an urban area; or* *(b) on existing infrastructure.*	The existing 1MWp PV Solar Power Plant is being expanded to 26.65 MWp, and in total will cover approximately 38 ha and will be done a phased approach (3 phases).
67	*Phased activities for all activities—* *(i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices;* *excluding the following activities listed in this Notice-* *17(i)(a-d); 17(ii)(a-d); 17(iii)(a-d); 17(iv)(a-d); 17(v)(a-d); 20; 21; 22 deleted 24(i); 29; 30; 31; 32; 34; 54(i)(a-d); 54(ii)(a-d); 54(iii)(a-d); 54(iv)(a-d); 54(v)(a-d); 55; 61; 64; and 65; or* *(ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices;* *where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.*	The 26.65 MWp PV Solar Power Plant will be constructed in 3 phases.
Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017)		
6	*The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding—* *(i) activities which are identified and included in Listing Notice 1 of 2014;* *(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;* *(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or* *(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.*	WML Activities (see table below) and WUL activities are being applied for as follows. • Section 21 (f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit. (Wastewater will not be discharged, it will be contained in RWD, and the pit and re-used in the plant, eventually deposited on the TSF) • Section 21 (g) disposing of waste in a manner which may detrimentally impact on a water resource. (Disposing of tailings in the pit) • Section 21 (j) removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people. (Dewatering the pit and dewatering around the TSF.)

Listed activity	Activity description	Applicability
15	*The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	The clearing of approximately 27 ha of indigenous vegetation (within the mining right boundary) for the PV solar power plant.
19	*The removal and disposal of a mineral, which requires a permission in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required for exercise the permission.".*	Disposal of tailings (a mineral) in the pit requires authorisation.

Listed activity	Activity description	
Waste Management Activity GN No. 921 of 29 November 2013 (amendment GN R 633, July 2015, 2017, 2022)		
Nr	**Category B (Environmental Impact Assessment Process)**	
Category B (9)	*The disposal of inert waste to land in excess of 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.*	The tailings are inert waste (refer to the waste classification meeting). Estimated 33,000 tonnes per month for 10 years (estimated total of 4.2 million tonnes over 10 years).
Category B (11)	*The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).*	The tailings at the TSF will be reclaimed from the TSF (residue stockpile). A new stock pad at the plant area for the temporary storage of tailings.

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South African National Biodiversity Institute Biological GIS database: https://www.sanbi.org/link/bgis-biodiversity-gis/

Abbreviations

AIP	Invasive Plant Species
BA	Basic Assessment
BGIS	Biodiversity Global Information System
CA	Competent Authority
CBA	Critical biodiversity areas

CR	Critically Endangered
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DENC	Departments of Nature Conservation and Forestry
DFA	Development Facilitation Act, 1995 (Act No. 67 of 1995)
DFFE	Department of Fisheries, Forestry and Environment
DWS	Department of Water and Sanitation
DWA	Department of Water Affairs
DMRE	Department of Minerals and Energy
ESA	Ecological support area
ESA	Early Stone Age
EIA	Environmental Impact Assessments
EA	Environmental Authorisation
ECI	Electrical, control and instrumentation
EMP	Environmental Management Programmes
EIAR/EMPr	Environmental Management Programme Report
FEPA	Freshwater Ecosystem Priority Area
GET	Ground Engaging Tool
GIS	Global Information System
ha	hectare
HGM	Hydro-geomorphic
HME	Heavy Mining Equipment
LDV	Light delivery vehicle
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LM	Local Municipality
LMC	Limberg Mining Company (Pty) Ltd
LOM	Life of Mine
LSA	Later Stone Age
MAR	Mean Annual Runoff
MAMSL	Metres above mean sea level

MF	Milling and Flotation
MR	Mining Right
MW	Megawatt
MWp	Megawatt peak
NEM:WA	National Environmental Management Waste Act (Act No. 59 of 2008)
NEMBA	National Environmental Management: Biodiversity Act (No 10 of 2004)
NFEPA	National Freshwater Ecosystem Priority Areas
MSA	Middle Stone Age
ONA	Other natural area
PGM	Platinum Group of Metals
PM	Particulate Matter
PV	Photovoltaic
ROM	Run of Mine
RWD	Return Water Dam
TSF	Tailings Storage Facility
SAIAB	South African Institute for Aquatic Biodiversity
SANParks	South African National Parks
SANBI	South African National Biodiversity Institute
SCC	Species of conservation concern
S&EIR	Scoping and Environmental Impact Assessment
SLP	Social and Labour Plan
VIA	Visual Impact Assessments
VU	Vulnerable
WML	Waste Management License
WRC	Water Research Commission
WUL	Water use license
WVG	Wetland Vegetation Group
WWF	World Wildlife Fund

1. Details of project applicant and environmental assessment practitioner

1.1. Details of the project applicant

Name of operation	Thaba Mine
Applicant	Limberg Mining Company (Pty) Ltd
Address	Ground Floor, Building 31, The Woodlands Office Park Woodlands Drive, Woodmead, 2152, Johannesburg, South Africa
Responsible person	Nico Schoeman
Telephone no.	+27 11 035 3950
e-mail address	Nico@Limberg.co.za
Company registration no.	2003/008407/07

1.2. Details of the environmental assessment practitioners

EAP's	Shangoni Management Services (Pty) Ltd.: Colleen van der Merwe: EAPASA Registration number: 2019/960 Lee-Anne Fellowes: EAPASA Registration number: 2019/850 SACNASP Registration number: 115574
Tel No	(012) 807 7036
Fax No	(012) 807 1014
e-mail Address	Colleen@shangoni.co.za Lee-anne@shangoni.co.za

1.3. Expertise of the environmental assessment practitioner

Name and Surname	Qualifications and summary of experience
Lee-Anne Fellowes	Lee-Anne has a B-tech degree in Nature Conservation from the Tshwane University of Technology and holds a National Diploma in Nature Conservation. She gained valuable experience in the conservation and the environmental field through her employment at Gauteng's Department of Agriculture, Conservation and Environment for a period of 5 years. Her areas of expertise include alien invasive surveys, biodiversity action & conservation plans, Environmental Impact Assessments ("EIA"), Environmental Management Programmes ("EMP"), Section 24G Rectification Applications, Basic Assessments, Water Use Licenses and Project Management. Lee-Anne has 16 years' experience at Shangoni Management Services. Lee-Anne has been registered as a Professional Natural Scientist in the field of Conservation Science Registration number: 115574 and is registered as an environmental impact assessment practitioner Registration number: 2019/850. Lee-Anne is currently serving

Name and Surname	Qualifications and summary of experience
	on the Gauteng's Department of Agriculture and Rural Development Appeals Panel Committee for a period of 36 months (2020 – 2023).
Colleen van der Merwe	Colleen van der Merwe is a registered Environmental Assessment Practitioner with more than 15 years' experience in the Environmental Management field with experience both as an Environmental Consultant and as Environmental Officer/Manager. Colleen holds a B.Sc. Degree in Geography and Environmental Management. She has extensive industry experience in Environmental Compliance Auditing, Environmental Permitting (Scoping and Environmental Impact Assessments, Water Use Licence Applications, Waste Management Licence Applications), ISO 14001 Environmental Management System (EMS) Development and Implementation.

2. Description of the property

Thaba Mine is located on portions of the farm Elandskuil 378 KQ, Middellaagte 382 KQ, Roodedam 368 KQ, Schilpadnest 385 KQ, and Zwartkop 369 KQ and is situated approximately 18 km south of Thabazimbi and approximately 23 km north-east of Northam in the Limpopo Province. The proposed activities are specifically located on Middellaagte 382 KQ. For the affected properties refer to Table 1, and Figure 1.

Table 1: Affected properties

Farm name	Elandskuil 378 KQ	Open cast pits and underground mining areas.
	Middellaagte 382 KQ	Tailings Re-treatment (TSF, dams and processing plant), In-pit deposition, and the 26.65MW PV Solar Power Plant, existing open cast pits and existing underground mining areas.
	Roodedam 368 KQ	Open cast pits
	Schilpadnest 385 KQ	Underground mining areas
	Zwartkop 369 KQ	Open cast pits
Magisterial district	Waterberg District Municipality	
Distance and direction from nearest town	18 km south of Thabazimbi and approximately 23 km north-east of Northam.	
21-digit Surveyor General Code	T0KQ00000000037800000	
	T0KQ00000000038200000	
	T0KQ00000000036800000	
	T0KQ00000000038500000	
	T0KQ00000000036900019	

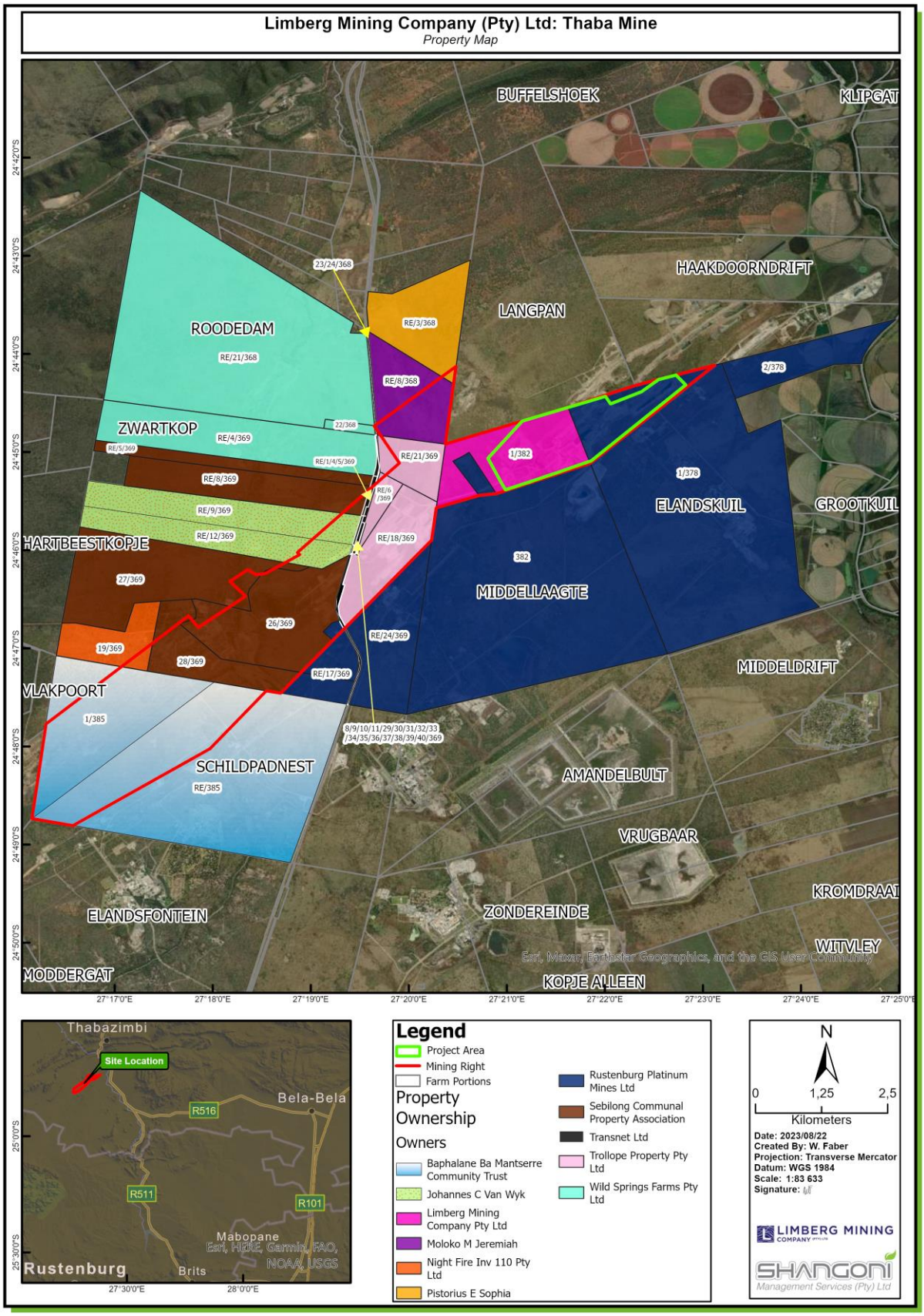

Figure 1: Property Map

3. Locality of the project

Thaba Mine falls within the administrative boundaries presented in Table 2. Refer to Figure 2 for the locality map.

Table 2: Administrative boundaries

Province	Limpopo Province
District municipality	Waterberg District Municipality
Local municipality	Thabazimbi Local Municipality
Department of Mineral and Energy ("DMRE") Local Office and the Competent Authority ("CA")	DMRE
Department of Water and Sanitation ("DWS") Local Office	DWS
Department of Economic Development, Environment and Tourism Limpopo	LEDET
Catchment zone	Quaternary catchment A24F (Bierspruit Sub-catchment)
Sub-catchments	Catchment 1A and 1B
Water Management Area ("WMA")	Crocodile (West) and Marico Water Management Area
Quaternary catchment	A24Ft

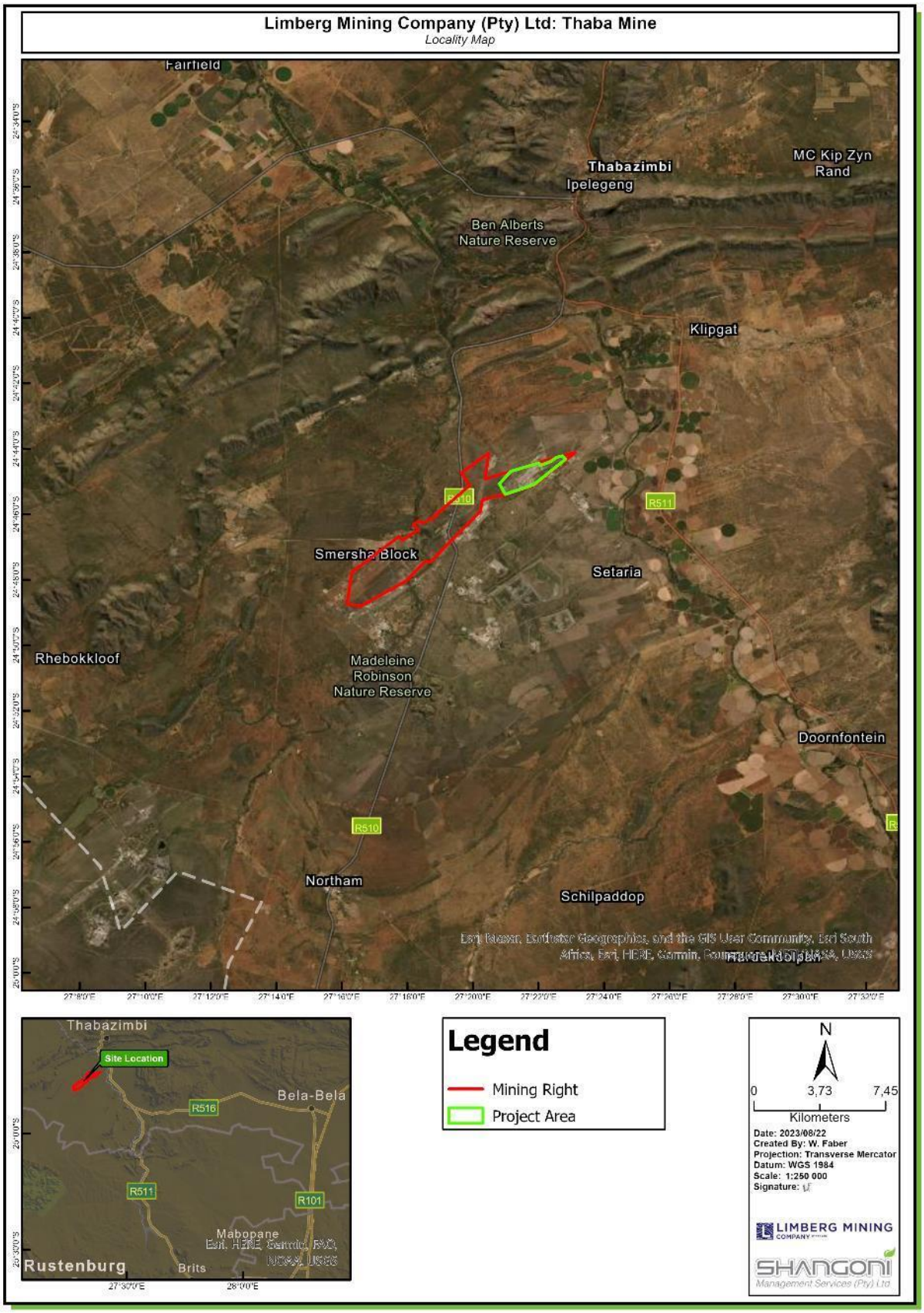

Figure 2: Locality map

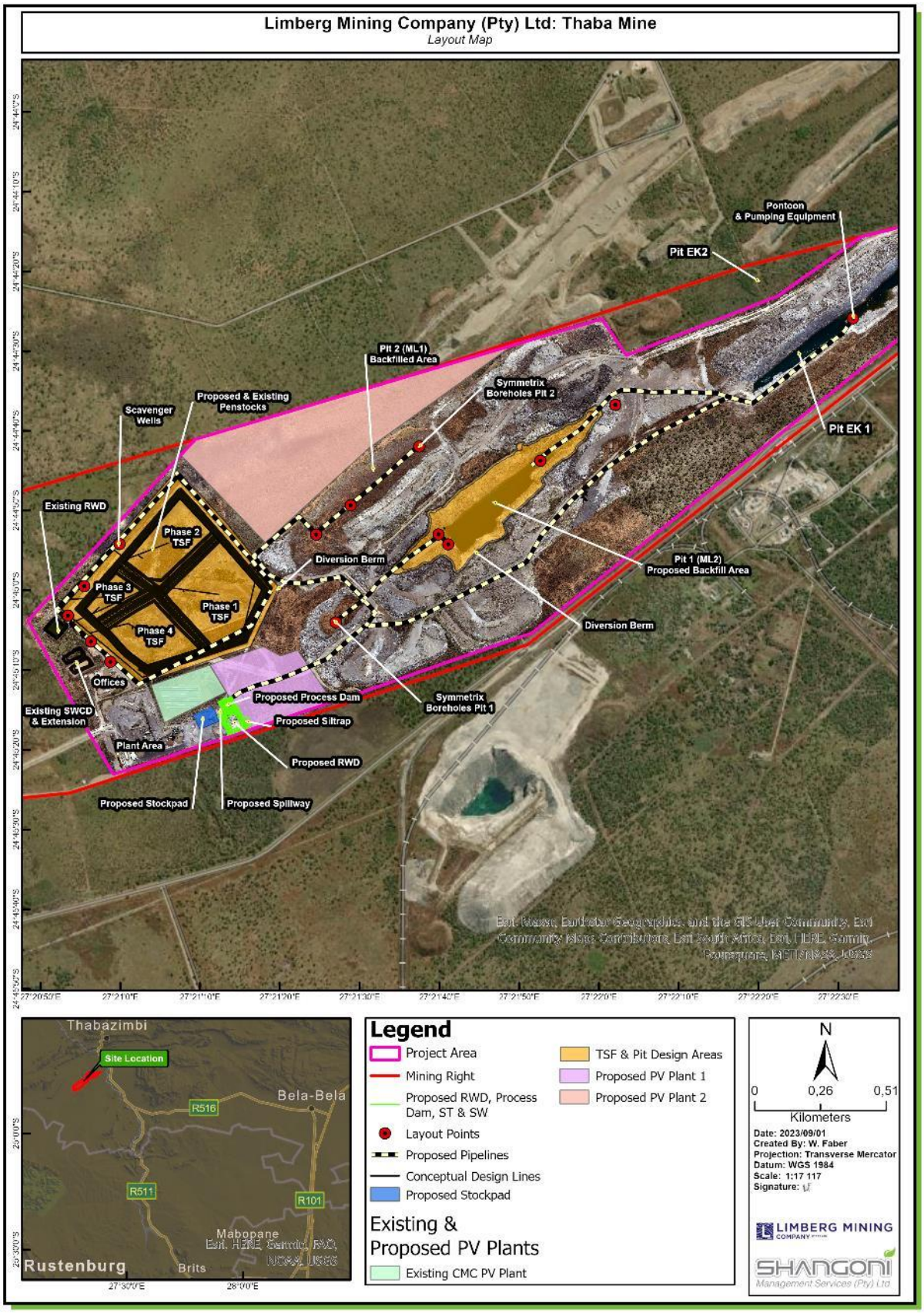

Figure 3: Layout Map of the proposed activities at Thaba Mine

4. Description of the scope of the proposed activities

Thaba Mine plans to re-treat the tailings currently stored at the existing TSF. The tailings re-treatment project entails upgrading the existing processing plant to extract residual Chrome and Platinum Group Metals ("PGM") from tailings at the existing Tailing Storage Facility ("TSF"). Tailings from the TSF and tailings from material processed from the continuation of mining of other opencast pits will be deposited into one of the Opencast Pits (Pit 1 (ML2)). The existing TSF will be kept available for future storage of tailings during the LOM. A new stock pad of approximately 225 m^2 will be established near the processing plant for the stockpiling of dry tailings, the stock pad will be lined with a class D liner.

Stormwater channels, clean and dirty water systems, pipelines, boreholes, including scavenger boreholes, and return water dams ("RWD") will need to be constructed/ upgraded around the TSF, Opencast Pit 2 (ML1) and near the processing plant.

A 26.65 Mega watt peak ("MWp") photovoltaic ("PV") solar power plant will be constructed for electricity to be used at the mine.

Refer to Figure 3 for the layout map.

4.1. Description of the proposed activities to be undertaken

A summary of the activities associated with the application is given below:

IN-PIT DEPOSITION

Tailings from the TSF and the continuation of mining from both current pits will be deposited into the Opencast Pit 2 (ML1) for an estimated period of 10 years. Refer to annexure A for the conceptual designs of the Tailings-In-Pit-Deposition and Stormwater management Plan.

DAMS, STORMWATER, PIPELINES, AND WATER STORAGE

(i) A new Return Water Dam (RWD) near the Plant will be constructed and have a HDPE liner.
(ii) At the TSF the existing RWD will be upgraded in size if necessary and lined with HDPE lining (it is currently lined.
(iii) At the TSF the existing Affected Stormwater Dam will be upgraded to increase capacity from approximately 8,000 m^3 to a maximum of 38,000m^3, and a HDPE liner will be added (this dam is already licenced and is referred to as a Pollution Control Dam (Stormwater Dam 1) in the existing WUL with reference number: 03/A34F/ACGIJ for a capacity of 38,000 m^3, this capacity will be exceeded).
(iv) Upgrading and installing new stormwater channels and pipelines for clean and dirty water (dirty water channels will have a HDPE liner).
(v) Up to 2.5 Megalitres (2,500 m^3) of water will be stored in a process water dam, which will be lined with HDPE lining, (or potentially a 2.5 ML Hydrex Dam) near the processing plant.

(vi) 5 Scavenger boreholes will be drilled at the TSF to extract groundwater to contain any potential leachates from the TSF, the water will be used in the processing plant.
(vii) 6 Boreholes will be drilled at the Pit 2 (ML1) where the in-pit deposition of tailings will take place The purpose of the boreholes is to extract groundwater to contain any potential leachates from the TSF, the water will be used in the processing plant.

TSF

The tailings at the existing TSF (the TSF is already authorised) will be re-treated to extract additional Chrome and PGM's. Refer to annexure B for the Conceptual Designs for the TSF and Stormwater Management at the TSF.

PROCESSING PLANT

The tailings re-treatment facility entails upgrading and expanding existing infrastructure and facilities which will include the following:

(i) upgrading the existing chrome recovery plant,
(ii) constructing a new secondary (fine) chrome recovery plant,
(iii) constructing a new PGM concentrator (MF1 and MF2 circuits),
(iv) upgrading existing services to support the three process units,
(v) a new tailings load station will be constructed (hydro mining station) with a stockpile area (stock pad) of approximately a 225m^2 footprint to be approved. The stock pad will be lined with a class D liner for the stockpiling of dry tailings at the secondary hydro mining area.

Tailing Re-Treatment High Level Project Overview:

The tailings re-treatment project entails an upgrade of the processing facility which will allow for the processing of Run of Mine (ROM) chrome ore and historical tailings for chrome and PGM recovery. The project will consist of the upgrade of existing ROM ore receiving, feed preparation and primary chrome recovery plant and the addition of a secondary chrome recovery plant and PGM flotation plant.

The plant will be designed to treat circa 50 000 tons per month of ROM ore and circa 16 000 tons per month of historical tailings reclaimed from the TSF. The block flow diagram below gives an overview of the planned process with average capacities based on dry solids rates.

ROM ore will be fed into the plant with mobile equipment and crushed down to -20mm in three crushing stages. A primary jaw crusher and a secondary jaw crusher will both be fed by vibrating grizzlies that remove the undersize onto the crusher product conveyors. The conveyors will feed the material to the next crushing stage. The dry vibrating screen will remove the undersize before feeding the tertiary cone crusher. The screen undersize and cone crusher product will combine onto the Primary spiral plant feed stockpile. Refer to Figure 4 for the block flow diagram.

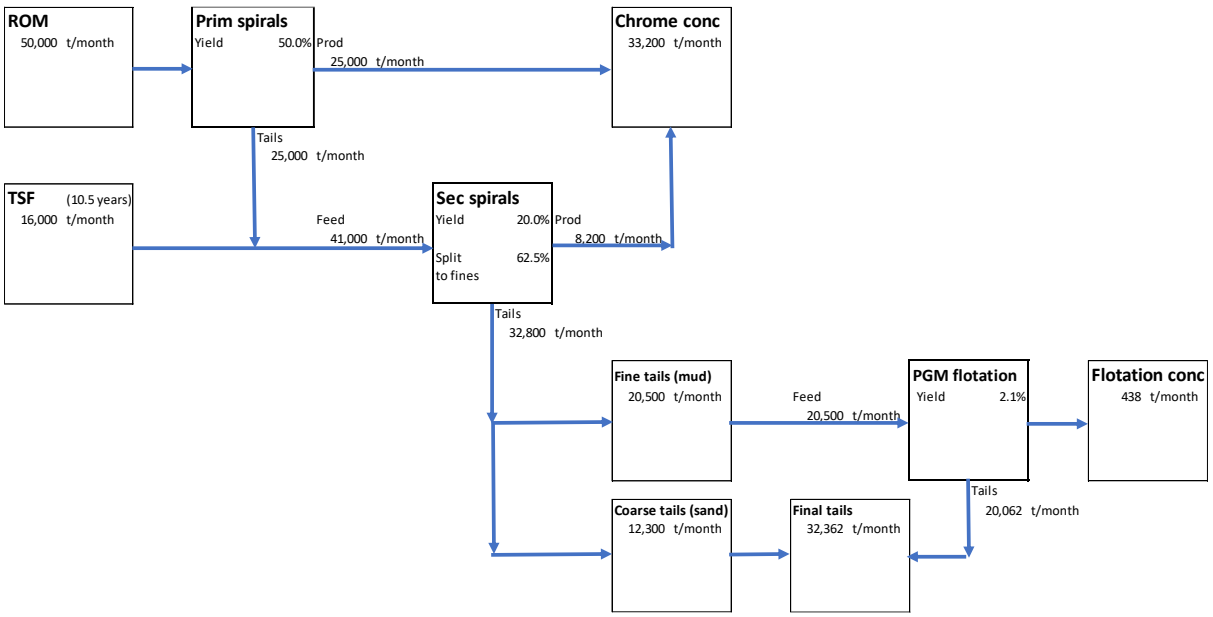

Figure 4: Block flow diagram

Vibrating feeders and a conveyor will extract crushed ore from the feed stockpile and will feed the wet sizing screen of the primary spirals plant. Over size material from the sizing screen will be fed to the primary ball mill where the ore will be ground down to -1mm. The sizing screen undersize will be pumped to the deslime cyclone with the undersize feeding the spirals circuit and the oversize feeding the primary slimes thickener. The spirals circuit will consist of various stages where the chromite will be concentrated into on-grade products that will be stacked on the product pad for loading. The tailings of the primary spirals circuit will be dewatered via a cyclone ahead of the tailings thickener before being fed to the secondary spirals circuit.

Historical tailings on the TSF will systematically be reclaimed using mobile equipment and fed into a feeding station consisting of a hopper, vibrating feeder, conveyor, trash screen and pump that will remove trash and vegetation and pump a slurry to the secondary spirals circuit.

Feed to the secondary spirals circuit will be fed into a surge tank and pumped to a cyclone feeding the secondary ball mill. The ball mill discharge will be screened into a coarse and a fines fraction and treated in two spirals circuits consisting of various stages where the chromite will be concentrated into on-grade products that will be stacked on the product pad for loading. The fine tailings will be thickened in the thickener before being fed to the PGM flotation plant. The coarse tailings will be thickened in a cyclone to the final tailings' thickener.

The PGM plant will consist of two circuits each incorporating a fine grinding mill before a rougher – cleaner – recleaner flotation circuit that will concentrate the PGM bearing minerals into an on-grade concentrate. The tailings from the first circuit will feed into the second circuit and the final tailings will be thickened in the final tailings thickener before being pumped to the new TSF. The concentrate from the PGM plant will be dewatered in a concentrate thickener before being stored in a holding tank for loading and dispatching via tanker trucks.

Material will be deposited into the new TSF (in-pit tailings deposition). Water will be recovered from the new TSF and pumped to the new silt trap and return water dam from where it will be returned to the process plant. Refer to annexure C for the design layout of the Processing Plant demonstrating existing and new facilities.

26.65 MW PV SOLAR POWER PLANT

The existing 1.0 MWp Solar Power Plant will be upgraded to 26.65 MWp and will cover an area of approximately 38 Ha in total (11 Ha on the Southern Portion and 27 Ha on the Northern portion). The PV Solar plant will be developed in a phased approach, with 3 phases. Refer to annexure D for the conceptual design layout of the proposed PV Solar Power Plant.

A detailed project description follows:

The new PV solar power plant has a planned total installed capacity of 26.65 MWp. The project will be constructed in three phases with installed capacities of 7 MWp, 10.75 MWp, and 8.9 MWp for phase 1, 2, and 3 respectively. The PV plant will consist of PV panels installed on static ground mount structures (single axis tracking are also being investigated). The PV panels will supply 110 kW inverter units to convert the DC power generated by the PV panels to AC (400V). The inverters are on-grid type units that synchronises with the electrical grid it is connected to and will shut-off when connection to the grid is lost. Up to 15 inverter outputs (1 650 kW total) will be combined in AC combiner boxes and the voltage increased to 22 kV by 2 MW, 22 kV / 400 V transformers. Multiple of the 1 650 kW (maximum) design blocks described above will be used to achieve the total output for each phase. The 22 kV output from the transformers will feed into a medium voltage (“MV”) substation with MV protection switchgear that allows each transformer (1 650 kW [max] block) input to be separately added/disconnected and will provide protection to the installation (from grid surges) and to the grid (from the installation side). One MV substation will be installed for phase 1, and a combined MV substation for phases 2 and 3. The MV substation(s) will feed into a newly constructed overhead line. The overhead line will connect to the existing overhead line on the mine that ties into to the Eskom supply point.

Battery backup is also envisioned for the project with a total of 2.5 hours (of maximum output) provided. The battery backup will be installed per power block described above, next to each transformer. The battery backup will connect with separate transformers and will be interlocked with the main supply to ensure battery power is only consumed by the mine itself and no power is fed into the ESKOM energy grid when ESKOM power is down. The batteries will be Li-ion or LiFePO4 batteries. The planned backup battery capacities are 17.5 MWh, 26.875 MWh, and 22.25 MWh for phase 1, phase 2, and phase 3 respectively.

Power usage:

Power will be used by the Limberg mine for mining and processing operations. Power production above the power requirements of the mine will be exported to ESKOM, and or third party off takers.

Details of use of the current PV and description to upgrade and incorporate into new PV system:

The current PV plant's power production is used by the Limberg mine with power limited to match the load. The application to export to ESKOM is in process after which excess power produced will be exported to ESKOM, and or third party off takers.

Phases:

Phase 1:	9.6998 ha	7 MWp
Phase 2:	14.911 ha	10.75 MWp
Phase 3:	12.3499 ha	8.9 MWp

Current land use:

The proposed 26.65 MW PV Solar Power Plant will be established within the mining right boundary. Part of the proposed area for the Solar Power plant is located on an area classified as an Other Natural Area (ONA) according to the South African National Biodiversity Institute ("SANBI") Biological GIS database (https://www.sanbi.org/link/bgis-biodiversity-gis/), and on top of a rehabilitated area (an opencast pit that was historically backfilled and rehabilitated).

Current electrical connection:

Current connection is a 22kV, 3MVA connection with an upgrade to a 10 MVA 132kV connection planned (new switching station), however, this is part of a separate application process involving ESKOM.

Waste from the PV Solar Power Plant:

The PV Panels will be recycled at the end of their life by third party recyclers. PV panels consist of aluminium, glass silicon wafers that are all recyclable. The batteries will be recycled at the end of their life by third party recyclers.

4.2. Listed and specified activities applied for

The proposed activities will trigger the following authorisations:

- An Environmental Authorisation ("EA") for listed activities contained in the Environmental Impact Assessment Regulations Listing Notices of 2014, as amended, and published in terms of sections 24(2), 24 (5), 24D, 44 and 47(A) (1) (b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA").
- Waste Management License ("WML") in terms of section 19 of the National Environmental Management Waste Act (Act No. 59 of 2008) ("NEM:WA") and the List of Waste Management Activities ("GN.R 921") dated 29 November 2013, as amended.

For the EA and WML applications, a Scoping and Environmental Impact Assessment ("S&EIR") will be conducted in accordance with the NEMA and the Environmental Impact Assessment Regulations, 2014 (GN R982 of 4 December 2014) ("GN R982"), as amended. Listed activities have been identified and provided in Table 3.

Table 3: Activities and listed activities associated with the proposed activities at Thaba Mine

Name of Activity	Arial Extent of Activity ha or m²	Listed/ Waste Activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
Site clearing of the footprint areas of the facilities			
Clearing of indigenous vegetation for the Northern portion of the PV Solar Power Plant.	27 ha	X	Activity 15 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017) *The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan*
Clearing of vegetation for the new RWD.	9000 m²		No activities triggered as no indigenous or sensitive vegetation will be cleared.
Clearing of vegetation for the upgrade of the existing Stormwater Dam at the TSF.	9000 m²		
Clearing of vegetation for the upgrading and lining of the RWD at the TSF.	9000 m²		
Construction and utilisation of the facilities			
Construction of pipelines	5 km		No activities triggered as the proposed facilities and infrastructure fall below the minimum thresholds requiring authorisation.
Construction of stormwater channels.	5 km		
Construction of new RWD	9000 m²		

Name of Activity	Arial Extent of Activity ha or m²	Listed/ Waste Activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
Upgrade of the existing Chrome and PGM recovery/ processing plant.	1 ha		
Reclaiming the tailings from the TSF (residue stockpile/ deposit).	30 ha	X	Activity 21F of Listing Notice 1 (GNR 983 of GG 41766 of 13 July 2018) *Any activity including the operation of that activity required for the reclamation of a residue stockpile or a residue deposit as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required for the reclamation of a residue stockpile or a residue deposit.*
The existing 1MW PV Solar Power Plant is being expanded to 26.65 MW, and in total will cover approximately 38 Ha and will be done in a phased approach (3 phases, over 3 years (1 phase per year).	38 ha	X	Activity 36 of Listing Notice 1 (GNR 983 of GG 41766 of 13 July 2018) *The expansion of facilities or structures for the generation of electricity from a renewable resource where—* *(i) the electricity output will be increased by 10 megawatts or more, excluding where such expansion takes place on the original development footprint; or* *(ii) regardless the increased output of the facility, the development footprint will be expanded by 1 hectare or more; excluding where such expansion of facilities or structures is for photovoltaic installations and occurs—* *(a) within an urban area; or* *(b) on existing infrastructure.*
		X	Activity 67 of Listing Notice 1 (GNR 983 of GG 41766 of 13 July 2018) *Phased activities for all activities—* *(i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices;* *excluding the following activities listed in this Notice-* *17(i)(a-d); 17(ii)(a-d); 17(iii)(a-d); 17(iv)(a-d); 17(v)(a-d);* *20; 21; 22 deleted 24(i); 29; 30; 31; 32; 34;* *54(i)(a-d); 54(ii)(a-d); 54(iii)(a-d); 54(iv)(a-d); 54(v)(a-d);* *55; 61; 64; and 65; or*

Name of Activity	Arial Extent of Activity ha or m²	Listed/ Waste Activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
			(ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; *where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.*
WML and WUL activities are being applied for in terms of national or provincial legislation governing the generation or release of emissions, pollution, or effluent.	NA	X	Activity 6 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017) *The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution, or effluent, excluding—* *(i) activities which are identified and included in Listing Notice 1 of 2014;* *(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;* *(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or* *(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.*
Disposal of tailings (a mineral/ and classified as inert waste) in the pit.	4.2 million tonnes in total over 10 years (33,000 tonnes per month)	X	Activity 19 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017) *The removal and disposal of a mineral, which requires a permission in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission.*
			Activity 9 of Category B of Waste Management Activity GN No. 921 of 29 November 2013 (amendment GN R 633, July 2015, 2017, 2022) *The disposal of inert waste to land in excess of 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.*
Tailings will be reclaimed from the TSF for re-treatment/ re-processing to		X	Activity 11 of Category B of Waste Management Activity GN No. 921 of 29 November 2013 (amendment GN R 633, July 2015, 2017, 2022)

Name of Activity	Arial Extent of Activity ha or m²	Listed/ Waste Activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
extract residual Chrome and PGM's.			*The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).*

5. Policy and legislative context

The following table is a summary of the policy and legislative context applicable to the proposed activities.

Table 4: Policy and legislative context

Applicable Legislation and Guidelines used to compile the Report	Reference where applied	Compliance and response of the Thaba Mine Project
The Constitution of the Republic of South Africa, 1996.	Throughout this Scoping Report.	The Constitution of the Republic of South Africa was considered and applied to throughout the Scoping Report as the Constitution states that everyone has the right: (a) to an environme.88nt that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations.
The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002, as amended).		The Scoping Report has been compiled to comply to the requirements of the Mineral and Petroleum Resources Development Regulations (GN R527 dated 2004).
The National Environmental Management Act (Act No. 107 of 1998 as amended).		The Scoping Report has been compiled in terms of GN R982, as amended and promulgated in terms of sections 24(5), 24M and 44 of the National Environmental Management Act, Act No. 107 of 1998 ("NEMA").
The Environmental Impact Assessment Regulations (GN R982 dated 2014, as amended).		The Scoping Report was compiled in terms of the requirements of Appendix 2 of the Environmental Impact Assessment ("EIA") Regulations (GN R.982 dated 2014, as amended).
The Environmental Impact Assessment Regulation. Listing Notice 1. (GN R983 dated 2014, as amended).	Section 4.2 of this Scoping Report.	Activity 21F, 36 and 67 of Listing Notice 1 are applied for the proposed activities.
The Environmental Impact Assessment Regulation. Listing Notice 2. (GN R984 dated 2014, as amended).		Activity 6, 15 and 19 of Listing Notice 2 are applied for the proposed activities.
The Environmental Impact Assessment Regulation. Listing Notice 3. (GN R985 dated 2014, as amended).		No activities applied for.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	Section 6.1 of this Scoping Report.	The need and desirability were assessed for the proposed activities.
Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector.	Chapters E, F and L of section 8.4.1; and section 8.4.4 of this Scoping Report.	Due to the proposed activities taking place on mine areas that are already impacted, biodiversity was not assessed.
The National Water Act (Act No. 36 of 1998, as amended).	Chapter G and H of section 8.4.1	The proposed activities will require a water use license ("WUL") for the following: • *Section 21 (a) Taking water from a water resource.*

Applicable Legislation and Guidelines used to compile the Report	Reference where applied	Compliance and response of the Thaba Mine Project
	of this Scoping Report.	(New boreholes) • *Section 21 (b) Storing water.* (Storing 2.5 ML (2500 cubic meters) in a process water dam or a Hydrex Dam) • *Section 21 (g) disposing of waste in a manner which may detrimentally impact on a water resource.* *(*Disposing of tailings in the pit) • *Section 21 (j) removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.* (Dewatering the pit and dewatering around the TSF.) The WUL will be applied for separately.
Regulations on use of water for mining and related activities aimed at the protection of water resources published in terms of the National Water Act under Government Notice 704 of 4 June 1999 (GN R704).	Chapter G of section 8.4.1 of this Scoping Report.	Storm water management measures, in compliance with GN R704, will be implemented for the proposed activities.
The National Environmental Management: Biodiversity (Act 10 of 2004, as amended).	Chapter E, F and L of section 8.4.1 of this Scoping Report.	Biodiversity related to the proposed activities and the alternatives considered. No DENC permits in terms of National Environmental Management: Biodiversity (Act 10 of 2004, as amended) will be required for the proposed activities.
Alien and Invasive Species Regulations (GN R598 dated 2014).		The occurrence of alien and invasive species will be assessed and mitigated (in accordance with these regulations) during the operational phase of the proposed activities.
Conservation of Agricultural Resources (Act 43 of 1983).		Erosion potential will be assessed and mitigated (in accordance with this act) during the operational phase of the proposed activities.
The National Environmental Management: Air Quality (Act 39 of 2004, as amended).	Chapter I of section 8.4.1 of this Scoping Report.	No Atmospheric Emissions Licence is required for the proposed activities.
SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication. SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.	Chapter J of section 8.4.1 of this Scoping Report.	The SABS Code of Practice 0103 will be taken into account when the mitigation measures for the proposed activities.

Applicable Legislation and Guidelines used to compile the Report	Reference where applied	Compliance and response of the Thaba Mine Project
National Environmental Management: Waste Act (Act No. 59 of 2008, as amended).	Section 4.1 of this Scoping Report.	The proposed activities trigger Category B: Activities 9 and 11.
National Heritage Resources Act (Act No. 25 of 1999, as amended).	Chapter K of section 8.4.1 of this Scoping Report.	No archaeological or historical sites are directly affected by the proposed activities.
DMRE Guideline for Consultation with communities and Interested and Affected Parties. As required in terms of sections 16(4)(b) or 27(5)(b) of the MPRDA, and in accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources.	Section 8.2 and 9.7 of this Scoping Report.	The public participation process is done in accordance with the DMRE guideline for consultation with communities and interested and affected parties.
Integrated Environmental Management Information Series. Criteria for determining alternatives in EIA.	Section 8.1 and section 8.6 of this Scoping Report.	Activity alternatives were assessed for the proposed activities.

6. Need and desirability of the proposed activities.

6.1. Need and desirability in terms of the guideline on need and desirability, 2017.

In 2017, the then Department of Environmental Affairs published an Integrated Environmental Management Guideline, the Guideline on Need and Desirability. The following provides information on how the guideline requirements were considered in this EIAR/EMPr.

6.1.1 How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?[1]

- The footprints of the proposed activities fall within areas already disturbed by mining activities, mining activities which were already authorised at Thaba Mine, therefore, in terms of vegetation clearance/ destruction it is anticipated that the proposed activities will have minor impact on the ecological integrity in the area.
- The site does not fall within a Critical Biodiversity (“CBA”) or Ecological Support Area (“ESA”), it falls within an Other Natural Areas (“ONA”)

[1] Section 24 of the Constitution and section 2(4)(a)(vi) of NEMA refer.

- There could be a potential impact in terms of pollution or the degradation of water resources and affected plant communities from some of the proposed activities which include the tailings re-treatment process, the in-pit deposition of tailings and the temporary storage of affected water in the RWD's (existing and new RWD's).
- The proposed 26.65 MW PV Solar Power Plant will be established within the mining right boundary. Part of the proposed area for the Solar Power plant is located on an area classified as an "Other Natural Area" according to the SANBI Biological GIS, and on top of a rehabilitated area (an opencast pit that was backfilled and rehabilitated), as such it can be expected that there will be an ecological impact whereby vegetation will be cleared for the establishment of the PV Solar Power Plant.
- The reclaiming of the tailings from the existing TSF (for which authorisation is already in place) and the re-deposition of tailings onto the existing TSF will not require any vegetation to be cleared or destroyed as these are already disturbed, operational mine areas.
- The proposed stormwater and clean/dirty water system upgrades and pipelines around the opencast pit (Pit 2 (ML1)) which will be backfilled with tailings, and the TSF is not anticipated to have a negative effect on the ecological integrity of the area, unless there is failure of the system (due to inadequate planning, operation, maintenance, or decommissioning) and resulting pollution from contaminated water.
- The in-pit deposition of tailings could potentially have an impact on groundwater, and therefore on the ecological integrity of affected plant and animal communities.
- Alternatives have been identified, refer to section 6.2. for the alternatives identified and section 6.8 for the advantages and disadvantages of the alternatives identified.
- The impacts on non-renewable resources that have been identified resulting from the proposed activities have been discussed in Section 6.6.1 of this document. Further thereto, a separate WUL application will be submitted for the proposed activities.
- EcoElementum is developing detailed designs of the Thaba Mine TSF and of the In-Pit Deposition, this includes amongst other designs, stormwater management around the pit and clean/dirty water channel around the pit, return water dam, outlet structures, silt trap, spillway design, and seepage analysis. The plan will be developed in accordance with the best practice guidelines (DWAF, 2006), Section 19 of the National Water Act and Regulation GN 704 (No. 704 of 4 June 1999) in terms of the National Water Act (Act No. 36 of 1998).
- A preliminary determination of the potential impacts associated with the Tailings Re-treatment Project have been included in Section 8.5 of this document. These impacts (including the residual and cumulative impacts) will be described and assessed in detail and the significance determined as part of the EIAR/EMPr.
- All negative and positive impacts associated with proposed activities have been identified and discussed in Section 6.8 below.
- Knowledge gaps as well as relevant assumptions were identified in section 13 of Part A of this Scoping Report.

6.1.2 Promoting justifiable economic and social development

- The proposed activities will allow for residual Chrome and PGM's to be extracted from both run of mine ore and historically processed tailings material.
- The proposed activities will allow continuation of mining activities and ensure security of the Life of Mine (to the year 2040) of Thaba Mine.
- The local economy is largely dependent on the mining sector. The proposed activities at Thaba Mine will continue to contribute to the socio economy in the area.
- A Social and Labour Plan 2022 ("SLP") has been developed and implemented for Thaba Mine.
- The proposed activities will not impact any cultural heritage of the area.
- The needs of the community will be determined through the public participation process of this Scoping Report and the EIR/EMPr with the results of the public participation process presented in the Public Participation Report. The public participation process that has been conducted aims to ensure that all I&APs are provided with an opportunity of access to information regarding the proposed activities at Thaba Mine.
- Refer to Section 8.1 of this report for an assessment of the alternatives identified and their potential impacts on the social environment.
- The identification of the potential impacts has been presented in Section 8.5 below. The potential impacts will be further described and assessed in detail and the significance determined as part of the EIAR/EMPr phase. Mitigation measures will also be provided for each potential impact that may occur.

7. Period for which environmental authorisation is required

Thaba Mine has sufficient reserves to sustain the remaining LOM (until 2040). The proposed activities will take place within the life of mine. Therefore, the period for which environmental authorisation is required is at least 17 years from the date of approval provided by the Department of Mineral Resources and Energy ("DMRE").

8. Description of the process followed to reach the proposed preferred site

8.1. Details of alternatives considered

The following alternatives have been identified and will be further assessed in the EIAR/EMPr.

8.1.1 Process/ Activity alternatives

8.1.1.1 Tailings Disposal

Activity Alternative 1: In-Pit Deposition of Tailings (preferred alternative)

This preferred alternative entails the following activities:

- In-Pit-Deposition (Dispose of tailings in the pit)
- Dams and stormwater management related to the in-pit deposition of tailings:
  - A new RWD will be constructed near the processing plant and will be lined with HDPE lining.
  - Upgrade the existing RWD at the TSF if the water balance shows that it needs to be upgraded and upgrade the existing HDPE liner.
  - Upgrade (expand) and line the existing stormwater dam at the TSF with HDPE liner.
- Boreholes will be drilled to extract water from the pit in which tailings will be deposited.
- Scavenger boreholes will be drilled around the existing TSF.

Activity Alternative 2: Deposition of Tailings back onto the existing TSF

This alternative entails the following activities:

- Return the tailings to the TSF after being re-treated/ re-processed.
- Dams and stormwater management related to re-depositing tailings on the existing TSF after re-treatment.
  - Upgrade the existing RWD at the TSF and add HDPE liner.
  - Upgrade (expand) and line the existing stormwater dam at the TSF with HDPE liner.
- If there is no in-pit deposition of tailings and the tailings will be deposited back onto the existing TSF then boreholes will not need to be drilled to extract water from the pit.
- Scavenger boreholes will be drilled around the existing TSF.

8.1.1.2 Electricity Sources

- Activity Alternative 1: Constructing a 26.65 MWp PV Solar Power Plant (preferred alternative).
- Activity Alternative 2 - Utilising electricity from the national grid/ Eskom.

8.1.2 Location alternatives

No Location alternatives were considered as the new proposed activities are related to existing mine activities. The proposed locations of the return water dams are the best possible option as they are

located close to the open-cast pit, TSF and the processing plant, they are at the lowest point in relation to these facilities, and they are located on already disturbed areas of the mine.

8.1.2.1 Return Water Dam for the Opencast Pit 1 (ML2)

- Alternative 1 (preferred alternative) RWD is situated to the processing plant, this is the preferred option as it is the lowest, and closest practical point, close to the point of consumption at the plant.
- Alternative 2 RWD is located to the South of the existing opencast pit 1 (ML2)

8.1.3 No-go option

The no-go option would mean that the *status quo* of the environment would stay as is and there would be no additional impacts to the site. However, if the historical tailings are not re-treated this would prevent the mine from increasing its turnover and contribution to GDP, prevent an increase in employment opportunities and impact on the LOM.

8.2. Details of the Public Participation Process to be followed

A detailed public participation process is undertaken as part of the initial application and scoping phase for the proposed activities. The following will be conducted as part of the Environmental Authorisation Application:

- Advertisements

Advertisements, notifying the public of the project and the Environmental Impact Assessment process will be placed in the Platinum Bushvelder newspaper, published on Friday 1 September 2023.

- Site notices

Notice boards (A2 size) in English were erected at visible locations in Thabazimbi and at visible locations on each of the farms.

- Written notices

Written notices were emailed to the adjacent landowners and stakeholders on 1 September 2023.

- Availability of Scoping Report for public review.

The draft scoping report was made available for review for 30 days via the following methods:

Digital Copy: www.shangoni.co.za and Hardcopy: Thabazimbi Public Library.

The comment period commenced on 1 September 2023 and will end on 1 October 2023.

- Summary of issues raised by I&APs

Error! Reference source not found.5 below will be completed when the final Scoping Report is c ompiled and will provide a summary of the comments and issues raised and responses thereto.

Table 5: Summary of the issues raised by the I&APs

Interested and Affected Parties	Date Comments Received	Issues Raised	EAPs Response to Issues as Mandated by the Applicant	Section and Paragraph Reference in this Report Where the Issues and or Responses Were Incorporated.
To be completed upon completion of the public participation process.				

8.3. Description of baseline environment

8.3.1 The type of environment affected by the Project

A baseline description or *"status quo"* of the present environmental situation is provided in this part of the document. The following attributes / aspects have been described in detail, in the following respective chapters:

- Chapter A: Geology.
- Chapter B: Climate.
- Chapter C: Topography.
- Chapter D: Soils, Land Use and Land Capability.
- Chapter E: Vegetation.
- Chapter F: Fauna.
- Chapter G: Surface water.
- Chapter H: Groundwater.
- Chapter I: Air Quality.
- Chapter J: Noise.
- Chapter K: Archaeology and cultural history.
- Chapter L: Sensitive landscapes.
- Chapter M: Visual aspects.
- Chapter N: Regional socio-economic structure.

Chapter A: Geology

The following information was sourced from the *Integrated Water and Waste Management Plan for Thaba Cronimet Chrome Mine 2022,* compiled by Shangoni Management Services (Pty) Ltd, dated 2022.

Regional Geology

The project area is underlain by the Rustenburg Layered Suite Geological Formation of the Bushveld Complex (Vaalian era)

The Bushveld Complex

The igneous layering at Rustenburg area is north-north striking with an average dip of approximately 30°. The UG2 reef at Lebowa occurs as a chromitite layer with an average thickness of approximately 75 cm. Three leader chromitite layers also occur above the main chromitite. The Bushveld Complex is unique because of its size, the persistence and regularity of the layering of the mafic and ultramafic rocks, and the importance of the economic minerals it contains. It is the most important depository of platinum group elements (PGEs) in the world, hosting some 85% of the world's resources, but is also one of the world's foremost sources of nickel, vanadium, and chromite. The mafic portion of the Bushveld Complex has been dated at 2095Ma and consists of a 7 to 9km thickness of magmatic rocks exposed in four lobes with a total surface area covering 65 000km².

The magmatic event that gave rise to the Bushveld Complex commenced with the extrusion of large volumes of basaltic (Dullstroom) and felsic (Rooiberg) magmas at the end of Transvaal sedimentation. This was subsequently intruded by pre-Bushveld sills, which collectively attain a thickness of 2 km. This event was followed closely by the 2095 Ma main mafic sequence and, ultimately by the intrusion of the various Bushveld granites. The mafic magmas spread upward and laterally along shallow-angled fractures to produce the four main lobes.

The Bushveld Complex is described as clover-shaped, consisting of four lobes. The two bracket-like Western and Eastern Lobes constitute the “main” Complex, which has an elliptical form, measuring 370km in an east-west direction and 365km in a northwest-southeast direction. The four lobes are:

- The Western Lobe extends from near Pretoria westward to Rustenburg, northwards around the Pilanesberg Complex and northwards to Thabazimbi;
- The Southern Lobe is largely covered by the Karoo-age coal-bearing sediments around Witbank, Middelburg and Bethal;
- The Eastern Lobe extends northwards through the eastern Mpumalanga from near Middelburg in the south to the east of Mokopane in the north; and
- The Northern Lobe extends northwards from Mokopane.

A layered sequence of mafic and ultramafic rocks known as the Rustenburg Layered Suite occurs within each of the four lobes. The general dip of the layering is towards the centre of each lobe at angles varying between 10° and 25°. The Rustenburg Layered Suite comprises five zones, from the base of the succession upwards – the Marginal, Lower, Critical, Main and Upper Zones. Individual layers or groups of layers can be traced laterally for distances exceeding 100km. The PGEs and chromium are the most important economic elements in the Rustenburg Layered Suite. The largest deposits of chromite in the world occur in the Critical Zone of the Eastern and Western Lobes. Those deposits in the lower part of the Critical Zone are prefixed “LG chromitites” whereas those of the upper Critical Zone are prefixed “UG chromitites”. The UG2 Chromitite is particularly significant for its PGE content.

General Hydrogeology

Bushveld Igneous Complex (BIC)

The aquifer potential of igneous rock in the primary state is very poor, however in areas of deep weathering the aquifer potential is likely to increase. Due to intrusions the rocks are shattered and fissured which accelerates the process of decomposition. In these areas the potential is good for aquifer development. Where the basic rocks are banded, weathering has generally been more rapid with borehole being more successful. Weathering proceeds further in the basic rocks than the acid granites.

In the latter, the weathered and fissured zones have been found to be the best target for groundwater. Recent intrusions, contacts with the basic rocks, major joints, faults lines and absorption zones close to sedimentary strata are also useful targets. Most of the boreholes in this geology have high yielding boreholes, but the percentage of failure is also high, indicating the difficulties involved in selecting suitable sites. The granophyres weathers into soft material close to fault zones where subsequent

movement has taken place, the most likely sites for boreholes are to be found in these faulted zones. Refer to 5.

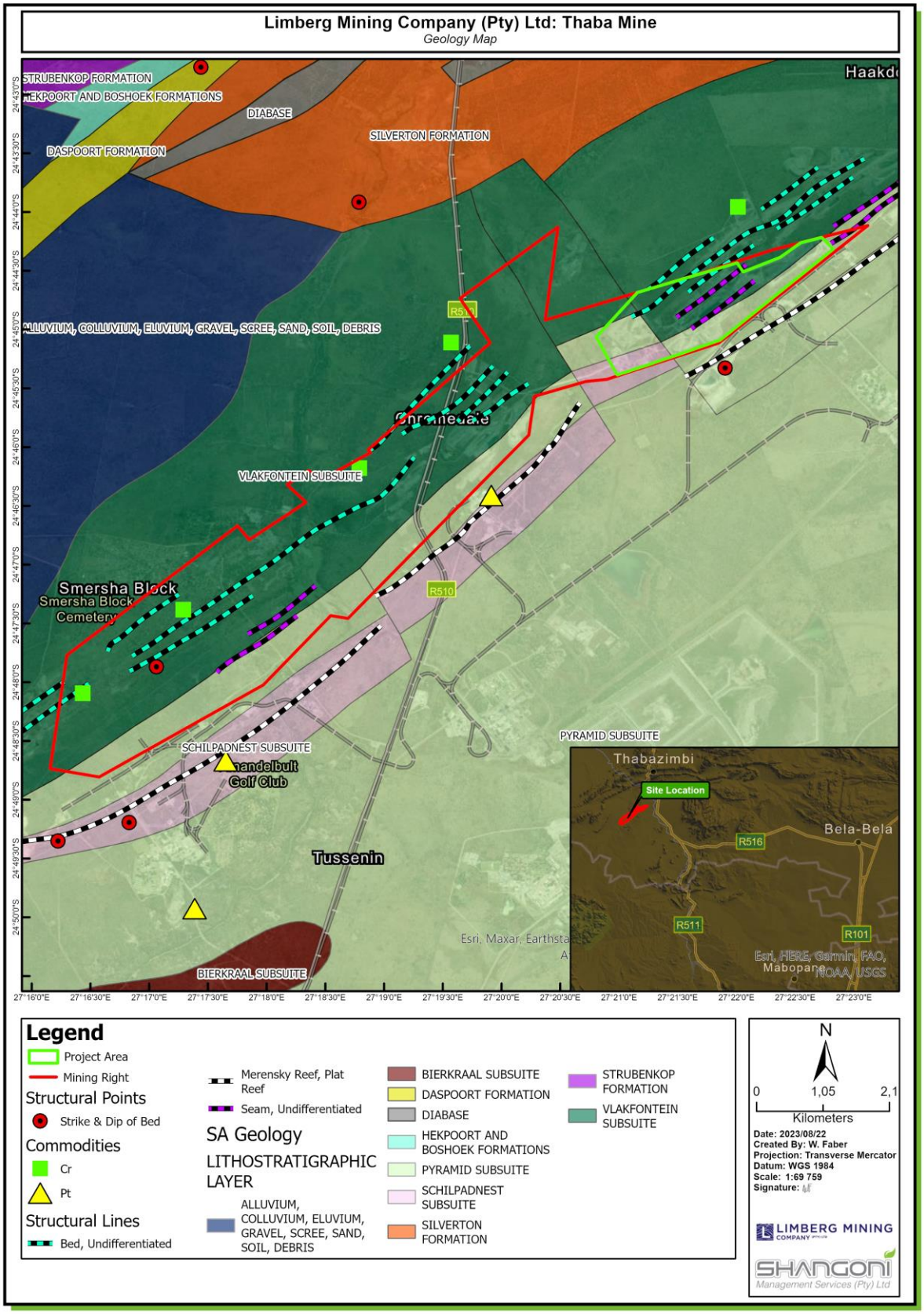

Figure 5: Geology associated with Thaba Mine

Chapter B: Climate

The following information was sourced from the *Cronimet Chrome Mining SA (Pty) Ltd – Thaba Cronimet Chrome Mine Integrated Water and Waste Management Plan*, compiled by Shangoni Management Services, dated October 2018.

4.1.1 Regional Climate

Thaba Mine is situated in an area that is characterised by summer rainfall and dry winters. The mining area has temperatures that are typical to the region, the highest temperatures are found at mid-day in the summer months of November to January. During the winter months, both night-time and day-time temperatures drop significantly lower than what is experienced during summer months.

4.1.2 Rainfall

Thaba Mine is situated in a summer rainfall area with little to no rainfall in the winter months. Precipitation in the area is highly seasonal with a mean annual rainfall of 546.3 mm according to the rainfall data from the DWS hydrological datasets collected at station A2E021 (Zwartklip at Rustenburg Platinum Mine).

Table 6: Monthly rainfall data from weather station A2E021 (Zwartklip at Rustenburg Platinum Mine)

Month	Mean Rainfall (mm)
January	150.8
February	62.4
March	78.0
April	38.7
May	6.1
June	2.8
July	1.4
August	3.5
September	15.6
October	51.2
November	66.6
December	82.0
Annual	546.3

4.1.3 Evaporation

Evaporation is measured at station A2E021 (Zwartklip at Rustenburg Platinum Mine) for an A-class pan. Table 7 below lists the average evaporation recordings. The average annual evaporation is calculated at 1899.3 mm.

Table 7: Monthly evaporation data (A Class Pan) from weather station A2E021 (Zwartklip at Rustenburg Platinum Mine)

Month	Mean Evaporation (mm)
January	197.9
February	159.9
March	153.7
April	115.7
May	102.2
June	82.2
July	100.2
August	139.7
September	182.0
October	216.9
November	201.5
December	203.8
Annual	1899.3

Chapter C: Topography

The following information was sourced from the C*ronimet Thaba Mine: Risk-based groundwater study at the proposed TSF extension, September 2016* compiled by Groundwater Complete.

The surface topography of the mine lease area can be described as relatively flat and drainage is towards the Bierspruit, which drains the project area northwards. Groundwater seepage mimics the surface topography. The flow gradient is very flat and slopes from the TSF area north-westwards to the Bierspruit. The nearest groundwater user point is situated about 2 km north of the TSF. The nearest groundwater receptor that may feasibly be affected by a pollution plume is more than 3 km downstream from the TSF. Refer to **Error! Reference source not found.**.

Chapter D: Soils, land use and land capability

The following information was sourced from the *Wetland Delineation and Impact Assessment Report for the Cronimet EIA Amendment III,* compiled by Wetland Consulting Services, dated July 2015.

The geology of the study area (the mining right area) and surroundings is dominated by rocks of the Bushveld Igneous Complex, with the site itself underlain mostly by norite and pyroxenite.

Soils derived from these mafic intrusive rocks are typically vertic black clays such as soils of the Rensburg and Arcadia forms. These soils display high shrink/swell characteristics and often show cracking on the soil surface when dry. When moist, the soils expand and can become virtually impermeable, resulting in the moisture within the soil being retained for extended periods, while all surplus rainfall ends up as surface run-off. Wetlands in these areas are characterised by valley bottom systems and floodplains with few, if any, hillslope seepage wetlands. Vertic soils, being characterised by a high pH, can present difficulties to wetland delineation in that these soils do not show typical wetness signatures such as mottling and gleying which are typically used for delineating wetlands (DWAF, 2005). Refer to **Error! Reference source not found.**7 and 8.

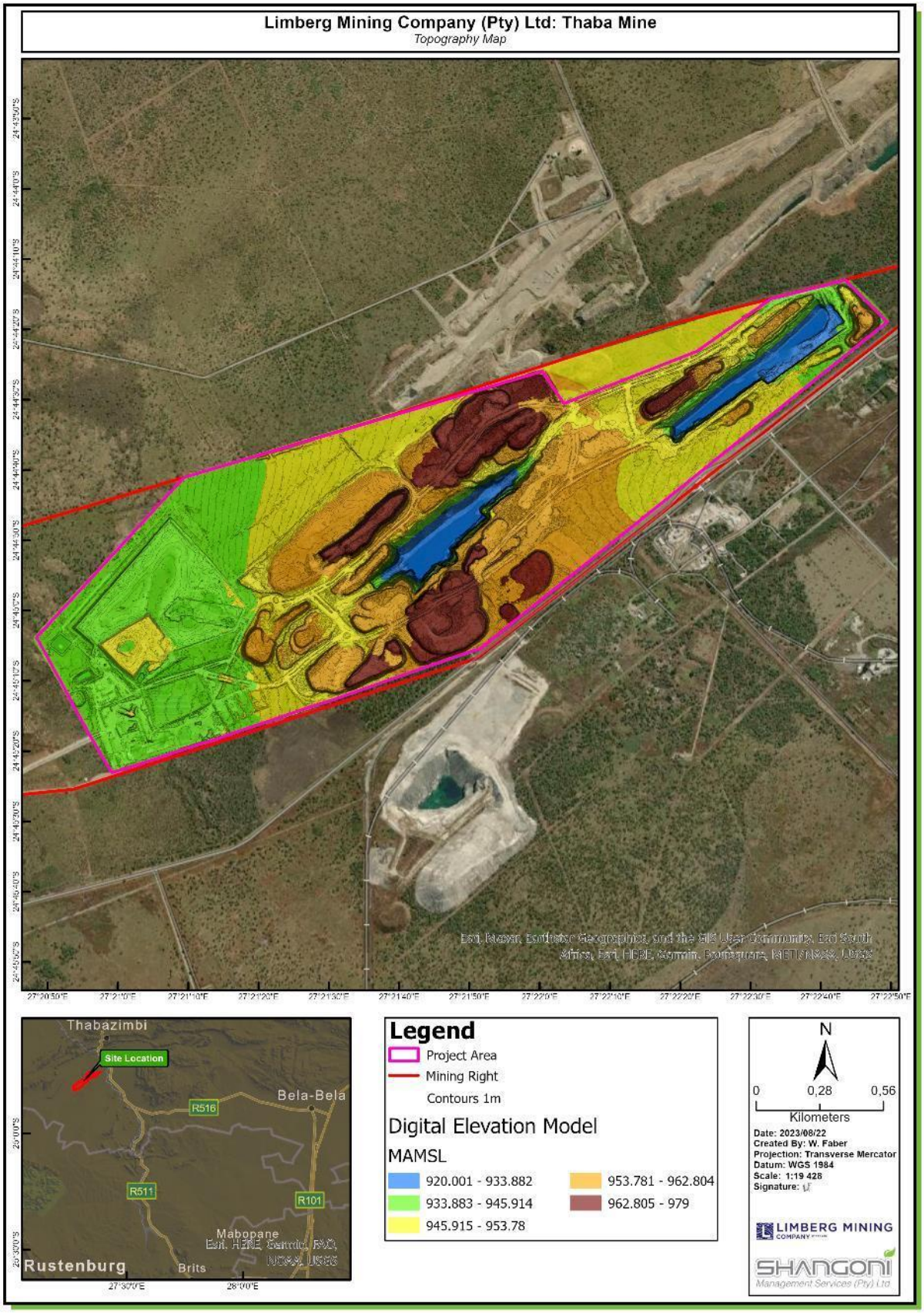

Figure 6: Map showing topography at the location of the proposed activities at Thaba Mine

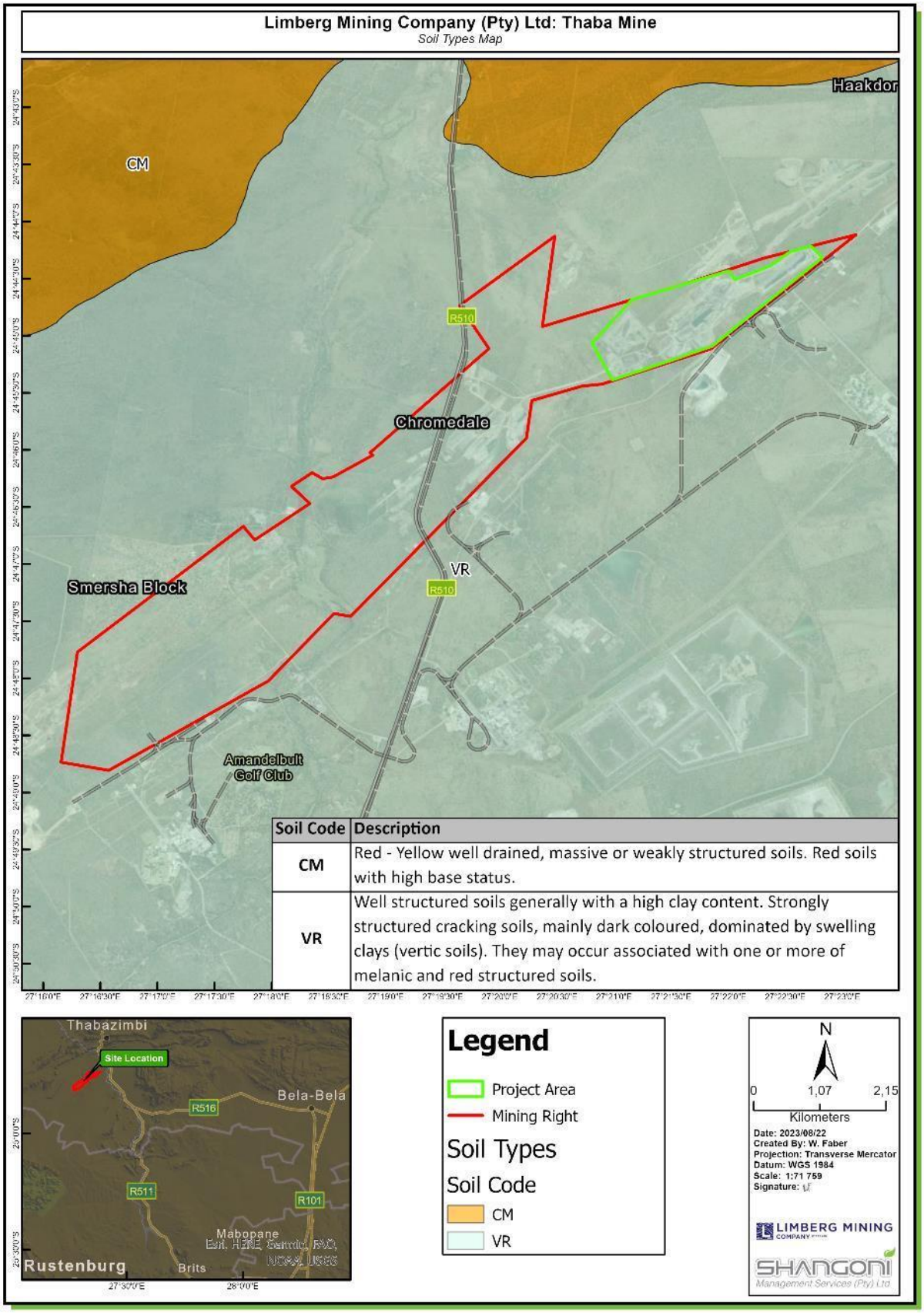

Figure 7: Map showing soils associated with Thaba Mine

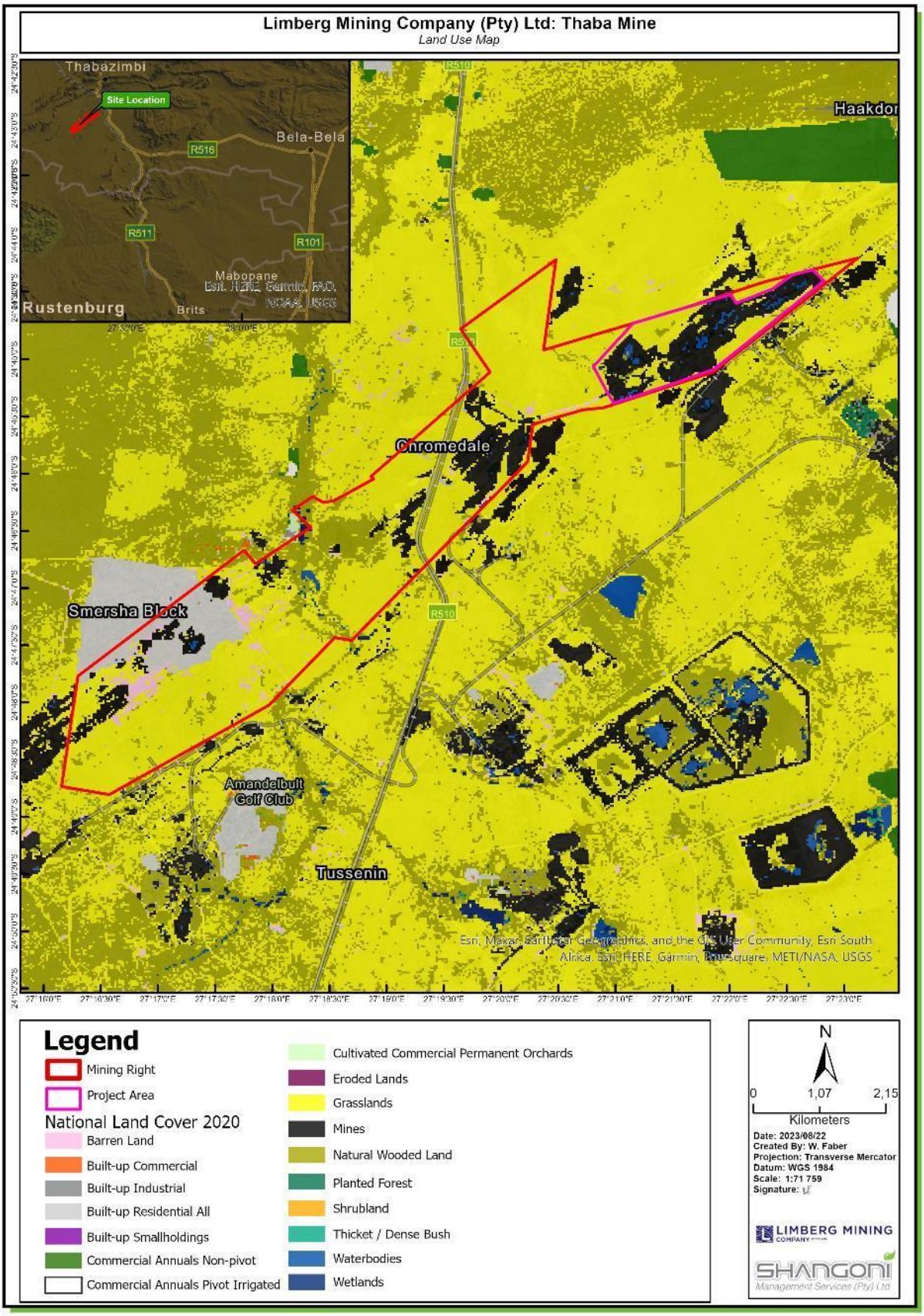

Figure 8: Map showing land use associated with of Thaba Mine

Chapter E: Vegetation

The following information was sourced from the *Wetland Delineation and Impact Assessment Report for the Cronimet EIA Amendment III,* compiled by Wetland Consulting Services, dated July 2015.

According to the Vegetation Map of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006), the study area (the mining right area) is in the Savanna Biome and in the Central Bushveld Bioregion. The specific vegetation type of the study area (the mining right area) is classed as Dwaalboom Thornveld, which occurs on vertic, black, ultramafic clays derived predominantly from norite and gabbro. This vegetation occurs on fairly flat plains with a layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. Acacia tortillas and A. nilotica dominate on medium clay soils, while A. tenuispina dominates as virtually the only woody plant in areas with particularly heavy soils. In more sandy areas A. erubescens is the most prominent tree.

Dwaalboom Thornveld was considered to be “least threatened” by Mucina & Rutherford (2006) with 6% statutorily conserved (out of a target of 19%) and approximately 14% transformed, mostly through cultivation. The main land use on this vegetation type is extensive cattle grazing. Refer to figure 9.

The Atlas of Freshwater Ecosystem Priority Areas in South Africa (Nel et al, 2011a) identified 791 wetland ecosystem types in South Africa based on classification of surrounding vegetation (taken from Mucina and Rutherford, 2006) and hydrogeomorphic (HGM) wetland type; seven HGM wetland types are recognised and 133 wetland vegetation groups. Based on this classification, the following wetland vegetation types are indicated as occurring on site:

- Central Bushveld Group 2_Channelled valley bottom wetland
- Central Bushveld Group 2_Unchannelled valley bottom wetland

The National Biodiversity Assessment 2011: Freshwater Component (Nel et al., 2011b) undertook an ecosystem threat status assessment for each of the 791 wetland ecosystem types where each wetland ecosystem type was assigned a threat status based on wetland type as well as on wetland vegetation group. A summary of the findings for the 2 wetland ecosystem types expected to occur on site is provided in Table 8 below.

Table 8: Summarised findings of the wetland ecosystem threat status assessment as undertaken by the National Biodiversity Assessment 2011: Freshwater Component (Nel et al., 2011b) for wetland ecosystems recorded on site. Wetland Group

	Wetland HGM Type	**Protection level of Wetland**	**Wetland Vegetation Group (WVG)**	**Threat Status of WVG**
Central Bushveld Group 2_Channelled valley bottom wetland	Channelled valley bottom	Hardly protected	Central Bushveld	CR – Critically Endangered
Central Bushveld Group 2_Unchannelled valley bottom wetland	Unchanneled valley bottom	Zero protection	Central Bushveld	VU -Vulnerable

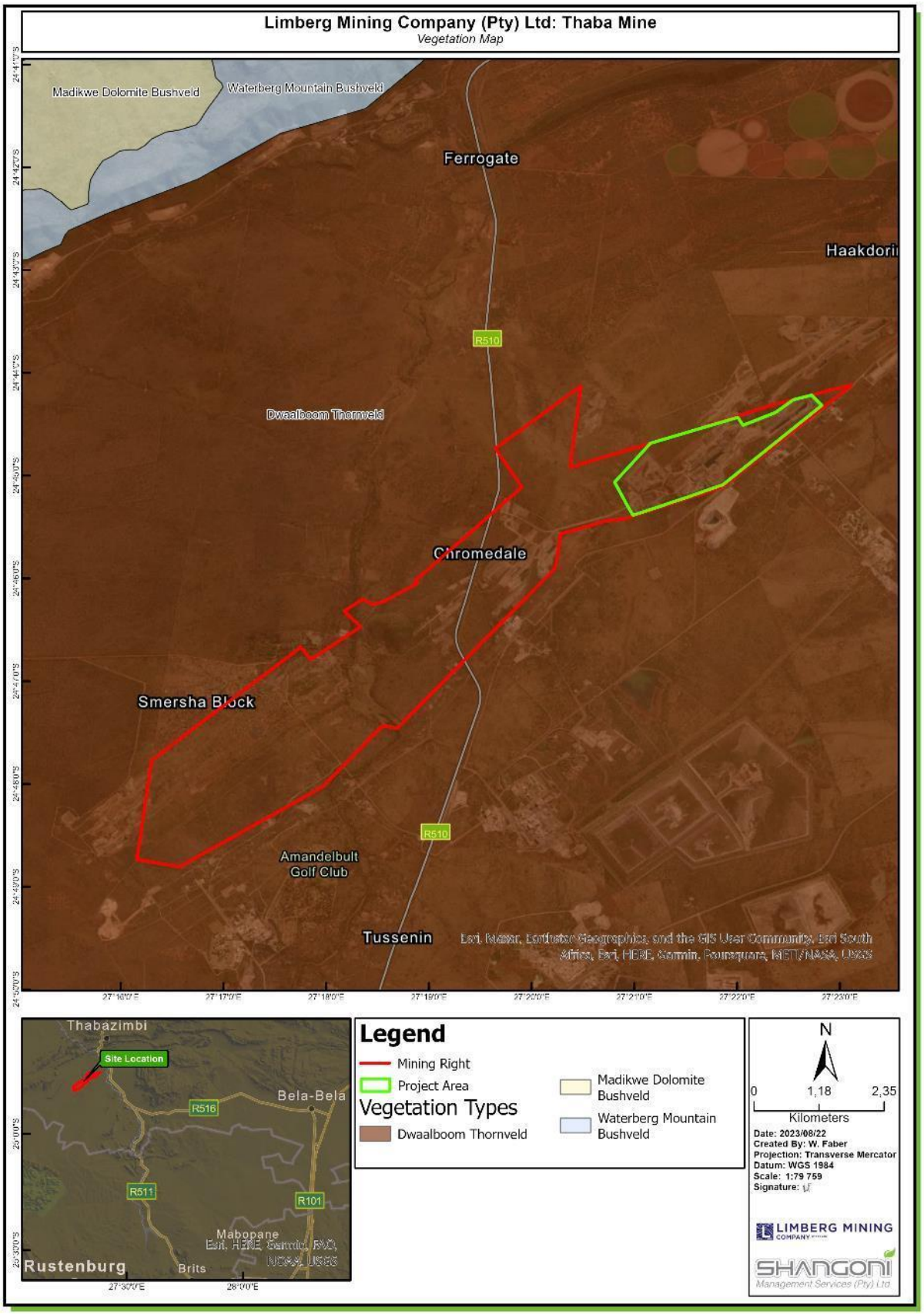

Figure 9: *Vegetation Map*

Vegetation Sensitivity

According to the Limpopo CBA (2016) database the sensitivity of the site is determined to be Other Natural Areas (ONA), as shown in Figure 10.

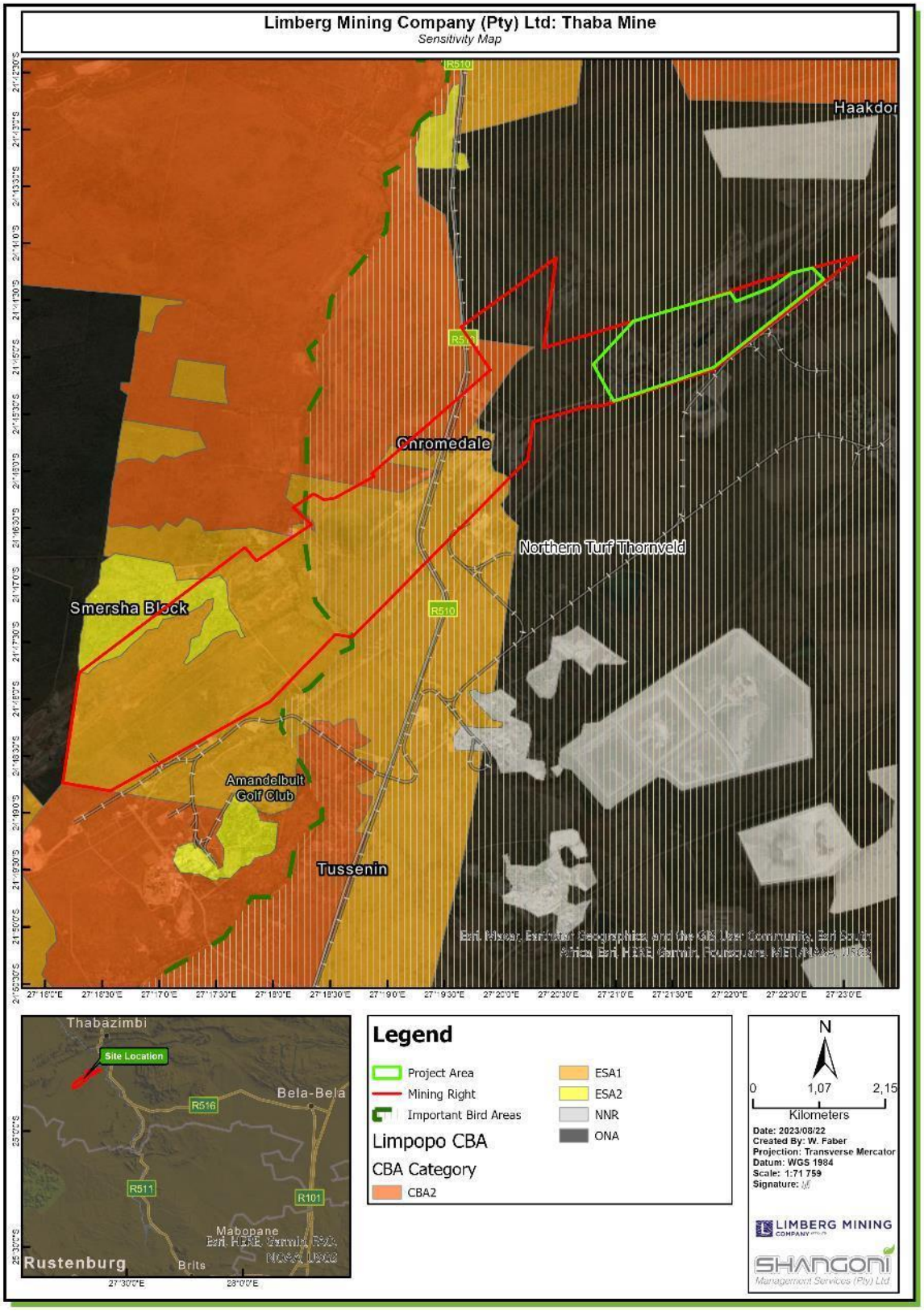

Figure 10: Sensitivity Map associated with the proposed activities at Thaba Mine

Chapter F: Fauna

The following information was sourced from the *Wetland Delineation and Impact Assessment Report for the Cronimet EIA Amendment III,* compiled by Wetland Consulting Services, dated July 2015.

The only mammal species observed during the 2015 field work was a single Blesbok. However, several species of mammals were observed during the wetland assessment undertaken in 2009, including Kudu, Waterbuck, Nyala, Impala, Bushbuck, Grey Duiker, Warthog, Vervet Monkey, Slender Mongoose, Porcupine (quills) and Cane Rat (field signs). Most of these species were observed within the vicinity of the Bierspruit. While most of these species are not directly dependant on the habitat provided by the wetlands and riparian zones on site (except for Bushbuck, Nyala, and Cane Rat), all of these species are expected to regularly utilise these habitats. Other species likely to regularly make use of the wetlands, dams and rivers on site include the Cape Clawless Otter and Water Mongoose.

A total of 102 bird species were observed during the wetland surveys in 2009 and 2015 (both within and adjacent to the wetland and riparian areas). Three Red Data listed birds, listed as near threatened, were observed on site: Yellow-billed Stork, Marabou Stork, and Secretary bird. Of these, the Yellow-billed Stork is directly dependant on the habitat offered by the wetlands, dams, and rivers, while the Marabou Stork is also expected to regularly make use of the habitat provided by these areas. Other Red Data listed species that are expected to make use of the wetlands, dams and rivers on site include the Greater Painted Snipe and the Black-winged Pratincole.

Given the general absence of surface water from the smaller wetlands and watercourses on site, these systems do not play a significant role in supporting waterbirds. By far the most significant habitat on site in this regard is the open water and wetland habitat provided by the Bierspruit and its dams.

Chapter G: Surface water

The following information was obtained from the *Cronimet Chrome Mining SA (Pty) Ltd: Surface Water Impact Assessment,* dated February 2016 and compiled by E-TEK Consulting (Pty) Ltd.

The site is situated within the Limpopo / Crocodile River catchment area and the Crocodile (West) and Marico water management area. The Limpopo Department of Water and Sanitation (“DWS”) is the responsible water authority.

No FEPA wetlands are indicated as occurring on site or within the immediate vicinity of the proposed activities. No watercourses or drainage lines occur in the vicinity of the proposed activities. Nearby watercourses include the Bierspruit is situated further South of the site.

Small, isolated wetlands that are indicated as occurring on within the mining right boundary are mostly classified as “artificial” wetlands in the NFEPA database and generally overlap with dams indicated on the 1:50 000 topographical maps. Refer to Figure 11.

There is a small drainage line flowing through the middle of the site. The area around this a riparian zone called the Middellaagte Riparian Zone. Refer to Figure 12. Due to the seasonal nature of the drainage line, no Mean Annual Runoff (“MAR”) can be established. The river (drainage line) is dry for

most of the time, but flows occur during heavy downpours, as sometimes happens during the summer rainfall season, and especially when the antecedent moisture content in the catchment is high, after successive storm events.

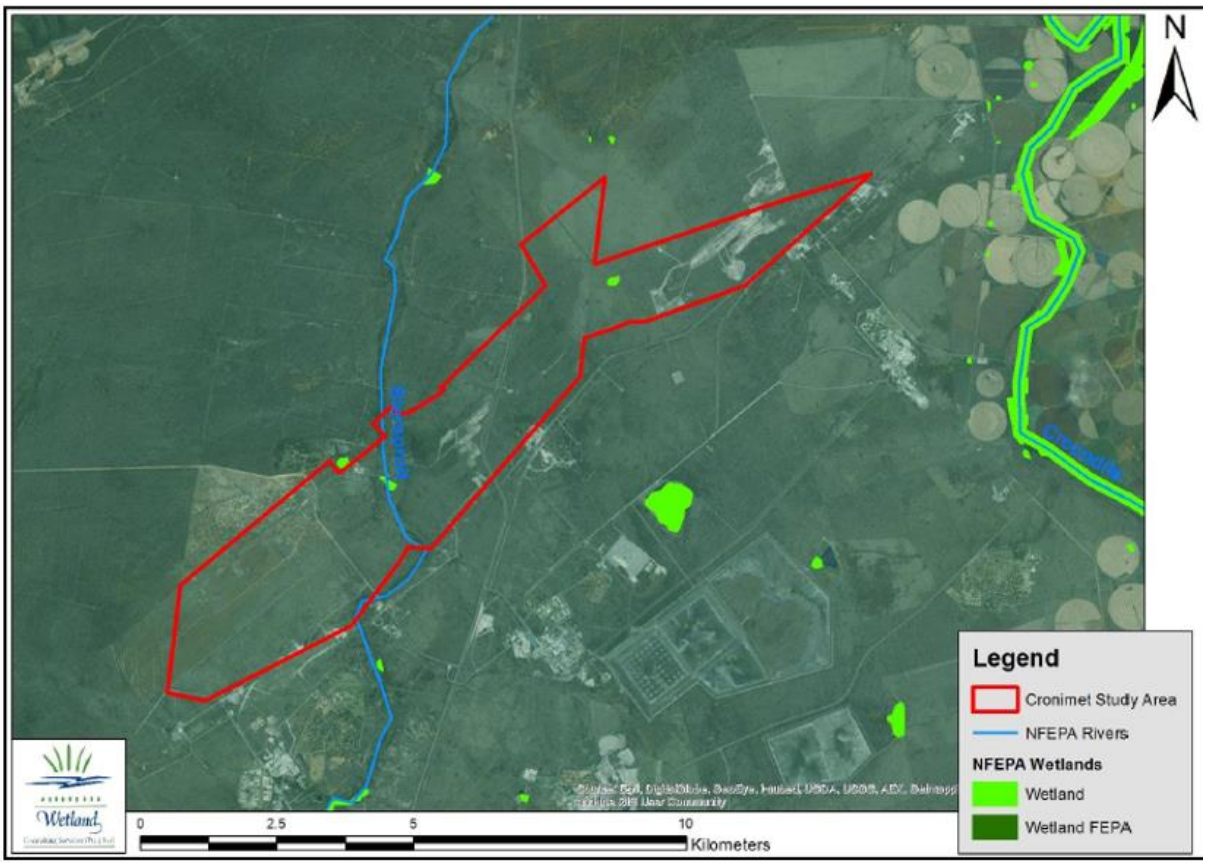

Figure 11: Surface water resources associated with the Thaba Mine - Extract of the Atlas of Freshwater Ecosystem Priority Areas in South Africa (Nel et al., 2011)

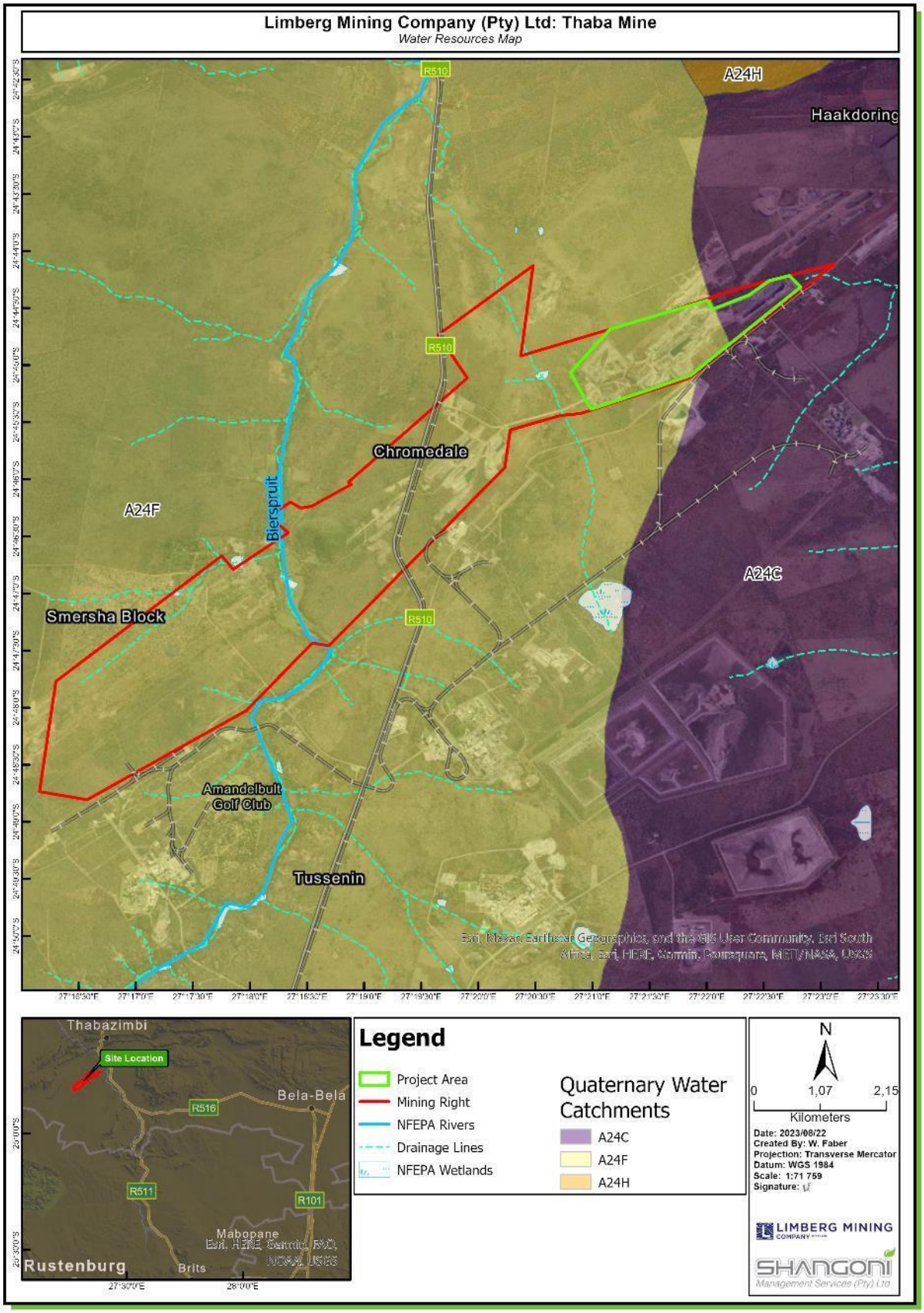

Figure 12: Watercourses within the mining footprint and in relation to the proposed activities.

Chapter H: Groundwater

The following information was extracted from the report *CRONIMET Chrome Mining SA (Pty) Ltd Geohydrological Specialist and Impact Assessment Report*, dated February 2016, and prepared by Jaco van den Berg, SP.

The groundwater specialist report (JMA Consulting (Pty) Ltd, June 2015) that was done parallel with this study provides the following information:

With reference to *WRC Report No KV 77/95, 1995, A South African Aquifer System Management Classification, Roger Parsons, Map: Aquifer Classification of South Africa*, the following regional characteristics:

- The aquifer type is indicated as a minor aquifer region or in other words a moderately-yielding aquifer system of variable water quality.
- The vulnerability, or the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer, is indicated at least vulnerable.
- Aquifer susceptibility, a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities, and which includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification, is indicated as low.

A new Geohydrological Study is being undertaken to determine the potential impacts of the proposed activities related to this application at Thaba Mine.

Chapter I: Air Quality

The following information was obtained from the *Air Quality Assessment report for the Thaba Cronimet Chrome Mine opencast and underground mining operation located in the Limpopo Province* for March 2016 compiled by Airshed Planning Professionals.

The mine is in the Waterberg - Bojanala Priority Air Quality Management Area and is closely monitored by the Department of Environmental Affairs. The airborne pollutants of concern in this study are chiefly particulate matter types (i.e., TSP, PM10 and PM2. 5). Carbon monoxide (CO), oxides of nitrogen (NOx) and sulphur dioxide (SO2) gasses from vehicle exhaust emissions can occur and where they are accumulated. The nearest sensitive receptors towns are Thabazimbi, Amandelbult Mine Town and Setaria. The nearest residential settlements outside the Thaba mining right boundary are farmhouses, located less than 700 m north-west and north of the mining right's northern boundary. Two receptors are located within the mining right boundary –Chrome Mine Primary School and – Farmhouse located on Zwartkop 369 KQ - Portion 9.

The most prevalent winds are typically from the north-north-west, south-south-east and south-east directions. In the day-time conditions, stronger winds are more frequent due to the north-north-west winds, while slower winds from the same directions are more prevalent at night. Seasonal wind direction variation is also noticeable with winds from the north-northwest, north-north-east, and east being more

frequent during the summertime. Spring wind fields are largely dictated by a sizeable north-north-west wind direction component, while in the autumn and winter months wind fields show a clear shift in wind direction arising from the south, south-south-east, and south-east wind directions.

Chapter J: Noise

The following information was obtained from the *Noise Study Report for The Cronimet Chrome Mining EIA Amendment* March 2016 compiled by FM/AC.

The overall ambient noise levels in the study area (the mining right area) are predominately determined by the noise emissions from mining & mining industrial plants (Diesel powered earth moving equipment, Transport vehicles and cranes, Supporting equipment, e.g., power generators and compressors and Construction tools, e.g., handheld tools), road traffic on the R510 and other roads in the area, community source (e.g., local traffic and domestic activities) and natural sounds. The ambient noise levels in the study were mostly found within the SANS 101103[5] and the Health and Safety Regulations of the International Finance Corporation of the World Bank. All phases of mining were observed to have a low insignificant impact on post-mining ambient noise levels. Therefore, ambient noise levels will have little to no impacts on surrounding residents.

Chapter K: Archaeology and Cultural History

The following information was obtained from the. *Archaeological Impact Assessment For the proposed additional underground and opencast mining, associated infrastructure and processing facilities at Thaba Cronimet Chrome Mine, Limpopo Province.* Compiled by HCAC - Heritage Consultants. February 2016.

The study found MSA material at the base of hills and next to watercourses in the study area (mining right area) that is associated with the later iron age period. During the archival study documents were found indicating that the farms Zwartkop and Middellaagte on which the proposed project is located were established during the 19th century. Six archaeology sites were recorded, however, none are located in close proximity to the proposed activities in this application. Further details will be included in the EIR/EMPr.

Chapter M: Visual aspects

The following information was obtained from the *Visual Impact Assessment Report Thaba Cronimet Crome Mine Amendment, Northern Province,* compiled by Newtown Landscape Architects cc and dated February 2016.

The landscape character associated with the focus area (the mining right area) and immediate surrounds can be described as bushveld vegetation, relatively flat topography, group of koppies and a low mountainous area to the one side of the study area (the mining right area). The study area (mining right area) also contains some perennial and non – perennial streams and depressions. The Bierspruit cuts across the process mining area, and a tributary near the processing plant. The Crocodile River is located east of the study area (the mining right area). The area has a mining and agricultural land use past giving it a feel of an industrial sense of place. The most sensitive viewer locations that will be

impacted visually with high sensitivity are the residences, farmsteads, game and guest lodges, and the Thabang Children Centre. The mine already has a visual impact reclamation of the tailings for re-treatment and the in-pit deposition is not likely to significantly increase the existing visual impact. The visual impact of the 26.65 MW PV Solar Power Plant is more likely to have a significant visual impact, especially to locations at a higher elevation than the Solar Power Plant, and to any aircraft that might fly through the area.

Chapter N: Regional socio-economic structure

The following information was obtained from the *Environmental Impact Assessment and Management Programme amendment for the Thaba Cronimet Mine to include opencast and additional underground mining and processing activities - Updated Social Impact Assessment Report,* dated 18 February 2016 and compiled by Advisian WorleyParsons Group.

The study area (the mining right area) is in the Waterberg District municipality in the Limpopo Province of south Africa. The local municipality it falls under is the Thabazimbi Local municipality the wards the site encompass are Wards 3 and 8. The towns that are the closest are Thabazimbi (25km to the north-northeast, Northam (approximately 20km to the south) and Rustenburg 100km to the South.

Smash Block informal settlement is the highest Concentration of people in the zone of influence around the study area (the mining right area). This settlement formed from job seekers and employers looking for work at the nearby Amandelbult Mine. The 200ha informal settlement houses about 1700 households, 8800 people of which 40% are renting.

The primary land uses in the direct vicinity of the mining right area, other than the informal settlement are agriculture where the chief agriculture activities being game and cattle farming, and the cultivation of lucerne and sunflowers) and mining such as the Amandelbult mine of Anglo Platinum being located next to the Thaba Mine and the processing plant.

8.4. Impacts and risks identified

The following information was obtained from Impacts and risks identified by the specialists.

Error! Reference source not found. below contains preliminary potential impacts that have been i dentified for the proposed activities at Thaba Mine. A detailed risk assessment will be undertaken as part of the EIAR/EMPr, in which the duration, probability, magnitude and reversibility of the impacts will be determined, and the significance of the impact calculated. Potential cumulative impacts have also been determined and are presented in **Error! Reference source not found.**9.

Table 9: Preliminary determination of potential impacts of the proposed activities at Thaba Mine

Environmental component	Activity	Potential Impact description
Topography	In-pit deposition and reclamation of tailings from the TSF.	In-pit deposition will have positive impact on topography.
		Reclamation of tailings from the existing TSF will have a positive impact on topography, by lowering the height of the site it will fit better into the surrounding environment.

Environmental component	Activity	Potential Impact description
Soil, land use and land capability	Clearing of soil for the RWD's, stormwater and clean/dirty water facilities and infrastructure, and pipelines and for the 26.65MW PV Solar Power Plant.	The removal of topsoil may result in the mixing of the horizons of the soil that will have an impact on the fertility and production potential of the soil.
		The temporary stockpiling of topsoil may result in a decrease in the fertility of the soil and the leaching of minerals due to exposure of the soil to elements.
		A loss of microbes and viable seed may occur as a result of the temporary stockpiling of topsoil.
		Soil compaction and topsoil loss through erosion may occur. This will further lead to a loss of soil fertility.
		Ineffective erosion control may lead to siltation of downstream water resources and scouring of soil.
Surface water	Surface water contamination and alteration of natural drainage patterns	In the event of chemical or hydrocarbon spillages on soil (from the processing plant or mine vehicles), surface water runoff that comes into contact with the soil may become contaminated and enter the receiving environment and / or water resources. This will have an impact on surface water quality.
		Surface water contamination may occur should the separation of clean- and dirty water management areas not be effectively implemented.
		Possible failure of the proposed RWD's or pipelines could result in contamination of surface water.
Groundwater	Groundwater contamination	Potential seepage of water from the TSF, in-pit deposition of tailings, and the RWD's, to the groundwater regime may contaminate groundwater resources.
		Groundwater quality may be impacted in the event of a spillage of chemicals or hydrocarbon materials (e.g. oil spill from vehicles and machinery or the processing plant). The contamination of groundwater will occur during all phases of development and may continue long after closure.
Biodiversity	Clearing of indigenous vegetation	The proposed 26.65 MW PV Power Plant will disturb natural vegetation and may impact on threatened or protected species.
	Tailings retreatment and in-pit deposition.	The Tailings re-treatment project and in-pit deposition will take place at areas that have already been disturbed and will therefore have little or no impact on biodiversity.
		The laying of pipelines, and the establishment of stormwater and clean and dirty water systems and RWD's could impact on biodiversity, however, this impact will likely not be significant as the area has already been disturbed by mining activities.
	Rehabilitation and closure activities	The rehabilitation and closure activities will disturb vegetation and may lead to the spread and growth of alien plants.
		The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of fauna species.
		The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of avifauna species.

Environmental component	Activity	Potential Impact description
Sites of archaeological and cultural importance	No sites of archaeological and cultural importance have been identified that will be affected by the proposed activities at Thaba Mine.	
Sensitive landscapes	Establishment of 26.65 MW PV Solar Power Plant and the RWD's.	The site where the proposed activities will take place are not sensitive landscapes (there are no watercourses or drainage lines etc. and no sensitive habitats (no ESA's or CBA's). However, the Solar Power Plant will be located on a previously rehabilitated section of the mine and in an area classified as an "Other Natural Area" according to the SANBI BGIS database.
Air quality	Earthworks (removal of tailings from the TSF), activities at the processing plant, hauling material and depositing material.	During the transport of mined or processed materials, and rehabilitation activities, dust (particulate matter, PM10 and PM 2.5) may be generated that may have an impact on the ambient air quality of the area.
		All vehicles and mining machinery may have an impact on the air quality of the surrounding area due to the emissions released by the vehicles and machinery.
		Generation of dust from earthworks (removal of tailings from the TSF), activities at the processing plant, hauling material and depositing material in the pit.
Noise	Increase in noise levels and disturbance	Noise pollution can be measured as noise disturbance and/or cause noise nuisance, both of which will have different impacts on the receiving environment and receptors.
Visual	Activities at the TSF, processing plant and the 26.65 MW PV Solar Power Plant.	These activities are likely to have a visual impact on receptors, especially at locations at a higher elevation and the PV Power Plant may have an impact on any aircraft travelling in the vicinity.
Socio-economic	Planning, designing, constructing the Tailings re-treatment project, in-pit deposition, and solar power plant.	Job security of the mine's current employees will continue, along with additional jobs to be created during the planning/ development/ construction phase, and the operational phase once the activities recommence, and other benefits arising from the Social and Labour Plan.

8.5. Methodology used in determining and ranking potential environmental impacts and risks

8.6.1 Methodology to be applied during the EIA and EMPr phase

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication, and evaluation.

- Specification of the impact identification techniques.
- Criteria to evaluate the significance of impacts.
- Design of mitigation measures to lessen impacts.
- Definition of the different types of impacts (indirect, direct, or cumulative).
- Specification of uncertainties.

After all impacts have been identified, the nature and scale of each impact can be predicted. The impact prediction will consider physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined, and appropriate mitigation measures can be developed. The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e., the source of the risk, the pathway and the target that experiences the risk (receptor).

Table 100 and Table 121 and 12 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.

Table 10: Determination of Probability of impact

Score	Frequency of Aspect / Unwanted Event	Availability of Pathway from the source to the receptor	Availability of Receptor
1	Never known to have happened, but may happen	A pathway to allow for the impact to occur is never available	The receptor is never available
2	Known to happen in industry	A pathway to allow for the impact to occur is almost never available	The receptor is almost never available
3	< once a year	A pathway to allow for the impact to occur is sometimes available	The receptor is sometimes available
4	Once per year to up to once per month	A pathway to allow for the impact to occur is almost always available	The receptor is almost always available
5	Once a month - Continuous	A pathway to allow for the impact to occur is always available	The receptor is always available

Step 1: Determine the PROBABILITY of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.

Table 11: Determination of Severity of impact

Environmental Impact Rating / Priority					
	MAGNITUDE				
Probability	**1 Minor**	**2 Low**	**3 Medium**	**4 High**	**5 Major**
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

Step 3: Determine the SEVERITY of the impact by plotting the averages that were obtained above for Probability and Magnitude.

Table 12: Determination of Magnitude of impact

Score	Source					Receptor
	Duration of impact	Extent	Volume / Quantity / Intensity	Toxicity / Destruction Effect	Reversibility	Sensitivity of environmental component
1	Lasting days to a month	Effect limited to the site. (metres);	Very small quantities / volumes / intensity (e.g., < 50 ℓ or < 1 ha)	Non-toxic (e.g., water) / Very low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes will remain unaltered.	Current environmental component(s) are largely disturbed from the natural state.
2	Lasting 1 month to 1 year	Effect limited to the activity and its immediate surroundings (tens of metres).	Small quantities / volumes / intensity (e.g. 50 ℓ to 210 ℓ or 1 ha to 5 ha)	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	Receptor of low significance / sensitivity
3	Lasting 1 – 5 years	Impacts on extended area beyond site boundary (hundreds of metres)	Moderate quantities / volumes / intensity (e.g. > 210 ℓ < 5000 ℓ or 5 – 8 ha)	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	Current environmental component(s) are moderately disturbed from the natural state.
4	Lasting 5 years to Life of Organisation	Impact on local scale / adjacent sites (km)	Very large quantities / volumes / intensity (e.g. 5000 ℓ – 10 000 ℓ or 8 ha– 12 ha)	Toxic (e.g. diesel & Sodium Hydroxide)	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	No environmentally sensitive components.
5	Beyond life of Organisation / Permanent impacts	Extends widely (nationally or globally)	Very large quantities / volumes / intensity (e.g. > 10 000 ℓ or > 12 ha)	Highly toxic (e.g. arsenic or TCE)	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	Current environmental component(s) are a mix of disturbed and undisturbed areas.

Step 2: Determine the MAGNITUDE of the impact by calculating the average of the factors above.

Knowledge gaps, assumptions, and limitations

This section will be completed once all the specialist studies have been completed, in the EIR phase.

8.6. Positive and negatives that the proposed activities at Thaba Mine and alternatives will have on the environment and community affected

The positive and negative implication of the proposed activities at the Thaba Mine and the alternatives identified have been provided below and assessed in terms of the following four categories:

- Environmental.
- Technical/Engineering.
- Economical.
- Social.

The positive and negative impacts of both the proposed activities and the preliminary identified alternatives will be further assessed as part of the EIAR/EMPr. Refer to the table 13.

Table 13: Advantage and disadvantages of the proposed activities and preliminary identified alternatives

Alternative	Advantages	Disadvantages
Activity Alternative for the Disposal of Tailings		
Activity Alternative 1: In-Pit Deposition of Tailings		
Activity Alternative 1 In-Pit Deposition (Dispose of tailings in the pit)	**Environmental:** Depositing the tailings in the pit (Pit 2 (ML1) will aid in filling up and rehabilitation of the opencast pit. The in-pit deposition and later the rehabilitation with depositing of soil and vegetation will limit exposure of tailings and rock in the pit to elements (water) and therefore also likely minimize the potential for leachate chemicals such as Nitrate into groundwater. **Technical/Engineer:** The tailings need to be re-treated/ re-processed, depositing tailings into the opencast pit has fewer engineering challenges and fewer logistical challenges than depositing tailings back onto the TSF. **Economical:** LMC has determined that this is the most cost-effective option for disposal of tailings as it serves a dual purpose of backfilling the pit with material for rehabilitation. **Social:** None.	**Environmental:** There is a potential for groundwater pollution through the leaching of Nitrates into groundwater. **Technical/Engineer:** None. **Economical:** None. **Social:** None.
Activity Alternative 1 Dams and stormwater management related	**Environmental:** The Construction of the new RWD near the plant will have minimal impact on the	**Environmental:** The Construction of the new RWD near the plant will have minimal impact

Alternative	Advantages	Disadvantages
to the in-pit deposition of tailings: 1) New RWD to be constructed near the pit and processing plant and add HDPE liner. 2) Upgrade the existing RWD at the TSF if the water balance shows that it needs to be upgraded and add HDPE liner. 3) Upgrade (expand) and line the existing stormwater dam at the TSF with HDPE liner.	environment as it is already a disturbed area. **Technical/Engineer:** Provides additional storage for water to be used in the processing plant. The location is the most optimal location in relation to the point of consumption at the processing plant. **Economical:** The construction and upgrading of the dams will enable Thaba Mine to carry out the new activity of re-treating the tailings and recovering higher concentrations of Chrome and PGM's from the available ore. **Social:** Job creation.	on the environment as it is already a disturbed area. **Technical/Engineer:** None. **Economical:** None. **Social:** None.
Activity Alternative 1 Boreholes drilled to extract water from the pit in which tailings will be deposited. Scavenger boreholes will be drilled around the existing TSF.	**Environmental:** The extraction of water from the boreholes will enable Thaba Mine to control the potential pollution plume of leachates at the pit and at the existing TSF. **Technical/Engineer:** None. **Economical:** The use of groundwater will reduce the dependency of treated water from the Magalies Water pipeline. **Social:** As less water will be required from the Magalies pipeline, the ability of the municipality to provide other users with water will be enhanced.	**Environmental:** The extraction of water from the pit and at the TSF will reduce the groundwater yield. **Technical/Engineer:** None. **Economical:** None. **Social:** None.
Activity Alternative 2: Deposition of Tailings back onto the existing TSF		
Activity Alternative 2 (Return the tailings to the TSF after being re-treated/ re-processed)	**Environmental:** The TSF is already an authorized activity**.** The TSF already exists and no new/ additional risks to the environment will be imposed. **Technical/Engineer:** None. **Economical:** None. **Social:** None.	**Environmental:** The pit will have to be backfilled with other material or will be left as an opencast void where the ground rock will be exposed to elements and possible leaching of polluting elements from the exposed rock into the groundwater. If not back-filled the pit can't be rehabilitated, this will reduce the potential for land-use and land-use capability and returning the area to a natural area. An open-cast pit will have a visual impact. An open-cast pit will be a hazard to fauna and people. If tailings need to be returned to the TSF, a stock pad of approximately 2ha will need to be established next to the existing TSF to make room for the process of removing and returning tailings to the TSF. This will result in 2ha of a rehabilitated pit being disturbed and will result

Alternative	Advantages	Disadvantages
		in the clearing of natural vegetation and disturbance of soil. **Technical/Engineer:** re-moving the tailings and returning it to the TSF poses technical and engineering challenges. **Economical:** The engineering and technical challenges of returning the tailings to the TSF while simultaneously removing tailings will have a bigger **Social:** None.
Activity Alternative 2 Dams and stormwater management related to re-depositing tailings on the existing TSF after re-treatment. 1) Upgrade the existing RWD at the TSF and add HDPE liner. 2) Upgrade (expand) and line the existing stormwater dam at the TSF with HDPE liner.	**Environmental:** Upgrades to existing RWD and Stormwater dam will not have a significant impact on the environment as the area adjacent to the TSF is already a disturbed area. **Technical/Engineer:** The additional capacity will allow for improved stormwater management clean and dirty water management, and storage of water for the processing plant. **Economical:** Job creation. **Social:** Job creation.	**Environmental:** Clearance of the vegetation around the existing dams, loss of flora, and loss of habitat for fauna. Increase in potential for surface water or groundwater pollution from the expanded RWD should there be any leaks or failures. **Technical/Engineer:** None. **Economical:** None. **Social:** None.
Activity Alternative 2 If there is no in-pit deposition of tailings and the tailings will be deposited back onto the existing TSF then boreholes will not be drilled to extract water from the pit. Scavenger boreholes will be drilled around the existing TSF.	**Environmental:** The extraction of water from the boreholes will enable Thaba Mine to control the potential pollution plume of leachates at existing TSF. If no boreholes are drilled at the opencast pit in which tailings would have been deposited, then there would be less potential pollution of leachates from tailings. **Technical/Engineer:** None. **Economical:** The use of groundwater will reduce the dependency of treated water from the Magalies Water pipeline. **Social:** As less water will be required from the Magalies pipeline, the ability of the municipality to provide other users with water will be enhanced.	**Environmental:** The extraction of water from the pit and at the TSF will reduce the groundwater yield. **Technical/Engineer:** None. **Economical:** Possibility to continue pumping after closure – risk and timeline needs to be determined. Can have a significant financial implication. **Social:** None.
Activity Alternatives for Electricity Supply.		
Activity Alternative 1: 26.65 MW PV Solar Power Plant		

Alternative	Advantages	Disadvantages
Activity Alternative 1 (26.65 MW PV Solar Power Plant)	**Environmental:** Use of renewable energy has a much smaller impact on the environment. Less air pollution, less waste, smaller mining impacts (no mining of coal or oil), **Technical/Engineer:** The mine can operate more sustainably with a reliable power source from the solar plant. The solar plant will potentially cost less than buying electricity from Eskom. **Economical:** The mine can operate more sustainably with a reliable power source from the solar plant. The solar plant will potentially cost less than buying electricity from Eskom in the long run. **Social:** After the LOM – electricity can be supplied to the local community which will have a smaller environmental impact.	**Environmental:** The solar power plant will create a visual impact. The establishment of the solar power plant will result in a rehabilitated area of the mine and "Other Natural Areas" as identified on the SANBI BGIS (all within the existing mining right footprint), being cleared of vegetation. The solar power plant will have an impact on fauna due to the change in habitat when vegetation is cleared. **Technical/Engineer:** None. **Economical**: There will be an initial large expense for the establishment of each phase of the three phases of the solar power plant. **Social:** The visual impact of the solar power could affect the sense of place and impact on surrounding landowners, occupiers of land and. The solar power plant will reduce the demand on the national power grid and make more power available for other users.
Activity Alternative 2: Use electricity supplied by Eskom		
Activity Alternative 2 (Electricity from Eskom and NO PV power plant)	**Environmental:** There will be little visual impact, when compared to the solar power plant. **Technical/Engineer:** There is an existing Eskom connection, and therefore from an engineering and technical aspect, will be simpler. **Economical:** There will be no need for a huge expense for the layout of fees for the establishment of a solar power plant, however, the expense of power from the from Eskom might be similar over a period. **Social:** None.	**Environmental:** None. **Technical/Engineer:** Additional generators and back-up power will be required during power outages (such as load shedding) **Economical:** The unreliable power source will result in the need to run expensive diesel generator and stop/ reduce production at these times which causes financial losses due to standing time. **Social:** None.

9. Plan of study for the Environmental Impact Assessment Process

9.1. Description of alternatives

Refer to sections 8.1 and 8.6 above for a description of the alternatives that have been identified.

9.2. Description of the aspects to be assessed as part of the environmental impact assessment process

As part of the proposed activities at Thaba Mine, the following aspects of the environment will be considered and include:

- Geology.
- Topography.
- Soil, Land use and land capability.
- Fauna and Flora.
- Surface water.
- Groundwater.
- Sensitive landscapes (including wetlands).
- Air quality.
- Noise.
- Visual aspects.
- Sites of cultural and archaeological importance.
- Socio-economic aspects.

9.3. Description of aspects to be assessed by specialists

The following specialist studies will be conducted:

- Geohydrological Study.
- Waste Classification
- Stormwater Assessment
- Visual Impact Assessment

Other Studies being conducted for the proposed activities.:

- Geotechnical Site Investigation
- In-situ Permeability testing
- Topographical Survey of entire site
- Bathometric Survey of selected open cast pit
- Remining Planning

Historical studies:

Information which is relevant to the activities proposed in this application will be extracted from the previous, 2015, specialist studies:

- 2016 Groundwater Study on TSF extension
- Air Quality
- Ecological Report
- Geotechnical Report
- Heritage Impact Assessment
- Noise Study Report
- Socio-economic impact assessment
- Soil and Land Use and LC Report
- Stormwater Management Plan
- Surface Water Impact Assessment
- Vibration Study
- Visual Impact
- Wetland Specialist Report

9.4. Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

9.4.1 Proposed method of assessing environmental aspects

The method for assessing the environmental aspects have been described in Section 8.6.2 above.

9.4.2 Proposed method of assessing alternatives

Refer to Sections 8.1 and 8.6 above for the description of alternatives identified and for the advantages and disadvantages of the identified alternatives.

9.5. The proposed method of assessing duration and significance

Refer to Section 8.6 above for the methodology used in determining and ranking potential environmental impacts and risks.

9.6. The stages at which the Competent Authority will be consulted

The Competent Authority, in this case the Limpopo Department of Mineral Resources and Energy ("DMRE"), will be consulted throughout the application process.

This Scoping Report is compiled and will be made available for public and stakeholder review for a period of thirty (30) days. This Scoping Report will be submitted to the DMRE, where after the DMRE will have 44 days to either refuse environmental authorisation or accept the Scoping Report and inform the applicant to proceed with the tasks contemplated in the plan of study for the EIA.

The Competent Authority (the DMRE) will further be involved during the EIA phase of the proposed activities at Thaba Mine. The EIAR/EMPr will also be made available for a public and stakeholder review period of thirty (30) days. Upon completion of the review period, the EIAR/EMPr will be finalised and submitted to the DMRE, where after the DMRE will have a period of 107 days to consider the application and, in writing, notify the applicant of the decision to grant or refuse environmental authorisation.

9.7. Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

9.7.1 Steps to be taken to notify interested and affected parties

Refer to section 8.2 that details the public participation to be undertaken as part of the proposed activities at Thaba Mine.

Description of the tasks that will be undertaken as part of the environmental impact assessment process.

The Environmental Impact Assessment Report ("EIAR") and Environmental Management Programme Report ("EMPr") will be submitted, once the Scoping Report has been accepted by the Competent Authority. The EIAR will be compiled in accordance with Appendix 3 of the EIA Regulations 2014, as amended and the EMPr will be compiled in accordance with Appendix 4 of the EIA Regulations 2014, as amended.

9.8. Measures to avoid, reverse, mitigate, or manage identified impacts

Table 144 below is the risk assessment table in which preliminarily identified impacts have been identified. Mitigations measures (to avoid, reverse, mitigate, or manage identified impacts) as well as the extent to which these impacts are anticipated to result in residual risks are also provided in Table 144.

Table 14: Risk assessment table for the proposed activities at Thaba Mine including alternatives.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Topography	Removing tailings from the TSF.	The removing of tailings from the TSF will have a positive impact on topography, returning the topography to the natural contours of the land.	The TSF should be landscaped to fit in with the natural topography of the area before/ during mine closure.	High (positive impact) The TSF may later be re-used for tailings deposition.
	In-pit deposition of tailings at open cast Pit 2 (ML1)	The backfilling of the pit with tailings will improve the topography by preventing open unnatural voids in the landscape.	The final shaping of the backfilled pit should fit in with the natural landscape/ topography.	High (positive impact)
Surface water	Surface water contamination and alteration of natural drainage patterns	In the event of chemical or hydrocarbon spillages on soil, surface water runoff which comes into contact with the soil may become contaminated and enter the receiving environment and / or water resources. This will have an impact on surface water quality.	Control: Footprint areas to be minimised to minimise the amount of run-off generated and the likelihood of the runoff containment infrastructure failing. Additional berms are to be constructed to contain contaminated runoff and clean run-off is to be diverted away from the site.	Low. If mitigated / managed appropriately.
		Surface water contamination may occur should the separation of clean- and dirty water management areas not be effectively implemented.	Control: Adequate clean and dirty water systems must be constructed and maintained.	Low. If mitigated / managed appropriately.
		Possible failure of the proposed RWD, Stormwater Dam, or leaking pipelines.	Control: Designs for the dams must consider the 1:100-year flood line. Maintain freeboard. Maintain the pipelines.	Low. Engineering designs. Maintenance and inspection programmes.
	Groundwater extraction	Groundwater extraction could affect surface water quality and quantity where groundwater seeps into surface areas.	Conduct a Geohydrological Study and implement mitigation measures from the Geohydrological Study.	Moderate.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Groundwater	Groundwater contamination	Potential leachate from the tailings in the pit or on the existing TSF to the groundwater regime may contaminate groundwater resources.	Control: Scavenger boreholes will be drilled to manage any potential pollution plumes. Monitoring boreholes should be identified on a gradient from site to ensure the extent of deterioration of groundwater is monitored.	Low. If mitigated / managed appropriately, and to prevent/minimise oil/lubricant spillages.
		Groundwater quality may be impacted in the event of a spillage of chemicals or hydrocarbon materials (e.g. oil spill from vehicles and machinery). Numerous pollution sources exist which have the potential to contaminate groundwater. The contamination of groundwater will occur during all phases of development and may continue long after closure.	Maintenance of operating machines and vehicles only to take place in designated areas regularly. Approved environmentally friendly chemicals should be used as far as possible. All hydrocarbons must be stored in bunded areas. Spillages should be cleaned up and discarded correctly immediately after such an event occurs. Contractor induction should include environmental awareness and the correct action to take in the event of a hydrocarbon spill.	Low. If mitigated / managed appropriately. If mitigated / managed appropriately.
	In-pit deposition of tailings (Backfilling the pit)	Positive Impact: The in-pit deposition and later the rehabilitation with depositing of soil and vegetation will limit exposure of tailings and rock in the pit to elements (water) and therefore also likely minimize the potential for leachate chemicals such as Nitrate into groundwater.	Cover with topsoil and establish indigenous plant communities on top of the backfilled pit. Continue monitoring groundwater for potential signs of pollution from the backfilled pit,	NA – positive impact.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
	Drilling of new Boreholes.	Groundwater reserves could be depleted when water is extracted from boreholes at the TSF and existing TSF. Downstream users may be affected by depletion of groundwater reserves. Groundwater pollution could affect downstream users.	Determine the groundwater yield and don't over-extract groundwater. Compensate downstream water users if they are affected. Conduct monitoring to determine if scavenger boreholes are effective in containing potential pollutants.	Low to moderate if mitigated/ managed properly.
Biodiversity	Clearing of indigenous vegetation	The establishment of the Solar Power Plant and water management infrastructure will disturb vegetation and may impact on indigenous species.	Control and / or stop: Mitigation measures include limiting the footprint area, restricting the footprint area. Mitigation measures include vegetation clearing kept to the minimum. All areas to be cleared must be demarcated.	Low. The removal of indigenous vegetation is regarded as a significant impact. However, should rehabilitation to as close as pre-mining conditions be undertaken appropriately and adequately, as well as the control of alien invasive species, a residual impact on vegetation may be prevented.
Soil, land use and land capability	Clearing of soil for the proposed water infrastructure.	The removal of topsoil may result in the mixing of the horizons of the soil which will have an impact on the fertility and production potential of the soil. The temporary stockpiling of topsoil may result in a decrease in the fertility of the soil and the leaching of minerals due to exposure of the soil to elements. A loss of microbes and viable seed may occur as a result of the temporary stockpiling of topsoil.	Control: Limiting site clearance. Pollution prevention. Successful rehabilitation can result in revegetation.	Low. If mitigated / managed appropriately. If rehabilitation is not implemented adequately, a residual impact on land use and land capability may occur.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
		Soil compaction and topsoil loss through erosion may occur as a result of the proposed activities. This will further lead to a loss of soil fertility.	Control: Contain spillage, excavated and dispose soil if required. Utilisation of spill kits and/or excavation of affected soil with subsequent disposal at an accredited disposal site is vital.	Low. If mitigated / managed appropriately. If rehabilitation is not implemented adequately, a residual impact on land use and land capability may occur.
		Ineffective erosion control along haul roads may lead to siltation of downstream water resources and scouring of soil.	Control: Compilation and implementation of an effective stormwater plan specifically compiled for this site, to minimize runoff, erosion and sedimentation. Stormwater channels should be filled with aggregate to slow the water flow and limit erosion.	Low. If mitigated / managed appropriately. If rehabilitation is not implemented adequately, a residual impact may occur.
Visual Impact	Establishment of the 26.65 MW Solar Power Plant	The development of the Solar Power plant will create a visual impact.	Use vegetation as a screen, by ensuring vegetation and tall trees become established at a suitable distance, around the Solar Power Plant.	Low to Medium risk as the Solar Power Plant is already located in a landscape transformed by mining.
		Reflections from the Solar Power Plant could affect aircraft flying close-by.	Consult with aviation authorities and any local airfields or airports during the public participation process.	Medium to high.
Air quality	Earthworks (removal of tailings from the TSF), activities at the processing plant, hauling material and depositing material.	During the transport of mined or processed materials, and rehabilitation activities, dust (particulate matter, PM10 and PM 2.5) may be generated that may have an impact on the ambient air quality of the area. All vehicles and mining machinery may have an impact on the air quality of the surrounding area due to the emissions released by the vehicles and machinery. Generation of dust from earthworks (removal of tailings from the TSF), activities	Implement speed controls for vehicles and mobile machinery. Use water for dust suppression.	Medium.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
		at the processing plant, hauling material and depositing material in the pit.		
Noise	Increase in noise levels and disturbance. (Drilling of boreholes, hauling of material and operation of the processing plant)	Noise pollution can be measured as noise disturbance and/or cause noise nuisance, both of which will have different impacts on the receiving environment and receptors.	Restrict noisy or excessively noisy activities to daylight hours. Use trees/ allow trees and shrubs to become established at suitable locations to screen noisy areas if possible.	Medium.
Positive Impact- Reducing dependency on non-renewable resources.	Establishment of the 26.65 MW Solar Power Plant	The Solar Power Plant will: Reduce dependency on non-renewable energy sources, therefore minimising the impact on the environment associated with non-renewable energy sources and the processes (such as mining impacts and air emissions associated with extraction and use of non-renewable energy sources).	None.	Medium positive impact.
Positive Impact Economic	Establishment of the 26.65 MW Solar Power Plant	Thaba Mine will be able to operate more sustainable with a reliable energy source, thus ensuring job security and economic stability of the Mine.	None.	Medium to high positive impact.
Positive Impact Social	Establishment of the 26.65 MW Solar Power Plant	Reducing dependency on the national grid, thereby reducing strain on the national grid, and leaving more power available for other users connected to the national grid, potentially minimising the need for loadshedding.	None.	Low to Medium positive impact.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Fauna and Avifauna	Construction, excavating, hauling material.	The solar power plant activities and water management systems will disturb vegetation and may lead to disturbances of fauna and avifauna species.	Control and / or stop: Mitigation measures include: • Impact area kept to the minimum. • All impact areas must be demarcated. • Any fauna directly threatened by the activities should be removed to a safe location by the EO or other suitably qualified person. • The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. • All staff and contractors should undergo an environmental induction course by the EO. • Fires should only be allowed within fire-safe demarcated areas. • No fuelwood collection should be allowed on-site. • No dogs should be allowed on site, unless used by security. Livestock from neighbouring farms should also not be permitted on site. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.	Low.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
	Rehabilitation and closure activities	The rehabilitation and closure activities will disturb vegetation and may lead to the spread and growth of alien plants.	Mitigation measures include: • Soil disturbance and vegetation clearing should be kept to minimum. • Cleared areas that are not going to be used should be revegetated with locally collected seed of indigenous species. • Regular monitoring to ensure that alien plants are not increasing due to the disturbance that has taken place. • Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility. • Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles. • Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species. • Re-vegetation efforts will be monitored every third month for a period of six months after initial seeding. • An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if this cover has not been achieved after six months.	Low

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
		The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of fauna species.	Mitigation measures include: • Impact area kept to the minimum. • All impact areas must be demarcated. • Any fauna directly threatened by the activities should be removed to a safe location by the EO or other suitably qualified person. • The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. • All staff and contractors should undergo an environmental induction course by the EO. • Fires should only be allowed within fire-safe demarcated areas. • No fuelwood collection should be allowed on-site. • No dogs should be allowed on site. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.	Low to Medium.
		The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of avifauna species.		
Sites of archaeological and cultural importance	No sites of archaeological and cultural importance have been identified that will be affected by the proposed activities.			

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Air quality	Reclaiming material from the TSF, transporting tailings, and in-pit deposition could result in dust.	During the transport of the tailings and re-treated tailings material, dust (particulate matter, PM10 and PM2.5) may be generated which may have an impact on the ambient air quality of the area. All vehicles and mining machinery may have an impact on the air quality of the surrounding area as a result of the emissions released by the vehicles and machinery.	Control: Dust management to be done on all cleared areas and unpaved roads, at the TSF and for the in-pit deposition activities. Additional dust suppression to be implemented if deemed necessary. Equipment to be selected in such a manner as to minimise emissions and equipment to be serviced at regular intervals.	Low. Re-treated tailings contain a high ratio of water and are unlikely to cause dust.
Noise	Increase in noise levels and disturbance.	Noise pollution can be measured as noise disturbance and/or cause noise nuisance, both of which will have different impacts on the receiving environment and receptors.	Control: Noise pollution is to be monitored regularly and night-time activities are to be kept to a minimum to lower noise pollution outside of daylight hours.	Low. Noise pollution continue to exist during mining operations.
Visual	Solar Power Plant, Removal of Tailings from the TSF. In-pit deposition.	The Solar Power Plant will have a visual impact. The removal of tailings from the TSF will have a positive visual impact. In-pit deposition will improve the visual impact, by reducing scars/ mine voids in the landscape. The in-pit deposition and subsequent rehabilitation of the pit will result in a visual improvement.	Control and modify: Trees and tall vegetation should be established around the perimeter of the Solar Power Plant to reduce the visual impact on the surrounding area.	Medium to high. The Solar Power Plant will likely have medium to high visual impact, especially due to the size of the power plant (38 ha) Positive impact – medium. The removal of tailings from the TSF and the backfilling of the pit will have a positive visual impact.
Socio-economic	Solar Power Plant.	The Solar Power Plant will provide a reliable source of electricity which will enable activities at the mine to operate continuously (uninterrupted by load shedding)	Control: If possible, goods and services should be procured from local small businesses; this will stimulate indirect job creation.	Low. Job security will not continue after the mine has closed.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
			Knowledge sharing and on-the-job training should be viewed as a prerequisite, where feasible, for all contractor's/service providers working on the project and employing local labour. Continued inclusion of skills development programmes in the mine's Social and Labour Plan ("SLP").	
	The re-treatment of tailings	The re-treatment of tailings will increase the socio-economic benefits of the mine.	Implement the SLP to support and uplift the local community.	Medium to high (positive impact)

10. Other information required by the Competent Authority

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

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

Table 15: Impact on the socio-economic conditions of any directly affected person.

Results of investigation, assessment and evaluation of impact on any directly affected person	Reference to where mitigation is reflected
LMC indicates that it strives to maintain a positive impact on the socio-economic environment during the life of mine. The mine indicates that it has made financial provision for the development for social upliftment as indicated in the 2022 – 2026 Social and Labour Plan. Limberg was placed into business rescue on 25 November 2020 and remain in business rescue as of the date of submission of this document. All mining operations ceased on 22 August 2020, and have not recommenced to date. The mine indicates in the SLP that once operational the mine will utilise mining contractors to carry out the open cast mining operations. The mine will also appoint community contract mining operators as part of a broader upliftment process to extend commercial opportunities to host communities and broaden the skill base within the same host communities. The mine will also appoint a specialist contractor to operate the processing facilities on site.	Section 8.5

10.1.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act 25 of 1999.

Table 16: Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act 25 of 1999.

Results of investigation, assessment and evaluation of impact on any national estate	Reference to where mitigation is reflected
No impact on national estate (heritage resources) in terms of the Heritage Resources Act (Act 25 of 1999), are identified as part of the proposed activities at Thaba Mine.	Refer to Chapter K of Section 8.4.1.

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

No additional matters in terms of section 24(4)(a) and (b) have been identified.

12. Undertaking

The EAP herewith confirms:

- the correctness of the information provided in the reports ☒
- the inclusion of comments and inputs from stakeholders and I&APs; ☒
- the inclusion of inputs and recommendations from the specialist reports where relevant; ☒and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

Name:	Lee-Anne Fellowes
Professional Registration	EAPASA 2019/850 SACNASP 115574
Date:	2023-08-31
Project Code	LIM-THA-22-12-07

Signature of EAP **31 August 2023**

13. Declaration of independence

Shangoni hereby declares that it is an independent EAP has no business, financial, personal, or other interest in this project in respect of which Shangoni is appointed. Furthermore, no circumstances exist that may compromise the objectivity of Shangoni, excluding fair remuneration for work performed in connection with this project.

Report compiled by:

Name:	Colleen van der Merwe
Professional Registration	EAPASA 2019/960
Date:	2023-08-31
Project Code	LIM-THA-22-12-07

Colleen van der Merwe

(Registered EAP)

Report reviewed by:

Name:	Lee-Anne Fellowes
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Lee-Anne Fellowes

(Registered EAP and Pr.Sci. Nat)