Rustenburg Platinum Mines

MORTIMER SMELTER – CONVERSION TO SLAG CLEANING FURNACE

Basic Assessment for Environmental Authorisation

JUNE 2025

PUBLIC

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TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 41107629

DATE: JUNE 2025

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Basic Assessment for Environmental Authorisation

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft BAR			
Date	2 June 2025			
Prepared by	Tiffany Seema			
Signature				
Checked by	Anri Scheepers			
Signature				
Authorised by	Anri Scheepers			
Signature				
Project number	41107629			
Report number	41107629-01			
File reference	\\corp.pbwan.net\za\Central_Data\Projects\41100xxx\41107629 - MORTIMER ESIA\41 EPA\01-Reports\01-Draft			

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1 INTRODUCTION

1.1 BACKGROUND AND TERMS OF REFERENCE

Rustenburg Platinum Mines (RPM), the world's largest primary producer of platinum, currently owns and operates the Mortimer Smelter in the North West Province. The nearest town is the town of Swartklip located approximately 2.5km North of the site, illustrated in Figure 1-1. The Mortimer Smelter is currently licensed as a primary metallurgical furnace used for smelting sulphide ores. The Mortimer Smelter was placed under care and maintenance in April 2024. If this application is successful, it is intended that the Mortimer smelter will be brought out of care and maintenance in its new capacity, as a slag cleaning furnace (SCF). SCF's perform a critical role in the recovery of PGMs and base metals (Ni, Cu and Co) to improve the overall recovery in the PGM value chain.

The Mortimer furnace will therefore be converted from being a primary furnace treating PGM concentrate to one which operates as a an SCF, treating converter slag (WACS) and converter slag tailings (WACSt) from RPM's Waterval Smelter Complex located in Rustenburg, South Africa.

Historically, deficits in slag cleaning capacity have given rise to excess WACS stockpiles containing significant quantities of base and precious metals, and it is important for overall smelting recoveries that there is sufficient slag cleaning capacity to process all the WACS and WACSt. Based on the requirements for reprocessing these stockpiles and new WACS arisings, Mortimer Smelter is thus proposed to be converted to an SCF.

Upgrades to the Mortimer furnace, to enable its conversion to a SCF which can process WACS and WACSt, will include the receiving, handling, drying, storing and transporting of the newly required feed material to the furnace and appropriate feeding systems into the furnace. There will be upgrades to the off gas system as well as the utilities required to support these systems.

Mortimer smelter has an Atmospheric Emission License (AEL) (Ref: BPDM/RUSTNEBURG PLAT/ 4.1&4.16/FEB23) for the existing primary smelting operations, aligned with Government Notice Regulation 893 of 2013 (Listed Activities), promulgated in line with Section 21 of the National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA), which is valid until 30 September 2026. The AEL requires amendment to provide for the proposed slag cleaning operation.

With the change to slag cleaning, subcategory 4.20: Slag Processes, subcategory 4.1: Drying and Calcining, will also. RPM are thus applying to amend the Mortimer AEL to allow slag cleaning (proposed) and remove the current subcategory 4:16 as primary smelting will no longer take place. While the dispersion modelling was simulated at maximum emission rates for the additional slag cleaning, it is expected, due to process and feedstock changes, that SO_2 emissions generated by the slag cleaning will be half those emitted by the primary smelter.

In accordance with the Listing Notice 1 (GNR 982 of 2014), as amended, the amendment to the AEL necessitates that RPM must apply for an Environmental Authorisation (EA) for the proposed activities to the Competent Authority (CA), which is the North West Department of Department of Economic Development, Environment, Conservation and Tourism (DEDECT), supported by a Basic Assessment (BA) Process. A separate AEL variation application will be required to be made to the Bojanala District Municipality under the NEM:AQA.

WSP Group Africa (Pty) Ltd (WSP) was appointed by RPM as the independent Environmental Assessment Practitioner (EAP), to undertake the required environmental authorisation process for the proposed activity.

1.2 PURPOSE OF THE BA PROCESS

The BA process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated. In the context of this report, the purpose of the BA process is to inform decision-makers and the public of potential negative and positive consequences of the proposed construction and operation of the ASC and SO_2 Abatement Plant. This provides the competent authority (CA) sufficient information to make an informed decision with regards to granting or refusing the EA applied for.

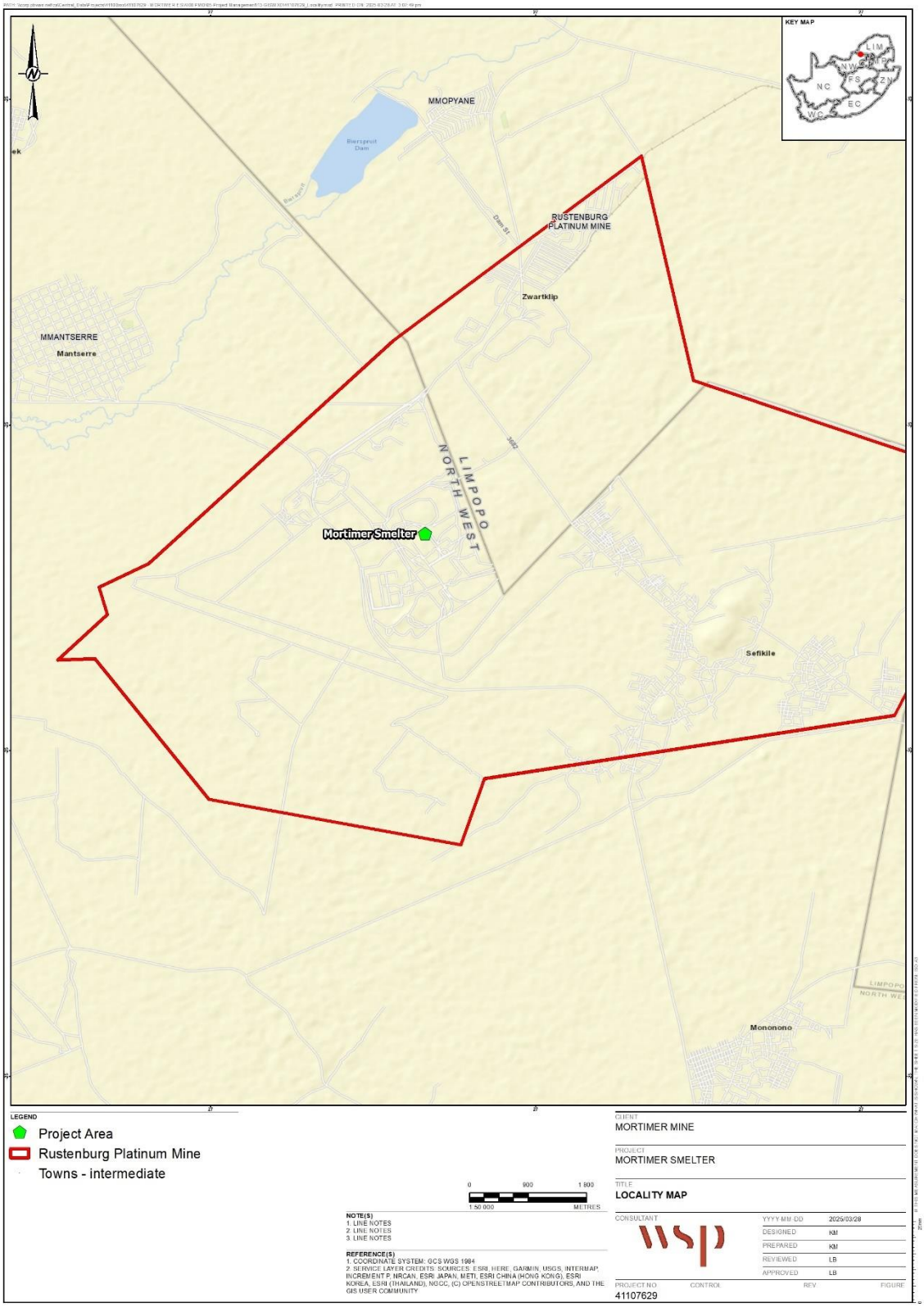

Figure 1-1 - Location of Mortimer Smelter

2 DETAILS OF KEY ROLE PLAYERS

2.1 DETAILS OF THE PROPONENT

Table 2-1 provides details of the project proponent.

Table 2-1 – Details of the proponent

Details	Description
Company Name	Rustenburg Platinum Mines Limited
Company Registration:	1946/022452/06
Physical Address:	Anglo American Platinum Limited, Corporate Office, 144 Oxford Road, Rosebank, Melrose, 2196
Postal Address:	Postnet Suite Number 153, Private Bag X31, Saxonwold, 2132
Telephone Number:	076 440 6254
Contact Person Details	
Contact Person:	Mr Willie Theron
Telephone:	076 440 6254
Email:	Platinum.Environmental@angloamerican.com

2.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

WSP has been appointed in the role of Independent EAP to undertake the BA process for the development of the ASC and SO2 Abatement Plant. The Curriculum Vitae (CV) of the EAP is available in Appendix A. The EAP declaration of interest and undertaking is included in Appendix B. Table 2-2 details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, a number of specialists will support the EAP.

Table 2-2 – Details of the EAP

Details	Description
Company:	WSP Group Africa (Pty) Ltd
Company Registration:	1999/008928/07
Physical Address:	Building 1, Magwa Crescent West, Maxwell Office Park, Waterfall City, Midrand, 1685
Postal Address:	P.O. Box 6001, Halfway House

Details	Description
Environmental Assessment Practitioner:	Anri Scheepers
EAP Qualifications	▪ Bachelor of Arts (Honours), Geography ▪ Bachelor of Arts, Geography
EAPASA Registration No.:	2019/1528
Telephone:	+31 62 287 0811
Email:	Anri.Scheepers@wsp.com

2.2.1 STATEMENT OF INDEPENDENCE

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

2.3 DETAILS OF THE SPECIALIST TEAM

Specialist input was required in support of this application for EA. The details of the specialists are provided in Table 1 5 below. The Curriculum Vitae of the specialists are attached in Appendix C and their declarations in Appendix D.

Table 2-3 - Details of Specialists

Study	Specialist Name	Company	Specialist Report Attached
Atmospheric Impact Assessment	Zayd Ebrahim	WSP	Appendix E1
Environmental Acoustic Impact Assessment	Kirsten Collet	WSP	Appendix E2
Terrestrial Biodiversity Assessment – Compliance Statement	Sandhya Moodley	WSP	Appendix E3
Aquatic Biodiversity Assessment – Compliance Statement	Shavaughn Davis	WSP	Appendix E4
Exemption from a full Phase I Heritage Impact Assessment	Anton Pelser	APelser Archaeological Consulting (APAC)	Appendix E5

Study	Specialist Name	Company	Specialist Report Attached
Exemption of any Palaeontological Impact Assessment	Marion Bamford	University of the Witwatersrand	Appendix E6
Surface Water Impact Assessment	Lee Boyd	WSP	Appendix E7
Rapid Health Impact Assessment	Karen Eatwell	Prime Africa Consult	Appendix E8

2.4 DECLARATION OF INDEPENDENCE

WSP has no vested interest in the Project and hereby declares its independence as required by the EIA Regulations of 2014 (as amended).

2.5 BASIC ASSESSMENT REPORT STRUCTURE

As per the EIA Regulations of 2014 (as amended), Appendix 1 of Government Notice Regulation (GN R.) 982 identifies the legislated requirements that must be contained within a BAR for the CA to consider and come to a decision on the application. Table 2-4 below details where the required information is located within the draft BAR (this report).

Table 2-4 - Legal Requirements as detailed in Appendix 1 of GN R. 982 of the 2014 EIA Regulations (as amended)

Appendix 1 of GN R. 326	Description	Relevant Report Section
3(1) (a)	Details of the EAP who prepared the report and the expertise of the EAP, including a curriculum vitae	Section 2.2
3(1) (b)	The location of the activity	Section 3.2
3(1) (c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale	Section 3
3(1) (d)	A description of the scope of the proposed activity	Section 3
3(1) (e)	A description of the policy and legislative context within which the development is proposed	Section 4
3(1) (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 6
3(1) (g)	A motivation for the preferred site, activity and technology alternative	Section 3.4

Appendix 1 of GN R. 326	Description	Relevant Report Section
3(1) (h)	A full description of the process followed to reach the proposed alternative within the site	Section 3.4
3(1) (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity	Section 5.5
3(1) (j)	An assessment of each identified potentially significant impact and risk	Section 9
3(1) (k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	Section 9
3(1) (l)	An environmental impact statement	Section 0
3(1) (m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr).	Section 9
3(1) (n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Section 11.3
3(1) (o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 5.6
3(1) (p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Section 11.4
3(1) (q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be conducted, and the post construction monitoring requirements finalised	N/A
3(1) (r)	An undertaking under oath or affirmation by the EAP	Section 12
3(1) (s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A
3(1) (t)	Any specific information that may be required by the competent authority	N/A
3(1) (u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act	N/A

3 PROJECT DESCRIPTION

3.1 OVERVIEW OF THE PROJECT

The proposed activities include the conversion of the existing Mortimer furnace from being a primary furnace treating Platinum Group Metals (PGM) concentrate, to be able to operate as a SCF treating WACS and WACS tailings (WACSt). Upgrades to the Mortimer furnace, to enable its conversion to a SCF which can process WACS and WACSt, will include the receiving, handling, drying, storing and transporting of the newly required feed material to the furnace and appropriate feeding systems into the furnace. There will be upgrades to the off gas system as well as the utilities required to support these systems. The Mortimer furnace will therefore be converted from being a primary furnace treating PGM concentrate to one which operates as a an SCF, treating converter slag (WACS) and converter slag tailings (WACSt) from RPM's Waterval Smelter Complex located in Rustenburg, South Africa.

Feasibility studies are still underway to determine the exact engineering solution that will be proposed. RPM intends to apply for an AEL under sub category 4.20, for the converted furnace, to align with the category used for a similar furnace at Waterval Smelter. In parallel, RPM will investigate an alternative compliance dispensation as contemplated under Regulation 12A of the Minimum Emission Standards.

The existing related EAs in place for the activities occurring within the Mortimer Smelter Complex are detailed below:

- Approved Mortimer Smelter Environmental Management Programme (EMPr) (EAR 05/2021)
  - Original Mortimer EMPr – 23 November 2017
  - Amendment – 18 December 2021
- SO_2 Abatement Plant EMPr and EA (NW30/5/1/2/3/2/1/366EM-3)
  - Approved - 12 March 2018
  - Amendment – 7 March 2022

3.2 DESCRIPTION OF THE AFFECTED PROPERTY

The Mortimer Smelter that is located on the border between the Limpopo and North West Provinces. The nearest town is the town of Swartklip located approximately 2.5km North of the site.

The Mortimer Smelter complex boundary falls within the jurisdiction of the Moses Kotane Local Municipality within the Bojanala Platinum District Municipality.

The affected property information is provided in Table 3-1 and a focused locality map is provided in Figure 3-1.

Table 3-1 – Description of the affected property

Farm Details	Turfbult 404 KQ																					
Application area	Plant area (Material receiving, storage and processing): 3.5 Ha																					
Magisterial District	Moses Kotane Local Municipality within the Bojanala Platinum District Municipality																					
Distance and direction from the nearest town	2.5km south of Swartklip																					
21-digit surveyor general code	**SG Office**	**Major Region**				**Minor Region**				**Erf / Farm Number**								**Portion Number**				
	F	T	0	K	Q	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0

3.3 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

This section provides an overview of the description of the activities to be undertaken and where infrastructure will be placed, as well as the triggered listed activities.

3.3.1 EXISTING OPERATIONS

Although currently under care and maintenance, the Mortimer Smelter is one of RPM's three primary smelters in South Africa. When it was operational, it was a single primary smelting furnace, which was upgraded to 38 MW in 2011. The wet concentrate from the RPM concentrators and third parties in the area was delivered to the Mortimer Smelter where it was dried in a 54 wet ton per hour (nominal at 16% moisture) flash dryer to produce the feed material. The furnace produced slag and matte products. The slag was granulated with high pressure water, dewatered in rake classifiers and sent to the slag mill for further processing. Slag that could not be utilised was deposited onto an intermediate slag stockpile. The matte would then be cast into silica sand pits for cooling, after which it was crushed and transported to the Anglo Converter Plant for further processing.

3.3.2 PROPOSED SLAG CLEANING CONVERSION

The SCF at Waterval Smelter provides a critical function for recovery of PGMs and base metals from the WACS. The SCF capacity has been constrained for many years and will continue to be under capacity pressure, despite a full furnace rebuild that was completed in 2023.

Historically, deficits in slag cleaning capacity have given rise to excess WACS stockpiles containing significant quantities of base and precious metals, and it is important for overall smelting recoveries that there is sufficient slag cleaning capacity to process all the WACS and WACSt. Based on the requirements for reprocessing these stockpiles and new WACS arisings, Mortimer Smelter is thus proposed to be converted to an SCF.

Upgrades to the Mortimer furnace, to enable its conversion to a SCF which can process WACS and WACSt, will include the receiving, handling, drying, storing and transporting of the newly required feed material to the furnace and appropriate feeding systems into the furnace. There will be upgrades to the off gas system as well as the utilities required to support these systems.

While the dispersion modelling was simulated at maximum emission rates for the additional slag cleaning, it is expected, due to process and feedstock changes, that SO_2 emissions generated by the slag cleaning will be half those emitted by the primary smelter.

Feasibility studies are still underway to determine the preferred and most appropriate and feasible SO_2 abatement technology, if required, and for this reason, this report considers the potential impacts of worst case scenario that is being considered, bearing in mind that the preferred and most appropriate and feasible option may not be option that has the least impact (BPEO). In parallel, RPM will investigate an alternative compliance dispensation as contemplated under Regulation 12A of the Minimum Emission Standards.

Alternative options to abate the proposed plant will replace the authorised SO_2 abatement plant (acid plant) included in the AEL. The acid plant, as per original design intentions, was halted due to the change in furnace duty and the applicability of the WSA technology to the new furnace operation as well as financial considerations associated with the WSA plant.

The proposed site layout is presented in Figure 3-2, the layout for the ASC Project is presented in Figure 3-3, recognising all proposed activities will occur within the existing Mortimer Smelter footprint. The terrace for the SO2 abatement plant has already been constructed as part of the existing EA's.

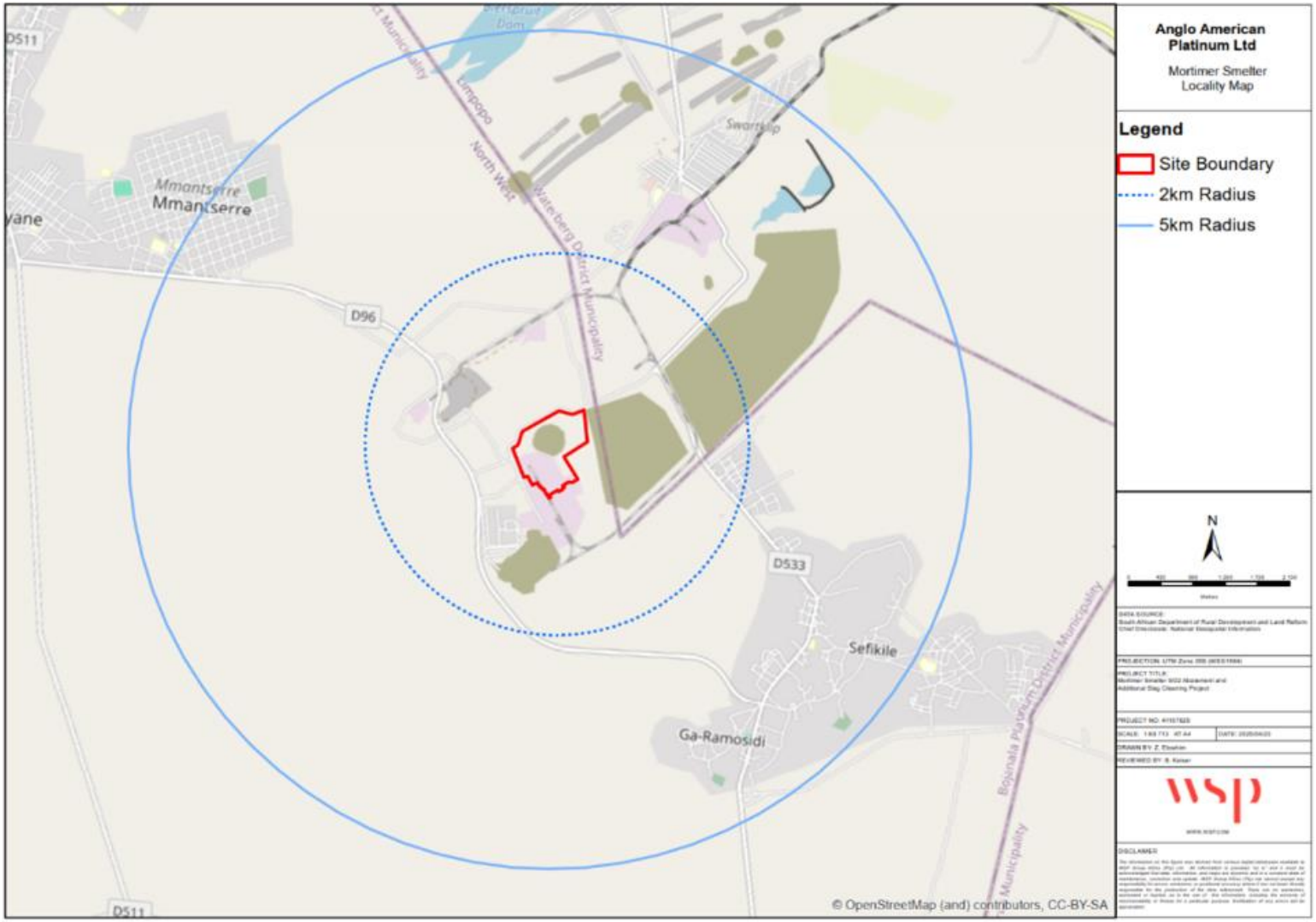

Figure 3-1 - Mortimer Smelter 5km Radius

Figure 3-2 - Proposed Site Layout

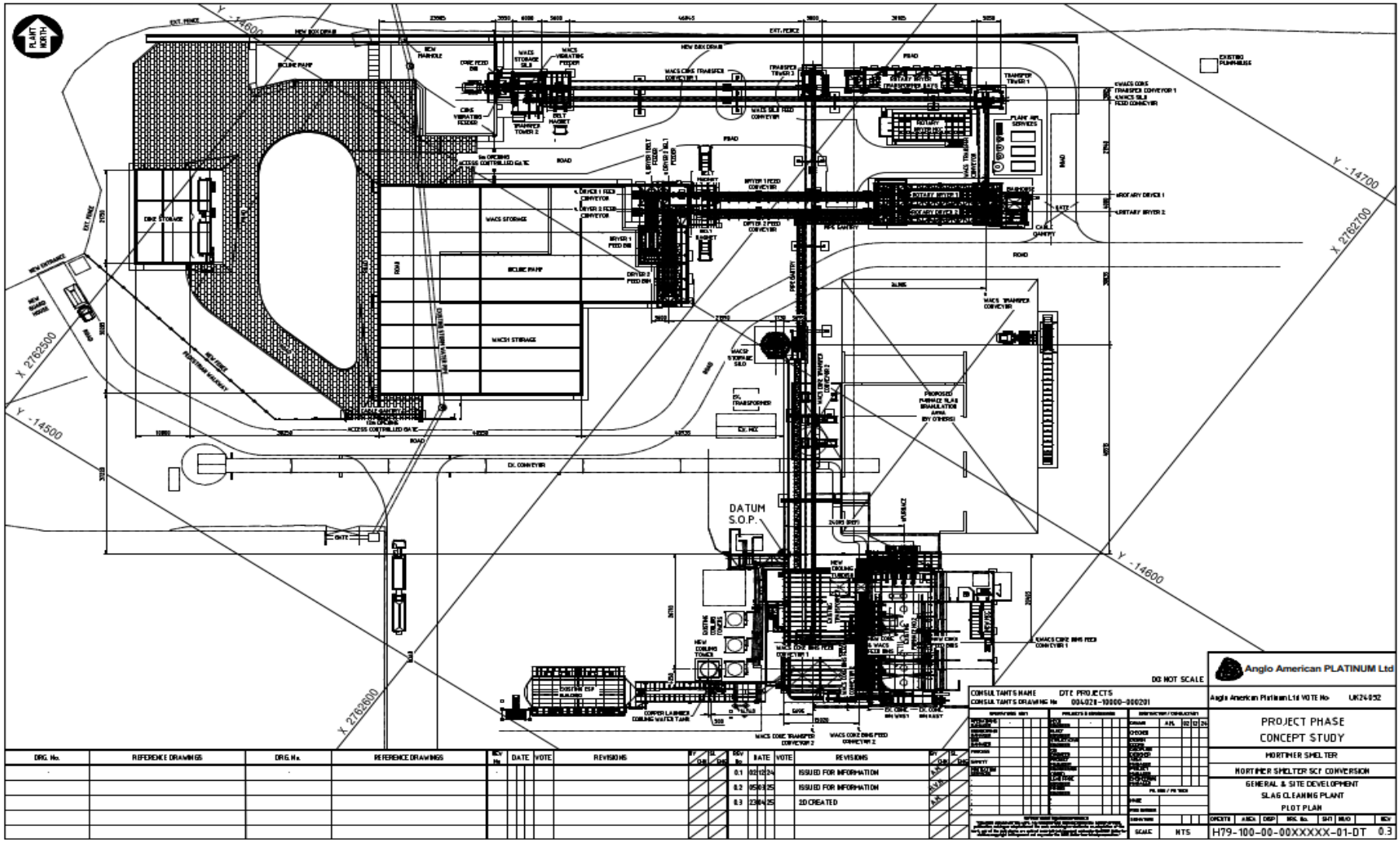

Figure 3-3 - Proposed ASC Layout

3.3.2.1 Furnace Feed Materials

The furnace will process three different feed stocks, namely green concentrate, WACS and WACSt. The materials will be added in a well-controlled ratio to manage the chemistry and hence operating conditions within the furnace. The processing of WACS will be prioritized before the WACSt as it contains a higher metal value.

Concentrate

Concentrate will be delivered to the Mortimer Smelter via both road tanker and piped as wet slurries from neighbouring plants. The largest concentrate sources for Mortimer smelter are Mogalakwena North, Mogalakwena South, Amandelbult UG2 and the Union concentrates. The concentrate will be "blended" and fed to the flash dryer to produce a bone-dry concentrate with <0.5% moisture. The concentrate will then be stored in the dry concentrate silo and transferred via enclosed pneumatic conveying systems to the furnace feed bins.

WACS

The "wet" WACS will be received in a dedicated bunker by side tipper road trucks. The dedicated WACS bunker will be roofed and enclosed on three sides. The WACS will be loaded by a front-end loader (FEL) into a dedicated WACS hopper from where the material will be transported to the electric dryer for drying, via an enclosed conveyor system. Surge capacity necessary to buffer the manual feeding will allow for consistent feeding into the dryer. The dry material (<0.5% moisture) will be discharged from the drier into an enclosed conventional conveyor. The dry material is transported via an enclosed conveyor network to a dedicated silo with sufficient capacity to effectively buffer the smelting process from the drying process.

WACSt

The "wet" WACSt will be received in a dedicated bunker by side tipper road trucks. The dedicated WACSt bunker will be roofed and enclosed on three sides. The WACSt will be loaded by a FEL into a dedicated WACSt hopper from where the material will be transported to the electric dryer for drying, via an enclosed conveyor system. Surge capacity necessary to buffer the manual feeding will allow for consistent feeding into the dryer. The dry material (<0.5% moisture) will be discharged by enclosed pneumatic conveyors into a dedicated silo with sufficient capacity to effectively buffer the smelting process from the drying process.

Reductant

Reductant (typically ~2% of WACS at Waterval SCF and hence WACSt here) is added to the Waterval SCF on a continuous basis in the form of coke. The purpose of reductant addition is to enable carbothermic reduction of the oxidised base metals and in presence of carbon, Ferric ion, Iron (3+) (Fe3+) reduces to Ferrous ion, Iron (2+) (Fe2+), some Fe2+ to Femetal and eventually collected in the matte phase. Besides improved recovery of base metals, the addition of reductant reduces the likelihood of 'build-ups' on the hearth of the furnace and intermediate layers between matte and slag. The reduction of the magnetite in the WACS / WACSt also helps decrease the slag electrical conductivity. Currently petrochemical coke is being utilized as the reductant at Waterval and will likely be used in this newly converted furnace at Mortimer smelter. The necessary feeding systems for coke will be installed as part of the proposed project.

Combustion Air

The generation of carbon monoxide (CO) will occur in the furnace through the reduction of the metal oxides present in the concentrate. CO is a potentially explosive gas (depending on temperatures and concentrations) and therefore needs to be combusted to carbon dioxide (CO_2) in the freeboard of the furnace. To ensure this combustion occurs in the furnace freeboard a dedicated mechanism for introducing controlled amounts of atmospheric air into the freeboard will be installed. This will perform the function of providing oxygen for the reaction with CO but will also work to dilute concentrations and manage freeboard temperatures.

3.3.2.2 Feed Material Drying and Handling

To feed the WACS, WACSt and coke into the furnace, an entirely new feed system will be required. This will run in conjunction with the existing concentrate feed system to feed all the required materials into the furnace.

A new set of dedicated electric dryers will be installed to ensure the WACS / WACSt is dried in line with the furnace feeding specifications. A new WACSt storage silo will be installed to provide a buffer between the drying and smelting processes. A pneumatic system will be used for the WACSt transport and will terminate into the existing furnace feed bins. The sequencing of the transfers of WACSt and concentrate into the feed bins, will be used to manage the feed ratio of the two materials. The existing feeders, air slides and furnace feed ports will be used to transport the material into the furnace.

A new WACS storage silo will be installed to provide a buffer between the drying and smelting processes. A traditional enclosed conveyor belt system will be used for the WACS transport and will terminate into the new WACS furnace feed bins. The sequencing of the transfers of WACS and coke will be managed to ensure the two commodities are not mixed in the respective feed bins.

The coke will be received in a dedicated bunker by side tipper road trucks. The dedicated coke bunker will be roofed and enclosed on three sides. A loading system will be required to get the coke into a storage bin to buffer between the furnace feeding requirements and the transport / receipt of fresh coke. The coke will be transported to the furnace building and diverted into three new dedicated storage bins, equipped with load cells, located adjacent to the furnace. The coke will be discharged into the furnace through the necessary feeding equipment to either the same roof ports as the WACS / WACSt or through dedicated roof ports for coke.

3.3.2.3 Furnace

The existing furnace at Mortimer is a rectangular six-in-line furnace with each pair of electrodes supplied by a 17 MVA transformer. The total furnace electrical supply is 51 MVA translating to a maximum power of 38 MW. The electrodes, with a diameter of 1,250 mm, are used to introduce power into the furnace leading to a hearth power density of 187 kW/m2. Power is generated primarily by the resistance of the slag to the flow of electrical current. As a consequence, heat is generated, and in turn melts the incoming feed materials.

The furnace currently consists of a refractory shell, cooled with composite coolers in the end and side walls all supported by a binding system external to the refractory shell. The hearth and lower sidewalls contain magnesia chrome refractory while the upper sidewalls and roof are super-duty fireclay or VR60 type bricks. The hearth is cooled by an induced draft of atmospheric air while dedicated cooling water is provided to the side and end wall copper components for energy removal.

It is envisaged that no significant changes will be required to the furnace hearth, end walls and side walls as a result of the conversion work for the proposed Project.

Furnace Feeding

The current furnace feeding system uses two feed bins (East and West) to control the feed of concentrate into the furnace. The bins are fed with dry concentrate from the flash dryers to maintain the required level. The material is discharged through metered feeders into an air slide which runs the length of the furnace. Seven feed ports along the length of each air slide open, as dictated by the furnace feed controller, to feed material into the furnace.

The feeding of the furnace will occur on a semi-continuous basis with WACS / WACSt plus concentrate and reductant being added through the roof of the furnace. The feeding is done in multiple batches per hour, but there are no dedicated reducing and settling phases, as is more common on copper slag cleaning furnaces. The feed is blended according to specified ratios to achieve the desired metallurgical outcomes.

The design of the new furnace feed ports for coke will need to be carefully considered to ensure minimal impact on the roof structural integrity, furnace blacktop formation, and as even a distribution of the new feeds as possible. The most appropriate location, and sequence, for coke feeding to maximize the carbon utilization in the bath must also be considered.

The addition of the WACS / WACSt and coke will need to be incorporated into the existing furnace feed controller. Careful consideration will need to be given to the sequencing of the feed to maximise the carbon utilization and preventing elevated furnace freeboard temperatures as far as possible.

Furnace Off Gas

The furnace off gas is generated in the freeboard of the furnace and is drafted out of the furnace through two off-gas ducts. The off gas consists of a process gas portion and an ingress air portion. The process gas consists mostly of SO_2, CO and CO_2. The furnace freeboard conditions need to be controlled to ensure full combustion of CO to CO_2 to ensure the risk of high CO levels in downstream equipment is mitigated. A freeboard temperature of 620 - 650°C will be targeted to enable CO combustion. This will be accomplished through new dedicated and controlled ingress air ports to ensure sufficient oxygen for combustion as well as freeboard temperature control through the power and feed settings of the furnace.

At the Mortimer Smelter, the off-gas cleaning plant consists of off-gas leaving the furnace via two uptakes, one on the slag side and one on the matte side of the furnace. The uptakes combine upstream of an electrostatic precipitator (ESP), where ambient air is allowed to cool the furnace off-gas as necessary to achieve temperatures less than the ESP design temperature of 400°C and remaining above the off-gas dew point temperature.

The removal of particulate matter down to 50mg/dNm^3, is performed by the existing dry electrostatic precipitator (ESP) and the SO_2 emissions are proposed to be removed post the battery limit by the proposed SO_2 abatement project.

3.3.3 SO_2 ABATEMENT

An EA was obtained for the SO_2 abatement project on 12 March 2018 and later amended on 7 March 2022. The proposed installation was in response to the NEM:AQA requirement for furnaces

at metallurgical industries to be operated with efficient SO_2 abatement systems by 2015, however Mortimer Smelter was given an extension until 2020 before further postponement was granted to 31 March 2025. Although the project was subsequently halted when the Mortimer Smelter went under care and maintenance in April 2024, a terrace and some associated infrastructure for the abatement infrastructure had already been prepared.

Due to the change from a primary furnace to an SCF, amendments to the approved SO_2 abatement project are also required. The WSA technology was best suited for gases with > 1% SO_2 content and with this change to the furnace to an SCF the off gas composition is going to be well below 1% SO_2.

Feasibility studies are still underway to determine the preferred and most appropriate and feasible SO_2 abatement technology, and for this reason, this report considers the potential impacts of the worst case scenario which is being considered. Bearing in mind that the preferred and most appropriate and feasible option may not be option that has the least impact. Based on the outcome of these studies, as well as the relevant dispensation work, an Emissions Management Plan (EMP) will be developed to ensure compliance with the updated AEL requested through the Bojanala District Municipality.

The technology alternatives currently being investigated as part of the feasibility study include;

- Fugitive gas extraction from the furnace building and tapping floors.
- Dry Sorbent Injection (DSI) for the capture of SO_2 in the furnace off gas.
- DSI residue collection and storage for transportation and integration in downstream RPM Operations.

The details of each scope item are listed below;Option 1 – Fugitive Gas Extraction as part of the EMP

Option 1 involves installing a new fugitive extraction system as well as a new stack. During normal operation, the fugitive off gas is combined with the furnace off gas and the resultant stream discharged to atmosphere via the new stack.

Options 2 and 3 – Fugitive Gas Extraction Coupled with Simplified/Full DSI as part of the EMP

Options 2 and 3 involve the addition of DSI in the flow scheme for Option 1. The fugitive gas extraction in Option1 is coupled either with simplified DSI or with full DSI.

DSI as an abatement solution involves adding a dry sorbent into the off-gas stream leaving the furnace which then reacts with the SO_2 in the off gas forming a salt. Sodium bicarbonate is used as the sorbent producing sodium sulphate as a dry product. This solution has two options based on where the dry sorbent is injected:

- Simplified DSI - Injecting upstream of existing ESP.
- Full DSI - Injection downstream of existing ESP and installing a new dedicated baghouse filter.

The differences between the fugitive gas extraction with full DSI (Option 3) and fugitive gas extraction with simplified DSI (Option 2) options include:

- For the full DSI option, a dedicated bag filter is installed downstream of the existing ESP, which is not required for the simplified DSI.

- This enables the production of a “clean” residue which can be integrated easier back into the RPM value chain.
- A combined mixture of concentrate and residue is collected from the simplified DSI process and transported to the Precious Metals Refinery (PMR) for integration, as opposed to a relatively clean sorbent without any concentrate for the full DSI process.

In addition, depending the outcome of these studies, it is possible that RPM will seek an alternative compliance dispensation as contemplated under Regulation 12A of the Minimum Emission Standards.

3.3.4 SLAG GRANULATION

Slag is currently tapped out of three slag tapholes, into wet launders and subsequent rake classifiers. Two mud gun and drill units are installed for opening and closing the tapholes. Lancing equipment is also available should it be required for opening the tapholes.

The potential risk for matte entrainment in the slag increases for a furnace in a slag cleaning duty, evident in the operation of the Waterval SCF. To mitigate the risk associated with this as well as the inherent risks associated with water granulation, the granulation technology will be changed at the Mortimer Smelter to a dry granulation process. This new technology has the potential to provide a step change improvement in the safety around the operational furnace.

3.3.5 MATTE TAPPING AND HANDLING

The matte produced in the furnace is periodically tapped out of one of three matte tapholes, into a matte ladle. The ladle is then transferred to the casting bay where the matte is poured into silica moulds for cooling and further processing. The matte superheat will play an important role in the ability to handle this furnace matte.

For the Mortimer slag cleaning furnace, the matte superheat and post taphole handling will rely on the furnace feed setup to ensure the matte does not freeze prior to reaching the casting bay. The concentrate to WACS / WACSt ratio will be adjusted to ensure sufficient superheat for this step as well. Conceptually a blend of 50% WACS / WACSt and 50% concentrate should have sufficiently low matte liquidus temperature to provide for suitable matte superheat for tapping and casting.

3.3.6 STORMWATER MANAGEMENT

Stormwater management in the area in which the additional infrastructure will be constructed will tie into this existing stormwater management plan. Channels/trenches will be developed in order to tie into the existing infrastructure.

3.4 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the BA process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts.

3.4.1 NO-GO ALTERNATIVE

The no-go alternative is the option of not undertaking the proposed development and the continuation of the status quo. The following negative impacts would result:

- There is currently no economic demand for primary smelting and as such Mortimer Smelter will remain under care and maintenance for the time being, and the return of staff and contractors will not be undertaken.
- The WACSt stockpile at Waterval Smelter will remain and no additional beneficiation will be undertaken.
- The new WACS arisings will not be processed.

3.4.2 LOCATION ALTERNATIVE

RPM proposes to convert the existing Mortimer furnace from being a primary furnace treating PGM concentrate to be able to operate as a slag cleaning furnace, treating WACS and WACSt. This will include the receiving, handling, drying, storing and transporting of the newly required feed material and appropriate feeding systems into the furnace from the Waterval Smelter Complex.

The proposed location lies within the already disturbed footprint of the Mortimer Smelter Complex, making it the most practical and feasible option. The logistical and commercial disadvantages of locating the Project on an alternative site are that this would require new facilities to be established, which would be potentially technically and/or commercially unviable as the infrastructure required will be an expansion to existing operations. The development will be located at the existing Mortimer Smelter, because the technology needs to be installed and connected to the existing gas cleaning equipment. As such, no site alternatives were considered. Additionally, the WACS and WACSt feed material stockpiles will be situated adjacent to the drying and furnace infrastructure, which will enhance operational efficiency and reduce environmental impact by reducing material handling distances.

3.4.3 PROCESS ALTERNATIVES

No process alternatives were identified as an ASC is the required process for the WACS and WACSt.

3.4.4 TECHNOLOGY ALTERNATIVES

The alternatives for the SO_2 Abatement Project are discussed in Section 3.3.3.

4 GOVERNANCE FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in Table 4-1 below.

Table 4-1 - Applicable Legislation

Applicable Legislation	Description of Legislation
The Constitution of South Africa (No. 108 of 1996)	Section 24(b) of the Constitution provides that "everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation [and] promote conservation." The Constitution cannot manage environmental resources as a stand-alone law, hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the National Environmental Management Act (No. 107 of 1998) (NEMA), the Minister may identify activities which may not commence without prior authorisation. In 2014, which has subsequently been amended, the Minister promulgated GNR 983 (Listing Notice 1), 984 (Listing Notice 2) and 985 (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for authorisation are published in GNR 982 EIA Regulations (2014, as amended). Listing Notice 1 and Listing Notice 3 identify activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require a Scoping and Environmental Impact Reporting (S&EIR) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. For the proposed Project, the responsibility for processing applications has been delegated to the North West DEDECT. Listed Activity 34 of GNR 983 is considered applicable to the proposed project and therefore, a BA process must be followed to obtain an EA.
Listing Notice 1: GNR 983 (as amended) Activity 34	The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution **Applicability:** With the inclusion of the proposed ASC, the existing AEL (Ref: BPDM/RUSTNEBURG PLAT/ 4.1&4.16/FEB23) for the Mortimer Smelter will require amendment to include a new subcategory reflecting the reprocessing of slag
NEM:AQA	The NEM:AQA regulates all aspects of air quality, including: ▪ Prevention of pollution and environmental degradation; ▪ Providing for national norms and standards (through a National Framework for Air Quality Management), regulating air quality monitoring, management and control; and ▪ Licensing of activities that result in atmospheric emissions and have or may have a significant detrimental effect on the environment. In terms of Section 22 of NEM:AQA no person may conduct a listed activity (as per GN R.893, 22 November 2013) without an AEL. The NEM:AQA has reviewed, categorised and documented all industrial processes that have an adverse impact on ambient air quality and categorised them as Listed Activities. They are all captured in Section 21 of the NEM:AQA (commonly referred to as the "Section 21 Listed Activities").

Applicable Legislation	Description of Legislation
	Mortimer Smelter currently holds an AEL (Ref: BPDM/RUSTNEBURG PLAT/ 4.1&4.16/FEB23), triggering *Category 4: Metallurgical Industry*, valid until 30 September 2026. In line with the Listed Activities contemplated in Section 21 of NEM:AQA, the category applicable to existing operations (Primary Smelting) at Mortimer Smelter is *Category 4: Metallurgical Industry, subcategory 4.1: Drying and Calcining, and subcategory 4.16: Smelting and Converting of Sulphide Ores.* With the addition of the proposed slag cleaning*, subcategory 4.1: Drying and Calcining and subcategory 4.20: Slag Processes*, will also apply.
National Ambient Air Quality Standards	Ambient air quality standards are defined as "targets for air quality management which establish the permissible concentration of a particular substance in, or property of, discharges to air, based on what a particular receiving environment can tolerate without significant deterioration" . The aim of these standards is to provide a benchmark for air quality management and governance. South Africa's National Ambient Air Quality Standards (NAAQS) are based primarily on guidance offered by two standards set by the South African National Standards (SANS): ▪ SANS 69:2004 Framework for implementing National ambient air quality standards; and ▪ SANS 1929:2005 Ambient air quality – Limits for common pollutants. SANS 69:2004 makes provision for the establishment of air quality objectives for the protection of human health and the environment as a whole. Such air quality objectives include limit values, alert thresholds and target values. SANS 1929:2005 uses the provisions in SANS 69:2004 to establish air quality objectives for the protection of human health and the environment and stipulates that limit values are initially set to protect human health. The setting of such limit values represents the first step in a process to manage air quality and initiate a process to ultimately achieve acceptable air quality nationally.
National Dust Control Regulations	On 01 November 2013 the legislated standards for dust fallout were promulgated in the form of the National Environmental Management: Air Quality Act (NEM:AQA) National Dust Control Regulations (GNR 827 of 2013). These regulations are applicable to this project based on potential impacts to ambient air quality associated with site activities including material handling, wind erosion and vehicular entrainment and provide the acceptable / allowable dust fallout rates for both residential and non-residential areas.
Waterberg Bojanala Priority Area	Mortimer Smelter lies within the Bojanala Platinum District Municipality which falls within the Waterberg-Bojanala Priority Area. The designated priority areas in South Africa are associated with poor air quality as a result of elevated concentrations of criteria pollutants contributed to a high density of source emitters including both industrial and non-industrial source operations. The Waterberg-Bojanala Priority Area was designated in 2012 and introduced as part of Air Quality Management in South Africa to direct resources into areas of poor air quality. Aligned with Government Notice Regulation 5153 of 2024 (Regulations for Implementing and Enforcing Priority Area Air Quality Management Plans), promulgated under Section 20 of the NEM:AQA, a stakeholder must within six months of the publication of a priority area air quality management plan or reviewed plan, submit an emission reduction and management plan for activities for which it is responsible, to the Licencing Authority or Air Quality Officer for approval. An emission reduction and management plan must include measures to achieve emission reduction and management, emission reduction targets in-line with the priority area air quality management plan and implementation timeframes to achieve these targets. Annual progress reports must be submitted to the National Air Quality Officer, in a prescribed format, on the implementation of the emission reduction and management plan for the preceding year.
National Water Act (No. 36 of 1998)	The National Water Act (No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under

Applicable Legislation	Description of Legislation
	certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: a) Taking water from a water resource; c) Impeding or diverting the flow of water in a watercourse; g) Disposing of waste in a manner which may detrimentally impact on a water resource; i) Altering the bed, banks, course or characteristics of a watercourse; The proposed activities will not trigger any water uses and thus do not require a new Water Use Licence.
National Heritage Resources Act (No. 25 of 1999)	The National Heritage Resource Act (No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally: Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite. Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as- any development or other activity which will change the character of a site— (i) exceeding 5 000 m2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by this proposed project, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668). Due to the already disturbed nature of the wider area, a motivation for exemption from a full Heritage and Palaeontology Impact Assessments has been submitted to the South African Heritage Resources Agency (SAHRA).
National Environmental Management: Biodiversity Act (No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection. NEM:BA regulates restricted activities that may harm listed threatened or protected species or activities that encourage the spread of alien or invasive species. NEM:BA also makes provision for the publication of bioregional plans and the listing of ecosystems and species that are threatened or in need of protection. Within the published bioregional (spatial) plan, terrestrial and aquatic features that are critical for conserving biodiversity and maintaining ecosystem functioning are indicated as Critical Biodiversity Areas (CBAs). Bioregional plans provide the guidelines for avoiding the loss or degradation of natural habitat in CBAs with the aim of informing EIAs and land-use planning, including Environmental Management Frameworks (EMFs), Spatial Development Frameworks (SDFs) and Integrated Development Plans (IDPs). Chapter 3 of the "Guideline regarding the determination of bioregions and the preparation of and publication of bioregional plans" requires environmental decision-makers who are required by NEMA to apply the NEMA Section 2 principles in their decision-making to consider, amongst other things, sensitive, vulnerable, highly dynamic or stressed

Applicable Legislation	Description of Legislation
	ecosystems, such as coastal shores, estuaries, wetlands and similar systems, which require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure. CBAs identified in a bioregional plan should be such areas and should, therefore, be considered by decision-makers during the decision-making process. Thus, bioregional plans should be considered by CAs in their decision-making regarding an application for EAs. Alien and Invasive Species Regulations (GN R 598 of 2014), as well as the Alien and Invasive Species List (GN R 864 of 2016), have been published to regulate the monitoring, control and eradication for listed invasive species. The Regulations are effective from 1 October 2014, and it is therefore necessary for all landowners on whose land alien and invasive species occur to make the necessary arrangements to be compliant with these Regulations. This may include studies to identify the existence of alien and invasive species, the determination of the category in the Alien and Invasive Species List and the implementation of programmes to combat or control such species. During site operations, closure and rehabilitation, cognisance would be given to the management of alien and invasive species.
National Environmental Management: Protected Areas Act (No. 57 of 2003)	The National Environmental Management Protected Areas Act (Act No. 57 of 2003) (NEM: PAA) concerns the protection and conservation of ecologically viable areas representative of South Africa's diversity and its natural landscapes and seascapes, and includes inter alia: ▪ The establishment of a national register of all national, provincial and local protected areas; ▪ The management of those areas in accordance with national standards; and ▪ Inter-governmental co-operation and public consultation in matters concerning protected areas. Sections 48 to 53 of the NEM: PAA lists restricted activities that may not be conducted in a protected area. Section 49 states that activities in protected areas are regulated or restricted to the extent prescribed by: ▪ Regulations made under Section 86 of the Act; ▪ Regulations made under Section 87, in the case of provincial and local protected areas; ▪ By-laws made by the relevant municipality, in the case of local protected areas; and ▪ Internal rules made by the managing authority of the area under Section 52. The project does not fall within any protected areas.
National Environmental Management Waste Act (No. 59 of 2008)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. However, the contents of this Report will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
Mineral and Petroleum Resources Development Act (No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land, and which may, for example, result in the sterilisation of a mineral resource. A Section 53 approval will be required due to the fact that the project is located on various mining right areas. A conditional no-objection letter was received on 24 April 2023 for the proposed project (Reference number: MP30/5/4/2/11096SU) following submission of a Section 53 application to the DMRE, thereby addressing the requirement.

Applicable Legislation	Description of Legislation
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: (1) The minister may prescribe essential national standards – (a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or (b) for determining – (i) a definition of noise; and (ii) the maximum levels of noise. (2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.
Conservation of Agricultural Resources Act (No. 43 of 1983)	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014.
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DEA Screening Tool Report identified Civil Aviation as having low sensitivity for the proposed Camden I SEF, and no major or other types of civil aviation aerodromes. ATNS and SACAA will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable. An application for the Approval of Obstacles has been submitted to ATNS/CAA and the required permits will be obtained prior to the development of the project.

Applicable Legislation	Description of Legislation
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The Act provides the legal framework which supports the development of renewable energy facilities for the greater environmental and social good. The main objectives of the Act are to: Ensure uninterrupted supply of energy to the Republic; Promote diversity of supply of energy and its sources; Facilitate effective management of energy demand and its conservation; Promote energy research; Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; Ensure collection of data and information relating to energy supply, transportation and demand; Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; Provide for certain safety, health and environment matters that pertain to energy; Facilitate energy access for improvement of the quality of life of the people of Republic; Commercialise energy-related technologies; Ensure effective planning for energy supply, transportation, and consumption; and Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: Achieve the efficient, effective, sustainable, and orderly development and operation of electricity supply infrastructure in South Africa; Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: Facilitate investment in the electricity supply industry; Facilitate universal access to electricity; Promote the use of diverse energy sources and energy efficiency; Promote competitiveness and customer and end user choice; and Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

5 BASIC ASSESSMENT PROCESS

5.1 OBJECTIVES OF THE BASIC ASSESSMENT PROCESS AS PER THE PROCEDURAL FRAMEWORK

As defined in Appendix 1 of the EIA Regulations, 2014 (as amended), published under GN R.982, the objective of the impact assessment process is to, through a consultative process:

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focuses on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites;
- To rate the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
    - The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    - The degree to which these impacts—
        - Can be reversed;
        - May cause irreplaceable loss of resources; and
        - Can be avoided, managed, or mitigated.
- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to–
    - Identify and motivate a preferred site, activity and technology alternative;
    - Identify suitable measures to avoid, manage or mitigate identified impacts; and
    - Identify residual risks that need to be managed and monitored.

5.2 DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT WEB-BASED ENVIRONMENTAL SCREENING TOOL

The Department of Forestry, Fisheries and the Environment (DFFE) has developed the National Web-based Environmental Screening Tool to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations of 2014 (as amended). The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended (GN R.960 of July 2019) states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under GN. R.982 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 (as amended) as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint and the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the proposed Project was generated and is attached as Appendix F. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the BA process based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

Table 5-1 below provides a summary of the sensitivities identified for the development footprint.

Table 5-1 - Sensitivities identified in the DFFE Screening Report

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

Based on the selected classification and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments were identified for inclusion in the BAR by the Screening Tool:

- Atmospheric Impact Assessment
- Environmental Acoustic Impact Assessment
- Terrestrial Biodiversity Assessment – Compliance Statement
- Aquatic Biodiversity Assessment – Compliance Statement
- Exemption from a full Phase I Heritage Impact Assessment
- Exemption of any Palaeontological Impact Assessment
- Surface Water Impact Assessment
- Rapid Health Impact Assessment

5.2.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation. Table 5-2 below outlines the specialist studies that were identified during the Screening Assessment and verified during a site verification assessment. Where the specialist studies are deemed not applicable a motivation is provided to that effect.

Table 5-2 - Specialist Studies

Specialist Study	Applicability
Hydrology Assessment	A Surface Water Impact Assessment was undertaken.
Noise Impact Assessment	An Environmental Acoustic Impact Assessment was undertaken.
Traffic Impact Assessment	The Mortimer Smelter receives materials via road tanker, and the feed material for the ASC is proposed to be delivered in the same manner. The rate at which this feed material will be delivered, is not anticipated to result in significant increase in traffic volumes beyond existing levels. Therefore, this assessment is not deemed necessary.
Health Impact Assessment	A Rapid Health Impact Assessment was undertaken.
Socio-Economic Impact Assessment	A full Socio-Economic Assessment has not been commissioned as the proposed activities will be an expansion to the existing Mortimer Smelter facility, with no additional impact expected to the surrounding communities. As such, the existing socio-economic conditions are not expected to be adversely affected by the proposed project. However, a full Public Participation Process will be undertaken in accordance with Chapter 6 of the EIA Regulations GN R. 982.
Ambient Air Quality Impact Assessment	An Atmospheric Impact Assessment was undertaken.
Air Quality Impact Assessment	
Plant Species Assessment	A Terrestrial Biodiversity Assessment – Compliance Statement was undertaken.
Animal Species Assessment	
Agricultural Impact Assessment	The proposed activities will occur within the existing disturbed footprint of the Mortimer Smelter complex. Based on the site verification the majority of the site is disturbed and there are no agricultural potential remaining. As such it is deemed that a specialist study is not required.
Landscape / Visual Impact Assessment	The proposed activities will occur within the existing disturbed footprint of the Mortimer Smelter complex. Based on the site verification the site is already disturbed with existing industrial and mining activities surrounding it and will not change the landscape of the area. As such it is deemed that a specialist study is not required.

Specialist Study	Applicability
Archaeological and Cultural Heritage Impact Assessment	Exemption from a full Phase I Heritage Impact Assessment was undertaken.
Palaeontology Impact Assessment	Exemption of any Palaeontological Impact Assessment was undertaken.
Terrestrial Biodiversity Impact Assessment	A Terrestrial Biodiversity Assessment – Compliance Statement was undertaken.
Aquatic Biodiversity Impact Assessment	An Aquatic Biodiversity Assessment – Compliance Statement was undertaken.

5.3 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of a pre-application consultation with the DEDECT and subsequently completing the appropriate application form, as well as the submission and registration of the application for an EA with the DEDECT. A pre-application meeting was held with the DEDECT on the 8th of April 2025. The application form will be submitted to the DEDECT on 2 June 2025 along with the Draft Basic Assessment Report.

5.4 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the environmental attributes of the Project area and its surroundings were compiled through a combination of desktop reviews and site investigations. Desktop reviews made use of available information including existing reports, aerial imagery, and mapping.

5.5 IMPACT ASSESSMENT METHODOLOGY

5.5.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed Project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources

and receptors to provide a detailed discussion of impacts. The assessment considers direct[1], indirect[2], secondary[3], as well as cumulative[4] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i·e., residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[5] presented in Table 5-3.

Table 5-3 – Impact Assessment Criterion and Scoring System

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$				

[1] Impacts that arise directly from activities that form an integral part of the Project.
[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[3] Secondary or induced impacts caused by a change in the Project environment.
[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

	$Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
Impact Significance Rating					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

5.5.2 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 5-1** below.

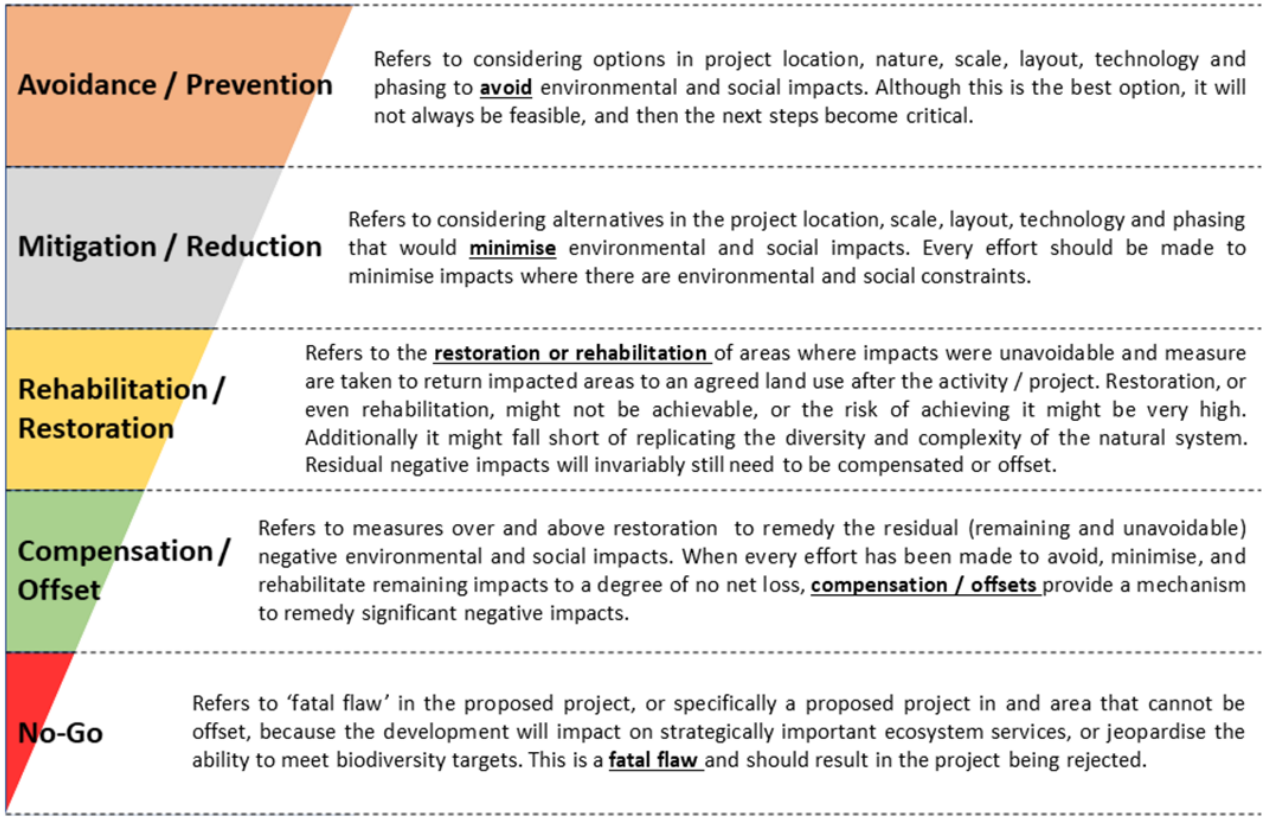

Figure 5-1 - Mitigation sequence/hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

5.6 ASSUMPTIONS AND LIMITATIONS

5.6.1 GENERAL ASSUMPTIONS AND LIMITATIONS

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project.
- A site visit has been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed.
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation.
- The comments received in response to the public participation process, will be representative of comments from the broader community.

- Based on the pre-application meeting and subsequent minutes, the CA has not requested additional specialist studies to decide regarding the application.
- WSP's assessment of the significance of impacts of the proposed project on the affected environment has been based on the assumption that the activities will be confined to those described in Section 3. If any substantial changes to the project description are made, impacts may need to be reassessed.
- All information is assumed to be accurate and relevant at the time of writing this report.
- The information provided by the proponent, and the specialists is assumed to be accurate.

5.6.2 ATMOSPHERIC IMPACT ASSESSMENT

- It is assumed that the data provided by RPM is accurate and representative of the proposed operations on site.
- Unless otherwise stated, operational information was provided by RPM. Any errors, limitations, or assumptions inherent in these datasets extend to this study.
- Of the options assessed in Screen3, it was assumed by selecting the worst-case option for further analysis in AERMOD implies that should RPM decide to implement another option which had improved Screen3 predictions, its impacts on the environment would be less than those modelled in AERMOD in this AIR.
- It is assumed that the operating hours of the plant and material haulage will be 24 hours a day, for 365 days a year.
- It is assumed that all fugitive emissions from the Furnace Building will report to the ESP stack via capture hoods.
- It is understood that the matte crusher is enclosed, and fugitive emissions will be captured and released to atmosphere via the New Abatement stack.
- The dry slag granulation will be a batch process. It is understood that operations will be conducted in 3-hour batches, four times a day.
- It is understood that the dry slag granulation SO_2 concentration provided was based on a design mass balance. For this study, the SO_2 concentration was calculated based on the production rate.
- Conveyor emissions are not assessed as the conveyor systems will be enclosed and no atmospheric emissions will occur.
- WACSt is conveyed in a pneumatic conveyor from the drier to storage silo, and silo to furnace. This is an enclosed system, and no atmospheric emissions will occur.
- It is assumed that the pressure release valve on WACSt silo will have a filter to mitigate release of particulate emissions.
- It is understood that the storage warehouses (bunkers) are naturally ventilated/ open one side. Based on this, emissions from the bunkers are assessed as material handling sources.
- WACSt/WACS moisture content of 4% - 15% was provided. A moisture content of 4% (driest material) was assumed as a worst-case scenario.
- Coke delivery estimated at 5 - 8 trucks in a single day per month (as provided by RPM). Eight return trips in one day for coke transport was assumed to be the worst-case scenario.
- Vehicle parameters were obtained from research materials where data was unavailable. It is assumed that the data is representative of operations on site as confirmed by RPM.
- It was assumed that all roads on site are paved, with exception of the slag dump access road. For this study, the slag dump road was not assessed as this road is utilised on an ad hoc basis and is therefore not considered a normal operating road.
- It was indicated by RPM that all vehicles assessed have diesel powered combustion engines.

- It is assumed all roads are 10m wide.
- Only exhaust emissions from haul trucks and delivery trucks are assessed as they account for the most significant portion of vehicle related emissions.
- Typical Diesel truck fuel consumption assumed to be 25L/100km, as per NPi recommendations.
- $PM_{2.5}/PM_{10}$ ratio assumed as per US EPA AP-42 Appendix B2, where applicable.

5.6.3 ENVIRONMENTAL ACOUSTIC IMPACT ASSESSMENT

- The information provided regarding the proposed operational activities is assumed to be representative of what will occur in reality.
- Due to the erratic nature of the construction phase, a quantitative assessment of construction phase acoustic impacts was not undertaken, but rather a qualitative discussion thereof.
- It was assumed that the 2012 baseline data is representative of the onsite noise climate while the smelter was fully operational.
- It was assumed, as a worst case, that all sources (operational and standby) will be operational at the same time.
- There is limited numerical data on industrial spray coolers, as such noise levels for commercial coolers were used as a substitute.
- There is limited numerical data for screw feeders, as such the same sound power level for belt feeders was assumed.
- The sound power level for rotary dryers includes noise from all associated sources including the drum drive and elements, so these are not included separately in the acoustic inventory.
- Vehicle trips presented indicate a worst-case number of vehicles per day situation.
- There will be no additional coal trucks, matte trucks or concentrate trucks to current operations, so these trucks were not included in the assessment.
- To represent a worst-case assessment, all sources were modelled as unenclosed. In reality some sources will be contained within buildings or acoustic enclosers.
- The acoustic model considered surrounding terrain, however, buildings were not included. Such an approach represents a worst case scenario with all sound propagating away from the source and not reflecting off/attenuating through surrounding structures.
- Sources in the model were located according to the site layout as provided by RPM.

5.6.4 TERRESTRIAL BIODIVERSITY ASSESSMENT – COMPLIANCE STATEMENT

- The baseline description is based on available national datasets and published literature for the study area region, and previous ecological studies conducted in the Project area in conjunction with a single wet season survey.

5.6.5 AQUATIC BIODIVERSITY ASSESSMENT – COMPLIANCE STATEMENT

- The Aquatic Biodiversity assessment was prepared based on the site sensitivity verification process undertaken in response to the national web-based screening report. The site sensitivity verification was completed via a combination of desktop analysis of existing literature and a ground truthing survey of potential freshwater watercourses likely to be impacted by the proposed Project.

- This study is considered a once off assessment, which can only take into consideration the current condition, with some speculation of historical events based on evidence observed in field and with the aid of satellite imagery. Since vegetation and habitats often vary temporally and spatially, there must be recognition of fact that certain aspects or features may not have been present on the day of the site visit.
- Whilst the assessment techniques applied in this report are used to standardise and 'objectify' the assessment of the systems' function, potential impacts, and services, it must be noted that much of the information is subjectively collected based on the assessor's experience and training. The assessor will, if additional information or counter arguments are provided and verified, hold the right to amend the report if necessary.
- The results of any other specialist reports reviewed and referenced in this report are assumed to be accurate and undertaken according to best practice.

5.6.6 EXEMPTION FROM A FULL PHASE I HERITAGE IMPACT ASSESSMENT

- None.

5.6.7 EXEMPTION OF ANY PALAEONTOLOGICAL IMPACT ASSESSMENT

- None.

5.6.8 SURFACE WATER IMPACT ASSESSMENT

- None.

5.6.9 RAPID HEALTH IMPACT ASSESSMENT

- Assumptions and limitations of the AERMOD modelling and modelled ambient air concentrations for SO_2, NO_X, PM_{10}, $PM_{2.5}$ and TSP for the two scenarios are provided in the AIR report (WSP, 2025). An important point from the AIR to state here again is that "Of the options assessed in Screen3, it was assumed by selecting the worst-case option for further analysis in AERMOD implies that should RPM decide to implement another option which had improved Screen3 predictions, its impacts on the environment would be less than those modelled in AERMOD in this AIR."
- It is assumed that the population numbers estimated based on extrapolations of available population ward, settlements or towns to a 2024 representative value are the best available values to use in this assessment.
- The exposure response functions (ERFs) used in the study are based on large sets of epidemiological study data on air pollution, however there is not a sufficient database of primary epidemiological evidence on air pollution for South Africa and therefore international studies from the WHO were used as recommended by the WHO (WHO, 2016a)

6 NEED AND DESIRABILITY FOR THE PROJECT

The DFFE's Guideline on Need and Desirability (GN R.891 of 2014) emphasises that while national strategies and policies are important for the development of the economy, they also need to address strategic issues such as climate, food security and the sustainability of natural resource supply and the condition of South Africa's ecosystem services. It is for this reason that the overarching framework for assessing the need and desirability of developments is adopted at policy - level by identifying and promoting the activities/industries/developments that civil society needs. The guidelines also note that at the project level (e.g., within the BA process), the "need" and "desirability" of a project should be reflected in the content of local and regional plans, frameworks and strategies.

Considering the above, the purpose of this part of the report is to outline the necessity and desirability of the proposed Project, highlighting how it fits into the strategic framework of global, national, regional and local development policies and programmes, as well as wider societal requirements (where applicable).

6.1 DIRECT BENEFITS OF THE PROJECT

The existing furnace is currently under care and maintenance. The SCF will result in increased job opportunities and associated economic benefits for the local community. It is estimated that there will be approximately 150 employment opportunities during construction and 116 during operation. The additional revenue generated will also result in increased tax payments to benefit the national economy.

In addition, the proposed development aligns with RPM's commercial priorities aimed at minimising the waste of mineral resources, increasing beneficiation and promoting responsible waste management. It supports the long-term viability of RPM's smelting operations by enhancing metal recovery efficiency and reducing the environmental footprint associated with unmanaged stockpiles of metallurgical rich waste.

6.2 NATIONAL DEVELOPMENT PLAN, 2030

The South African National Development Plan (NDP) outlines the country's long-term vision and goals for sustainable development. The NDP recognises the importance of the minerals and metals cluster of the economy as a key sector contributing to economic growth and job creation. Some of the other key elements of the NDP 2030 related to the proposed Project include:

- **Infrastructure Development:** The NDP underscores the importance of infrastructure development to support economic growth.
- **Beneficiation and Value Addition:** The NDP promotes beneficiation, which involves adding value to raw minerals before export. It identifies priority areas for beneficiation where existing capacity can be leveraged or where there is strong potential to stimulate downstream manufacturing.
- **Environmental Sustainability:** The NDP also stresses the need for environmentally sustainable practices within the industry. Balancing economic growth with environmental conservation is a key consideration, ensuring that mineral processing activities are conducted responsibly and do not harm the environment in the long term.

- **Inclusive Economic Participation:** The NDP advocates for the inclusion of historically disadvantaged groups, including black South Africans, in the mining sector. Policies such as Black Economic Empowerment (BEE) are aligned with the NDP's goal of promoting inclusive economic participation and reducing historical inequalities.
- **Research and Innovation:** The NDP highlights the importance of research and innovation. Encouraging research and the adoption of innovative technologies is seen as essential for improving efficiency, safety, and environmental sustainability.

The proposed Project aligns with the NDP's objectives by enhancing mineral processing capacity within the established infrastructure of the RPM smelter operations. The activities also endeavour to ensure inclusive and sustainable operations which will result in the economic benefit of the region.

6.3 INDUSTRIAL POLICY ACTION PLAN (IPAP), 2018/19-2020/21

IPAP aims to promote industrialisation and enhance the competitiveness of South African industries. Similar to the policies previously discussed, IPAP encourages mineral beneficiation as a key instrument for the industrialisation agenda aiming to shift the economy from mining and resource extraction towards value-added manufacturing that supports diversification, job creation, and sustainable growth.

The proposed Project will play a role in encouraging mineral beneficiation and supporting sustainable economic growth.

6.3.1 SPECIAL ECONOMIC ZONES (SEZ)

With an eye to international trends, the South African government has also sought to employ the SEZ policy instrument with several defined objectives including promotion of beneficiation and value-addition to the country's minerals and other natural resources.

South Africa has 7 established SEZs located in different provinces. In addition, work is underway on the planning and implementation of new SEZs including the proposed Bojanala SEZ with focus on the mineral beneficiation of PGMs. The SEZ will capitalise on the area's well-established mining industry, good infrastructure and a large labour pool to drive investment and economic growth, skills development and employment.

While the Mortimer Smelter is located outside the proposed Bojanala SEZ, it is closely aligned with the SEZ's objectives and is expected to play a significant role in advancing the socio-economic development of the Bojanala region which has been identified as central to the province's economic recovery strategy.

6.4 INTEGRATED DEVELOPMENT PLAN (IDP)

6.4.1 BOJANALA DISTRICT MUNICIPALITY IDP, 2024/25

The IDP of the Bojanala District Municipality outlines the strategic objectives and concerns of the municipality, focusing on comprehensive development over a specific period. While the specific details of the plan can vary, the main concerns that impact negatively on economic development that are most relevant to the proposed Project include:

- High level of unemployment
- High poverty levels
- Inability to tap into the main economic sectors of the district

The location quotient indicates that the district has comparative advantage in the mining industry. The municipality aims to explore strategies that shift the focus of mining activities to generate more production output that can leave either the district and/or province at final consumable state. The location quotient result places the district in a better position to grow the economy and create jobs using the sector that mainly focuses on mineral beneficiation, which has been identified as one of the components of the Nine Point Plan that forms part of the government's strategy to implement the NDP.

The proposed activities are a good step in aligning with the objectives of the Bojanala District Municipality IDP objectives to shift the focus of the economy to mineral processing.

6.4.2 MOSES KOTANE LOCAL MUNICIPALITY IDP, 2024/25

The ultimate objective of the Moses Kotane Local Municipality's IDP mirror those of the regional municipality, which is to improve the quality of life for local communities. In the medium-term, there are three strategic priorities that have been identified:

- To drive inclusive growth and job creation
- To reduce poverty and tackle the high cost of living; and
- To build capable, ethical and developmental state.

The proposed project is well aligned with these priorities and is expected to make a meaningful contribution toward addressing them. Furthermore, the municipality's Local Economic Development (LED) Strategy outlines, *inter alia,* a commitment to sustainable growth that aligns with the proposed activities.

7 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section provides an overview of the public participation process (PPP) that will be undertaken as part of this BA process.

7.1 OBJECTIVES OF STAKEHOLDER ENGAGEMENT

The PPP was designed to provide information to, and receive feedback from, I&APs throughout the BA process, thus providing organisations and individuals and other stakeholders with an opportunity to raise concerns and provide comments and suggestions regarding the Project.

The principles that determine communication with society at large are included in the principles of the NEMA and are elaborated upon in General Notice 657, titled "Guideline 4: Public Participation" (Department of Environmental Affairs and Tourism, 19 May 2006), which states that: *"Public participation process means a process in which potential interested and affected parties (I&APs) are given an opportunity to comment on, or raise issues relevant to, specific matters."*

Opportunities for Comment

Documents will be available during the BA process to provide stakeholders with information, further opportunities to identify issues of concern and suggestions for enhanced benefits and to verify that the issues raised have been considered.

Public participation is an essential and regulatory requirement for the BA process and will be undertaken in terms of Chapter 6 of the EIA Regulations GNR.982. Public participation is a process that is intended to lead to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently.

The PPP is designed to provide sufficient and accessible information to I&APs in an objective manner and enable them to:

- Raise issues of concern and make suggestions for enhanced benefits.
- Verify that their issues have been recorded.
- Assist in identifying reasonable alternatives.
- Contribute relevant local information and traditional knowledge to the environmental assessment.
- Comment on the findings of the environmental impact assessment and the mitigation measures proposed.

Once the CA, the DEDECT, has announced its decision, I&APs will be notified of the outcome and the appeal procedure.

7.2 PUBLIC CONSULTATION PROCESS FOR THE BA PROCESS

7.2.1 REGISTRATION OF I&APS

The NEMA Regulations distinguish between I&APs and registered I&APs.

I&APs, as contemplated in Section 24(4) (d) of the NEMA include:

"*(a) any person, group of persons or organisation interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity*".

In terms of the Regulations:

"An EAP managing an application must open and maintain a register which contains the names, contact details and addresses of:

- *All persons who; have submitted written comments or attended meetings with the applicant or EAP;*
- *All persons who; have requested the applicant or EAP managing the application, in writing, for their names to be placed on the register; and*
- *All organs of state which have jurisdiction in respect of the activity to which the application relates."*

Stakeholders will be encouraged to register as I&APs and participate in the consultation processes by completing the registration and comment sheet and returning it to the Public Participation Office.

A stakeholder database was developed for the project based on information supplied by RPM and additional I&APs which had been identified by the project team. These included regulatory authorities, surrounding landowners and others. The stakeholder database is included in Appendix H1.

7.2.2 NOTIFICATION OF POTENTIAL I&AP'S

In accordance with GNR 982 Section 41(2)(a-b) site notices were developed (proof of notification will be included in Appendix H of the Final BAR) and will be placed at the site and three public locations.

The site notice serves to inform the occupiers of the land along with the newspaper advert and existing stakeholder database.

In accordance with GN. R 982 41(2)(c) of Chapter 6 an advert will be placed in two newspapers. There are many local languages spoken in the area with English being considered a universal language; therefore, the newspaper adverts will be published in English only.

Should the EAP identify an affected stakeholder, and be made aware of his/her existence by the ward councillor, efforts will be made to ensure his/her participation in the stakeholder engagement process [as required by Section 41(2) (e) of Chapter 6].

In addition to the minimum requirements outlined in GNR 982, as amended, the EAP will undertake the following:

- Distribution of notification letters to the stakeholders via email and bulk sms (where contact data is available).

Any stakeholder who submits a comment during the course of the process will automatically be registered on the project specific stakeholder database. Comments received during the Draft BAR review period will be included in the Final BAR as part of the comments and responses report (CRR) in Appendix H and submitted to the competent authority.

7.2.3 PUBLIC REVIEW OF THE DRAFT BAR

The draft BAR has been placed into the public domain for comment from **2 June** to **4 July 2025**. The report will be made available at 2 public places and posted to the WSP website: https://www.wsp.com/en-za/services/public-documents.

All registered stakeholders and authorising/commenting state departments will be notified of the public review period as well as the locations of the Draft BAR via email and bulk sms. The abovementioned plan, for notification and provision of reports, will also be utilised for the review of the Final BAR.

7.2.4 COMMENTS AND RESPONSES REPORT

All concerns, comments, viewpoints and questions (collectively referred to as 'issues' will be documented and responded to adequately in a CRR, which will be attached as Appendix H of the FSR. The CRR record the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

7.2.5 FINAL BAR REPORT

The Draft BAR will be updated based on comments received from I&APs during the public review period. The Final BAR will thereafter be submitted to the CA.

7.2.6 NOTIFICATION OF DECISION

Once the CA has taken a decision about the Project, the Public Participation Office will notify I&APs of this decision and of the opportunity to appeal. This notification will be provided as follows:

- A letter will be sent, addressed to all registered I&APs, summarising the authority's decision and explaining how to lodge an appeal should they wish to.

8 BASELINE ENVIRONMENTAL ATTRIBUTES

This section of the report presents an overview of the environmental baseline and status quo of the project area at Mortimer. Information presented in this section is based on available desktop information, specialist studies and previous studies undertaken in the project area.

Information was obtained from the following specialist studies undertaken as part of this BA process:

- Atmospheric Impact Assessment
- Environmental Acoustic Impact Assessment
- Terrestrial Biodiversity Assessment – Compliance Statement
- Aquatic Biodiversity Assessment – Compliance Statement
- Exemption from a full Phase I Heritage Impact Assessment
- Exemption of any Palaeontological Impact Assessment
- Surface Water Impact Assessment
- Rapid Health Impact Assessment

8.1 CLIMATE AND METEOROLOGY

8.1.1 CLIMATE

The climate of the interior of South Africa is primarily governed by the subtropical high-pressure, with temporary disruptions by low pressure cells or fronts. The high-pressure zone is centred near 33°S latitude and is associated with strong divergence at the surface and convergence in the upper atmosphere (Tyson and Preston-Whyte, 2000). Figure 8-1 below present the predominant macroscale atmospheric circulations over the subcontinent. Easterly wave and low-pressure cells tend to be summer phenomena, while the westerly wave and low-pressure cells tend to be autumn to spring phenomena.

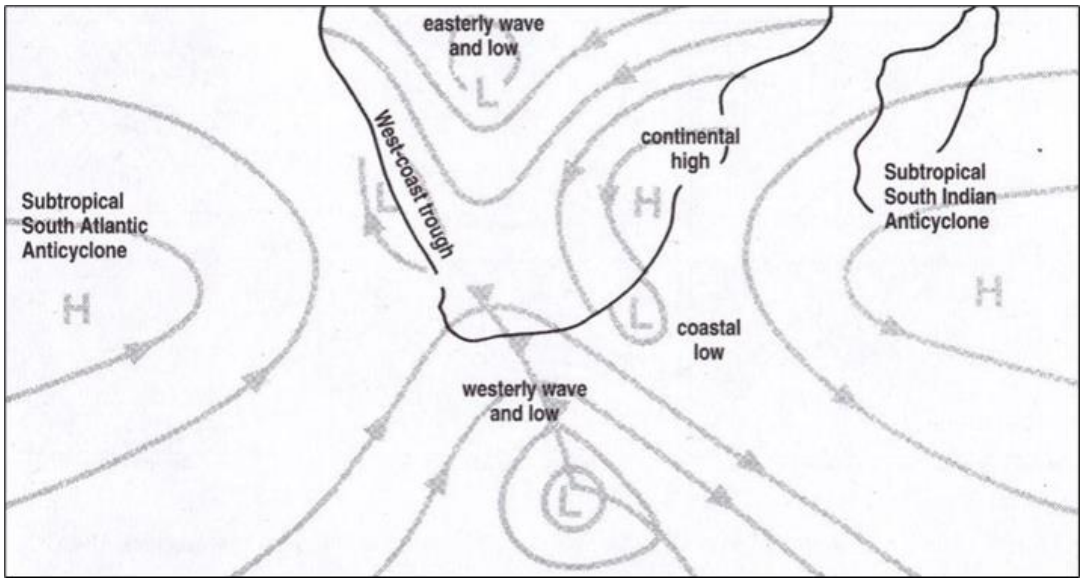

Figure 8-1 - South African meteorological phenomena (Tyson and Preston-Whyte, 2000)

Rainfall over the south-western region of South Africa predominantly occurs during winter and spring, driven by the influence of mid-latitude westerly waves. Precipitation is typically initiated by

upper-level divergence and surface-level convergence on the rear of a trough, which induces vertical uplift and cloud development. The interaction between a surface trough along the west coast and an upper-tropospheric westerly wave offshore can lead to widespread rainfall events across the western interior.

During summer, these westerly systems migrate further south, reducing the occurrence of frontal rainfall over the region. In contrast, the eastern coastline benefits from warm ocean currents and moist onshore winds that enhance convective rainfall in the summer months. The cold Benguela Current along the west coast inhibits evaporation, thereby suppressing summer precipitation.

Inland regions such as those north of Rustenburg in the North West Province experience a semi-arid climate, characterised by hot summers with isolated convective thunderstorms and dry winters. Rainfall in this region is largely confined to the summer months and is typically associated with short-duration, high-intensity events resulting from localized convection.

Based on four monitoring points, the site experience a summer rainfall pattern, with the majority of annual precipitation occurring between December and February. Annual rainfall totals vary slightly across the sites, ranging from 450 mm at 4B Decline to 604 mm at the Hostel. Summer temperatures across the sites average between 24°C and 26°C, while winter temperatures range from 12°C to 15°C

8.1.2 WIND FIELD

Based on four monitoring points, the following key items are highlighted in terms of wind field:

- Calm conditions were recorded 7.7% of the time at 4B Decline, 32.2% at Bierspruit, 14.1% at Fridge Plant, and a notable 43.7% at Hostel.
- At 4B Decline, east-southeasterly and northly winds are dominant for the periods assessed, except for early morning winds (00:00 – 06:00), which originate predominantly from the east-southeast.
  - During the wet season (September to March), 4B Decline recorded fastest and dominant winds from the north. During the dry season (April to August), winds predominantly originated from the southwest and southeast, with fastest wind speeds recorded from the southwest.
- At Bierspruit, easterly and westerly winds are dominant for all periods assessed. Northerly components are identified during morning (06:00 – 12:00) and afternoon (12:00 – 18:00) at the Bierspruit monitoring station.
  - During the wet season (September to March), Bierspruit recorded fastest winds from the north and predominantly easterly winds.
- South westerly and north easterly winds are dominant for all periods assessed at the Fridge Plant station, except for early morning (00:00 – 06:00) recording south westerly dominant winds.
  - Dry season (April to August) winds at Fridge Plant have a stronger south westerly component, in comparison to wet season (September to March) winds which display a stronger north easterly component.
- Easterly and westerly winds are dominant at the Hostel station for all periods assessed. Early morning winds (00:00 – 06:00) at the Hostel station have a similar pattern to the 4B Decline early morning winds, with dominant east-southeasterly winds.
  - After sunrise (06:00 – 12:00), when convective mixing is initiated, wind speeds at all stations increased, with the fastest speeds recorded at 4B Decline, with an average wind speed of 2.12 m/s.
- All stations present low occurrence of westerly winds, predominantly with low wind speeds.

- Fastest wind speeds were recorded from the north for the 4B Decline and Bierspruit stations, while Fridge Plant and Hostel recorded fastest wind speeds from the easterly direction.

- At night (18:00 – 24:00) winds remained strong across all stations, indicating continued atmospheric mixing and limited surface cooling effects during this period.

8.2 GEOLOGY

The Mortimer smelter complex is located in the north-eastern portion of the Bushveld Igneous Complex (BIC), within the Rustenburg Platinum Mines – Union Section (RPM-US). The BIC in South Africa is the largest layered mafic intrusion in the world and holds most of the planet's Platinum Group Metal (PGM) reserves. These include Platinum, Palladium, Rhodium, Osmium, Iridium, and Ruthenium. The BIC also contains large amounts of other valuable minerals such as Iron, Chromium, Vanadium, Titanium, and Tin.

The complex is divided into three main parts: the eastern, western, and northern limbs. All three are believed to have formed around the same time, about 2 billion years ago, and are geologically very similar. The BIC was intruded into older layers of volcanic and sedimentary rocks known as the Transvaal Supergroup.

It covers around 65 000km^2 and stretches roughly 350 km from east to west and 250 km from north to south.

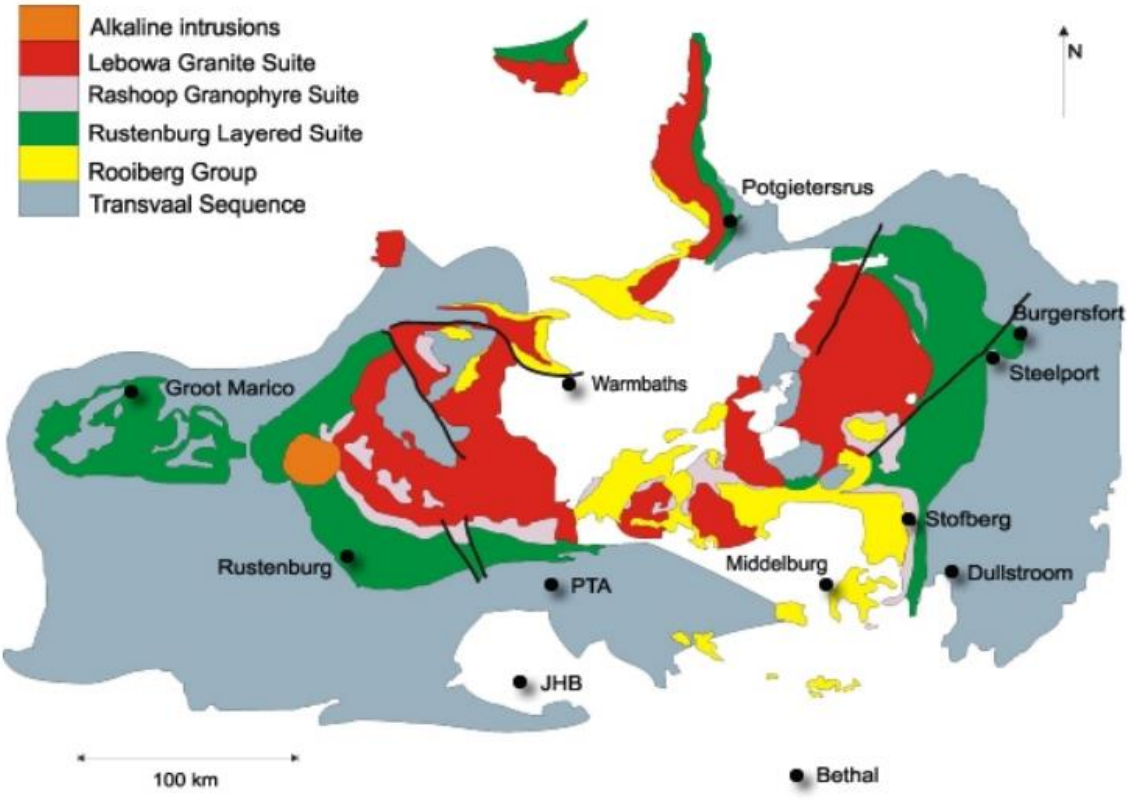

Figure 8-2 – Simplified of the Bushveld Igneous Complex (Kinnaird, No date)

Approximately 9 km northeast of the site, the Merensky Reef and UG2 Reef outcrop. The Merensky Reef, composed of feldspathic pyroxenite and about 1 meter thick, is underlain by the UG2 Reef,

which consists of chromitite and has an average thickness of 1.5 meters. Both reefs dip regionally at approximately 18˚ to the southeast.

Geologically, the site is underlain by gabbro, norite, and anorthosite of the Pyramid Gabbronorite Formation, part of the Rustenburg Layered Suite of the BIC. Additionally, several dykes trending from southwest to northeast have been mapped, particularly in the southeastern areas of RPM-US.

8.3 TOPOGRAPHY

The proposed project area is situated within an already disturbed site that has previously been cleared and levelled for development. As a result, the original natural topography has been significantly altered, and no undisturbed or original landforms remain within the project footprint. The area is flat to gently undulating with gentle elevations sloping from west to east, ranging from approximately 1050 metres above mean sea level (mamsl) in the west to 990 mamsl at the Sefathlane River southeast of the smelter. The Spitskop and a low ridge approximately 7 km north-west of the site are the only points of significant elevation within a 10 km radius. Mortimer Smelter's lease area is located on a gentle sloping watershed that divides the Bierspruit and Brakspruit catchments.

There are no sensitive areas, however, the riparian zones along drainage lines are classified as wetlands but are not considered significant.

8.4 SOILS AND LAND USE CAPABILITY

The majority of the development site has already been transformed from its original natural state as a result of previous levelling and construction activities associated with the establishment and operation of the Mortimer Smelter. This includes the proposed feed material storage location where material stockpiling is already being undertaken. These activities have significantly altered the soil profile of the area through the implementation of relevant infrastructure such as concrete surfaces rendering and the area no longer retains its original land capability or ecological soil functions.

8.5 CULTURAL HERITAGE

The study and proposed development area have been extensively impacted by the existing operations, and as a result, the original natural and historical landscape has been severely altered. If any significant cultural heritage (archaeological and/or historical) sites, features or material did exist here in the past, it would have been heavily disturbed or destroyed. Although a physical assessment of the area under discussion was not undertaken by the Heritage Specialist, previous work for the proposed Mortimer Smelter found no cultural heritage (archaeological and/or recent historical) sites in the study area, and it is therefore deemed highly unlikely that any significant cultural heritage resources would be present here.

8.6 PALAEONTOLOGY

The project lies entirely on the gabbro-norite Mai Zone of the of the Rustenburg Layered Suite (RLS) that is part of the Bushveld Igneous Complex. The RLS intruded through the Transvaal Supergroup rocks about 2055 million years ago (Cawthorne et al., 2006; Zeh et al., 2020). All these rocks are igneous in origin and do not preserve any fossils at all. In addition, their emplacement predates the evolution of visible life-forms and only microbes were present in certain environments.

The Rustenburg Layered Suite is part of the Bushveld Igneous Complex that intruded through the Transvaal Supergroup rocks about 2055 million years ago (Cawthorne et al., 2006; Zeh et al., 2020). All these rocks are igneous in origin and do not preserve any fossils at all.

The insignificant to zero palaeosensitivity is confirmed by the grey colouration in the SAHRIS map (Figure 8-3). Since there is no chance of fossils occurring tin the project footprint

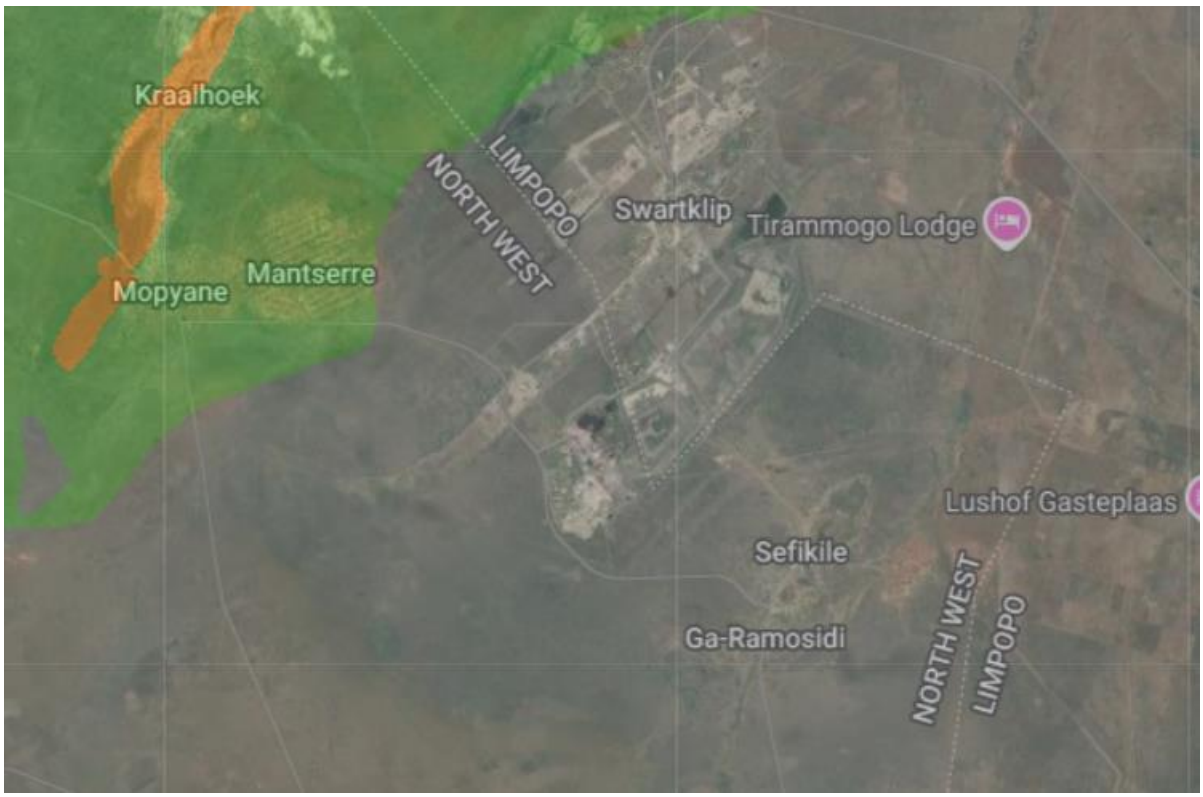

Figure 8-3 - SAHRIS palaeontology sensitivity map for the site for the proposed

8.7 BIODIVERSITY

8.7.1 TERRESTRIAL BIODIVERSITY

The North-West Biodiversity Sector Plan identifies aquatic and terrestrial priority areas, identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). Each category of priority area has specific land use guidelines. Critical Biodiversity Areas (CBAs) are parts of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

Ecological Support Areas (ESAs) are areas that are not essential for meeting biodiversity representation targets (thresholds), but which nevertheless play an important role in supporting the ecological functioning of CBAs and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration.

The Project area does not intersect with any CBA or ESA habitats as mapped by the North-West Biodiversity Sector Plan (Figure 8-4).This is supported by the national landcover dataset which reveals this landscape to be characterised as mines and quarries (Figure 8-5). Based on this

assessment it can be concluded that the proposed development is unlikely to impact on any aquatic or terrestrial CBAs or ESAs.

The project area does not intersect with areas earmarked as Priority Areas per the National Protected area expansion strategy or any regionally or nationally protected areas (Figure 8-7).

The Mortimer Smelter site is situated in the Savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include: a) Seasonal precipitation; and b) (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006). The Savanna biome comprises many different vegetation types.

The Project area falls within the Dwaalboom Thornveld vegetation type (SANBI, 2018) (Figure 8-6). According to the Red List of Ecosystems (SANBI, 2021) the ecosystem is categorised as Least Concern (Figure 8-8) and thus not of significant conservation importance. Although indicated as falling within Dwaalboom Thornveld vegetation, the Project area is currently better classified as fully modified land (Figure 8-5).

Figure 8-4 - North-West Biodiversity Sector Plan in relation to the PAOI

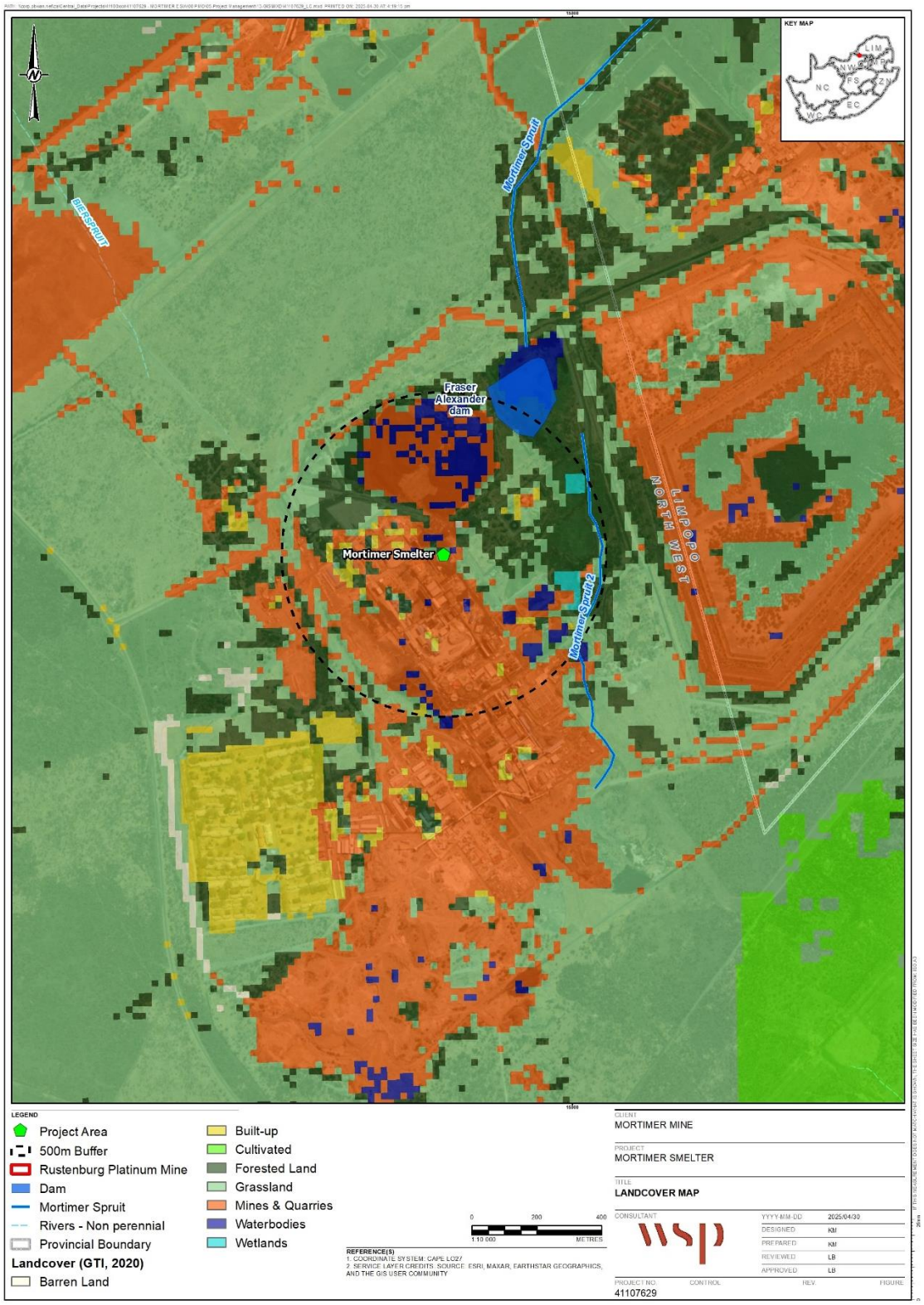

Figure 8-5 - Landcover in relation to the PAOI

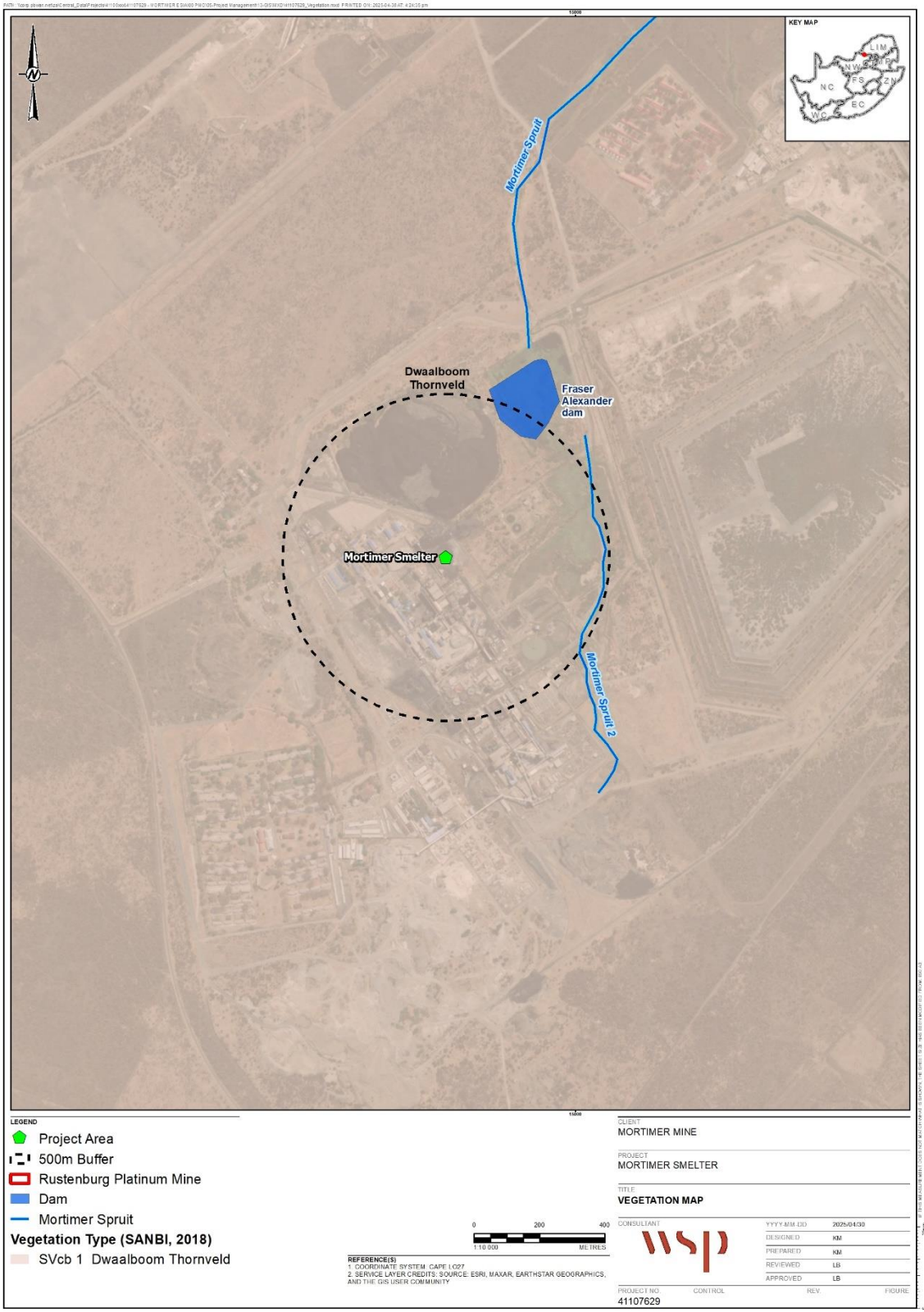

Figure 8-6 - Vegetation type in relation to the PAOI

Figure 8-7 - National Protected Area Development Strategy in relation to the PAOI

Figure 8-8 - National Threatened Ecosystems in relation to the PAOI

8.7.2 AQUATIC BIODIVERSITY

Catchment and Freshwater Ecoregion

The Project area falls within the A24E quaternary catchment of the Crocodile (West) and Marico Water Management Area (WMA) (Table 8-1 and Figure 8-9). The proposed Project area is located within the Bushveld Basin freshwater ecoregion. The Mortimer Smelter property is drained by a non-perennial, unnamed tributary of the Brakspruit, which is in turn a tributary of the Bierspruit, which discharges to the Crocodile River to the north. Details of the relevant quaternary catchment are provided in

Table 8-1 - Quaternary catchment details

Quaternary Catchment	Catchment Area (km^2)	Mean Annual Precipitation [MAP] (mm)	Mean Annual Evaporation [MAE] (mm)	MAP:MAE ratio [MAP:PET ratio]	Mean Annual Runoff [MAR] (mm)
A24E	688	592	1801	0.3	15.1

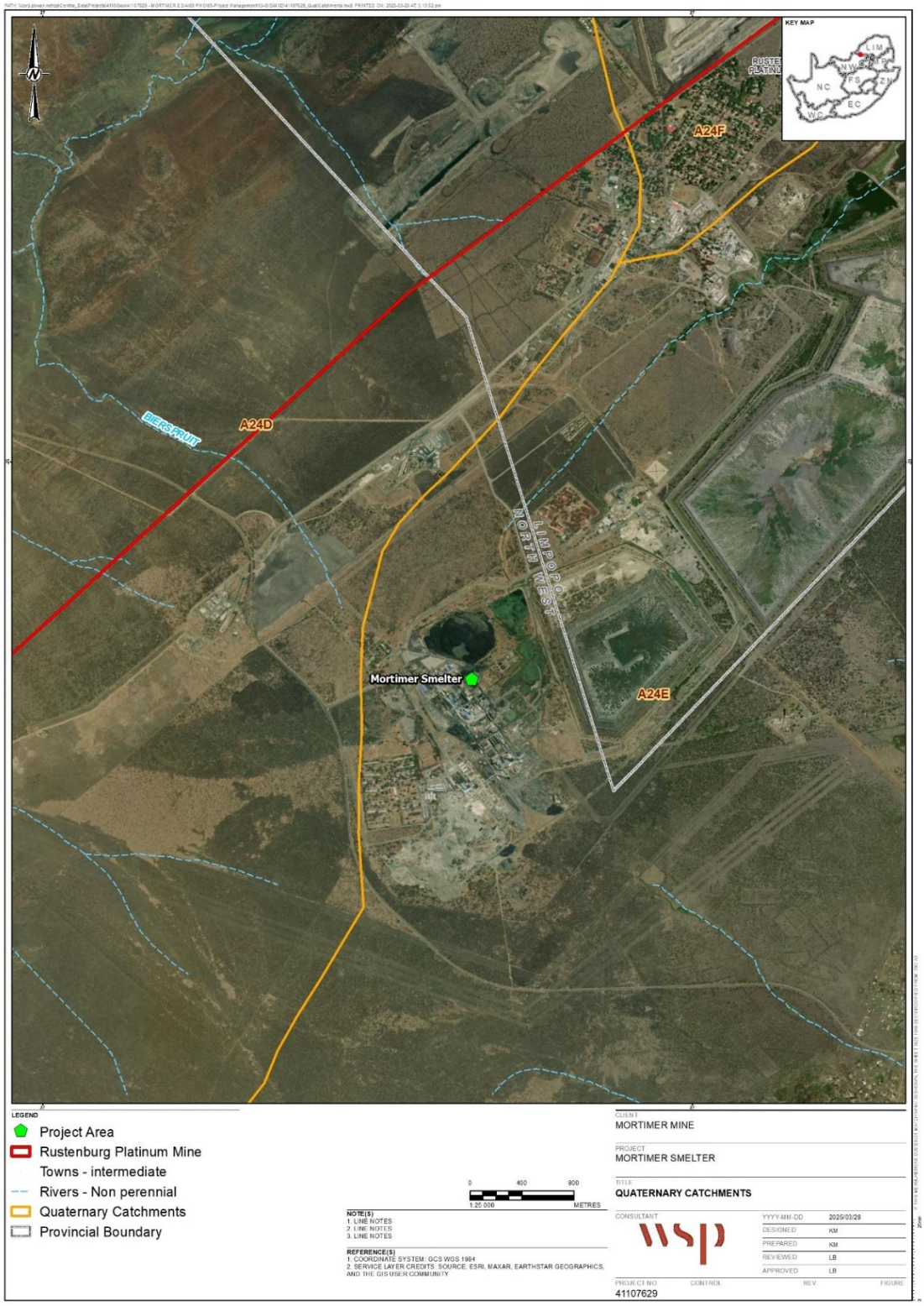

Figure 8-9 - Mortimer Smelter property in relation to catchments and primary and secondary rivers

National Wetland Map 5

The South African National Wetland Map version 5 (NWM5) portrays the most up-to-date spatial data for the extent and types of estuarine and inland aquatic (freshwater) ecosystems of South Africa (Van Deventer et al., 2019). The project strives to conserve a sample of freshwater ecosystems and diversity of species as well as the ecosystem processes which generate and maintain diversity (Nel et al., 2011).

The study area in relation to wetlands mapped as part of the National Wetland Map 5 project is illustrated in Figure 8-10. The National Wetland Map 5 identified two depression wetlands within a 500m radius of the development footprint. However, based on a review of current satellite imagery of the area, it is apparent that the identified “wetlands” are artificial ponds that form part of the existing Mortimer Smelter infrastructure footprint.

Figure 8-10 - Wetland features according to the National Wetland Map 5 dataset in relation to the study area

National Freshwater Ecosystem Priority Areas

No National Freshwater Ecosystem Priority Areas (NFEPA) occur in the study area.

Strategic Water Resource Areas

No Strategic Water Resource Areas (SWSA) occurs in the study area.

North West Province Biodiversity Sector Plan

The North West Province Biodiversity Sector Plan (NWBSP 2015) – Aquatic CBA layer divides the landscape into CBA, and ESA. Based on the NWBSP, the proposed development footprint does not intersect with any aquatic CBA or ESA areas.

Site Specific Findings

It is evident that the development areas are fully transformed, with no natural habitat remaining. The area proposed for the slag cleaning project is currently covered by material stockpiles. The site survey confirmed these findings.

A non-perennial stream (locally identified as the Mortimerspruit) lies to the northeast of the Mortimer Smelter property, however it does not extend into the study area (see Figure 6-2). Within the study area, areas of wetness were identified, however these were found to be artificial in origin and are associated with the mine dam (Fraser Alexander dam) along the eastern edge of the Mortimer Smelter, and outflow from the Mortimer Smelter water management infrastructure to the dam. An area of surface water colonised by Phragmites australis – an obligate wetland gras species – was noted adjacent to the slag cleaning project development footprint. However, it was determined that ponding of flows at this location has resulted from transformation of the landscape and does not represent natural wetland habitat. The artificial wet features identified within the study area, and associated with the Fraser Alexander dam impoundment and localised ponding of surface water, are illustrated in Figure 7-4.

The Fraser Alexander dam lies on a drainage path that directs surface flow into the Mortimerspruit. Wetness signatures evident on satellite imagery suggest that overflows and/or seepage from the dam have led to increased wetness in the non-perennial stream downstream. It is uncertain the level of connectivity between the dirty water catchment reporting to the dam, and the clean water catchment and drainage network downstream.

Figure 8-11 - Identified artificial wet features within the study area and in relation to the development footprint

8.8 SURFACE WATER

8.8.1 RESOURCE DIRECTED MEASURES – PROJECT REQUIREMENTS

The site falls within integrated unit of analysis (IUA) 12, Bierspruit catchment, that has been classified as a Class III, which means that it is a workhorse river. The Resource Unit (RU) is RU 12-2 that includes quaternary catchments A24E and A24F, described as the Bierspruit to confluence with Crocodile River, Brakspruit, Phufane, Sefatlhane, Lesobeng, lower reach Bofule River. The Recommended Ecological Category for has been set as a D category.

The Resource Quality Objectives (RQOs) set for the quaternary catchment in which Mortimer Smelter operations fall are set out in Figure 8-2, for Bierspruit catchments. It is important to note that not every variable is included as an objective, and if necessary, where additional variables are identified as a concern for a specific activity, could be included as water quality planning limits at a finer scale (sub-catchment level).

Table 8-2 – RQO relevant to the Mortimer Smelter operations

Variable	Units	Percentile	A24E,F
Water Resource Class			Class II!

Variable	Units	Percentile	A24E,F
Resource Unit			RU 12_2
Ecological Category			D Category
Flows	m^3/s	N/A	No RQO set for flow
Chloride	mg/L	95th percentile	≤ 100
Electrical Conductivity	mS/m	95th percentile	≤ 85
Sulphate	mg/L	95th percentile	≤ 100
Sodium	mg/L	95th percentile	≤ 100
pH	units	5th and 95th percentile	6 - 8.5
Orthophosphate	mg/L as P	50th percentile	≤ 0.125
Nitrate-Nitrite	mg/L as N	50th percentile	≤ 1.0
Turbidity	NTU	95th percentile	10% variation from background
Iron	mg/L	95th percentile	≤ 0.3
Aluminium	mg/L	95th percentile	≤ 0.1
Copper (hard*)	mg/L	95th percentile	≤ 0.0073
Manganese	mg/L	95th percentile	≤ 0.15
Lead (hard*)	mg/L	95th percentile	≤ 0.0095
Nickel	mg/L	95th percentile	≤ 0.07
Cobalt	mg/L	95th percentile	≤ 0.05
Zinc	mg/L	95th percentile	≤ 0.002
Pathogens (Escherichia coli)	counts/100mL	95th percentile	130
Habitat			
Instream Habitat	Index of Habitat Integrity, Rapid Habitat Assessment Method and Model (RHAMM)		Instream Habitat Integrity EC = D ≥ 42%
Riparian Habitat	Vegetation Response Assessment Index		VEGRAI EC = D ≥ 42%
Biota			
Fish	Fish Response Assessment Index (FRAI).		Fish ecology category= D; FRAI ≥ 42% (collect 4+ species in a 20-minute sampling effort)

8.8.2 HYDROLOGICAL DESCRIPTION

The catchment in which Mortimer Smelter is located forms part of the Crocodile (West) Catchment which falls within the Limpopo-Olifants Water Management Area (WMA01). Mortimer Smelter straddles quaternary catchments A24D, A24E and A24.

However, the operations are predominantly in quaternary catchment A24E with drainage to the southeast to the non-perennial Sefathlane River which drains from the north through the villages of Moruleng, Koedoespruit and Manamakhotheng upstream of the site, and then through the villages of Ga-Ramosidi and Sefikile east of the project site, to join the Brakspruit.

An ephemeral unnamed tributary of the Brakspruit, runs through the Mortimer Smelter lease area and is referred to as Mortimerspruit (or Union Stream). The Mortimerspruit and the Sefathlane River confluence to form the Brakspruit downstream of the Union Mine boundary, and then the Bierspruit which enters the Crocodile (West) River some 26 kilometres downstream (Figure 8-9).

8.8.3 WATER USERS

The area around the smelter is highly developed with predominantly dry-land agriculture and mining up and downstream of the site, and some natural areas that are used for grazing.

The villages of Ga-Ramosidi and Sefikile are located approximately 2.5 kilometres (km) southeast of the smelter along the river with subsistence land further downstream where the Sefathlane River joins the Brakspruit. As the river is non-perennial it is unlikely that the villagers would take water from the river for domestic purposes, and they are supplied by a Water Services Supplier. However, some water abstraction may occur especially for subsistence crop irrigation during the wet season when the river may be flowing.

8.8.4 WATER QUALITY

Water quality data for this area is sparse because there is seldom flow in the Sefathlane River. DWS site A24_192756 on the Bierspruit just downstream of the confluence with the Brakspruit, has data for the period February 2012 to March 2024. Due to the non-perennial nature there are several gaps. Table 8-3 sets out the 5, 50th and 95th percentile data, and highlights the following for the catchment:

- Salts are considerably elevated based on the 95th percentile data. This is not unexpected because of the non-perennial nature of the systems and the impacts from the mines and to a lesser extent from the urban areas in the upstream catchment, and
- Nutrients are elevated but within the 50th percentile RQOs for orthophosphate and within the acceptable limit for domestic use for nitrate.
- There are no definite water quality trends as illustrated in Figure 8-12 with spikes occurring at regular intervals, and an overall poor water quality over the last 10 years.

Table 8-3 – Water Quality at the downstream site, A24_192756 on the Bierspruit

Parameter	Units	RQO/ water quality guidelines	5th percentile	50th percentile	95th percentile
Calcium	mg/L	***80****	32.4	70	123
Chloride	mg/L	***100***	36	145	566.8

Parameter	Units	RQO/ water quality guidelines	5th percentile	50th percentile	95th percentile
Total Dissolved Solids	mg/L	***550****	316	810	1 618
Electrical Conductivity	mS/m	***85***	43	114	267
Fluoride	mg/L	***1****	0.32	0.81	2.00
Potassium	mg/L	***50***	3.59	7.79	18
Magnesium	mg/L	***50***	17.7	45.4	111
Sodium	mg/L	***100***	28.82	88	311
Ammonium	mg/L	*-*	0.05	0.05	0.6
Nitrate/ nitrite	mg/L	***10****	0.05	5.5	33
pH	mg/L	***6-8.5***	7.7	8.2	8.6
Orthophosphate	mg/L	***0.125***	0.01	0.1	0.7
Silica	mg/L	*-*	1.5	5.7	8.7
Sulphate	mg/L	***100***	30	128	259
Total Alkalinity	mg/L	*-*	93	131	219

*calculated using the factor of 6.5; ** based on the acceptable water quality guidelines limit for the stricter value for either aquatic ecosystems or domestic use (DWS, 1996); - no guidelines set.

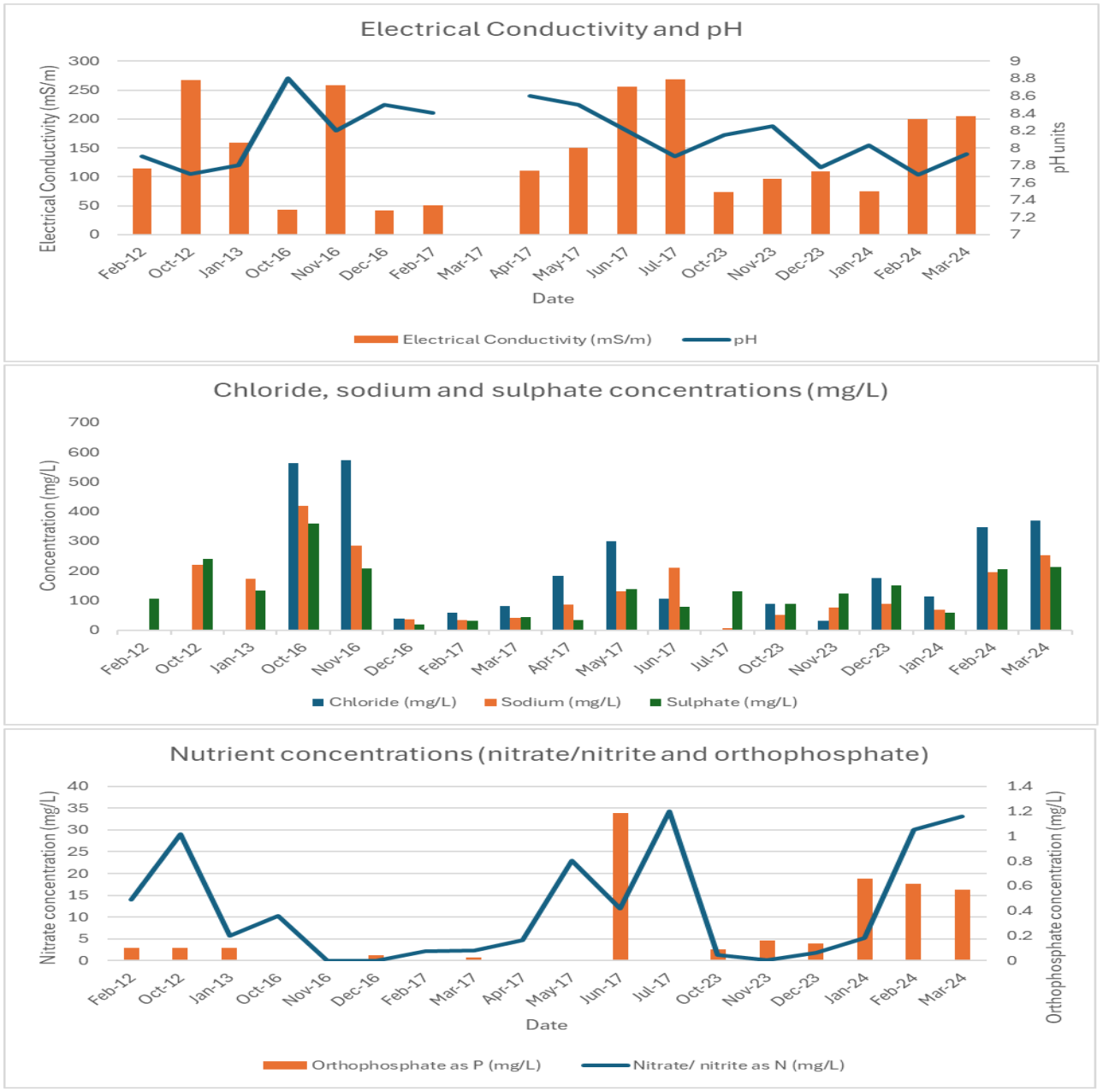

Figure 8-12 - Water quality trends at site A24_192756

8.9 AIR QUALITY

To assess the existing air quality situation in the surrounding areas, data was provided by RPM from four continuous monitoring stations within proximity to the Mortimer Smelter. Data was provided for the period 2019 – 2024 for all stations. This 6-year period was assessed to identify differences in concentrations surrounding the Mortimer Smelter during normal operations (Primary Smelting) compared to current conditions with Mortimer being in Care and Maintenance (C&M) during 2024.

From the existing air quality data provided, data was not available for $PM_{2.5}$ and NO_2. No other air quality monitoring stations were identified within proximity to Mortimer Smelting. Given this, the measured ambient concentrations of $PM_{2.5}$ and NO_2 cannot be presented.

8.9.1 AMBIENT SO2 CONCENTRATIONS

Table 8-4 presents the data recovery at each of the continuous monitoring stations for the pollutants measured. SO_2 data recovery for all stations was below the required 90% recovery for the reporting period at all stations. The South African Accreditation System (SANAS, 2009) TR 07-03 standards stipulate a minimum data recovery of 90% is required for a dataset to be deemed representative of conditions during a specific reporting period. Therefore, while this data is presented in this AIR, it must be viewed with caution due to the low data recovery.

Table 8-4: SO_2 data recovery

Station Name	Latitude (S)	Longitude (E)	Altitude (masl)	Data Recovery SO_2
4B Decline	24.966462°	27.125306°	~1030	76.1%
Bierspruit	24.909593°	27.145628°	~989	78.3%
Fridge Plant	24.974560°	27.164143°	~1035	66.4%
Hostel	24.977106°	27.140159°	~1038	79.4%

4B Decline

Figure 8-13 presents the 1-hour average SO_2 concentrations measured for the period January 2019 – January 2025. For this period, no exceedance of the National Ambient Air Quality Standard (NAAQS) was recorded. Figure 8-14 presents the 24-hour average SO_2 concentrations measured for the period January 2019 – January 2025. No exceedances of the NAAQS 24-hour average standard were recorded during this period, remaining well below the standard. Table **8-5** presents the annual average concentrations and the number of recorded NAAQS exceedances of the 1-hour and 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. A decrease in SO_2 concentrations is evident from early 2024, coinciding with the Mortimer Smelter going into C&M, and therefore no longer contributing to ambient SO_2 concentrations. This indicates that Mortimer is one of the key contributing sources of SO_2 emissions in the area. However, importantly, even during Mortimer operations, ambient SO_2 concentrations remained low in the area, well below the relevant NAAQS.

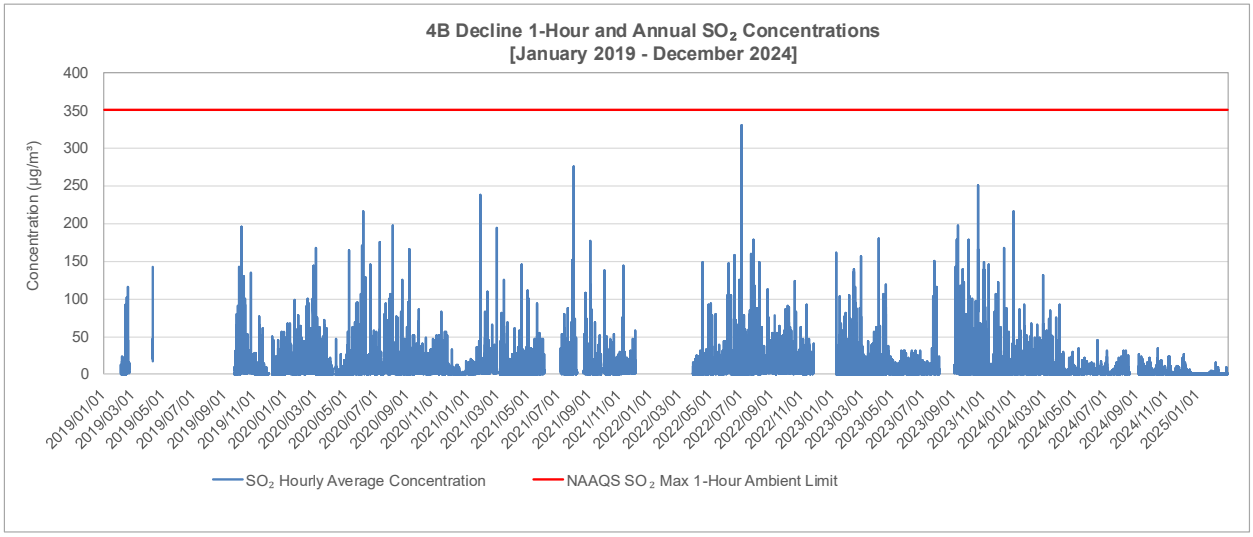

Figure 8-13: 4B Decline 1-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

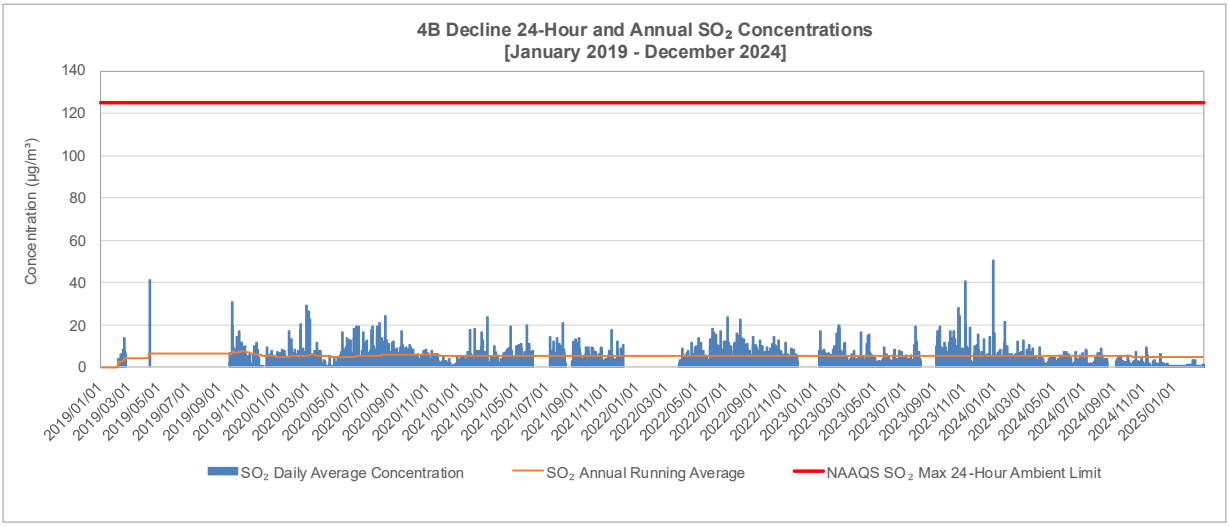

Figure 8-14: 4B Decline 24-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

Table 8-5: 4B Decline annual average SO_2 concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (1-hour)	Recorded Exceedances (1-hour)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	50	5.09	88	0	4	0
2020		5.58		0		0
2021		5.12		0		0
2022		6.33		0		0
2023		5.44		0		0
2024		3.08		0		0

Bierspruit

Figure 8-15 presents the 1-hour average SO_2 concentrations measured for the period January 2019 – January 2025. For this period, no exceedance of the National Ambient Air Quality Standard (NAAQS) was recorded. Figure 8-16 presents the 24-hour average SO_2 concentrations measured for the period January 2019 – January 2025. No exceedances of the NAAQS 24-hour average standard were recorded during this period, remaining well below the standard. Table 8-6 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 1-hour and 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. An annual running average concentration of 1.91 µg/m^3 was measured over the period assessed. The 1-hour average emission trend indicates similar concentrations during the 2024 calendar year as compared to previous years. Given the emissions trend, and that the Mortimer Smelter was under C&M during 2024, the surrounding activities are the main contributor of emissions to the surrounding environment near the station.

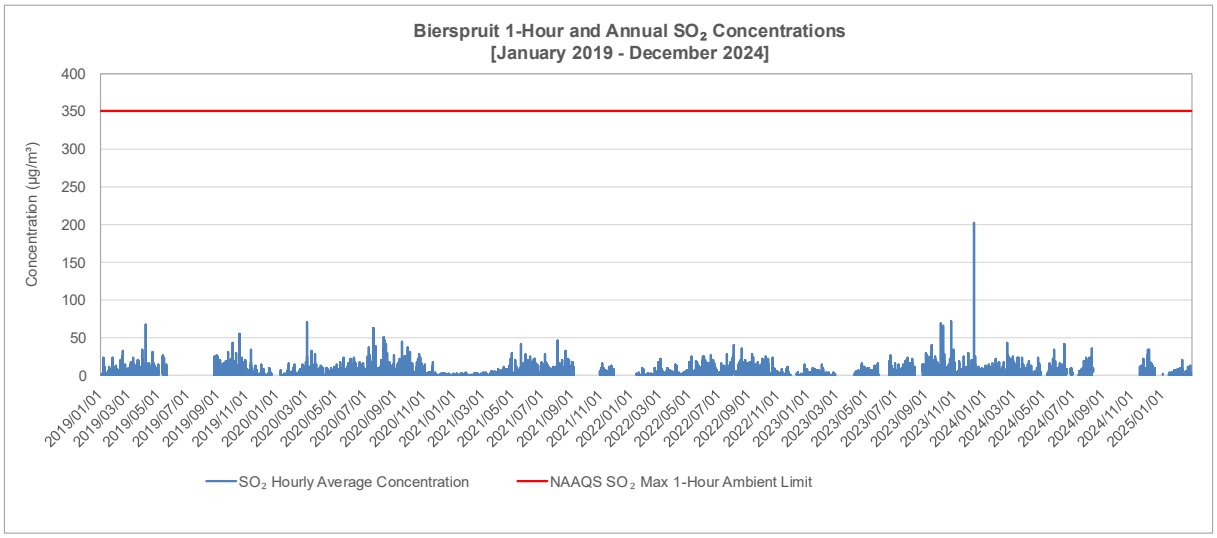

Figure 8-15: Bierspruit 1-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

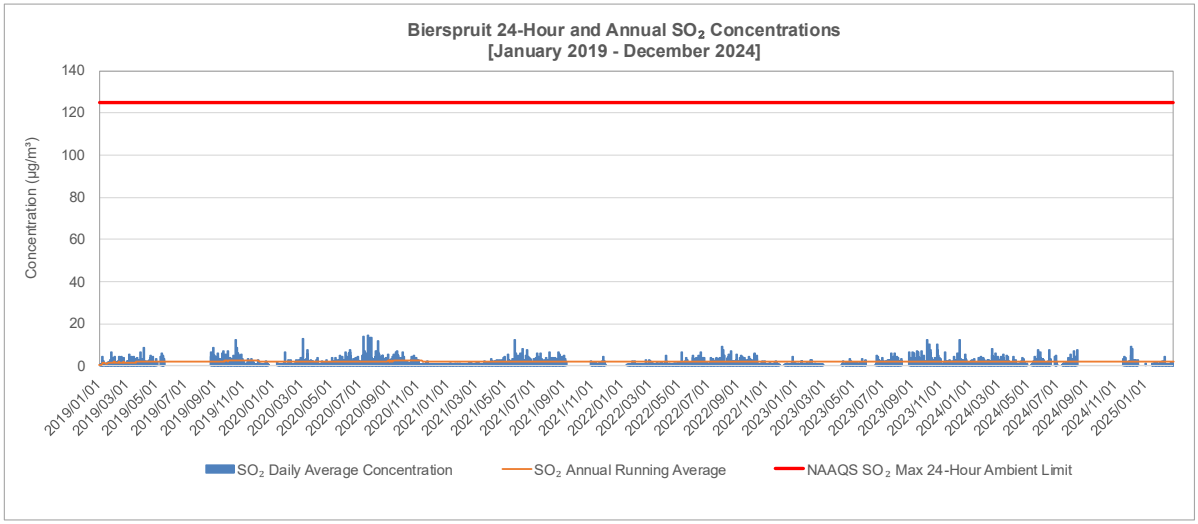

Figure 8-16: Bierspruit 24-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

Table 8-6: Bierspruit annual average SO_2 concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (1-hour)	Recorded Exceedances (1-hour)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	50	2.15	88	0	4	0
2020		2.10		0		0
2021		1.83		0		0
2022		1.53		0		0
2023		2.01		0		0
2024		2.15		0		0

Fridge Plant

Figure 8-17 presents the 1-hour average SO_2 concentrations measured for the period January 2019 – January 2025. For this period, no exceedance of the National Ambient Air Quality Standard (NAAQS) was recorded. Figure 8-18 presents the 24-hour average SO_2 concentrations measured for the period January 2019 – January 2025. No exceedances of the NAAQS 24-hour average standard were recorded during this period, remaining well below the standard. Table 8-7 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 1-hour and 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. An annual running average concentration of 5.0 µg/m^3 was measured over the period assessed. The 1-hour average emission trend indicates lower average concentrations during the 2024 dry season than previous years. Notably, the Mortimer Smelter was under C&M during 2024. Given the emissions trend, the smelter operations are a significant contributor of SO_2 emissions to the surrounding environment.

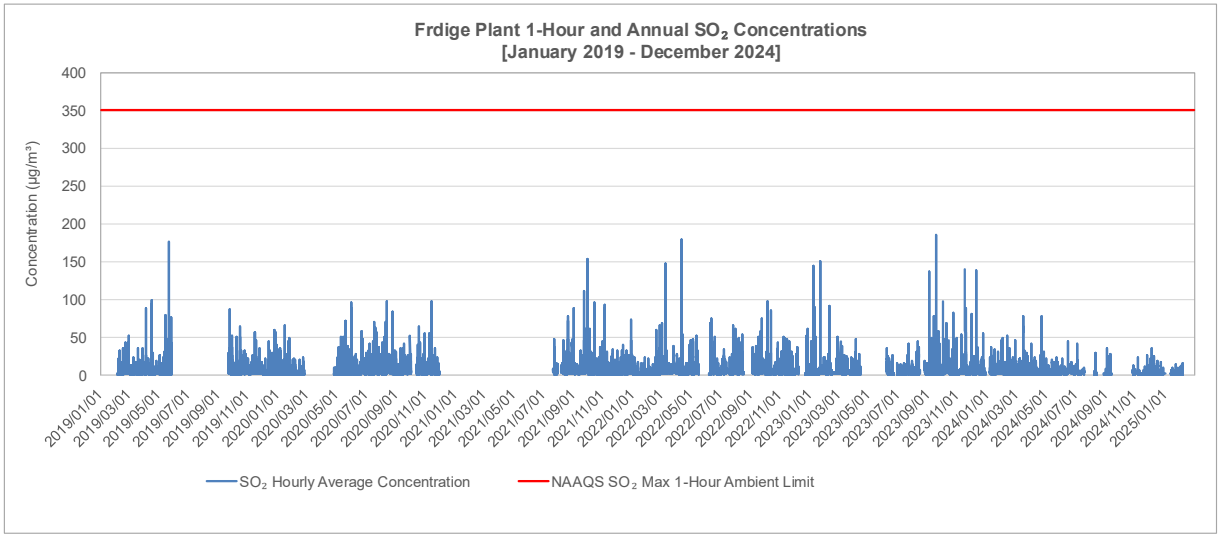

Figure 8-17: Fridge Plant 1-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

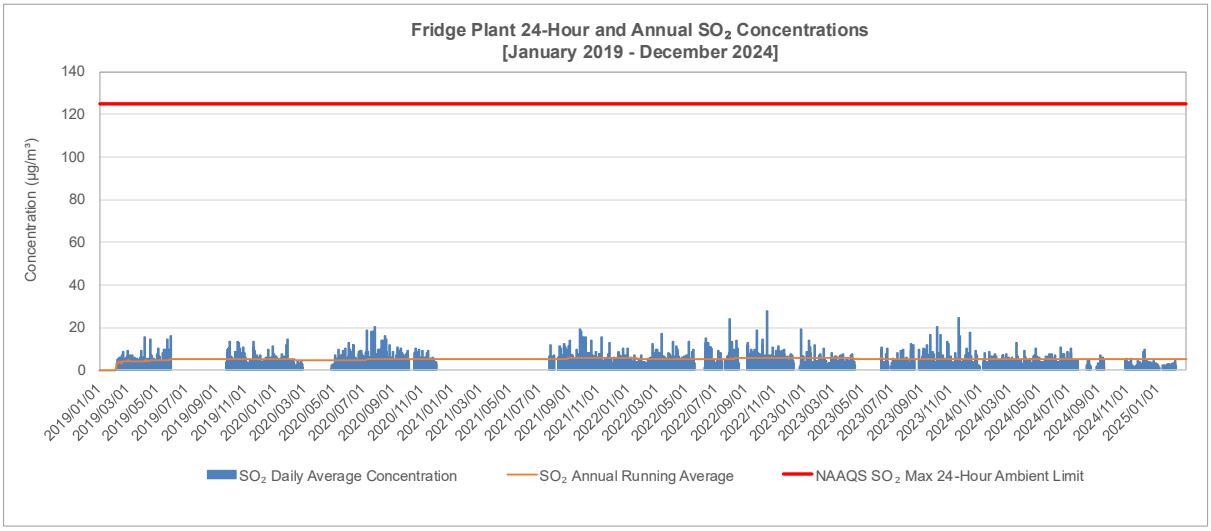

Figure 8-18: Fridge Plant 24-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

Table 8-7: Fridge Plant annual average SO_2 concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (1-hour)	Recorded Exceedances (1-hour)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	50	5.14	88	0	4	0
2020		5.53		0		0
2021		5.99		0		0
2022		5.66		0		0
2023		4.69		0		0
2024		3.89		0		0

Hostel

Figure 8-19 presents the 1-hour average SO_2 concentrations measured for the period January 2019 – January 2025. For this period, two exceedances of the NAAQS were recorded in 2020, remaining compliant with the NAAQS. Figure 8-20 presents the 24-hour average SO_2 concentrations measured for the period January 2019 – January 2025. No exceedances of the NAAQS 24-hour average standard were recorded during this period, remaining well below the standard. Table 8-8 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 1-hour and 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. An annual running average concentration of 9.6 µg/m^3 was measured over the period assessed. The 1-hour average emission trend indicates lower average concentrations during the 2024 dry season than previous years. Notably, the Mortimer Smelter was under C&M during 2024. Given the emissions trend, the smelter operations are a significant contributor of SO_2 emissions to the surrounding environment, but still within teg legislated limit.

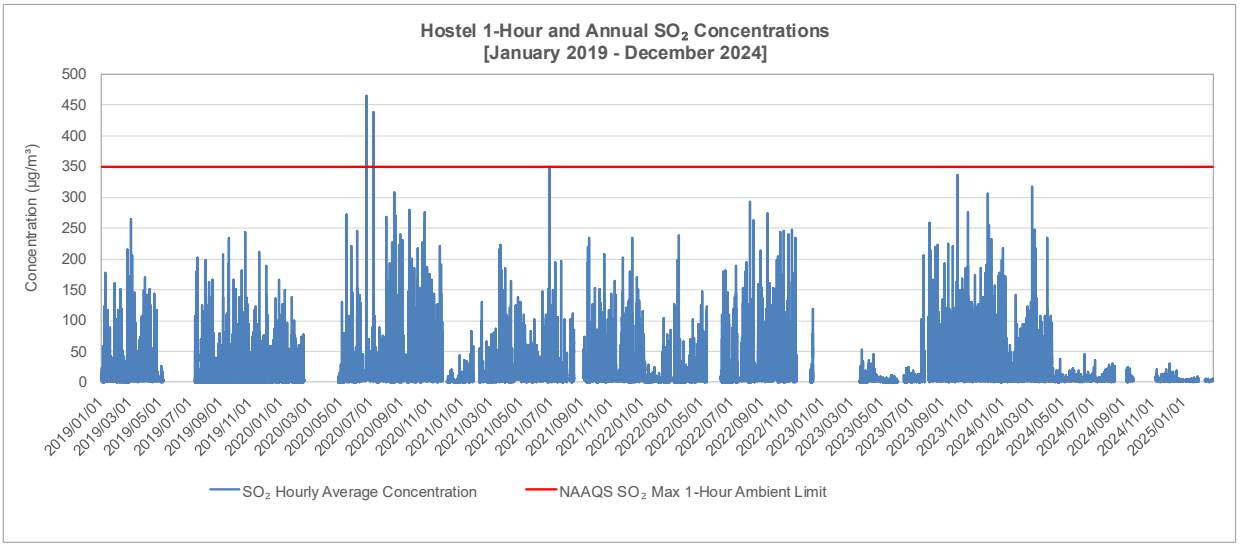

Figure 8-19: Hostel 1-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

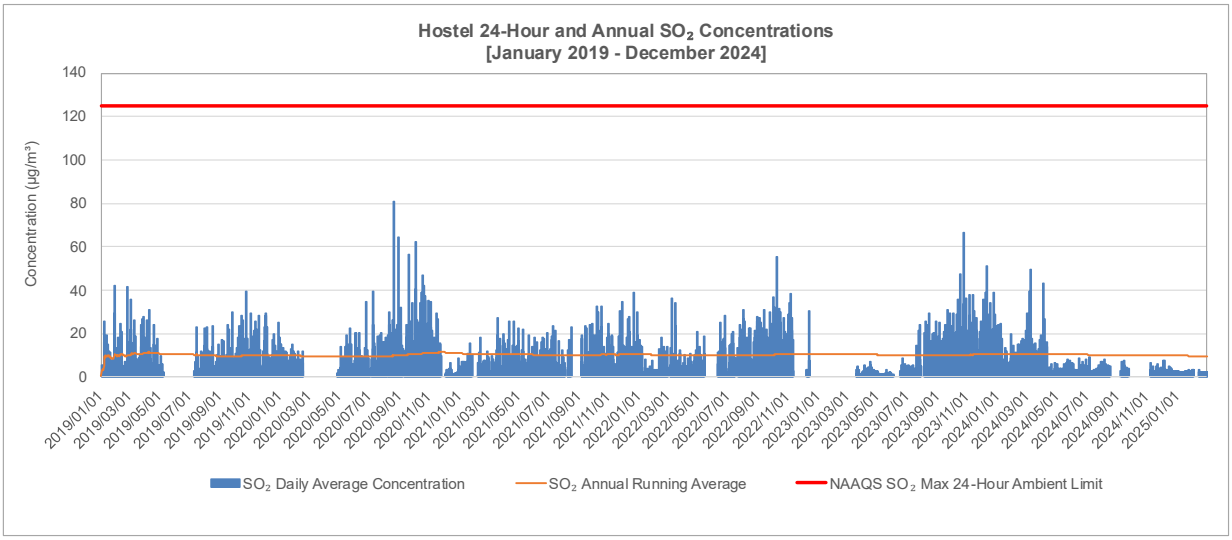

Figure 8-20: Hostel 24-hour averaged SO_2 concentrations for period Jan'19 – Jan'25

Table 8-8: Hostel annual average SO_2 concentrations and exceedances count

Year	Annual NAAQS (µg/m^3)	Annual Average Concentration (µg/m^3)	Allowable Exceedances (1-hour)	Recorded Exceedances (1-hour)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	50	10.19	88	0	4	0
2020		11.74		2		0
2021		9.64		1		0
2022		10.93		0		0
2023		10.54		0		0
2024		6.35		0		0

8.9.2 AMBIENT PM10 CONCENTRATIONS

Table 8-9 presents the data recovery at each of the continuous monitoring stations for PM_{10}. 87% of PM_{10} was recovered from the Bierspruit and Hostel stations, with low recovery at the 4B Decline and Fridge Plant stations. The South African Accreditation System (SANAS, 2009) TR 07-03 standards stipulate a minimum data recovery of 90% is required for a dataset to be deemed representative of conditions during a specific reporting period. Therefore, while this data is presented in this AIR, it must be viewed with caution due to the low data recovery.

Table 8-9: PM_{10} data recovery

Station Name	Latitude (S)	Longitude (E)	Altitude (masl)	Data Recovery PM_{10}
4B Decline	24.966462°	27.125306°	~1030	59.2%
Bierspruit	24.909593°	27.145628°	~989	87.9%
Fridge Plant	24.974560°	27.164143°	~1035	54.6%
Hostel	24.977106°	27.140159°	~1038	87.6%

4B Decline

Figure 8-21 presents the 24-hour average PM_{10} concentrations measured for the period January 2019 – January 2025. 24 exceedances of the NAAQS 24-hour average standard were recorded during 2024 and in noncompliance with the NAAQS as only four exceedances are permitted per calendar year. Table 8-10 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, with the exception of 2024 exceeding the annual NAAQS. Notably, the Mortimer Smelter was under C&M during the period of 2024, indicating that other surrounding sources were the main contributor to PM_{10} emissions. An annual running average concentration of 25.8 µg/m^3 was measured over the period assessed.

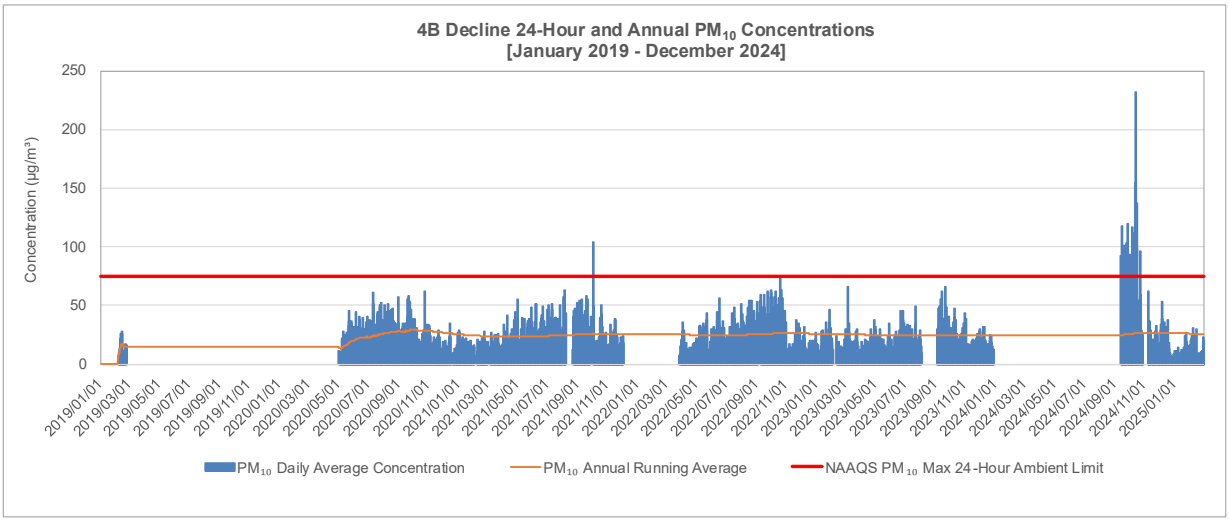

Figure 8-21: 4B Decline 24-hour averaged PM_{10} concentrations for period Jan'19 – Jan'25

Table 8-10: 4B Decline annual average PM_{10} concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	40	14.77	4	0
2020		26.26		0
2021		25.38		1
2022		26.75		0
2023		21.45		0
2024		**46.06**		**24**

Note: Bold, **red** highlight indicates exceedance of NAAQS

Bierspruit

Figure 8-22 presents the 24-hour average PM_{10} concentrations measured for the period January 2019 – January 2025. Three exceedances in 2019, six exceedances in 2020, two exceedances in both 2021 and 2022 and five exceedances in 2023 of the NAAQS 24-hour average standard were recorded during this period, exceeding the allowable number of four exceedances for 2020 and 2023. No exceedances were identified during the 2024 period. Table 8-11 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. An annual running average concentration of 19.1 µg/m^3 was measured over the period assessed.

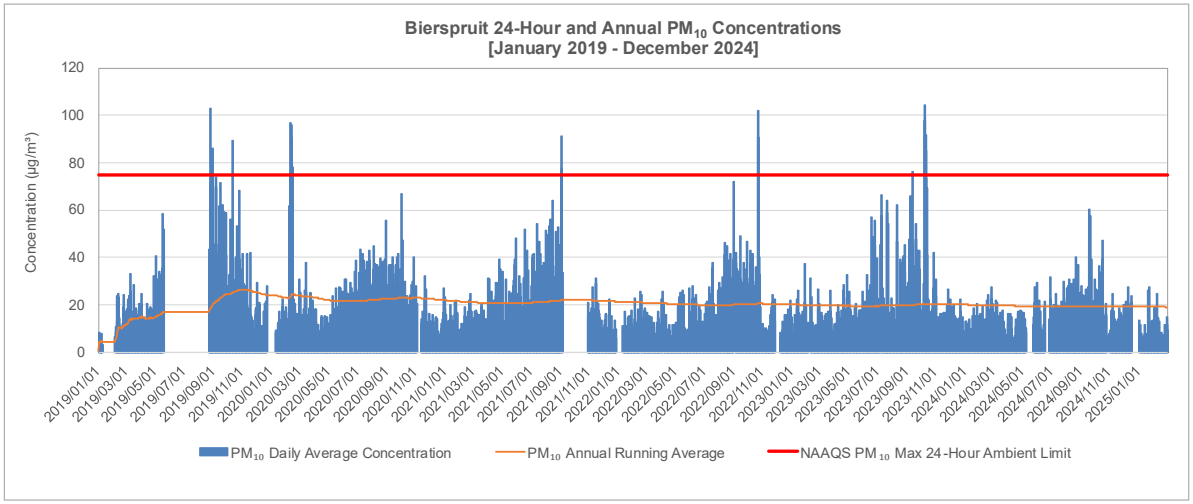

Figure 8-22: Bierspruit 24-hour averaged PM_{10} concentrations for period Jan'19 – Jan'25

Table 8-11: Bierspruit annual average PM_{10} concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	40	24.12	4	3
2020		20.47		**6**
2021		20.34		2
2022		16.76		2
2023		19.87		**5**
2024		15.93		0
Note: Bold, **red** highlight indicates exceedance of NAAQS				

Fridge Plant

Figure 8-23 presents the 24-hour average PM_{10} concentrations measured for the period January 2019 – January 2025. No exceedances of the NAAQS 24-hour average standard were recorded during this period, remaining well below the standard. The emission trend indicates that 2024 had a similar average concentration as compared to previous years, where the data was available. Table 8-12 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. An annual running average concentration of 21.3 µg/m^3 was measured over the period assessed.

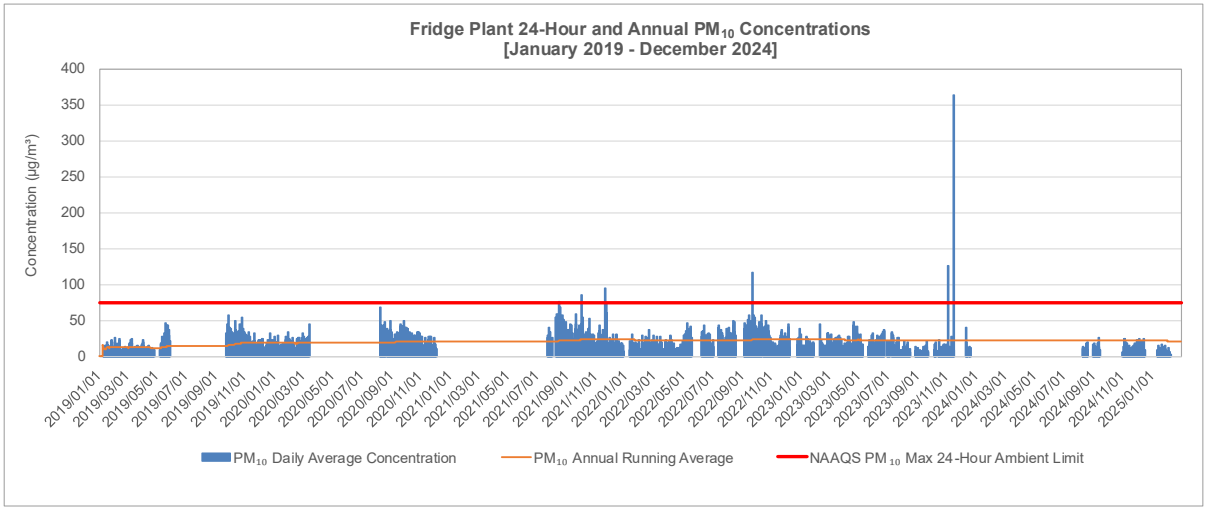

Figure 8-23: Fridge Plant 24-hour averaged PM_{10} concentrations for period Jan'19 – Jan'25

Table 8-12: Fridge Plant annual average PM_{10} concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	40	18.65	4	0
2020		23.43		0
2021		29.50		3
2022		24.01		1
2023		18.17		2
2024		12.99		0

Hostel

Figure 8-24 presents the 24-hour average PM_{10} concentrations measured for the period January 2019 – January 2025. Four exceedances of the NAAQS 24-hour average standard were recorded during 2019, and one exceedance was recorded in 2020, within the standard of allowable exceedances, of four within a calendar year. The emission trends identified little to no change in PM_{10} average concentrations, indicating that Mortimer Smelter is not a significant contributor of PM_{10} emissions. Table 8-13 presents the annual average concentrations and the number of recorded NAAQS exceedances of the 24-hour averaging periods. The maximum annual average concentrations recorded for each year were well within the annual NAAQS, remaining compliant across the period assessed. An annual running average concentration of 22.4 µg/m^3 was measured over the period assessed.

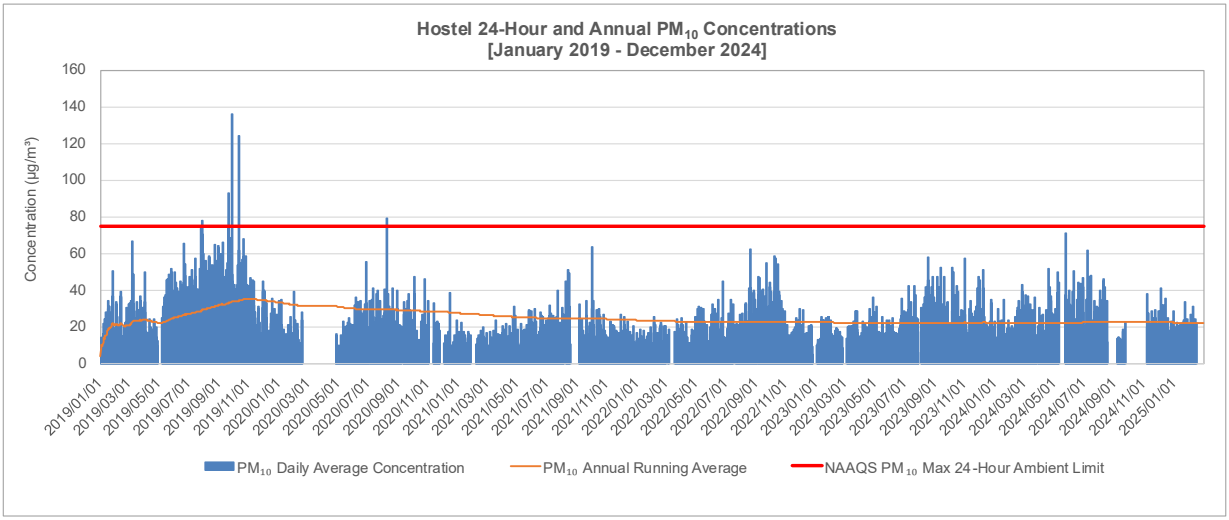

Figure 8-24: Hostel 24-hour averaged PM_{10} concentrations for period Jan'19 – Jan'25

Table 8-13: Hostel annual average PM_{10} concentrations and exceedances count

Year	Annual NAAQS (µg/m³)	Annual Average Concentration (µg/m³)	Allowable Exceedances (24-hour)	Recorded Exceedances (24-hour)
2019	40	33.28	4	4
2020		19.75		1
2021		16.16		0
2022		19.39		0
2023		21.47		0
2024		22.57		0

8.10 NOISE CLIMATE

8.10.1 PREVIOUS BASELINE NOISE CLIMATE (2012)

These results represent the noise climate of the area when the Mortimer Smelter was in full operation.

Daytime

The results from the daytime noise monitoring campaign conducted on 23 May 2012 are presented in Table 8-14 and Figure 8-25. Daytime (L_{Aeq}) noise levels at all monitoring locations were below the SANS industrial guideline rating level (70 dB(A)), except for NS 06 which exceeded the guideline by 9 dB(A). The dominant noise source at NS 06 was most likely the furnace hearth cooling fans. Since the smelter was fully operational at the time, the noise climate at the site can be described as predominantly industrial. The daytime monitored noise levels are considered an accurate representation of ambient conditions, with limited impact from external sources.

Table 8-14 - Daytime noise monitoring results (2012 campaign)

ID	Time	L_{Amax} (dB(A))	L_{Amin} (dB(A))	L_{Aeq} (dB(A))	SANS Guideline (dB(A))	Compliant
NS 01	09:49	77.6	67.0	69.1	70	Yes
NS 02	10:09	80.7	59.1	64.9	70	Yes
NS 03	10:27	73.9	63.3	65.8	70	Yes
NS 04	10:45	73.4	62.5	67.4	70	Yes
NS 05	11:02	72.3	62.6	65.4	70	Yes
NS 06	11:19	84.0	77.5	79.0	70	No
NS 07	11:36	69.9	64.1	65.6	70	Yes
NS 08	12:01	74.7	58.9	61.9	70	Yes
NS 09	12:28	85.0	47.5	62.7	70	Yes

Note: Exceedances of the SANS guideline are highlighted in red

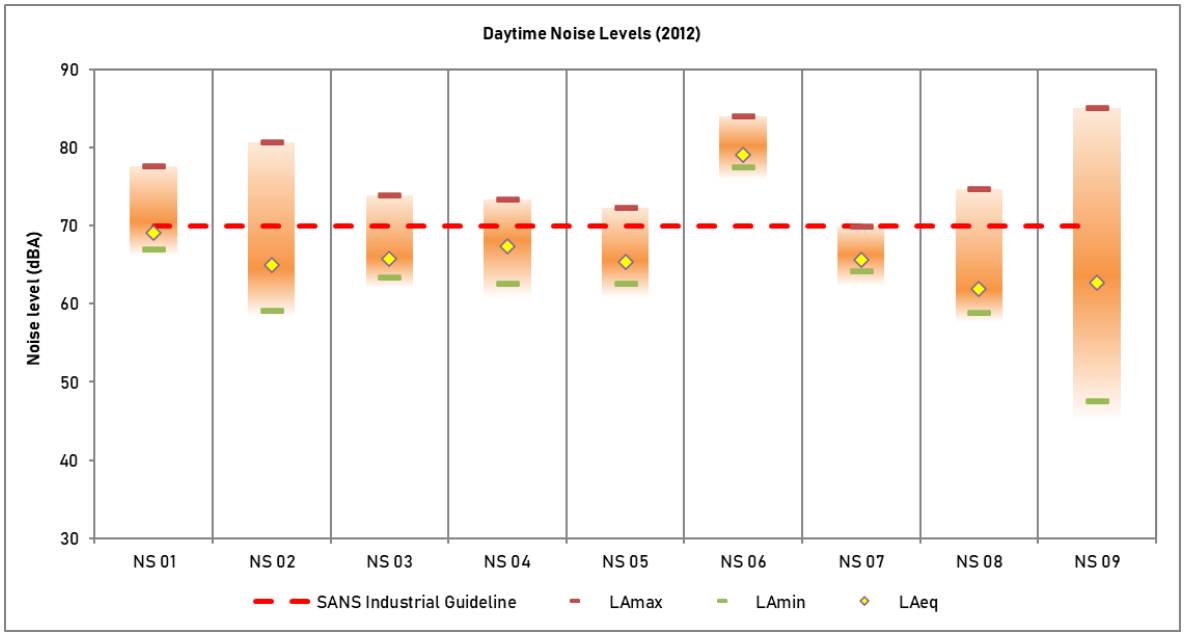

Figure 8-25 - Daytime monitored noise levels (2012 campaign). LAeq (yellow diamond) is compared with the SANS guideline

Night-time

The results from the night-time noise monitoring campaign conducted on 23 to 24 May 2012 are presented in Table 8-15 and Figure 8-26. Night-time (L_{Aeq}) noise levels at all monitoring locations

were above the SANS industrial guideline rating level (60 dB(A)), except for NS 09. Dominant noise sources at night included the flash dryer and other plant operations which contributed to the elevated ambient noise levels recorded. Since the smelter was fully operational at the time, the noise climate at the site can be described as predominantly industrial. Since Mortimer Smelter is a 24-hour operation, similar day and night noise levels were recorded, with such results considered an accurate representation of ambient conditions, with limited impact from external sources.

Table 8-15 - Night-time noise monitoring results (2012 campaign)

ID	TIME	L_{AMAX} (DB(A))	L_{AMIN} (DB(A))	L_{AEQ} (DB(A))	SANS GUIDELINE (DB(A))	COMPLIANT
NS 01	22:31	87.8	67.4	69.4	60	No
NS 02	22:51	77.2	58.8	63.1	60	No
NS 03	23:09	77.4	62.3	64.2	60	No
NS 04	00:22	69.3	64.8	66.1	60	No
NS 05	23:27	73.0	62.4	64.2	60	No
NS 06	00:53	80.7	76.4	77.7	60	No
NS 07	23:45	77.7	63.8	65.0	60	No
NS 08	00:05	73.0	58.8	61.6	60	No
NS 09	21:44	81.6	48.8	58.9	60	Yes
Note: Exceedances of the SANS guideline are highlighted in red						

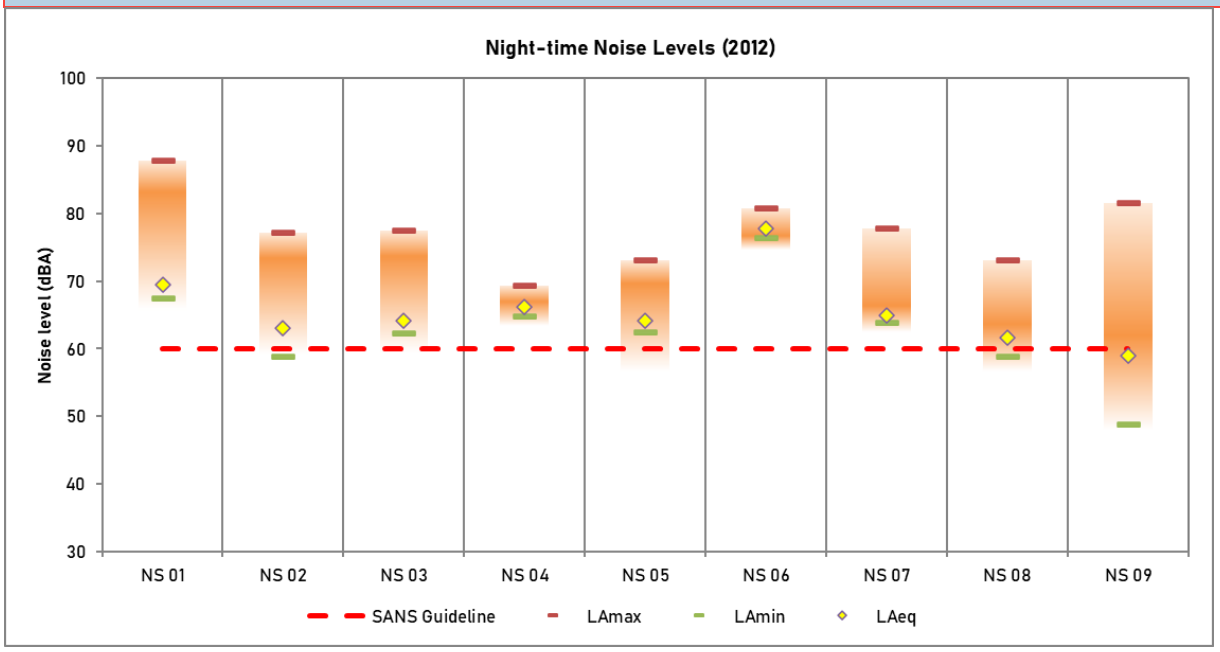

Figure 8-26 - Night-time monitored noise levels (2012 campaign). LAeq (yellow diamond) is compared with the SANS guideline

8.10.2 CURRENT NOISE CLIMATE (2025)

These results represent the noise climate of the area with the Mortimer Smelter not in operation. It is understood that the smelter is in care and maintenance with current onsite activities only including intermittent matte crushing activities.

It is important to note that wind speed and direction play a vital role in determining baseline noise levels. Noise monitoring is usually discouraged when wind speeds exceed 5 m/s (>18 km/h) as wind noise distorts the baseline noise levels by masking other noise sources. However, no wind speeds exceeding 5 m/s were recorded during the monitoring period.

Daytime

The results from the daytime noise monitoring campaign conducted on 24 March 2025 are presented in Table 8-16 and Figure 8-27. Conditions during the campaign were hot and clear with intermittent light winds (up to 1.8 m/s). Noise levels at all offsite receptor locations were compared to the typical daytime rating level for noise in urban (Class C) areas (55 dB(A)), while noise levels onsite were compared to the typical daytime rating level for noise in industrial (Class F) areas (70 dB(A)).

Daytime noise levels (L_{Aeq}) at all eight monitoring locations were below the respective guideline rating level. The main sources of noise identified at each location included:

- Pt 01 (Worker's Accommodation): Traffic on nearby roads, birds and insects.
- Pt 02 (Richard Shaft Hostel): Traffic on nearby roads, offsite tractor-loader-backhoe (TLB), birds, insects and cattle.
- Pt 03 (Swartklip Residential): Traffic on nearby roads, people talking, birds and insects.
- Pt 04 (Sefikile Residential): Traffic on nearby roads, people talking, alarm, birds and insects.
- Pt 05 (Onsite – previous NS 09): Traffic on nearby roads, people talking, neighbouring industrial noise, birds and insects.
- Pt 06 (Onsite – previous NS 02): Neighbouring industrial activities, onsite activities including a conveyor and constant hum and birds.
- Pt 07 (Onsite – previous NS 04): Neighbouring industrial activities, offsite loader, constant onsite hum, insects and birds.
- Pt 08 (Onsite – previous NS 07): Traffic on nearby roads, constant onsite hum, insects and birds.

From the daytime monitoring campaign, it is evident that the current noise climate surrounding the Mortimer Smelter is predominantly traffic-related, with influences from natural sources like birds and insects and occasional industrial influences from activities at the site as well as neighbouring sources.

Table 8-16 - Daytime noise monitoring results (2025 campaign)

ID	TIME	L_{AMAX} (DB(A))	L_{AMIN} (DB(A))	L_{AEQ} (DB(A))	L_{A90} (DB(A))	SANS GUIDELINE (DB(A))	COMPLIANT
Pt 01	16:16	68.7	41.7	46.1	43.2	55	Yes
Pt 02	14:18	65.2	39.6	49.4	42.0	55	Yes
Pt 03	15:56	64.9	30.6	49.0	33.4	55	Yes

ID	TIME	L_{AMAX} (DB(A))	L_{AMIN} (DB(A))	L_{AEQ} (DB(A))	L_{A90} (DB(A))	SANS GUIDELINE (DB(A))	COMPLIANT
Pt 04	15:05	59.3	32.2	40.0	36.2	55	Yes
Pt 05	13:38	72.4	40.1	53.1	42.2	70	Yes
Pt 06	18:04	69.8	53.4	59.3	54.4	70	Yes
Pt 07	17:45	77.6	47.2	55.8	49.7	70	Yes
Pt 08	17:21	65.6	39.2	48.8	41.8	70	Yes
Note: Exceedances of the SANS guideline are highlighted in red							

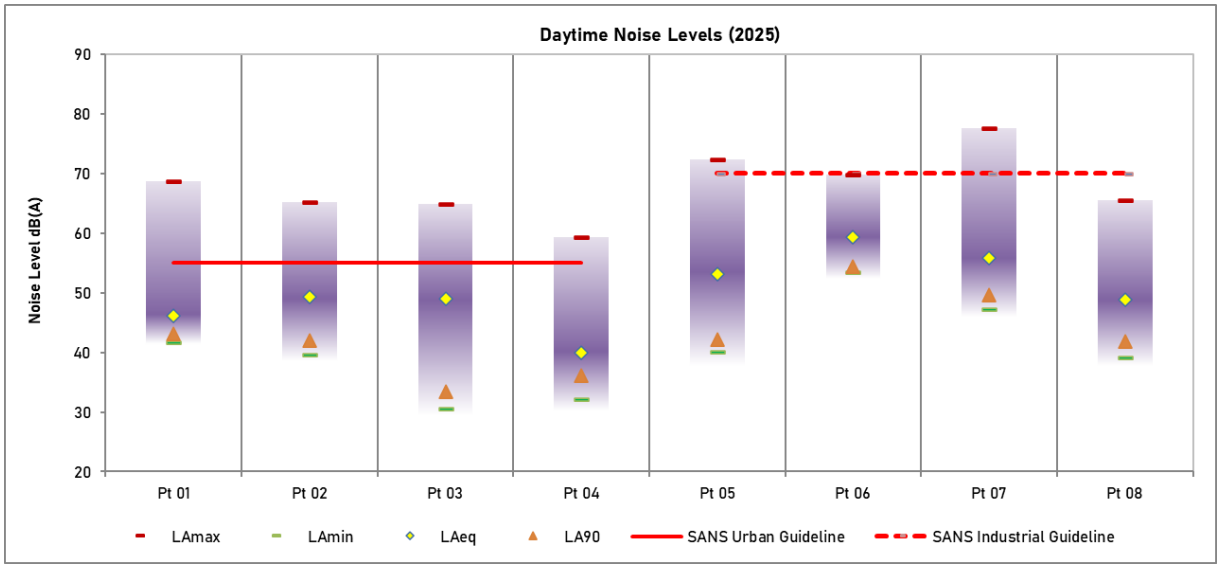

Figure 8-27 - Daytime monitored noise levels (2025 campaign). LAeq (yellow diamond) is compared with the SANS guideline

Night-Time

The results from the night-time noise monitoring campaign conducted from 24 to 26 March 2025 are presented in Table 8-17 and Figure 8-28. Conditions during the campaign were warm and clear, with generally calm conditions on both nights. Noise levels at all offsite receptor locations were compared to the typical night-time rating level for noise in urban (Class C) areas (45 dB(A)), while onsite noise levels were assessed against the typical night-time rating levels for noise in industrial (Class F) areas (60 dB(A)).

Average L_{Aeq} noise levels at all of the offsite monitoring locations (Pt 01, Pt 02, Pt 03 and Pt 04) exceeded the urban guideline level. Average L_{Aeq} noise levels at all of the onsite locations were below the industrial guideline level, as would be expected as the smelter was not operational. The main sources of noise identified at each location include:

- Pt 01 (Worker's Accommodation): A constant offsite plant hum and insects.
- Pt 02 (Richard Shaft Hostel): A constant hum from Richards Shaft, traffic on nearby roads, birds and insects.

- Pt 03 (Swartklip Residential): Traffic on nearby roads, a siren, a constant industrial hum, people talking in the distance, insects and dogs.
- Pt 04 (Sefikile Residential): Insects, dogs, people talking in the distance and a constant industrial hum.
- Pt 05 (Onsite – previous NS 09): A constant offsite plant hum, traffic on nearby roads, a few vehicles operating onsite and insects.
- Pt 06 (Onsite – previous NS 02): Offsite industrial noise, onsite hum and reverse alarm, onsite vehicles and insects.
- Pt 07 (Onsite – previous NS 04): Offsite industrial activities, onsite plant hum, onsite TLB activity, insects and birds.
- Pt 08 (Onsite – previous NS 07): Vehicle movement onsite and offsite, onsite plant hum, people talking and insects.

From the night-time monitoring campaign, it is evident that the current noise climate surrounding the site is predominantly influenced by industrial activities. Natural sources like insects are also evident at this time, along with intermittent influences from traffic.

Table 8-17 - Night-time noise monitoring results (2025 campaign)

ID	TIME	L_{AMAX} (DB(A))	L_{AMIN} (DB(A))	L_{AEQ} (DB(A))	L_{A90} (DB(A))	SANS GUIDELINE (DB(A))	COMPLIANT
24 March 2025 (late night)							
Pt 01	23:29	58.3	48.0	50.0	49.1	45	No
Pt 02	23:06	60.6	52.2	56.7	56.1	45	No
Pt 03	22:43	75.3	41.3	52.2	43.8	45	No
Pt 04	22:07	61.8	42.8	47.3	45.6	45	No
Pt 05	23:49	64.7	45.2	49.6	46.9	60	Yes
Pt 06	00:52	65.8	54.9	57.0	56.5	60	Yes
Pt 07	00:35	66.4	46.6	52.2	48.6	60	Yes
Pt 08	00:11	68.6	46.9	49.1	48.3	60	Yes
25 March 2025 (early morning)							
Pt 01	03:01	68.2	51.6	54.4	53.0	45	No
Pt 02	02:39	58.3	42.3	46.0	44.2	45	No
Pt 03	02:17	59.0	38.3	50.0	43.2	45	No
Pt 04	01:39	61.0	49.8	55.2	51.1	45	No
Pt 05	03:21	73.3	43.7	60.2	45.5	60	No
Pt 06	04:35	65.6	57.4	58.9	58.3	60	Yes
Pt 07	04:17	78.3	48.8	56.2	49.7	60	Yes
Pt 08	03:54	67.1	46.8	54.0	51.9	60	Yes
25 March 2025 (late night)							

ID	TIME	L_{AMAX} (DB(A))	L_{AMIN} (DB(A))	L_{AEQ} (DB(A))	L_{A90} (DB(A))	SANS GUIDELINE (DB(A))	COMPLIANT
Pt 01	23:32	55.7	47.1	49.6	48.3	45	No
Pt 02	23:11	57.0	47.6	50.4	49.5	45	No
Pt 03	22:47	77.9	42.4	54.6	45.1	45	No
Pt 04	22:10	70.9	43.0	45.9	44.6	45	No
Pt 05	23:52	76.7	44.3	54.5	46.5	60	Yes
Pt 06	00:50	79.5	56.6	61.6	57.7	60	No
Pt 07	00:33	67.3	47.9	55.6	49.2	60	Yes
Pt 08	01:13	57.4	46.9	49.0	48.1	60	Yes
26 March 2025 (early morning)							
Pt 01	04:37	62.4	48.5	51.5	50.1	45	No
Pt 02	04:16	76.4	40.7	48.2	43.1	45	No
Pt 03	03:53	73.9	40.6	49.8	43.7	45	No
Pt 04	03:16	67.9	46.5	49.6	48.0	45	No
Pt 05	02:43	69.8	43.0	48.7	44.6	60	Yes
Pt 06	01:53	65.3	53.6	60.8	55.2	60	No
Pt 07	01:35	58.4	47.3	49.8	48.4	60	Yes
Pt 08	02:17	63.3	45.0	47.6	46.4	60	Yes
Logarithmic Averages							
Pt 01		63.7	49.2	51.8	50.5	45	No
Pt 02		70.6	48.0	52.3	51.3	45	No
Pt 03		74.8	40.9	52.1	44.0	45	No
Pt 04		67.3	46.5	51.1	48.1	45	No
Pt 05		73.0	44.1	55.7	46.0	60	Yes
Pt 06		74.0	55.9	59.9	57.1	60	Yes
Pt 07		72.9	47.7	54.2	49.0	60	Yes
Pt 08		65.8	46.5	50.7	49.2	60	Yes
Note: Exceedances of the SANS guideline are highlighted in red							

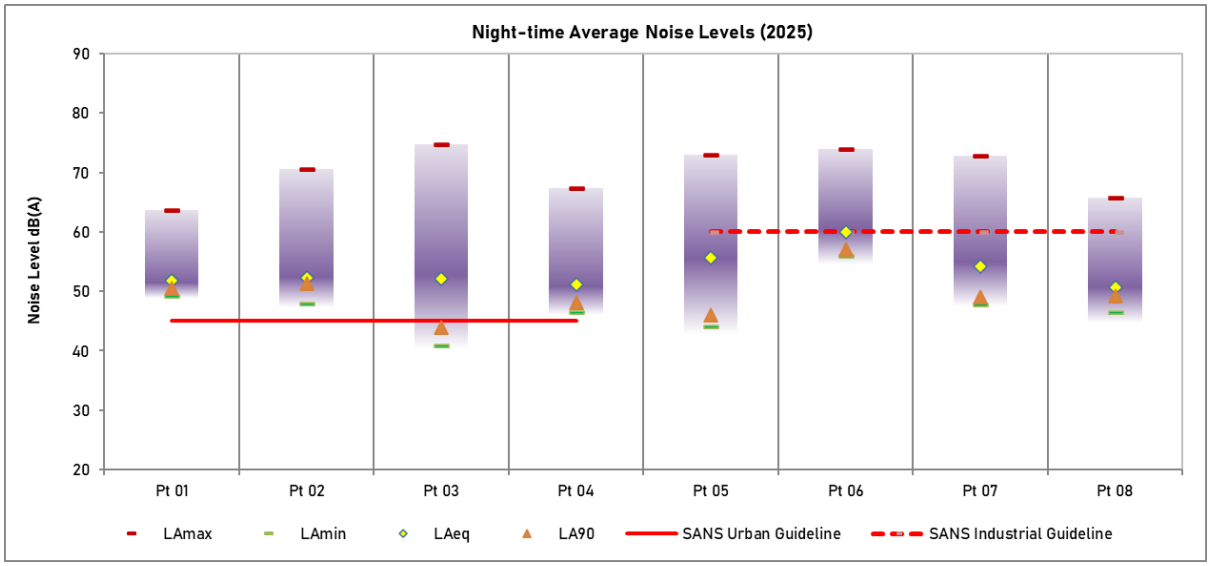

Figure 8-28 - Night-time average (logarithmic) monitored noise levels (2025 campaign). LAeq (yellow diamond) is compared with the SANS guideline

8.10.3 CURRENT CUMULATIVE BASELINE

Since the current (2025) baseline data does not account for existing operations at the Mortimer Smelter, cumulative current baseline levels at each monitoring location were calculated using a combination of the 2012 and 2025 baseline data.

Current calculated baseline noise levels at each monitoring location for day and night-time are presented in Table 8-18 and Table 8-19, respectively. These noise levels were used in the assessment against modelled results to determine the changes in noise levels with the operation of the ASC and SO_2 Abatement Project and the resulting impacts.

Table 8-18 - Cumulative daytime baseline noise levels

ID	2012 BASELINE NOISE LEVEL CONTRIBUTION FROM MORTIMER SMELTER (DB(A))*	2025 BASELINE MONITORED NOISE LEVELS (WITHOUT MORTIMER SMELTER OPERATIONAL) (DB(A)	CUMULATIVE BASELINE NOISE LEVELS FOR ASSESSMENT WITH MODELLED RESULTS (DB(A))**
Pt 01	1.8	46.1	46.1
Pt 02	0.0	49.4	49.4
Pt 03	0.0	49.0	49.0
Pt 04	0.0	40.0	40.0
Pt 05	62.7	53.1	62.7
Pt 06	64.9	59.3	64.9
Pt 07	67.4	55.8	67.4
Pt 08	65.6	48.8	65.6

Notes:
* Offsite 2012 baseline levels as a result of Mortimer operations were calculated using onsite measured levels and attenuation-over distance acoustic calculations.
** Cumulative levels for the model were either: a) calculated using the logarithmic sum of Mortimer's contribution in 2012 and the 2025 monitored noise levels (offsite locations); or b) assumed the same as 2012 levels (onsite locations) when the smelter was in full operation.

Table 8-19 - Cumulative night-time baseline noise levels

ID	2012 Baseline noise level contribution from Mortimer Smelter (dB(A))*	2025 Baseline monitored noise levels (without Mortimer Smelter operational) (dB(A)	Cumulative baseline noise levels for assessment with modelled results (dB(A))**
Pt 01	0.8	51.8	51.8
Pt 02	0.0	52.3	52.3
Pt 03	0.0	52.1	52.1
Pt 04	0.0	51.1	51.1
Pt 05	58.9	55.7	58.9
Pt 06	63.1	59.9	63.1
Pt 07	66.1	54.2	66.1
Pt 08	65.0	50.7	65.0

Notes:
* Offsite 2012 baseline levels as a result of Mortimer operations were calculated using onsite measured levels and attenuation-over distance acoustic calculations.
** Cumulative levels for the model were either: a) calculated using the logarithmic sum of Mortimer's contribution in 2012 and the 2025 monitored noise levels (offsite locations); or b) assumed the same as 2012 levels (onsite locations) when the smelter was in full operation.

8.11 SOCIO-ECONOMIC

The socio-economic baseline for the site currently under care and maintenance provides a comprehensive overview of the existing conditions. This baseline assessment serves as a foundation for understanding the current socio-economic context and will inform the project's development to promote sustainable and inclusive growth.

8.11.1 BOJANALA DISTRICT MUNICIPALITY

Mortimer Smelter is located within the Bojanala Platinum District Municipality which comprises of 5 local municipalities namely; Moretele, Madibeng, Rustenburg, Kgeleng and Moses Kotane. As per the Statistics South Africa's survey in February 2022, the Bojanala District Municipality has a population of approximately 1 624 428 million which is the highest population number in the North West province by district (IDP, 2024/25).

Approximately 50.8% of the population is male whereas 49.2% of the population is female. The district is predominately inhabited by Africans who make up 94.5% of the population followed by White at 3.7%, Coloured at 0.7% and Indian at 0.1%. Setswana is the most widely spoken language (72.8%), followed by Sesotho (5.9%) and Afrikaans (5.2%). Approximately, 49.3% of the population has completed Matric with only 11.9% having received a higher education (IDP, 2024/25).

As the economic hub of the North West Province, Bojanala Platinum District drives much of the province's production and job creation. The main economic sectors are mining (30-35%), community

services (15-20%), finance (10-15%), trade (10-15%), transport (5-10%), and manufacturing (5-10%) (CoGTA, 2020). The unemployment rate in the district was low at 24.5% in 2012, but it went up to 48.1% by 2021. The largest number for working age population age group was the 25-34 years at 375 438 followed by the 35-44 years at 292 698.

8.11.2 MOSES KOTANE LOCAL MUNICIPALITY

The Project site falls under the Moses Kotane Local Municipality, which spans approximately 5726 km^2. The municipality shares its northern boundary with Thabazimbi Local Municipality in Limpopo, and its southern borders with Kgetlengrivier and Rustenburg Local Municipalities. Mogwase serves as the administrative centre of the municipality.

The total population increased from 242 554 in 2011 to 265 668 in 2022 (StatsSA, 2025). The average household size only increased by 0.1 from 3.2 in 2011 to 3.3 in 2022. The population is predominantly Black African (99.3%), followed by Coloured at 0.3%, White at 0.2% and Indian at 0.1%. Setswana is the primary language spoken by the majority (87.92%), with IsiZulu and IsiXhosa being the next most common at 2.75% and 2.74% respectively (StatsSA, 2025). The sex ratio is equal with a 50-50 split.

The Moses Kotane Local Municipality is predominantly rural, consisting of 107 villages and two established towns: Mogwase and Madikwe. Most settlements are clustered along the southern and eastern edges of the Pilanesberg. The predominant housing type is formal, with 90% of dwellings made from brick structures, 8.4% classified as informal settlements and 1.1% as traditional dwellings (StatsSA, 2025).

About 37.9% of the population have completed high school with a Matric certificate, while only 5.3% have gone on to pursue a higher education. 6.2% of the population has had no schooling at all, showing an improvement from 9.3% in 2011 (StatsSA, 2025). The unemployment rate is sitting at approximately 51%, with a participation rate of 56.9% i.e. the labour force as a percentage of the population in the working age group (15-64 years old). 86.4% of people who are considered employed work for the formal sector (IDP, 2025/2026). The primary economic sectors in the municipality are mining and quarrying as well as agriculture, forestry, and fishing (IDP, 2025/2026). Most people are employed as plant and machine operators or assemblers (21.6%), in basic labour jobs (17.6%), or as service workers, shop assistants, and market sellers. Only 22.3% of residents are employed in jobs that require high levels of skill (IDP, 2025/2026). According to the draft IDP for the 2025/2026 financial year, most people in the Moses Kotane Local Municipality earn low incomes, which means many households do not make enough money to cover their basic needs or support their families. Specifically, 22.2% of residents earn between R8,590 and R17,177 per year, which is about R716 to R1,431 per month (IDP, 2025/2026).

8.12 HERITAGE AND PALAEONTOLOGY

The Cultural Heritage Impact Assessment that was undertaken by Archaetnos Culture & Cultural Resource Consultants in 2017 for the SO_2 abatement plant, indicated that no sites of cultural heritage significance were located during the survey. In addition, the proposed location has been impacted already, and no existing structures will be impacted/demolished. Due to the existing activities occurring on site, it is not expected that any places of archaeological or cultural importance would occur on the site itself.

9 ENVIRONMENTAL IMPACTS ASSESSMENT

This Chapter identifies the perceived environmental and social effects associated with the proposed Project. The assessment methodology is outlined in Section 5.5. The issues identified stem from those aspects presented in Section 8. of this document as well as the Project description provided in Section 3.

Furthermore, a decommissioning assessment will be considered as part of the decommissioning process that will be subject to a separate authorisation and impact assessment process. The impact assessment in this section encompasses the geographical, physical, biological, social, economic, heritage and cultural aspects in accordance with Appendix 1 of GN R. 982.

NOTE: The sub-sections set out in the section below should be read in conjunction with the specialist reports enclosed herewith as Appendix E.

9.1 AIR QUALITY IMPACT ASSESSMENT

9.1.1 CONSTRUCTION PHASE

Emissions during construction are associated with land clearing, drilling, and blasting, ground excavation, cut and fill operations and the movement of construction vehicles. Pollutants associated with construction activities are typically Total Suspended Particulates (TSP), PM_{10} and $PM_{2.5}$ with lesser contributions of CO, NO_2, SO_2 and C_6H_6 from vehicle exhausts.

PM refers to solid or liquid particles suspended in the air. PM varies in size from particles that are only visible under an electron microscope to soot or smoke particles that are visible to the human eye. Particles can be classified by their aerodynamic properties into coarse particles, PM_{10} (particulate matter with an aerodynamic diameter of less than 10 µm) and fine particles, $PM_{2.5}$ (particulate matter with an aerodynamic diameter of less than 2.5 µm). In addition to reduced visibility, particulate air pollution poses health risks associated with the respiratory system.

Construction activity is a source of dust emissions that can have a significant but transient impact on local air quality. The amount of dust emitted from construction operations depends on the area of land being worked, the proportion of land lying exposed at any time, the clearing and dozing equipment used, the number and type of vehicles on temporary roads, and the duration of the construction phase.

Although the increased dust and emissions from construction activities may not significantly impact air quality, increased dust can be a nuisance to the nearby receptors and site workers. Considering the temporary nature of construction and the nature of the proposed activities, impact on air quality is anticipated to be moderate. With the implementation of appropriate control measures, the impact on sensitive receptors will be reduced to be low.

The potential impact on air quality is indicated in Table 9-1.

Table 9-1 – Impact on ambient air quality during construction

Potential Impact: Impact on air quality during construction	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	2	4	28	Low	(-)
With Mitigation	1	1	1	1	4	16	Low	(-)
Mitigation and Management Measures	▪ Limit the duration of the construction phase to as short a timeframe as possible. ▪ Where possible, minimise the area under construction. ▪ Make use of wet suppression techniques to minimise dust entrainment during periods of high wind speeds. ▪ Where possible, minimise speed limits. ▪ Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and soil/material stockpiles especially. This includes wetting of exposed soft soil surfaces and not conducting activities during high wind periods which will increase the likelihood of dust being generated; ▪ All stockpiles (if any) must be restricted to designated areas and may not exceed a height of two (2) metres. ▪ Ensure that all vehicles, machines and equipment are adequately maintained to minimise emissions. ▪ All materials transported to, or from, site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials. ▪ No burning of waste, such as plastic bags, cement bags and litter is permitted.							

9.1.2 OPERATIONAL PHASE

The Modelling Regulations recommends the 99th percentile (P99) concentrations to be considered for short-term (1-hour and 24-hour average) assessments against the relevant NAAQS since the highest predicted ground-level concentrations can be considered outliers due to complex variability of meteorological processes. This complexity might cause exceptionally high concentrations that the facility may never actually exceed in its lifetime. For the purpose of this assessment, the short-term assessment was conducted against the P99 concentrations for the relevant pollutants

SO_2 Concentration Predictions

Table 9-2 presents predicted SO_2 concentrations at receptors during the proposed Slag Cleaning operations at Mortimer, while Figure 9-1 illustrates P99 SO_2 1-hour average concentrations, Figure 9-2 illustrates P99 SO_2 24-hour average concentrations and Figure 9-3 illustrates long-term SO_2 predicted concentrations. While the dispersion modelling was simulated at maximum emission rates for the additional slag cleaning, it is expected, due to process and feedstock changes, that SO_2 emissions generated by the slag cleaning will be half those emitted by the primary smelter. Key findings include:

- All residential sensitive receptor concentrations remain below the 1-hour, 24-hour and annual average standards, with highest concentrations predicted at Hlatini Village, although remaining below the relevant NAAQS.
- The maximum 1-hour average fence line concentration predicted was 1,172 µg/m^3, maximum 24-hour average fence line concentration predicted was 423 µg/m^3, with a long-term concentration of 99 µg/m^3 predicted, all occurring along the southern fence line of Mortimer Smelter, and exceeding their relevant NAAQS. Importantly, predicted concentrations disperse substantially with distance from this fence line, with all residential receptor concentrations predicted to be below the relevant standards.
- Concentrations are predicted to disperse predominantly towards the northwest and south of Mortimer. Notably, the Mortimer Smelter is located near the southern fenceline of the property, with emissions having little time to disperse prior to reaching the fence line. Further, the area immediately north of Mortimer Smelter is uninhabited, and comprises predominantly open land and mining activity.

Table 9-2: Scenario 2 predicted SO_2 receptor concentrations

ID	Receptor Name	1-Hour NAAQS (µg/m^3)	1-Hour P99 Average (µg/m^3)	24-Hour NAAQS (µg/m^3)	24-Hour P99 Average (µg/m^3)	Annual NAAQS (µg/m^3)	Long-Term Average (µg/m^3)
R_1	Sefikile Residential Area	350	32.57	125	35.72	50	2.83
R_2	Makuka Secondary School		18.97		13.71		1.43
R_3	Sefikile Primary School		29.32		36.06		2.69
R_4	Hlatini Village		344.39		113.32		27.51
R_5	Ga-Ramosidi Residential Area		42.87		42.88		3.60
R_6	Informal Settlement		71.97		50.80		5.44
R_7	Etafeni Village		74.15		32.25		5.17
R_8	Mantserre Residential Area		64.76		20.90		3.07
R_9	Mamodimakwana Primary School		64.65		22.91		3.18
R_10	Modise Commercial High School		52.50		19.65		2.66
R_11	Mopanye Residential Area		51.13		25.59		2.71
R_12	Swartklip Residential Area		22.28		28.78		1.94
R_13	Francois Uys Covid Hospital		25.74		31.54		2.24
R_14	Platinum Health Union Hospital		24.31		29.84		2.05
R_15	Laerskool Platina		20.24		25.06		1.80
	Maximum Fence line Concentration – 1Hr [X: 514747m; Y:7237960m]		**1,171.74**		-		-
	Maximum Fence line Concentration – 24Hr, LT [X: 514674m; Y:7237909m]		-		**423.02**		**99.16**

Note: Bold, **red** highlight indicates exceedance of NAAQS

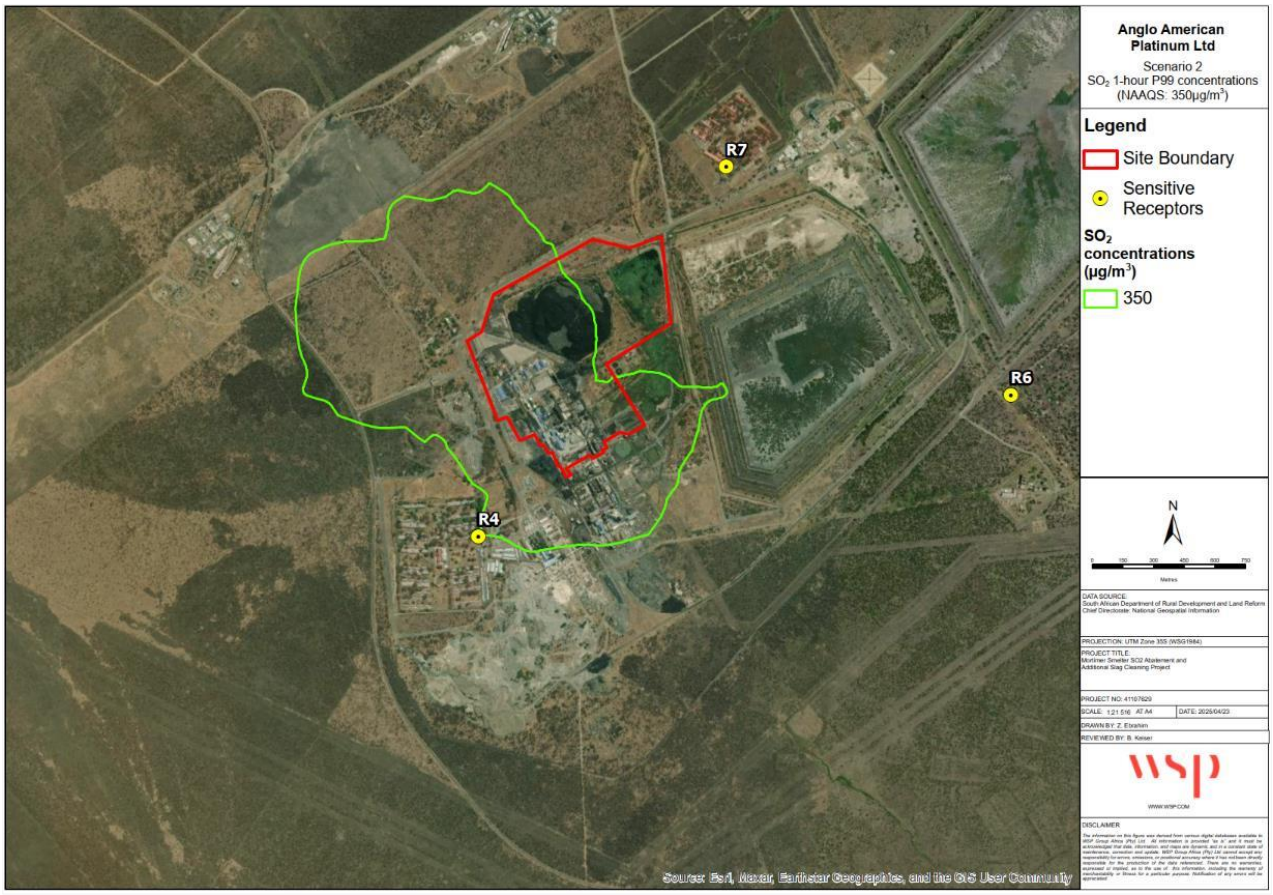

Figure 9-1: Scenario 2 predicted SO_2 1-hour concentrations

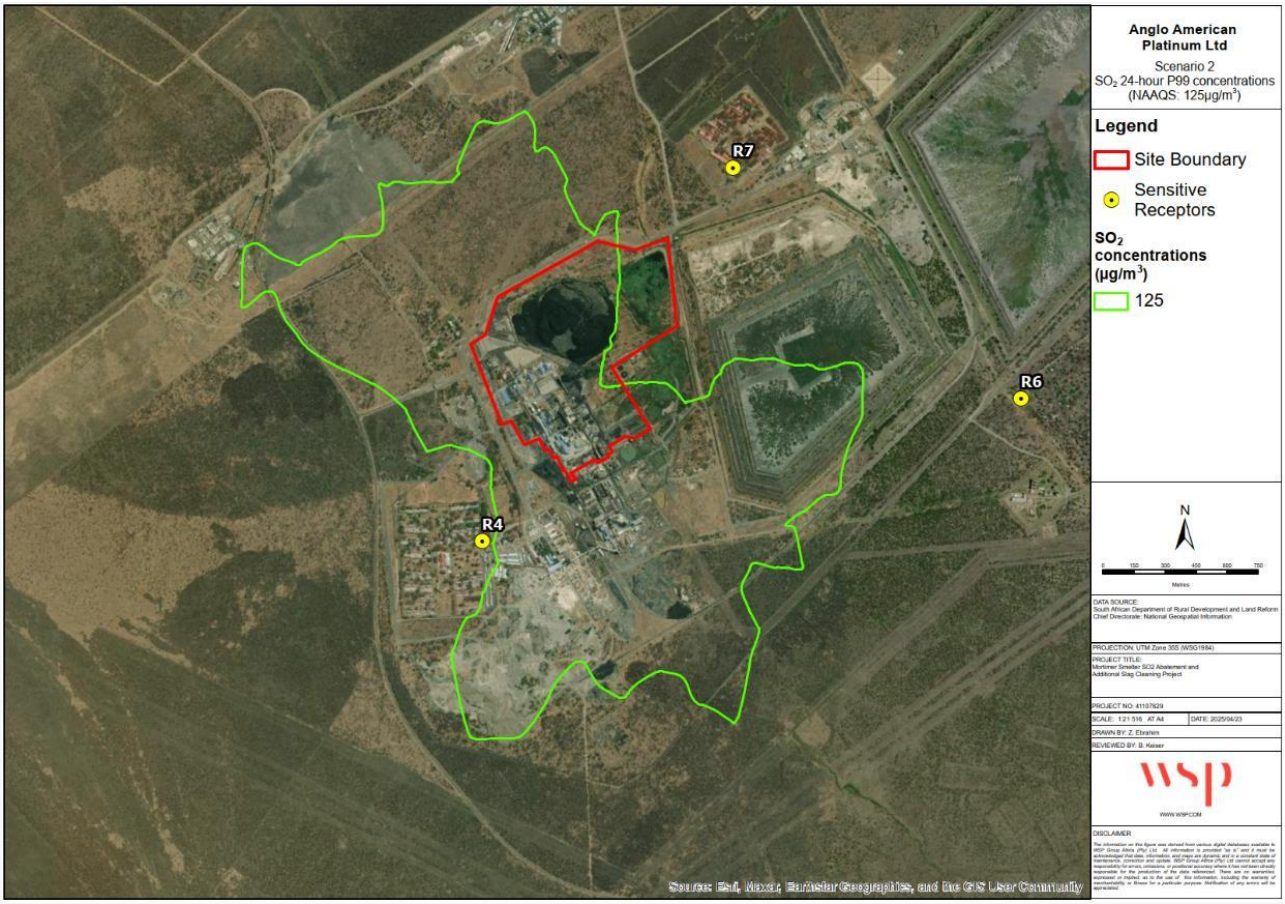

Figure 9-2: Scenario 2 predicted SO_2 24-hour concentrations

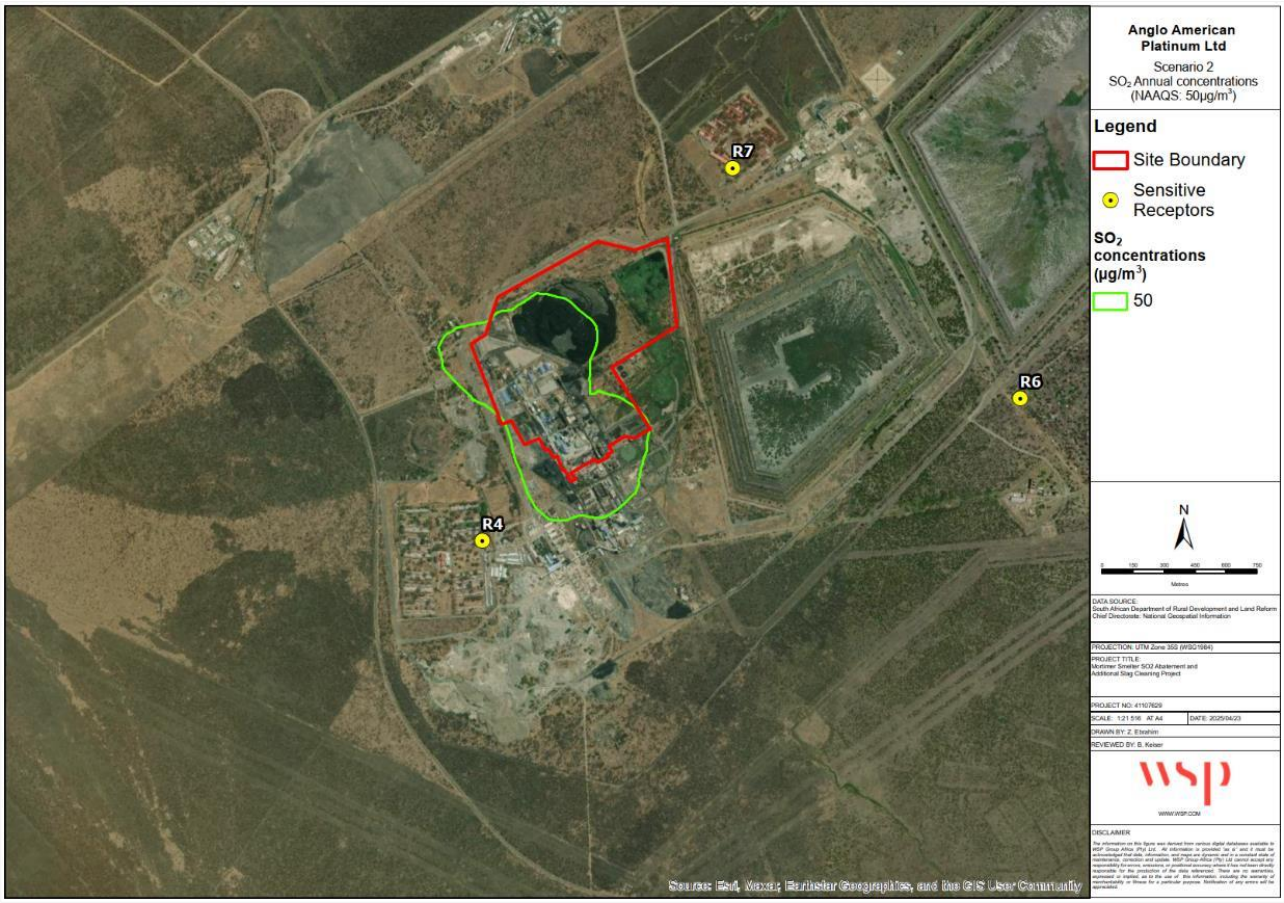

Figure 9-3: Scenario 2 predicted SO_2 long-term concentrations

NO_2 Concentration Predictions

Table 9-3 presents predicted NO_2 concentrations at receptors during the proposed ASC operations at Mortimer, while **Figure 9-4** illustrates P99 NO_2 1-hour average concentrations and **Figure 9-5** illustrates long-term NO_2 predicted concentrations. Key findings include:

- All residential sensitive receptor concentrations remain well below the 1-hour and annual average standards, with highest concentrations predicted at Hlatini Village, well below the relevant NAAQS.
- The maximum 1-hour average fence line concentration predicted was 87 µg/m^3, with a long-term concentration of 10 µg/m^3 predicted, both occurring along the southern fence line of Mortimer Smelter, remaining below their relevant NAAQS.

Table 9-3: Scenario 2 predicted NO_2 receptor concentrations

ID	Receptor Name	1-Hour NAAQS (µg/m^3)	1-Hour P99 Average (µg/m^3)	Annual NAAQS (µg/m^3)	Long-Term Average (µg/m^3)
R_1	Sefikile Residential Area	200	5.68	40	0.38
R_2	Makuka Secondary School		3.44		0.23
R_3	Sefikile Primary School		5.13		0.34

ID	Receptor Name	1-Hour NAAQS (µg/m³)	1-Hour P99 Average (µg/m³)	Annual NAAQS (µg/m³)	Long-Term Average (µg/m³)
R_4	Hlatini Village		51.00		4.49
R_5	Ga-Ramosidi Residential Area		7.12		0.51
R_6	Informal Settlement		10.56		0.70
R_7	Etafeni Village		13.29		0.97
R_8	Mantserre Residential Area		6.32		0.36
R_9	Mamodimakwana Primary School		6.01		0.34
R_10	Modise Commercial High School		4.66		0.27
R_11	Mopanye Residential Area		5.33		0.28
R_12	Swartklip Residential Area		4.37		0.26
R_13	Francois Uys Covid Hospital		4.91		0.29
R_14	Platinum Health Union Hospital		4.54		0.27
R_15	Laerskool Platina		3.98		0.23
	Maximum Fence line Concentration – 1Hr, LT [X: 514408m; Y:7238010m]		87.22		10.44

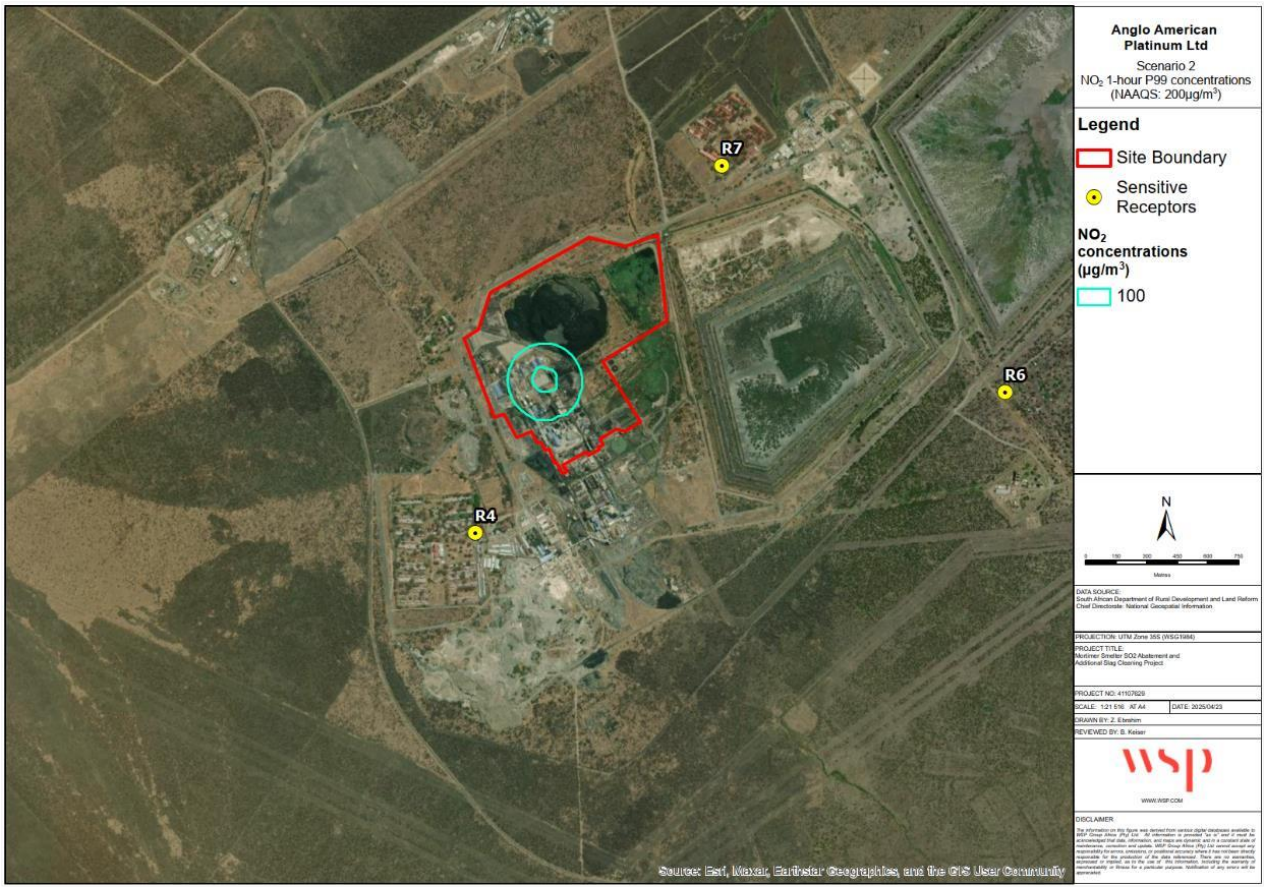

Figure 9-4: Scenario 2 predicted NO_2 1-hour concentrations

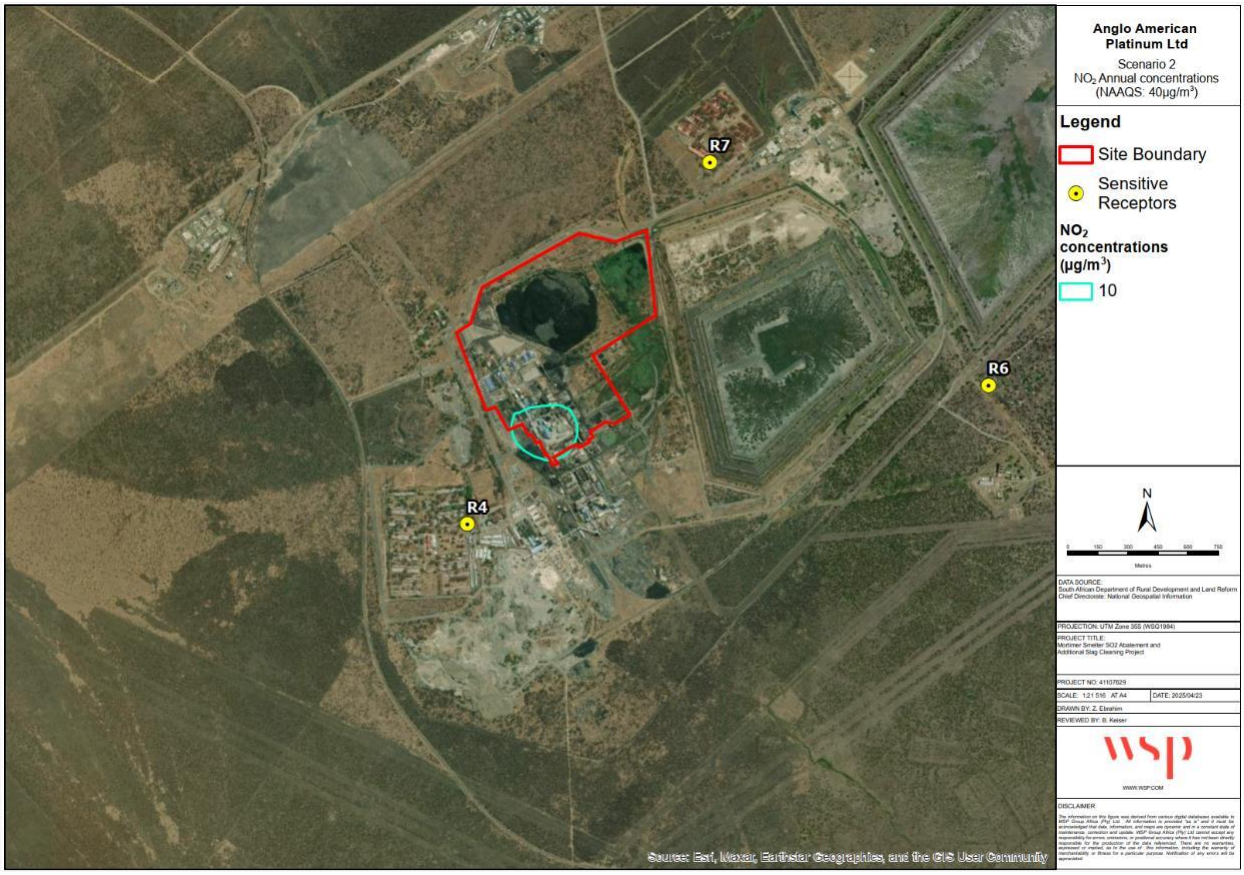

Figure 9-5: Scenario 2 predicted NO_2 Annual concentrations

PM_{10} Concentration Predictions

Table 9-4 presents predicted PM_{10} concentrations at receptors during the proposed ASC operations at Mortimer, while **Figure 9-6** illustrates P99 PM_{10} 24-hour average concentrations and **Figure 9-7** illustrates long-term PM_{10} predicted concentrations. Key findings include:

- All residential sensitive receptor concentrations remain well below the 24-hour and annual average standards, with highest concentrations predicted at Hlatini Village, although remaining below the relevant NAAQS.
- The maximum 24-hour average fence line concentration predicted was 325 µg/m^3, with a long-term concentration of 193 µg/m^3 predicted, both occurring along the southern fence line of Mortimer Smelter, and exceeding their relevant NAAQS. Importantly, predicted concentrations disperse substantially with distance from this fence line, with all residential receptor concentrations predicted to be below the relevant standards.
- Concentrations are predicted to disperse predominantly towards the northwest and south of Mortimer Smelter. Notably, Mortimer Smelter is located near the southern fenceline of the property, with emissions having little time to disperse prior to reaching the fence line. Further, the area immediately north of Mortimer Smelter is uninhabited, and comprises predominantly open land and mining activity.

Table 9-4: Scenario 2 predicted PM_{10} receptor concentrations

ID	Receptor Name	24-Hour NAAQS (µg/m³)	24-Hour P99 Average (µg/m³)	Annual NAAQS (µg/m³)	Long-Term Average (µg/m³)
R_1	Sefikile Residential Area	75	7.93	40	1.80
R_2	Makuka Secondary School		5.57		1.11
R_3	Sefikile Primary School		7.70		1.70
R_4	Hlatini Village		59.62		27.14
R_5	Ga-Ramosidi Residential Area		9.39		2.46
R_6	Informal Settlement		15.57		3.89
R_7	Etafeni Village		28.24		5.66
R_8	Mantserre Residential Area		11.42		3.56
R_9	Mamodimakwana Primary School		9.45		3.19
R_10	Modise Commercial High School		8.78		2.61
R_11	Mopanye Residential Area		8.33		2.69
R_12	Swartklip Residential Area		9.96		1.49
R_13	Francois Uys Covid Hospital		8.86		1.76
R_14	Platinum Health Union Hospital		8.51		1.60
R_15	Laerskool Platina		7.48		1.36
	Maximum Fence line Concentration – 1Hr, LT [X: 514571m; Y:7237857m]		**325.37**		**192.95**

Note: Bold, **red** highlight indicates exceedance of NAAQS

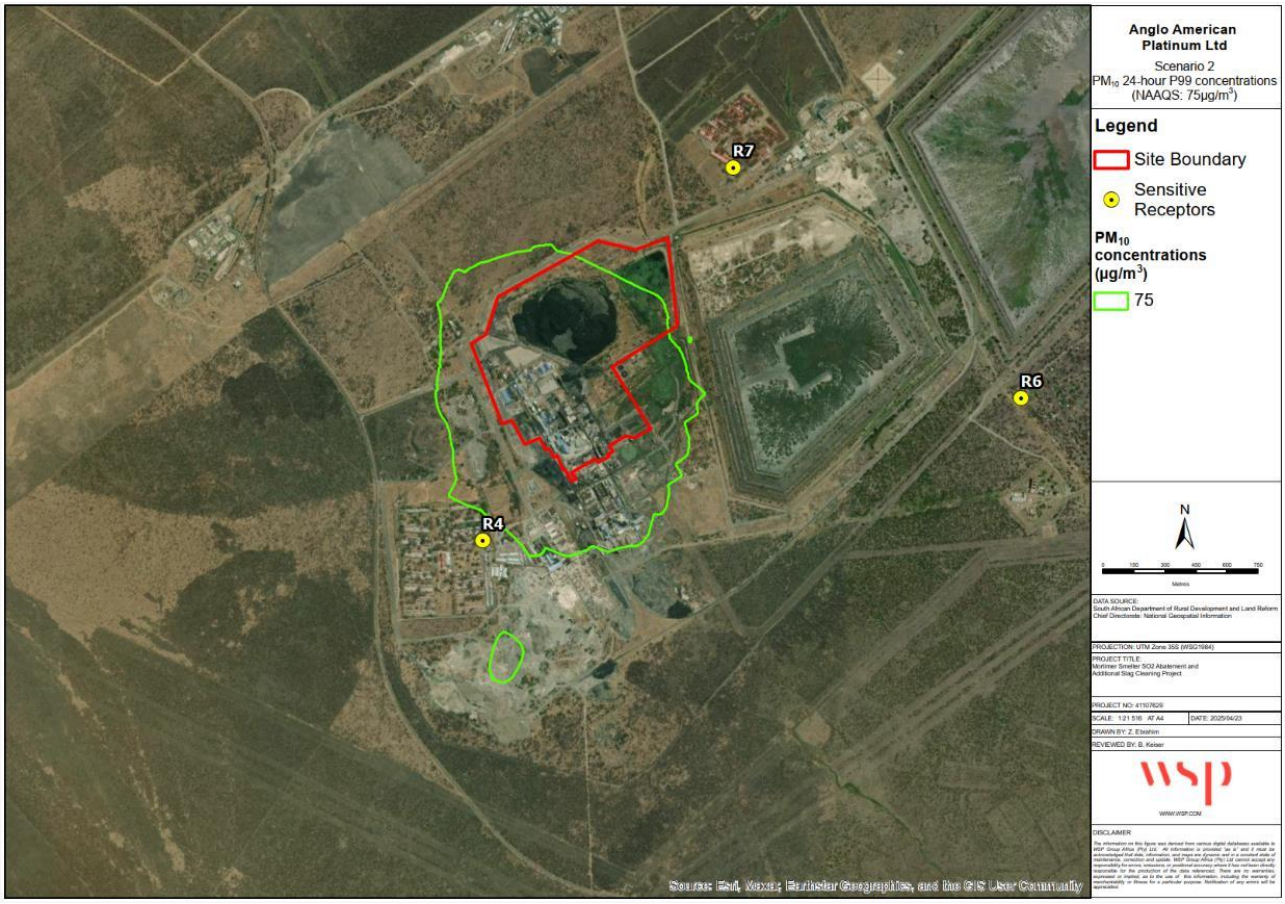

Figure 9-6: Scenario 2 predicted PM_{10} 24-hour concentrations

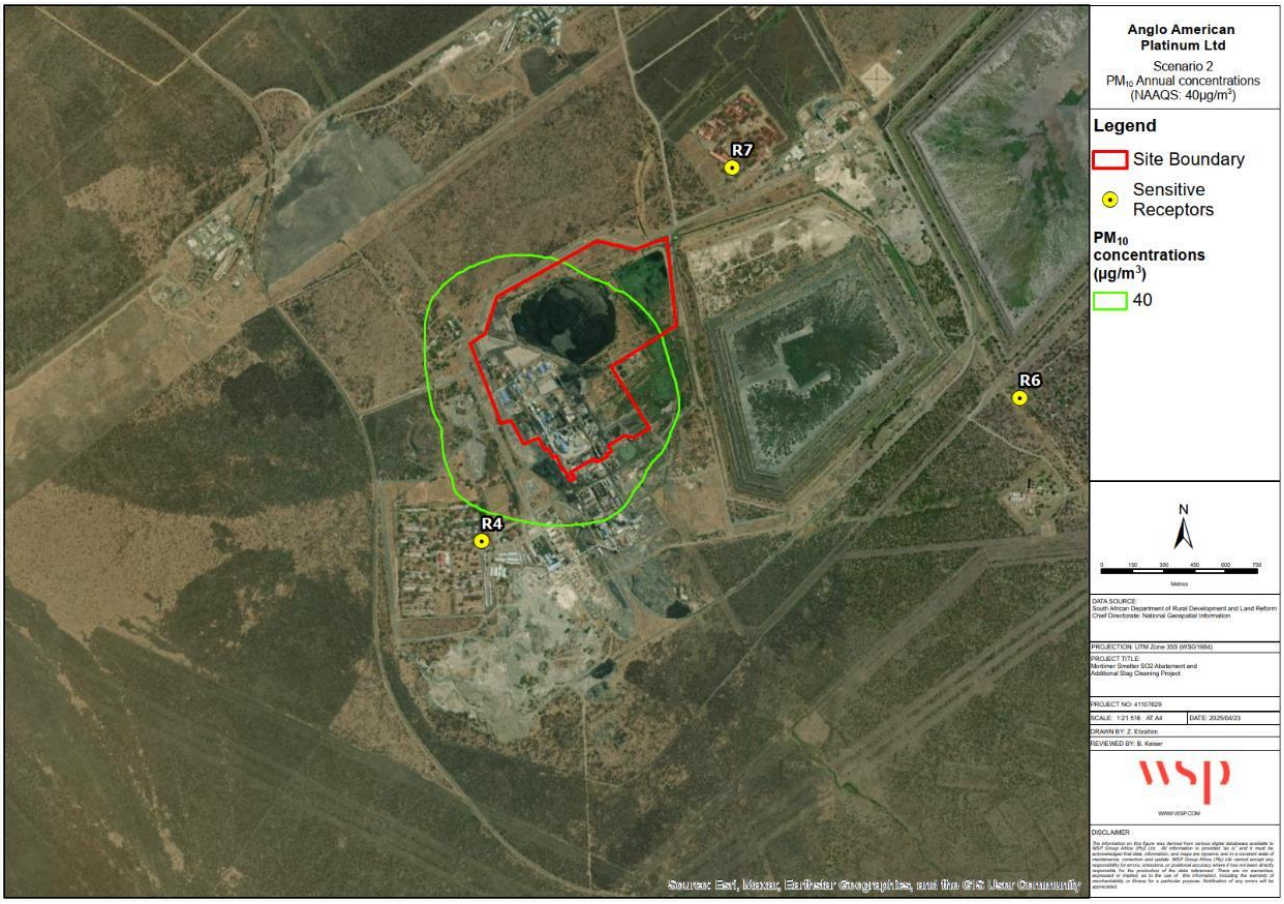

Figure 9-7: Scenario 2 predicted PM_{10} Annual concentrations

PM2.5 Concentration Predictions

Table 9-5 presents predicted $PM_{2.5}$ concentrations at receptors during the proposed ASC operations at Mortimer, while **Figure 9-8** illustrates P99 $PM_{2.5}$ 24-hour average concentrations and **Figure 9-9** illustrates long-term $PM_{2.5}$ predicted concentrations. Key findings include:

- All residential sensitive receptor concentrations remain well below the 24-hour and annual average standards, with highest concentrations predicted at Hlatini Village, remaining below the relevant NAAQS.
- The maximum 24-hour average fence line concentration predicted was 160 µg/m^3, with a long-term concentration of 65 µg/m^3 predicted, both occurring along the southern fence line of Mortimer Smelter, and exceeding their relevant NAAQS. Importantly, predicted concentrations disperse substantially with distance from this fence line, with all residential receptor concentrations predicted to be below the relevant standards.
- Concentrations are predicted to disperse predominantly towards the south of Mortimer Smelter. Notably, the Mortimer Smelter plant is located near the southern fenceline of the property, with emissions having little time to disperse prior to reaching the fence line. Further, the area immediately north of Mortimer Smelter is uninhabited, and comprises predominantly open land and mining activity.

Table 9-5: Scenario 2 predicted $PM_{2.5}$ receptor concentrations

ID	Receptor Name	24-Hour NAAQS (µg/m³)	24-Hour P99 Average (µg/m³)	Annual NAAQS (µg/m³)	Long-Term Average (µg/m³)
R_1	Sefikile Residential Area	75	2.93	40	0.46
R_2	Makuka Secondary School		1.72		0.28
R_3	Sefikile Primary School		2.60		0.43
R_4	Hlatini Village		27.50		8.09
R_5	Ga-Ramosidi Residential Area		3.16		0.63
R_6	Informal Settlement		5.83		1.09
R_7	Etafeni Village		10.45		1.50
R_8	Mantserre Residential Area		3.39		0.83
R_9	Mamodimakwana Primary School		2.87		0.73
R_10	Modise Commercial High School		2.65		0.59
R_11	Mopanye Residential Area		2.43		0.60
R_12	Swartklip Residential Area		2.89		0.38
R_13	Francois Uys Covid Hospital		3.26		0.45
R_14	Platinum Health Union Hospital		2.90		0.41
R_15	Laerskool Platina		2.34		0.34
	Maximum Fence line Concentration – 1Hr, LT [X: 514571m; Y:7237857m]		**159.60**		**64.92**

Note: Bold, **red** highlight indicates exceedance of NAAQS

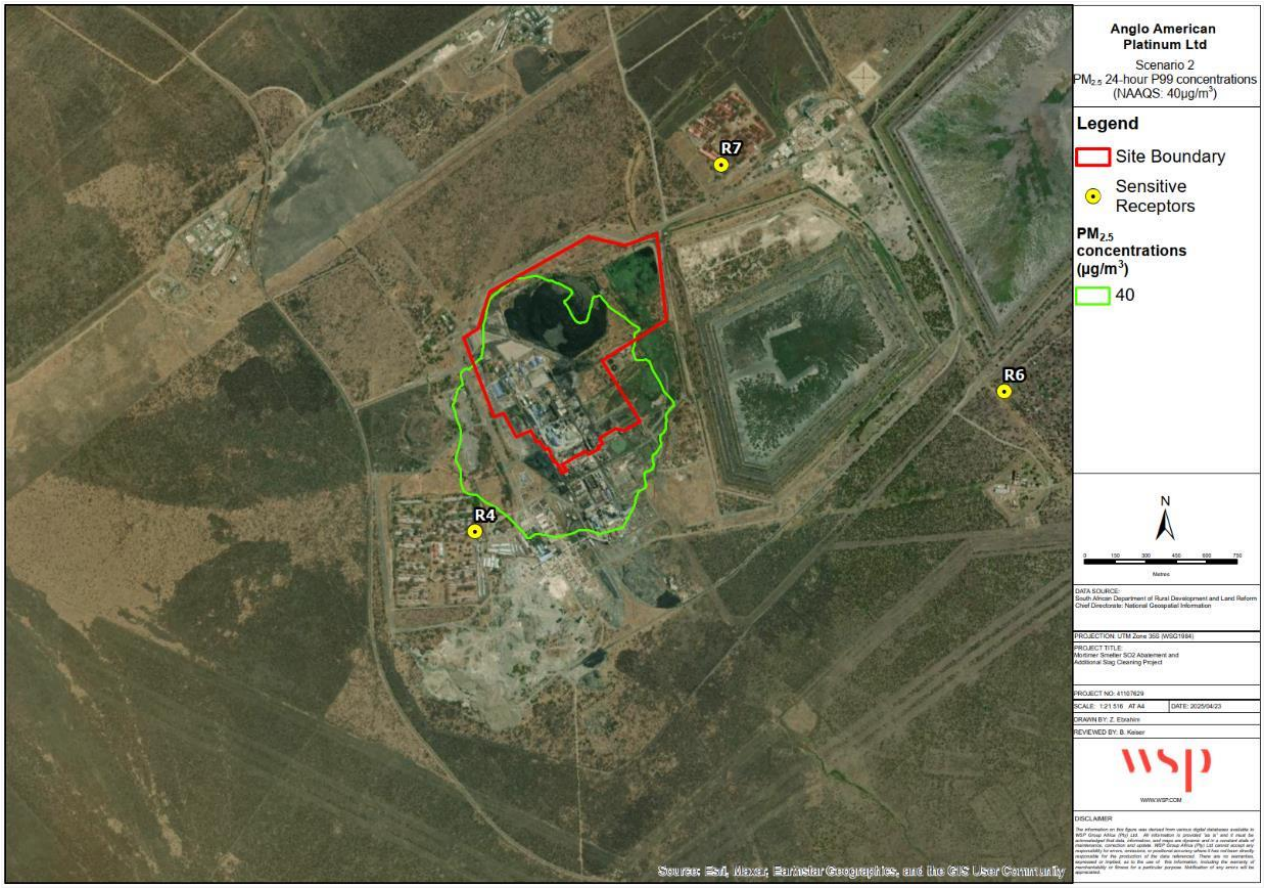

Figure 9-8: Scenario 2 predicted $PM_{2.5}$ 24-hour concentrations

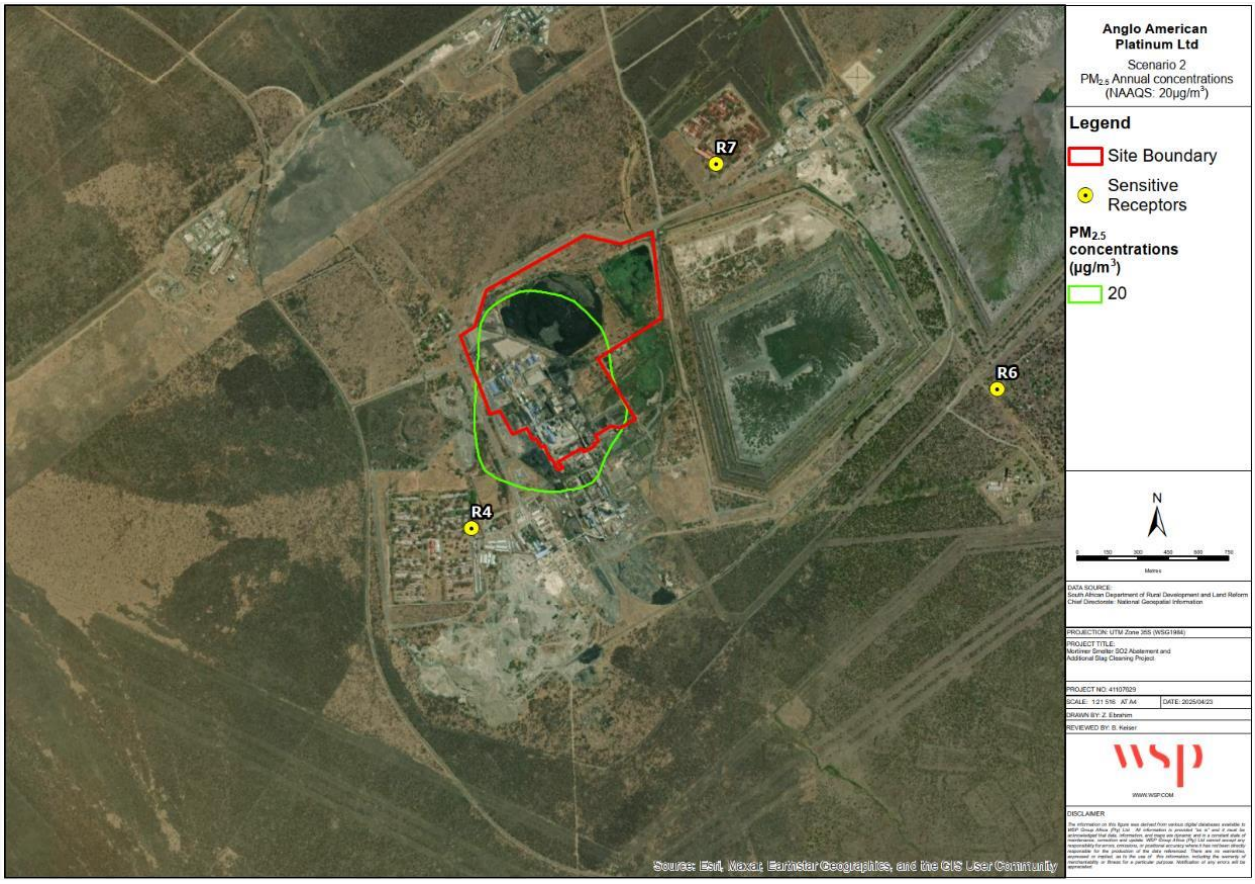

Figure 9-9: Scenario 2 predicted $PM_{2.5}$ Annual concentrations

Dust Fallout Predictions

Table 9-6 presents predicted 30-day dust fallout rates at receptors during the proposed ASC operations at Mortimer, while **Figure 9-10** illustrates the dust fallout predicted rates. Key findings include:

- All residential sensitive receptor fallout rates remain well below the residential standard, with highest fallout rates predicted at Etafeni Village, well below the residential dust control standard.
- The maximum dust fallout rate predicted was 277 mg/m^2/day, occurring along the northern fence line of Mortimer Smelter, remaining below both the residential and non-residential dust control standard.

Table 9-6: Scenario 2 predicted dust fallout rates

ID	Receptor Name	Residential Standard (mg/m^2/day)	Non-residential Standard (mg/m^2/day)	Dust Fallout Rates (mg/m^2/day)
R_1	Sefikile Residential Area	600	1 200	0.81
R_2	Makuka Secondary School			0.29
R_3	Sefikile Primary School			0.64
R_4	Hlatini Village			44.40

ID	Receptor Name	Residential Standard (mg/m²/day)	Non-residential Standard (mg/m²/day)	Dust Fallout Rates (mg/m²/day)
R_5	Ga-Ramosidi Residential Area			0.81
R_6	Informal Settlement			4.13
R_7	Etafeni Village			45.17
R_8	Mantserre Residential Area			1.77
R_9	Mamodimakwana Primary School			1.06
R_10	Modise Commercial High School			0.49
R_11	Mopanye Residential Area			0.32
R_12	Swartklip Residential Area			1.04
R_13	Francois Uys Covid Hospital			1.40
R_14	Platinum Health Union Hospital			1.15
R_15	Laerskool Platina			0.71
	Maximum Fence line Concentration – 1Hr, LT [X: 514571m; Y:7237857m]			64.92

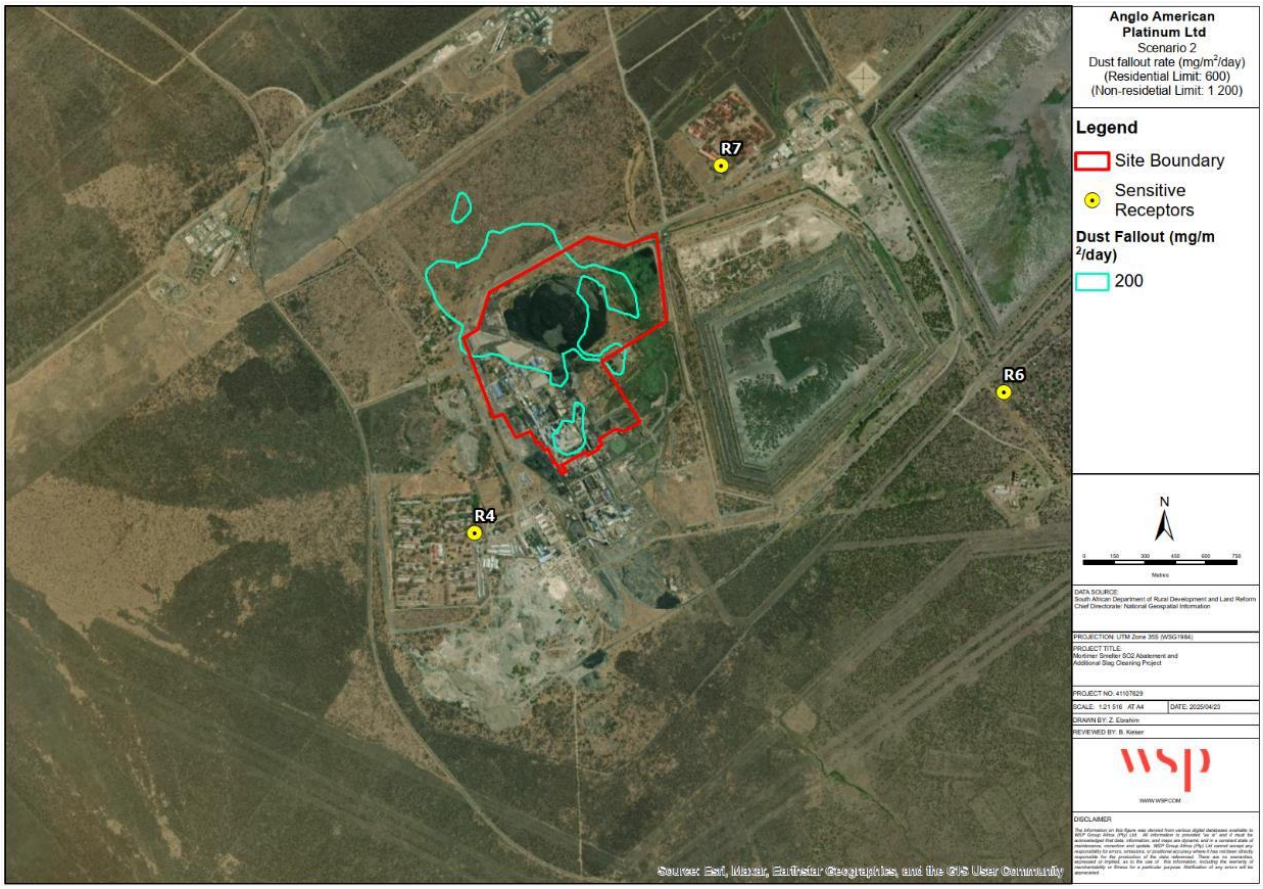

Figure 9-10: Scenario 2 predicted dust fallout concentrations

Based on the dispersion modelling predictions, the following key, summary findings are noted:

- As reported in the impact study conducted by Airshed (Airshed, 2023), predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ associated with the Primary Smelting operations are well below the relevant NAAQS for both short-term and long-term averaging periods, these concentrations do not impact residential sensitive receptors, with all sensitive receptor concentrations predicted to remain low. As noted previously, since existing operations (primary smelting) are not changing regarding NO_2 and PM emissions, the Airshed findings are considered representative of primary smelting operations.
- Predicted short-term and long-term average SO_2, PM_{10} and $PM_{2.5}$ concentrations associated with the proposed ASC operations remain low at all sensitive receptors within the relevant NAAQS. Notably, the Mortimer Smelter operational areas are near the southern fence line with emissions having very little time to disperse.
- Predicted short-term and long-term average NO_2 concentrations associated with the proposed ASC operations remain low at all sensitive receptors, with no exceedances predicted both onsite and at identified sensitive receptors.
- Dust fallout rates are predicted to remain low at all sensitive receptors, below the Residential Standard. No exceedances of the national dust control regulations are predicted both on site and at identified sensitive receptors.
- Cumulative predicted concentrations at the identified monitoring stations are within the annual SO_2 and PM_{10} NAAQS.

9.1.3 IMPACTS OF ENTERPRISE ON THE RECEIVING ENVIRONMENT

Analysis of Emissions' Impact on Human Health

As pollutants disperse into the air, workers and people close to the source might be exposed directly through inhalation, or indirectly through consumption of food or water contaminated by deposition of the pollutants to soil and vegetation (NRC, 2000). Others can be exposed through a different mix of environmental pathways after the particles travel some distance in the atmosphere. This includes, going through various chemical and physical transformations, or passing through soil, water, or food. Inhalation has shown to be the most direct path for exposure to pollutants emitted from stacks and dispersed into the atmosphere. However, the combination of long-range transport, deposition, and uptake of the pollutants by the food chain, appears to be a significant mode of exposure (NRC, 2000).

The primary raw materials used on site include wet and dry concentrate, coal (washed pea), limestone, and electrode paste, which are processed through flash drying and smelting operations. While these materials do not inherently pose acute chemical toxicity in their raw form, their health and environmental risks arise primarily from their contribution to airborne particulate matter and gaseous emissions during thermal and mechanical processing.

PM, particularly in the PM_{10} and $PM_{2.5}$ size fractions, is generated during the flash drying of concentrates, handling of coal and limestone, and furnace operations. These fine particles are suspended in ambient air and can penetrate deep into the lungs or even enter the bloodstream, potentially leading to respiratory and cardiovascular issues, including lung inflammation, bronchitis, decreased lung function, and in severe or prolonged exposures, heart disease or cancer (WHO, 2006; US EPA, 2011).

Coal combustion and smelting processes may also result in the release of sulphur dioxide (SO_2), particularly when sulphur-bearing concentrates are processed. SO_2 is a known respiratory irritant and, in combination with particulate matter, can exacerbate conditions such as asthma and chronic obstructive pulmonary disease. Incomplete combustion or high-temperature reactions may also produce carbon monoxide (CO) and volatile organic compounds (VOCs), which pose further risks if ventilation or control systems are insufficient.

Amenity impacts, such as dust deposition on vegetation, structures, and surfaces, are common around operations that handle dry raw materials like limestone and concentrate. This can lead to visual degradation of property, surface staining, and community complaints. The high-temperature processing of these raw materials, particularly in furnaces using electrode paste, also contributes to localised thermal plumes and visible emissions, which may raise concerns among surrounding communities.

Dust management, SO_2 abatement (e.g. via acid plants), and robust air pollution control equipment (e.g. bag filters and electrostatic precipitators) are essential to minimise off-site transport of pollutants and to ensure compliance with MES under the NEM:AQA. Ongoing monitoring, together with stakeholder engagement, remains vital in assessing the environmental and health implications of the site's operations.

Effects on Vegetation

Air pollution in South Africa was first identified as a potential threat to vegetation in 1988 (Tyson et al., 1988). The commercial forests of the eastern escarpment were highlighted as a threatened resource due to their proximity to the heavily industrialised Highveld. Marshal et al., (1998) also identified concerns around the potential impacts on crop yields on the Highveld. Air pollutants that could impact on vegetation include PM, SO_2, O_3, NO_x and Hydrogen Fluoride (HF).

The effects of pollution on plants include mottled foliage, 'burning' at leaf tips or margins, twig dieback, stunted growth, premature leaf drop, delayed maturity, abortion or early drop of blossoms, and reduced yield or quality. In general, the visible injury to plants is of three types: (1) collapse of leaf tissue with the development of necrotic patterns, (2) yellowing or other colour changes, and (3) alterations in growth or premature loss of foliage (Sikora and Chappelka, 2004).

Factors that govern the extent of damage and the region where air pollution is a problem are (1) type and concentration of pollutants, (2) distance from the source, (3) length of exposure, and (4) meteorological conditions. Other important factors are city size and location, land topography, soil moisture and nutrient supply, maturity of plant tissues, time of year, and species and variety of plants. A soil moisture deficit or extremes of temperature, humidity, and light often alter a plant's response to an air pollutant (Sikora and Chappelka, 2004).

Effects on Animals

Air pollution is a recognized health hazard to domestic animals and wildlife. Industrial air pollutants effect both wild birds and mammals, causing notable decreases in local populations (Newman, 1979). The major effects include direct mortality, debilitating injury and disease, stress, anaemia, and bioaccumulation (Newman, 1979). Certain air pollutants are also known to cause variation in the distribution of certain wildlife species (Schreiber, and Newman, 1988). Animals are typically exposed to air pollution through a) inhalation of gases or small particles, b) ingestion of particles suspended in food or water, or c) absorption of gases through the skin (Burdo, 2018). Soft-bodied invertebrates (such as earthworms), or animals with thin, moist skin (such as amphibians) are the most

susceptible to absorption of pollutants. Individual responses to pollutants are dependent on the type of pollutant involved, the duration and time of exposure, and the concentration taken up by the animal (Wong and Candolin, 2015). The individual's age, sex, health, and reproductive condition also determines its response. There is much variability observed between animal classes, species, and even genotypes, in terms of the level of tolerance to a specific pollutant (Wong and Candolin, 2015).

The potential impact on air quality is indicated in Table 9-7.

Table 9-7 – Impact on ambient air quality on surrounding sensitive receptors from SCA

Potential Impact: **Impact on air quality during operation from SCA**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	2	4	2	22	Low	(-)
With Mitigation	3	2	1	4	2	20	Low	(-)
Mitigation and Management Measures	▪ It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications. ▪ It is recommended that PM_{10}, SO_2 and dust fallout monitoring is continued to assess ambient concentrations and dust fallout levels. ▪ It is recommended that fugitive emissions from the furnace building are monitored to accurately determine, and better understand, the potential impacts of this source.							

9.1.4 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9.2 HUMAN HEALTH IMPACT ASSESSMENT

9.2.1 OPERATIONAL PHASE

The health risk assessment involved the quantitative determination of the incremental individual risk of the population due to exposures to the modelled (predicted) impacts of the industrial emissions on air concentrations, from the operations at the Mortimer Smelter for two modelled scenarios.

The risk assessment, assessing and ranking the impacts was conducted using the IFC HIA guidelines (IFC, 2009). The assessment utilised quantitative and qualitative approaches.

The health risk was informed by three sets of analysis:

- 1) Evaluating the health risk in the exposed population, associated with predicted ambient emissions from the Mortimer Plant through the use of exposure-response functions (ERFs) and considering the increased relative risk of premature all-cause mortality from the predicted ambient concentrations of pollutants in each scenario.
- 2) Using the Hazard Quotient (HQ) approach to further evaluate the potential for adverse health effects in the exposed population.
- 3) The significance of the impact was assessed using a set of questions related to several critical elements as recommended in the IFC guidelines (IFC, 2009).

These are detailed further in the sections that follow.

Exposed population and predicted ambient pollutant concentrations

The total exposed population for the year 2024 within the study area which includes three wards in Moses Kotane Local Municipality and one ward in Thabazimbi Local Municipality is estimated at 25,980.

The average annual predicted ambient concentrations over 2022 to 2024 is summarised in Table 9-8.

Table 9-8 - Annual average predicted concentrations of pollutants across 2022 - 2024 in all wards

Scenario	Predicted annual average concentrations (µg/m^3)			
	SO_2	PM_{10}	$PM_{2.5}$	NO_2
Additional Slag Cleaning operations	3.12	2.77	0.68	0.41

Results of incremental change of health risk

The potential increase in health risk of premature all-cause mortality attributable to the associated predicted annual average emissions of the Mortimer Smelter was estimated. This analysis informed the risk level assessment in conjunction with the ambient annual running average concentrations of SO_2 and PM_{10} across the four monitoring stations. Data was not available from the monitoring stations for $PM_{2.5}$ and NO_2 and the final risk level assessment is therefore limited to SO_2 and PM_{10}.

While the AIR did assess Dust fallout (modelled as total suspended particles, TSP), this pollutant was not assessed in terms of the potential increase in premature all-cause mortality. TSP includes a wide range of particle sizes, and health effects and ERF functions are focused on the finer particle sizes of PM_{10} and $PM_{2.5}$. The health effect risks associated with the finer particulate matter is assessed in this HIA assessment in relation to PM_{10} risks. Dust health impacts to surrounding communities may include eye irritation and exacerbate asthma symptoms in sensitive individuals. The AIR assessment found no exceedances of the national dust control regulations both on site and at identified sensitive receptors and the dust fallout rates are predicted to remain low at all sensitive receptors, below the Residential Standard (Dust fallout rate of below 600 mg/m^2/day). The health effect risks associated with the finer particulate matter is assessed in relation to PM_{10} risks.

The risk assessment in relation to the increased SO_2 associated risk of all-cause mortality in relation to the baseline incidence level within the exposed population (Table 9-9) found that the risk as measured by incidence increases by less than 1%. The risks associated with PM_{10} as measured by incidence increases by between 1% and 2%. These modelled increases in all-cause mortality risk reflect a health impact which contributes to the burden of disease.

Table 9-9 - Summary of risk level assessment findings for increased health outcome risk

Pollutant	Potential increase of the risk of all-cause mortality
SO_2	<1%
PM_{10}	1 – 2%
$PM_{2.5}$	<1%
NO_2	<1%

Hazard Quotients

The Hazard Quotient (HQ) values for both annual and 24-hour (daily) ambient concentrations of SO_2 and PM_{10} across the dispersion modelled domain are presented in Table 9-10. These values were obtained by dividing the ambient concentrations from the air quality monitoring stations and the added impact of predicted ambient concentrations (from dispersion modelling) by the corresponding Toxicological Reference Values (TRVs), consistent with the NAAQS.

The results indicate that the HQ values for both SO_2 and PM_{10} are well below 1, indicating that exposure is well within acceptable limits for the modelled exposure scenarios.

Table 9-10 - Hazard Quotient (HQ) results for SO_2 and PM_{10} (the annual and 24-hour concentrations used in the calculations below include both the baseline concentrations plus the additional effects of the respective scenarios)

Scenario	Annual				24-Hour			
	SO_2 (µg/m³)	HQ (SO_2)	PM_{10} (µg/m³)	HQ (PM_{10})	SO_2 (µg/m³)	HQ (SO_2)	PM_{10} (µg/m³)	HQ (PM_{10})
Additional Slag Cleaning operations	8.42	0.17	25.17	0.63	28.14	0.23	31.81	0.42
TRV (SO_2 annual) = 50 µg/m³ (South African NAAQS) TRV (PM_{10} annual) = 40 µg/m³ (South African NAAQS) TRV (SO_2 24-Hour) = 125 µg/m³ (South African NAAQS) TRV (PM_{10} 24-Hour) = 75 µg/m³ (South African NAAQS)								

Evidence from health risk assessment shows additional ambient concentrations from scenario will not result in large change remaining well within NAAQS limits. The HQ values for both SO_2 and PM_{10} are well below 1, indicating that exposure is well within acceptable limits for the modelled exposure scenarios. RPM operates an integrated healthcare system through Platinum Health, a wholly owned subsidiary. System includes primary, secondary and tertiary healthcare, occupational

health services, pharmaceutical services and workplace wellness programmes.; RPM have prevention, care and rehabilitation service programmes for HIV/AIDS and Tuberculosis (TB) and chronic diseases like diabetes and hypertension RPM have community health initiatives such as mobile clinics, Smart lockers for collection of chronic medications and RPM collaborate with health departments to improve health services in four provinces which includes North West.

In close proximity to the Mortimer Plant site within 3 km are the Francois Uys covid hospital and the Platinum Health Union Hospital. Other hospitals or clinics within or near to the exposed population area include two clinics in Northam about 24km from Mortimer Plant site; The Motlhabe Clinic 35km away; and the Moruleng Community Health Centre 28km away.

The NAAQS of South Africa provide a benchmark for air quality management and governance and are guided by two South Africa National Standards (SANS), SANS 69:2004 and 1929:2005. The SANS 1929:2005 sets the limit values for common pollutants. The impacts to ambient air quality from the proposed project activities are such that the changes are not likely to exceed the NAAQS in the surrounding communities. Even at the closest residential receptor at Hlatini Staff village where ambient concentrations are higher than further away, the annual ambient concentrations remain below the NAAQS for SO_2, PM_{10}, $PM_{2.5}$ and NO_2. The HQ values reported are all well below 1, indicating that exposure is well within acceptable limits for the modelled exposure scenarios.

The WHO 2021 Global Air Quality Guidelines (AQGs) provide updated, health-based recommendations for the maximum allowable concentrations of key air pollutants, focusing on minimizing the risk of mortality and morbidity. These values are significantly more stringent than previous WHO guidelines, reflecting new scientific evidence showing health impacts at even very low pollutant levels. The guidelines do not prescribe legal standards but serve as targets to inform policy. For annual average concentrations, the WHO recommends limits of 5 µg/m³ for $PM_{2.5}$, 15 µg/m³ for PM_{10}, and 10 µg/m³ for NO_2. No annual guideline is proposed for SO_2 due to insufficient evidence of long-term effects at low concentrations. For 24-hour averages, the recommended limits are 15 µg/m³ for $PM_{2.5}$, 45 µg/m³ for PM_{10}, 25 µg/m³ for NO_2, and 40 µg/m³ for SO_2. Using these AQGs as guidelines, all HQ parameters, except for PM_{10}, remain below 1. With respect to PM_{10}, the baseline (i.e. “no project” level ambient concentrations from all sources of air pollution) HQ = 1.49, which implies that the baseline HQ already exceeds the WHO 2021 AQGs. The additional HQ contribution of Scenario 2 is HQ = 0.18.

The potential impact on health risk is indicated in Table 9-7.

Table 9-11 – Impact on health risk on surrounding sensitive receptors from SCA

Potential Impact: **Impact on health risk during operation from SCA**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	3	3	4	3	36	Moderate	(-)
With Mitigation	1	2	1	4	3	24	Low	(-)

Mitigation and Management Measures	▪ Continue implementation of RPM integrated healthcare system through Platinum Health ▪ Continue implementation of prevention, care and rehabilitation service programmes for HIV/AIDS and Tuberculosis (TB) and chronic diseases like diabetes and hypertension. ▪ Implement community health initiatives such as mobile clinics, Smart lockers for collection of chronic medications.

9.3 NOISE IMPACT ASSESSMENT

9.3.1 CONSTRUCTION PHASE

Unlike general industry, construction activities are not always stationary and in one location. Construction activities at the site will include civil works (including surveying), reinforced concrete works, masonry works, façade works, floor works, carpentry works as well as mechanical and electrical installation works. Due to the erratic and transient nature of such construction activities as well as the fact that detailed construction phase plans have not yet been developed for the proposed Project, noise impacts from the construction phase of the facility could not be quantified.

During the construction phase of the facility various noise sources will be present onsite including earth-moving equipment (trucks, cranes, scrapers and loaders), compressors and generators, pumps, rotary drills, concrete mixers and materials handling activities, among others. All of these sources will generate substantial amounts of noise and may impact on neighbouring sensitive receptors. As such, mitigation interventions are advised during the construction phase. These mitigation recommendations are detailed in the section that follows.

Table 9-12 – Construction Phase Noise Impact Assessment

Potential Impact: Noise impact on surrounding sensitive receptors	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	1	3	18	**Low**	(-)
With Mitigation	1	2	1	1	2	10	**Very Low**	(-)
Mitigation and Management Measures	▪ When working near a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. ▪ Using noise control devices, such as temporary noise barriers and deflectors for high impact activities, and exhaust muffling devices for combustion engines. ▪ Selecting equipment with the lowest possible sound power levels.							

	▪ Ensuring equipment is well-maintained to avoid additional noise generation.

9.3.2 OPERATIONAL PHASE

The predicted noise levels were compared with the current calculated baseline noise levels to assess any changes (cumulative impact) and the resultant impacts on the surrounding receptors.

Day-time noise levels at the offsite receptor locations are predicted to increase by between 1.7 and 4.7 dB(A) with the operation of the proposed Project, resulting in “little” community/group response. Night-time noise levels at the offsite receptor locations are predicted to increase by between 0.2 and 1.8 dB(A), also resulting in “little” community/group response. It is noted that such increases at these locations (during both day and night) are well below the 7 dB(A) threshold for annoyance as per the Noise Control Regulations and as such, these increases are likely to go unnoticed.

Noise levels at the onsite locations are predicted to increase by between 0.9 and 9.0 dB(A) during the day and between 1.3 and 9.5 dB(A) at night with the operation of the proposed Project. It is noted that the noise climate onsite is industrial in nature, with elevated noise levels expected. As such, onsite personnel must ensure compliance with the use of the correct personal protective equipment (PPE). It must be noted that this assessment represents a worst-case scenario, with all noise sources being unenclosed. In reality, with various sources being located within buildings and acoustic enclosures, the ambient noise levels are anticipated to be lower. Furthermore, compliance with the guideline rating levels apply at the fenceline. These predicted elevated noise levels are onsite and will decrease as one moves away from the sources towards the boundary, as is evident in the plot presented in Figure 9-11. Predicted noise levels at the boundary range from 47 dB(A) to 60 dB(A), compliant with the industrial daytime (70 dB(A)) and night-time (60 dB(A)) guideline.

Highest noise levels are predicted around the air services, dry slag granulation area and SO2 abatement plant, as these areas all contain the noisiest sources (blowers, compressors and ID fans). It is understood that in reality, some of these sources may be contained within acoustic enclosures. It is again reiterated that this model is a worst-case scenario, without sources being contained. Elevated noise levels are also evident in the areas where the FELs will be working. Such sources are more difficult to mitigate as they will be operational outdoors, however, intermittently and not considered a continuous source. Noise levels decrease as distance from the sources increase, with levels dropping below the industrial guideline level (70 dB(A) (day) and 60 dB(A) (night)) onsite.

Based on both the day and night-time results presented here, acoustic impacts of the operation of the proposed Project are negligible and noise-related complaints from receptors are not anticipated.

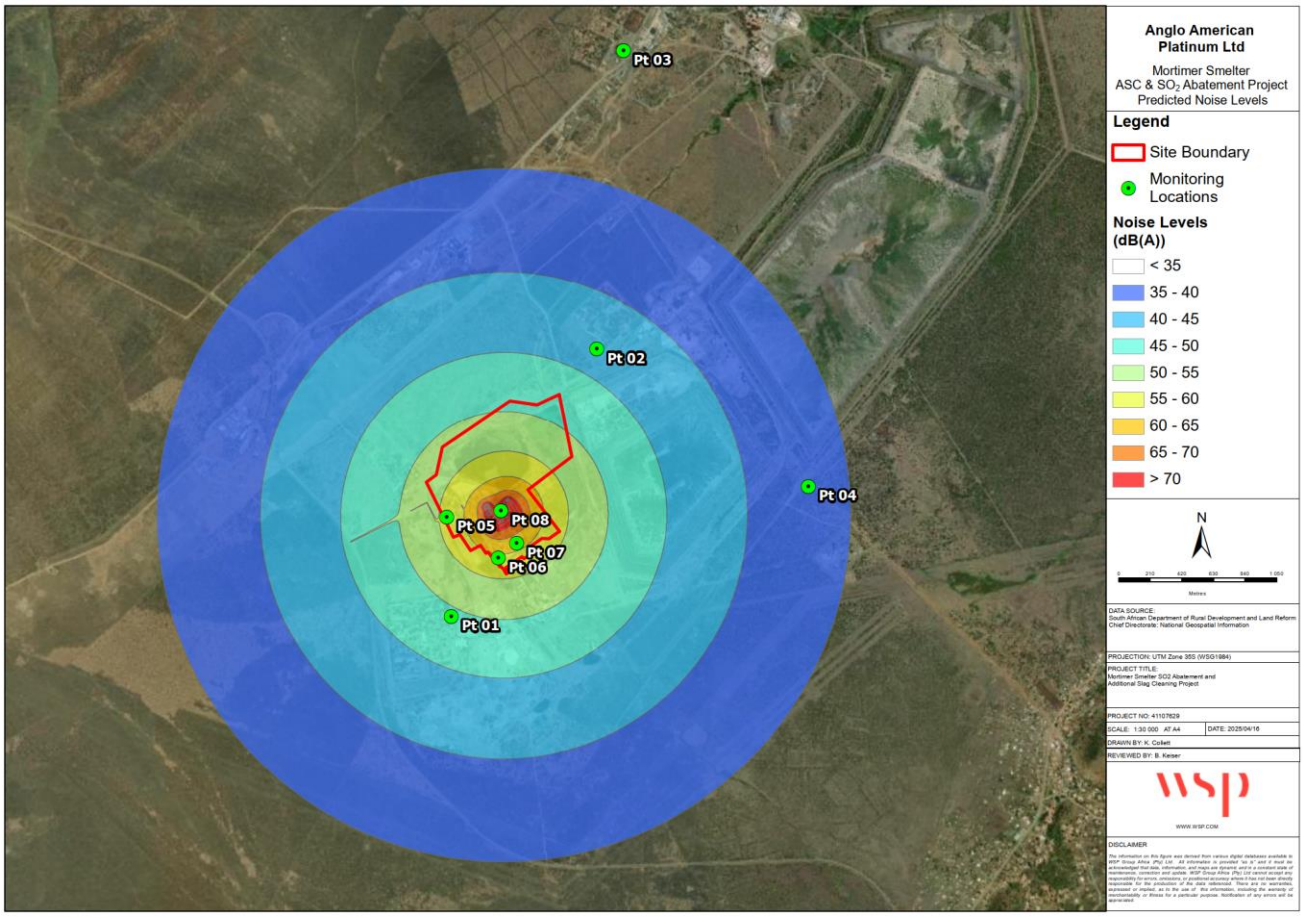

Figure 9-11 - Predicted noise levels during the operational phase of the ASC and SO2 Abatement Project

Table 9-13 – Operational Phase Noise Impact Assessment

Potential Impact: Noise impact on surrounding sensitive receptors	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	4	3	27	**Low**	(-)
With Mitigation	1	1	1	4	2	14	**Very Low**	(-)
Mitigation and Management Measures	▪ Ensuring equipment is well-maintained to avoid excessive noise generation. ▪ When replacing equipment, ensure that equipment with the lowest sound power level specifications are selected. ▪ Installing suitable mufflers on engine exhausts. ▪ Installing acoustic enclosures for equipment causing radiating noise.							

	▪ Improving the acoustic performance of constructed buildings by applying sound insulation. ▪ Should any complaints arise, regular fenceline noise monitoring campaigns should be established to determine the source of such noise, which will allow for the implementation of correct mitigation strategies.

9.3.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9.4 HERITAGE IMPACT ASSESSMENT

9.4.1 CONSTRUCTION PHASE

An exemption from a full Heritage Impact Assessment will be submitted due to the disturbed nature of the proposed development areas, which has resulted in the original natural and historical landscape being severely altered. If any significant cultural heritage (archaeological and/or historical) sites, features or material existed historically, these would have been heavily disturbed or destroyed. Previous studies for the proposed Mortimer Smelter SO_2 Abatement Project found no cultural heritage (archaeological and/or recent historical) sites in the study area, and it is therefore deemed highly unlikely that any significant cultural heritage resources would be present currently.

The following has been concluded based on aerial images and a heritage desktop study:

- Stone Age: If any Stone Age artifacts are to be found in the study and proposed development area then it would more than likely be single or small scatters of stone tools in an open-air surface context.
- Iron Age: There are no known Iron Age sites or material in the study & proposed development area, and none are evident on any of the aerial images for the area. If any did exist historically these would have been destroyed by the development of the current Mortimer Smelter Operations.
- There are no known sites or features of recent historical origin or significance in the study and proposed development area footprint.

Table 9-14 – Construction Phase Cultural Heritage Impact Assessment

Potential Impact: Destruction of cultural heritage	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	2	1	1	2	10	**Very Low**	(-)
With Mitigation	1	1	1	1	1	4	**N/A**	(-)

Mitigation and Management Measures	▪ A Chance Find Protocol for future activities in the area be drafted and implemented as mitigation measure.

9.4.2 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9.5 PALAEONTOLOGY ASSESSMENT

9.5.1 CONSTRUCTION PHASE

The insignificant to zero palaeosensitivity is confirmed by the grey colouration in the SAHRIS map (Figure 8-3). Since there is no chance of fossils occurring in the project footprint, an exemption request from any further palaeontological impact assessment will be undertaken.

There will thus be no impact to palaeontology.

9.6 SURFACE WATER IMPACT ASSESSMENT

9.6.1 CONSTRUCTION PHASE

While it is noted that the rainfall is low, considering anomalous rainfall events throughout South Africa over the past several years, and that the rainfall events are often heavy downpours, leading to flash floods in the areas in which they occur, erosion of exposed areas is likely during such events. However, as the area to be used is within an old plant area that has already been cleared and levelled, it is unlikely that extensive erosion will occur. Sediment run-off is however still expected during heavy rainfall events due to the windblown sediment that collects in the areas from the operations and increased compacted areas, reducing natural infiltration. The sediment is likely to end up in the RWDs with the potential of being washed further downstream during high rainfall events.

Contaminants, specifically hydrocarbons, from construction vehicles and equipment may be spilled or leak during use leading to contaminated soils. Run-off from these areas during high rainfall events, which are extremely unlikely, may lead to hydrocarbon contaminated sediment entering the return water dams and eventually the Brakspruit with overflow from the Game Farm Flood Storge Dam.

During construction it is expected that the magnitude of the impact will be minor due to the topography of the area and potential hydrocarbon contamination from equipment and trucks being likely but limited to small spills/ leaks on the site only.

In addition, the duration is likely to be short-term for the cleared areas construction occurs and as revegetation takes place once infrastructure is complete. The probability is low resulting in a low impact significance.

Table 9-15 – Construction Phase Surface Water Impact Assessment

Potential Impact: Run-off containing soil contaminated by hydrocarbon spills from vehicles and equipment used during construction	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	2	2	14	**Very Low**	(-)
With Mitigation	2	2	1	1	2	12	**Very Low**	(-)
Mitigation and Management Measures	▪ Reduce areas that need to be cleared for the laydown area. ▪ Rehabilitate as soon as possible once construction is complete in an area and ensure adequately designed berms and stormwater collection facilities to capture contaminated sediment before water is released to the environment. ▪ Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site, or rehabilitated in-situ as needed.							

9.6.2 OPERATIONAL PHASE

Stockpiling of feed material, inadequate stormwater management structures and RWDs, and storage and use of hydrocarbons and hazardous chemicals can all impact on surface water resources.

No new stormwater management infrastructure will be constructed as part of the SO_2 abatement plant, and stormwater management in the area in which the additional infrastructure will be constructed will therefore tie into this existing stormwater management plan. Additional infrastructure to tie into the existing stormwater system will be constructed.

It is expected that the run-off from the new area will be cleaner because of the increased roofing and concrete structures, and it is noted that the granulation process will change from wet to dry granulation, meaning that there will be less water required as part of the process and therefore no discharge to the RWDs.

There is however a probability that hydrocarbons from workshops and areas where heavy machinery is used, as well as incorrect storage and handling of hazardous chemicals used in the process can contribute to downstream contamination.

In this respect the probability of overflow from Game Farm Flood Storage Dam may decrease and under normal circumstances, is seen as low probability, considering the low rainfall and very few anomalous rainfall events. Should an incident occur, the magnitude is likely to be low and depending on the quality of the water at the time, the duration would be short-term, and the scale would be local. With a low probability, the impact significance is therefore low.

Table 9-16 – Operational Phase Surface Water Impact Assessment

Potential Impact: Contamination of water resources from overflow from RWDs	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	2	2	14	**Very Low**	(-)
With Mitigation	2	1	1	2	1	6	**Very Low**	(-)
Mitigation and Management Measures	▪ Any storage facilities for hazardous chemicals and hydrocarbons used in the process or in heavy equipment, must be adequately designed and maintained. ▪ Water samples should be taken for analyses at an accredited laboratory from the dirty water facilities, at least every quarter, as well as at a point downstream in the Brakspruit, such as at the Swartklip Road, when water is present. ▪ Maintain any upstream silt traps. ▪ Maintenance of oil and water separators where present. ▪ Maintain surface water monitoring as per existing WUL.							

9.6.3 DECOMMISSIONING PHASE

Run-off during the rehabilitation (decommissioning/ closure) phase may still contain contaminants and the RWDs will need to be maintained until rehabilitation of the plant footprint. Ultimately the stormwater management system can then be rehabilitated. Contaminants in the sediments in the dams may include concentrated chemicals including dissolved solids, metals and hydrocarbons.

The magnitude of the impact at closure is rated as moderate, with a medium-term duration, on a local scale. The probability is low with the resultant impact significance of the run-off during rehabilitation expected to be low.

Table 9-17 – Decommissioning Phase Surface Water Impact Assessment

Potential Impact: Contaminated run-off from the removal of infrastructure and rehabilitation of waste rock dumps	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character

Without Mitigation	2	2	1	3	2	16	**Low**	(-)
With Mitigation	2	1	1	2	1	6	**Very Low**	(-)
Mitigation and Management Measures	▪ Maintain relevant stormwater system as needed while rehabilitation proceeds ▪ Rehabilitate areas as soon as possible as infrastructure is removed and areas are cleared ▪ Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site, or rehabilitated in-situ as needed.							

9.7 TERRESTRIAL IMPACT ASSESSMENT

9.7.1 CONSTRUCTION PHASE

The Project area is currently completely transformed. The proposed project infrastructure will be situated in a built-up landscape within which a prominent level of impact has occurred through habitat transformation (Figure 9-12). Barriers to faunal movement in the shape of boundary fencing, train tracks, mine infrastructure and internal roads occur throughout the Project area (see Figure 9-12 and additional site photos in Figure 9-13).

Figure 9-12 - Existing land use in Project area (24°58'14.39"S; 27° 8'37.01"E)

Existing infrastructure within the Project Area	
	
24°58'16.72"S ; 27°8'39.31"E	24°58''27.85"S ; 27°8'40.28"E
	
24°58'13.57"S ; 27°8'36.41"E	

Figure 9-13 - Site photos taken during the site survey (4th April 2025).

No plant species of conservation concern (SCC) were observed during the ground-truthing site survey. Given the levels of transformation and ongoing disturbance within the Project area, it is highly unlikely that any plant SCC's would occur in the Project area.

Details of fauna species observed during the field study are summarised in the sections that follow. **Table 9-18** provides a list of animal species observed during the field study.

Table 9-18 – Fauna observed during field study (4th April 2025)

Class	Common Name	Scientific Name	Conservation Status
Mammal	Yellow Mongoose	*Cynictis penicillata*	Least Concern
Aves	Groundscraper Thrush	*Turdus litsitsirupa*	Least Concern
Aves	Southern Red Bishop	*Euplectes orix*	Least Concern
Insecta	Katydid sp.		-

The national screening tool indicates no sensitive mammal, herpetofauna or invertebrate species expected to occur in the Project area. Given the transformed habitat condition of the Project area, in addition to no SCCs having been observed during ground-truthing, it is unlikely that these species would occur.

The national screening tool indicates one sensitive avifauna species as possibly occurring: *Aquila Rapax* – Tawny Eagle (Endangered). However, No SCC species were recorded in the field study and are unlikely to occur given the transformed habitat condition of the Project area.

Based on the outcomes of the desktop assessment and field survey, it is the opinion of the specialist that the land is low sensitivity for terrestrial biodiversity features, including animal and plant species. A full Terrestrial Biodiversity Assessment is therefore NOT required for these aspects of Terrestrial Biodiversity.

Since the proposed project infrastructure and activities, and the anticipated area of influence for terrestrial biodiversity receptors, is situated within areas that are of low sensitivity further to the verification process conducted as part of this study, a terrestrial biodiversity compliance statement (inclusive of animal and plant species) is therefore motivated.

Table 9-19 – Construction Phase Terrestrial Biodiversity Impact Assessment

Potential Impact: Disturbance of terrestrial biodiversity as a result of construction activities	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	1	1	2	2	12	**Very Low**	(-)
With Mitigation	1	1	1	1	2	8	**Very Low**	(-)
Mitigation and Management Measures	▪ Vegetate open and exposed areas to prevent soil erosion and the establishment of alien invasive vegetation. ▪ Alien invasive vegetation needs to be identified and removed throughout the Project area and lifespan. ▪ The boundaries of the development footprint area are to be clearly defined (fenced) and it must be ensured that all construction and operation activities remain within the defined footprint areas.							

	▪ The proposed development footprint areas should remain as small as possible. ▪ No areas falling outside of the demarcated study area may be cleared during the construction and operational phases. ▪ Any natural areas beyond the development footprint should not be disturbed. ▪ It is recommended that a speed limit of 40km/h is implemented on all maintenance roads running through the study area to minimise risk to fauna from vehicles. ▪ Ensure that all waste material is removed. ▪ All disturbed areas are to be rehabilitated and reseeded where necessary. ▪ No trapping, collecting or hunting of faunal species must be allowed during any phases of the proposed development. ▪ A record of fauna mortalities/injury due to interactions with Project infrastructure/activities should be kept on site and regularly reviewed to inform the need for implementation of any additional mitigation measures. ▪ The implementation of the recommended construction/operation phase mitigation measures should be monitored on an annual basis, to audit their efficacy in addressing potential impacts, so that adaptive management actions can be timeously undertaken as necessary, to ensure that potential impacts on animal species are avoided/minimised.

9.7.2 OPERATIONAL PHASE

The following potential impacts were considered on biodiversity (fauna and flora) during the operational phase. This phase refers to when construction has been completed and the proposed infrastructure has been built and is functional:

- Continued disturbance of vegetation communities and encroachment by alien invasive plant species;
- Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the system); and
- Spilling of corrosive and toxic substances.

Table 9-20 – Continued disturbance of terrestrial biodiversity 1

Potential Impact: Continued disturbance of terrestrial biodiversity	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	1	1	2	2	12	**Very Low**	(-)
With Mitigation	1	1	1	1	2	8	**Very Low**	(-)
Mitigation and Management Measures	▪ Vegetate open and exposed areas to prevent soil erosion and the establishment of alien invasive vegetation.							

	▪ Alien invasive vegetation needs to be identified and removed throughout the Project area and lifespan. ▪ The boundaries of the development footprint area are to be clearly defined (fenced) and it must be ensured that all construction and operation activities remain within the defined footprint areas. ▪ The proposed development footprint areas should remain as small as possible. ▪ No areas falling outside of the demarcated study area may be cleared during the construction and operational phases. ▪ Any natural areas beyond the development footprint should not be disturbed. ▪ It is recommended that a speed limit of 40km/h is implemented on all maintenance roads running through the study area to minimise risk to fauna from vehicles. ▪ Ensure that all waste material is removed. ▪ All disturbed areas are to be rehabilitated and reseeded where necessary. ▪ No trapping, collecting or hunting of faunal species must be allowed during any phases of the proposed development. ▪ A record of fauna mortalities/injury due to interactions with Project infrastructure/activities should be kept on site and regularly reviewed to inform the need for implementation of any additional mitigation measures. ▪ The implementation of the recommended construction/operation phase mitigation measures should be monitored on an annual basis, to audit their efficacy in addressing potential impacts, so that adaptive management actions can be timeously undertaken as necessary, to ensure that potential impacts on animal species are avoided/minimised.

9.7.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9.8 AQUATIC BIODIVERSITY IMPACT ASSESSMENT

9.8.1 CONSTRUCTION PHASE

The development footprints are fully transformed due to existing activities at the Mortimer Smelter.

Wet features identified within the larger study area include an artificial dam that forms part of the Mortimer Smelter infrastructure, seepage from various mine infrastructure to the dam and ponding on uneven surfaces. No natural wetlands or rivers are present within the study area.

The proposed project remains outside of any sensitive natural wetland or watercourse habitat and the applicable regulated area's thereof.

Table 9-21 – Construction Phase Aquatic Biodiversity Impact Assessment

Potential Impact: Disturbance of aquatic biodiversity as a result of construction activities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	2	2	12	**Very Low**	(-)
With Mitigation	1	1	1	1	2	8	**Very Low**	(-)
Mitigation and Management Measures	▪ All construction activities and infrastructures associated with the project must remain within the existing disturbance footprint associated with the Mortimer Smelter property. ▪ All surface runoff from the slag cleaning area must be contained within an established dirty water area that is contained and separate from the surrounding clean water catchment. ▪ No release of polluted runoff to the downstream river network should be permitted. ▪ Areas where potentially contaminating materials will be stored should include appropriate barrier systems in their design to prevent leaching of contaminants into the environment. ▪ An aquatic biomonitoring programme should be initiated (if not already undertaken as part of the mine's current environmental management programme) within the Mortimerspruit to monitor for any adverse water quality impacts arising from activities proposed at Mortimer Smelter.							

9.8.2 OPERATIONAL PHASE

The following potential impacts were considered on biodiversity (fauna and flora) during the operational phase. This phase refers to when construction has been completed and the proposed infrastructure has been built and is functional:

- Continued disturbance of vegetation communities and encroachment by alien invasive plant species;
- Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the system); and
- Spilling of corrosive and toxic substances.

Table 9-22 – Continued disturbance of terrestrial biodiversity 1

Potential Impact: Continued disturbance of terrestrial biodiversity	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	2	2	12	**Very Low**	(-)

With Mitigation	1	1	1	1	2	8	**Very Low**	(-)
Mitigation and Management Measures	▪ All construction activities and infrastructures associated with the project must remain within the existing disturbance footprint associated with the Mortimer Smelter property. ▪ All surface runoff from the slag cleaning area must be contained within an established dirty water area that is contained and separate from the surrounding clean water catchment. ▪ No release of polluted runoff to the downstream river network should be permitted. ▪ Areas where potentially contaminating materials will be stored should include appropriate barrier systems in their design to prevent leaching of contaminants into the environment. ▪ An aquatic biomonitoring programme should be initiated (if not already undertaken as part of the mine's current environmental management programme) within the Mortimerspruit to monitor for any adverse water quality impacts arising from activities proposed at Mortimer Smelter.							

9.8.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9.9 SOIL AND AGRICULTURE POTENTIAL

9.9.1 CONSTRUCTION PHASE

The proposed footprint has been transformed in entirety from its natural state due to levelling and construction activities associated with the development of the Mortimer Smelter. The proposed road and may result in a minimal change to the soil and land capability, however these areas have already been disturbed by existing activities at the Smelter.

Table 9-23 – Construction Phase Soil and Agricultural Impact Assessment

Potential Impact: Contamination and alternation of land capability	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	3	2	2	18	**Low**	(-)
With Mitigation	2	1	1	1	2	10	**Very Low**	(-)
Mitigation and Management Measures	▪ All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay down area. All repairs are to be performed on an impervious surface.							

	▪ Storage areas and vehicle maintenance areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches. ▪ All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage. ▪ If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin. ▪ Spilled material must be cleaned up and disposed of appropriately as soon as practically possible ▪ A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that, it does not run into the surrounding areas.

9.9.2 OPERATIONAL PHASE

During the operational phase there is a potential that soil can be contamination as a result of spillages due to the incorrect storage and handling of hazardous materials.

The project will entail the handling of raw materials, wastes, effluents, and products that have the potential to cause pollution of not adequately managed. There is potential for direct pollution from these sources e.g. of the soil below the facility, or to stormwater runoff) as well as indirect pollution to offsite areas in the event that pollution is not adequately managed and contained.

Table 9-24 – Construction Phase Soil Impact Assessment

Potential Impact: Soil Contamination	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	2	18	**Low**	(-)
With Mitigation	2	1	1	1	2	10	**Very Low**	(-)
Mitigation and Management Measures	▪ All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay down area. All repairs are to be performed on an impervious surface. ▪ Storage areas and vehicle maintenance areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches. ▪ All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage. ▪ If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin.							

	▪ Spilled material must be cleaned up and disposed of appropriately as soon as practically possible ▪ A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that, it does not run into the surrounding areas.

9.10 GROUNDWATER

9.10.1 CONSTRUCTION PHASE

The aquifer characteristics are consistent with the regional description provided above. The rest groundwater level in the vicinity of the Mortimer Concentrator Complex is approximately 3m below ground level. The aquifer characteristics are consistent with the regional description provided above. The rest groundwater level in the vicinity of the Mortimer Concentrator Complex is approximately 3m below ground level.

There is the potential contamination of groundwater due to the incorrect handling, storage and disposal of hazardous materials.

Table 9-25 – Construction Phase Groundwater Impact Assessment

Potential Impact: Groundwater Contamination	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	2	18	**Low**	(-)
With Mitigation	2	1	1	1	2	10	**Very Low**	(-)
Mitigation and Management Measures	▪ All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay down area. All repairs are to be performed on an impervious surface. ▪ Storage areas and vehicle maintenance areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches. ▪ All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage. ▪ If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin. ▪ Spilled material must be cleaned up and disposed of appropriately as soon as practically possible ▪ A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that, it does not run into the surrounding areas.							

9.10.2 OPERATIONAL PHASE

There is the potential contamination of groundwater due to the incorrect handling, storage and disposal of hazardous materials.

Table 9-26 – Operational Phase Groundwater Impact Assessment

Potential Impact: Groundwater Contamination	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	2	18	**Low**	(-)
With Mitigation	2	1	1	1	2	10	**Very Low**	(-)
Mitigation and Management Measures	▪ All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay down area. All repairs are to be performed on an impervious surface. ▪ Storage areas and vehicle maintenance areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches. ▪ All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage. ▪ If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin. ▪ Spilled material must be cleaned up and disposed of appropriately as soon as practically possible ▪ A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that, it does not run into the surrounding areas.							

9.10.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9.11 SOCIAL

Various current social and socio-economic issues exist within the MKL. These include the current social, cultural and political landscape and the existing mining activities. An overview of these issues, is provided below:

- Unemployment
- Community Public Safety
- Water Resources
- Lack of service provision
- Social conflict

9.11.1 CONSTRUCTION PHASE

No significant socio-economic implications are anticipated during the construction phase of the proposed ACS and SO_2 abatement project.

The positive impacts associated with the construction phase are the potential for employment and economic development opportunities. There are a number of recommendations that can enhance of these impacts including appointment of local contractors and use of local labour as far as possible; and use of local suppliers and manufacturers.

Table 9-27 – Construction Phase Employment and Economic Development Opportunities

Potential Impact: Employment and Economic Development	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	27	**Low**	(+)
With Mitigation	3	3	3	2	3	33	**Moderate**	(+)
Mitigation and Management Measures	▪ Should unskilled labour be required during the construction phase, this should be sourced from the local communities. This requirement must be specified within the contract signed by the contractor. ▪ RPM is to ensure that any new or replacement employment and procurement opportunities maximise benefits to local communities. ▪ Local entrepreneurs and previously disadvantaged contractors must be provided preferential opportunities to tender for contracts. ▪ Local recruitment must take place through the tribal recruitment office and with the knowledge of mutually agreed community structures and recruitment channels / mechanisms. ▪ Mortimer Smelter must keep records of the number of local people ▪ employed, place of residence, recruitment office, job descriptions, length of service and opportunities for career development. Sub-contractors to Mortimer Smelter must keep similar records for all placements of local people.							

9.11.2 OPERATIONAL PHASE

The operational phase of the proposed project will result in new employment opportunities (5). Should the project not be implemented the facility is at risk of potential closure.

The potential negative impacts are limited to minor nuisance factors such as noise, dust and traffic disturbances, all of which can be adequately addressed through the implementation of the EMPr.

Table 9-28 – Operational Phase Employment and Economic Development Opportunities

Potential Impact: Employment and Economic Development	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	4	44	**Moderate**	(+)
With Mitigation	3	3	3	4	4	52	**Moderate**	(+)
Mitigation and Management Measures	▪ Should unskilled labour be required during the construction phase, this should be sourced from the local communities. This requirement must be specified within the contract signed by the contractor. ▪ RPM is to ensure that any new or replacement employment and procurement opportunities maximise benefits to local communities. ▪ Local entrepreneurs and previously disadvantaged contractors must be provided preferential opportunities to tender for contracts. ▪ Local recruitment must take place through the tribal recruitment office and with the knowledge of mutually agreed community structures and recruitment channels / mechanisms. ▪ Mortimer Smelter must keep records of the number of local people employed, place of residence, recruitment office, job descriptions, length of service and opportunities for career development. Sub-contractors to Mortimer Smelter must keep similar records for all placements of local people.							

Table 9-29 – Operational Phase Nuisances

Potential Impact: Nuisances to local communities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	3	3	4	3	36	**Moderate**	(-)
With Mitigation	1	2	1	4	3	24	**Low**	(-)
Mitigation and Management Measures	▪ Implement the recommendations outlined for noise, air quality and human health.							

9.11.3 DECOMISSIONING PHASE

During the closure phase employment opportunities associated with the existing operations will be lost.

Table 9-30 – Decommissioning Phase Employment and Economic Development Loss

Potential Impact: Employment and Economic Loss	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	4	44	**Moderate**	(-)
With Mitigation	1	2	1	4	3	24	**Low**	(-)
Mitigation and Management Measures	▪ Mortimer Smelter must establish skills training programmes for locals and to promote small, medium and micro enterprise (SMME) development. ▪ Implement the actions outlined in the SLP.							

10 CUMULATIVE IMPACT ASSESSMENT

Although the objective of the NEMA, BA process is to undertake an impact and risk assessment process, inclusive of cumulative impacts, which is essential to assessing and managing the environmental and social impacts of projects, it may be insufficient for identifying and managing the incremental impacts on areas or resources used or directly affected by a given development from other existing, planned, or reasonably defined developments at the time the risks and impacts are identified.

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities (IFC GPH).

A cumulative impact assessment is the process of (a) analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen Valued Environmental and Social Components (VECs) over time, and (b) proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible (IFC GPH).

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed project. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

10.1 AIR QUALITY

The National Framework for Air Quality Management in South Africa calls for air quality assessment in terms of cumulative impacts rather than the contributions from an individual facility. Compliance with the NAAQS is to be determined by considering all local and regional contributions to background concentrations. For each averaging time, the sum of the model predicted concentration (C_P) and the background concentration (C_B) must be compared with the NAAQS. The background concentration must be the sum of contributions from non-modelled local sources and regional background air quality. If the sum of background and predicted concentrations ($C_B + C_P$) is more than the NAAQS, the design of the facility must be reviewed (including pollution control equipment) to ensure compliance with NAAQS. Compliance assessments must provide room for future permits to new emissions sources, while maintaining overall compliance with NAAQS. For the different facility locations and averaging times, the comparisons with NAAQS must be based on recommendations in **Table 10-1**.

Table 10-1: Summary of recommended procedures for assessing compliance with NAAQS

Facility Location	Annual NAAQS	Short-term NAAQS (24 hours or less)
Isolated facility not influenced by other sources; C_B insignificant*	Highest C_P must be less than the NAAQS, no exceedances allowed.	99th percentile concentrations must be less than the NAAQS. Wherever on year is modelled, the highest impact of this concentrations shall be considered.

Facility Location	Annual NAAQS	Short-term NAAQS (24 hours or less)
Facilities influenced by background sources e.g. in urban areas and priority areas.	Sum of the highest C_P and background C_B must be less than the NAAQS, no exceedances allowed.	Sum of the 99th percentile concentrations and background C_B must be less than the NAAQS. Wherever one year is modelled, the highest concentrations shall be considered.
*For an isolated facility influenced by regional background pollution C_B must be considered.		

The South African Accreditation System (SANAS, 2009) TR 07-03 standards stipulate a minimum data recovery of 90% for the dataset to be deemed representative of conditions during a specific reporting period. Therefore, while this data is presented in this AIR, it must be viewed with caution due to the low data recovery. From the existing air quality data provided, data was not available for $PM_{2.5}$ and NO_2. No other air quality monitoring stations were identified within proximity to Mortimer Smelting. Given this, cumulative impacts of these pollutants could not be assessed.

Table 10-2 and Table 10-3 present the cumulative annual average concentrations at the identified ambient air quality monitoring stations.

The maximum cumulative long-term SO_2 concentration of 37 µg/m^3, occurring at the Hostel monitoring station, is within the relevant NAAQS (50 µg/m^3). The maximum cumulative long-term PM_{10} concentration of 27.47 µg/m^3, occurring at the 4B Decline monitoring station, is within the relevant NAAQS (40 µg/m^3). All cumulative concentrations, at the remaining monitoring stations, remain below the relevant NAAQS. Importantly, PM_{10} concentrations, as presented in Table 10-3, predicted from wind erosion sources are excluded as these concentrations are already accounted for in the background measured concentrations.

Table 10-2: Scenario 2 cumulative SO_2 concentrations

Station Name	Annual NAAQS (µg/m^3)	Background Concentration (µg/m^3)	Predicted Concentration (µg/m^3)	Cumulative Concentration (µg/m^3)
4B Decline	50	4.78	12.69	17.47
Bierspruit		1.85	1.01	2.86
Fridge Plant		4.77	5.29	10.06
Hostel		9.21	27.69	36.90

Table 10-3: Scenario 2 cumulative PM_{10} concentrations

Station Name	Annual NAAQS (µg/m^3)	Background Concentration (µg/m^3)	Predicted Concentration (µg/m^3)	Cumulative Concentration (µg/m^3)
4B Decline	40	27.13	0.34	27.47
Bierspruit		17.59	0.04	17.63
Fridge Plant		20.30	0.18	20.48
Hostel		21.80	1.58	23.28

10.2 SURFACE WATER

The current situation is that the catchment is already highly developed and impacted with water resources bearing the brunt of the contamination, specifically from the mines in the sub-catchment, and to a lesser extent the urban areas.

Considering the existing impacts to the Brakspruit and the downstream Bierspruit, and ultimately the Crocodile (West) River, the additional cumulative impact of potential contamination (hydrocarbons, metals and sediments) to surface water resources, and considering the improvements that the area will have on dirty stormwater, the proposed ASC and SO_2 abatement project, is likely to have a positive impact on the system, and there is unlikely to be any further adverse impacts to the surface water resources if good management practices are practiced.

11 ENVIRONMENTAL IMPACT STATEMENT

The essence of any impact assessment process is aimed at ensuring informed decision-making, environmental accountability, and to assist in achieving environmentally sound and sustainable development. In terms of NEMA, the commitment to sustainable development is evident in the provision that "development must be socially, environmentally and economically sustainable…. and requires the consideration of all relevant factors…". The NEMA also imposes a duty of care, which places an obligation on any person who has caused, is causing, or is likely to cause damage to the environment to take reasonable steps to prevent such damage. In terms of NEMA's preventative principle, potentially negative impacts on the environment and on people's environmental rights (in terms of the Constitution of the Republic of South Africa, Act No. 108 of 1996) should be anticipated and prevented, and where they cannot be prevented altogether, they must be minimised and remedied in terms of "reasonable measures".

In assessing the environmental feasibility of the proposed construction of the Proposed Project, the requirements of all relevant legislation have been considered. The identification and development of appropriate mitigation measures that should be implemented to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience, and the relevant legislation (where applicable).

The conclusions of this BAR are the result of comprehensive assessments. The BAR will be subject to public review, which will be undertaken according to the requirements of NEMA with every effort made to include representatives of all stakeholders within the process. The BAR will be updated and finalised taking into consideration all comments received during the public review period before being submitted to the CA for consideration.

11.1 IMPACT SUMMARY

All negative impacts associated with the proposed project can be reduced to low to very low significance with the implementation of recommended mitigation measures as presented within this BAR, EMPr and the associated specialist studies. The positive impacts can be further enhanced to moderate significance.

The table below is a summary of the impacts associated with the Proposed Project.

Table 11-1 – Summary of Impacts associated with the Proposed Project

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
Construction Phase				
Air Quality	Impact on ambient air quality during construction	Negative	**Low**	**Low**
Noise	Noise impact on surrounding sensitive receptors	Negative	**Low**	**Very Low**
Cultural Heritage	Destruction of cultural heritage	Negative	**Very Low**	**N/A**

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
Surface Water	Run-off containing soil contaminated by hydrocarbon spills from vehicles and equipment used during construction	Negative	**Very Low**	**Very Low**
Terrestrial Biodiversity	Disturbance of terrestrial biodiversity as a result of construction activities	Negative	**Very Low**	**Very Low**
Aquatic Biodiversity	Disturbance of aquatic biodiversity as a result of construction activities	Negative	**Very Low**	**Very Low**
Soil and Agricultural	Contamination and alternation of land capability	Negative	**Low**	**Very Low**
Groundwater	Groundwater Contamination	Negative	**Low**	**Very Low**
Social	Employment and Economic Development	Positive	**Low**	**Moderate**
Operational Phase				
Air Quality	Impact on ambient air quality during operation	Negative	**Low**	**Low**
Human Health	Impact on health risk during operation from SCA	Negative	**Moderate**	**Low**
Noise	Noise impact on surrounding sensitive receptors	Negative	**Low**	**Very Low**
Surface Water	Contamination of water resources from overflow from RWDs	Negative	**Very Low**	**Very Low**
Terrestrial Biodiversity	Continued disturbance of terrestrial biodiversity	Negative	**Very Low**	**Very Low**
Aquatic Biodiversity	Continued disturbance of aquatic biodiversity	Negative	**Very Low**	**Very Low**
Soil and Agricultural	Soil contamination	Negative	**Low**	**Very Low**
Groundwater	Groundwater Contamination	Negative	**Low**	**Very Low**
Social	Employment and Economic Development	Positive	**Moderate**	**Moderate**
Social	Nuisances to local communities	Negative	**Moderate**	**Low**
Decommissioning Phase				
Air Quality	Impact on ambient air quality during decommissioning	Negative	**Low**	**Low**
Noise	Noise impact on surrounding sensitive receptors	Negative	**Low**	**Very Low**

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
Cultural Heritage	Destruction of cultural heritage	Negative	**Very Low**	**N/A**
Surface Water	Contaminated run-off from the removal of infrastructure and rehabilitation of waste rock dumps	Negative	**Low**	**Very Low**
Terrestrial Biodiversity	Disturbance of terrestrial biodiversity as a result of decommissioning activities	Negative	**Very Low**	**Very Low**
Aquatic Biodiversity	Disturbance of aquatic biodiversity as a result of decommissioning activities	Negative	**Very Low**	**Very Low**
Groundwater	Groundwater Contamination	Negative	**Low**	**Very Low**
Social	Employment and Economic Loss	Negative	**Moderate**	**Low**

11.2 SPECIALIST CONCLUSIONS

11.2.1 AIR QUALITY

RPM propose to develop an additional slag cleaning project and associated SO_2 abatement plant at the Mortimer Smelter, to recover base and precious metals from WACS and WACSt. Mortimer currently hold an AEL for the existing primary smelting operations. While the primary smelting, as licensed, will not be changing, the AEL requires amendment to include the proposed additional slag cleaning operations.

Critically, RPM propose to install a new abatement system in order to mitigate and manage SO_2 emissions in order for the facility to be compliant with the new plant Minimum Emission Standards. Notably, the predicted maximum concentrations for the slag cleaning process were lower than the Primary Smelting operations, with the exception of PM.

In the opinion of WSP, based on the findings of this AIR, we recommend that Mortimer Smelter be authorised to commission the Slag Cleaning operations and SO_2 abatement project., with the AEL being amended to include the already licensed primary smelting as well as the slag cleaning process.

The dispersion model was conducted assuming the worst-case conditions, and the predicted concentrations are deemed to be an overestimation of the actual ambient conditions. Given this, it is recommended that stack and ambient monitoring be conducted to determine the Mortimer smelter operations contribution to the surrounding environment.

11.2.2 HUMAN HEALTH

The overall outcome of this HIA assessment finds the risk for the RPM Mortimer Smelter Additional Slag Cleaning operations as follows:

- SO_2 associated risk = Very Low (Severity = Medium and Probability = Very Low)
- PM_{10} associated risk = Low (Severity = Medium and Probability = Low)

These risk ratings were informed by:

- The predicted ambient concentrations of the pollutants as provided by the AIR (WSP, 2025) and the annual concentrations observed at the Air Quality Monitoring Stations which are under the respective NAAQS limits for each pollutant.
- Severity assessment for both SO_2 and PM_{10}:
  - The AP-HRA informed assessment indicated by risks of all-cause mortality is assessed as Medium
- Probability assessment for SO_2:
  - The Hazard Quotients that are less than 0.3 for SO_2 based on NAAQS and is assessed as Very Low.
- Probability assessment for PM10:
  - The Hazard Quotients that are less than 0.7 for PM_{10} based on NAAQS and is assessed as Low.
  - It is to be noted that the Low probability rating for PM_{10} results predominantly from the already high baseline PM_{10} levels.

11.2.3 CULTURAL HERITAGE

Based on the aerial images of the area and the heritage desktop study, it is deemed unlikely that any significant sites, features or material of cultural heritage (archaeological and/or historical) origin and/or significance will exist in the RPM's Mortimer Smelter study & development Project Area. The development of the existing Operations in the area in the recent past would have extensively disturbed or destroyed any sites or features of cultural heritage origin or significance if they did exist here in the past. Previous heritage assessments in the development area also did not identify any cultural heritage resources here.

Although there are no known archaeological and historical sites, features and material in the specific area, some have however been identified in the larger geographical area. This aspect needs to be taken into consideration during activities related to the proposed Mortimer Smelter Development Project. It is therefore recommended that a Chance Find Protocol for future activities in the area be drafted and implemented as mitigation measure. This will ensure that if any previously unknown cultural heritage (archaeological and/or historical) sites, features or material are exposed in future, that these could be investigated by a Heritage Specialist, who will then provide recommendation on the way forward in terms of the best suitable mitigation measures required.

The subterranean nature of cultural heritage (archaeological and/or historical) resources must always be kept in mind. This could include previously unknown and unmarked graves/burials and/or cemeteries.

Finally, it is recommended that Exemption from a Full Phase 1 Heritage Impact Assessment (HIA) for the RPM's Mortimer Smelter ESIA Project be granted to the applicants taking into consideration the above measures.

11.2.4 PALAEONTOLOGY

The insignificant to zero palaeosensitivity is confirmed by the grey colouration in the SAHRIS map (Figure 8-3). Since there is no chance of fossils occurring in the project footprint, an exemption request from any further palaeontological impact assessment will be undertaken.

11.2.5 SURFACE WATER

From a catchment perspective, the catchment is highly developed with the main activities being mining and subsistence agriculture. The impact assessment has indicated that considering the location of the plant area the impacts identified would have a low impact significance for the construction, operation and decommissioning phases. The objectives for the surface water component should include the recommended mitigation measures.

Considering the existing impacts to the Brakspruit and the downstream Bierspruit, and ultimately the Crocodile (West) River, the additional cumulative impact of potential contamination (hydrocarbons, metals and sediments) to surface water resources, and considering the improvements that the area will have on dirty stormwater, the proposed ASC and SO_2 abatement project, is likely to have a positive impact on the system, and there is unlikely to be any further adverse impacts to the surface water resources if good management practices are practiced.

11.2.6 TERRESTRIAL BIODIVERSITY

Due to the Low and Medium terrestrial biodiversity, plant theme and animal theme sensitivities identified for the development footprint at a desktop level and confirmed to be Low through the site survey, this report serves as a compliance statement, in accordance with the gazetted requirements for Terrestrial Biodiversity Specialist Assessment (Notice No.320 and 1150 Government Gazette 43110 of March 2020) and Plant and Animal Theme Specialist Assessment (Notice No.1150 Government Gazette 43855 of October 2020)

Due to its transformed habitat and lack of very high sensitivity features, the study area is of a low sensitivity for terrestrial ecosystems, plants and animals

The proposed development will not have a significant impact on sensitive terrestrial ecosystems, assuming that the proposed impact management actions are integrated into the projects EMPr and implemented to avoid the risk.

11.2.7 AQUATIC BIODIVERSITY

Due to the Low aquatic biodiversity sensitivity identified for the development footprint at a desktop level and confirmed through the site survey, this report serves as a compliance statement, in accordance with the gazetted requirements for an Aquatic Biodiversity Specialist Assessment (Notice No.320 Government Gazette 43110 of March 2020).

Due to its transformed habitat and lack of very high sensitivity features, the study area is of a low sensitivity for aquatic ecosystems

The proposed development will not have an impact on sensitive aquatic ecosystem, assuming that the proposed impact management actions are integrated into the projects EMPr and implemented to avoid the risk of water quality deterioration in downstream watercourses.

11.3 RECOMMENDATIONS

The following key aspects are recommended to be included as conditions of authorisation:

- The mitigation measures included in the EMPr must be adhered to.
- The final EMPr must form part of all contractual documents with contractors during construction and operational phases of the project. Furthermore, a dedicated Environmental Control Officer (ECO) must be appointed to ensure compliance to all EA conditions and EMPr commitments throughout the construction phase.
- An Environmental Compliance Officer (ECO) must be appointed for the development.

11.4 IMPACT STATEMENT

The overall objective of the BAR is to provide sufficient information to enable informed decision-making by the authorities. This was undertaken through consideration of the proposed project components, identification of the aspects and sources of potential impacts and subsequent provision of mitigation measures.

In assessing the environmental feasibility of the ASC and SO_2 Abatement Project, the requirements of all relevant legislation have been considered. The identification and development of appropriate management and mitigation measures that should be implemented in order to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience and the relevant legislation (where applicable).

The impact assessment process has found that the Proposed Project will involve activities which will lead to a number of direct and indirect negative impacts on the biophysical and socio-economic environment. These impacts were found to vary in terms of their consequence and probability. Positive impacts are limited to the creation of employment and economic development opportunities and will also assist with RPM being legally compliant by reducing the WACSt stockpile at Waterval Smelter.

Mitigation measures have been developed where applicable for the above aspects and are presented within the EMPr (Appendix I). The mitigation measures are necessary to ensure that the project is planned, constructed and operated in an environmentally responsible manner. It is imperative that all impact mitigation recommendations contained in the EMPr, of which the environmental impact assessment took cognisance, are legally enforced.

It is the opinion of WSP that the information contained in this document (read in conjunction with the EMPr) is sufficient for the North West DEDECT to make an informed decision for the environmental authorisation being applied for in respect of this project. The findings of this BAR and associated Specialist studies conclude that there are no fatal flaws associated with the proposed development. Negative environmental impacts associated with the proposed ASC and SO_2 Abatement Project can be mitigated to acceptable levels. It is therefore the opinion of the EAP that the project can proceed, and that all the listed mitigation measures and recommendations are considered.

12 EAP DECLARATION OF INTEREST AND UNDERTAKING OF OATH

The EAP hereby confirms:

- The correctness, to the best of his/her knowledge, of the information provided in the specialist reports and on information provided by RPM. The information was accepted as being as reliable as information generated during an BA process and a feasibility study, and provided in good faith, can be;
- 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.

13 CONCLUSION AND WAY FORWARD

The overall objective of the BA is to provide sufficient information to enable informed decision-making by the competent authorities. This was undertaken through consideration of the proposed project components, identification of the aspects and sources of potential impacts and subsequent provision of mitigation measures.

It is the opinion of WSP that the information contained in this document (read in conjunction the EMPr) is sufficient for the North West DEDECT to make an informed decision for the EA being applied for in respect of this Project.

Mitigation measures have been developed, where applicable, for the above aspects and are presented within the EMPr. It is imperative that all impact mitigation recommendations contained in the EMPr of which the environmental impact assessment took cognisance, are legally enforced.

Considering the findings of the respective studies, no fatal flaws were identified for the proposed Project. Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all negative aspects pertaining to the environmental aspects is expected to be low. It is thus the opinion of the EAP that the Project can proceed, and that all the prescribed mitigation measures and recommendations are considered by the issuing authority.

Appendix A

EAP CV

Public

Appendix B

EAP DECLARATION

Public

Appendix C

SPECIALIST CV'S

Public

Appendix D

SPECIALIST DECLARATIONS

Public

Appendix E

SPECIALIST STUDIES

Public

Appendix E.1

AIR QUALITY ASSESSMENT

Public

Appendix E.2

NOISE ASSESSMENT

Public

Appendix E.3

TERRESTRIAL BIODIVERSITY ASSESSMENT

Public

Appendix E.4

AQUATIC BIODIVERSITY ASSESSMENT

Public

Appendix E.5

HERITAGE ASSESSMENT

Public

Appendix E.6

PALAEONTOLOGY ASSESSMENT

Public

Appendix E.7

SURFACE WATER ASSESSMENT

Public

Appendix E.8

RAPID HUMAN HEALTH ASSESSMENT

Public

Appendix F

DFFE SCREENING

Public

Appendix G

PRE-APPLICATION MEETING

Public

Appendix H

PUBLIC PARTICIPATION PROCESS

Appendix H.1

STAKEHOLDER DATABASE

Public

Appendix I

EMPR

Public