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NEW KLEINFONTEIN GOLDMINE (PTY) LTD

(A SUBSIDIARY OF GOLD ONE GROUP LIMITED)

NON-TECHNICAL SUMMARY OF THE SCOPING REPORT FOR THE PROPOSED EXPANSION TO THE EXISTING MODDER EAST OPERATIONS TAILINGS STORAGE FACILITY (TSF), SPRINGS, GAUTENG

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Prepared for:

GOLD ONE
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1 INTRODUCTION

1.1 Environmental Assessment Practitioner (EAP)

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1.2 Purpose of this document

This document presents a summary of the Scoping Report, the purpose of which is to provide a less technical overview of the project to all Interested and Affected Parties (IAPs). The aim of the document is to allow as many stakeholders as possible the opportunity understand the project. Legislative requirements have been fully addressed in the Scoping Report and only summarised in this report. IAPs seeking further details are directed to the full Scoping Report.

1.3 Disclaimer

This document serves only to summarise certain important aspects of the Scoping Report. Only certain pertinent aspects of the Scoping Report have been included in this non-technical report, and the information is presented in a concise and non-technical fashion. Legislative requirements as per the National Environmental Management Act, No. 107 of 1998 (NEMA) as amended; EIA Regulations of GNR982, December 2014; NEMA Listing Notice GNR983, 984 and 985 of 2014, as amended; NEM:WA Regulations (GNR921 of November 2013) and Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) have been fully addressed in the Scoping Report.

2 BACKGROUND AND LOCATION

New Kleinfontein Goldmine (Pty) Ltd (NKGM or the Mine) (also known as Modder East Mine) is a subsidiary of Gold One Group Limited and is located near Springs in Ekurhuleni. The mine is adjacent to the suburbs of Modder East and Eastvale and is a fully operational, underground, medium-sized gold mine with existing mining rights, several Environmental Authorisations (EA), and an approved Social and Labour Plan (SLP) and Water Use License (WUL). The mine’s surface rights area covers the remaining extent (RE) of the Farm Cloverfield 75 IR, which is zoned for mining. The remaining Life of Mine (LoM) is estimated to be 4 years, with decommissioning expected to commence in 2027. Once the underground resources are exhausted in 2027, the mine intends to process ore from other operations at the existing NKGM processing plant. In order to store the tailings from this processing, a larger Tailings Storage Facility (TSF) is required. NKGM is proposing to expand the existing TSF westwards and northwards. Expansion of the TSF will allow for the surface infrastructure involved in the processing of ore to remain in place beyond 2026 and will add a further ten years to the life of surface operations at Modder East.

The total footprint for the proposed northern and western site and associated infrastructure is ± 118 ha.

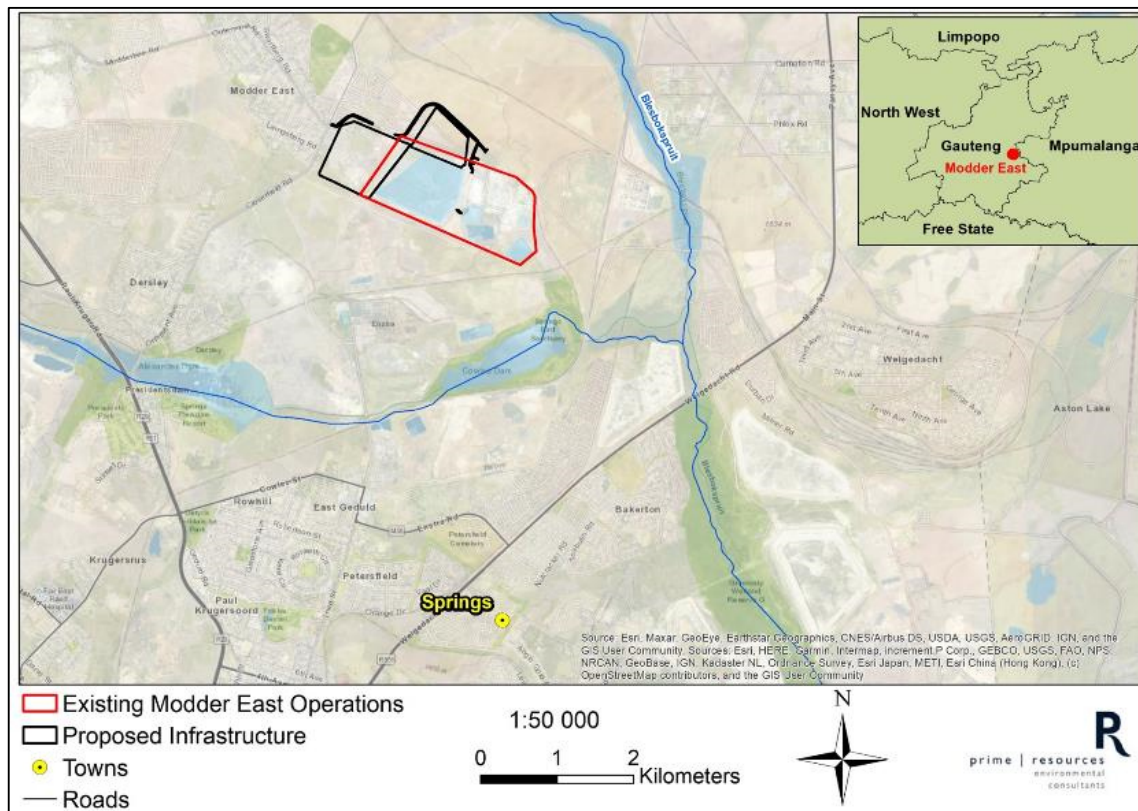


Figure 1. Locality map for the proposed project

The surrounding communities are a combination of formal and informal suburbs, industries, farming and smallholdings (see Figure 2 below). The medium to low density residential areas of Modder East, Eastvale, and the high-density informal settlement of Skoonplaas lie immediately to the north-west of the existing TSF. Skoonplaas falls within the current mine lease area. The suburb of Dersely lies to the south-west, as do Alexander Dam and the suburb of Presidents Dam. The informal settlement of Lindelani lies beyond these to the west. Adjacent to Eastvale, north-west of the TSF, is the recently-built Alliance low-cost housing suburb.

- Mine water supply pipeline
- Over-head powerline will be re-routed around the northern edge of the TSF expansion along the access road.

The final footprint of the proposed expanded TSF will be close to existing residential areas. The western TSF boundary will be 140 m from houses in Modder East along Cloverfield Road and 110 m from dwellings on the southern edge of Skoonplaas informal settlement. The northern TSF expansion will be 150 m from dwellings on the eastern border of Skoonplaas (Figure 2).

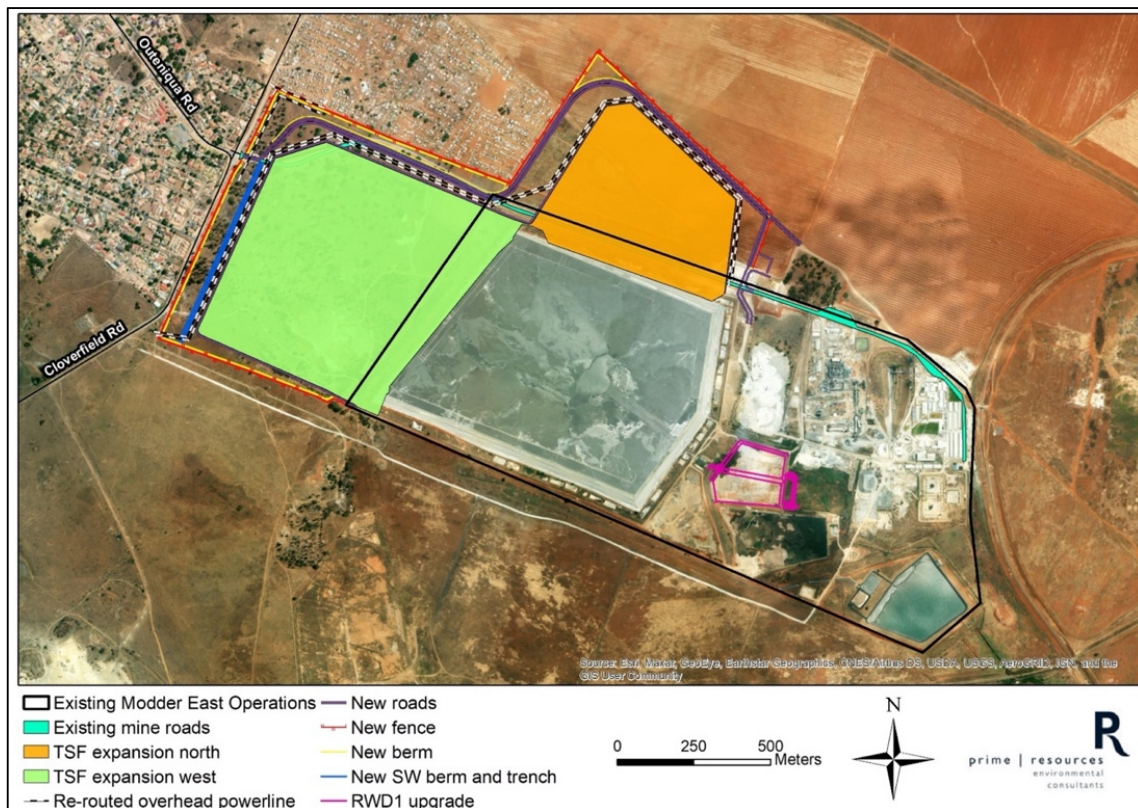


Figure 3. Site plan showing the existing infrastructure and position of the proposed TSF expansion

2.2 The EIA process and public consultation

The EIA process can be seen in Figure 4. The project is currently in the Scoping Phase. The Competent Authority, the Department of Mineral Resources and Energy (DMRE), was formally notified of the project and an application for Environmental Authorisation was submitted on 17 October 2022. A 30-day period for public participation runs from 21 October to 21 November 2022 as per the NEMA EIA Regulations, which allows all IAPs an opportunity to comment, raise concerns and provide feedback on the project. An IAP register will be started and representatives from all the relevant State Departments, landowners, adjacent landowners, surrounding businesses and community organisations as well as any IAPs who engage with Prime Resources during this period, or request to register, will be added to the database. Registering as an IAP means that you will be notified of project-related information as it becomes available.

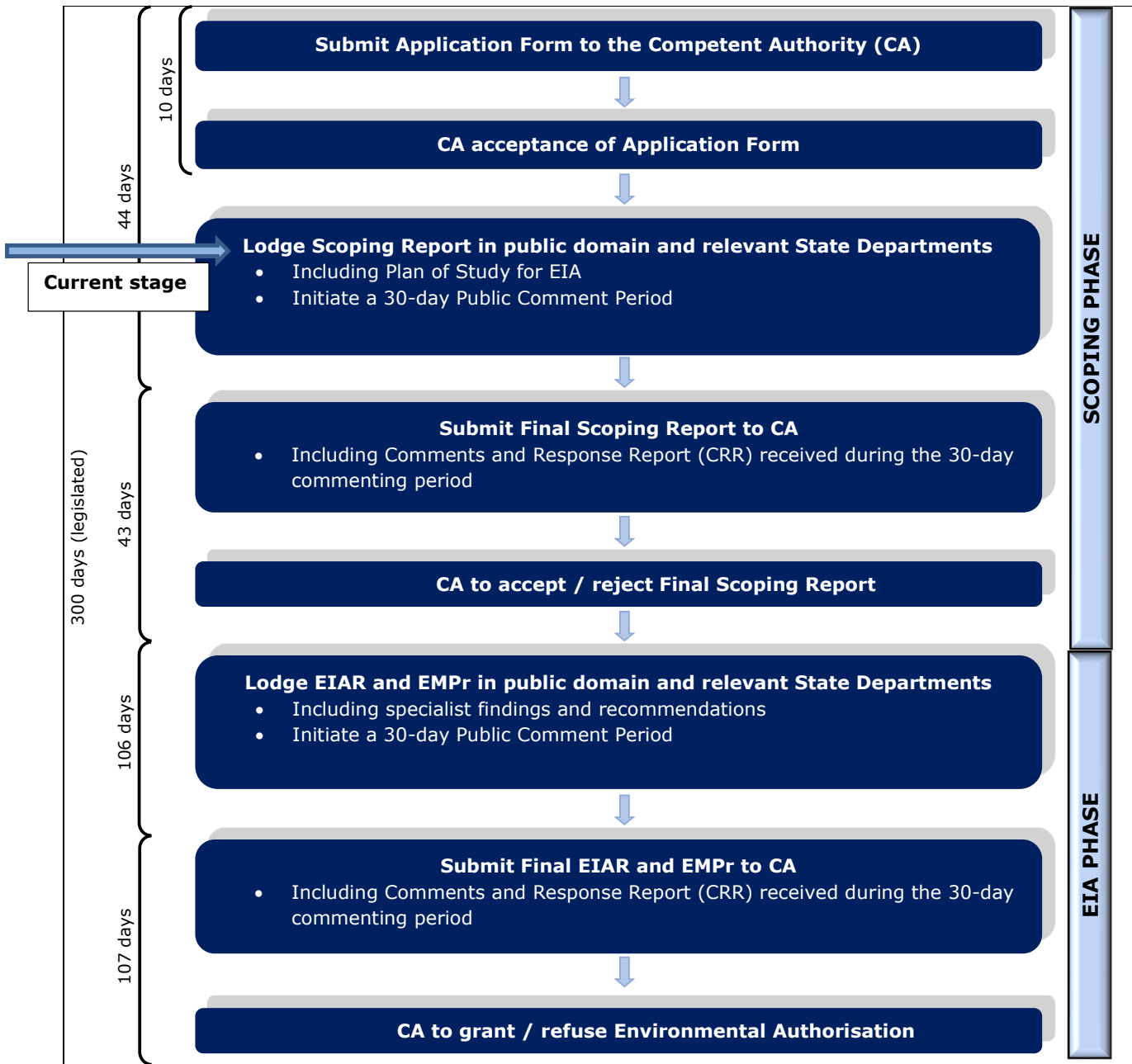


Figure 4. The Scoping and EIA process

IAPs have been notified about the project during the Scoping phase via the following means:

- Notification letters emailed to the affected landowner, farmer, and adjacent landowners
- Advertisements (in English) published in two local newspapers (the Springs Advertiser and the African Reporter) on 20 and 21 October 2022 explaining how IAPs can register and where they can review the Scoping Report
- Site notices (in English and Afrikaans) posted at suitable conspicuous locations within the surrounding communities
- A Background Information Document (BID) has been compiled (in English and Afrikaans), which briefly describes the project, the associated potential impacts, the legislated environmental process,

availability of the Scoping Report, the IAP registration process and deadline, and the contact details for questions or comments

- Focus group meetings will be held with confirmed community representatives of Skoonplaas and Modder East suburb. Copies of the Background Information Document will be available at these meetings
- An Open Day will be held on Thursday 27 October 2022. This is an informal information sharing opportunity where more information about the project will be available. The Open Day will be held at the project site (access road to the site is on the corner of Outeniqua Road and Cloverfield Road – project site is located adjacent and to the west of the existing TSF). All IAPs are welcome to visit the Prime Resources team anytime between 13h00 and 16h00 on the day, at the project site, and obtain more information, ask questions, make comments, or register as IAPs.
- The Scoping Report and Non-Technical Summary (this document) will be available for review for 30 days on the Prime Resources website (www.resources.co.za - for downloads). Hard copies will be available at the Springs Public Library, the Bakerton Public Library, the Dersley Post Office, Skoonplaas Community Offices (at the playgrounds), and Gulf petrol station on Outeniqua Road.

After the 30-day commenting period all of the comments raised will be addressed in a Comments and Responses Report and included in the Final Scoping Report. This will be submitted to the DMRE.

There will be a further 30-day commenting period during the EIA phase (early next year, likely around February / March 2023).

2.3 Legislative requirements

Table 1. Legislation considered in compiling the Scoping Report

Details	Legislation considered
Legislation applicable to the EIA Process	<ul style="list-style-type: none"> • Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) • National Environmental Management Act, No. 107 of 1998 (NEMA) • EIA Regulations of GNR982, December 2014 • Regulations GNR983, GNR984, and GNR985 (all of 2014 as amended in 2021), provide lists of activities for which Environmental Authorisation is required.
Other legislation and guidelines that were considered	<ul style="list-style-type: none"> • National Environmental Management Air Quality Act, No. 39 of 2004 (NEM:AQA) • National Heritage Resources Act, No. 25 of 1999 (NHRA) • National Water Act, No. 36 of 1998 (NWA) • National Environmental Management Waste Act, No. 59 of 2008 (NEM:WA) • Hazardous Substances Act, No. 15 of 1973 • National Environmental Management: Biodiversity Act, No. 10 of 2004 (NEM:BA) • National Environmental Management: Protected Areas Act (No. 57 of 2003) (NEM:PAA) • Conservation of Agricultural Resources Act, No. 43 of 1983 (CARA) • National Forests Act (No. 84 of 1998) • Mine Health and Safety Act, No. 29 of 1996 and Regulations • Occupational Health and Safety Act, No. 85 of 1993 (OHSA) • National Nuclear Regulator Act, No. 47 of 1999 (NNRA) • National Screening Tool • CoE Regional Spatial Development Framework (RSDF) (2015) • City of Ekurhuleni (CoE) Integrated Development Plan (IDP) (2013/14 - 2015/16) • Gauteng Province Environmental Management Framework (GPEMF) (2015) • Gauteng Pollution Buffer Zones Guideline (2017) • International Council on Mining and Metals (ICMM): Global Industry Standard on Tailings Management (GISTM) (2020) • National Road Traffic Act (NRTA) (Act No. 93 of 1996) and the National Land Transport Act (NLTA) (Act No. 5 of 2008) • Gauteng Transport Infrastructure Act, 2001 (Act No 8, 2001) • Civil Aviation Act, 2009 (CAA) (Act No. 13 of 2009)

3 NEED FOR THE PROJECT AND ALTERNATIVES

3.1 Need and desirability

The primary need for the expansion of the TSF is to allow for the continued operation of the processing plant at the mine. Expansion of the existing TSF prior to closure maximises the use of existing resources and infrastructure.

The location of the proposed TSF expansion is dependent on the position of the current TSF and existing supporting infrastructure. The current Return Water Dam (RWD) will also need to be refurbished as additional capacity will be required to collect and contain water removed from the expanded TSF. The expansion sites are considered to be already largely impacted. The northern site has been disturbed by agriculture, and the western site has been disturbed by previous mining activities and associated buildings. The whole of the mine's lease area is zoned for mining.

The project will allow NKGm to optimise the extraction and processing of gold resources at Gold One's other authorised mining projects. Continued operations will allow the mine to continue to positively add to the nation's GDP. According to the mine's approved SLP, approximately 43 020 people depend on NKGm for their livelihood (directly and indirectly), and mine expenditure and taxes add approximately R274 million to the economy annually. NKGm has provided direct employment opportunities for over 2 600 people (NKGm SLP, 2021). If the proposed project is authorised and implemented, continued employment opportunities will be secured for a portion of employees which will result in continued incomes and associated downstream benefits.

The project will be economically sustainable in the short term (10 years) as it will allow NKGm to continue processing gold and employing people in their surface operations. Costs for rehabilitation, closure, and long-term monitoring of the TSF expansion will be calculated and required to be made available prior to commencement of construction activities.

The potential exists however, for negative impacts on surrounding settlements including Skoonplaas informal settlement and Modder East suburb. There the potential decrease in air quality and associated dust, pollution and community health impacts, a visual intrusion on the residents of Skoonplaas and Modder East suburbs, a minor increase in noise during construction, the potential in-migration of job seekers and associated expansion of informal settlements, and community health and safety risks including those from TSF failure.

3.2 Alternatives

The option of not proceeding with the TSF expansion is considered the "no-go" alternative. In this scenario, the existing TSF would reach capacity in 2026 and NKGm would commence with decommissioning and closure of underground and surface operations as planned, in 2027.

3.3 Reasons for site selection

No alternative site locations were assessed as the expansion of the TSF, rather than the construction of a new TSF, is considered the most feasible option considering also the location of the existing processing plant that generates tailings. Additional reasons for the selected sites include:

- The footprint of the proposed development is limited to the existing lease area, which is zoned for mining, to prevent impacts on other landowners

-
- Expanding the current TSF means that the processing plant is optimally located to prevent the need for piping tailings slurry over great distances which may have additional impacts such as potential vandalism of tailings pipeline and associated spillages of tailings
 - The development footprint is restricted to areas that have already been impacted by human activities
 - Expansion on the neighbouring property situated to the north is unfeasible due to environmental sensitivity (the presence of a wetland)
 - The TSF could not be expanded to the immediate south due to a planned and approved solar park at this location.

4 CURRENT BASELINE CONDITIONS, POTENTIAL IMPACTS, AND MITIGATION

Several specialist studies have been conducted to determine the environmental and social conditions in and around the TSF expansion sites. Further detailed studies will take place during the EIA Phase. The full baseline studies are attached to the Scoping report.

Table 2. Baseline specialist studies conducted

Study type	Responsible party
Land use, soils, and land capability	Zimpande Research Collaborative
Geology and palaeontology	Professor Marion Bamford
Hydrogeology/Ground water	Wesst Consulting
Hydrology (surface water), aquatic ecology, and wetlands	Scientific Aquatic Services (SAS)
Terrestrial biodiversity study (flora and fauna)	Scientific Terrestrial Services (STS)
Air quality	Rayten Engineering Solutions
Noise	Enviro-Acoustic Research (EARES)
Radiation	ID Kruger Consulting and AquiSim.
Community health and vulnerability to disease	Infotox
Visual	Prime Resources
Archaeology/heritage	Archaetnos Culture & Cultural Resource Consultants
Baseline Socio-Economic Study	Prime Resources

The sections below provide an overview of the environmental and socio-economic conditions of the site. Detailed information, data and maps can be found in the Scoping Report. For each section there is also a summary of the potential impacts of the proposed activities, based on an initial high-level assessment, and the significance of these impacts both with and without mitigation measures. Select mitigation measures have also been included. The potential positive, negative, and cumulative impacts of the proposed project will be assessed in greater detail during the EIA phase. The impacts will be updated after consultation with IAPs and when all of the specialist studies have been completed during the EIA phase. An Environmental Management Programme (EMPr) will be included in the EIA with detailed mitigation, management and monitoring measures.

4.1 Method used for rating impacts

A specific method was used to determine the significance of impacts on the surrounding biophysical and socio-economic environment, before and after applying mitigation measures. This is calculated using the following equation:

$$\text{Significance} = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The specifics of the methods are described in detail in the full Scoping Report. Impacts can be rated as high, medium, or low, depending on their significance.

The impacts were considered for the three distinct phases of the project: construction phase (C), operational phase (O), and decommissioning and closure phase (D).

Table 3. Activities expected in the project phases

Phase	Activities
Construction (C)	<ul style="list-style-type: none"> • Clearing of land, surface preparations and site establishment • Soil stockpiling • Vehicles travelling on unpaved roads • Operation of machinery • Mixing and handling of concrete • Construction of surface infrastructure including the expansion of the existing TSF, internal haul roads and access roads, pedestrian walkway, and parking area • Rerouting of utilities • Excavation
Operation (O)	<ul style="list-style-type: none"> • Development of the TSF through deposition of wet tailings slurry on the TSF • Handling of slurry tailings • Vehicles and trucks travelling on the re-routed unpaved road • Occasional maintenance of TSF
Decommissioning and closure (D)	<ul style="list-style-type: none"> • TSF closure and rehabilitation • Removal of access roads and disturbed areas (apart from the TSF) • Placing of final cover and final shaping re-profiling of the TSF • Capping • Revegetation

4.2 Baseline conditions and impacts

4.2.1 Land use

The current land uses of the proposed TSF expansion areas are:

- Proposed northern TSF expansion – The land use is dominated by modified grassland and agricultural land used for the cultivation of soya beans and maize.
- Western TSF expansion – This area is currently vacant land within the mine’s surface lease area. There is evidence of historical mining activities (ruins of old mine buildings, excavations and waste rock dumps), grasslands (modified and degraded) and stands of invasive trees (*Eucalyptus camaldulensis*).

4.2.2 Climate and topography

The project is in the summer rainfall region, with typical summer rainfall patterns that vary from gentle soaking rains to afternoon thunderstorms. Mean annual precipitation ranges from 600 - 800 mm per year and mean annual temperature is 14.8 °C. The winter months (June to August) are characterised by intermittent cold spells. During spring and summer, the prevailing winds are from the north-northeast. During autumn and winter, the prevailing wind originates from the east. Wind speeds are generally high during all seasons.

The topographical elevations of the area range from 1 588 -1 625 mamsl. Due to the existing mine operations, the localized topography of the area has been altered as mine waste dumps protrude above the natural horizon. The topography associated with the proposed sites differs: the northern site slopes in a north-eastern and eastern direction and the western site slopes in an eastern and south-eastern direction.

Potential impacts

Impact	Phase	Pre-mitigation	Post-mitigation
Changes to the topography from TSF development and temporary topsoil stockpiles	O	Medium	Low
Permanent change to the topography from the protruding TSF at a final height of 32.5 m	O, D	High	High

4.2.3 Land use, soils, and land capability

The sites earmarked for the TSF expansion have previously been impacted. The current land use of the western site is dominated by modified/degraded grasslands, abandoned derelict buildings, and a waste rock dump consisting of soil and rock remains, possibly originating from historic mine-related excavations. The northern site is dominated by modified grassland and agricultural land, which has been cultivated with soya bean and maize crops. The soils at the proposed western site (soil type: Witbank) have very low agricultural potential and are not suitable for grazing or cultivation. The soils at the northern site (soil types: Hutton and Nkonkoni forms) are suitable for arable agriculture and associated with moderate to good land capability.

Potential impacts

The proposed development is not anticipated to cause any significant impacts on soils and land use of the western site as it is dominated by disturbed soils. However, 4.73 ha of the northern site is characterised by soils with a high agricultural capability, and 16.43 ha of soils with moderate land capability (both of which are currently cultivated).

Impact	Phase	Pre-mitigation	Post-mitigation
Loss of land capability and agriculturally important soils (4.7 ha with high land capability and 16.43ha with moderate land capability)	C	High	High
Loss of soils due to compaction and subsequent soil structure destruction of area around the TSF footprints	C	Medium	Low
Contamination of soils from pollution, spillages, and unsafe storage/handling of chemicals	C, O, D	Medium	Low
Erosion from stormwater runoff and vegetation clearance	C, O	Medium	Low

4.2.4 Hydrogeology/Groundwater

The mine is situated in an area that has been extensively mined in the past, with the hydrogeological setting therefore already considerably altered. The general area is underlain by dolomite and a system of aquifers, faults, and dykes, which serve as preferential flow paths, influencing groundwater flow. Surface water sources (e.g., the Cowles Dam and Blesbokspruit) are also intersected at several localities, serving as links to the aquifers. The Cowles Dam is the main source of surface water ingress into the neighbouring Grootvlei Mine’s underground workings. Groundwater tends to flow in an easterly, south-easterly direction towards the Blesbokspruit and Cowles Dam, largely aligning with the topography.

Prior to mining, the major groundwater characteristic was likely a seasonal high-low water level fluctuation, with most of the groundwater activity taking place in the upper levels of the Malmani Dolomite. Mining has however changed the hydrogeological setting, and dewatering activities in the area have resulted in the lowering of groundwater levels.

ERWAT is the only groundwater user that has been identified within 3 km of the surface and underground activities of the mine. Quarterly groundwater monitoring is conducted in and around the site. The March 2022 quarterly monitoring results were evaluated against the SANS 241 (2015) Drinking Water Standards. Several exceedances of parameters were noted. Elevated sulphate and metal (iron and manganese) concentrations were observed downstream of the Mine’s operations. These elevated concentrations are usually associated with mine pollution indicators. Increased nitrate concentrations were also observed in some boreholes. These may be indicative of mine blasting activities. Groundwater quality has been altered due to historic and current mining activities in the East Rand Basin. Additional boreholes have been drilled

at the proposed expansion sites to obtain a better understanding of the local groundwater flow and hydrogeological character. The results will be included during the EIA phase.

Potential impacts

The primary potential groundwater impacts are groundwater / aquifer contamination due to potential seepage from the expanded TSF and RWD, groundwater contamination due to spills, and a decrease in groundwater recharge due to an increase of impermeable surfaces.

Impact	Phase	Pre-mitigation	Post-mitigation
Groundwater contamination and change in groundwater chemistry/quality due to accidental spills	C, O, D	Medium	Low
Groundwater/aquifer contamination due to potential seepage from the expanded TSF and refurbished RWD	O, D	Medium	Low
Deterioration of groundwater quality due to contaminated stormwater run-off and inadequate stormwater management implementation	O, D	Medium	Low
Decrease in groundwater recharge	O	Medium	Low

Mitigation measures

- The TSF expansions and RWD must be lined with appropriate HDPE liners to prevent seepage into the groundwater.
- Measures to prevent spills and contamination should be implemented.
- Groundwater monitoring should be conducted regularly as per the recommendations of the groundwater specialist.

4.2.5 Hydrology, aquatic ecology, and wetlands

The proposed site is situated within the Eastern Karst Belt National Strategic Water Source Area, in the C21D quaternary catchment of the Upper Vaal Water Management Area (WMA), the Highveld ecoregion, and the Blesbokspruit sub-quaternary catchment.

No rivers, wetlands or freshwater ecosystems were identified within the study area. A depression wetland is situated approximately 500 m north-northwest from the edge of the proposed western TSF site and an unchannelled valley-bottom wetland is situated approximately 500 m to the north of the proposed northern TSF site. A hillslope wetland is situated 500 m south-west of the proposed western TSF site. The hillslope wetland is highly disturbed and greatly impacted by sewage discharge. These wetlands all occur within 500m of the edge of the TSFs and therefore will need authorisation from DWS as Section 21C&I water uses.

The closest river, the Blesbokspruit, is located approximately 1.4 km east of the study area. The Cowles Dam lies approximately 1.5 km south and the Alexander Dam lies approximately 3 km south-west of the site. The proposed infrastructure is not located within or near the 1:50 and 1:100 year floodline.

Potential impacts

Stormwater runoff from the TSF may contain contaminants. Poor stormwater management will potentially result in these contaminants reaching the surface water resources. In the unlikely event of TSF failure, tailings would be transported in an easterly direction towards the Blesbokspruit and Cowles Dam and could lead to contamination of rivers and wetlands.

Impact	Phase	Pre-mitigation	Post-mitigation
Change in surface water run-off or drainage patterns due to an increase in impermeable surfaces and due to permanence of the TSF	C, O, D	Medium	Low
Increased risk of surface water contamination through runoff from the TSF during high rainfall events	O	Medium	Low
Potential TSF failure (unlikely) and subsequent contamination of wetlands and rivers	O, D	Medium	Low

4.2.6 Terrestrial ecology

The site falls within the Grassland Biome and the Mesic Highveld Grassland Bioregion. The dominant vegetation unit is the Soweto Highveld Grassland, which is characterized by gently to moderately undulating landscapes on the Highveld plateau. The western expansion area was identified as containing potential important biodiversity. However, the specialist investigation confirmed that the area is largely degraded and transformed and due to this, they are not considered optimal areas to be prioritised or protected.

During the baseline assessment, two broad habitats, each with two sub-units, were identified.

- Secondary Grassland habitat:
 - Degraded Grassland comprising of scattered areas with a grassland structure; floral communities are degraded and are of moderately low indigenous species richness. Indigenous species are largely absent and habitat integrity is entirely diminished (both western and northern sites).
 - Modified Grassland comprising of sections with a high abundance of alien invasives (western site).
- Transformed habitat characterised by vegetation clearance (partial or complete) and the transformation of natural vegetation:
 - Agricultural fields dominated by monoculture floral communities (northern site).
 - Excavations and waste dumps dominated by homogenous stands of alien invasives (western site).

The NEMA Screening Report highlighted the proposed TSF expansion sites as having a medium plant and animal sensitivity, and very high terrestrial biodiversity sensitivity. Due to the extent of transformation within the proposed sites, the lack of significant biodiversity features and the decreased species composition representative of the Soweto Highland Grassland, the very high terrestrial biodiversity sensitivity could not be confirmed and is therefore disputed by the specialist.

Flora

The site has high diversity of alien invasives, most of which are listed category invaders for which control is required. The site also has a high diversity of medicinal plant species, many of which are regarded as alien invasive weeds. These medicinal species are widespread and not unique to the site. One Orange-Listed plant was positively identified in large numbers at the proposed western site. The species is classified as Least Concern (LC) but has a declining population status.

Fauna

Several smaller-bodied mammal species or signs thereof were observed during the baseline assessment. These common mammals are expected to occur in the area. Avifauna (bird) diversity is relatively low. Only

a few common species were observed, particularly in the agricultural fields at the proposed northern site. No amphibians were observed, with amphibian occurrences limited by the lack of freshwater ecosystems. Similarly, no reptiles were observed; however, as reptiles are inherently capable of living in altered habitats, it is expected that they will occur in the area. Invertebrate diversity was observed to be high in the Secondary Grasslands habitat and comprised of various spiders, grasshoppers, bugs, butterflies, and beetles. The site may have potentially suitable habitat for three faunal Species of Conservation Concern (SCC), specifically certain invertebrates, although no SCC were observed during the assessment. Overall, although the site has a medium sensitivity for certain species, the occurrence of these species is unlikely due to the disturbed habitat and adjacent human activities.

In summary, at both the northern and western TSF expansion sites, historical transformations have resulted in the area being heavily degraded.

Potential impacts

Impact	Phase	Pre-mitigation	Post-mitigation
Reduction/loss of floral and faunal diversity	C, O	Medium	Low
Habitat fragmentation and/or degradation	C, O	Medium	Low
Spread of alien and invasive species	C, O, D	Medium	Low
Loss of SCC plants	C	Medium	Low

4.2.7 Air quality

The site is located within the nationally declared Highveld Priority Area (HPA), which is associated with poor air quality, with industrial emitters (e.g., coal mines, power stations, the petrochemical industry) being the largest contributor of criteria air pollutants. Potential sources of emissions and air pollutants close to the mine include the Enstra Paper Mill, Impala Platinum, Grootvlei Proprietary Mines, Largo Colliery, various fuel burning appliances such as generators at hospitals, households, etc., and dust from sources such as roads, open areas, agricultural activities, and mining. Within the mining footprint possible emission sources were identified as material handling operations, crushing activities, wind erosion from the existing TSF and waste rock dump, vehicles travelling on the unpaved access road, diesel-powered process equipment and stack emissions.

The air quality was assessed, for the period of January 2021 to December 2022, using data from the Springs Air Quality Monitoring Station (AQMS), located 8.8 km southwest of the mine. Results from the Springs AQMS show that the current air quality is poor due to persistent elevated ambient concentrations of criteria air pollutants such as PM₁₀, PM_{2.5}, SO₂ and NO_x.

As part of the dustfall monitoring programme for the mine, dust fallout is monitored and reported on annually. On the fence line (i.e along the Sfoonplaas boundary) dust fallout rates predominantly fall within the residential bands, but with several exceedances, and some instances where with dust fallout exceeds the industrial band. A total of six exceedances (in terms of the National Dust Control Regulations, 2018) of the residential standard were recorded at stations located along the access road. Six exceedances of the non-residential standard were also recorded. On average, dustfall rates are higher between August and October.

Potential impacts

The overall ambient air quality of the Springs area is generally of poor quality. Dust is likely to be generated during construction activities. During the operational stage, tailings will be incrementally deposited as a wet slurry on the expanded TSF footprint, and there is not expected to be significant dust and particulate matter emissions generated during the operational phase. Once wet deposition ceases during decommissioning, there is an increased likelihood of dust and particulate matter emissions from the TSF. However, the dry tailings slurry develops a thin “crust” as it dries, which reduces wind-borne dust generation.

Emissions from the expanded TSF will likely be transported towards the south-southwest (SSW), south (S) and south-southeast (SSE), and possibly towards the north-northeast (NNE), based on the dominant wind directions. The potential transport of emissions to the NNE may mean that dwellings in Skoonplaas could potentially be exposed to increased dust and emissions from the western TSF expansion during construction and decommissioning / closure.

The potential impact on the solar park is currently unknown and will be further investigated during the EIA phase, but it is expected that this will not be more significant than impacts from the existing TSF as the expansion sites are further away from the solar park. Residential areas to the SSW and SSE are >5 km from the TSF expansion and are therefore not expected to be impacted.

Impact	Phase	Pre-mitigation	Post-mitigation
Dust generation from construction-related activities	C	Medium	Medium
Human health may be affected by increased pollutant concentrations in the air	C, O, D	Medium	Low
Dust may result in temporary nuisance to surrounding sensitive receptors and a change in ambient air quality	C	Medium	Low
Wind-borne dust generation at the TSF surface and unrehabilitated areas	O	Medium	Low
Increased dust and associated particulate matter emissions generated due to the removal of surface infrastructure	D	Medium	Low

Mitigation measures

- Implement dust suppression throughout all phases.
- Monitor air quality; implement mitigation measures more frequently if dust fallout increases.
- Rehabilitate cleared areas and temporary access roads as soon as they are no longer needed.
- Progressive revegetation of the TSF should take place, commencing with the lower slopes. The sloping face of the TSF should be kept moist with water sprays, covered with topsoil and vegetated. In this way, rehabilitation of the tailings dam will be carried out during the life of the facility and limit dust and particulate matter generation.
- Strictly enforce speed limits on the gravel road.
- Maintain a complaints register.

4.2.8 Community health and vulnerability to disease

A Scoping Rapid Appraisal Health Impact Assessment (RAHIA) was compiled for the project and looked at the current health status of Ekurhuleni as a whole by assessing the leading causes of natural death and comparing these with provincial and national figures to determine if there are existing health vulnerabilities in the surrounding communities. The study found that communities in CoE as a whole are not more vulnerable to mortality due to respiratory and cardiovascular diseases when compared with the South African and Gauteng population in general. Communities in CoE are comparably, or in some cases less vulnerable.

The population under 15 and over 65 were considered separately because they may be more susceptible to air pollutants. Those younger than 15 make up 20 to 30 % of the total population in the receptor area, and the study found a slightly increased vulnerability to the cardiovascular and respiratory effects of exposure to the air pollutants of interest. The group aged 65 and over constituted only 1.4 to 9 % of the population in the receptor area, and the Infotox study showed a slightly increased vulnerability to the cardiovascular, but not to the respiratory effects of exposure to air pollutants.

The study determined the major pathways of interest for potential impacts on community health to be through air and groundwater. The RAHIA will be completed during the EIA phase and will include a Human Health Risk Assessment (HHRA) for air and groundwater, which is based on concentrations of hazardous substances in the air and groundwater, to determine whether specific exposures might lead to adverse health effects.

4.2.9 Radiation

The existing mine processing plant handles ore that contains Naturally Occurring Radioactive Materials (NORM). Most of these naturally occurring radionuclides are members of the uranium, actinium and thorium radioactive series. NORM has the potential to impact negatively on the health of humans that are exposed to these materials. Gold mine tailings are expected to have levels of radon (a naturally occurring radioactive gas) and uranium. Radioactivity is a result of radionuclides in the uranium decay chain.

A Radiological Public Safety assessment was conducted in 2016 by AquiSim Consulting (Pty) Ltd. Radiation concentrations in the soil were assessed and found to be below the National Nuclear Regulator (NNR) limit of 0.5Bq/g per radio isotope. A radiological assessment of current operations (including the current TSF) shows that residents of Modder East and Skoonplaas, as well as farmstead employees to the north are currently not exposed to the regulatory dose constraint of 250 μ Sv/y (microSievert per year) or the public dose limit of 1 000 μ Sv/y as prescribed by the National Nuclear Regulator (NNR).

Exposure levels are well within the guideline limits. A radiation study considering the radiation exposure through groundwater and atmospheric pathways is underway and the findings and recommendations will be included in the EIA phase.

4.2.10 Noise

Potential contributors to the soundscape of the area include vehicular noise, mine activity noise, industrial noise, agricultural noise, railway noise and ventilation noise. As the mine is located within 8 km of an aerodrome, aircraft noise may be heard from time to time. Skoonplaas informal settlement and the suburb of Modder East were identified as potential noise sensitive receptors. Ambient sound levels were determined to be typical of a suburban noise district. The noise level during low and no-wind conditions generally fell within those typical of a suburban (daytime) to suburban (night-time) noise district, i.e. 50 dBA for the daytime period 40 dBA for the night-time period. Existing sources of noise were determined to include people talking, birds, occasional noises associated with suburban activities such as lawn mowers and chain saws, traffic noises from passing cars.

Potential impacts

Potential noise impacts would be of low significance for daytime construction activities at both TSF expansion sites. No significant noise impacts are foreseen during the operational phase of the proposed project.

Impact	Phase	Pre-mitigation	Post-mitigation
Temporary increase in ambient noise levels and nuisance noise during the construction phase for the establishment of access roads, transport of required equipment to the site, operation of equipment and machinery, and site preparation / earthworks	C	Medium	Low
Increase in ambient noise levels and nuisance noise to surrounding sensitive receptors	O, D	Low	Low

4.2.11 Visual aesthetics

The visual quality of the greater surrounds is not of high quality. The following landscape features dominate the character of the project site and surrounds: i) mining and associated infrastructure (including the existing TSF); ii) overhead railway structures and power lines; iii) rural and residential land-use features; and iv) agricultural land use (crop cultivation) features. The most sensitive receptors to project include the residents of Skoonplaas and Modder East due to their proximity to the site.

Potential impact

The TSF will be gradually developed i.e., the tailings will be deposited in layers over an extended period of time, thus affording sensitive viewers time to adapt to the change in the visual landscape. The intended final height of the TSF will be 32.5 m above the natural ground level and will be developed over a 10-year period. The visual impact will largely be felt towards the end of the operational phase, and during decommissioning/closure and post closure. Residents of Skoonplaas will have a permanent view of both the proposed western and northern expanded TSF. Residents of Modder East will have a permanent view of the western expansion. Existing vegetation (stands of trees at the western perimeter) may act as a visual buffer from Modder East toward views of the proposed western TSF and may mitigate the visual exposure from certain areas.

Impact	Phase	Pre-mitigation	Post-mitigation
Dust generation caused by construction-related activities, airborne dust at the TSF surface and vehicles travelling on unpaved/gravel roads	C	Medium	Low
Loss of visual aesthetics due to vegetation clearance and increased presence of construction-related aspects	C	Medium	Low
Change in visual aesthetics and sense of place due to the incremental development of the TSF	O	High	Medium
Night-time illumination for the safety and security of workers. Flooding of lights at night onto neighbouring properties	C, O	Low	Low
Permanent change in visual aesthetics and sense of place due to the final TSF height of 32.5 m	D	High	Medium

Mitigation measures

- Implement concurrent rehabilitation of disturbed areas as works are complete in a disturbed area.
- Plant fast-growing indigenous trees, and maintain any tall trees, along the property boundary, where possible.
- Limit the activity footprint to the final approved layout.
- Implement lighting in such a manner that it does not unnecessarily spill outward onto oncoming traffic or into the neighbouring properties.
- To reduce visual intrusion, fence the expanded TSF with a concrete palisade and use shade cloth to conceal site camps and storage areas.

4.2.12 Palaeontology

Although the area is indicated as having a very high sensitivity in terms of palaeontology, no fossils were found during the baseline survey.

Potential impacts

Impact	Phase	Pre-mitigation	Post-mitigation
Loss of subterranean / previously unidentified paleontological resources	C	Medium	Low

4.2.13 Archaeology and heritage

No sites of the Stone, Iron or the Historical Age were recorded during the baseline survey, however four sites of cultural heritage significance were identified. These are summarized below:

- Site 1 – old foundations and collapsed concrete/brick buildings, some older than 60 years – western expansion site.
- Site 2 – remains of old mining infrastructure, including concrete foundations and old dam walls – western expansion site.
- Site 3 – remains of old mining and waterworks infrastructure, including concrete channels, underground tunnels, walling, and concrete structures and pillars, some older than 60 years – western expansion site
- Site 4 – a fenced-off cemetery with several unmarked graves – located *near, but not on the proposed northern expansion site*.

The remains of other old buildings and structures were also noted however, these were deemed as having no heritage significance. The cultural significance of Sites 1, 2, and 3 is low. These sites may be disturbed without a formal permit application. The cemetery was determined to be of high cultural significance; however, it is not located within the proposed development footprint.

Potential impact

There are no sites of cultural / archaeological significance at the proposed development footprint; however, it is possible that artefacts / graves may be unearthed and destroyed during construction-related activities or that there may be damage to the nearby cemetery from vandalism / increased activity in the area during the construction phase.

Impact	Phase	Pre-mitigation	Post-mitigation
Loss of subterranean/previously unidentified heritage resources	C	Medium	Low
Damage to the existing cemetery (although not within the proposed development footprint)	C	Low	Low

4.2.14 Socio-economic

Local context

The mine falls into Ward 72 of the City of Ekurhuleni (CoE or Ekurhuleni). The Ekurhuleni population makes up approximately a quarter of Gauteng’s population. The population density for Ward 72 is 650 people/km², which is significantly lower than that of Ekurhuleni as a whole (1 707 people/km²). However, the population across Ekurhuleni is growing, due to in-migration in search of employment opportunities, as well as other pull factors including health, medical services, education, social security, and a general trend of urbanization.

This population growth has resulted in large numbers of informal settlements; over half of the households (51.1%) in Ward 72 are informal dwellings. Service provision in these informal settlements remains a challenge. Only 45% of households in the Ward have electricity, 47.8% have flush toilets, and 62.3% have regular refuse collection. Almost half of the households in Ward 72 do not have access to basic services.

The finance, insurance and business services sector makes the largest contribution to Ekurhuleni's economy (24%), followed by Government (16.9%), wholesale and retail trade (15.2%), and transport, storage, and communications (11.4%). Unemployment in Ekurhuleni is estimated to be 31.8%, which is slightly higher than the Gauteng and national averages. Unemployment in Ward 72 is slightly lower than the Ekurhuleni average, however as with Ekurhuleni, a concerning proportion of the population over the age of 15 is either unemployed or not economically active. Only 51% of people over the age of 15 are employed. The median annual household income in Ward 72 is R29 400, which is the same for Ekurhuleni. Many households have no income at all. In 2018, 1.71 million people across Ekurhuleni were living in poverty. Poverty levels have implications for people's health, particularly in the case of vulnerable groups like the elderly and children, and mental wellbeing. High poverty levels are also often associated with increased crime levels and social conflict. These statistics indicate significant economic challenges within the municipality.

Socio-economic profile of the project area

For the purposes of the socio-economic baseline investigation, a potential zone of influence of within a 2 km radius of the proposed new expansion footprint, was selected. The following receptor communities and businesses are located within this zone:

- the Skoonplaas informal settlement
- the suburbs of Modder East, Eastvale and Dersley
- the Enstra Paper Mill and the proposed Calodex Solar Park.

Skoonplaas is located within the mine's surface lease area. The mine leases this land from the Municipality. Prior to construction of NKGM, a small existing settlement consisting of approximately 24 households was situated within the surface lease area. According to the original EIA for Modder East operations, this was the original Skoonplaas, reportedly residing in abandoned mining buildings from historical mining in the area. The settlement has grown dramatically since 2015, and it is estimated that it currently consists of 3 000 to 4 000 households (Planact, 2021). Households in the south-eastern part of Skoonplaas are currently approximately 160 m from the northern corner of the existing TSF. The residents of Skoonplaas are provided with basic services by the Municipality including chemical toilets, refuse collection and water through communal and stand taps.

The medium to low-density, middle-income suburbs of Modder East, Eastvale and Dersley consist of generally well-maintained houses and gardens, with significant security. There are various small businesses located in and around these suburbs, including take away and food stores, guest houses, schools, travel agencies, gyms, hardware stores, etc. Larger businesses include the Enstra Paper Mill and Impala Refining Services.

Potential impacts

There are both positive and negative potential socio-economic impacts associated with the TSF expansion. The expansion would support the ongoing operation of the mine processing plant, which would delay the closure of the mine and extend the employment of certain employees. Additionally, approximately 50 temporary jobs will be created during the construction phase of the TSF.

Negative impacts include potential negative health impacts (from decreased air quality) for individuals in surrounding communities, emergency situations (although unlikely) associated with failure of the TSF, including potential fatalities, particularly given the proximity of residential areas, specifically Skoonplaas and Modder East, to the expanded TSF. The development may result in in-migration of jobseekers into the region and associated secondary impacts (pressure on existing infrastructure and services, increase in crime). The expanded TSF will also have a visual impact on residents of Modder East and Skoonplaas.

Impact	Phase	Pre-mitigation	Post-mitigation
Dust generated during construction may cause temporary nuisance to surrounding sensitive receptors	C	Medium	Low
In-migration of job seekers and associated expansion in informal settlements	C	Medium	Low
Temporary employment opportunities during construction	C	Low +	Low +
Temporary increased noise during construction and decommissioning may result in temporary nuisance to surrounding sensitive receptors	C, D	Low	Low
Ongoing operation of the NKGGM processing plant and associated continued employment and delay of closure	O	Medium +	Medium +
Visual intrusion from the expanded TSF towards the end of operation	O	Medium	Medium
Community health impacts related to potential decline in air quality and groundwater quality	O	Medium	Low
Risks associated with TSF failure and potential loss of life and damage to property	O, D	Medium	Low
Potential decline in property values in surrounding areas	O, D	Medium	Low
Loss of employment/retrenchment and associated negative impacts	D	Medium	Medium
Decrease in air quality and associated dust, pollution and health impacts including windblown dust and particulate matter from the TSFs during and after rehabilitation	O, D	Medium	Medium
Potential safety issues related to crime once there is no longer a security presence and the mine is decommissioned and closed off	D	Low	Low

Mitigation measures

- Design the TSF using best practice & the Code of Practice for Mine Residue (SABS 0286:1998). Include stringent safety precautions to prevent TSF failure.
- The TSF expansion must be managed as a high hazard facility with all precautions taken to avoid emergency situations.
- An emergency plan must be put in place which includes alerts to surrounding residents of potential dangers and an evacuation plan.
- Establish and communicate to all IAPs a grievance procedure (the Applicant should appoint a representative to engage with the community).
- Recruitment (by the mine and any contractors) must not be conducted at the mine gate so as to dissuade job seekers gathering at the mine gate.
- Mine security patrols should monitor the perimeters of the TSF thereby providing an increased security presence.
- Encourage ongoing open communication between the mine and all stakeholders including residents of informal settlements near the mine as a means to improve relations in an effort to address any problems before there is any social unrest.
- The boundary fence around the TSF and the safety barrier along the road should be maintained in a good state.

5 PLAN OF STUDY FOR THE EIA PHASE

During the EIA Phase further specialist studies will need to be conducted and completed including:

- Air Quality Impact Assessment, including a detailed pollution inventory and pollutant dispersion model
- Community Health Impact Assessment, including a Human Health Risk Assessment (HHRA) for air and groundwater
- Groundwater Impact Assessment, including a numerical groundwater flow model that will include modelling the potential contamination plume
- A radiological public safety and impact assessment
- A socio-economic impact assessment
- A dolomite stability evaluation
- A Dam Break Analysis to determine the potential zone of influence and impacts that may be associated with TSF failure.

There will be a further 30-day opportunity for IAPs to comment on the issues raised during the EIA phase. A comparison between the information to be found in the Scoping Report and the EIA report is outlined below.

	Information	Scoping Report	EIA Report
1	A layout plan showing the proposed development area relative to surrounding land uses, infrastructure, and residential areas. For the EIA phase, any changes identified during the Scoping Phase will be included	✓	✓
2	A description of the project components including the scale and extent of activities requesting authorisation	✓	✓
3	A description of the baseline environment	✓	✓
4	A summary of the specialist investigations, findings, and recommendations (with the full specialist studies attached)	✓	✓
5	A preliminary identification (Scoping Report) or a detailed assessment (EIA Report) of potential impacts for all phases of the project (including closure and post closure)	✓	✓
6	A preliminary identification (Scoping Report) or a detailed identification (EIA Report) of mitigation measures including management, and monitoring measures included in the EMP	✓	✓
7	A list of additional investigations (i.e., specialist studies) to be undertaken during the EIA	✓	✗
8	Details of the legislated environmental process, including Scoping and EIA phases, and timeframes associated with these	✓	✓
9	Details of other legislation to be considered for the project	✓	✓
10	Assumptions, limitations and gaps identified	✗	✓
11	Financial provision for closure and closure objectives	✗	✓
12	Comments made by IAPs, including State Departments, during the Scoping Phase of the project (and responses by the EAP to these comments) in a Comments and Responses Report	✗	✓

6 CONCLUSION

6.1 Summary of potential negative impacts

The preliminary potential negative socio-economic impacts include: the potential decrease in air quality and associated dust, pollution and community health impacts, a visual impact on the residents of Skoonplaas and Modder East suburbs, a minor increase in noise during construction, the potential in-migration of job seekers and associated expansion of informal settlements, and community health and safety risks including those from TSF failure.

The preliminary potential negative environmental impacts include: the loss of land of high agricultural capability in the northern expansion site (high potential land: 4.73 ha, moderate potential land: 16.53ha), a permanent change in topography of the expansion sites, a decrease in ambient air quality through increased dust and particulate matter generation, potential groundwater contamination (although this is expected to be minimal), the disturbance of flora and fauna, although the expansion areas are considered to be largely transformed and have low to moderately low sensitivity in terms of terrestrial ecology. No rivers, wetlands or freshwater ecosystems occur within the proposed development footprint.

6.2 Summary of potential positive impacts

The preliminary positive socio-economic impacts include: the continued operation of the existing mine processing plant and continued employment for some of the current surface employees due to a delay in closure of the processing plant, ongoing taxes and profits from the procurement of goods and services, and the increased spending power of employees (a percentage of the existing employees), and temporary employment opportunities will be available during the construction phase of the project.

The preliminary positive environmental impacts are limited to the positive impacts associated with rehabilitation and revegetation of the area upon decommissioning