



Assmang (Pty) Ltd: Khumani Iron Ore Mine

DRAFT Environmental Scoping Report for in terms of Nation Environmental Management Act, 1998 for:

Project 1: New Return Water Dam 3.

Project 2: New Infrastructure (New Water Containment Facility and Pipelines

Project 3: Water Use License (WUL) amendment



Report Purpose

Draft Environmental Scoping Report for Stakeholder Comment

Report Status

Draft for Stakeholder Comment

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Executive Summary

Introduction

Khumani Iron Ore Mine (hereafter referred to as “Khumani” or “the mine”), is situated 15km south of Kathu, adjacent to the Kumba Iron Ore Mine and comprises of four (4) farms, namely Parson, King, Bruce and Mokaning.

The mine comprises of four (4) farms, namely Parson 564 (including Police Camp 692) (Portions 0, 2, 8 and 9), King 561 (Portions 0), Bruce 544 (Portion RE) and Mokaning 560 (Portions 0, 1, 2, 3, and 4). Khumani falls within two Local and District Municipalities. The farm Mokaning is situated within the Tsantsabane Local Municipality (NC085), which forms part of the ZF Mgcau District Municipality (formally known as the Siyanda District Municipality). The farms Parson, Bruce and King are situated within the Gamagara Local Municipality (NC01B1), which forms part of the John Taolo Gaetsewe District Municipality (formally known as the Kgalagadi District Municipality).

Construction of Khumani commenced during 2006 and the mine has been operational since 2009.

Project Description

Project 1: New Return Water Dam 3

Khumani intends to construct a new Return Water Dam (“Return Water Dam 3”) at a capacity of approximately 49 000m³ – (details and designs of the facility are not as yet finalised, however, the wall height will be below 5m) associated with the existing Paste Disposal Facility. The new Return Water Dam 3 will be located on Portion 0 of the farm King. The intention of the project is as follows:

- Supernatant and storm water will be pumped from the Paste Disposal Facility compartments to the existing concrete lined silt trap.
- The silt trap overflows into the existing HDPE lined Return Water Dam 1 from where the water is returned to the thickener overflow tank for re-use in the process.
- Excess storm water will overflow from the Return Water Dam 1 into the existing Return Water Dam 2.
- In turn, excess storm water will overflow from the existing Return Water Dam 2 into the new Return Water Dam 3.
- Water will then be pumped from the Return Water Dam 3 to the Return Water Dam 1 or 2 once the water level in the Return Water Dam 1 has dropped significantly.
- The intention is to operate the Return Water Dams dry and to maintain the level in the Return Water Dam 1 at less than 30%.

The new Return Water Dam 3 will have a spillway that will divert overflow to the Paste Disposal Facility Compartment 3B in case of an emergency. The design intent is not to utilise this spillway more than once in 50 years.

Project 2: New Infrastructure

In addition to this, the mine will also establish a second pipeline from the King Plant to the Parson Beneficiation Plant to transport the paste water to and from the plants. The pipeline will be routed from the Paste Disposal Return Water Tank located on the farm King to the Beneficiation Plant Thickener located on the farm Parson. The volume to be pumped through the pipeline is planned to be approximately 375l/s.

Another pipeline of approximately 3km is planned from the Parson Return Water Dam (currently called the Parson Plant Storm Water Dam) which will return water back to the plant for reuse. The design of the pipeline is currently not final, however it is anticipated that the throughput will be about 100m³/hr, which will amount to about 1 700l/s when water is present in this facility.

A new Water Containment Facility, of which the designs are still in planning phase, is planned at the King Plant area to supply water to the mining operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new storage facility at the King operation, Khumani can store water for this mining operation specific and allow for buffer capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m³. Should clearance be required this will also be less than 1 ha of indigenous vegetation.

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Project 3: Water Use License (WUL) amendment

Khumani intends to amend the existing 2013 WUL to correct various administrative errors, as well as to include water uses associated with the 2016 Environmental Authorisation (Permit 21/2016) (see Appendix 5). In addition to this, a water optimisation study is being undertaken by Geo Tail (Pty) Ltd. Based on the outcomes of the current Water Studies (Water Balance and Storm Water Management Study), various other amendments may be required to approved water uses in terms of throughput volume/naming and/or capacity. One amendment currently considered is the duplication of the Braithwaite Water Tank at King to allow for additional buffer capacity. The amendments to facilities are located on all four (4) farms owned by Khumani.

Listed Activities

In terms of the NEMA, there are three (3) listing notices which should be considered for this application. These listing notices were amended during April 2017. This amendment did not repeal the 2014 listed activities, but purely amended certain listings. Listing Notice 1 (Regulation 983) activities require a Basic Assessment Process, whereas Listing Notice 2 (Regulation 984) activities require a full Environmental Impact Assessment (EIA) Process. Listing Notice 3 (Regulation 985) activities require a Basic Assessment Process if the area falls within certain geographic zones. Khumani is not characterised by gazetted Endangered Ecosystems, Critical Biodiversity Areas (CBAs) or located in proximity to a Protected or Conservation Area and for this reason Listing Notice 3 is not applicable to the mine.

Considering the above, the following listed activities may be triggered:

Name of Activity	Aerial extent of the Activity (Ha or m ²)	Applicable Listing Notice	Waste Management Authorisation Required	Water Use Licence Authorisation Required (x for yes)
Project 1: Proposed Return Water Dam 3	Approx. 2ha	Government Notice 327, Listing Notice 1: <ul style="list-style-type: none"> ☛ Activity 13: “The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic meters or more,” Government Notice 325, Listing Notice 2: <ul style="list-style-type: none"> ☛ Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). 	Note: At the current time and with the information available it is not foreseen that a waste license will be required for the Return Water Dam, as this facility will be regarded as a storage facility (transfer point) between the Paste Disposal Facility and Beneficiation Plant. The facility is not considered a lagoon, but will be a constructed dam, which will contain runoff contaminated water (which constitutes waste water by the Department of Environmental Affairs (DEA)).	x
Project 2 (new infrastructure): Proposed Pipeline from the Paste Disposal Thickener to the Beneficiation Plant thickener at a volume of approximately 375l/s. Proposed Pipeline from the Parson Return Water Dam to the Beneficiation Plant to improve the commitment of Khumani to reuse water optimally within the water circuit. The throughput volume is 1 700l/s. A new Water Containment Facility is planned at the King Plant area to supply the mining	Paste Disposal Facility Pipeline: Approx. 4 200m (Approx. 375l/s) Parson Return Water Dam Pipeline: Approx. 3 000m (Approx. 1 700l/s)	Government Notice 327, Listing Notice 1: <ul style="list-style-type: none"> ☛ Activity 10: “The development and related operation of infrastructure exceeding 1 000 meters in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – <ul style="list-style-type: none"> ○ with an internal diameter of 0,36 meters or more; or ○ with a peak throughput of 120 liters per second or more; ○ excluding where— ○ such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge 	Not Applicable (N/A)	X (Water Containment Facility at King)

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<p>operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new Water Containment Facility at the King operation, Khumani can store water for this mining operation specific and allow for buffer capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m³. Should clearance be required this will also be less than 1ha of indigenous vegetation.</p>		<p>or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.</p> <p>Government Notice, Listing Notice 2:</p> <ul style="list-style-type: none"> ☛ Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). 		
<p>Project 3: The areas approved under approved Environmental Authorisations, such as Permit 21/2016, but which still requires a WUL.</p>	<p>Approx. 430ha</p>	<p>All the activities for which amendments will be required are present and approved in existing environmental authorisation and therefore no clearance activities are applicable. However the amendments to the WUL will trigger the following listed activities:</p> <p>Government Notice 327, Listing Notice 1:</p> <ul style="list-style-type: none"> ☛ Activity 34: “The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions or pollution” (not considered at this time but may be required depending on Department of Water and Sanitation Consultation). <p>Government Notice, Listing Notice 2:</p> <ul style="list-style-type: none"> ☛ Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). 	<p>All the activities for which amendments will be required are present and approved in existing environmental authorisation. It is currently not foreseen that additional waste licenses will be required.</p>	<p>x</p>
<p>Project 3: Regulation 158 amendment for changes and corrections to the approved WUL.</p>	<p>N/A – overall farm portion of about 9000ha, no new construction areas.</p>	<p>A new Water Balance and Storm Water Management Assessment is being completed by the mine which will be included into the Scoping Phase. These studies may identify the need to apply for amendments to existing approved Water Uses and therefore the following activity has been included:</p> <p>Government Notice 327, Listing Notice 1:</p> <ul style="list-style-type: none"> ☛ Activity 34: “The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions or pollution” (not 	<p>-</p>	<p>x</p>

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		considered at this time, but may be required depending on Department of Water and Sanitation Consultation).		

Aim and Motivation of the Project

Project 1: Return Water Dam 3

The mine currently has two return water dams which form part of the Paste Disposal Facility General Arrangements and water circuit. It is the intention of the mine to expand the capacity of storage around the Paste Disposal Facility due to the following reasons:

1. The expansion of the Paste Disposal Facility into its next disposal compartment will require the management of storm water around the area.
2. Additional storage capacity for storm water will be required when Compartment 3B (existing KM02 opencast pit) is commissioned as a paste storage compartment.
3. The initial intention of sourcing water from the groundwater aquifers to supplement water supply in periods when the Sedibeng Water Supply Scheme cannot provide water have been placed on hold, due to concerns raised by the surrounding landowners regarding water scarcity in the catchment, and the opportunity for the mine to firstly consider optimising its internal water circuit.
4. The new Return Water Dam3 will also ensure legal compliance (i.e. GN 704 etc.).
5. The additional dam, Return Water Dam 3, will ensure that water can be optimally stored in the area and pumped to the Beneficiation Plant.

Project 2: Pipelines and Water Containment

Khumani's only source of water supply is that of the Sedibeng Water Supply Scheme. For this reason it is pertinent for the mine to ensure that there is sufficient infrastructure on site to optimise water reuse within the process water circuit, as well as to allow for buffer storage capacity in periods where the pipeline scheme is not operational or supply lower volumes of water.

The additional pipeline to transport water to and from the Paste Disposal Facility is merely an upgrade and improvement of the existing system. The mine experiences blockages on the system due to the high density of the slurry pumped. For this reason the additional pipeline will not only assist to transport water during technical constraints on one line, but will also allow for an increase in pumping volume during periods of high rainfall events.

The Water Balance of Khumani and approved WUL requires Khumani to reuse water optimally in the circuit. The volumes of water currently being received in the Parson Return Water Dam cannot be pumped optimally to the Beneficiation Plant due to the infrastructure constraints. With the increase in the pumping infrastructure and associated pipelines, the mine will have the opportunity to return more water from the dams to the process circuit. For this reason an upgrade to the pumping system at the Parson Storm Water Dam and increase to the pipeline from the Storm Water Dam to the Beneficiation Plant is required.

As mentioned before, a new Water Containment Facility is planned at the King Plant area to supply the mining operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new Water Containment Facility at the King operation, Khumani can store water for this mining operation specific and allow for buffer capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m³. Should clearance be required this will also be less than 1 ha of indigenous vegetation.

Project 3: Changes and/or Amendments to WUL

The mine has an approved WUL (2013). Upon receipt of this WUL, the mine has requested various amendment to the WUL. The Department of Water and Sanitation (DWS) presented the mine with a formal letter of rejection (dated 07 August 2017) which pertained to the amendment application submitted on 4 September 2013 (10/D41J/BCJ/2122; 21/11/2008; and 719242). The reasons for the rejection related to:

- ☞ The Department cannot trace the administrative mistakes;
- ☞ The Department was unable to source the relevant application documents from DWS Head Office;
- ☞ The Department was unable to source the comments from DWS Head Office;

- ☞ Some of the requested amendments were seen as upgrades and not administrative mistake. .

In addition to this, the mine has applied for a new WUL for the Mine Residue Facilities approved in terms of Permit 21/2016. This application was submitted by GCS (Pty) Ltd during 2016. The DWS instructed the mine to resubmit the 2016 application as designs of the facilities were still outstanding, with the amendments required.

As mentioned before, the initial intention of sourcing water from the groundwater aquifers to supplement water supply in periods when the Sedibeng Water Supply Scheme cannot provide water have been placed on hold, due to concerns raised by the surrounding landowners regarding water scarcity in the catchment, and the opportunity for the mine to firstly consider optimising its internal water circuit. The mine has, as a commitment to stakeholders, engaged with a hydrologist to reassess the Water Balance and Storm Water Management system on site. This study is still ongoing and will form part of the Environmental Impact Assessment Report (EIAR). Preliminary outcomes of the study have indicated the following:

- ☞ Inclusion of activities as approved in Permit 21/2016;
- ☞ Increase in the capacity of approved water containment facilities; and
- ☞ Optimising pumping throughput through containment facilities, due to the rerouting of water in the system; etc.

All of these activities will require amendments to the existing WUL.

Alternatives Considered

The projects presented is located within the existing Mining Area. The activities considers in this application are linked to approved and established sites and therefore no property alternatives or location alternatives are relevant.

Project 1: Return Water Dam 3

Increasing the capacity of the existing Return Water Dam 1 was considered. The operation received an updated WUL (Reference 10/D41J/BC1J/2122) for Section 21(a), Section 21(c&i), Section 21(g) and Section 21(j) water uses on 16 March 2013. One of the activities approved in the 2013 WUL, is the Paste Disposal Decant Dam (i.e. Surge Dam/ Return Water Dam 2). This activity is approved as the Decant Dam (Activity 8 on page 18 of the WUL).

The current capacity of the facility is 49 000m³ (approved at 1 152 094m³/a disposal). The initial intention of the mine was to expand the capacity of this dam. The expansion would have resulted in an increase in the capacity of the facility to about 180 000m³. The concern was the large storage capacity in one facility close to the Paste Disposal Facility. The mine therefore initiated the investigation of optimising pumping capacities to and from the Paste Disposal Facility and as a result identified the opportunity to construct a smaller facility up gradient of the Return Water Dam 2), which will aid in the water storage management around the Paste Disposal Facility. For this reason the Return Water Dam 3 was considered as a more suitable alternative based on the management of the facilities (water volume storage) and the pumping of water between facilities, as well as safety considerations on the facility.

Project 2 – Pipeline and Water Containment Facility

No alternatives are applicable as the pipelines are designed according to the current design infrastructure successfully utilised on site and with the throughput capacities as identified as part of the hydrological study.

In terms of the Water Containment Facility, the location and size will be dependent on the outcomes of the Water Study currently being completed by Geo Tail (Pty) Ltd. The alternatives in terms of design may range from a tank structure or a civil constructed dam.

Project 3: Changes and/or Amendment to WUL

No alternatives are applicable, as the activities in question are established, and/or approved in terms of Environmental Authorisations.

Application and Consultation Process

The NEMA Application was submitted to the Department of Mineral Resources (DMR) on 2 October 2018.

In terms of stakeholder consultation the following were undertaken:

- ☞ A project notification was sent to all stakeholders on the current Khumani Stakeholder Database;
- ☞ In accordance with GNR 982 Section 41(2)(a-b), a site notice was developed in both Afrikaans and English) and placed at four locations in order to inform surrounding communities and adjacent landowners of the proposed project. The site notices were placed on 22 August 2018) and at visible locations close to the site.

- ☞ In accordance with GNR 982 41(2)(c) of Chapter 6 an advert was placed in both the Diamond Fields Advertiser and the Kathu Gazette. The advert was placed in both Afrikaans and English in the above newspapers on 29 August 2018 and 1 September 2018 respectively.
- ☞ The Draft Scoping Report has been made available to all registered stakeholders from 17 October to 16 November 2018.

Key Potential impacts

The proposed projects as part of this application are situated on the existing Khumani Mining Right Area. Mining activities have been present in this area since the 2009.

The mine has been investigating measures to optimise water management on site due to the fact that groundwater resources are mostly dewatered in the operational areas of the mine as a result of surrounding mining activities and water supply is purchased at high costs from the Sedibeng Water Supply Scheme, which is the main source of water supply to not only the mine, but also the surrounding towns, farmers and communities.

The following key positive impacts are foreseen:

- ☞ The operation of the mine due to a lawful construction of the activities will allow the mine to operate within the legal realm of the Environmental Legislation;
- ☞ The construction of Return Water Dam 3 will ensure that water can be optimally stored in the area and pumped to the Beneficiation Plant.
- ☞ It is pertinent for the mine to ensure that there is sufficient infrastructure on site to optimise water reuse within the process water circuit, as well as to allow for buffer storage capacity in periods where the pipeline scheme is not operational or supply lower volumes of water
- ☞ The location of the facilities will not require the removal of vegetation as it is contained within already disturbed footprint areas. It should be noted that the location of the Water Containment Facility has not been finalised, however it is likely that this facility will be located within the King Plant or existing mining operations area.

The key potential negative impacts which may/ will arise and for which management measures have been recommended are, but still require confirmation by specialists are:

- ☞ Construction activities may lead to an increase in dust emissions if not managed.
- ☞ By not maintaining the dams and pipelines spills can occur, which could lead to soil erosion and a loss of water.
- ☞ By not maintaining the areas around the facilities, alien and invasive plant species can be established.

When considering the above it is clear that with the implementation of management measures negative impacts can be managed.

Some of the key management measures currently foreseen include:

- ☞ A legal assessment of all activities and future planned activities must be undertaken annually to ensure that all activities are authorised.
- ☞ A copy of the Water Use Licence (WUL) must be available on site at all times.
- ☞ Construction areas must be clearly demarcated to control movement of personnel and vehicles, providing clear boundaries for construction sites in order to limit the spread of impacts. Markers and pegs will be erected and maintained along the boundaries of the working areas, access roads, haul roads and paths before commencing any work. If proved insufficient for control, these shall be replaced by fencing.
- ☞ Clean and dirty water separation as part of a Storm Water Management Plan must be implemented early in the construction phase, especially down-gradient of construction areas to ensure that the natural runoff patterns are impacted as little as possible.
- ☞ Ensure that all design drawings include effective erosion control measures.
- ☞ Alien and invasive plant species eradication should be implemented on site.
- ☞ Equipment will be well maintained to reduce excessive noise creation.
- ☞ Ensure the required erosion protection measures are monitored and corrected where necessary.
- ☞ Storage of fuels and oils, the refuelling of vehicles and equipment maintenance must be limited to designated, bunded areas. Bunds to be 110% of volume of the materials stored).

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- ☛ All workers must undergo an induction which includes environmental awareness training to make them aware of the environmental incident management procedures as well as the importance of complying with management measures.
- ☛ Any significant spills must be captured in the incident reports and must be reported to the relevant department (DMR and DWS).
- ☛ Water levels in the Return Water Dams should be monitored and should be maintained at a 0.8m freeboard.
- ☛ Pipeline flows should be recorded on mine recording system (active at any time) to determine when there may be a potential leak on a pipeline.

All rehabilitated areas should be effectively fenced off to avoid access thereto by unauthorised parties up until full rehabilitation has been achieved.

Plan of Study for EIA

The aspects of the project that will be assessed in the EIA phase are those considered by the Environmental Assessment Practitioner (EAP) as having the potential to result in environmental and social impacts. They include:

- ☛ Establishment of alien and invasive plant species;
- ☛ Release of dust due to clearance activities;
- ☛ Implementation of the Storm Water Management System.

Geo Tail (Pty) Ltd (Bruce Randall) has been appointed to conduct the assessment of water management on site and to update the Water Balance and Storm Water Management Plan.

Commenting authorities will receive hard copies the Draft Scoping Report and will receive hard copies of the Draft EIA Report. All comments received from the authorities will be provided to the DMR for considerations.

During the EIA Phase, the following information will be disclosed in the EIA Report:

- ☛ Impact assessment undertaken and results thereof;
- ☛ Management measures;
- ☛ Monitoring plans; and
- ☛ Closure objectives.

Once the comments have been received on the Draft Scoping Report the final Scoping Report will be completed. The Final Scoping Report will be submitted to the DMR, and once accepted the proposed project will proceed into the detailed EIA Phase, which involves the detailed hydrological investigations.

The EAP will produce a Draft EIA Report after the completion of the required specialist studies. The Draft EIA Report will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the 2014 EIA Regulations and amendments thereto will be included in the Draft EIA Report.

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FIRST DRAFT SCOPING REPORT (for stakeholder comment)

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT:	Assmang (Pty) Ltd: Khumani Iron Ore Mine
TEL NO:	+27(0) 53 372 8000
FAX NO:	+27(0) 53 723 8599
POSTAL ADDRESS:	Private Bag X 503, Kathu, Northern Cape
PHYSICAL ADDRESS:	Khumani Iron Ore Mine, 15km south of Kathu along the N14
FILE REFERENCE NUMBER SAMRAD:	Mining Right Reference Number: NC30/5/1/2/3/2/1/070

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the valuation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process—

- identify the relevant policies and legislation relevant to the activity;
- motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- identify the key issues to be addressed in the assessment phase;
- agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored. _____

SCOPING REPORT

The application for the Environmental Authorisation Process was submitted to the Department of Mineral Resources (DMR) on 2 October 2018. A letter of acknowledgement from the DMR has to date not been received from the DMR.

Please refer to Annexure 1 for the submitted application form and proof of submission.

1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

1.a Details

1.a.i Details of the Environmental Assessment Practitioner (EAP)

Table 1: Details of EAP

Name	Tanja Bekker
Designation	Environmental Assessment Practitioner
Postal Address	PO Box 22014, Helderkruijn, 1733
Physical Address	21 Gladiolus Street, Roodekrans, 1724
Telephone Number	+27 (0) 82 412 1799
Cell Phone Number	+27 (0) 82 412 1799
Fax Number:	+ 27 (0) 86 551 5233
Email Address	tanja@envirologistics.co.za

1.a.ii Expertise of the EAP

The following table presents a summary of the EAP's experience:

Table 2: Experience of EAP

Name	Position	Qualification	Professional Registrations	Experience
Tanja Bekker	Principal Practitioner	M.Sc. Environmental Management (RAU), now Johannesburg University)	Certified member of the Environmental Assessment Practitioners Association of South Africa (October 2013) Registered with the South African Council of National Scientific Professions (SACNASP: Pr.Sci.Nat. Reg No. 400198/09) Member of International Association of Impact Assessors (IAIA) Member of the Environmental Law Association of South Africa	15 Years

Please refer to Annexure 2 for the EAP's Curriculum Vitae.

Education

- BSc. Earth Sciences (Geography & Geology) – RAU (University of Johannesburg)
- BSc. Geography Honours - RAU (University of Johannesburg)
- MSc. Environmental Management - RAU (University of Johannesburg)

Career Enhancing Courses

- ISO 14000 Lead Auditors Course (WTH Management)
- Certificate in Project Management (Pretoria University)
- Management Advance Programme (MAP 81) (Wits Business School)

Professional Affiliations

- Certified member of Environmental Assessment Practitioners Association of South Africa
- Certified ISO 14001 Environmental Management System Auditor
- Registered as a Professional Natural Scientist,
- Member of the South African affiliate of the International Association for Impact Assessment
- Member of the Environmental Law Association of South Africa (ELA).

Summary of the EAP's past experience

Ms. Bekker is registered as a Professional Natural Scientist in the field of Environmental Science with the South African Council for Natural Scientific Professions (SACNASP) Board and is also a Certified Environmental Assessment Practitioner (EAP) with the Interim Certification Board of Environmental Assessment Practitioners of South Africa (EAPSA), a legal requirement stipulated by NEMA. She is further certified as an ISO 14001 Lead Auditor. Her qualifications include BSc. Earth Sciences (Geology and Geography), BSc. Hons. Geography, and MSc. Environmental Management. In addition to these tertiary qualifications, she obtained a Certificate in Project Management, and completed the Management Advancement Programme at Wits Business School.

With more than 15 years' working experience in environmental management and the consulting industry and managing various Large Account Clients, she understands the South African Regulatory System, and can advise clients with due diligence on their environmental regulatory requirements and offer a solution driven service to their project life cycle. She is equipped with exceptional project management and coordination skills, which especially enhances the service she offers clients within the environmental permitting system.

Her key focus is environmental management and compliance with extensive experience in the mining industry. Project Management and Coordination of projects form a critical component of her duties, which include project planning, initiation of projects, client, authority and stakeholder consultation, specialist coordination, budget control, process control, quality control and timeframe management. Her interest lies in a client advisory capacity, being involved during due diligence investigations, pre-project development and assisting the client and engineering team in adding value to develop the project in an environmentally sustainable manner, considering client costs and liabilities, as well as considering the implication of environmental authorisation conditions and requirements on project deliverables. Her involvement in projects has spanned over the project life cycle from Due Diligence Investigations, Pre-Feasibility Investigations, Prospecting Right Applications, Mining Right Applications, Environmental Reporting and implementation and auditing of Environmental Management Plans and Authorisations.

1.a.iii Details of the Applicant

Khumani Iron Ore Mine (hereafter referred to as "Khumani" or "the mine"), located near Kathu in the Northern Cape Province, is owned by Associated Manganese Mines of South Africa Limited ("Assmang").

Khumani has an approved Mining Right, granted by the Department of Mineral Resources (hereafter referred to as the "DMR") in January 2007 for activities associated with the mining of iron ore. Khumani comprises four (4) farms, namely Parson 564 (including Police Camp 692) (Portions 0, 2, 8 and 9), King (Portion 0), Bruce 544 (Portion RE) and Mokaning 560 (Portions 0, 1, 2, 3, and 4), hereafter referred to as "Parson", "King", "Bruce" and "Mokaning" respectively.

The Mining Right is located over portions of the farms King, Bruce and Mokaning. The overall mining area, however, also includes the farm Parson, where the plant infrastructure, product- and low grade stockpiles, an explosives magazine and main offices are situated. The last mentioned farm property does not form part of the mining right and therefore no mining activities are undertaken over this farm.

Construction activities at Khumani commenced during June 2006, with an environmental approval in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (hereafter referred to as the "ECA"), while operational activities on the farm Bruce commenced during May 2007.

Khumani is an opencast Iron Ore Mine and is classified in terms of the DMR as a Primary Risk Class: A, which relates to the mining of base metals (including Iron Ore) for a Large Mining Operation, which includes a mine, mine waste, plant and plant waste.

The mining operations include opencast mining operations, within seven (7) Opencast Pits, from where the Run of Mine (ROM) is trucked to a primary crusher and transported via conveyor to the secondary and tertiary crushers, with the latter located at the Beneficiation Plant on the farm Parson. Material is washed and screened in the Beneficiation Plant, where the final product is stockpiled for rail transport to either Saldanha for export (via the OREX Line) or Port Elizabeth for local markets (via Transnet Freight Rail (TFR)). Waste rock (or low-grade material) is placed on, what will in future be named the Low Grade Stockpiles, and earmarked for reprocessing in the future, depending on market requirements. Waste material from the beneficiation process is pumped through a series of thickeners to the Paste Disposal Facility located on the farm King. Additional ancillary mine infrastructure has been constructed, such as the main offices, access roads, haul roads, power lines, fences for

security purposes, etc. The mine has, in the past number of years, invested in the delineation of its primary catchment areas for the purposes of designing a detailed clean and dirty water management system for the mine. One of the key purposes of this system is water conservation. The area in which the mine is located is characterised as a water negative environment, i.e. evaporation exceeds precipitation. The mine is committed to reuse as much water as possible, not only from an environmental and sustainable viewpoint, but also due to the fact that the mine is reliant on purchasing water from the Sedibeng Water Pipeline, which is currently considered to be an unreliable source of water supply, having often resulted in the mine not having access to water. Water from the storm water system is utilised as a dust suppressant over roads, in combination with roads also being treated with a dust suppressant.

The mining infrastructure associated with each farm of the Mining Right is detailed as follows:

Parson:

- Rapid Load-Out Facility;
- Product Stockpile Area;
- ROM Stockpile Area;
- Discard Stockpile (to be known as the Low Grade ROM Stockpile);
 - The mine is currently in the process of undertaking an Environmental Authorisation Process to increase this facility in terms of its footprint, and through additional infrastructure such as a Reclaiming Facility.
- Plant Area (Original Beneficiation Plant and the Wet, High-Intensity Magnetic Separation (WHIMS) Plant);
 - The mine is currently in the process of undertaking an Environmental Authorisation Process to establish a second WHIMS Plant. During 2013 the mine was awarded with approval for the establishment of another Plant, the Off-Grade 2 Plant. This plant has as yet not been constructed and for this reason, has not been included in this 2018 assessment.
- Plant Offices;
- Third Party Stockpile Area
- Workshop Areas;
- Explosives Magazine (operated by Sasol Nitro);
- Sewage Facilities;
- Conveyors;
- Storm Water Management Infrastructure (channels and dam);
- Borrow Pits; and
- Contractor Workshop Areas.

Bruce:

- Primary Crusher;
- Secondary Crusher;
- Mine Workshops;
- Offices;
- Overland Conveyors;
- Sewage Facilities;
- Contractor Workshop Areas;
- Opencast Operations (five main Opencast Pits – BA05, BB01, BC01, BC02, BC03);
- Topsoil Stockpile;
- Barrier Pillar Mining operations;
- Panhandle Dump;
- Low Grade ROM Stockpile (Waste Rock Dump); and
- Storm Water Management Infrastructure (channels and dam).

King/ Mokaning:

- Paste Disposal Facility;
- Topsoil Stockpile;

- ☞ Low Grade Run of Mine (ROM) Stockpile;
- ☞ Waste Rock Dump;
 - A second Waste Rock Dump is planned in the near future. The mine is currently in the process of undertaking an Environmental Authorisation Process for the Dump.
- ☞ Contractor Workshop Areas;
- ☞ Opencast Pits (two main Opencast Pits – KM01, KM02);
- ☞ Primary and Secondary Crusher;
- ☞ Sewage Facilities;
- ☞ TFR Diversion has been completed and the decommissioned Port Elizabeth Railway Line is being dismantled;
- ☞ River Diversion associated with the TFR Diversion;
- ☞ Mine Workshops; and
- ☞ Offices.

Linear Activities Connecting the Farms Include:

- ☞ Conveyors;
- ☞ Roads; and
- ☞ Power lines.

Table 3: Details of Applicant

Project applicant:	Assmang (Pty) Ltd: Khumani Iron Ore Mine
Registration no (if any):	1935/007343/06
Trading name (if any):	Assmang (Pty) Limited - Khumani Iron Ore Mine
Responsible Person, (e.g. Director, CEO, etc.):	Mr Dirk Coetzee
Contact person:	Mr Dirk Coetzee
Physical address:	Khumani Iron Ore Mine, Kathu, Northern Cape Province, 15km south of Kathu, along the N14
Postal address:	Private Bag X503, Kathu, Northern Cape Province, 8446
Postal code:	8446
Telephone:	+27 (0) 53 723 8090
E-mail:	Dirk.Coetzee@assmang.co.za
Cell Phone Number	+27 (0) 83 459 7580
Fax:	+27 (0) 53 723 8599

1.a.iv *Environmental Authorisations*

The mine is operating with all required environmental authorisations in terms of the following:

- ☞ National Environmental Management Act, 1998 (Act No. 107 of 1998) (hereafter referred to as the “NEMA”) [also the original approval in terms of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) (hereafter referred to as the “ECA”)];
- ☞ National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (hereafter referred to as the “NEM:WA”);
- ☞ Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (hereafter referred to as the “MPRDA”); and
- ☞ National Water Act, 1998 (Act No. 36 of 1998) (hereafter referred to as the “NWA”).
 - The aforementioned Act makes provision for a Water Use Licence (hereafter referred to as a “WUL”), which was obtained during 2013. This WUL is currently being amended by the Department of Water and Sanitation (hereafter referred to as the “DWS”) due to inconsistencies found in the WUL.

Environmental Authorisations held by the mine include the following:

- ☞ Permits:

- NEMA (and ECA):
 - Permit 43/2006 for the development of an Iron Ore Opencast Mine with all associated infrastructure.
 - Permit 47/2009 for the Railway Line Diversion and Local Siding Establishment.
 - Permit 37/2012 for the expansion of Diesel Storage and a Silo for Explosives, construction of a Tar Road and Additional Refuelling Station, Storm Water Dams and Storage Tanks.
 - Permit 56/2013 for the Off-Grade 2 Plant.
 - Permit 21/2016 for the expansion of the Parson Low Grade Stockpile (previously the Parson Discard Dump), infrastructure associated with the reworking of this facility, expansion of the King/ Mokaning and Bruce Low Grade ROM Stockpiles, and the establishment of additional Low Grade ROM Stockpiles on the farm King.
 - Environmental Authorisation: NC 30/5/1/2/3/2/1/(070)EM, 2018 for the decommissioning of and establishment of Silos and Magazines, as well as the establishment of a new Low Grade Sorter Plant.
- NEM:WA:
 - Permit 12/9/11/L812/8 for the Landfill Site and Hazardous Storage Facility.
- MPRDA
 - MPRDA Environmental Management Programme (EMP) Record of Decision (ROD) 2007 for the new Mining Operation and associated EMP dated February 2006.
 - MPRDA EMP ROD – undated 2007 (document date of modification states August 2007) for the Barrier Pillar and associated EMP dated April 2007 (EMP resulted in a change to certain commitments by the mine since the original EMP).
 - MPRDA EMP ROD 2011 – for the additional infrastructure such the local siding in line with Permit 47/2009.
 - MPRDA EMP ROD 2012 – for the additional infrastructure such as the diesel storage in line with Permit 37/2012.
- NWA:
 - WUL: 10/D41J/BC1J/2122 for the 2013 WUL.

Copies of the Environmental Authorisations are available from the mine.

1.b Description of the Property

1.b.i Location of the Mine

Khumani is situated 15km south of Kathu, adjacent to the Kumba Iron Ore Mine and comprises of four (4) farms, namely Parson, King, Bruce and Mokaning located on the following properties: Parson 564 (including Police Camp 692) (Portions 0, 2, 8 and 9), King 561 (Portion 0), Bruce 544 (Portion RE) and Mokaning 560 (Portions 0, 1, 2, 3, and 4).

The mine falls within two Local and two District Municipalities. The farms Parson, Bruce and King are situated within the Gamagara Local Municipality (NC01B1), which forms part of the John Taolo Gaetsewe District Municipality (formally known as the Kgalagadi District Municipality). The farm Mokaning is situated within the Tsantsabane Local Municipality (NC085), which forms part of the ZF Mgcawu District Municipality (formerly known as the Siyanda District Municipality).

Neighbouring towns and villages include Olifantshoek, Beeshoek, Postmasburg and Dingleton. The main industries in the area include mining (mainly of manganese ore, iron ore and tiger's eye), agriculture (mainly cattle, sheep, goat and game farming) and tourism.

Please refer to the following table for the registered name, administrative jurisdiction and summary of location of the land.

Table 4: Property Information

<p>Farm Name:</p>	<p>Farm Ownership:</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ Mokaning 260, Portion 1 ☞ Mokaning 260, Portion 3 ☞ Parson 564, Portion RE ☞ Parson 564, Portion 2 ☞ Parson 564, Portion 9 (new registration) ☞ Bruce 544, Portion RE <p>Overall WUL¹ Project (National Water Act, 1998, Regulation 158 Amendment – amendment to water uses previously excluded or errors/ amendments required):</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ Mokaning 260, Portion 1 ☞ Mokaning 260, Portion 3 ☞ Parson 564, Portion RE ☞ Parson 564, Portion 2 ☞ Bruce 544, Portion RE <p>New WUL Applications [(Permit 21/2016 issued by the Northern Cape Department of Environment and Nature Conservation (NCDENC))]:</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ Mokaning 260, Portion 1 ☞ Mokaning 260, Portion 3 ☞ Parson 564, Portion RE ☞ Bruce 544, Portion RE <p>New Infrastructure (Proposed new Return Water Dam 3, Paste Disposal Facility Water Return Pipeline and Return Water Pipeline from the Parson Return Water Dam to the Beneficiation Plant):</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ King 561, Portion 2 (crossing of pipeline underneath N14 at existing culvert) ☞ Parson 564, Portion 2
<p>Magisterial district:</p>	<p>Kuruman Registration Division (RD)</p>
<p>Distance and direction from nearest town.</p>	<p>The entrances to Bruce and Parson Mines are located 16km and 23km south of Kathu respectively, with the entrance to King Mine located approximately 13km to the south of Kathu.</p>
<p>21-digit Surveyor General Code for each farm portion applicable to this application.</p>	<ul style="list-style-type: none"> ☞ King 561, Portion RE: C0410000000056100000 ☞ King 561, Portion 2: C0410000000056100002 ☞ Mokaning 260, Portion 1: C0410000000056000001 ☞ Mokaning 260, Portion 3: C0410000000056000003 ☞ Parson 564, Portion RE: C0410000000056400000 ☞ Parson 564, Portion 2: C0410000000056400002 ☞ Bruce 544, Portion RE: C0410000000054400000

¹ The 2013 WUL is being updated to include new uses and to correct various administrative errors.

DRAFT Environmental Scoping Report for in terms of Nation Environmental Management Act, 1998 for: Project 1: New Return Water Dam
3. Project 2: New Infrastructure (New Water Containment Facility and Pipelines) Project 3: Water Use License (WUL) amendment
Mining Right Ref: NC30/5/1/2/3/2/1/070
Project Ref: 21819
Version: Draft for Stakeholder Comment



Figure 1: Local and Regional Setting of the surface operations

DRAFT Environmental Scoping Report for in terms of Nation Environmental Management Act, 1998 for: Project 1: New Return Water Dam
3. Project 2: New Infrastructure (New Water Containment Facility and Pipelines) Project 3: Water Use License (WUL) amendment
Mining Right Ref: NC30/5/1/2/3/2/1/070
Project Ref: 21819
Version: Draft for Stakeholder Comment

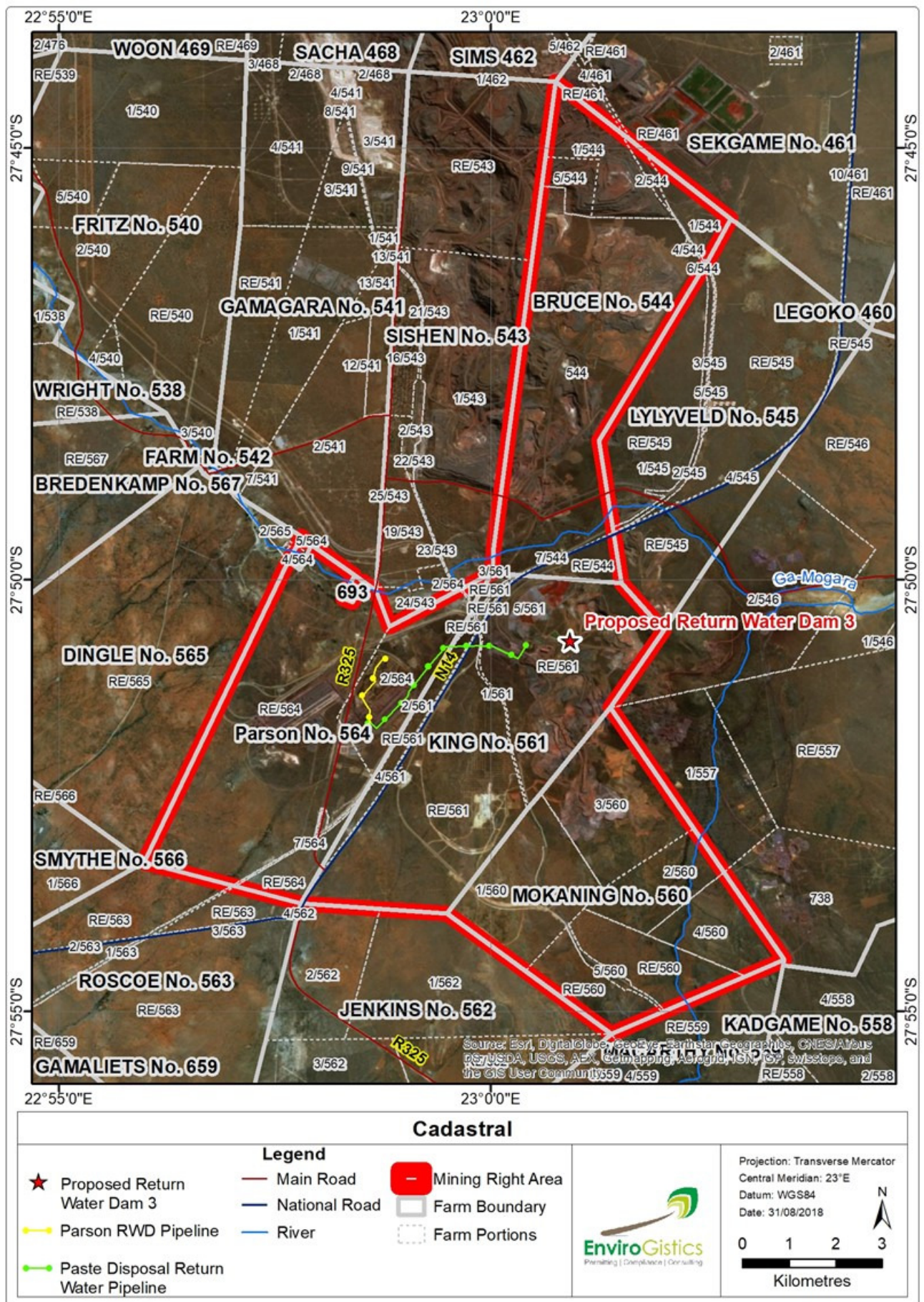


Figure 2: Cadastral Information

1.b.ii Ownership of Land

As mentioned before, the mine comprises of four (4) farms, namely Parson, King, Bruce and Mokaning located on the following properties: Parson 564 (including Police Camp 692) (Portions 0, 2, 8 and 9), King 561 (Portions 0), Bruce 544 (Portion RE) and Mokaning 560 (Portions 0, 1, 2, 3, and 4). Khumani falls within two Local and District Municipalities. The farms Parson, Bruce and King are situated within the Gamagara Local Municipality (NC01B1), which forms part of the John Taolo Gaetsewe District Municipality (formally known as the Kgalagadi District Municipality). The farm Mokaning is situated within the Tsantsabane Local Municipality (NC085), which forms part of the ZF Mgcau District Municipality (formally known as the Siyanda District Municipality). The property details are presented in the following table:

Table 5: Landownership

Farm Name	Portion	Registration Division	Size	Surface Owner and Title Deed	Mineral Rights Ownership
Bruce No. 544	RE	Kuruman RD	2346ha	Assmang Ltd T 349 of 1954	√
	3		11ha	Transnet Ltd T 790 of 1993	√
	4		5ha	Transnet Ltd T 790 of 1993	?
	5		91ha	Sishen Iron Ore Company (Pty) Ltd T 3280 of 2001	√
King No. 561	RE	Kuruman RD	2320ha	Assmang Ltd T 349 of 1954	√
	1		17ha	Transnet Ltd T 1447 of 1993	√
Mokaning No. 560	RE	Kuruman RD	542ha	Assmang (Pty) Ltd T 3565 of 2017	√
	1		652ha	Assmang Ltd T 572 of 1968	√
	2		326ha	Assmang Ltd T 572 of 1968	√
	3		558.7530ha	Assmang Ltd T 572 of 1968	√
	4		279ha	Assmang (Pty) Ltd T 3565 of 2017	√
	5		16.6819ha (19.4802M)	Transnet Ltd T 414 of 1968	√
	6		21.9ha	Transnet Ltd	-
	9		13.2ha	Assmang (decom railway)	√
	10		202ha	Transnet Ltd	-
	Parson No. 564		RE	Kuruman RD	1879ha
2		426ha	Assmang Ltd T 3907 of 2005		-
6		1.4076ha	Transnet Ltd T 45 of 1993		-
9		7.5ha	Assmang Ltd		√
Police Camp No. 693	-	Kuruman RD	10.6ha	Assmang Ltd	√

Note, the details in this table is captured via the Deeds website, site information and Planet GIS Cadastral Information (SA). More refinement is required.







1.c Locality Map

Figure 3, Figure 4 and Figure 5 present the location of the activities being applied for within the approved mine surface rights as described in the following table. Please refer to Figure 1 for the local setting of the site.

Table 6: Location of Listed Activities

<p>Farm Name and associated activities:</p>	<p>Farm Ownership:</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ Mokaning 260, Portion 1 ☞ Mokaning 260, Portion 3 ☞ Parson 564, Portion RE ☞ Parson 564, Portion 2 ☞ Parson 564, Portion 9 (new registration) ☞ Bruce 544, Portion RE <p>Overall WUL² Project (National Water Act, 1998, Regulation 158 Amendment – amendment to water uses previously excluded or errors/ amendments required):</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ Mokaning 260, Portion 1 ☞ Mokaning 260, Portion 3 ☞ Parson 564, Portion RE ☞ Parson 564, Portion 2 ☞ Bruce 544, Portion RE <p>New WUL Applications [(Permit 21/2016 issued by the Northern Cape Department of Environment and Nature Conservation (NCDENC))]:</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ Mokaning 260, Portion 1 ☞ Mokaning 260, Portion 3 ☞ Parson 564, Portion RE ☞ Bruce 544, Portion RE <p>New Infrastructure (Proposed new Return Water Dam 3, Paste Disposal Facility Water Return Pipeline and Return Water Pipeline from the Parson Return Water Dam to the Beneficiation Plant):</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ King 561, Portion 2 (crossing of pipeline underneath N14 at existing culvert) Parson 564, Portion 2
<p>Application area (Ha)</p>	<p>Project 1: The area on which the new Return Water Dam 3 will be constructed:</p> <ul style="list-style-type: none"> ☞ King Portion RE: Approximately 2ha on existing disturbed land (no clearance required) <p>Projects 2: The area on which the additional Paste Disposal Facility Return Water Pipeline will be located:</p> <ul style="list-style-type: none"> ☞ King 561, Portion RE ☞ King 561, Portion 2 (crossing of pipeline underneath N14 at existing culvert) ☞ Parson 564, Portion 2 <p>The area on which the additional Parson Return Water Dam Pipeline will be</p>

² The 2013 WUL is being updated to include new uses and to correct various administrative errors.

	<p>located:</p> <ul style="list-style-type: none"> Parson 564, Portion 2 <p>The area on which the additional Water Containment Facility will be located:</p> <ul style="list-style-type: none"> King 561, Portion RE <p>Projects 3:</p> <p>The area approved under Permit 21/2016, but which still requires a WUL:</p> <ul style="list-style-type: none"> Parson Portion RE: Parson Low Grade Stockpile Discard Dump - The expansion of the area from the approved 110.8ha area to the new area of approximately 356.3ha King Portion RE: Dump J – New facility of 48ha Mokaning Portion 1, 3 and King Portion RE: Mokaning Low Grade ROM Stockpile Expansion - Expansion of about 58ha Bruce Portion RE - Bruce Low Grade ROM Stockpile Expansion – expansion of about 75ha <p>No additional clearance is required. The overall Mining Area is about 9 000ha.</p>
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 3. Project 2: New Infrastructure (New Water Containment Facility and Pipelines) Project 3: Water Use License (WUL) amendment
 Mining Right Ref: NC30/5/1/2/3/2/1/070
 Project Ref: 21819
 Version: Draft for Stakeholder Comment

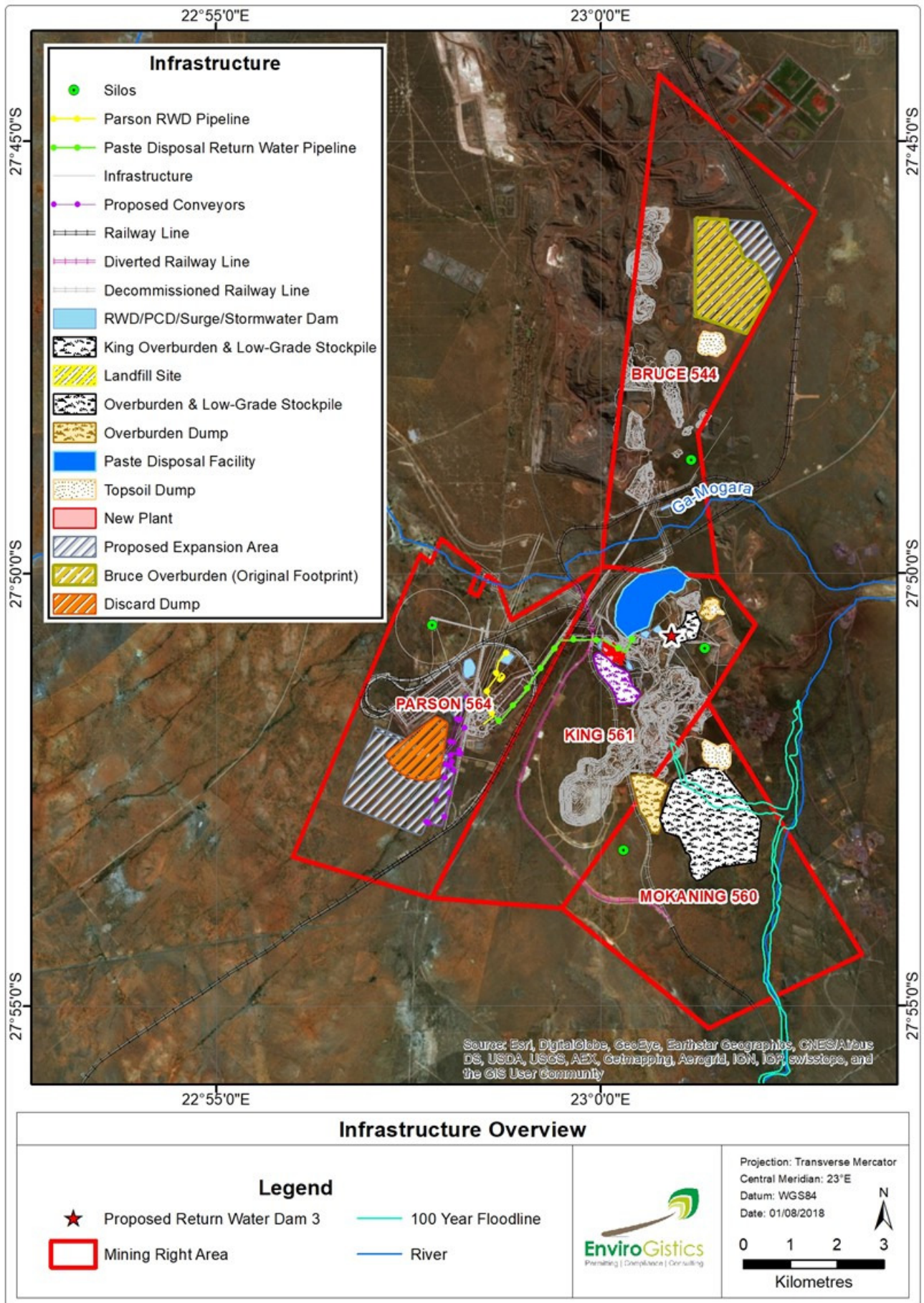


Figure 3: Location of Mine Infrastructure

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 Mining Right Ref: NC30/5/1/2/3/2/1/070
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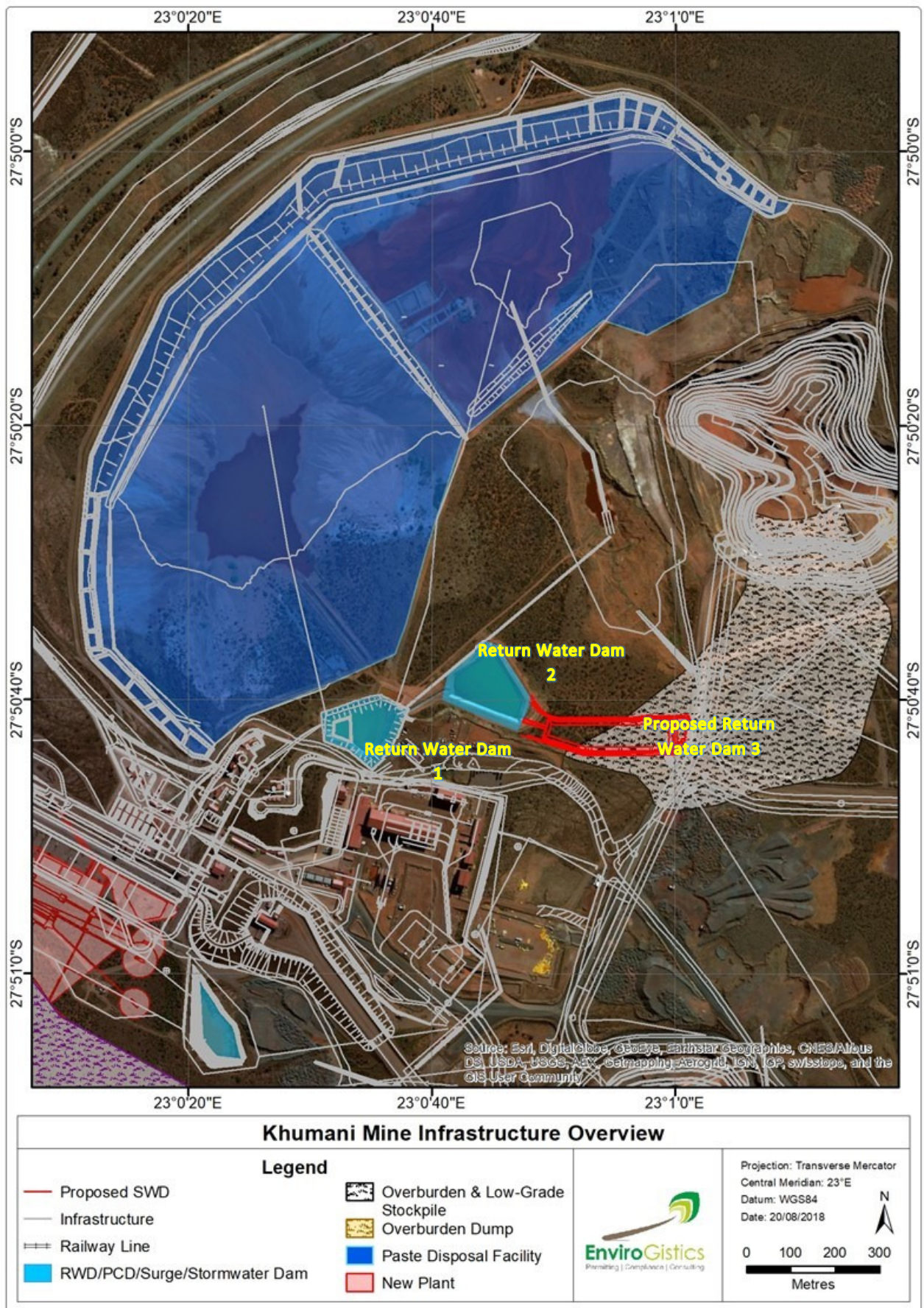


Figure 4: Location of Activities – New Return Water Dam 3

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Figure 5: Location of Activities – New Pipelines (yellow – Paste Disposal Facility Return Water Pipeline; orange – Parson Return Water Dam Pipeline))

1.d Description of the Scope of the Proposed Activity

It is the intention of Khumani to apply for the necessary WUL for activities already approved in terms of Environmental Authorisations (Project 3). In addition to this, Khumani will apply for the construction of a third return water dam (which will be referred to as Return Water Dam 3 for the purpose of this project) (Project 1). This latter activity will also require a WUL for a Section 21g water use. Other projects which will form part of the water optimisation project is the additional pipeline from the Paste Disposal Facility to the Beneficiation Plant and the additional pipeline from the Parson Plant Storm Water Dam to the Beneficiation Plant to optimise water reticulation and return within the water circuit (Project 2). Based on the hydrological investigation currently being undertaken, capacities of approved infrastructure may be required, such as the duplication in tanks like the King Braithwaite Tanks to allow for additional water storage buffer capacity on site (Project 3).

The following sections present a detailed description of each of the projects. However, prior to introducing the activities, a background to the Environmental Authorisation required is presented to provide clarity on the purpose of the current authorisation process.

1.d.i *Listed Activity Location and Size (also considering other Environmental Legislation)*

1.d.i.1 National Environmental Management Act, 1998 (NEMA)

In terms of the NEMA, there are three (3) listing notices which should be considered for this application. These listing notices were amended during April 2017. This amendment did not repeal the 2014 listed activities, but purely amended certain listings. Listing Notice 1 (Regulation 983) activities require a Basic Assessment Process, whereas Listing Notice 2 (Regulation 984) activities require a full Environmental Impact Assessment (EIA) Process. Listing Notice 3 (Regulation 985) activities require a Basic Assessment Process if the area falls within certain geographic zones. Khumani is not characterised by gazetted Threatened Ecosystems, Critical Biodiversity Areas (CBAs) or located in proximity to any Protected or Conservation Areas and for this reason Listing Notice 3 is not applicable to the mine.

Considering the above, the following listed activities may be triggered:

NEMA Government Notice 983 (amended 2017 in Government Notice 327), Listing Notice 1:

- ☞ Activity 10: The development and related operation of infrastructure exceeding 1 000 meters in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes –
 - with an internal diameter of 0,36 meters or more; or
 - with a peak throughput of 120 liters per second or more;
 - excluding where—(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
- ☞ Activity 13: The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic meters or more.
- ☞ 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, excluding— (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies.

NEMA Government Notice 984 (amended in Government Notice 325), Listing Notice 2:

- ☞ Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.

No additional road construction or linear infrastructure development which triggers the NEMA listed activities are required. In addition to this no clearance of vegetation is required for the activities in question as these have either been approved for such purpose (Permit 21/2016 activities) or will be located in already disturbed areas such as the proposed Return Water Dam 3 (49 000m³ facility with a dam height of less than 5m) which will be located within the footprint of the existing Paste Disposal Facility on the southern perimeter.

1.d.i.2 National Heritage Resources Act, 1999 (NHRA)

For this project, no authorisations in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) are triggered when considering:

- a) Archaeological artefacts, structures and sites older than 100 years;
- b) Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
- c) Objects of decorative and visual arts;
- d) Military objects, structures and sites older than 75 years;
- e) Historical objects, structures and sites older than 60 years;
- f) Proclaimed heritage sites;
- g) Grave yards and graves older than 60 years;
- h) Meteorites and fossils; and
- i) Objects, structures and sites of scientific or technological value.

Section 34 of the NHRA deals with structures that are older than 60 years. Section 35(4) of the NHRA deals with archaeology, palaeontology and meteorites. Section 36 of the NHRA, deal with human remains older than 60 years. Unidentified/ unknown graves are also handled as older than 60 years until proven otherwise. Heritage studies have been completed for the areas in question as part of the approved Environmental Authorisations. As no areas of clearance will take place, it is confidently stated that no impact on heritage resources will take place.

According to Regulation 38 of the NHRA, any development or other activity which will change the character of a site exceeding 5 000m² in extent requires notification to the South African Heritage Resources Agency (SAHRA). As mentioned above, as no areas of clearance will take place, it is confidently stated that no impact on heritage resources will take place and the character of the site will not be altered.

1.d.i.3 National Environmental Management: Waste Act, 2008 (NEM:WA)

Considering the NEM:WA, Regulation 921, dated 29 November 2013 and as amended, makes provision for lists of waste management activities that have, or are likely to have a detrimental effect on the environment.

No waste activities are planned in terms of the project. Sumps may be present as silt traps to the Return Water Dam 3 at the Paste Disposal Facility. Dirty water will be disposed of in terms of legal practices to a licensed facility (in this event the Paste Disposal Facility should the freeboard require this). It is further pertinent to note that at present and with the information available, it is not foreseen that a waste licence will be required for the Return Water Dam 3, as this facility will be regarded as a storage facility (transfer point) between the Paste Disposal Facility and Beneficiation Plant. The facility is not considered a lagoon, but will be a constructed dam, which will contain runoff contaminated water (which constitutes waste water as defined by the Department of Environmental Affairs (DEA)).

1.d.i.4 National Water Act, 1998 (NWA)

Chapter 4 of the NWA specifically addresses the use of water and is a tool for an authority to ensure the implementation of the principle that National Government has overall responsibility over water resource management, including the equitable allocation and beneficial use of water in the public interest, including that a person can only be entitled to use water if the use is permissible under the Act. In general, a water use must be licensed unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. Section 21 of the NWA identifies eleven (11) consumptive and non-consumptive water uses which must be authorised.

The activities associated with this project will trigger WULs, due to the following:

- ☞ The new Return Water Dam 3 and the King Water Containment Facility will trigger a Section 21g water use for storage of water containing “waste”;
- ☞ The new pipelines will not require any additional WULs;
- ☞ The Permit 21/2016 activities (Mine Residue Deposits) will trigger a Section 21g water use for the disposal of waste in a manner which may detrimentally impact on a water resource;
- ☞ The Permit 21/2016 activities (Bruce Low Grade ROM Stockpile) is located near a dry pan and therefore triggers both Section 21c (impeding or diverting the flow of water in a watercourse) and Section 21i (altering the bed, banks, course or characteristics of a watercourse) within the ambit of the definitions of the NWA.

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Mining Right Ref: NC30/5/1/2/3/2/1/070

Project Ref: 21819

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- Various amendments will be applied for on the approved WUL (2013) based on water throughput volumes in dams, disposal volumes, etc. which will be based on the outcomes of the Water Studies (Water Balance and Storm Water Management studies) currently being undertaken by Geo Tail (Pty) Ltd. These could result in new water uses or amendments to water uses such as the duplication of a Braithwaite Tank, etc.

It is important to note that this Environmental Authorisation Process currently being undertaken only provides for the following:

- Environmental Authorisation Application for the proposed Return Water Dam 3;
- Environmental Authorisation Application for the proposed pipelines and the proposed King Water Containment Facility;
- Environmental Authorisation Application for the construction of the Paste Disposal Facility Return Water Pipeline and Parson Return Water Dam Pipeline and likely the proposed Water Containment Facility at King;
- Environmental Authorisation Application for the required changes to the WUL (2013) or inclusion of approved Environmental Authorisations which triggers: “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, excluding— (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies” or “The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.”

The activities in question and a brief location description is presented in the following table:

Table 7: Listed Activities

Name of Activity	Aerial extent of the Activity (Ha or m ²)	Listed Activity (X – yes where applicable)	Applicable Listing Notice	Waste Management Authorisation (Indicate whether an authorisation is required in terms of the NEM:WA). (Mark with an X)	Water Use Licence Authorisation (Indicate whether an authorisation is required in terms of the NWA). (Mark with an X)
Project 1: Proposed Return Water Dam 3	Approx. 2ha	X	Government Notice 327, Listing Notice 1: <ul style="list-style-type: none"> ☛ Activity 13: “The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic meters or more,” Government Notice 325, Listing Notice 2: Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA).	Note: At the current time and with the information available it is not foreseen that a waste license will be required for the Return Water Dam, as this facility will be regarded as a storage facility (transfer point) between the Paste Disposal Facility and Beneficiation Plant. The facility is not considered a lagoon, but will be a constructed dam, which will contain runoff contaminated water (which constitutes waste water by the Department of Environmental Affairs (DEA)).	x
Project 2 (new infrastructure): Proposed Pipeline from the Paste Disposal Thickener to the Beneficiation Plant thickener at a volume of approximately 375l/s. Proposed Pipeline from the Parson Return Water Dam to the Beneficiation Plant to improve the commitment of Khumani to reuse water optimally within the water circuit. The throughput volume is 1 700l/s. A new Water Containment Facility is planned at the King Plant area to supply the mining operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new Water Containment Facility at the King operation, Khumani can store water for this mining operation specific and allow for buffer	Paste Disposal Facility Pipeline: Approx. 4 200m (Approx. 375l/s) Parson Return Water Dam Pipeline: Approx. 3 000m (Approx. 1 700l/s)	X	Government Notice 327, Listing Notice 1: <ul style="list-style-type: none"> ☛ Activity 10: “The development and related operation of infrastructure exceeding 1 000 meters in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – <ul style="list-style-type: none"> ○ with an internal diameter of 0,36 meters or more; or ○ with a peak throughput of 120 liters per second or more; or ○ excluding where— ○ such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area. Government Notice, Listing Notice 2: <ul style="list-style-type: none"> ☛ Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). 	Not Applicable (N/A)	X (Water Containment Facility at King)

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Mining Right Ref: 30/5/1/3/2/1(179) EM
Project Ref: 21808
Version: FINAL

Name of Activity	Aerial extent of the Activity (Ha or m ²)	Listed Activity (X – yes where applicable)	Applicable Listing Notice	Waste Management Authorisation (Indicate whether an authorisation is required in terms of the NEM:WA). (Mark with an X)	Water Use Licence Authorisation (Indicate whether an authorisation is required in terms of the NWA). (Mark with an X)
capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m ³ . Should clearance be required this will also be less than 1ha of indigenous vegetation.					
Project 3: The areas approved under approved Environmental Authorisations, such as Permit 21/2016, but which still requires a WUL.	Approx. 430ha	X	All the activities for which amendments will be required are present and approved in existing environmental authorisation and therefore no clearance activities are applicable. However the amendments to the WUL will trigger the following listed activities: Government Notice 327, Listing Notice 1: <ul style="list-style-type: none"> ☛ Activity 34: “The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions or pollution” (not considered at this time but may be required depending on Department of Water and Sanitation Consultation). Government Notice, Listing Notice 2: <ul style="list-style-type: none"> ☛ Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). 	All the activities for which amendments will be required are present and approved in existing environmental authorisation. It is currently not foreseen that additional waste licenses will be required.:	x
Project 3: Regulation 158 amendment for changes and corrections to the approved WUL.	N/A – overall farm portion of about 9000ha, no new construction areas.	X	A new Water Balance and Storm Water Management Assessment is being completed by the mine which will be included into the Scoping Phase. These studies may identify the need to apply for amendments to existing approved Water Uses and therefore the following activity has been included: Government Notice 327, Listing Notice 1: <ul style="list-style-type: none"> ☛ Activity 34: “The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions or pollution” (not considered at this time, but may be required depending on Department of Water and Sanitation Consultation). 	-	x

1.d.ii Description of the Activities to be Undertaken

1.d.ii.1 Project 1: Return Water Dam 3

Please refer to the following table for details regarding this project:

Table 8: Project 1: Return Water Dam 3

Description	Footprint Size	Dimensions	Coordinates	Listed Activities triggered
Return Water Dam 3	2.7ha	Approx. 330m in length Approx. 90m in width <i>Depth: To be finalised</i> Wall height below 5m	Corner Points: 27°50'40.97"S 23° 0'49.53"E 27°50'41.23"S 23° 1'1.09"E 27°50'43.83"S 23° 1'0.57"E 27°50'44.14"S 23° 1'0.14"E 27°50'44.03"S 23° 0'52.58"E 27°50'43.02"S 23° 0'48.88"E	<u>Government Notice 327, Listing Notice 1:</u> Activity 13: The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic meters or more. <u>Government Notice 325, Listing Notice 2:</u> Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the NWA.
Temporary Access Roads	N/A			
Permanent linear infrastructure (roads or pipelines)	N/A			
Clearance	N/A will be located within the existing cleared area associated with the Paste Disposal Facility.			

The sections in italic will be finalised during the EIA Phase.

1.d.ii.1.a Location

Return Water Dam 3 will be located on Portion 0 of the farm King, on the southern boundary of the existing Paste Disposal Facility.

Please refer to Figure 4 for the location of Return Water Dam 3.

1.d.ii.1.b Operational Setting

In 2015, water supply shortages were experienced at the mine and an augmentation project was initiated in consultation with the DWS, Kimberley, to site, drill and test boreholes suitable for supplying the water requirements of the mine in periods when the Sedibeng Water Supply Scheme cannot meet the requirement. The lack of water supply during the October to January period every year results in significant production losses with the processing plant coming to a halt.

For this reason, the mine initiated investigations to implement abstraction boreholes on the Remainder Portion of the farm Bruce, located within the mining area. It was the intention of the mine to abstract approximately 456 192m³ (at 44l/s) of groundwater combined from these boreholes during the four (4) month period. Based on the outcomes of the Stakeholder Consultation Process, and the concern raised by stakeholders on the already strained aquifers, the mine committed to undertake further studies to optimise water management within the existing water circulation system. This brought attention to the optimisation of the dirty water catchment and water management in and around the Paste Disposal Facility. Khumani operates the Paste Disposal Facility to dispose of the fines from the beneficiation process.

This paste technology is a benchmark technology to ensure that no significant environmental impacts occur and that the maximum volume of water returns to the Plant. For this reason approximately 90% of water is recovered

through the paste thickening procedures. Water recovered during the thickening process is returned to the Beneficiation Plant to be reused. The remaining water on the Paste Disposal Facility is captured via a barge system and pumped to the Return Water Dam. The water system between the Beneficiation Plant and the Paste Disposal Facility is interlinked.

General Arrangements of the Paste Disposal Facility

The Paste Disposal Facility complex comprises three active paste storage compartments (Compartments 1, 2 and 3A), the Return Water Dam 1 and the Return Water Dam 2 (approved in the WUL as the Decant Dam)). The Return Water Dam 1 (utilised during normal operating conditions) overflows into the Return Water Dam 2 (utilised during storm conditions) which overflows into Compartment 3A (only during emergency conditions – not utilised to date). The KM02 Opencast Pit is currently an active pit located adjacent to Compartments 2 and 3A. The locations of these storage compartments are shown in the following figure.

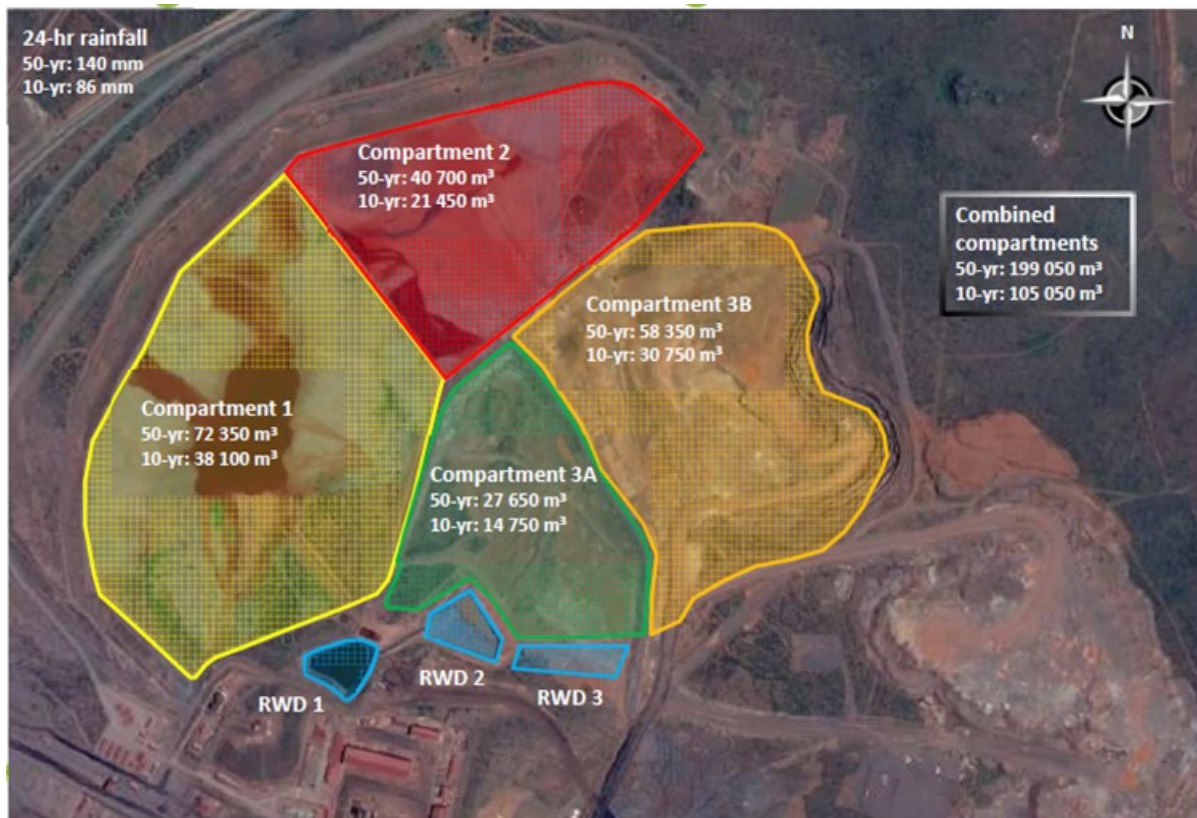


Figure 6: General Arrangements of the Paste Disposal Facility layout in terms of Storm Water Management

As per the approved EMP and WUL, once mining in KM02 Opencast Pit is complete, it will be converted into a paste storage compartment and named Compartment 3B. Compartment 3B will form part of the overall Paste Disposal Facility. Compartments 1, 2, 3A and 3B are fully impoundment with perimeter embankments constructed using waste rock and other suitable construction materials

Paste is discharged from the impoundment wall delivery stations to form a beach that slopes downwards away from the wall to the southeast flank of the facility, where the supernatant pond will be located.

A waste rock dump (referred to as the Southeast Overburden Dump) has been formed in the upstream catchment of the Paste Disposal Facility, creating a broadly oval shaped facility.

Supernatant water on the Paste Disposal Facility accumulates in a pool within each of the compartments as a result of beaching. This supernatant water, predominantly derived from the process, but also from rainfall, is decanted from the surface of the Paste Disposal Facility for the following reasons:

- ☞ To conserve water;
- ☞ To prevent accumulation and eventual overtopping;
- ☞ To allow drying consolidation of the residue;

- ☞ To reduce infiltration and potential rises in the phreatic surface and eventually instability or groundwater contamination; and
- ☞ To reduce evaporation losses.

The decant arrangement comprises of duty and standby submersible pumps mounted on a floating barge, connected to an HDPE pipeline. Supernatant is pumped to the Return Water Dam 1 at a nominal rate of 400m³/h and a maximum rate of 600m³/h. The decant pump is relocated, as required, to keep it within the pool. A floating walkway and platform provide access to the floating barge. The decant barge system returns supernatant to the Return Water Dam from where it is pumped to the secondary thickener water tank. Overflow from the thickener also report to this tank from where it is pumped to the primary thickener located at the Beneficiation Plant for use as process water. This Return Water Dam 1 is HTPE lined and has a capacity of 49 000m³. To optimise water management in terms of freeboard of the Return Water Dam and when water cannot be pumped to the Beneficiation Plant, an additional Return Water Dam 2 was included to the system in early 2013. Water from the Return Water Dam 1 gravity feeds to the Return Water Dam 2), which is also a HTPE lined facility at 49 000m³.

Phased Development and the Water Management Requirements

Compartments 1 and 2 have rate of rise restrictions to ensure their structural stability. Deposition rates on Compartments 1 and 2 are currently maximised, so excess paste is deposited on Compartment 3A.

The paste level within Compartment 3A is nearing the point where further impoundment embankment raising is required to maintain adequate freeboard in Compartment 3A. Most of the impoundment embankments were historically raised to final height apart from a section in the southern portion of Compartment 3A. This is along the interface between Return Water Dam 2 and Compartment 3A. This section of the embankment needs to be raised to maintain legal freeboard requirements for Compartment 3A. Return Water Dam 2 is located within the Compartment 3A basin, in the upstream (southern) portion of the basin.

The existing Return Water Dam 2 has a trapezoidal shaped spillway that discharges into the Compartment 3A basin. However, by raising the outstanding impoundment embankment section, the spillway route will be blocked. As the basin of Compartment 3A continues to rise, its elevation will also become higher than that of Return Water Dam 2).

To mitigate this, the mine will develop the proposed Return Water Dam 3. The water from the Return Water Dam 2 will be gravity fed to Return Water Dam 3, through a pipe system. Return Water Dam 3 will in discharge into Compartment 3B though a pipe spillway. This will ensure that the Return Water Dam 1 and Return Water Dam 2, operate in the same way that it was originally designed to operate.

The exact designs of the proposed Return Water Dam 3 are not yet available, but the volume of the facility will be approximately 49 000m³.

The intention of the project is as follows:

- ☞ Supernatant and storm water will be pumped from the Paste Disposal Facility compartments to the existing concrete lined silt trap.
- ☞ The silt trap overflows into the existing HDPE lined Return Water Dam 1 from where the water is returned to the thickener overflow tank for re-use in the process.
- ☞ Excess storm water will overflow from the Return Water Dam 1 into the existing Return Water Dam 2.
- ☞ In turn, excess storm water will overflow from the existing Return Water Dam 2 into the new Return Water Dam 3.
- ☞ Water will then be pumped from the Return Water Dam 3 to the Return Water Dam 1 or 2 once the water level in the Return Water Dam 1 has dropped significantly.
- ☞ The intention is to operate the Return Water Dams dry and to maintain the level in the Return Water Dam 1 at less than 30%.

1.d.ii.2 Project 2: Pipelines and Water Containment Facility

Table 9: Project 2: New Pipelines and Water Containment Facility

Description	Footprint Size	Dimensions/Details	Coordinates	Listed Activities triggered
Proposed Pipeline from the Paste Disposal Thickener to the Beneficiation Plant thickener at a volume of approximately 375l/s.	Approximately 4 200m in length	<i>Type of pipe to be confirmed (steel or HTPE)</i> <i>Diameter of pipe to be confirmed</i>	Start Point: 23° 0'24.73"E 23° 0'24.73"E End Point: 22°58'29.97"E 22°58'29.97"E	<u>Government Notice 327, Listing Notice 1:</u> Activity 10: The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – with an internal diameter of 0,36 metres or more; or with a peak throughput of 120 litres per second or more; excluding where—(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
Proposed Pipeline from the Parson Return Water Dam to the Beneficiation Plant to improve the commitment of Khumani to reuse water optimally within the water circuit. The throughput volume is 1 700l/s.	Approximately 3 000m in length	<i>Type of pipe to be confirmed (steel or HTPE)</i> <i>Diameter of pipe to be confirmed</i>	Start Point: 27°50'55.16"S 22°58'46.91"E End Point: 22°58'29.97"E 22°58'29.97"E	<u>Government Notice 327, Listing Notice 1:</u> Activity 10: “The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – with an internal diameter of 0,36 meters or more; or with a peak throughput of 120 litres per second or more; excluding where—(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
A new Water Containment Facility is planned at the King Plant area to supply the mining operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new Water Containment Facility at the King operation, Khumani can store water for this mining operation specific and allow for buffer capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m ³ . Should clearance be required this will also be less than 1 ha of indigenous vegetation.	Capacity of less than 50 000m ³ and footprint less than 1ha. <i>The design has not been finalised, however, if the facility is a constructed dam, the wall height will not exceed 5m.</i>	<i>Not yet finalised, this facility may be a tank or dam structure.</i>	Not yet finalised.	<u>Government Notice 325, Listing Notice 2:</u> Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. – this activity is triggered as the proposed dam would require approval in terms of a new Water Use (Section 21g) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

The sections in italic will be finalised during the EIA Phase.

1.d.ii.2.a Location

The Paste Disposal Facility Return Water Pipeline is planned to tap of the existing Paste Disposal Facility Tank circuit and follow the existing pipe system towards the Beneficiation Plant.

The pipe will cross underneath the N14 National Road, via an existing circuit and will run parallel with the existing conveyors and pipeline systems towards the Parson Beneficiation Plant.

The Storm Water Dam Return Pipeline will be routed from the existing pumping facility at the Parson Storm Water Dam and will follow the existing pipeline route towards the Beneficiation Plant.

The King Water Containment Facility location has not been finalised, but it will be located in the vicinity of the King mining operations on Portion RE of the farm King.

Please refer to Figure 5 for the location of the pipeline.

1.d.ii.2.b Operational Setting

Paste Disposal Facility Return Water Dam Pipeline

As mentioned before, the mine operates in a closed water circuit and therefore various thickener phases are included on site (one at the Beneficiation Plant and one at the King Plant). Water from the King Plant is diverted back via a pipeline system to the Beneficiation Plant for reuse in the system. In order to maximise water return on site, the mine will establish a second pipeline to pump water from the Paste Disposal Facility circuit back to the Plant. Water from the existing Return Water Dam will be pumped to the Thickener Tank and from there will be piped to the Beneficiation Plant.



Figure 7: Location of the Thickener Tank and the Return Water Dam

The type and design of the pipeline are yet to be finalised. Various flanges will be included to optimise maintenance on the infrastructure. It is currently planned that a volume of 375 l/s will be pumped from the Paste Disposal Facility Circuit to the Beneficiation Plant via this circuit.

Storm Water Dam Return Pipeline

Another pipeline of approximately 3km is planned from the Parson Return Water Dam (currently called the Storm Water Dam) which will return water back to the Plant for reuse. The design of the pipeline is currently not final,

however it is anticipated that the throughput will be about 100m³/hr, which will amount to about 1 700l/s when water is present in this facility.

Water Containment Facility for King mining operations

A new Water Containment Facility is planned at the King Plant area to supply the mining operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new Water Containment Facility at the King operation, Khumani can store water for this mining operation specifically and allow for buffer capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m³. Should clearance be required this will also be less than 1 ha of indigenous vegetation.

1.d.ii.3 Project 3: Changes and/or Amendments to WUL

Table 10: Project 2: Changes to the approved WUL

Description	Footprint Size	Dimensions/Details	Coordinates	Listed Activities triggered	
Regulation amendment for changes and corrections to the approved WUL.	158 for and the	N/A – overall farm portion of about 9 000ha, no new construction areas.	<i>The various water uses to be amendment is still to be confirmed.</i>	General changes to the existing WUL (2013)	A new Water Balance and Storm Water Management assessment is being completed by the mine which will be included into the EIA Phase. These studies may identify the need to apply for amendments to existing approved water uses and therefore the following activity has been included: <u>Government Notice 327, Listing Notice 1:</u> Activity 34: The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions or pollution. (Not considered at this time, but may be required depending on consultation with the DWS).

The sections in italic will be finalised during the EIA Phase.

Khumani intends to amend the existing WUL to correct various administrative errors, as well as to include water uses associated with the 2016 Environmental Authorization (Permit 21/2016). The latter involves the expansion and development of various Mine Residue Deposits on site. In addition to this, the mine intends to construct a new Return Water Dam (details and designs not as yet finalised) associated with the existing Paste Disposal Facility. The projects are located on all four (4) farms owned by Khumani.

The Permit 21/2016 issued by the NCDENC makes provision for the following activities:

- Expansion of the Parson Low Grade Discard Stockpile;
- Expansion of the King/Mokaning Overburden Low Grade ROM Stockpile (H);
- New Low Grade Stockpile (J); and
- Expansion of the Bruce Low Grade ROM Stockpile.

Based on the outcomes of the Water Studies by Geo Tail (Pty) Ltd (Water Balance and Storm Water Management assessment) various other amendments may be required to approve water uses in terms of throughput/ naming and/or volume amendments. Once the amendments to the WUL has been finalised the updated water uses will be presented in the EIA phase.

1.d.iii Description of the Activities to be undertaken

The infrastructure and activities that will form part of the proposed project will include the following:

- Planning Phase:
 - Ensure the implementation of Legal Requirements (Environmental Permits and Authorisations).
- Construction Phase:
 - Establishment of surface infrastructure;
 - Storm Water Management; and
 - Waste Management.
- Operational Phase:
 - Optimise pumping of water from the Paste Disposal Facility circuit to the Beneficiation Plant;
 - Operation of the Return Water Dam and Water Containment Facility;
 - Storm Water Management; and
 - Waste Management.
- Closure Phase:
 - Ensure the implementation of Legal Requirements (Environmental Permits);
 - Storm Water Management;
 - Removal of Pipelines and potential spills as a result of the removal;
 - Removal and Rehabilitation of the Water Containment Facility;
 - Rehabilitation of the Return Water Dam 3 in parallel with the Paste Disposal Facility;
 - Earth moving, shaping and ripping of ground;
 - Cessation of Labour Contracts; and
 - Waste Management.

1.e Policy and Legislative Context

South Africa has a comprehensive environmental governance framework underpinned by an extensive array of environmental laws. The past years have evidenced the wholesale reform of South Africa's environmental legal framework under the guidance of the Constitution.

Historically, the mining industry in South Africa has not been subjected to comprehensive environmental regulation. However, in recent years, this has changed significantly and the industry is now required to comply with a multifaceted network of mining and environmental legislation. There are no shortages of policy and legal frameworks to ensure "responsible" mining in South Africa. The Minerals and Mining Policy for South Africa, 1998 affirmed that the State, as custodian of the nation's natural resources, will support mining development while maintaining and enhancing environmental awareness of the mining industry in accordance with national environmental policy, norms and standards.

The following table presents the key policy and legislative considerations as part of this application.

Table 11: Policy and Legislative Context

Applicable Legislation And Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
The Constitution of South Africa (Act No. 108 of 1996)	Sustainable development is relevant to all projects.	<p>The Constitution reigns supreme and the advancement of human rights is one of the foundations of South Africa’s democracy. Furthermore, the Bill of Rights plays a central role in the democratic regime because it embodies a set of fundamental values which should be promoted at all times. An environmental right is contained in Section 24 and is, arguably, the cornerstone for environmental governance in South Africa, which includes the mining industry. Section 24(a) proclaims the right of everyone “to an environment that is not harmful to their health or well-being”. Mining companies are thus duty-bound to constitutional, legislative, and other measures to prevent pollution and ecological degradation, promote conservation and to develop in a sustainable manner.</p> <p>The Constitution cannot manage environmental resources as a stand-alone piece of legislation, hence additional legislation have been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations is designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on 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.</p>
Specific Environmental Management Acts (SEMAs)		
The Hazardous Substances Act, 1973 (Act No. 15 of 1973) (HSA)	Management of Chemicals	All chemicals transported to and stored on site will be handled in accordance with the HSA and the applicable materials safety data sheets. A chemical log will be kept and all the necessary signage erected on site.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)	-	<p>Section 34 and 38 of the NHRA details specific activities that require an approved heritage impact assessment by the South African Heritage Resources Association (SAHRA).</p> <p><i>A heritage permit will only be required where a road exceeding 300m in length will be constructed, or more than 5 000m² of land will be cleared – none of these are applicable to this project..</i></p>
National Water Act, 1998 (Act No. 36 of 1998) (NWA)	Amendment of the WUL (2013) as well as the application for the Return Water Dam 3.	<p>One of the main and ever-continuing concerns in South Africa is the sustainability of water management, and the costs associated with the prevention and remediation of pollution. The NWA is one of the government’s answers to some of these challenges and functions as sectoral legislation within the framework of NEMA.</p> <p>Section 19 of the NWA echoes the duty of care envisaged in Section 28 of NEMA and addresses the prevention and remediation of the effects of pollution. The NWA provides for a broad duty of care in that:</p> <p>“(1) an owner of land, a person in control of land or a person who occupies or uses the land on which-</p> <p>a) any activity or process is or was performed or undertaken; or</p> <p>b) Any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.”</p> <p>The words “likely to cause pollution” broadens the scope of the duty, which enables an activity, or situation that is land-based, to trigger the application of the duty. The “reasonable measures” are not prescribed, but may include measures intended to:</p>

Applicable Legislation And Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p><i>“Cease, modify or control any act or process causing the pollution; comply with any prescribed waste standard or management practice; contain or prevent the movement of pollutants; eliminate any source of pollution; remedy the effects of pollution; and remedy the effects of any disturbance to the bed and banks of a watercourse.”</i></p> <p>The NWA, furthermore, provides for water use authorisations which a mine will have to apply for, before commencing with its primary activity of mining. Water uses that need to be licensed under Section 21 of the NWA include:</p> <ul style="list-style-type: none"> a) Taking water from a water resource; b) Storing water; c) Impeding or diverting the flow of water in a watercourse; d) Engaging in a stream flow reduction activity; e) Engaging in a controlled activity; f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; g) Disposing of waste in a manner which may detrimentally impact on a water resource; h) Disposing in any manner of waste which contains waste from, or which has been heated in , any industrial or power generation process; i) Altering the bed, banks, course or characteristics of a watercourse; j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and k) Using water for recreational purposes. <p>Khumani’s existing Water Use Licence (WUL) is currently being updated and the changes to the approved facilities will be incorporated into this process.</p>
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA)</p>	<p>The NEM:WA waste activities are not being triggered as part of this project. However, this legislation is considered in the development of waste management measures and assessing potential impacts.</p>	<p>The NEM:WA fundamentally reformed the law regulating waste management, and for the first time provides a coherent and integrated legislative framework addressing all the steps in the waste management hierarchy. The objectives of the NEM:WA are to protect health, well-being and the environment by providing reasonable measures for, <i>inter alia</i>, remediating land where contamination presents, or may present, a significant risk of harm to health or the environment.</p> <p>The objectives of the NEM:WA are structured around the steps in the waste management hierarchy, which is the overall approach that informs waste management in South Africa. The waste management hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority; i.e.: waste avoidance, reduction, re-use, recycling, recovery, treatment, and safe disposal as a last resort.</p> <p>NEMA, as previously mentioned, introduced a number of additional guiding principles into South African environmental legislation, including the life-cycle approach to waste management, producer responsibility, the precautionary principle and the polluter pays principle (i.e. the sustainability principles as contained in Section 2 of NEMA). Section 5(2) of the NEM:WA stipulates that the Act should be interpreted and guided in accordance with these sustainability principles.</p> <p>The NEM:WA, furthermore, echoes the duty of care provision in terms of Section 28 of NEMA, by obliging holders of waste to take reasonable measures to implement the waste management hierarchy. Section 16(1) of the NEM:WA provides that:</p> <p><i>“A holder of waste must, within the holder’s power, take all reasonable measures to –</i></p>

Applicable Legislation And Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p><i>a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;</i></p> <p><i>b) reduce, re-use, recycle and recover waste;</i></p> <p><i>c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;</i></p> <p><i>d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;</i></p> <p><i>e) prevent any employee or any person under his or her supervision from contravening this Act; and</i></p> <p><i>f) prevent the waste from being used for an unauthorised purpose.”</i></p> <p>When considering whether a “substance” is considered a “waste” or not, the definition of the NEM:WA must be considered. The NEM:WA defines “waste” as:</p> <p>“Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 of this Act; or</p> <p>Any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette.”</p> <p>At the current time and with the information available it is not foreseen that a waste licence will be required for the new Return Water Dam 3, as this facility will be regarded as a storage facility (transfer point) between the Paste Disposal Facility and Beneficiation Plant. The facility is not considered a lagoon, but will be a constructed dam, which will contain runoff contaminated water (which constitutes waste water by the DEA).</p>
<p>National Environmental Management Act, 2004 (Act No. 10 of 2004) (NEM:BA)</p>	<p>Relevant to protected tree removals, as well as to development within CBAs and listed Threatened Ecosystems.</p>	<p>The NEM:BA addresses a number of issues related to biodiversity and how it should be protected and managed in undertaking development activities.</p> <p>The purpose of the NEM:BA is to provide for the management and conservation of South Africa’s biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.</p> <p>Khumani is not located in a CBA, furthermore, no clearance of vegetation is required as part of this project. In the event that clearance is required for the King Water Containment Facility this will be less than 1ha and where required the necessary permits will be applied for as per the standard practice currently implemented by the mine.</p>
<p>Framework Legislation</p>		
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)</p>	<p>This Draft Scoping Report & the EMP which will follow as part of the EIA process.</p>	<p>In respect of the Listed Activities in terms NEMA, Section 24F(1)(a) of NEMA stipulates the following:</p> <p>“no person may- commence an activity listed or specified in terms of section 24(2)(a) or (b) unless the competent authority or the Minister of Minerals and Energy, as the case may be, has granted an environmental authorisation for the activity...”</p>

Applicable Legislation And Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p>Section 24F is clear in its prohibition that only those “listed or specified” activities may not commence without prior Environmental Authorisation. Consequently, the activities to be conducted by the Mine will only trigger Environmental Authorisation requirements when these said activities trigger a listed or specified activity referred to in Section 24F.</p> <p>Furthermore, note that the law is clear in that NEMA and its Regulations do not have retrospective working. Accordingly, in terms of the various Listing Notices promulgated since 1997, it is paramount to link the commencement date of the specific activities with the corresponding Listed Activities.</p> <p>There are currently five sets of EIA Regulations which govern potential Listed Activities. The focus should be on if and when a Listed Activity was commenced with in terms of the specific Regulations; i.e.:</p> <ul style="list-style-type: none"> ☛ Environmental Conservation Act, 1989 (ECA) Listed Activities, promulgated in terms of the ECA (effective between 08 September 1997 and end of day 09 May 2002); ☛ ECA Listed Activities, promulgated in terms of the ECA (effective between 10 May 2002 and before end of day 02 July 2006); ☛ The 2006 EIA Regulations, 2006 Listing Notice 1 and 2006 Listing Notice 2 (effective between 03 July 2006 and end of day 01 August 2010); ☛ The 2010 EIA Regulations, 2010 Listing Notice 1, 2010 Listing Notice 2 and 2010 Listing Notice 3 (effective between 02 August 2010 and end of day 07 December 2014); and ☛ The 2014 EIA Regulations, 2014 Listing Notice 1, 2014 Listing Notice 2 and 2014 Listing Notice 3 (commencement date 08 December 2014, as amended in April 2017). <p>Accordingly, an activity must be assessed in terms of the specific Regulations applicable at the time of commencement of the specific activity.</p> <p>EnviroGistics undertook a detailed review of the listed activities according to the proposed project description to assess the listed activities that are considered applicable. The assessment was undertaken in line with the 2017 EIA Listed Activities.</p> <p>The EIA Application fee of R10 000 was paid to the DMR on 28 September 2018. An Application for Environmental Authorisation was couriered to the DMR and received by the DMR on 2 October 2018.</p> <p>The acknowledgement of the application has as yet not been received from the DMR.</p> <p><i>Under the One Environmental System (December 2014), the Minister of Mineral Resources will issue environmental authorisations in terms of the NEMA for mining activities related to the primary extraction and/or primary processing of ore material. The Minister of Environmental Affairs will form the appeal authority.</i></p>
<p>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 1998) (MPRDA)</p>	<p>Existing Mining Right, amendments to activities and addition to infrastructure and activities on site.</p>	<p>Since 2004, the MPRDA has been the principle piece of legislation that regulates the South African mineral and petroleum sector.</p> <p>The MPRDA was enacted with the objectives of promoting local and rural development, ensuring equal access to minerals, and eradicating discriminatory practices in the industry, while still guaranteeing security of tenure to participants in the industry and increasing the industry's international competitiveness.</p> <p>Recent amendments to NEMA and the MPRDA have been published with the objective to align NEMA and the MPRDA authorisation processes as well as to provide for cooperative governance between the DMR and the DEA.</p>

DRAFT Environmental Scoping Report for in terms of Nation Environmental Management Act, 1998 for:Project 1: New Return Water Dam 3.Project 2: New Infrastructure (New Water Containment Facility and PipelinesProject 3: Water Use License (WUL) amendment
Mining Right Ref: 30/5/1/3/2/1(179) EM
Project Ref: 21808
Version: FINAL

Applicable Legislation And Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p>The governing provisions in respect of EMPs/ EMPr's were removed from the MPRDA and incorporated into Sections 24N, 24O, 24P, 24Q, 24R and 24S of NEMA.</p> <p>The project does not entail any additional authorisation for mining rights in terms of the MPRDA. The surface infrastructure will be located within the approved mining area within Khumani. No changes to the Mining Works Programme are required at this time.</p>
Municipal Plans		
Integrated Development Plan (IDP) for the Gamagara Local Municipality (Draft for Year 2017-2022) in which the new activities are located.	Economic Development	The IDP, clearly states that the Gamagara Local Municipality, "being situated in an arid area, has extremely limited water resources. Settlements in the area are therefore extremely dependent on the extraction of groundwater for various uses. Although water resources in the area are supplemented by Sedibeng Water, the exponential growth in the area, especially around Kathu, has necessitated the close monitoring and protection of underground water resources" (IDP 2010/11). The purpose of optimising water management and circulation within the mining area is therefore paramount to the key water issues raised in the IDP.
National Development Plan (NDP)	Local Municipality within the National and Provincial Planning Context	<p>The IDP/ Budget argues that South Africa displays what could be seen or described as a "top-down, and, at the same time, bottom-up" process of development planning. The NDP is a plan for the country to encourage long term planning, i.e. up to 2030. The municipality incorporates the long term visioning as espoused in the NDP. The following six pillars have widespread merits for strategic planning:</p> <ul style="list-style-type: none"> ☛ Unite all South Africans around a common programme to fight poverty and inequality and promote social cohesion; ☛ Have South Africans be active citizens in their community and in the development of the country; ☛ A growing and inclusive economy with higher investment, better skills, rising savings and greater levels of competitiveness; ☛ Building capabilities of the people and the state; ☛ A developmental state capable of correcting historical inequalities and creating opportunities for more people while being professional, competent and responsive to the needs of all citizens; and ☛ South African leaders putting aside narrow sectarian interests in favour of national interest and putting the country first.

1.f Need and Desirability of the Proposed Activities

Khumani has been operational since 2006 when construction started. The mine has been investigating measures to optimise water management on site due to the fact that groundwater resources are mostly dewatered in the operational areas of the mine as a result of surrounding mining activities and water supply is purchased at high costs from the Sedibeng Water Supply Scheme, which is the main source of water supply to not only the mine, but also the surrounding towns, farmers and communities.

As a result the mine has identified various projects to aid in optimising the internal water circuit.

1.f.i *Project 1: Return Water Dam 3*

The mine currently has two dams which form part of the Paste Disposal Facility General Arrangements and water circuit. It is the intention of the mine to expand on the capacity of storage around the Paste Disposal Facility due to the following reasons:

1. The expansion of the Paste Disposal Facility into its next disposal compartment will require the management of storm water around the area.
2. Additional storage capacity for storm water will be required when Compartment 3B (existing KM02 opencast pit) is commissioned as a paste storage compartment.
3. The initial intention of sourcing water from the groundwater aquifers to supplement water supply in periods when the Sedibeng Water Supply Scheme cannot provide water have been placed on hold, due to concerns raised by the surrounding landowners regarding water scarcity in the catchment, and the opportunity for the mine to firstly consider optimising its internal water circuit.
4. The new Return Water Dam3 will also ensure legal compliance (i.e. GN 704 etc.).
5. The additional dam, Return Water Dam 3, will ensure that water can be optimally stored in the area and pumped to the Beneficiation Plant.

1.f.ii *Project 2: Pipelines and Water Containment Facility*

Khumani's only source of water supply is that of the Sedibeng Water Supply Scheme. For this reason it is pertinent for the mine to ensure that there is sufficient infrastructure on site to optimise water reuse within the process water circuit, as well as to allow for buffer storage capacity in periods where the pipeline scheme is not operational or supply lower volumes of water.

The additional pipeline to transport water to and from the Paste Disposal Facility is merely an upgrade and improvement of the existing system. The mine experiences blockages on the system due to the high density of the slurry pumped. For this reason the additional pipeline will not only assist to transport water during technical constraints on one line, but will also allow for an increase in pumping volume during periods of high rainfall events.

The Water Balance of Khumani and approved WUL requires Khumani to reuse water optimally in the circuit. The volumes of water currently being received in the Parson Return Water Dam cannot be pumped optimally to the Beneficiation Plant due to the infrastructure constraints. With the increase in the pumping infrastructure and associated pipelines, the mine will have the opportunity to return more water from the dams to the process circuit. For this reason an upgrade to the pumping system at the Parson Storm Water Dam and increase to the pipeline from the Storm Water Dam to the Beneficiation Plant is required.

As mentioned before, a new Water Containment Facility is planned at the King Plant area to supply the mining operations. Currently water is being supplied via the Parsons storage facilities, which in periods hampers capacities, when water scarcity arise in the area. With a new Water Containment Facility at the King operation, Khumani can store water for this mining operation specific and allow for buffer capacities in dry events. The capacity of the facility and the design of the facility are as yet not available, but will be less than 50 000m³. Should clearance be required this will also be less than 1 ha of indigenous vegetation.

1.f.iii *Project 3: Changes and/or Amendments to WUL*

The mine has an approved WUL (2013). Upon receipt of this WUL, the mine has requested various amendment to the WUL. The DWS presented the mine with a formal letter of rejection (dated 07 August 2017) which

pertained to the amendment application submitted on 4 September 2013 (10/D41J/BCJ/2122; 21/11/2008; and 719242). The reasons for the rejection related to:

- ☞ The Department cannot trace the administrative mistakes;
- ☞ The Department was unable to source the relevant application documents from DWS Head Office;
- ☞ The Department was unable to source the comments from DWS Head Office; and
- ☞ Some of the requested amendments were seen as upgrades and not administrative mistake. .

In addition to this, the mine has applied for a new WUL for the Mine Residue Facilities approved in terms of Permit 21/2016. This application was submitted by GCS (Pty) Ltd during 2016. The DWS instructed the mine to resubmit the 2016 application as designs of the facilities were still required, together with the required amendments.

As mentioned before, the initial intention of sourcing water from the groundwater aquifers to supplement water supply in periods when the Sedibeng Water Supply Scheme cannot provide water have been placed on hold, due to concerns raised by the surrounding landowners regarding water scarcity in the catchment, and the opportunity for the mine to firstly consider optimising its internal water circuit. The mine has, as a commitment to stakeholders, engaged with a hydrologist to reassess the water balance and storm water management system on site. This study is still ongoing and will form part of the Environmental Impact Assessment Report (EIAR). Preliminary outcomes of the study have indicated the following:

- ☞ Inclusion of activities as approved in Permit 21/2016;
- ☞ Increase in the capacity of approved water containment facilities; and
- ☞ Optimising pumping throughput through containment facilities, due to the rerouting of water in the system; etc.

All of these activities will require amendments to the existing WUL.

1.g Period for which the Environmental Authorisation is required

The Environmental Authorisation is required for the life of mine, which is in excess of 24 years.

1.h Description of the process followed to identify Alternatives for the Overall Preferred Site, Activities and Technology Alternative

1.h.i Details of the Development Footprint Alternatives Considered

1.h.i.1 Details of all alternatives considered

1.h.i.1.a The property on which or location where it is proposed to undertake the activity

The projects presented are all located within the existing Mining Area. The activities considered in this application are linked to approved and established sites and therefore no property alternatives or location alternatives are relevant.

1.h.i.1.b The design or layout of the activity

1.h.i.1.b.1 Project 1: Return Water Dam 3

Increasing the capacity of the existing Return Water Dam 1 was considered. The operation received an updated WUL (Reference 10/D41J/BC1J/2122) for Section 21(a), Section 21(c&i), Section 21(g) and Section 21(j) water uses on 16 March 2013. One of the activities approved in the 2013 WUL, is the Paste Disposal Decant Dam (i.e. Surge Dam/ Return Water Dam 2). This activity is approved as the Decant Dam (Activity 8 on page 18 of the WUL).

The current capacity of the facility is 49 000m³ (approved at 1 152 094m³/a disposal). The initial intention of the mine was to expand the capacity of this dam. The expansion would have resulted in an increase in the capacity of the facility to about 180 000m³. The concern was the large storage capacity in one facility close to the Paste Disposal Facility. The mine therefore initiated the investigation of optimising pumping capacities to and from the Paste Disposal Facility and as a result identified the opportunity to construct a smaller facility up gradient of the Return Water Dam 2), which will aid in the water storage management around the Paste Disposal Facility. For this reason the Return Water Dam 3 was considered as a more suitable alternative based on the management of

the facilities (water volume storage) and the pumping of water between facilities, as well as safety considerations on the facility.

1.h.i.1.b.2 Project 2 – Pipelines and Water Containment Facility

No alternatives are applicable as the pipelines are designed according to the current design infrastructure successfully utilised on site and with the throughput capacities as identified as part of the hydrological study.

In terms of the Water Containment Facility, the location and size will be dependent on the outcomes of the Water Study currently being completed by Geo Tail (Pty) Ltd. The alternatives in terms of design may range from a tank structure or a civil constructed dam.

1.h.i.1.b.3 Project 3: Changes and/or Amendment to WUL

No alternatives are applicable, as the activities in question are established, and/or approved in terms of Environmental Authorisations.

1.h.i.1.c The technology to be used in the activity

No technological alternatives are relevant to the three projects.

1.h.i.1.d The operational aspects of the activity

As mentioned before, Khumani has been operational since 2007. The mine has been investigating measures to optimise water management on site due to the fact that groundwater resources are mostly dewatered in the operational areas of the mine as a result of surrounding mining activities. Water supply is purchased at high costs from the Sedibeng Water Supply Scheme, which is the main source of water supply to not only the mine, but also the surrounding towns, farmers and communities.

As a result, the mine has identified various projects to aid in optimising the internal water circuit, which relates to the required Return Water Dam 3 and new pipeline infrastructure.

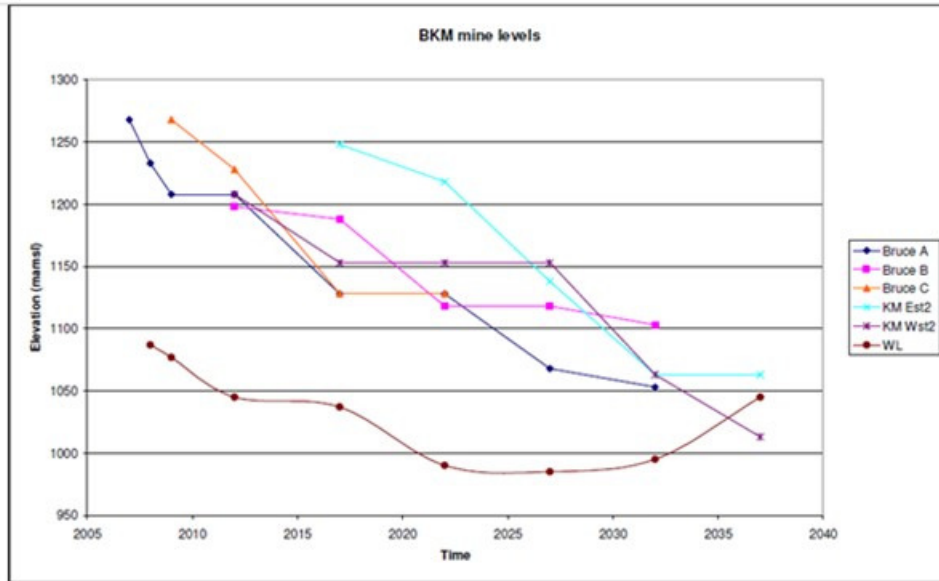
The only alternative to consider would be to operate in terms of the status quo, which present water constraints during four months of the year (October and January) when the Sedibeng water supply is not consistent, or to apply for the use of groundwater, which has raised concerns during initial consultation processes in 2017.

The options in question relate to the improvement of existing facilities on site.

1.h.i.1.e The option of not implementing the activity

In 2007, Khumani was granted a mining right and mine construction began shortly thereafter. Production at the mine started in 2008. Khumani has the capacity to mine approximately 16 million tons of iron ore per annum, which is mined from a series of opencast pits by conventional mining methods such as drilling, blasting and loading into trucks for haulage to the crushers. To date no dewatering has been required from Khumani mine to ensure safe mining conditions. Water supply for processing has been supplied by Sedibeng Water Board via the Vaal/ Gamagara Pipeline.

Khumani currently has an approved WUL (Reference 10/D41J/BC1J/2122 dated 16 March 2013). In addition, the mine has another WUL (Reference 719242, dated 27 November 2008), but was replaced by the 2013 WUL. Both of these WULs allow the mine to abstract groundwater for safe mining conditions (Section 21j water use - abstraction of water at 432 000m³/annum for safe mining purposes) once the mine intercepts groundwater through its opencast pit operations. Current studies foresee these activities to be required from 2035. The numerical studies of 2006 and 2017 indicate that the dewatering will only affect the groundwater compartment within which the opencast pits are situated, please refer to the following graph.



Graph 1: Future Dewatering Trends

In 2015 water supply shortages were experienced at the mine and an augmentation project was initiated in consultation with the DWS, Kimberley, to site, drill and test boreholes suitable for supplying the water requirements of the mine in periods when the Sedibeng Water Supply Scheme cannot meet the requirement. The lack of water supply during the October to January period every year results in significant production losses with the processing plant coming to a halt.

For this reason, the mine is investigating the implementation of four boreholes on Portion RE of the farm Bruce, located within the mining area. It is the intention of the mine to abstract a combined volume of approximately 456 192m³ (at 44l/s) of groundwater from these boreholes during the four (4) month period. During the consultation phase with stakeholders in 2017, the stakeholders voiced concern regarding further water abstraction in the catchment. The mine therefore committed to undertake further water studies to first identify measures to optimise water internally.

The activities applied for in terms of this application (specifically the new activities: Return Water Dam 3, Water Containment Facility, two new pipelines) is considered to optimise the internal water flow within the mining circuit. If this project is not approved, the mine will continue to experience shortage of water supply during certain times of the year, and lose the opportunity to implement sound Water Conservation and Demand Management Practices.

The new activities being applied for will be located in existing disturbed or cleared areas, where ancillary infrastructure is present. The Return Water Dam 3 will be located in the Paste Disposal Facility footprint area, and the pipelines will follow an existing linear corridor.

The activities relating to the WUL Amendment are approved activities in terms of Environmental Authorisations and therefore no conditions are not relevant.

1.h.ii Details of the Public Participation Process Followed

Public participation is understood to be a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the Scoping and Environmental Impact Reporting (S&EIR) process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts and opportunities of the proposed project.

The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the Proposed Project, including the scale and nature of the existing and proposed activities;

- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues and solutions.
- In accordance with the NEMA GNR 982, Chapter 6, the following activities as stipulated in the sections hereafter, have taken place or are proposed to take place within the Draft Scoping Report review period or beyond:

1.h.ii.1 Stakeholder Identification

The public participation process must include consultation with (1) the competent authority, (2) every state department that administers a law relating to the matter, (3) all organs of state which have jurisdiction in respect of the activity to which the application relates, (4) all potential, or, where relevant, registered Interested and Affected Parties (I&APs). In order to satisfy this requirement, the EAP includes the following consultations in the process:

- Competent Authority - The DMR is the competent authority related to this application. This application forms the first of the consultations with the DMR. The EAP undertakes to engage in on-going communications with the DMR (preferably directly with the allocated case officer).
- Departments that administer a law relating to the matter - The DWS has been directly informed of the proposed projects via email and telephonic conversations. DWS will be the competent authority due to a WUL application that needs to be submitted for the proposed project.
- All organs of state which have jurisdiction in respect of the activity to which the application relate;:
- National Level: DEA - Under the "One Environmental System" rolled out by Government on 8 December 2014, licensing processes for mining, environmental authorisations and water use have been streamlined. Under the One Environmental System, the Minister of Mineral Resources will issue environmental authorisations and waste management licences in terms of the NEMA, and the NEM:WA respectively, for mining and related activities. However, note that in the new system, the Minister of Environmental Affairs will be the appeal authority for these authorisations to ensure complete independency to the competent authority.
- Provincial Level: Given that the activity is located within the Northern Cape Province, the Northern Cape Department of Environment and Nature Conservation (NCDENC) will form a primary commenting authority during the process. The provincial Heritage Resource authority will be informed of the project.
- District and Local Level: The farm Mokaning is situated within the Tsantsabane Local Municipality (NC085), which forms part of the ZF Mgcau District Municipality (formally known as the Siyanda District Municipality). The farms Parson, Bruce and King are situated within the Gamagara Local Municipality (NC01B1), which forms part of the John Taolo Gaetsewe District Municipality (formally known as the Kgalagadi District Municipality).
- All potentially registered I&APs - The existing Khumani stakeholder database was used as a base starting point. The database was updated following any stakeholder requests to be registered. The use of site notices, notification letters, Short Messaging Systems (SMS), email and fax was used as methods in which to reach potential I&APs.
- Affected Adjacent Landowners and Land Owners - As far as possible, all affected adjacent property owners were contacted and informed of the proposed new development at Khumani.
- Property Owners: Khumani holds the mining rights and surface rights.

The latest stakeholder database is included within this report as Annexure 3.

All registered I&APs, which have a direct affect/effect on the proposed project or are directly or indirectly impacted by the proposed project, have the right to lodge a comment/question on the project (until such time that the appeals process comes to a close).

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Mining Right Ref: 30/5/1/3/2/1(179) EM

Project Ref: 21808

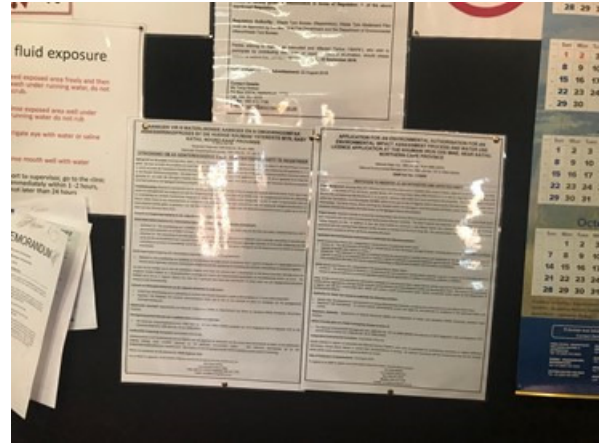
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1.h.ii.2 Stakeholder Identification and Notification

Please refer to Annexure 3 for copies of these notifications. Proof of email submissions can be requested from the EAP.

1.h.ii.3 Site Notices

In accordance with GNR 982 Section 41(2)(a-b) a site notice was developed in both Afrikaans and English and placed at four locations (see proof of placement below), in order to inform surrounding communities and adjacent landowners of the proposed project. The site notices were placed on 22 August 2018) and at visible locations close to the site. Site Notices were placed at the following locations:

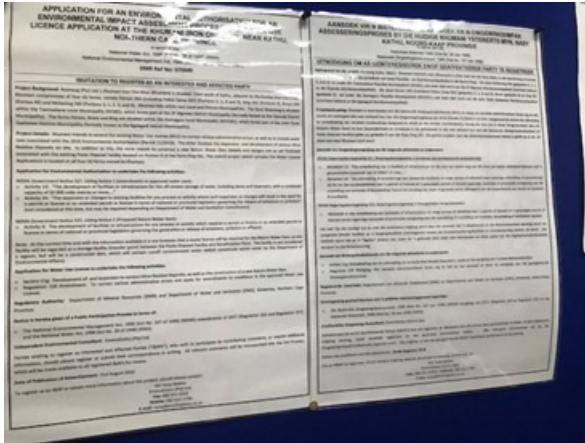


Bruce Mine

King Mine



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Parson Entrance



Gamagara Municipality

1.h.ii.4 Background Information Documents

Key stakeholders, that included the following sectors, were directly informed of the proposed development by e-mail and fax through the submission of the Background Information Document and Registration Sheet:

- ☞ Authorities;
- ☞ Municipalities;
- ☞ Residential Associations;
- ☞ Non-Governmental Organisations;
- ☞ General Public;
- ☞ Parastatals/ Service providers, and
- ☞ Adjacent Landowners.

Please refer to Annexure 3 for a copy of the Background Information Document, which was made available to all stakeholders on 31 August 2018, when the notification of the project was emailed to all stakeholders.

1.h.ii.5 Advertisements

In accordance with NEMA GNR 982, 41(2)(c) of Chapter 6 an advert was placed in:

- ☞ The Diamond Fields Advertiser (DFA); and
- ☞ The Kathu Gazette.

The advert was placed in both Afrikaans and English in the above newspapers on 29 August 2018 and 1 September 2018 respectively (see proof of newspaper adverts below).

Should the EAP note an affected stakeholder and be made aware of his/ her existence by the ward councillor, or traditional leader, efforts will be made to ensure his/ her participation in the stakeholder engagement process (as required by NEMA GNR 982, Section 41(2)(e) of Chapter 6).

Any stakeholder who submits a comment during the course of the process will automatically be registered on the project-specific stakeholder database.

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Diamond Fields Advertiser - WEDNESDAY AUGUST 29, 2018

Legals & Tenders

AANSOEK VIR 'N WATERLEENSAE AANSOEK EN 'N OMGEWINGSIMPAK ASSESSERINGSDOPOES BY DIE HUIDIGE KHUMANI YSTERIKERS MYN, NABY KATHU, NOORD-KAAP PROVINSIE

Nasionale Waterwet 1988 (NW1) en 28 van 1988
Nasionale Omgevingsimpakwet 1988 (OIA) en 107 van 1988
DMR Ref No: 21808

LETINGSOEK OM AS GINTERESSEERDE EN/OF AANGEFASDE PARTYE BESPESIFIEER

Aansoek vir die projek: Bouw van 'n dam (Return Water Dam) en 'n nuwe waterleensat (WUL) vir die Noord-Kaapse Waterregering (NW) in die Khumani-sterikermyn, naby Kathu, Noord-Kaap. Die projek is onderwerp van 'n omgewingsimpak assessering (OIA) en 'n waterleensat aansoek (WUL) vir die Noord-Kaapse Waterregering (NW). Die projek is onderwerp van 'n omgewingsimpak assessering (OIA) en 'n waterleensat aansoek (WUL) vir die Noord-Kaapse Waterregering (NW). Die projek is onderwerp van 'n omgewingsimpak assessering (OIA) en 'n waterleensat aansoek (WUL) vir die Noord-Kaapse Waterregering (NW).

APPLICATION FOR AN ENVIRONMENTAL AUTHORIZATION FOR AN ENVIRONMENTAL IMPACT ASSESSMENT PROCESS AND WATER USE LICENCE APPLICATION AT THE KHUMANI BRON ORE MINE, NEAR KATHU, NORTHERN CAPE PROVINCE

In terms of the National Water Act, 1988 (Act No 36 of 1988) (NW1) and National Environmental Management Act, 1988 (Act No 107 of 1988) (OIA).

DMR Ref No: 21808

INVITATION TO REGISTERED AND INTERESTED AND AFFECTED PARTY

Project background: The proposed Return Water Dam and Water Use License (WUL) application for the Khumani Mine, near Kathu, Northern Cape Province, is currently under review. The project is subject to an Environmental Impact Assessment (EIA) process and a Water Use License (WUL) application. The project is subject to an Environmental Impact Assessment (EIA) process and a Water Use License (WUL) application. The project is subject to an Environmental Impact Assessment (EIA) process and a Water Use License (WUL) application.

Diamond Fields Advertiser (DFA)

01 September / Lewende 2018 • KATHU GAZETTE 7

POSTMASSBURG

Lief & Leed

Miel Swart

ORLEDE
Miel Swart (14) het by die skool se sportfees, 'n 1000-ronde-wedstryd gewen. Die wedstryd was baie kompetitief en Miel Swart het baie goed gevaar. Hy het baie goed gevaar en het baie goed gevaar. Hy het baie goed gevaar en het baie goed gevaar. Hy het baie goed gevaar en het baie goed gevaar.

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POSTMASSBURG

Idol deelneem uit eie bodem

Miel Swart

ORLEDE
Miel Swart (14) het by die skool se sportfees, 'n 1000-ronde-wedstryd gewen. Die wedstryd was baie kompetitief en Miel Swart het baie goed gevaar. Hy het baie goed gevaar en het baie goed gevaar. Hy het baie goed gevaar en het baie goed gevaar. Hy het baie goed gevaar en het baie goed gevaar.

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Kathu Gazette

1.h.ii.6 Document Review

The Draft Scoping Report will be made available on public review for a period of 30 days from **17 October 2018**.

Electronic Copies of the report are available from:

- Public Participation Office via Dropbox link.

Hard copies of the Draft Scoping Report were couriered to the following authorities:

- Department of Mineral Resources – Registry
- Northern Cape Department of Environment and Nature Conservation – Ms. Doreen Werth
- Department of Water and Sanitation (Kimberley) – Mr. Aron Magono
- SAHRA – Online system (although no site clearance will take place)
- Gamagara Municipality – Municipal Manager
- ZF Mgcawu District Municipality – Municipal Manager

1.h.ii.7 Stakeholder Meetings

Due to the nature of the project (being largely the optimisation of existing infrastructure, no stakeholder meetings are considered.

1.h.ii.8 Summary of Issues raised by the I&APs

The Issues and Responses Register will include the comments received during the Stakeholder Consultation Process undertaken for the proposed project. This includes responses to the advertisements, response sheets, individual discussions with key stakeholders, and any other comments received during the project timeframe up to **16 November 2018**.

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Return Water Dam 3.Project 2: New Infrastructure (New Water Containment Facility and PipelinesProject 3: Water Use
License (WUL) amendment

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Comments reported within this Issues and Response Register will be updated during the project. This document can therefore be considered as an active document up until the final reports are submitted. No comments have been received to date.

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Table 12: Stakeholder Comments received

NO.	THEME: GENERAL COMMENTS / ISSUES	DATE AND HOW ISSUE WAS RAISED	COMMENTATOR	RESPONSE
-	-	-	-	-

1.h.iii The Environmental Attributes associated with the Alternatives

As no significant changes in the location of infrastructure are required based on the alternative discussions to date, the environmental attributes associated with the current site locations are presented.

1.h.iii.1 Baseline Information

1.h.iii.1.a.1 Climate

Information contained in this section was obtained from Khumani EMP Amendment undertaken in 2011, the Air Quality Assessment undertaken by Airshed Planning Professionals (Pty) Ltd in 2005 and the Air Quality Gap Analysis undertaken by Prism EMS (Pty) Ltd in 2015.

Temperature

Although the Northern Cape is mainly semi desert, the western areas of the Northern Cape, including Namaqualand, a small section of the Green Kalahari and Calvinia, Nieuwoudtville and Loeriesfontein in the Karoo fall in the winter rainfall area, with rains received from April to September. Sharing the same climate as Namaqualand, these two sub regions provide displays of wild flowers during spring months from July to October.

The Northern Cape’s weather is typical of desert and semi desert areas. This is a large dry region of fluctuating temperatures and varying topographies. The annual rainfall is sparse, only 50 to 400mm per annum. In January, afternoon temperatures usually range from 34 to 40°C. In 1939 an all-time high of 47.8°C was recorded at the Orange River. Summer temperatures often reach 40°C. See the following for the mean monthly minimum and maximum temperatures from the Parson Weather Station.

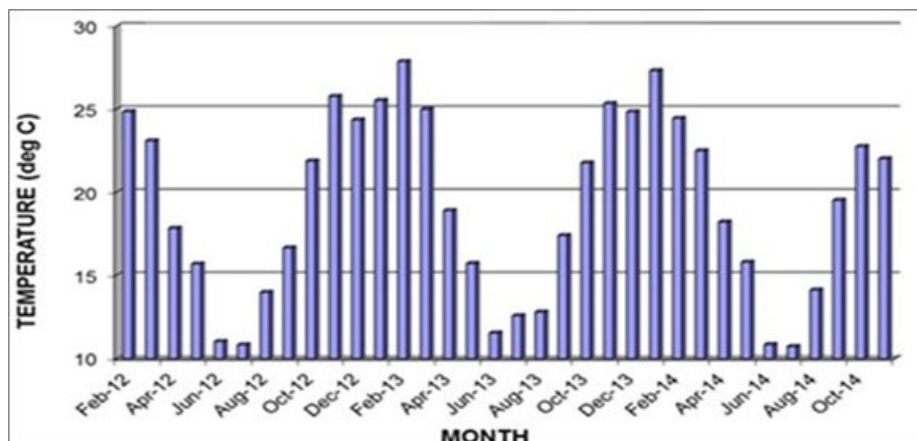


Table 13: Mean monthly Minimum and Maximum temperatures

Rainfall

Records from the previous study from South African Weather Service for the Postmasburg and Kuruman Weather Stations (years 2000 and 2003) and from the Sishen Weather Station for the years 1961 to 2001 (Sishen Iron Ore Mine EMPr, 2002) show that the mean annual rainfall for the area is approximately 386 mm, while the observed records on the farm Parson for the three year period show 353mm. The data obtained from the weather station on site for the periods 2012, 2013 and 2014, noted an annual rainfall for the area of 418mm, 154mm and 314mm respectively, as shown in the following figure.

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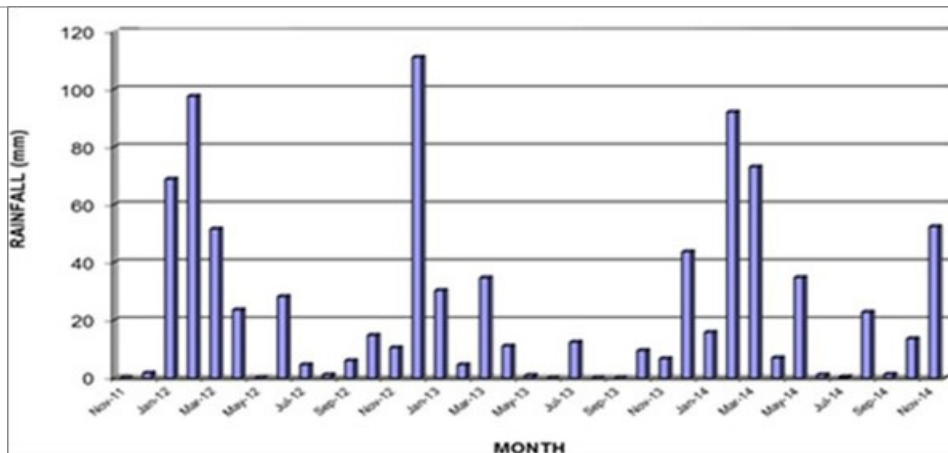


Figure 8: Total Annual Rainfall measured at Parson Weather Station (2012-2014)

Wind

The weather station that monitors standard meteorological parameters has been operational on the farm Parson at the Salvage Yard, north of processing plant and west of stackers/ reclaimers since the end of November 2011. The station experienced problems with data capturing during the first few months of operation, but is now yielding results on a regular basis. The graphs for wind roses and different measured parameters are presented in the following graph.

In terms of the data collected from the weather station, the spatial and annual variability in the wind field for farm Parson is clearly evident in the following figure. The predominant wind direction is from north-northeast and south southwest, with frequent winds also occurring from the north and south. Over the three-year period, frequency of occurrence was over 8% from the south and south south-westerly sector, with south-westerly winds occurring over 7% of the time. Less frequent (above 6% of the time), but stronger winds were noted from the north, north-north-easterly and north-easterly sector.

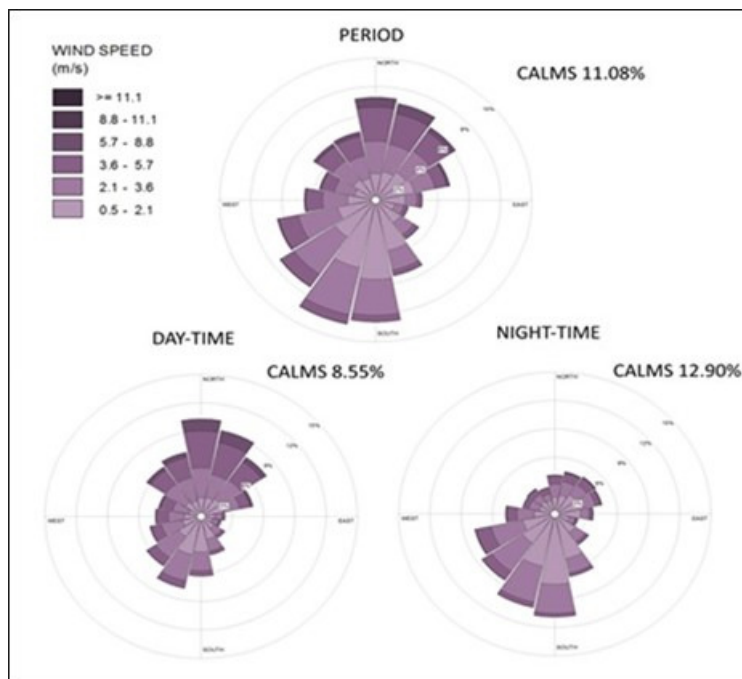


Figure 9: Period wind roses measured at Parson Weather Station (2012-2014)

Calm conditions (wind speeds less than 0.5m/s) occur for less than 11.8% of the time, with winds between 0.5-2.1m/s occurring for 40% of the time. The data is in good agreement with data sourced for the previous study for

the SAWS automated weather station in Kathu, indicating that the average wind speeds over this site for the period November 2011 to end November 2014 is 2.21m/s.

During daytime there is an increase in winds from north-northwest, north and northwest, with frequencies of greater than 10%. Nocturnal wind flow reflects more dominant winds from the south, south-southwest and southwest. Frequent winds from the south occur for approximately 10% of the time. Night-time conditions also reflect a decrease in wind speeds with average wind speed decreasing to 1.87 m/s in comparison to daily wind speeds of between 2.55m/s. Refer to Figure 10 for indication of seasonal wind directions as measures at Parson Weather Station.

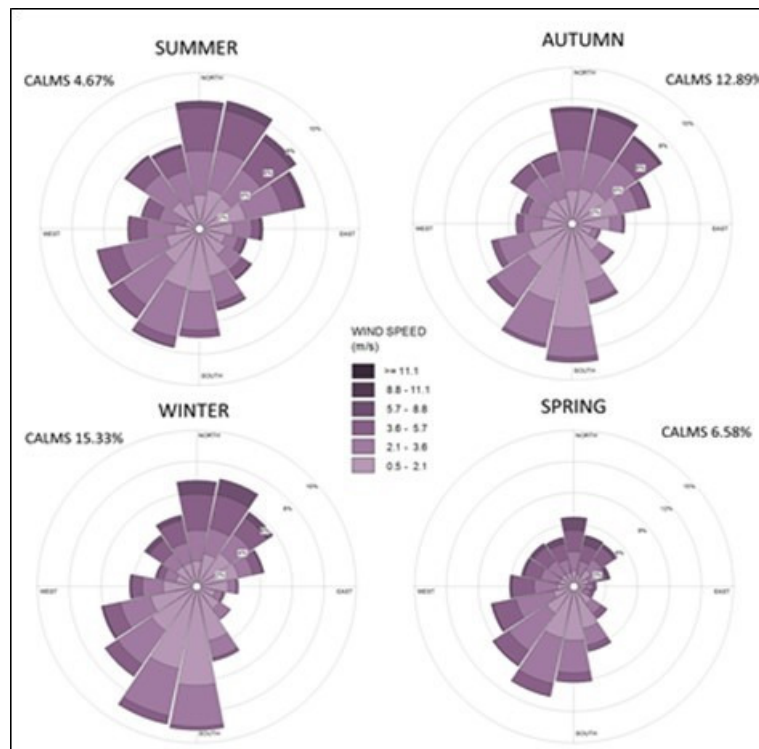


Figure 10: Seasonal wind roses measured at Parson Weather Station (2012-2014)

1.h.iii.1.a.2 Topography

The topography of the project area is characterised by relatively flat terrain, with no steep inclines with the exception of the mountain ranges to the west (Langberg range) and a smaller range to the east (Kuruman Heuwels). Altitudes range from approximately 1235 metres above mean sea level (mamsl) in the south to 1210mamsl in the north.

Various landform elevations occur within the mining right area, with the highest elevation present on the southern portion of farm Bruce (1271mamsl) and the lowest elevation (1200masl) in the floodplain of the Gamagara River, with the land gradually increasing in gradient to approximately 1240masl in the central part of the mining right area. The elevation gradient from north to south along the central line of the mining right areas is shown.

The project areas in question are located on relatively flat terrain already graded as part of the Paste Disposal Facility as can be seen from the following figures.

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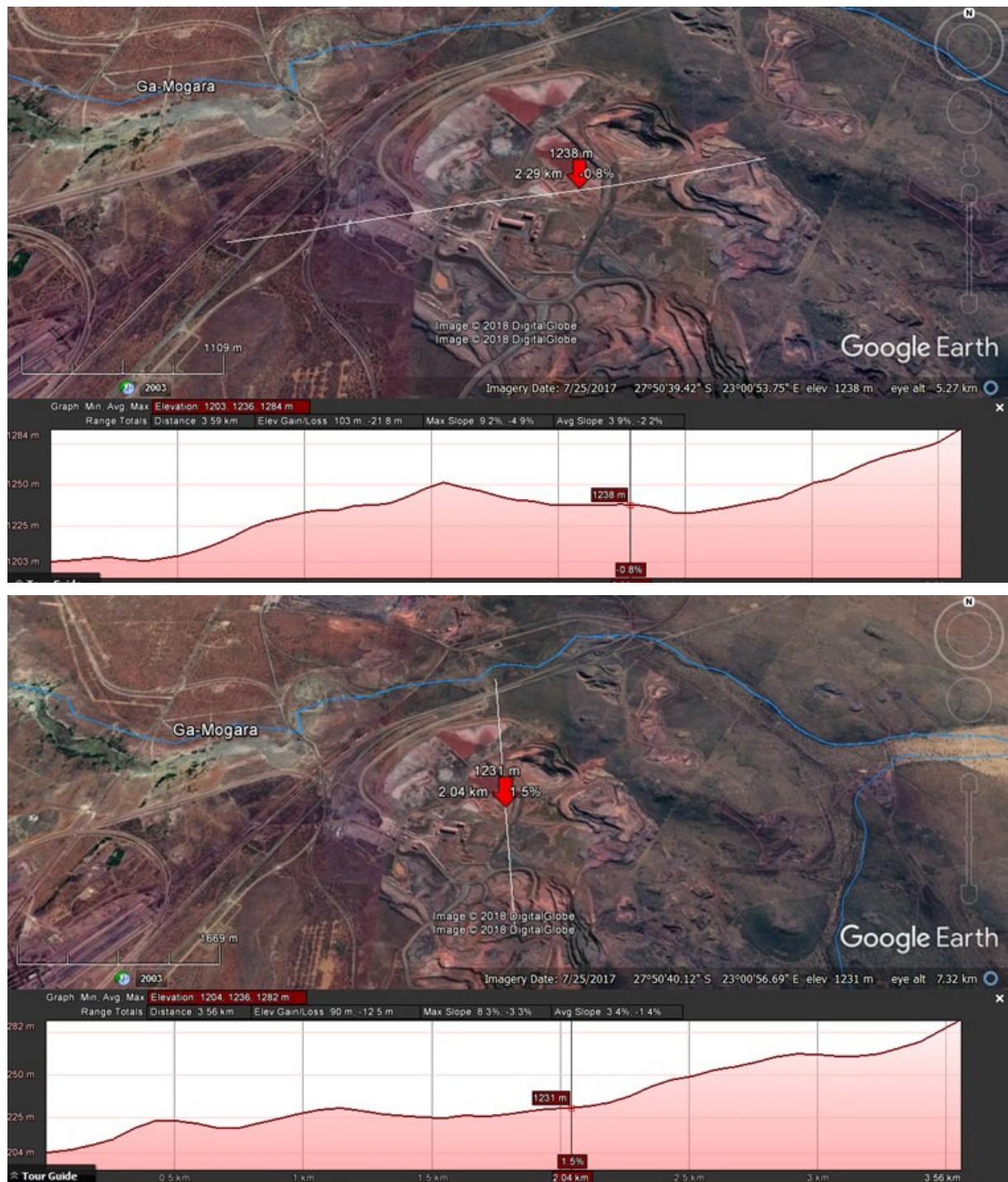


Figure 11: Topographical Setting where the Return Water Dam 3 is planned

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Figure 12: Topographical Setting of the area in which the pipelines are planned

1.h.iii.1.a.3 Geology

According to a report compiled by Golder Associates Africa (Pty) Ltd on the Water Augmentation Project, January 2017, the central part of the mine consists of the Campbellrand Subgroup (Ghaap Group) and represents the Maremane Anticline (Dome). East of the dome is the Asbestos hills Subgroup (Kuruman Iron-Formation) in the form of large, easterly arching syncline, the Dimoten Syncline. The Ongeluk Formation (andesitic lavas) represents the cover rocks in the syncline, deposited on an unconformity. The western boundary of the Ghaap Group lies on a regional thrust fault system overlain by quartzite and shales of the Mapedi and Gamagara Formations.

The regional geology of the mine comprises of sedimentary and extrusive rocks of three Supergroup sequences, spanning a significant geological time span (between 2680 and 358 Ma) and is illustrated in the table below. These sequences are partially covered by Tertiary-Quaternary sediments of the Kalahari Group and windblown sands of the Gordonia Formation.

The rock formations of the pre-Karoo Group are located close to the western margin of the Kaapvaal Craton. This margin has been subjected to intensive, structural deformation due to tectonism ~2400 – 1700 Ma (i.e. the Kheis Orogeny: folding, thrusting and faulting).

A thick succession of dolomites, viz. the Campbell Rand Subgroup represents the central part of the Maremane Dome (or anticline) and consists of alternating layers of oolitic and stromatolitic dolomite with thin interbedded layers of shale and quartzite. This succession is believed to be several thousand metres thick, based on the stratigraphic core borehole drilled by the CGS just north of Sishen during the 1990's. During the Kheis Orogeny, the basal units of the dolomite were exposed to palaeo-erosion and subsequent karstification of the dolomites. This process has played a major role in the enrichment (i.e. leaching of silica from the overlying Banded Ironstone Formation (BIF)) of hematite and subsequently forming the vast amounts of iron ore occurrences in the study area.

The Asbestos hills Subgroup lies conformably on the Campbellrand Subgroup and consists of typical banded ironstones of various thicknesses. The "blinklip breccia", a basal layer of banded iron stone, lies on the Campbell Rand Formation in the Maremane Anticline (see the following table) and serves as a marker in the regional geological sequences in the area.

The Postmasburg Group (Makganyane diamictite formation and the overlying Ongeluk lava formation) in the western part of the Maremane Dome, unconformably overlies the Ghaap Group (i.e. Campbellrand and Asbestos hills Formations) and underlies the Gamagara Formation (Olifantshoek Group) with an unconformity –

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representing a local thrust fault package from the west which sits between the Asbestos hills Subgroup (lower) and the Makganyene diamictite and Ongeluk lava. The regional extend of this feature is not known; although it has been mapped in the Sishen and Beeshoek areas.

Table 14: Basic Geological Model of the Area

Sequence	Supergroup	Group/ Subgroup/ Formation	Lithology	Comments
(5)		<u>Kalahari</u>	Sand Calcrete/Clay Boulder Beds	D41J: Moderate aquifer & local flow path.
(4)	Karoo	<u>Dwyka</u>	Shale Diamictite	D41J: Karoo paleo-channel fill;
(2)	Olifantshoek	<u>Mapedi/Gamagara</u>	Quartzite/Shale Lava Shale Quartzite/Flagstone Shale Quartzite Shale Conglomerate	Represents western boundary formations of study area; Tectonism – regional, but low metamorphism.
(3)-(2)		Diabase		Intrusive, localised occurrence.
(3)	Transvaal	Postmasburg: <u>Ongeluk</u> <u>Makganyene</u>	Andesitic lava ♦Diamictite	Western and Eastern flanks of the Maremane Dome (Anticline). ♦Localised occurrences
		Thrust Fault Zone		Originated from the west during regional tectonism (2400 Ma-2700Ma)
(1)	Transvaal	<u>Ghaap:</u> Asbestoshills	Banded formation (BIF) iron	Western and Eastern flanks of the Maremane Dome (Anticline); Large exposures on Dimoten Syncline in the east; and Forms the eastern high lands area and subsequent boundary of the study area.
		Chert Breccia		Localised, mainly in Maremane Dome (Anticline).
		<u>Ghaap:</u> Campbellrand	Dolomite (DLMT)	Large exposures in the centre of the Maremane Dome (Anticline) Extremely thick succession (~3000m just north of Sishen – CGS Exploration bh.)
Unconformities in geological profile (GCS, 2011 and Da Silva, 2011).				

The Ongeluk Formation (lava) forms the upper part of the Transvaal Supergroup and overlies the Makganyene Group. Andesitic lava belonging to this formation crops out in the Dimoten Syncline and southeast of the Maremane Anticline and disappears under the Kalahari sand cover further north.

The Gamagara Formation was deposited on the Maremane Anticline; this contact zone represents an unconformity overlying the dolomite and banded iron formations of the underlying formations.

Tertiary - Quaternary Deposits

The bedrock geology in the mining right area is partially concealed by sediments of the Kalahari Group. In the eastern parts of the mine the cover becomes thin and patchy and large areas of bedrock are exposed.

The Kalahari Group consists primarily of calcrete, gravel and clay beds. It is subdivided into 5 Formations, i.e. Wessels Gravel Formation, overlain by the Budin Clay Formation and the Eden Sandstone Formation, followed by the Mokalanen Limestone Formation (mainly calcrete) with the Gordonia aeolian Sand Formation at the top.

Kalahari Group sediments with roughly a northeast to southwest strike direction vary in thickness from a few millimetres to several meters and covers the northern middle part of the mining right area. Relatively thick deposits of calcrete occur as capping's of the dolerite rocks and normally causes a higher relief due to the expansion mechanism present in the calcification process.

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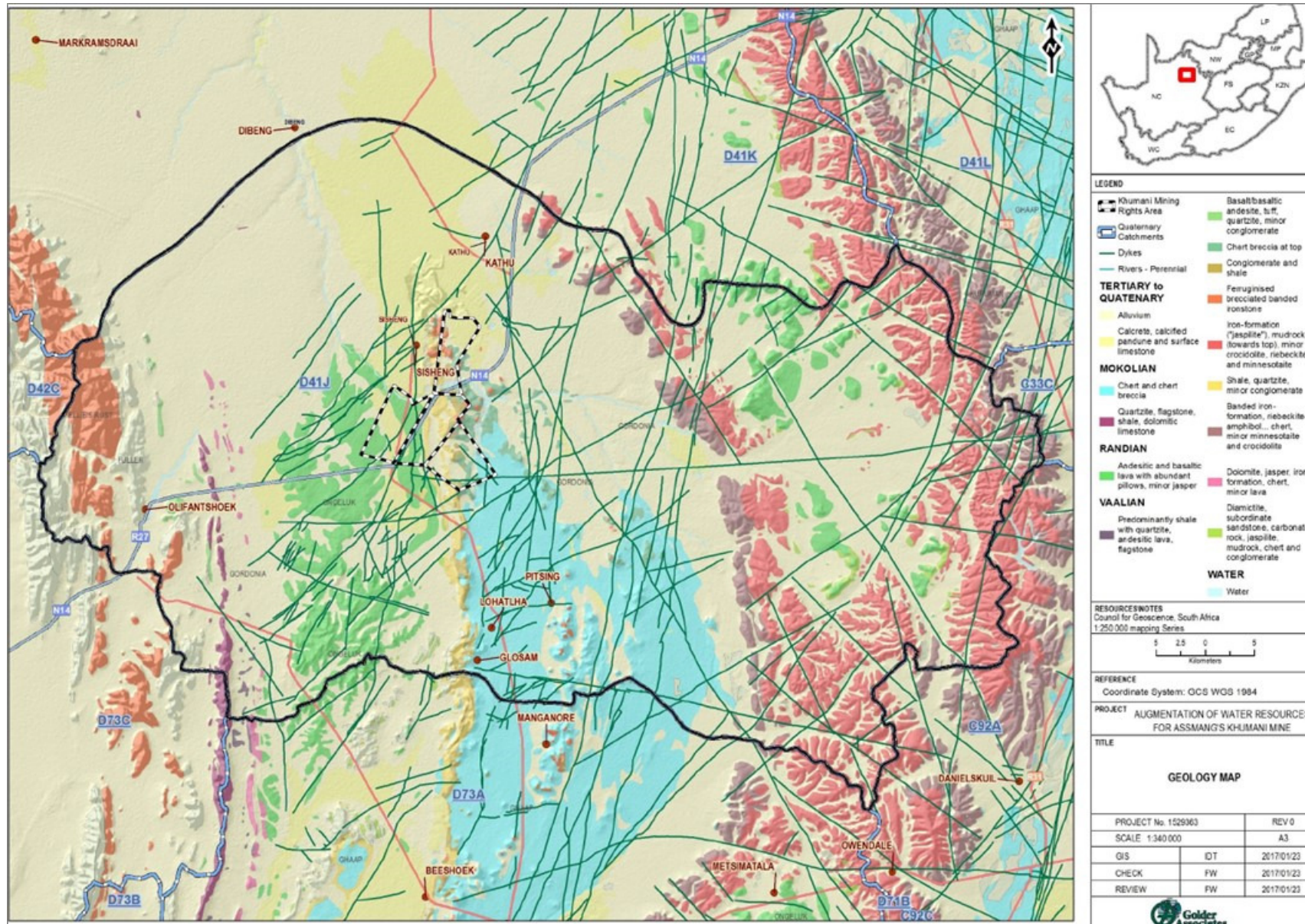


Figure 13: Geological Setting (Golder, 2017)



Intrusive Structures

The area is relatively deformed and intense fracturing has occurred in the hard rock unit's – this fracturing is associated with the development of faults and in many cases dyke material intrusions. Intrusive dolerite/diabase dykes are a common feature but seldom outcrops. Dolerite dykes are typically observed as major linear structures and intersect the geological formations perpendicular. These dykes are subjective to both positive and negative weathering, depending on the specific hydrological environment and their geochemical characteristics.

Chemical weathering is responsible for the deposition of secondary calcite on top of the dykes, with the intensive materialising of clayey decomposed dolerite at depth. These dykes naturally appear as ridges with depressions formed by the solution of the country rocks within the contact zone alongside the dykes. Most of the surface water drainage channels are restricted to these features. These dolerite dykes with low permeability compartmentalise the dolomite aquifer.

1.h.iii.1.a.4 Soils

Soil distribution is strongly linked to the topography of the area. In turn, the topography is closely linked to the underlying surface geology. Hard rock outcrops characterise the topographic highs of the area. The outcrops generally comprise quartzites and the iron ore bearing ironstones. These outcrops form prominent hills or ridges with moderate to steep slopes. In these areas, soils are very shallow to non-existent, occurring as erratic pockets of orange sands within the outcrops. The pockets can be as deep as 1m. These soils are classified as Mispah Form soils, with minor occurrences of Hutton Form soils.

The very gently sloping areas between the hills and ridges are generally underlain by calcrete or dolomite. The calcrete is overlain by orange fine sands, which can be classified as Plooyburg Form soils. The calcrete surface is undulating, with isolated boulder outcrops occurring within the soils. The soil depth is highly variable, being between about 0,3m to greater than 2m. This is the area in which the new infrastructure is located.

On the lower slopes, between the Plooyburg Form soils and the Mispah Form soils are Hutton Form soils. These areas are characterised by abundant, to numerous surface boulders, derived from the outcrops upslope thereof, which have moved by gravity down slope to be deposited on the ground surface. Refer to the following figure for the soil map.

The area where the Return Water Dam 3 is planned, has no more natural soils occurring as it is located within the Paste Disposal Facility footprint area. The land type Ae12 is classified as: Red-yellow Apedal, freely drained soils, red with high base status, greater than 300mm deep. The pipeline routes will also cross this land class as well as Ag110, which has the same description as the Ae12 land type.

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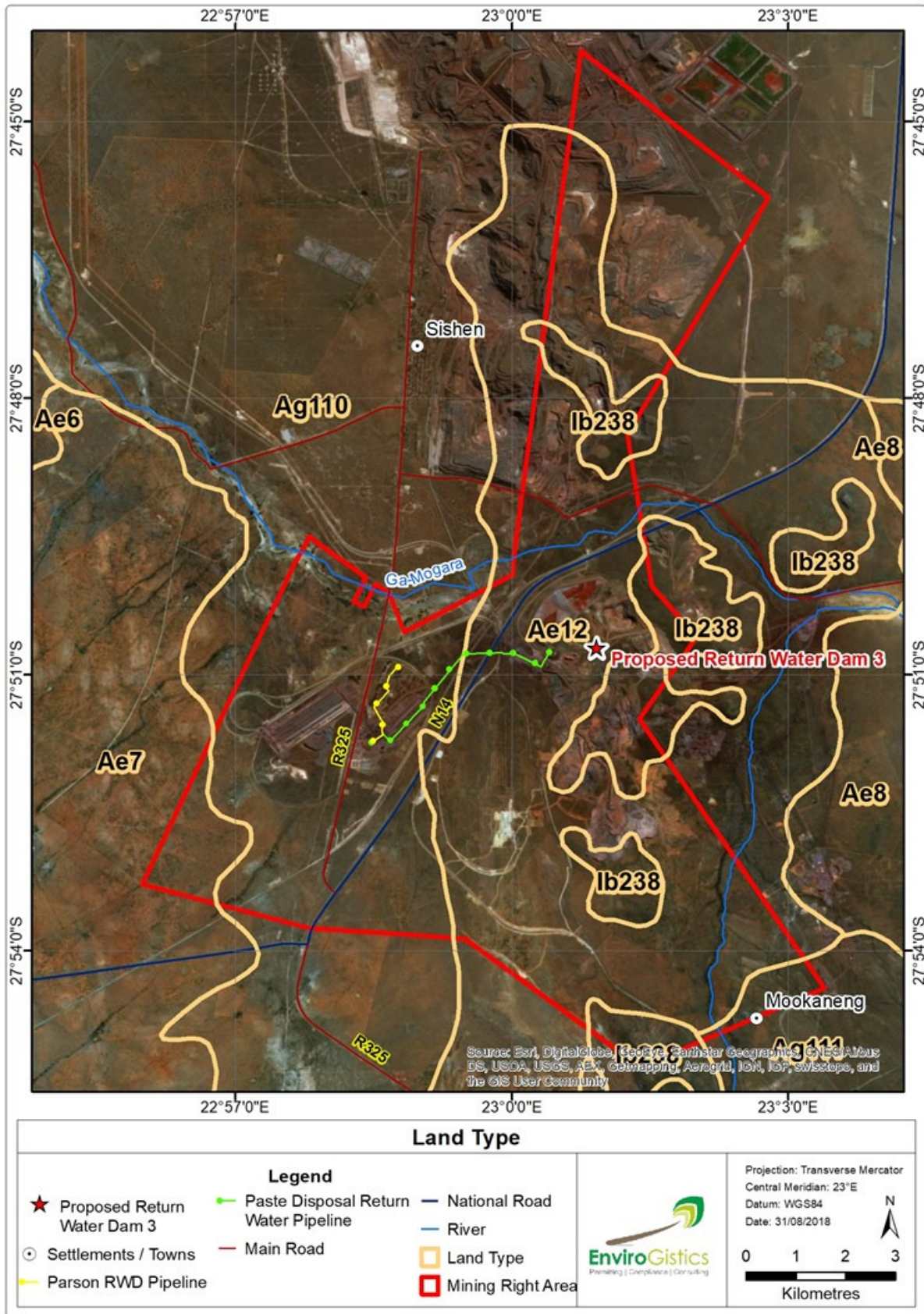


Figure 14: Soils map of the mine

1.h.iii.1.a.5 Ecological Footprint

According to Mucina & Rutherford (2006), Khumani falls within four vegetation types (please refer to the following figure) namely Kuruman Thornveld (SVk 9), Kuruman Mountain Bushveld (SVk 10), Kathu Bushveld (SVk 12) and Olifantshoek Plains Thornveld (SVk 13). All elements of the study however fall within the Kuruman Thornveld (SVk 9) vegetation type.

The study area falls within savanna vegetation biome of South Africa and Swaziland, which constitutes the southernmost extension of the most widespread biome in Africa. It represents 32.8% of South Africa (399 600km²) and 74.2% of Swaziland (12 900km²). It extends beyond the tropics to meet the Nama-Karoo Biome on the central plateau, the Grassland Biome at higher altitudes towards the east and extends down the eastern seaboard interior and valleys where it grades into Albany Thicket in the Eastern Cape. The most recent and detailed description of the vegetation of this region is part of a national map (Mucina & Rutherford, 2006).

The diversity of African savanna is exceptional, comprising more than 13 000 plant species, of which 8 000 are savanna endemics. Specifically, dry savannas have more than 3 000 species. This diversity equals that of the South African grasslands and is only exceeded by Fynbos (Knobel, 1999). Similarly, in respect of animal diversity, savannas are without peer, including approximately 167 mammals (15% endemism), 532 birds (15% endemism), 161 reptiles (40% endemism), 57 amphibians (18% endemism) and an unknown number of invertebrates (Knobel, 1999). Flagship species include the Starburst Horned Baboon Spider (*Ceratogyrus bechuanicus*), ground Hornbill (*Bucorvus leadbeateri*), Cape Griffon (*Gyps coprotheres*), Wild dog (*Lycaon pictus*), Short-Eared Trident Bat (*Cloeotis percivali*) and the White Rhino (*Ceratotherium simum*) (Endangered Wildlife Trust, 2002).

Distribution of Kuruman Thornveld SVk9:

This vegetation type occurs in the North West and Northern Cape Provinces. This vegetation type tends to occur on flats from the vicinity of Postmasburg and Danielskuil (west of the Kuruman Hills) in the south, and extend via Kuruman to Tsineng and Dewar in the North West Province in the north, at an altitude of 1100–1500m (Mucina & Rutherford, 2006).

Vegetation and Landscape Features:

This vegetation type is characterised by an open tree layer dominated by *Vachellia erioloba*, *V. karroo*, *Searsia lancea* and *Ziziphus mucronata*. The shrub layer is poorly developed and dominated mainly by *Grewia flava* and *Tarchonanthus camphoratus*. The grass layer is characterised as open, with a large amount of bare soil in places (Mucina & Rutherford, 2006).

Important Taxa:

(d dominant species)

Tall Tree: *Vachellia erioloba* (d*).

Small Trees: *Senegalia mellifera* subsp. *detinens* (d), *Boscia albitrunca* (d) (Mucina & Rutherford, 2006).

Tall Shrubs: *Grewia flava* (d), *Lycium hirsutum* (d), *Tarchonanthus camphoratus* (d), *Gymnosporia buxifolia* (Mucina & Rutherford, 2006).

Low Shrubs: *Vachellia hebeclada* subsp. *hebeclada* (d), *Monechma divaricatum* (d), *Gnidia polycephala*, *Helichrysum zeyheri*, *Hermannia comosa*, *Pentzia calcarea*, *Plinthus sericeus*. Geoxylic Suffrutex: *Elephantorrhiza elephantina* (Mucina & Rutherford, 2006).

Graminoids: *Aristida meridionalis* (d), *A. stipitata* subsp. *stipitata* (d), *Eragrostis lehmanniana* (d), *E. echinochloidea*, *Melinis repens* (Mucina & Rutherford, 2006).

Herbs: *Dicoma schinzii*, *Gisekia africana*, *Harpagophytum procumbens* subsp. *procumbens*, *Indigofera daleoides*, *Limeum fenestratum*, *Nolletia ciliaris*, *Seddera capensis*, *Tripteris aghillana*, *Vahlia capensis* subsp. *vulgaris* (Mucina & Rutherford, 2006).

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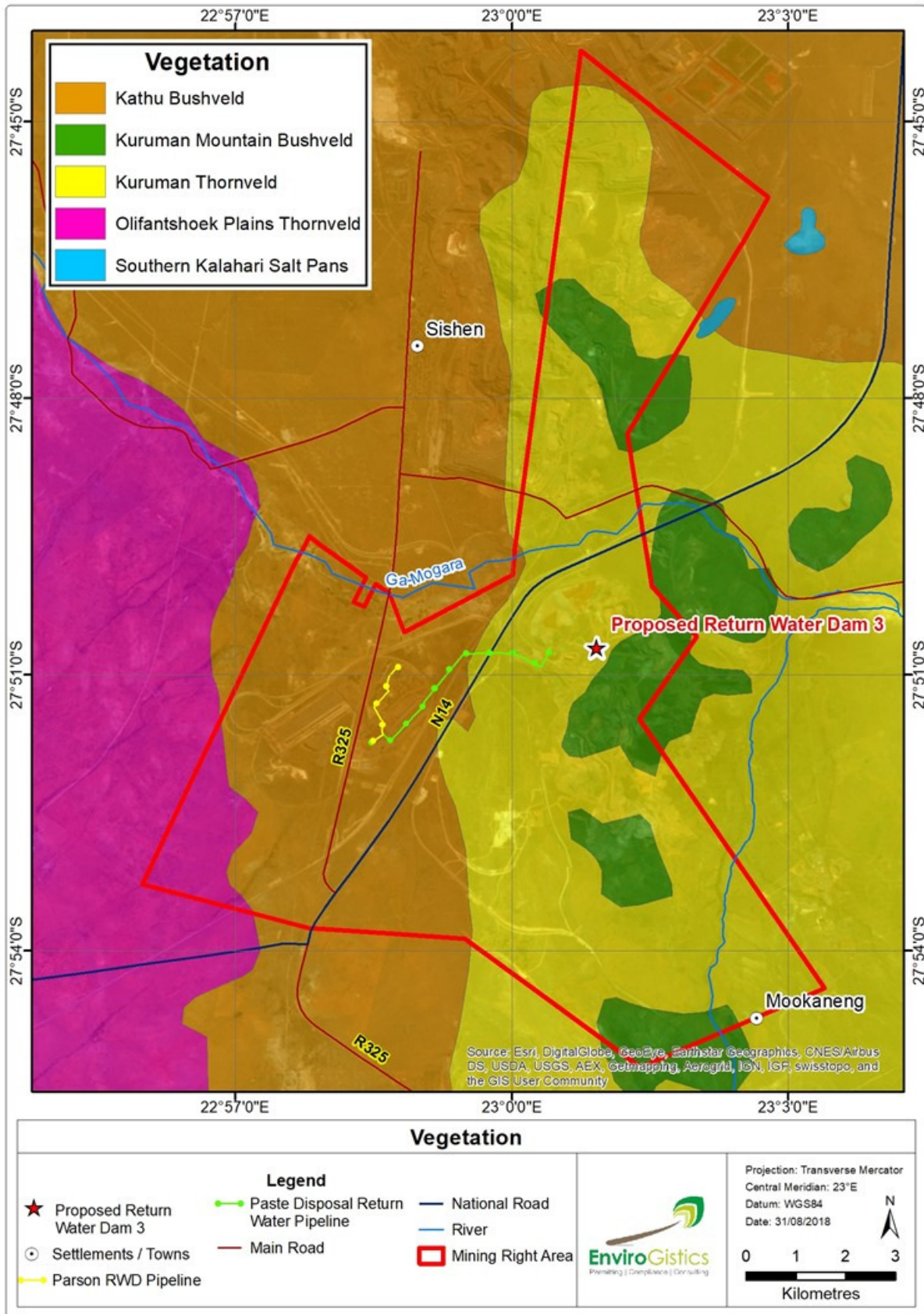


Figure 15: Vegetation Types

Biographically Important Taxa:

(^{GW}Griqualand West endemic, ^KKalahari endemic, ^SSouthern most distribution in interior of southern Africa)



Small Trees: *Vachellia luederitzii* var. *luederitzii*^K, *Terminalia sericea*^S (Mucina & Rutherford, 2006)

Tall Shrub: *Vachellia haematoxylon*^K (Mucina & Rutherford, 2006)

Low Shrub: *Blepharis marginata*^{GW} (Mucina & Rutherford, 2006)

Graminoid: *Digitaria polyphylla*^{GW} (Mucina & Rutherford, 2006)

Herb: *Corchorus pinnatipartitus*^{GW} (Mucina & Rutherford, 2006)

Endemic Taxon:

Herb: *Gnaphalium englerianum* (Mucina & Rutherford, 2006)

Conservation Status:

This vegetation type is classified as least threatened. It has a conservation target of 16%, but none of this vegetation type is conserved in statutory conservation areas. Only approximately 2% of this vegetation type is already transformed and erosion potential is very low. Disturbed areas of this vegetation type are characterised by *Aristida adscensionis*, *A. congesta*, *Enneapogon scoparius*, *Geigeria ornativa*, *Melhaniania rehmanii*, *Rhigozum trichotomum* (Mucina & Rutherford, 2006).

Site Specific Discussion

It should be noted that the projects in question are located in already cleared area where ancillary infrastructure is present. The Return Water Dam 3 will be located in the Paste Disposal Facility Footprint area, and the pipelines will follow an existing linear corridor.

Flora

A list of plant species previously recorded in the quarter degree grid in which the mine is situated was obtained from the South African National Biodiversity Institute (SANBI). Additional species that could occur in similar habitats, as determined from official database searches and reviewed literature, but not recorded in mining right area were also taken into account. During an ecological study undertaken by Adrian Hudson, for the Silo Relocation Project at Khumani, 2017, a total of 21 threatened or protected species were determined to possibly occur in the mine. As the projects are planned in existing cleared areas no disturbance to these will occur.

During the 2017 ecological study it was observed that alien plant species were not numerous although a number of alien plant species were recorded in low abundances.

Fauna

Thirty arthropod species were recorded during the 2017 study by Adrian Hudson. No threatened arthropod species were recorded and the likelihood of finding any threatened invertebrate species is considered low due to the lack of suitable habitat and the proposed development is unlikely to pose a significant conservational threat to species of concern for this taxon.

Eight species of herpetofauna were confirmed during the site visit and no species of conservation importance were recorded during the study. No alien herpetofauna species are expected to occur on the study site.

Six amphibian species were recorded in the study area during the study; it is unlikely that all six these species would be present on site at drier times. All the recorded species were common species which are not listed or range restricted.

Recorded avifauna species diversity and abundance was low with only 39 species being recorded during the site visit. All the recorded avifauna species were common species which are not listed or range restricted.

All eleven mammal species recorded are robust and widespread, mostly with the proviso that suitable habitat and sufficient space to maintain home ranges/ territories are available. Given no or low-key prosecution, all species are capable of maintaining their presences in remote areas such as the site and surrounding properties.

A regional list of protected faunal species for the Northern Cape Province is included in the Northern Cape Nature Conservation Act No. 9 of 2009 (NCNCA, 2009). No threatened status has been included in this report and thus the National publication of threatened faunal species list, which was published in 2004 and amended in 2007 (National Environmental Management: Biodiversity Act No. 10 of 2004, NEMBA 2007) and the IUCN red data list, was used to identify listed or threatened species with distribution ranges that overlap with the mining right area.

Optimal habitat for these species as documented by the IUCN 2013 and Birdlife International were then compared to the habitat available within the mining right area.

No faunal species of conservation importance were identified within Khumani and due to surrounding anthropogenic activity it is deemed unlikely that a great diversity of species of conservation importance would be found.

1.h.iii.1.a.6 Hydrological Setting

Khumani falls within the Lower Vaal Water Management Area (WMA) and within the Molop subWMA. The area is situated in the catchment of the Gamagara River, the quaternary catchment being D41J (refer to the following figure). The mine is located on gently sloping to hilly terrain with rivers flowing in a north-westerly direction. The major river traversing the site is the Gamagara River, which flows from the east to west north of the Parson Plant area. The river then flows north to confluence with the Kuruman River.

Iron ore, diamonds and manganese are mined in the water management area. Farming activity ranges from extensive livestock production and rain fed cultivation to intensive irrigation enterprises at Vaalharts. Kimberley, which straddles the divide between the Lower Vaal and Upper Orange WMAs, is the largest urban centre in the area. More than 50% of the yield from natural water resources in the tributary catchments within the water management area is supplied from groundwater.

Water Management Area and Catchment

The Lower Vaal WMA borders Botswana in the North of the Northern Cape Province and also extends into the North West Province. The major rivers are listed as Molopo, Harts, Dry Harts, Kuruman and Vaal Rivers. A particular characteristic of the Lower Vaal and Upper Orange WMAs is the extensive inter-catchment transfer of water within WMAs as well as interbasin transfers between these and other adjoining WMAs.

The Lower Vaal WMA is dependent on water releases from the Middle Vaal WMA for meeting the bulk of the water requirements by the urban, mining and industrial sectors within its area of jurisdiction, with local resources mainly used for irrigation and smaller towns.

Water quality is of special concern in the lower reaches of the Harts and the Vaal Rivers because of the high salinity of leach water from the Vaalharts irrigation scheme. To counter this problem, better quality water is transferred from the Orange River to the Douglas Weir in the lower reaches of the Vaal River for blending purposes.

Downstream Water Users

There are no significant surface water users downstream of the mine due to the unreliability of flow in the Gamagara River and its tributaries (Knight Piesold, 2005). Downstream users (primarily the farming community) rely on groundwater abstraction for livestock watering and domestic consumption (Knight Piesold, 2005).

Surface Water Settling

Within the region there are no significant dams on the Orange River. There are however various containment dams from which water for irrigation or urban settlement is diverted through canals. Examples of these are Boegoeberg Dam near Groblershoop and the Neusberg Dam near Kakamas. The Rooiberg Dam at Kenhardt is fed by the Hartbees River and is sometimes empty because of the inconsistency of the river flow. In the north of the region is the Leeubos Dam in the Swartbees River.

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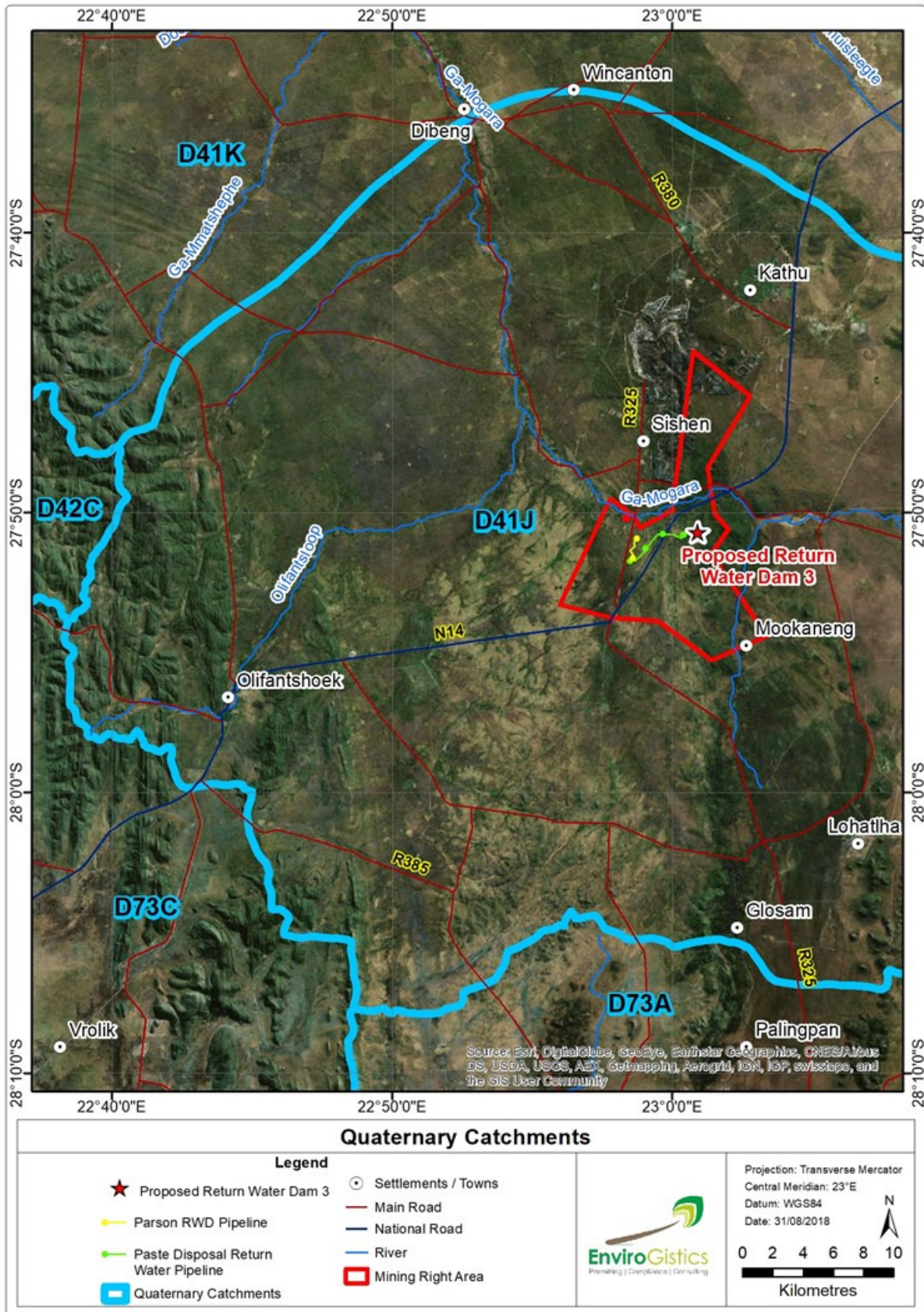


Figure 16: Catchments

Although the amount of silt in the Orange River has decreased since the construction of the Gariep Dam, the Boegoeberg Dam was already covered by silt before the building of the Gariep Dam. The quality of the rain water is good in the area since there is no significant air pollution in the area which could result in acid rain.

A bulk water supply scheme from the Vaal River (Sedibeng Water Supply Scheme) to the arid areas of the Gamagara valley near Postmasburg and North thereof was implemented by the DWS to supply potable water to these areas and thus to enable the development of the large scale mining operations in areas such as Beeshoek, Lime Acres, Sishen, Mamatwane, Hotazel and Black Rock.

The closest river to the project area is the Gamagara River, and located approximately 2km to the north and approximately 3.5km west of the proposed Return Water Dam 3 and start of the Pipeline route (please refer to the figure above). This river is a non-perennial river.

1.h.iii.1.a.7 Hydrogeological Setting

According to the Golder Associates Africa (Pty) Ltd, 2017 Water Augmentation Project Report, groundwater resources occur throughout the D41J quaternary catchment, but aquifer characteristics are highly variable due to the nature of the various rock formations, as well as topographical effects, viz. elevated mountainous areas on the eastern and western perimeters of the quaternary catchment. Intergranular (Kalahari Sediments), weathered and fractured BIF as well as karst dolomite bedrock aquifers are present in the different geological formations. The major aquifers identified comprise of:

- ☛ Kalahari Group Sediments - intergranular unconfined and shallow aquifer system - sandstone, gravel & calcrete, with low permeability retards and restrict water movement and acts as a storage unit – occurs in the north-central part of the quaternary catchment;
- ☛ Banded Ironstone Formation (BIF) - weathered and fractured semi confined aquifer system mostly present on the eastern perimeter of the quaternary catchment representing the Kuruman Hills. These hills represent the major groundwater recharge area in the quaternary catchment. A few relicts of enriched BIF inliers occur in the central parts of the quaternary catchment's (viz. the iron ore mining areas); and
- ☛ Dolomite karst aquifers - unconfined to confined aquifer system, compartmentalised by dolerite dykes.
- ☛ The water bearing properties of the Ongeluk Lava is highly variable (mainly fractured type water bearing zones) and much dependant on frequent and local recharge.

The intergranular aquifers of the Kalahari sediments are presented by the upper (Eden Formation) as well as basal sand and gravel beds (Wessels Formation). These aquifers are low productive with borehole yields generally less than 2 l/s, but with the ability to store large volumes of water. They are separated by the red clays of the Budin Formation acting as a confining layer.

The basal Kalahari sand and gravel formation and underlying bedrock can be regarded as one aquifer. In the absence of the red clays the upper sand and gravel aquifer of the Eden Formation are in hydraulic continuity with the bedrock aquifers.

Massive calcrete, acting as an aquitard, appear in the area. In areas with limited Kalahari thickness (< 40m) the calcrete directly overlay the underlying bedrock. The calcrete with relative low permeability retards and restricts the movement of water, but acts as a storage unit. It is reported by Dziembowski (1979) that for three years after the 1973/74 rainy season there was a very high water table in the calcrete in the north mine excavations, with associated surface seepage.

The weathered and fractured BIF bedrock aquifer is quite productive and supports borehole blow yields of over 45 l/s. The BIF aquifer and underlying dolomite can be regarded as one aquifer. The karst aquifers associated with the Ghaap Plateau dolomite formations, are highly productive. High yielding production boreholes in karst aquifers (abstraction rate > 40 l/s for 24 hours per day) are in use at Sishen and Kathu.

Several intrusive dykes, with low to impervious hydraulic conductivity, compartmentalize the dolomite aquifer. These dykes are only present in the bedrock underlying the Kalahari sediments. The dykes act near surface as aquitards in terms of perpendicular groundwater flow and will therefore retard groundwater flow across the dyke feature. Theoretically, at depth, the dykes become fresher; thus more solid and intact and act as aquicludes, i.e. significantly retarding groundwater flow through its matrix and even not allowing any flow through the matrix. Recent research work (Meyer, 2009) suggests that younger fracturing (east-west directional faults) in the area may have displace sections of the older north-south directed dykes. Groundwater flows along-side dyke structures are significantly higher; features such as dykes can play a major role diverting groundwater flow from the normal expected down gradient pathways characteristically observed in aquifer systems. It is therefore important to note that dyke/bedrock contact zones itself represent preferential groundwater flow paths.

Groundwater Use

Groundwater is mainly used for domestic supply, livestock watering and watering of gardens. The borehole yields from the upper calcrete aquifer are relatively low. The deeper fractured rock aquifer is generally associated with higher yields, with exploitable potential.

1.h.iii.1.a.8 Sensitive Sites or Wetlands

The Atlas of Freshwater Ecosystem Priority Areas in South Africa (Nel et al, 2011), which represents the culmination of the National Freshwater Ecosystem Priority Areas project (NFEPA), a partnership between SANBI, CSIR, WRC, DEA, DWS, WWF, SAIAB and SANParks, provides a series of maps detailing strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources. Freshwater Ecosystem Priority Areas (FEPAs) were identified through a systematic biodiversity planning approach that incorporated a range of biodiversity aspects such as ecoregion, current condition of habitat, presence of threatened vegetation, fish, frogs and birds, and importance in terms of maintaining downstream habitat. The Atlas incorporates the National Wetland Inventory (SANBI, 2011) to provide information on the distribution and extent of wetland areas.

No sensitive landscapes or rivers are located within close vicinity (500m) of the proposed listed activities. However, various areas defined as part of the NFEPA database in terms of wetlands are present on the southern portions of the mine. These are associated with the Eastern Kalahari Bushveld Group 3 Depressions (refer to Figure 17). Note that the projects in question will not impact on any of the identified NFEPA systems.

1.h.iii.1.a.9 Air Quality

An air quality monitoring programme has been implemented to measure fallout dust and to monitor ambient concentration of suspended particulate matter (dust).

The air quality data used are from the previous Khumani EMP Amendment 2011, and from the Air Quality Gap Analysis undertaken by Prism EMS (Pty) Ltd in 2015.

Sources that may contribute to air pollution include blasting activities associated with the mining operations, windblown dust from the various mine stockpiles in the area, vehicle emissions (the N14 runs between the farms Bruce and King), household fuel combustion, biomass burning (from veld fires and agriculture) and various miscellaneous fugitive dust sources (agriculture activities, wind erosion of open areas and vehicle entrainment of dust along unpaved and paved roads).

Sensitive receptor areas in the vicinity of the mine are road users on the N14, the towns of Olifantshoek and Kathu. In addition, there are various farms and homesteads surrounding the proposed area.

Khumani currently has an ambient air and weather monitoring programme that includes dust fall monitoring, Particulate Matter 10 microns (PM10) and meteorological monitoring. Dust fallout is measured at:

- ☞ Khumani has 15 single fall out dust monitoring points.

PM10 monitoring is conducted at:

- ☞ Seven (7) PM10 monitoring locations (E-Samplers manufactured by Met One Instruments, Inc.) that are located at strategic locations to capture ambient concentration of particulate matter on mine premises [five (5) instruments are co-located with dust monitoring points, while two (2) are independent, stand-alone sites].
- ☞ Three (3) monitoring locations with handheld instrument (SKC Deployable Particulate Sampler System with Portable Air Kit for 24-hour sampling) once a month for 24 hours.

A meteorological Station (EM-02-WXT weather station with Vaisala all-weather sensor) measures temperature, relative humidity, rainfall, hail, barometric pressure, as well as wind direction, wind speed, and wind gusts via ultrasonic anemometer. The station is located in the Salvage Yard on the farm Parson (coordinates: 27°51'23.05"S; 22°58'34.59"E), east of the Dingleton Road.

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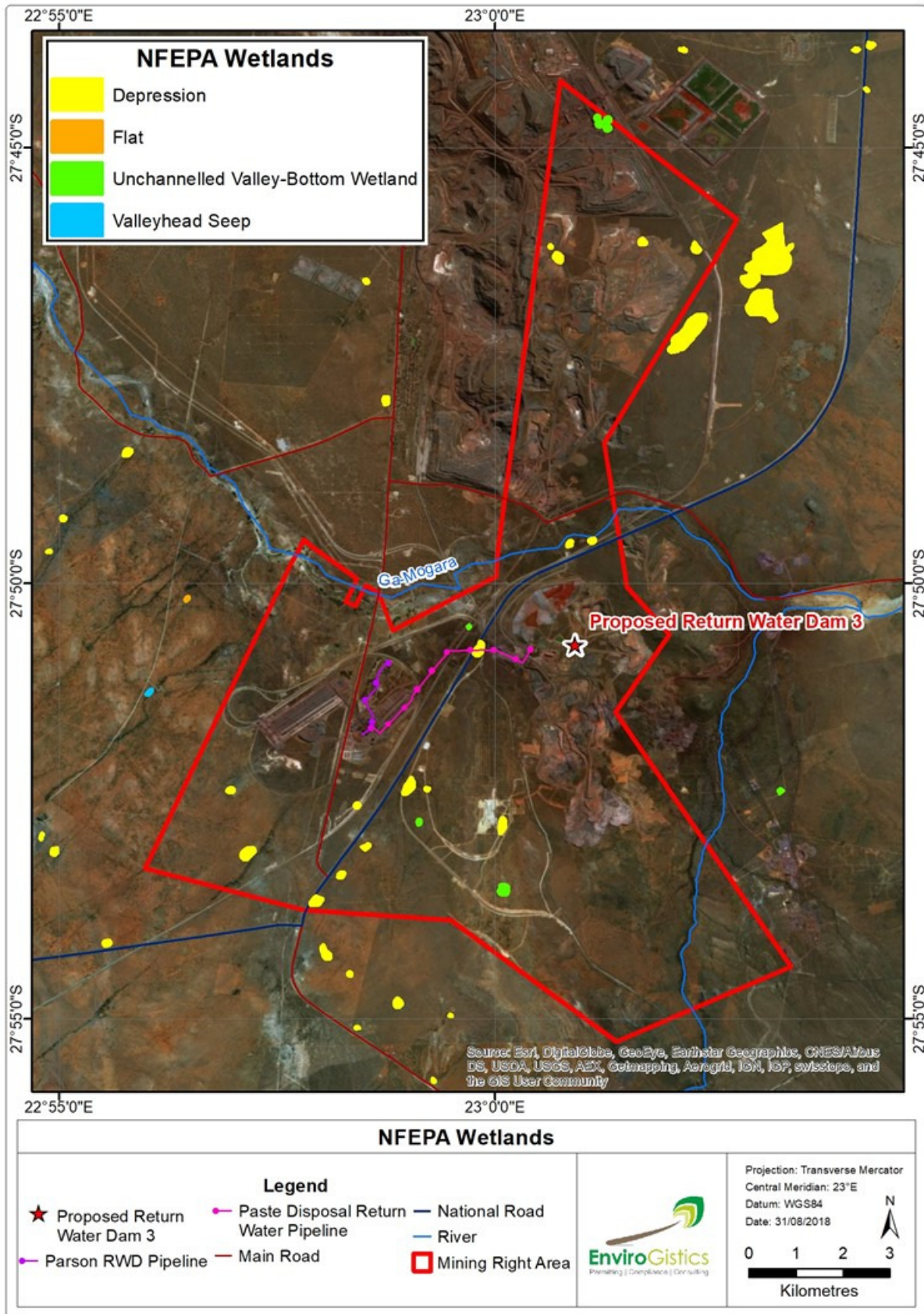


Figure 17: NFEPA Wetlands and Rivers

1.h.iii.1.a.10 Noise

The noise description was from the previous Khumani EIA/EMP as part of the EMP Amendment 2011.

The area in which the proposed the proposed infrastructure are to be established is characterised by the following environments:

- ☞ A rural farming community where the farmsteads are located at large distances apart;
- ☞ The existing large opencast operation at Kumba;
- ☞ The existing opencast operation at Khumani; and
- ☞ The N14 and the railway lines that cross the area.

Areas in the proximity of mining activities will already be subjected to the noise emissions from diesel-powered equipment and other mining processes as a result of existing mining infrastructure.

The major sources of noise from the current mining operations are:

- ☞ The diesel powered equipment, such as bulldozers, FELs, construction and haul trucks used during both the construction and operational periods of the mine;
- ☞ The drilling of rock inside the open pit;
- ☞ The handling of material inside the pit, e.g. the loading of haul trucks;
- ☞ The hauling of ore and waste rock from the open pit to the surface;
- ☞ The dumping of ore and waste rock at the crushing plant and on the waste rock dumps respectively. During this process the use of reverse warning hooters may be audible over long distances, particularly during the night; and
- ☞ The crushing and screening of ore in the plant area.

Limited noise may result from the proposed infrastructure, although this may be considered to be insignificant as the proposed location is already surrounded by mining activities.

1.h.iii.1.a.11 Cultural and Heritage Setting

A heritage impact assessment was undertaken during 2017 for the Khumani Silo Relocation Project. Although the projects in question are located in already cleared areas, which have been subjected to specialist studies during the original 2006 EMP for the mine, the general cultural and heritage setting is presented.

Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- ☞ Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago.
- ☞ Middle Stone Age; associated with *Homo sapiens* and archaic modern humans. 30-300 thousand years ago.
- ☞ Earlier Stone Age; associated with early *Homo* groups such as *Homo habilis* and *Homo erectus*. 400 000- > 2 million years ago.

The larger region surrounding the mine has a wealth of pre-colonial archaeological sites (Morris & Beaumont 2004). Famous sites in the region include the world renowned Wonderwerk Cave to the north of the study area. Closer to Kuruman two shelters on the northern and southern faces of GaMohaana (in the Kuruman Hills north west of the town) contain Later Stone Age remains and rock paintings. Rock art is known to occur at Danielskuil to the north east and on Carter Block (Morris 2008). Middle Stone Age material is on record in the area around the mine.

Archaeological surveys have shown rocky outcrops and hills, drainage lines, riverbanks and confluences to be prime localities for archaeological finds and specifically Stone Age sites, as these areas were utilised for settlement of base camps close to water and hunting ranges.

Iron Age

Iron Age expansion southwards past Kuruman into the Ghaap plateau and towards Postmasburg dates to the 1600's (Humphreys, 1976; Thackeray, 1983). Definite dates for Tswana presence in the Postmasburg area are around

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1805 when Lichtenstein visited the area and noted the mining activities of the Tswana (probably the Thlaping) tribes in the area. The Thlaro and Thlaping settled the area from Campbell in the east to Postmasburg and towards the Langeberg close to Olifantshoek in the north west before 1770 (Snyman, 1988). The Korana expansion after 1770 started to drive the Thlaro and Thlaping further north towards Kuruman (Shillington, 1985).

Anglo-Boer War

There are no battlefields or concentration camp sites close to Khumani.

Cultural Landscape

The mine was constructed from October 2006, prior to this the area was undeveloped and characterised by sparse vegetation. The surrounding area have been characterised by intensive mining activities.

Paleontologically Assessment

According to the specialist study undertaken during June 2017, the development footprint is underlain by Palaeoproterozoic Gamagara Formation sediments that are not considered to be paleontologically sensitive.

The site is capped by superficial (Quaternary) deposits considered to be of low to very low palaeontological sensitivity, because the impact area is degraded and not situated within or near pan, alluvial or spring deposits (considered to be potentially fossiliferous in the region).

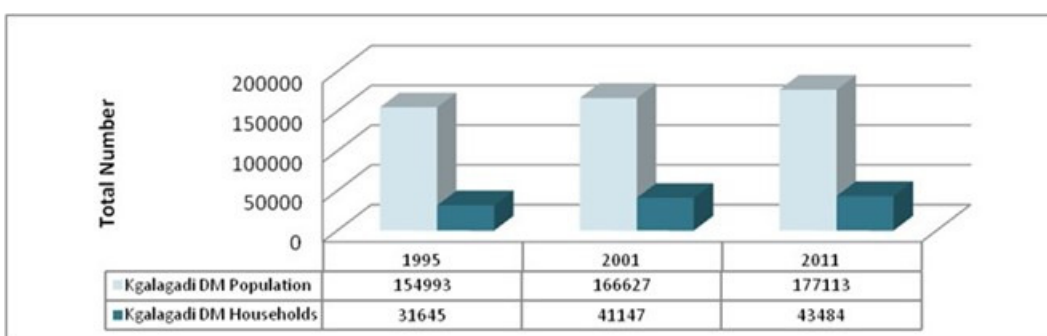
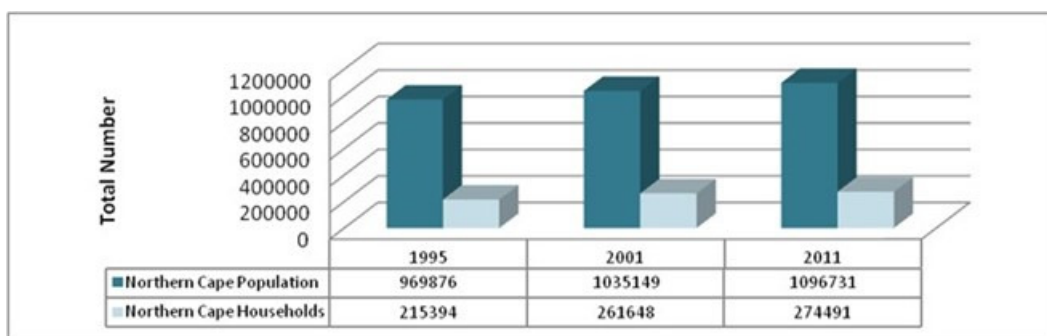
1.h.iii.1.a.12 Socio-Economic Setting

Khumani is located within the Northern Cape Province and falls within two Local and District Municipalities. The farm Mokaning is situated within the Tsantsabane Local Municipality (NC085), which forms part of the ZF Mgcau District Municipality (formally known as the Siyanda District Municipality). The farms Parson, Bruce and King are situated within the Gamagara Local Municipality (NC01B1), which forms part of the John Taolo Gaetsewe District Municipality (formally known as the Kgalagadi District Municipality).

In order to assess the potential impact of the proposed project, it is important to consider the particular Province, district municipalities, and local municipalities as well as the nearby towns in a holistic way.

Population

The population size (persons) for the Gamagara Municipality increased by 25.47% over the 1995 to 2011 time period, whereas the John Taolo Gaetsewe District Municipality only grew by 12.49% over the same period. Households have also grown over the 1995 to 2011 time period, with the Gamagara Local Municipality showing a 30.36% increase and the John Taolo Gaetsewe District Municipality by 27.23%.



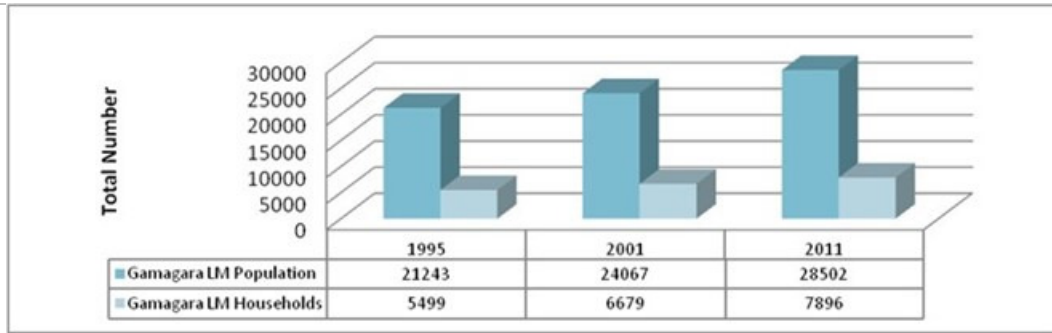


Figure 18: Population and household size (1995 – 2011)

Age

It is important to assess the age distribution of persons in order to determine both the current and future needs of an area. Age is an important indicator as it relates to education, skills and dependency. A young population may require an improved educational system, whereas an older society may need an accented focus on healthcare. The largest percentage of people in the Gamagara Local Municipality, 71.9% fall within the working age category (16-64 years of age). 25.5% of the population are between the age of 0 and 14. And the elderly population forms 2.5% of the municipality’s population. (Statistics South Africa, census 2011) Persons younger than 15 years of age do not form part of the Economically Active Population of the area. The age and sex distribution for the Gamagara Local Municipality is depicted.

Education

The largest percentage (89,5%) of the Gamagara Local Municipality population has obtained some form of primary schooling. 24.9% of the population has attained matric and a further 3.6% with higher education.

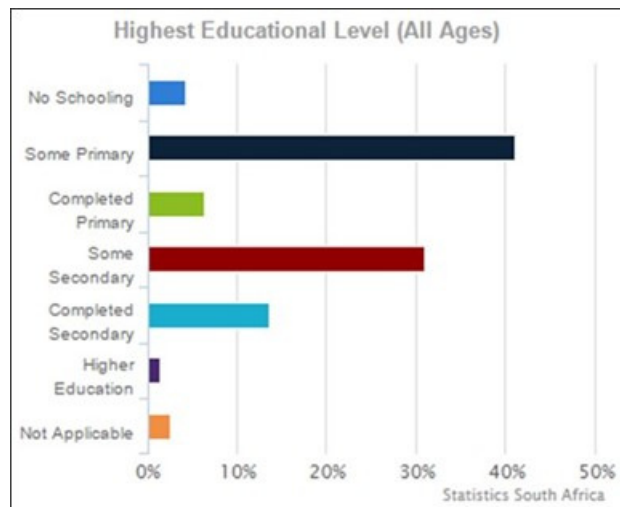


Figure 19: Education Level (2011)

Spatial Development Framework (SDF)

According to the IDP, the SDF also indicate the Impact of development activities planned in this document on the environment and rate impacts as low, medium and high. According to the National Biodiversity Strategy (NBS), biodiversity considerations are to be integrated into all other strategies and plans at local government level, such as poverty eradication and developmental programmes. The NBS provides the map for achieving the biodiversity related objectives contained, i.e. reducing the rate of loss of biodiversity by 2010. The goal of the NBS was therefore always to conserve and manage biodiversity to ensure sustainable benefits to the people of South Africa, through co-operation and partnerships that build on strengths and opportunities.

According to the National Spatial Biodiversity Assessment (NSBA), Tsantsabane and the broader ZF Mqcawu District was not identified as a priority with regard to biodiversity. However, it continues to be important to address the issue, since biodiversity makes a substantial contribution to the livelihoods of rural communities, in the form of housing, fuel, food and medicines. The SDF also highlights that many people have become alienated

from nature, through apartheid policies and processes like urbanization. Hence, much more needs to be done to make conservation more inclusive and relevant to people's lives.

With all the development happening in the area, the demands for water have increase as in the rest of the semi-arid province.

The area is rich in minerals which has historically been the mainstay of the area's economy. Iron and manganese mining is an important activity in the economy of the area. Haematite deposits in the form of ferriginised banded 15 ironstone occur as a cake or capping to the Gamagara hills which lies between Postmasburg and Sishen. The ore is very pure and typically consist of 95% ferric oxide. There are significant undeveloped mineral resources left in the area that can contribute to future economic growth in the area, depending on the future viability of exploiting the minerals. Large areas of unrehabilitated and poorly rehabilitated mining activities (current and closed) have a significant negative effect on the scenic environment in the area, especially in the mountainous areas.

Internal Strategic Perspective

According to the Lower Vaal Water Management Area: Overview of Water Resources Availability and Utilisation Report, the Gross Domestic Product (GDP) of the Lower Vaal WMA was R9,8bn in 1997. The most important magisterial districts in terms of contribution to GDP in this WMA are shown below:

- 📌 Kimberley 29,6%;
- 📌 Postmasburg 14,8%;
- 📌 Lichtenburg 9,6%;
- 📌 Kuruman 8,9%; and
- 📌 Vryburg 8,3%.

The most important economic activities of the WMA are:

- 📌 Mining 23%;
- 📌 Government 16%;
- 📌 Trade 15%; and
- 📌 Agriculture 14%

The main agricultural activities identified include livestock and dryland cropping. Livestock includes beef and dairy cattle, goats, non-wooled sheep, pigs and ostriches. Crops grown are mainly maize, but also sunflower, cotton, groundnuts and vegetables. The mining activities in this WMA include mining for diamonds, iron ore, manganese and other minerals such as lime stone, dolomite and amphibole asbestos. Kimberlite diamonds are mined at the Finch Mine at Lime Acres, one of the most important diamond producing mines of the De Beers Company. Kimberley is also an important diamond mining area, which is known for its high quality diamonds. The Sishen Mine, currently the major supplier of iron ore in the country, is located in the Lower Vaal WMA. This mine has a mineable depth of 30 metres and was opened in 1953 as part of Iscor's expansion strategy. In 1997, it produced approximately 2 400 million ton iron ore per year. An increase in mining and transportation activities can be expected with the construction of the Sishen-Coega railway line that will link Sishen with the Coega initiative near Port Elizabeth. Other important mining areas includes Kudumane (iron, manganese and asbestos etc.), Ganyesa (diamonds, mica group clay and salt) and Taung (diamonds, limestone, dolomite and salt). Since manufacturing production is far less than mining production, it can be deduced that only a small percentage of beneficiation is done locally. This implies that a large percentage of raw mining products are exported to other areas for beneficiation. Lichtenburg is the largest manufacturing town in the WMA, where manufacturing includes cement and cheese factories. Kimberley is the second largest manufacturing town, but its output is half that of Lichtenburg.

The trade sector is concentrated in wholesale of primary products and related services to the community. Main products of trade in this WMA are:

1. diamonds (for export);
2. food retail related products; and
3. ostrich-related products.

1.h.iii.2 Type of Environment Affected by the Proposed Activity

Please refer to the preceding section detailing the environmental setting in which the mine is located. The proposed activities will be located in already disturbed areas but will still necessitate the following:

- Clearing of vegetation only where necessary and if required – less than 1ha;
- Removal and stockpiling of soils only where necessary and if required;
- Shaping of the landscape; and
- Establishment of infrastructure.

These activities may therefore impact on the following:

- Groundwater Setting (establishment of waste related activities);
- Water Setting (establishment of activities and the change in runoff patterns);
- Ecological Settling (removal of ecology and potential spread of invasive species);
- Soils (removal of soils for stockpiling); and
- Topography (shaping).

1.h.iii.3 Description of the Current Land Uses

Land Capability

The Mispah Form soils can be classified as wilderness land or non-arable land. Although the remainder of the area is underlain by Plooyburg and Hutton Form soils, due to the variability of soil depth and the presence of isolated rock outcrops within these soils, as well as abundant to numerous scattered boulders on the surface, these soils are classified as low yield grazing land.

The site is located within the mining area and surrounded by infrastructure associated with the mining industry and as a result, has no specific land capabilities other than that of mining and mining related activities.

Land Use

Kumba Iron Ore Mine, a large opencast mining operation, is situated directly north of the farm Parson, northwest of the farm King and west of the farm Bruce. Besides the mining operations, other activities in the region include livestock farming, small residential communities and business trade. The land use on site is currently mining and mining related operations. The main land uses in the mining right area are livestock grazing, game farming and mining.

The typical land types associated with the mining right area is illustrated in the figure below.

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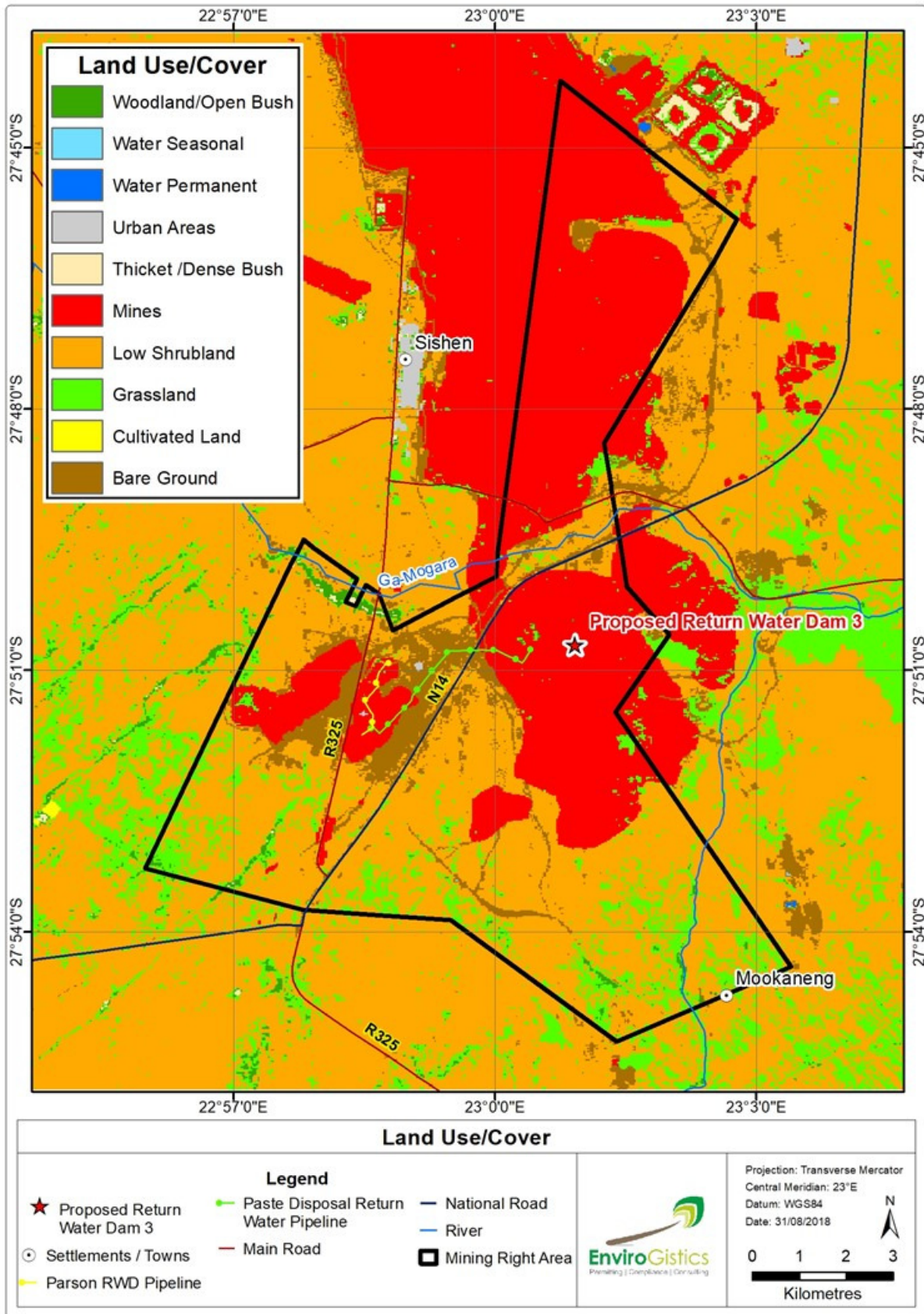


Figure 20: Land Cover within the study area

1.h.iii.4 Description of Specific Environmental Features and Infrastructure on Site

There are no specific environmental features of concern on site where the projects are planned:

- ☞ The Gamagara River system is located more than 2km from the proposed new activities;
- ☞ According to the NFEPA Wetland database, an unchannelled valley bottom wetland is located about 650m from the proposed pipeline route, where it crosses the N14 via an existing culvert;
- ☞ A depression is indicated on the NFEPA Wetland database, but this is located on the existing culvert which crosses below the N14, and cannot be considered a natural depression as it is a man-made culvert underneath the main N14 highway; and
- ☞ The sites in question are located on existing cleared land and established mining infrastructure approved as part of the 2006 EMP.

1.h.iii.5 Environmental and Current Land Use Map

Please refer to Figure 20.

1.h.iv *Impacts Identified*

1.h.iv.1 Methodology used in determining and ranking the Nature, Significance, Consequences, Extent, Duration and Probability of potential Environmental Impacts and Risks

In order to adequately assess and evaluate the impacts and benefits associated with the project it is necessary to use a methodology that could scientifically achieve this and to reduce the subjectivity involved in making such evaluations. For proper decision making it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impacts or benefits on the surrounding natural and social environment.

This section will aim to discuss the methodology to be followed to determine, assess and describe possible impacts as a result of project implementation. Impacts will be discussed in terms of the construction, operational and decommissioning/closure phases of the project. The evaluation of impacts is conducted in terms of the criteria discussed below. The various environmental impacts and benefits of this project will be discussed in terms of the nature of the impact, as well as the status, certainty, duration, magnitude, extent, intensity, frequency and significance. The significance rating of each impact will determine whether or not mitigation will be required.

The EIA will also aim to achieve the following:

- ☞ Provide an overall assessment of the social and biophysical environments affected by the proposed project;
- ☞ Assess the study area in terms of environmental criteria;
- ☞ Identify and recommend appropriate mitigation measures for potentially significant environmental impacts;
- ☞ Successfully analyse all public issues raised to date in order to recommend appropriate mitigation measures for all social and environmental related concerns; and
- ☞ Assess impacts and benefits before and after the application of mitigation measures.

The following section presents the criteria used to assess the potential impacts presented in the previous section.

1.h.iv.1.a *Criteria of assigning significance to potential impacts*

The evaluation of impacts is conducted in terms of the criteria detailed in Table 15 to Table 20. The various environmental impacts and benefits of this project are discussed in terms of impact status, extent, duration, probability, and intensity. Impact significance is regarded as the sum of the impact extent, duration, probability and intensity and a numerical rating system has been applied to evaluate impact significance. Therefore, an impact magnitude and significance rating is applied to rate each identified impact in terms of its overall magnitude and significance (Table 20).

In order to adequately assess and evaluate the impacts and benefits associated with the project, it was necessary to develop a methodology that would scientifically achieve this and to reduce the subjectivity involved in making such evaluations. To enable informed decision-making it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impact or benefit on the surrounding natural and social environment.

1.h.iv.1.b Impact Status

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of what causes the effect, what will be affected and how it will be affected. The nature of the impact can be described as negative, positive or neutral.

Table 15: Status of Impact

Rating	Description	Quantitative rating
Positive	A benefit to the receiving environment.	P
Neutral	No cost or benefit to the receiving environment.	-
Negative	A cost to the receiving environment.	N

1.h.iv.1.c Impact Extent

The extent of an impact is considered as to whether impacts are either limited in extent or if it affects a wide area or group of people. Impact extent can be site specific (within the boundaries of the development area), local, regional or national and/or international.

Table 16: Extent of Impact

Rating	Description	Quantitative rating
Low	Site Specific; Occurs within the site boundary.	1
Medium	Local; Extends beyond the site boundary; Affects the immediate surrounding environment (i.e. up to 5 km from the Project Site boundary).	2
High	Regional; Extends far beyond the site boundary; Widespread effect (i.e. 5 km and more from the Project Site boundary).	3
Very High	National and/or international; Extends far beyond the site boundary; Widespread effect.	4

1.h.iv.1.d Impact Duration

The duration of the impact refers to the time scale of the impact or benefit.

Table 17: Duration of Impact

Rating	Description	Quantitative rating
Low	Short term; Quickly reversible; Less than the project lifespan; 0 – 5 years.	1
Medium	Medium term; Reversible over time; Approximate lifespan of the project; 5 – 17 years.	2
High	Long term; Permanent; Extends beyond the decommissioning phase; >17 years.	3

1.h.iv.1.e Impact Probability

The probability of the impact describes the likelihood of the impact actually occurring.

Table 18: Probability of Impact

Rating	Description	Quantitative rating
Improbable	Possibility of the impact materialising is negligible; Chance of occurrence <10%.	1
Probable	Possibility that the impact will materialise is likely; Chance of occurrence 10 – 49.9%.	2
Highly Probable	It is expected that the impact will occur; Chance of occurrence 50 – 90%.	3
Definite	Impact will occur regardless of any prevention measures; Chance of occurrence >90%.	4
Definite and Cumulative	Impact will occur regardless of any prevention measures; Chance of occurrence >90% and is likely to result in in cumulative impacts	5

1.h.iv.1.f Impact Intensity

The intensity of the impact is determined to quantify the magnitude of the impacts and benefits associated with the proposed project.

Table 19: Intensity of Impact

Rating	Description	Quantitative rating
Maximum Benefit	Where natural, cultural and / or social functions or processes are positively affected resulting in the maximum possible and permanent benefit.	+ 5
Significant Benefit	Where natural, cultural and / or social functions or processes are altered to the extent that it will result in temporary but significant benefit.	+ 4

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Rating	Description	Quantitative rating
Beneficial	Where the affected environment is altered but natural, cultural and / or social functions or processes continue, albeit in a modified, beneficial way.	+ 3
Minor Benefit	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are only marginally benefited.	+ 2
Negligible Benefit	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are negligibly benefited.	+ 1
Neutral	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are not affected.	0
Negligible	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are negligibly affected	- 1
Minor	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are only marginally affected.	- 2
Average	Where the affected environment is altered but natural, cultural and / or social functions or processes continue, albeit in a modified way.	- 3
Severe	Where natural, cultural and / or social functions or processes are altered to the extent that it will temporarily cease.	- 4
Very Severe	Where natural, cultural and / or social functions or processes are altered to the extent that it will permanently cease.	- 5

1.h.iv.1.g Impact Significance

The impact magnitude and significance rating is utilised to rate each identified impact in terms of its overall magnitude and significance.

Table 20: Impact Magnitude and Significance Rating

Impact	Rating	Description	Quantitative rating
Positive	High	Of the highest positive order possible within the bounds of impacts that could occur.	+ 12 – 16
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. Other means of achieving this benefit are approximately equal in time, cost and effort.	+ 6 – 11
	Low	Impacts is of a low order and therefore likely to have a limited effect. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.	+ 1 – 5
No Impact	No Impact	Zero impact.	0
Negative	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural, and economic activities of communities can continue unchanged.	- 1 – 5
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly possible. Social cultural and economic activities of communities are changed but can be continued (albeit in a different form). Modification of the project design or alternative action may be required.	- 6 – 11
	High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or a combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt.	- 12 - 16

1.h.iv.2 Impacts and Risks identified

The following table presents the potential list of impacts, which will be assessed as part of the specialist studies during the EIA Phase.

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Table 21: Potential Impacts – Planning Phase (CbA – Can be Avoided; R – Reversible; Ir – Irreversible; SbM – Significance before Mitigation; SaM – Significance after Mitigation)

Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					Mitigation Type	Rating Post Measures							
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
Planning Phase																	
Legal Requirements (Environmental Permits)	1, 2, 3	Legal Compliance	Unlawful water and waste activities, which could lead to NWA Directives and Section 24G Rectification fines.	N	-4	-3	-2	-5	-14	CbA	<p>A legal assessment of all activities and future planned activities must be undertaken annually to ensure that all activities are authorised.</p> <p>All legally appointed personnel responsible or involved in water use activities and activities associated with the Environmental Authorisations on site must receive training on the requirements of the Environmental Authorisations and relevant Environmental Legislation.</p> <p>Quarterly internal audits on the lawful implementation of the Environmental Authorisation must be undertaken during the construction phase, where after biannual audits can be undertaken once construction has been completed.</p> <p>A Water Use Licence (WUL) must be available on site at all times for all Section 21 Water Uses.</p> <p>The following buffers should be maintained: No activities may take place within the 1:100 year flood line of the Gamagara River.</p> <p>No protected and or sensitive plant, shrub or tree species may be removed without the necessary permits.</p> <p>A legal register must be updated annually to indicate all activities associated with Environmental Authorisations.</p>	P	4	3	5	5	17
Planning the Pipeline routes	2	Landowner Relationships	Unlawful placement of activities	N	-2	-2	-3	-2	-9	CbA	<p>Early consultation must be undertaken with the South African National Roads Agency Limited (SANRAL) to determine whether there are any specific requirements in the establishment of the additional pipeline within the existing culvert under the N14.</p> <p>An open channel of consultation must be maintained throughout the process.</p> <p>The Standard Operating Practices (SOP) and/or Contactors SOP for the establishment of the pipeline within the road reserve must be compiled.</p>	N	-1	-1	-1	-1	-4

Table 22: Potential Impacts –Construction Phase

Name of Activity		Project	Impact Area	Potential Impacts	Rating Prior to Measures						Mitigation Type		Rating Post Measures					
Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	
Construction Phase regarding the Pipeline and Return Water Dam 3 (The establishment of the Mine Residue Stockpiles are addressed in the EMP and associated Permit 21/2016 and therefore not included in this assessment)																		
Construction of the Return Water Dam 3 and the Water Containment Facility	Legal Compliance	1 and 2	Unlawful or incorrect construction of the Return Water Dam 3.	N	-4	-3	-2	-5	-14	CbA	The Return Water Dam 3 footprint must be clearly demarcated.	N	-1	-1	-1	-1	-4	
											The approved design drawings must be available on site at all times.							
											The Return Water Dam 3 must be constructed in terms of detailed designs signed off by a Registered Engineer.							
											All WUL requirements must be adhered to in terms of the construction of the Return Water Dam 3.							
											As built drawings must be submitted to the DWS and DMR upon completion of the facility.							
											A Code of Practice (COP) must be developed during the construction phase for the operation of the Return Water Dam 3.							
	Geology	1 and 2	The area where the Return Water Dam 3 is planned is characterised by underlying dolomites. The mine is continuously monitoring movement of strata in this area.	N	-3	-3	-3	-4	-13	CbA	Ongoing monitoring of movement around the Paste Disposal Facility must continue.	N	-2	-1	-1	-1	-5	
											The Return Water Dam 3 must be constructed in terms of detailed designs signed off by a Registered Engineer and the on-site Geologist.							
											An effective liner system should be implemented to ensure that no seepage from the facility occurs.							
											Underdrainage systems must be in place to monitor the presence of seep.							
Topography	1 and 2	No further impact is foreseen as the area is located within the Paste Disposal Facility footprint.	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Soil and Land use	1 and 2	No further impact is foreseen as the area is located within the Paste Disposal Facility footprint, no clearance of soils will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

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Name of Activity		Project	Impact Area	Potential Impacts	Rating Prior to Measures						Mitigation Type		Rating Post Measures					
Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	
			Soil and Land use	No further impact is foreseen as the area is located within the Paste Disposal Footprint, no clearance of vegetation will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-	-	-	-	-	-	-	
			Ecology	The establishment of Alien and Invasive Plant species.	N	-2	-3	-4	-4	-13	CbA	An alien and invasive plant species eradication programme will be developed and implemented to eradicate alien and invasive plants and to prevent new invasions during the ongoing mining operation. If natural succession of vegetation is not established within one rainy season after commencement of rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission.	N	-1	-1	-2	-1	-2
				Depending on the location of the Water Containment Facility on King, some vegetation clearance may be required, although unlikely.	N	-2	-3	-4	-4	-13	CbA	In the event that new areas, previously not altered due to mining activities, an ecological walk-over study must be undertaken to determine whether any protected or sensitive species are present. If such species are present, the required permits must be obtained.	N	-1	-1	-2	-1	-2
			Surface Water	Release of Contaminated Water into the environment is unlikely as the Return Water Dam 3 is located within the overall dirty water system. The changes to water management due to the construction of the facility could however impact on the integrity of the existing system.	N	-1	-2	-2	-2	-7	CbA	Clean and Dirty water separation systems should be upgraded in terms of the 2018 Water Studies currently being undertaken by Geo Tail (Pty) Ltd. Measures should be implemented during the construction phase to ensure that excess silt is contained and not released into the water management area and thereby hampering its GN704 compliance in terms of capacity and freeboard. Maintenance of all Storm Water Management systems must be undertaken regularly on site.	N	-1	-1	-2	-1	-5
			Groundwater	Damage to the existing liners and underdrains may lead to groundwater pollution.	N	-2	-2	-2	-2	-8	CbA	The Return Water Dam 3 must be constructed in terms of detailed designs signed off by a Registered Engineer and the on-site Geologist. Groundwater monitoring must continue in line with the requirements of the approved WUL.	N	-1	-1	-1	-1	-4

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Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					SbM	CbA, R, Ir	Mitigation Type	Rating Post Measures						
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity			Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	
		Air Quality	Construction activities and material movement may temporarily result in dust dispersion.	N	-2	-1	-2	-1	-6	CbA	The Dust Monitoring Programme as currently undertaken by the mine should be maintained throughout the construction process. Dust suppression should be undertaken whilst constructing the storm water dam where required.	N	-1	-1	-1	-1	-4	
		Noise	The activities are located within the mining boundary, in proximity to the current King Plant and the operational Paste Disposal Facility. No further impacts in terms of noise are anticipated.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Heritage	No further impact is foreseen as the area is located within the Paste Disposal Footprint, no clearance of soils or underlying material will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Socio-Economic	The Return Water Dam 3 is planned in terms of overall water management on site. The construction activities should have no impact on the Socio-Economic Setting in which the mine is located.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction of pipelines.		Geology	No impact is foreseen to take place on geology as a result of the pipeline construction.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Topography	No further impact is foreseen as the area is located within the existing buffer in which pipelines are located to and from the Paste Disposal Facility.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Soil and Land use	No further impact is foreseen as the area is located within the existing buffer in which pipelines are located to and	N	-1	-2	-4	-4	-11	CbA	Vehicles and machinery will be regularly maintained. Maintenance programmes will be established and implemented. Clean spills, if occur within 24 hours.	N	-1	-1	-2	-2	-6	

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Name of Activity		Impact Area	Potential Impacts	Rating Prior to Measures					Mitigation Type		Rating Post Measures						
Activities	Project		Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
			from the Paste Disposal Facility. However the construction phase may involve the use of hydrocarbons and the presence of vehicles which could lead to accidental spillages in the establishment of the pipeline structures. Vehicle movement in the area could also lead to soil contamination if not well managed. The presence of people in this area could lead to an increase in littering.								Hazardous waste should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site. Documentation of removal and safe disposal must be kept on record and in good order. A detailed waste management strategy will be established and implemented, which will clearly demarcate the containments for different waste streams.						
		Ecology	The establishment of Alien and invasive Plant Species.	N	-2	-3	-4	-4	-13	CbA	An alien and invasive plant species eradication programme will be developed and implemented to eradicate alien and invasive plants and to prevent new invasions during the ongoing mining operation. If natural succession of vegetation is not established within one rainy season, after commencement of rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission.	N	-1	-1	-2	-1	-2
		Surface Water	No impacts are foreseen to take place on surface water, as the pipeline route is not located in close vicinity of watercourses.	-	-	-	-	-	-	-		-	-	-	-	-	-
		Groundwater	No impact is foreseen to take place on groundwater resources as a result of the pipeline construction.	-	-	-	-	-	-	-		-	-	-	-	-	-
		Air Quality	No impact is foreseen to take place on ambient air quality conditions as a result of the pipeline construction.	-	-	-	-	-	-	-		-	-	-	-	-	-
		Noise	No impact is foreseen to take place on ambient noise	-	-	-	-	-	-	-		-	-	-	-	-	-

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Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					Mitigation Type		Rating Post Measures						
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
			conditions as a result of the pipeline construction.														
		Heritage	No further impact is foreseen as the area is located within the existing buffer constructed for pipelines, to and from the Paste Disposal Facility. No clearance of soils or underlying material will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-							
		Socio-Economic	The construction activities should have no impact on the Socio-Economic Setting in which the mine is located.	-	-	-	-	-	-	-							
Upgrade of approved Water Use Licence (WUL) Activities	3	Legal Compliance	Unlawful or incorrect construction of the Water Management Systems	N	-4	-3	-2	-5	-14	CbA	The upgrade sites must be clearly demarcated. The approved design drawings must be available on site at all times. The upgrades to approved Water Uses must be undertaken in terms of detailed designs signed off by a Registered Engineer. All WUL requirements must be adhered to in terms of the upgrade of the facilities. As built drawings must be submitted to the DWS and DMR upon completion of the upgrades A COP must be developed during the construction phase for the operation of the Water Storage Facilities and Mine Residue Facilities in line with the overall Water Conservation and Management requirements as identified in the 2018 Water Studies by Geo Tail (Pty) Ltd currently being undertaken or subsequent approved amendments thereto. An Emergency Preparedness Plan must be developed for any incident which may occur around the Paste Disposal Facility which may impact the integrity of the Facility itself, as well as the existing Return Water Dams.	N	-1	-1	-1	-1	-4
		Geology	No impacts are foreseen on the geological conditions of the area. As the upgrades are limited to the not characterised by underlying dolomites.	-	-	-	-	-	-	-							

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Name of Activity		Project	Potential Impacts	Rating Prior to Measures					Mitigation Type		Rating Post Measures						
Activities	Impact Area		Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
	Topography		No further impact is foreseen as the sites will be located in areas already designed for water containment purposes.	-	-	-	-	-	-	-		-	-	-	-	-	-
	Soil and Land use		No further impact is foreseen as the sites will be located in areas already designed for water containment purposes.	-	-	-	-	-	-	-		-	-	-	-	-	-
	Ecology		The establishment of Alien and invasive Plant Species.	N	-2	-3	-4	-4	-13	CbA	An alien and invasive plant species eradication programme will be developed and implemented to eradicate alien and invasive plants and to prevent new invasions during the ongoing mining operation. If natural succession of vegetation is not established within one rainy season, after commencement of rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission.	N	-1	-1	-2	-1	-2
	Surface Water		Release of Contaminated Water into the environment is unlikely as the Water Uses approved are located within the overall dirty water system. The changes to water management due to the construction of the facility could however impact on the integrity of the existing system.	N	-1	-2	-2	-2	-7	CbA	Clean and Dirty water separation systems should be upgraded in terms of the 2018 Water Studies currently being undertaken by Geo Tail (Pty) Ltd. Measures should be implemented during the construction phase to ensure that excess silt is contained and not released into the existing water uses and thereby hampering its GN704 compliance in terms of capacity and freeboard. Maintenance of all Storm Water Management systems must be undertaken regularly on site.	N	-1	-1	-2	-1	-5
	Groundwater		Damage to the existing liners and underdrains may lead to groundwater pollution.	N	-2	-2	-2	-2	-8	CbA	The upgrade of the facilities must be constructed in terms of detailed designs signed off by a Registered Engineer. Groundwater monitoring must continue in line with the requirements of the approved WUL.	N	-1	-1	-1	-1	-4
	Air Quality		Construction activities and material movement may temporarily result in dust dispersion.	N	-2	-1	-2	-1	-6	CbA	The Dust Monitoring Programme as currently undertaken by the mine should be maintained throughout the construction process. Dust suppression should be undertaken whilst constructing the new infrastructure where required.	N	-1	-1	-1	-1	-4
	Noise		The activities are located within the mining boundary, in proximity to the current	-	-	-	-	-	-	-		-	-	-	-	-	

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Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					Mitigation Type			Rating Post Measures				
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity
			Parson, King and Bruce Plants. No impacts in terms of noise are anticipated.													
		Heritage	No further impact is foreseen as the area is located within the approved mining footprints, no clearance of soils or underlying material will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-						
		Socio-Economic	The upgrade of the Water Containment Structures are planned in terms of overall water management on site. The construction activities should have no impact on the Socio-Economic Setting in which the mine is located.	-	-	-	-	-	-	-						

Table 23: Potential Impacts – Operational Phase

Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					Mitigation Type			Rating Post Measures					
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
Operational Phase regarding the Pipeline and Return Water Dam 3 (The establishment of the Mine Residue Stockpiles are addressed in the EMP and associated Permit 21/2016 and therefore not included in this assessment)																	
Operating of Dirty Water Containment Facilities (Return Water Dam 3 and all other upgrades which may be identified in the water study by Geo Tails.)	1, 3	Geology	The area where the Return Water Dam 3 will be established is characterised by underlying dolomites. The mine is continuously monitoring movement of strata in this area.	N	-3	-3	-3	-4	-13	CbA	Ongoing monitoring of movement around the Paste Disposal Facility must continue. Regular dolomitic studies must be undertaken by the mine to determine the underlying conditions of the containment areas located over the dolomitic aquifers. Leak detection must be undertaken to determine the integrity of the Return Water Dam 3. The effective liner system should be continuously monitored on all water containment facilities.	N	-2	-1	-1	-1	-5
		Topography	No further impact is foreseen.	-	-	-	-	-	-	-							

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Name of Activity		Project	Impact Area	Potential Impacts	Rating Prior to Measures					SbM	CbA, R, Ir	Mitigation Type	Rating Post Measures				
Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	Mitigation Measures			Status	Extent	Duration	Probability	Intensity	SaM
	Soil and Land use		Overflow of facilities could lead to erosion of soil resources.	N	-1	-2	-3	-2	-8	CbA	Dam levels should be monitored and should be maintained at a 0.8m freeboard and within GN704 requirements. Any erosion present on the slopes or surrounds of containment facilities should be immediately rehabilitated.	N	-1	-2	-1	-1	-5
	Ecology		The establishment of Alien and Invasive Plant species	N	-2	-3	-4	-4	-13	CbA	The Alien and Invasive Plant species eradication plan will be implemented continuously. If natural succession of vegetation is not established within one rainy season, after commencement of rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission.	N	-1	-1	-2	-1	-2
	Surface Water		Overflow of Dams resulting in contamination of surrounding water resources. No surface water resources are in close vicinity to the mining operations and therefore such impact unlikely of occurring.	N	-1	-2	-3	-2	-8	CbA	Dam levels should be monitored and should be maintained at a 0.8m freeboard and within GN704 requirements. Operational Procedures must be implement to ensure the optimise operation of the water containment structures to ensure efficient reuse of water. Level meters must be put in place and be maintained. Measurements of water return to the Beneficiation Plant must be kept for auditing purposes and to feed into the Water Balance. The water circuit must be managed at one central location to ensure that there is integration between the plant, Paste Disposal Facility, and general surface water needs and requirements. Automated pumps must be implemented at the Return Water Dams and Storm Water Dams where indicated in the Geo Tail water study to ensure that water can be pumped to the Beneficiation Plant when certain levels are met. The Water Balance must be updated annually, with a strong focus on improving the management of the internal water circuit on site. No change in the design or operation of the facilities may be undertaken without the approved of the relevant government department. Any significant spills must be captured in the incident reports and must be reported to the relevant department (DMR, Catchment Management Agency/ DWS).	N	-1	-2	-1	-1	-5
	Groundwater			N	-2	-2	-2	-2	-8	CbA	Leak detection must be undertaken to determine the integrity of the Return Water Dam 3.	N	-1	-1	-1	-1	-4

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Name of Activity		Project	Potential Impacts		Rating Prior to Measures						Mitigation Type		Rating Post Measures					
Activities			Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
			Damage to the existing liners and underdrains may lead to groundwater pollution								The effective liner system should be continuously monitored on all water containment facilities. Groundwater monitoring must continue in line with the requirements of the approved WUL.							
			Air Quality No impact on the ambient air quality conditions are foreseen as a result of the operation of the water containment facilities.	-	-	-	-	-	-	-		-	-	-	-	-	-	-
			Noise No impact on the ambient noise levels are foreseen as a result of the operation of the water containment facilities.	-	-	-	-	-	-	-		-	-	-	-	-	-	-
			Heritage No further impact is foreseen as the area is located within the Paste Disposal Footprint, no clearance of soils or underlying material will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-		-	-	-	-	-	-	-
			Socio-Economic The operational aspect of the water containment facilities should have a positive impact on the socio-economic conditions, as the opportunity exists for the mine to reuse its internal water resources optimally and not depend on the Sedibeng Water Supply Scheme on a 100% basis. This will allow for the mine to plan towards periods where water shutdowns may be experienced and during which times the mine can then continue to operate.	P	3	1	2	3	9	-	Level meters must be put in place and be maintained. Measurements of water return to the Beneficiation Plant must be kept for auditing purposes and to feed into the Water Balance. The water circuit must be managed at one central location to ensure that there is integration between the Plant, Paste Disposal Facility, and general surface water needs and requirements. Automated pumps must be implemented at the Return Water Dams and Storm Water Dams where indicated in the Geo Tail water study to ensure that water can be pumped to the Beneficiation Plant when certain levels are met. For this purpose level meters must be put in place. The Water Balance must be updated annually, with a strong focus on improving the management of the internal water circuit on site.	P	3	3	5	5	16	
Operating of Pipelines	1, 3	Geology	No impact is foreseen to take place on geology as a result of the pipeline operation.	-	-	-	-	-	-	-		-	-	-	-	-	-	-

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Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					SbM	CbA, R, Ir	Mitigation Type	Rating Post Measures					
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity			Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
		Topography	No further impact is foreseen as a result of the pipeline operation.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Soil and Land use	Spills along pipelines could contaminate or impact on the conditions of soils.	N	-2	-2	-4	-2	-10	CbA	Regular monitoring must be undertaken through walk-about to ensure that the mine is aware of any spills along the pipelines. Any area where spills are present must be contained immediately. Spills must be cleaned within 24 hours. Hazardous waste should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site. Documentation of removal and safe disposal must be kept on record and in good order. A detailed waste management strategy will be established and implemented, which will clearly demarcate the containments for different waste streams.	N	-1	-1	-2	-2	-6
		Ecology	The establishment of Alien and Invasive Plant species.	N	-2	-3	-4	-4	-13	CbA	The Alien and Invasive Plant species eradication plan will be implemented continuously. If natural succession of vegetation is not established within one rainy season, after commencement of rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission.	N	-1	-1	-2	-1	-2
		Surface Water	No impacts are foreseen to take place on surface water, as the pipeline route is not located in close vicinity of watercourses.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Groundwater	Although unlikely, spills along pipelines could contaminate or impact on the conditions of groundwater resources if left unmanaged.	N	-1	-3	-1	-2	-7	CbA	Regular monitoring must be undertaken through walk-about to ensure that the mine is aware of any spills along the pipelines. Any area where the spills are present must be contained immediately. Spills must be cleaned within 24 hours. Ongoing groundwater monitoring must be undertaken in line with the WUL conditions.	N	-1	-1	-1	-1	-4
		Air Quality	No impact on the ambient air quality conditions are foreseen as a result of the	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures						Mitigation Type	Rating Post Measures						
Activities			Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
			operation of the water containment facilities.														
		Noise	No impact on the ambient noise levels are foreseen as a result of the operation of the water containment facilities.	-	-	-	-	-	-	-	-						
		Heritage	No further impact is foreseen as the area is located within the Paste Disposal Footprint and existing pipeline corridors, no clearance of soils or underlying material will be required. All activities will remain within approved footprints.	-	-	-	-	-	-	-	-						
		Socio-Economic	The operational aspect of the water containment facilities should have a positive impact on the socio-economic conditions, as the opportunity exists for the mine to reuse its internal water resources optimally and not depend on the Sedibeng Water Supply Scheme on a 100% basis. This will allow for the mine to plan towards periods where water shutdowns may be experienced and during which times the mine can then continue to operate. The pipeline is an integral part of moving water from the Return Water Dam 3 to the Beneficiation Plant.	P	3	1	2	3	9	-	<p>The water circuit must be managed at one central location to ensure that there is integration between the plant, Paste Disposal Facility, and general surface water needs and requirements.</p> <p>Regular monitoring must be undertaken through walk-about to ensure that the mine is aware of spills on the pipelines.</p> <p>The pumping system must be reviewed continuously to ensure that the water between the Beneficiation Plant and Paste Disposal Facility is moved optimally.</p>	P	3	3	5	5	16
Waste Management and Handling	1, 2, 3	Geology	No direct impact.	-	-	-	-	-	-	-	-						
		Topography	No direct impact.	-	-	-	-	-	-	-	-						
Hydrocarbon spills within the Mining Area		Soils		N	-1	-2	-4	-4	-11	CbA	Storage of fuels and oils, the refuelling of vehicles and equipment maintenance must be limited to designated,	N	-1	-2	-1	-1	-5

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Name of Activity		Project	Impact Area	Potential Impacts	Rating Prior to Measures					SbM	CbA, R, Ir	Mitigation Type	Rating Post Measures					
Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	Mitigation Measures			Status	Extent	Duration	Probability	Intensity	SaM	
											Clear signs informing staff of waste management practices must be implemented on site. Hazardous waste handling should only take place within bounded and/ or lined areas. Any significant spills must be captured in the incident reports and must be reported to the relevant department (DMR, Catchment Management Agency/DWS). Hazardous waste should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site. Documentation of removal and safe disposal must be kept on record and in good order. The mine will adopt a cradle-to-grave (inspection of disposal sites) approach to ensure that the waste is removed and disposed of in a legally compliant manner. Weekly inspections of Storm Water Management Systems must be undertaken. Any blockages or maintenance requirements must be documented and an action plan developed.							
			Groundwater	Large scale hydrocarbon spills could be present if not well managed.	N	-1	-1	-4	-4	-10	CbA	Clean and Dirty water separation systems should be incorporated in terms of the 2018 Water Studies currently being undertaken by Geo Tail (Pty) Ltd or subsequent approved amendments thereto. Maintenance vehicles must be well maintained. No maintenance of vehicles may be undertaken outside of approved workshop areas. No activities associated with hydrocarbons and/or chemicals may be undertaken outside of an effectively designed and contained area. All used oils must be removed from site by a licensed company and disposed of at a suitably licensed site. Any spills occurring during the collection process must be cleaned up immediately. Any significant spills must be captured in the incident reports and must be reported to the relevant department (DMR, Catchment Management Agency/DWS). All equipment and machinery should be kept in good working order. A clean up procedure (i.e. Works Instruction) must be in place.	N	-1	-1	-2	-1	-5

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Name of Activity		Project	Impact Area	Potential Impacts	Rating Prior to Measures						Mitigation Type	Rating Post Measures					
Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	SbM	CbA, R, Ir		Mitigation Measures	Status	Extent	Duration	Probability	Intensity
	Air Quality		No direct impact is foreseen.	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Heritage		No direct impact is foreseen.	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Noise		No direct impact is foreseen.	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Visual		No direct impact is foreseen.	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Socio-Economic		Unmanaged waste management practices could impact on surrounding areas, if grazing animals have access to and consume waste material.	N	-2	-3	-2	-4	-11	CbA	Develop dedicated waste handling areas, prevent access to rodents and opportunistic species and prevent the spread of waste. Develop dedicated waste handling areas, fit for purpose and prevent the spread of waste. Maintain an open channel of communication with surrounding landowners.	N	-1	-2	-2	-1	-6

Table 24: Potential Impacts – Decommissioning Phase

Name of Activity		Project	Impact Area	Potential Impacts	Rating Prior to Measures						Mitigation Type	Rating Post Measures						
Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	Significance before Mitigation	CbA, R, Ir		Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
Decommissioning Phase																		
Legal Requirements (Environmental Permits)		1, 2, 3	Legal Compliance	Unlawful activities could lead to NWA Directives and Section 24G Rectification fines.	N	-4	-3	-2	-5	-14	CbA	Vehicles must be well maintained. All used oils must be removed from site by a licensed company and disposed of at a suitably licensed site Any spills occurring during the collection process must be cleaned up immediately. Any significant spills must be captured in the incident reports and must be reported to the relevant department (NCDENC, Water Users Association, CMA, or DWS). A clean up procedure (i.e. Works Instruction) must be in place.	P	4	3	5	5	17

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Name of Activity	Project	Impact Area	Potential Impacts	Rating Prior to Measures					Significance before Mitigation	CbA, R, Ir	Mitigation Type	Rating Post Measures					
			Potential Impacts	Status	Extent	Duration	Probability	Intensity			Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
											The legal register must be updated to indicate all updated activities.						
Dismantling and decommissioning of the dams, pipeline and ancillary infrastructure of the dams	1, 2, 3	Geology	No direct impact	-	-	-	-	-	-	-	-	Linear infrastructure constructed by the mine will be removed if it proves to inhibit land use at decommissioning. Where possible, infrastructure will remain for social investment opportunities, this will be decided in conjunction with the Integrated Development Plan of the area and the local authorities.	-	-	-	-	-
		Topography	Removal of infrastructure may impact on the topography.	N	-2	-3	-4	-4	-13	R	Ensure the entire site remains fenced for the duration of rehabilitation.	P	3	3	4	4	14
											Retain security access control to the site for the duration of rehabilitation.						
			Spills around decommissioning areas	N	-1	-2	-4	-4	-11	CbA	Draw up a plan clearly defining the area where the removal of infrastructure should take place. Implement	-	-1	-2	-1	-1	-5

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Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	Mitigation Measures			Status	Extent	Duration	Probability	Intensity	SaM	
			Soil, Land Use and Land Capability	(hydrocarbons and paste) may result in the contamination of soils.								the plan with sufficient measures in place not to compact new areas. All hazardous waste should be disposed of at licensed and fit-for-purpose areas and safe disposal records should be kept on file. Any hydrocarbon, effluent or other contaminants should be collected and the soils remediated immediately.						
				Contamination of soils as a result of a lack of sanitary services	N	-1	-2	-4	-4	-11	CbA	Chemical toilets must be readily available to contractors. Licensed companies must be appointed to remove any contaminated material and or wastes to licensed landfill sites.	-	-1	-2	-1	-1	-5
				Loss of soils due to decommissioning activities present on site.	N	-1	-2	-4	-4	-11	CbA	Draw up a plan clearly defining the area where the removal of infrastructure should take place. Implement the plan with sufficient measures in place not to compact new areas. Compacted soils adjacent to the infrastructure footprint can be lightly ripped to alleviate compaction where required. Implement a strict penalty fine system for rule breaking with regard to vehicular movement. Maintain Clean and Dirty water systems and undertake regular monitoring and maintenance thereof.	N	-1	-2	-1	-1	-5
			Ecology	The establishment of Alien and Invasive Plant species.	N	-2	-3	-4	-4	-13	CbA	The Alien and Invasive Plant species eradication plan will be implemented continuously. If natural succession of vegetation is not established within one rainy season, after commencement of rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a	N	-1	-1	-2	-1	-2

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											protective cover, to minimise soil erosion and dust emission.						
		Surface Water	Erosion control over rehabilitated areas and the prevention of erosion gullies.	N	-1	-1	-4	-2	-8	CbA	The topography of all disturbed areas must be shaped in such a manner that the surrounding natural area blends naturally with the rehabilitated areas well as to be free-draining. This will reduce soil erosion and improve natural re-vegetation.	N	-1	-1	-2	-2	-6
			Contamination of surface water as a result of removal of infrastructure.	N	-2	-2	-4	-3	-11	CbA	The detailed waste management strategy implemented during the construction and operation phases must be continuously implemented throughout the closure and decommissioning phase. Contaminated water from the water containment facilities should be reused in the plant system as long as possible and left to evaporate. No unlawful discharge of water will be allowed.	N	-1	-1	-2	-2	-6
			Rubble and waste from site could pollute runoff.	N	-1	-1	-4	-2	-8	CbA	All wastes required should be removed to licensed waste disposal facilities and by licenced companies.	N	-1	-1	-2	-2	-6
		Groundwater	Decommissioning and removal of facilities could lead to the infiltration of dirty water to groundwater resources.	N	-2	-3	-2	-2	-9	CbA	No water may be discharged into watercourses, if this water has not been treated to the correct quality OR if approval from the DWS for such activity has not been obtained.	P	2	3	4	5	14
											Once the dams are empty, any silt remaining in the dams should be disposed of on the Paste Disposal Facility and/or approved Mine Residue Deposits.						
											The Return Water Dams should be demolished, and the liner and rubble should be classified to determine the type of landfill site suitable to cater for this material. Groundwater monitoring must continue up until closure is obtained.						
		Heritage	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Visual	Fugitive dust emissions as a result of infrastructure removal and associated exposed/bare areas may have an impact in terms of air quality and visual characteristics.	N	-2	-2	-4	-3	-11	CbA	The dust monitoring network and dust suppression programme established during the construction phase of the project will be maintained throughout the decommissioning/ closure phase of the mine. With respect to road dust levels, it is recommended to limit vehicle speeds, especially during high risk periods of high winds, high temperature and low humidity.	N	-2	-1	-3	1	-5
											Establish and implement a dust suppression plan in consultation with the Environmental Control Officer						



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Activities	Impact Area		Potential Impacts	Status	Extent	Duration	Probability	Intensity	Mitigation Measures			Status	Extent	Duration	Probability	Intensity	SaM	
											and an air quality specialist as part of the contractor's responsibility.							
	Air Quality		All activities associated with the removal of infrastructure and rehabilitation has the potential to release dust.	N	-2	-2	-4	1	-7	CbA	The dust monitoring network and dust suppression programme established during the construction phase of the project will be maintained throughout the closure phase of the mine. With respect to haul road dust levels, it is recommended to limit vehicle speeds, especially during high risk periods of high winds, high temperature and low humidity.	N	-2	-1	-3	1	-5	
	Noise		All activities associated with the removal of infrastructure and rehabilitation has the potential to generate noise.	N	-2	-2	-4	1	-7	CbA	The removal of all infrastructure is to take place during daytime periods only. Where noise becomes a nuisance, management measures will be investigated and implemented to address these.	N	-2	-1	-3	1	-5	
	Social		No direct impact	N	-2	-2	-4	1	-7	-	Local residents, with the focus on the surrounding landowners, should receive accurate information with regards to the project status, timeframes for decommissioning and other relevant information about issues that could influence their daily living and movement patterns.	N	-2	-1	-3	1	-5	
Earth moving, shaping and ripping of ground	Geology		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Topography		The shaping of the site should be undertaken in such a manner that it improves the overall topography of the site.	P	1	3	4	5	13	R	Pre-mining topography should be reasonably restored through shaping and landscaping, such that the topography of rehabilitated areas will ultimately be commensurate with that of adjacent, non-disturbed areas. The final shaping should be viable to allow for final post mining land use. If possible ensure a continuation of the premining surface drainage pattern.	-	1	3	5	5	14	
	Soils	Soil erosion			N	-6	-3	-4	-3	-16	CbA	Re-vegetate as soon as possible.	N	-2	-1	-3	1	-5
Ripping and topsoil replacement will restore the				P	1	3	4	5	13	CbA	Compacted soils will be ripped and topsoil will be replaced if the latter is deemed necessary for effective vegetation.	P	1	3	5	5	14	

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Activities	Potential Impacts			Status	Extent	Duration	Probability	Intensity	Mitigation Measures			Status	Extent	Duration	Probability	Intensity	SaM	
				soil physical characteristics prior to re-vegetation.								Where sites have been alienated of vegetation or where soils have been compacted or covered with concretes, these sites will be ripped and ploughed. The mine will encourage self-succession of vegetation, if this does not take place effectively a re-vegetation project will be implemented.						
			Terrestrial Ecology (Fauna & Flora)	The rehabilitation (ripping, topsoil replacement and shaping) of the site will allow reestablishment of natural vegetation.	P	1	2	3	4	10	CbA	Compacted soils will be ripped and topsoil will be replaced if the latter is deemed necessary for effective vegetation. After the topsoil has been replaced the area should be ameliorated and seeded, should self-succession of vegetation not take place. Only species indigenous to the area will be included. The soil fertility status should be determined by soil chemical analysis after levelling and before seeding/re-vegetation if deemed applicable. On-going alien and invasive floral species control is required through all phases of rehabilitation. If a reasonable assessment indicates that the re-establishment of vegetation is unacceptable slow, the soil need to be analysed and any deleterious effects must be corrected and the area be seeded with a seed mix to specification. Access to rehabilitated areas should be restricted to vehicles/ machinery specifically required for the implementation of the decommissioning/ closure plan.	P	3	3	3	4	13
			Wetland	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Surface Water	Runoff from rehabilitated areas will impact on watercourses especially during intensive rainstorms especially if the area are not free draining.	N	-2	-1	-3	1	-5	CbA	The areas will be shaped to be free draining in line with the approved storm water management plan. Berms, should they be necessary, must remain upstream and downstream of the areas to ensure that clean water is kept separate from dirty water until the area is free draining and self-succession has occurred.	P	3	3	3	4	13
			Groundwater	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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			Potential Impacts	Status	Extent	Duration	Probability	Intensity			Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
		Heritage	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Visual	The rehabilitation (ripping, topsoil replacement (if required) and shaping) will remove the visual incongruity.	P	2	4	4	1	11	CbA	<p>An overall visual improvement will be noticed once all mining related infrastructure has been demolished and the area has been shaped and self-succession has occurred.</p> <p>Demarcate the decommissioning area and limit the decommissioning activities as far as possible.</p> <p>Final shaping will be implemented such that the final profile of the rehabilitated areas are formed to emulate natural contours of the area.</p> <p>Foundations will be removed to a depth of 1 m below the surface and the area rehabilitated.</p> <p>All material recovered from the demolition of buildings and/or structures will either be transported to a permitted disposal site, or made available to the local community as building materials (provided they are in a satisfactory condition following demolition).</p> <p>Linear infrastructure constructed by the mine (i.e. pipelines) will be removed if it proves to inhibit land use at decommissioning.</p> <p>All fences erected around the mine will be dismantled and disposed of at a permitted disposal site.</p> <p>Dust sampling will be undertaken on a monthly basis.</p>	P	2	4	4	3	13
		Air Quality	All activities associated with the removal of infrastructure has the potential to release dust.	N	-2	-2	-4	1	-7	CbA	<p>Monthly monitoring reports will be generated by the mine or through a suitably qualified air quality specialist.</p>	N	-2	-1	-3	1	-5

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			Potential Impacts	Status	Extent	Duration	Probability	Intensity			Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
											In the event that air quality or dust issues are identified based on the monitoring programme, an independent specialist should be appointed to determine the best course of action to ameliorate the situation.						
		Noise	All activities associated with the removal of infrastructure and rehabilitation has the potential to generate noise.	N	-2	-1	-4	3	-4	CbA	The removal of all infrastructure is to take place during daytime periods only. Where noise becomes a nuisance, management measures will be investigated and implemented to address these. Machinery with low noise levels and maintained in a good order to be used and to comply with the International Finance Corporation's (IFC) Health and Safety Regulations. Speed control measures will be implemented by the mine through the placement of adequate signage. Implement a penalty system for non-compliance to speed control measures and ensure that all workers are made aware of the penalty systems. Gravel roads to be maintained in as good and smooth a condition as possible.	N	-2	-1	-3	1	-5
		Social	No direct impact	-	-	-	-	-	-	-	-		-	-	-	-	-
		Geology	No direct impact	-	-	-	-	-	-	-	-		-	-	-	-	-
		Topography	No direct impact	-	-	-	-	-	-	-	-		-	-	-	-	-
Waste Management and decommissioning of hazardous (also fuels) substances		Soil, Land Use and Land Capability	Hydrocarbon spills.	N	-1	-2	-4	-4	-11	CbA	Any hydrocarbon, effluent or other contaminants should be collected and the soils remediated immediately. A contaminated land assessment should be undertaken at all areas where diesel was stored, as well as where fuel pipelines were placed.	N	-1	-2	-1	-1	-5
		Terrestrial Ecology (Fauna & Flora)	No direct impact	-	-	-	-	-	-	-	-		-	-	-	-	-
		Wetland	No direct impact	-	-	-	-	-	-	-	-		-	-	-	-	-

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	Groundwater	Handling or Hazardous Waste within workshops and general mine area.	N	-2	-2	-2	-4	-10	CbA	Clean and Dirty water separation systems should be incorporated in terms of the Geo Tail water study recommendations or any approved update thereafter.	N	-1	-1	-2	-2	-6	
										Waste management training must be implemented on site.							
										Clear signs informing staff of waste management practices must be implemented on site.							
										Hazardous waste handling should only take place within bunded and/or lined areas.							
										Hazardous waste should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site.							
										Documentation of removal and safe disposal must be available on site.							
		Handling of Building Rubble	N	-2	-2	-2	-3	-9	CbA	All infrastructure will be removed and rehabilitated, should no alternative use be found for the structures.	N	-1	-1	-2	-2	-6	
										Foundations will be removed to a depth of 0.5m below surface.							
										All building rubble will follow the waste hierarchy and will therefore either be sold for reuse where possible and as a last option be disposed of at a licensed facility suitable for such waste in line with the NEM:WA.							
Handling and Storing of Domestic Waste	N	-3	-3	-3	-3	-12	CbA	Clean and Dirty water separation systems should be maintained.	N	-2	-3	-2	-2	-9			
								Waste management training must be implemented on site.									
								Clear signs informing staff of waste management practices must be implemented on site.									
								Groundwater monitoring must be undertaken in such a manner as to ensure that any potential impacts from the site can be detected.									
								Recycling practices must be investigated and implemented on site.									

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			Potential Impacts	Status	Extent	Duration	Probability	Intensity			Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
		Surface Water	Handling of Hazardous Waste within workshops and general mine area could contaminate the dirty water storage areas. The water is then reused in the system and could have impacts on the integrity of the storm water system and also the production.	N	-3	-2	-2	-4	-11	CbA	Clean and Dirty water separation systems should be maintained up until closure. Waste management training must be implemented on site. Clear signs informing staff of waste management practices must be implemented on site. Hazardous waste handling should only take place within bunded and/or lined areas. Hazardous waste and contaminated materials should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site. Documentation of removal and safe disposal must be available on site. Weekly inspections of Storm Water Management Systems must be undertaken. Any blockages or maintenance requirements must be documented and an action plan developed.	N	-1	-1	-2	-2	-6
			Handling and Storing of Domestic Waste should have no impact on the surface water resources due to the location of the facility. However, incorrect disposal of waste could hamper the integrity of the storm water system.	N/A	-1	-2	-3	-3	-9	CbA	Clean and Dirty water separation systems should be maintained up until closure. Waste management training must be implemented on site. Weekly inspections of Storm Water Management Systems must be undertaken. Any blockages or maintenance requirements must be documented and an action plan developed. Clear signs informing staff of waste management practices must be implemented on site. Recycling practices must be investigated and implemented on site. Building rubble must be disposed of in line with the requirements of the NEM:WA. Access control must be strictly enforced.	N	-1	-1	-2	-1	-5

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Activities	Impact Area		Potential Impacts	Status	Extent	Duration	Probability	Intensity	Significance before Mitigation	CbA, R, Ir	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM
	Air Quality		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heritage		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Visual		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Air Quality		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Noise		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Social		No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1.h.iv.3 The Positive and Negative Impacts that the Proposed Activity (in terms of the Initial Site Layout) and Alternatives will have on the Environment and the Community that may be affected

The proposed projects as part of this application are situated on the existing Khumani Mining Right Area. Mining activities have been present in this area since the 2009.

The mine has been investigating measures to optimise water management on site due to the fact that groundwater resources are mostly dewatered in the operational areas of the mine as a result of surrounding mining activities and water supply is purchased at high costs from the Sedibeng Water Supply Scheme, which is the main source of water supply to not only the mine, but also the surrounding towns, farmers and communities.

The following key positive impacts are foreseen:

- ☞ The operation of the mine due to a lawful construction of the activities will allow the mine to operate within the legal realm of the Environmental Legislation;
- ☞ The construction of Return Water Dam 3 will ensure that water can be optimally stored in the area and pumped to the Beneficiation Plant;
- ☞ It is pertinent for the mine to ensure that there is sufficient infrastructure on site to optimise water reuse within the process water circuit, as well as to allow for buffer storage capacity in periods where the pipeline scheme is not operational or supply lower volumes of water; and
- ☞ The location of the facilities will not require the removal of vegetation as it is contained within already disturbed footprint areas. Limited clearance may be required for the King Water Containment Facility depending on its final location, this will however be less than 1ha in area.

The key potential negative impacts which may/ will arise and for which management measures have been recommended are, but still require confirmation by specialists are:

- ☞ Construction activities may lead to an increase in dust emissions if not managed.
- ☞ By not maintaining the dams and pipelines spills can occur, which could lead to soil erosion and a loss of water.
- ☞ By not maintaining the areas around the facilities, alien and invasive plant species can established.

When considering the above it is clear that with the implementation of management measures negative impacts can be managed.

1.h.iv.4 The possible mitigation measures that could be applied and the level of risk

Please refer to Table 21 to Table 24 for potential management measures. Some of the key management measures currently foreseen include:

- ☞ A legal assessment of all activities and future planned activities must be undertaken annually to ensure that all activities are authorised.
- ☞ The Water Use Licence (WUL) must be available on site at all times.
- ☞ Construction areas must be clearly demarcated to control movement of personnel and vehicles, providing clear boundaries for construction sites in order to limit the spread of impacts. Markers and pegs will be erected and maintained along the boundaries of the working areas, access roads, haul roads and paths before commencing any work. If proved insufficient for control, these shall be replaced by fencing.
- ☞ Clean and dirty water separation as part of a Storm Water Management Plan must be implemented early in the construction phase, especially down-gradient of construction areas to ensure that the natural runoff patterns are impacted as little as possible.
- ☞ Ensure that all design drawings include effective erosion control measures.
- ☞ Alien and invasive plant species eradication should be implemented on site during all development phases.
- ☞ Equipment will be well maintained to reduce excessive noise creation.
- ☞ Ensure the required erosion protection measures are monitored and corrected where necessary.
- ☞ Storage of fuels and oils, the refuelling of vehicles and equipment maintenance must be limited to designated, bunded areas. Bunds to be 110% of volume of the materials stored).

- ☞ All workers must undergo an induction which includes environmental awareness training to make them aware of the environmental incident management procedures as well as the importance of complying with management measures.
- ☞ Any significant spills must be captured in the incident reports and must be reported to the relevant department (DMR and DWS).
- ☞ Water levels in the Return Water Dams should be monitored and should be maintained at a 0.8m freeboard.
- ☞ Pipelines flows should be recorded on mine recording system (active at any time) to determine when there may be a potential leak on a pipeline.
- ☞ All rehabilitated areas should be effectively fenced off to avoid access thereto by unauthorised parties up until full rehabilitation has been achieved.

1.h.iv.5 The outcome of the Site Selection Matrix, Final Site Layout Plan

All activities as currently presented in this report are located on the proposed sites. The projects proposed are required for the optimisation of existing infrastructure and/or facilities on site. Therefore the locations are based on existing infrastructure and existing cleared areas.

1.h.iv.6 Motivation where no alternatives sites exist

Please refer to Section 1.h.i.1 of this report.

1.h.v *Statement motivating the preferred site*

Please refer to Section 1.h.i.1 of this report.

1.i Plan of Study for the Environmental Impact Assessment

1.i.i *Description of alternatives to be considered including the option of not going ahead with the activity*

Please refer to 1.h of this report which presents the views and options of relevant alternatives to the projects in question.

All activities as currently presented in this report are located on the proposed sites. The projects proposed are required for the optimisation of existing infrastructure and/or facilities on site. Therefore the locations are based on existing infrastructure and existing cleared areas.

No further alternative assessments will be undertaken.

1.i.ii *Description of the aspects to be assessed as part of the environmental impact assessment process*

The aspects of the project that will be assessed in the EIA phase are those considered by the EAP as having the potential to result in environmental and social impacts. They include:

- ☞ Establishment of alien and invasive plant species;
- ☞ Release of dust due to presence of construction activities; and
- ☞ Implementation of the Storm Water Management System.

Detailed description of each of the activities are presented in Section 1.d.

1.i.iii *Description of aspects to be assessed by specialists*

1.i.iii.1 Hydrology

Geo Tail (Pty) Ltd (Bruce Randall) has been appointed to conduct the assessment of water management on site and to update the Water Balance and Storm Water Management Plan.

1.i.iv The proposed method of assessing duration significance

Please refer to Section 1.h.iv.1 presenting the methodology to be used in the determination of the significance of the impacts.

1.i.v Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

Please refer to Section 1.h.iv.1 presenting the methodology to be used in the determination of the significance of the impacts.

1.i.vi The stages at which the competent authority will be consulted

The commenting authorities have been notified of the proposed project via notification letters. The documents provided high level project information with a reference to the project.

Commenting authorities will receive hard copies the Draft Scoping Report and will receive hard copies of the draft EIA Report.

All comments received from the authorities and Stakeholders will be provided to the DMR for considerations.

The EAP will request an authority meeting with the DMR.

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

1.i.vii.1 Steps to be undertaken to notify interested and affected parties

In accordance with the NEMA GNR 982, Chapter 6, potential I&APs either have been or will be notified of the proposed project using the following means:

- ☞ Fixing a notice board in conspicuous areas around the proposed project site.

Written notice to the:

- ☞ Registered Stakeholders;
- ☞ Municipality which has jurisdiction in the area; and
- ☞ Commenting authorities.

Placing an advertisement in a local newspaper.

Please refer to Section 1.h.ii for more detail in this regard.

1.i.vii.2 Details of the engagement process to be followed

Please refer to Section 1.h.ii for more detail in this regard. All registered stakeholders will receive an electronic copy of the draft reports to comment on.

1.i.vii.3 Description of the information to be provided to Interested and Affected Parties

During the initial stakeholder notification process, high level project detail will be provided including location of the project, boundary of the proposed project site, farm details, land use information, legal triggers and proposed way forward.

During the draft scoping report, public review period (xxx), comments will be received from stakeholders. These comments will be included into the Final Scoping Report and will be address in further detail during the EIA Phase.

During the scoping phase the stakeholders will obtain information regarding the:

- ☞ Site Plans;
- ☞ Alternatives;
- ☞ A description of activities and operations to be undertaken;

- Baseline information;
- Specialist studies to be undertaken; and
- Proposed impact assessment methods.

During the EIA Phase, the following information will be disclosed in the EIA Report:

- Impact assessment undertaken and results thereof;
- Management measures;
- Monitoring plans; and
- Closure objectives.

1.i.viii Description of the tasks that will be undertaken during the environmental impacts assessment process

Once the comments have been received on the Draft Scoping Report the Final Scoping Report will be completed. The Final Scoping Report will be submitted to the DMR, and once accepted the proposed project will proceed into the detailed EIA Phase, which involves the detailed specialist investigations (as described in earlier sections of this report).

The EAP will produce a Draft EIA Report after the completion of the required specialist studies. The Draft EIA Report will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the 2014 EIA Regulations and amendments thereto will be included in the Draft EIA Report.

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

Please refer to Sections 1.h.iv.2, 1.h.iv.3, and 1.h.iv.4 for a detailed description of the potential impacts and management measures.

1.j Other Information required by the Competent Authority

A meeting has been requested with the DMR. This date has not been finalised. Once the meeting has been completed, the outcomes of such meeting will be included into the final reports.

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

1.j.ii Impact on the socio-economic conditions of any directly affected person

The project will have a long term positive impact on the socio-economic environment, specifically due to an improvement in Water Conservation and Demand Management, as the project allows for an improvement in the in the use of water within the internal mining circuit and therefore reducing the full water demand requirement on the Sedibeng Water Supply Scheme. In addition to this, the project will allow for the improvement and formalisation of existing activities on site, which will enhance safety and environmental management on site.

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

The sites in question are located on already disturbed areas no new excavations or clearance will be undertaken. In the event that the location of the King Water Containment Facility indicate new areas for clearance, the SAHRA will be consulted. For this reason no impact on the national estate is foreseen.

Other matter required in terms of sections 24(4) (a) and (b) of the Act.

None applicable. The motivation for lack of consideration of site alternatives is presented within this report.

2 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

The EAP herewith confirms:

- 2.a The correctness of the Information provided in the Reports
- 2.b The inclusion of Comments and Inputs from Stakeholders and I&APs
- 2.c The inclusion of Inputs and Recommendations from the Specialist Reports where relevant
- 2.d That the Information provided by the EAP to I&APs and any Responses by the EAP to Comments and Inputs made by I&AP are correctly reflected herein

Signature of the Environmental Assessment Practitioner

EnviroGistics (Pty) Ltd

Name of company

Date

3 UNDERTAKING REGARDING LEVEL OF AGREEMENT

Undertaking by the client:

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

Full Names and Surname

Identity Number

Designation

Signature

Date



DRAFT Environmental Scoping Report for in terms of Nation Environmental Management Act, 1998 for:Project 1: New
Return Water Dam 3.Project 2: New Infrastructure (New Water Containment Facility and PipelinesProject 3: Water Use
License (WUL) amendment
Mining Right Ref: 30/5/1/3/2/1(179) EM
Project Ref: 21808
Version: FINAL

Annexures

Annexure 1: DMR Acknowledgment of Receipt

Annexure 2: EAP Curriculum Vitae

Annexure 3: Stakeholder Consultation

Annexure 4: Proof of submission to commenting authorities

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Annexure 2: EAP Curriculum Vitae

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Annexure 3: Stakeholder Consultation Information

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Annexure 4: Proof of submission to commenting authorities