



KONGIWE
ENVIRONMENTAL SCIENCE & ENGINEERING

THE RECLAMATION OF THE SOWETO CLUSTER DUMPS IN JOHANNESBURG, GAUTENG PROVINCE

FINAL SCOPING REPORT

15 July 2019



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FINAL SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH THE RECLAMATION AND REPROCESSING OF THE SOWETO CLUSTER DUMPS IN JOHANNESBURG, GAUTENG PROVINCE.

APPLICATION FOR ENVIRONMENTAL AUTHORISATION (EA):

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 MAY BE TRIGGERED.

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Final Scoping Report Information

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SECTION 1: SCOPING REPORT OVERVIEW

Important Notice

Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act, 1998 (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 Regulation 16(3) (b) of the Environmental Impact Assessment Regulations 2017, 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 Regulation 17 (1) (c) the Competent Authority must check whether the application has considered 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 a failure to meet the requirements of the Regulations and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner (EAP) 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—

- (a) identify the relevant policies and legislation relevant to the activity;
- (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- (d) 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;
- (e) identify the key issues to be addressed in the assessment phase;
- (f) 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
- (g) 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.

Public Review Period for the Draft Scoping Report

The Draft Scoping Report (DSR) was made available to stakeholders on the Kongiwe Environmental website and in public places for a 30-day comment period from **4th of June to 8th July 2019**. Notification of the availability of the documentation for review was distributed on the 31st of May 2019. The report was made available at the following locations:

LOCATION	PHYSICAL ADDRESS	CONTACT PERSON
Hard copies		
Bramfischerville Public Library	Cnr Loerie Blaar & Methlokgo Phase 2, Bramfischerville	Ms Patricia Mathe (Librarian) Tel: (011) 765 4025
Roodepoort Public Library	Cnr Berlandina & Hodgson Streets	Ms Monique Ramabulana Tel: (011 763 1031)
Electronic copies		
Kongiwe Environmental website at www.kongiwe.co.za/public documents		
For a CD copy please contact the stakeholder engagement team (Sibongile Bambisa/ Vanessa Viljoen), Tel: 012 003 6627, Email: stakeholders@kongiwe.co.za		

Comments received from the public throughout this public review process have been included within this Final Scoping Report in Appendix C9 of the Comments and Responses Report.

Foreword

Kongwe Environmental (Pty) Ltd (hereafter Kongwe) is committed to Environmental Quality. Environmental Quality refers to the total environment, not just the natural environment. It is a measure of the health of the environment itself (including the fauna and flora it supports), and of the effects it has on the health, comfort, and psychological state of the people that inhabit it. Environmental Quality ensures that the value of South Africa's land is preserved, protected and sustained, and not unacceptably exploited or degraded.

All members of this project team, including the appointed specialist professionals, are committed to protecting the environment and encouraging its sustainability. To ensure that Environmental Quality is achieved, Kongwe has been involved since the earliest design stage of the project. Kongwe is committed to working closely with the client, stakeholders, landowners and community members.

Kongwe believes that with the co-operation of stakeholders throughout the project process, Environmental Quality can be achieved in all mining development stages.

Executive Summary

Kongiwe has been appointed as the Independent Environmental Service Provider, tasked with conducting the S&EIA process which is aimed at critically evaluating the potential environmental and social impacts of the proposed **Soweto Cluster Dumps Reclamation and Reprocessing Project** (hereafter the Proposed Project).

The Application for Environmental Authorisation was submitted to the Department of Mineral Resources and Energy (DMRE) on **Thursday, 30th May 2019**, and the DSR was made available for public review from **4 June 2019 to 8 July 2019**.

Project Introduction and Background

The Applicant for the reclamation of the Soweto Cluster dumps will be Crown Gold Recoveries (Pty) Limited (hereafter Crown Gold), a subsidiary of DRDGold Limited (hereafter DRD). Crown Gold intends to reclaim and reprocess gold from six historic slimes dams: 2L24; 2L20; 2L21; 2L16; 2L17 and 2L18 as well as two historic sand dumps 2A6 and 2A8. These dams and dumps are referred to collectively as “the Soweto Cluster” and were all created prior to the Mineral and Petroleum Resources Development Act, 2002 (MPRDA) which came into force in 2004.

Crown Gold intends to make use of current infrastructure held by DRD and its main shareholder Sibanye Stillwater Limited for the reclamation of the Soweto Cluster.

Surface gold retreatment is a largely mechanised process with a risk profile that is significantly lower from that of conventional mining. The tailings material from the Soweto Cluster will be reclaimed by using high-pressure water jets (slimes dams) and by front-end loaders (sand dumps) which is fed as slurry to a metallurgical processing plant for gold recovery.

Project Alternatives

Three existing authorised processing plants, each with a capacity to process 500 000 tons to 1.2 million tons of slurry per month, will be investigated for this project. The plants include Ergo Plant, Cooke Plant and the yet to be constructed, Central Processing Plant (CPP). Final deposition of the processed slurry from the plants will be at the associated plants authorised deposition sites, namely the Brakpan/Withok Tailings Storage Facility (TSF), the Cooke TSF or Millsite Pits and/or the West Rand Regional TSF (which is still to be constructed).

Three 500 mm slurry pipelines and three 500 mm return water pipelines are being evaluated for the proposed activities. These pipelines are linked to the plant alternatives considered above. The pipelines will require authorisation in terms of the National Water Act (Act No. 36 of 1998) (NWA) for Section 21 water uses. An Integrated Water Use Licence Application (IWULA) will be prepared and submitted in accordance with the Water Use Licence Application and Appeals Regulations 2017 published in GNR 267

on 24 March 2017 and will be supported by a Technical Report and Integrated Water and Waste Management Plan (IWWMP).

Ultimately, by reclaiming the Soweto Cluster Dumps, Crown Gold will displace environmentally problematic slimes dams and sand dumps to controlled tailings disposal facilities such as Brakpan/Withok Tailings Storage Facility (TSF), Cooke TSF and the Regional TSF.

Environmental Impact Process

The Department of Environmental Affairs (DEA), in consultation with the DMRE identified the need for the alignment of Environmental Authorisations (EAs) and promulgated a single environmental system under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). This has resulted in simultaneous decisions in terms of NEMA, the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) and other specific environmental management Acts.

As from 2 September 2014 the statutory dispensation regarding environmental management on mines changed with the implementation of the One Environmental System and the commencement of the National Environmental Management Laws Amendment Act (Act No. 25 of 2014) (NEMLAA). In line with the One Environmental System the Environmental Impact Assessment Regulations (EIA 2014 Regulations) were promulgated and came into force on 8 December 2014. The EIA 2014 Regulations have subsequently been amended on the 7th of April 2017. With reference to the aforementioned, this S&EIA, prepared in support of the EA application, will comply with the requirements of the EIA 2014 Regulations, as amended.

The Proposed Project therefore requires Environmental Authorisation (EA) in terms of the NEMA and the NEM:WA and will follow a S&EIA process in terms of the EIA 2014 Regulations, as amended. The aforesaid regulations enforce a strict timeframe and require a decision by the competent authority, the DMRE, within **300 days** from submission of the EA application.

The nature and extent of the Proposed Project, as well as the potential environmental impacts associated with the construction, operation, decommissioning and rehabilitation of a facility of this nature is assessed and presented in this FSR.

Legal Background and Requirements

This FSR has been compiled in terms of the provisions of Appendix 2 of the EIA Regulations 2014, as amended, and the Directive set out in the template prescribed by the DMRE. Table 0-1 cross-references the various sections in this report with these requirements.

Table 1-1: Structure of the Scoping Report in line with the Appendix 2 of the EIA 2014 Regulations, as amended.

NO.	REGULATION REQUIREMENT	REPORT SECTION	PAGE NUMBER
(a)	Details of -		
(i)	The EAP who prepared the report and;	1.5	6-7
(ii)	The expertise of the EAP including a CV		
(b)	The location of the activity, including –		
(i)	The 21-digit Surveyor General code of each cadastral land parcel	2	11-13
(ii)	Where available, the physical address and farm name		
(iii)	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property or properties	N/A	N/A
(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –		
(i)	A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken	2.1	14
(ii)	On land where the property has not been defined, the coordinates within which the activity is to be undertaken		
(d)	A description of the scope of the proposed activity, including –	2.4	15
(i)	All listed and specified activities triggered	2.5	17-20
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure	2.6	21-23
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	3	24-40
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the	4	41-44

NO.	REGULATION REQUIREMENT	REPORT SECTION	PAGE NUMBER
	context of the preferred location		
(g)	Period of environmental authorisation	5	45
(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including -	6	46-53
(i)	Details of the alternatives considered	6.1	46-53
(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	7	54-61
(iii)	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	7 Appendix C	54-61 Appendix C
(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	8	62-78
(v)	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated	9	79-88
(vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	9.1	79-84
(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	9.2	84-87
(viii)	The possible mitigation measures that could be applied and level of residual risk	9.4	87
(ix)	The outcome of the selection matrix	9.5	88
(x)	If no alternatives, including alternative locations for the activity were	9.6	88

NO.	REGULATION REQUIREMENT	REPORT SECTION	PAGE NUMBER
	investigated, the motivation for no considering such		
(xi)	A concluding statement indicating the preferred alternatives, including preferred locations of the activity	9.7	88
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including -	10	89-118
(i)	A description of the alternatives to be considered and assessed within the preferred site	10.1	89
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(ix)	Identify suitable 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	10.4.5	106
(j)	An undertaking under oath or affirmation by the EAP in relation to – (i) The correctness of the information provided in the report; (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties	11.1	119

NO.	REGULATION REQUIREMENT	REPORT SECTION	PAGE NUMBER
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment	11	119
(l)	Where applicable, any specific information required by the competent authority	10.5	116
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act	10.5	116

Environmental Considerations

The proposed project will adopt the standards as set out in the DRDGold Environmental Policy. The Policy states that DRD is committed to the responsible management of the environment in which it operates, adopting and implementing environmental practice as outlined in the National Environmental Management Act, 1998. Recognising that the environment is held in trust for the people, the policy commits DRD to:

- ❖ Complying with relevant environmental legislation as a minimum, and adopting and applying the best practicable environmental option with respect to current activities as well as prospective projects;
- ❖ Evaluating, through a process of monitoring, auditing and reviewing by management, the success of the management and mitigation measures applied; and
- ❖ Ensuring that environmental risks and potential emergencies are identified and managed through effective controls and procedures as identified in the applicable Environmental Management Programmes.

Key Findings of the Scoping Report

The report provides a scoping-level identification of potential environmental impacts (physical, biological and social) associated with the Proposed Project, as well as a strategy for how these impacts will be investigated and assessed further in the EIA Phase. The baseline environmental information provided in this FSR was compiled as a high-level desktop investigation, and the project information is sourced from existing background information, relevant to the Proposed Project. The preliminary environmental impacts identified in Table 1-1 will be further refined, calculated and assessed for all the feasible alternatives identified. Mitigation and management measures will also be suggested by the specialists for all impacts identified. The potential positive and negative impacts which may arise as a consequence of the Proposed Project have also been summarised in Table 1-1 overleaf.

Table 1-1: Potential identified impact because of the Proposed Project.

ENVIRONMENTAL COMPONENT	COMPONENT TYPE	POTENTIAL IMPACT	SPECIALIST STUDY PLANNED FOR EIA
Physical Environment (non-living)	Hydrology (including wetlands, surface water and ground water) Soils	<ul style="list-style-type: none"> ❖ Potential for acid mine drainage (AMD), increased heavy metal concentration and increased sulphate concentration. ❖ Changes to water quality. ❖ Release of contaminated water to the environment. ❖ Changes in natural surface water flow parameters. ❖ Disruption stream banks and wetlands. ❖ Changes to water regime of wetlands and affected streams. ❖ Further downstream movement of a pollution plume within the weathered zone aquifer. ❖ Soil contamination. ❖ The removal of the slime dams and sand dumps will lead to the removal of a major pollution source. 	Surface Water Impact Assessment Groundwater Impact Assessment Wetland Impact Assessment
Biological Environment (living)	Ecology and Biodiversity (including fauna and flora)	<ul style="list-style-type: none"> ❖ Disturbance of sites of conservation importance. ❖ Loss of migration corridors, and access to nesting and refuge areas, watering points, food supplies. ❖ Displacement of animal species ❖ Removal of invasive species from the slimes dams and sand dumps. 	Biodiversity Impact Assessment
Cultural Environment	Heritage Resources	<ul style="list-style-type: none"> ❖ Should heritage resources be present in the area, the reclamation project could potentially impact these. 	Heritage Impact Assessment
Social and Economic Environment	Employment	<ul style="list-style-type: none"> ❖ Continued employment and job security ❖ Continued investment in local economy 	Social Impact Assessment
	Land-use	<ul style="list-style-type: none"> ❖ Land use will change to an active mine reclamation site. ❖ Restoration and unlocking of land for future land uses. ❖ Management and control of the area 	Social Impact Assessment

ENVIRONMENTAL COMPONENT	COMPONENT TYPE	POTENTIAL IMPACT	SPECIALIST STUDY PLANNED FOR EIA
	Visual	<ul style="list-style-type: none"> ❖ Changes to landscape character, visual appeal and sense of place of the area. ❖ Removal of a visual impact 	Visual Impact Assessment
	Noise	<ul style="list-style-type: none"> ❖ Increase in ambient noise levels. ❖ Disturbances to sensitive receptors. 	Noise Impact Assessment
	Illegal Mining	<ul style="list-style-type: none"> ❖ Mitigating illegal mining in the project are through the removal of the dumps 	Social Impact Assessment
	Air Quality	<ul style="list-style-type: none"> ❖ Possible Increase in dust levels in areas where mechanical removal occurs. ❖ Fallout dust nuisances. ❖ Decreased dust levels in areas where hydraulic reclamation occurs. ❖ Air quality impacts on fauna and flora. ❖ Health impacts due to fine particulate emissions and gaseous emissions. ❖ The air quality will improve and dust pollution within the area will decrease once the unmanaged dumps and dams have been removed. 	Air Quality Impact Assessment

Overall Conclusions

At this stage, the findings of this FSR indicate that **no environmental fatal flaws** have been identified for the Proposed Project and its associated infrastructure. While some limitations do exist, it is anticipated that the implementation of appropriate mitigation measures would assist in reducing the significance of such impacts to acceptable levels. Impacts associated with the Proposed Project need to be considered further during the EIA Phase according to the Way Forward and the Plan of Study contained in this report. It is important to take note of the current conditions of the propose project area. Currently the area is unmanaged, and the slime dams and sand dumps are a source of pollution and other nuisances. The removal of these dumps will assist with the alleviation of a major pollution source as well as help address other related nuisances in the area.

Way Forward

This FSR has been undertaken with the aim of identifying potential positive and negative impacts on the environment and gathering issues, concerns and queries from stakeholders. It documents the process followed, the findings and recommendations of the Scoping Phase study, and the proposed Plan of Study for the EIA Phase to follow. The overarching objectives of the EIA process will be to:

- ❖ Prepare integrated sensitivity maps for the study area based on the findings of specialist assessments as input into the project design process;
- ❖ Identify and assess the significance of potential impacts associated with the project activities; and
- ❖ Recommend mitigation and enhancement measures to ensure that the development is undertaken in such a way as to promote the positive impacts and to minimise the negative impacts.

The future procedure for this study is as follows:

- ❖ Submit the finalised Scoping Report to the Competent Authority (CA) for permission to undertake the EIA Phase of the project;
- ❖ Upon the decision to grant or refuse the final Scoping Report, all stakeholders will be notified of the conditions of the CA for proceeding/not proceeding with the EIA Phase of the project;
- ❖ In the case of approval of the final scoping, Kongiwe will execute the Plan of Study for the Impact Assessment during the EIA Phase of the project;
- ❖ Kongiwe will incorporate and address comments and issues raised during the consultation period on the Scoping Report into the EIA, and make changes to the report where relevant;
- ❖ Kongiwe will make the EIA Report and Environmental Management Programme report (EMPr) available to the public, stakeholders and authorities;
- ❖ Finalise the EIA Report and submit the final EIA Report to the CA; and
- ❖ CA review period and decision-making for 107 calendar days.

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Abbreviations

ABBREVIATION/ SYMBOL	DESCRIPTION
AQIA	Air Quality Impact Assessment
BID	Background Information Document
CA	Competent Authority/Authorities
CBA	Critical Biodiversity Area
CoJ	City of Johannesburg
CoJMM	City of Johannesburg Metropolitan Municipality
CRR	Comments and Response Report
DALRRD	Department of Agriculture, Land Reform and Rural Development
DEFF	Department of Environment, Forestry and Fisheries
DHSWS	Department of Human Settlements, Water and Sanitation
DoH	Department of Health
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme Report
FSR	Final Scoping Report
GDARD	Gauteng Department of Agriculture and Rural Development
GDRDLR	Gauteng Department of Rural Development and Land Reform
ha	Hectare
IDP	Integrated Development Plan
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
Km	Kilometre
M	Metre
Mamsl	Metres above mean sea level
MAP	Mean annual precipitation
µm	Micrometre
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

ABBREVIATION/ SYMBOL	DESCRIPTION
NEMLAA	National Environmental Laws Amendment Act, 2014 (Act No. 25 of 2014)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NNR	National Nuclear Regulator
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PGDS	Provincial Growth and Development Strategy
PPP	Public participation process
RoD	Record of Decision
S&EIA	Scoping, Environmental Impact Assessment and Environmental Management Programme
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SSC	Species of special concern
TSF	Tailings storage facility
WMA	Water Management Area
WML	Waste Management Licence

SECTION 2: SOWETO CLUSTER DUMPS RECLAMATION AND REPROCESSING PROJECT

1 Introduction and Background

1.1 The History of Gold Mining in South Africa

The first official gold prospector of the Transvaal Republic was Mr Pieter Jacob Marias who discovered alluvial gold in 1853 in the Jukskei and Crocodile Rivers in the Western Transvaal. This gave rise to an influx of prospectors looking for gold, including at Pilgrims Rest and Barberton. Following this, Australian prospector Henry Lewis discovered gold-bearing rock at Blaauwbank in the western parts of the Transvaal Republic (now known as the North West Province) (Durand, 2012), whereafter Mr George Harrison discovered a gold-bearing conglomerate on the farm Langlaagte near what is now Johannesburg. This conglomerate turned out to be the richest and most extensive gold deposit in the world.

In September 1886, nine farms were proclaimed as public diggings. These public digging sites formed the main focus of the initial gold development which would later become known as the Central Rand (Durand, 2012). The development of the Central Rand and the outlying goldfields along the Witwatersrand were instrumental in the formation of today's City of Johannesburg (Harrison and Zack, 2012). Figure 1-1 below gives an example of the historic mining environment of Johannesburg.

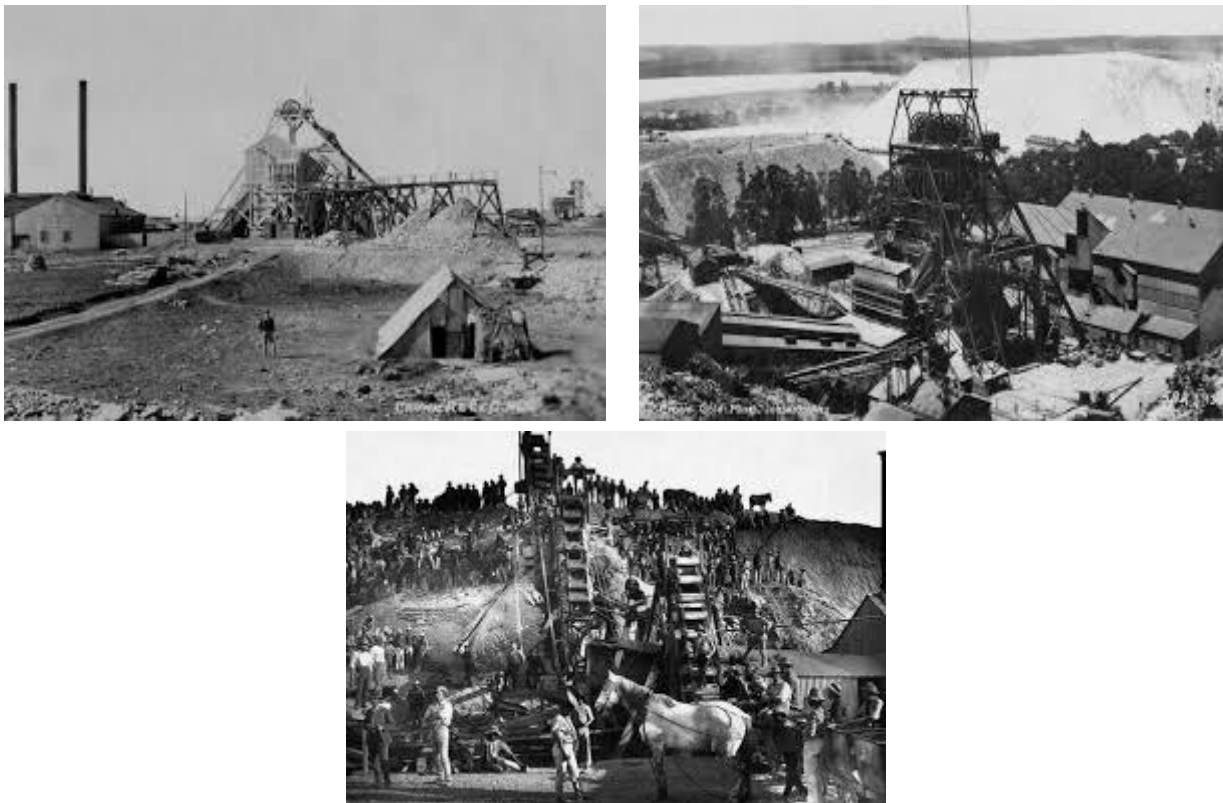


Figure 1-1: Historic mining activities within the Johannesburg area.

1.2 The Origin and Importance of Mine Dumps in Johannesburg

The Gauteng landscape is filled with mine dumps bearing testament to South Africa's rich mining heritage. The rising demand for minerals, and the need to exploit larger and lower-grade deposits to help satisfy demand, led to mining operations increasing in scale and size. During this time, mining and gold recovery were left unregulated. A number of mine dumps began to define the landscape – a result of mining operations where large volumes of ore were mined and brought to the surface where it was crushed and gold extracted.

In laymen's terms the phrase '*mine dump*' refers to an area where excess material containing forms of mineral(s) were left (either valuable or of no value to the miner) by the person who won the minerals from the earth in accordance with his/her right or entitlement to mine. Prior to more rigorous regulation, such as the Mines and Works Act, 1956, and its Regulations, mine dumps were placed in convenient positions adjacent to mining operations. This was often along fault lines, or within wetland areas. It is the legacy of these mine dumps within sensitive areas which has caused the environmental and health effects that are felt today.

As the mines in the Witwatersrand area began to close (during the 70's) the valuable resource of gold and other minerals within the dumps and dams were discovered. In 1978 the East Rand Gold and Uranium Company (Ergo) began to reclaim the dumps to gain access to the residues of gold, uranium and pyrite. Over the last two decades there have been advances in mining and environmental policy and legislation, as well as advances in mining technologies and increasing gold prices. Today, Gauteng's physical landscape is once again in a state of transition due to the demand for the reclamation of historic mine dumps.

Through the process of reclamation, gold recovered from the historic mine dumps is made available for domestic and international markets. On the 7th of May 2019 DRDGold (DRD) recorded a 15% quarter-on-quarter rise in gold production to 1 279kg. This means that the continual reclamation of mine residue material (from historic mine dumps) will result in additional gold supply into the gold market - which has been experiencing a downward trend the last few years. The removal of these dumps also leads to the increased availability of useable land after the required rehabilitation has been conducted and clearance certificates have been awarded. The aim of rehabilitation would be to return the land to a functional topography, clear of any pollution sources. Typically, end-use of the land would be aligned to the zoning of the area where the dumps were situated i.e. urban, industrial and agricultural.

1.3 Trends in The Current Gold Industry

Total world production of gold was estimated to be about 3.4 billion troy ounces, of which more than two-thirds have been mined in the past 50 years. The Witwatersrand reef was responsible for about 45% of the world's total gold production (USGS, 2001). In 2014, the Republic of South Africa remained one of the world's leading mining and mineral-processing countries and contributed to 9% of the world's refined gold and 5% of the mined gold.

The country has however been undergoing a long-term decline in gold output, the share of South Africa’s world gold production decreased from 14% to about 5% and this decrease in gold mine production continued in South Africa in 2018 (USGS, 2019).

The price of gold per ounce underwent a steady increase from 2001 until it reached the high point in August of 2011 (\$2058.60). Figure 1-2 below, indicates that from August 2011 the price of gold per ounce continually fluctuated in a decreasing trend until its current price of \$ 1275.21 per ounce on 20 May 2019.¹ This indicates that the gold price remains a volatile market with an ever-fluctuating commodity price.



Figure 1-2: Price of Gold per ounce 2000-2018 (Macrotrends, 2019)

1.4 Scoping and Environmental Impact Assessment

1.4.1 Applications Relevant to the S&EIA Process

Kongiwe has been appointed by **Crown Gold Recoveries (Pty) Limited (Crown Gold)** to undertake a Scoping and Environmental Impact Assessment (S&EIA) process which evaluates the environmental impacts associated with the Proposed Project as part an Environmental Authorisation (EA). The S&EIA and specialist studies to be undertaken will support the applications for the required approvals. The following applications will be made to the Department of Mineral Resources and Energy (DMRE) for the Proposed Project:

1. **Application for EA** for listed activities triggered in Listing Notices GN R983, GN R984 and GN R985² published pursuant to the EIA Regulations 2014 (as amended), promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA); and
2. **Application for a waste management licence (WML) authorising waste management activities listed** in GN R921 of 29 November 2013 published in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (as amended) (NEM:WA).

¹ In early July 2019, the gold price reached US\$1400/oz, sparked by speculation on USA Federal Reserve interest rate policy

² These Listing Notices have been amended by GN R327, GN R325 and GN R324 of 7 April 2017

In addition, the following applications will be made to the relevant Competent Authorities:

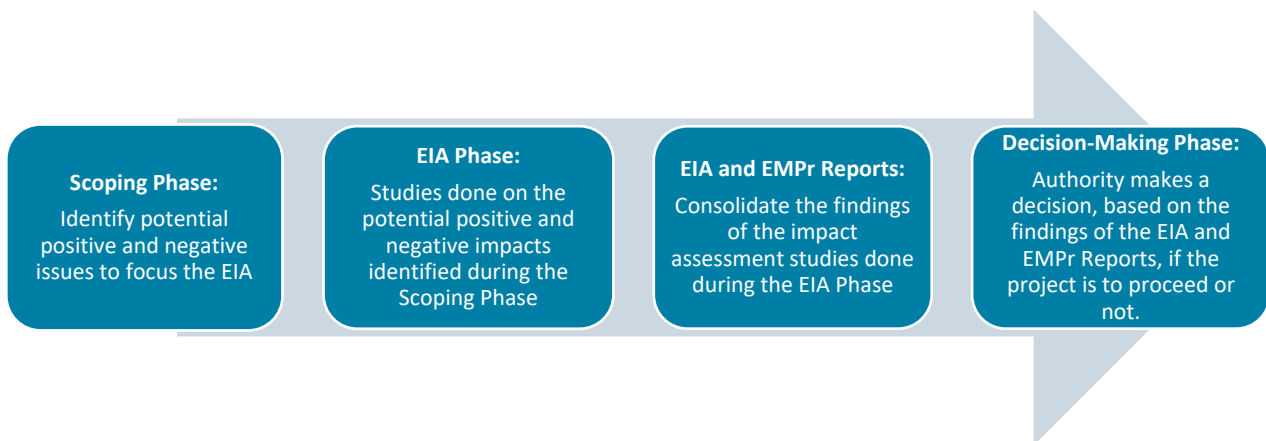
- ❖ **An Integrated Water Use Licence Application (IWULA)** in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will be submitted to the Department of Water and Sanitation (DWS) for any potential impact to water resources by the Proposed Project.

The period of the EA applied for is **20 years for the reclamation period.**

The EIA findings, including specialist findings, are used by the applicant and authorities to obtain an objective view of the potential environmental, social and cultural impacts that could arise during the mining of the proposed area. Measures for the avoidance or mitigation of negative impacts will be proposed and positive impacts will be enhanced.

1.4.2 Methodology applied to conducting the Scoping Process

The outcome of the first phase of the S&EIA is the Scoping Report, which provides the terms of reference for undertaking the EIA Phase of the project. The figure below indicates the methodology that is applied in conducting the S&EIA process.



1.4.3 S&EIA Timeframes

The Draft Scoping Report (DSR) has been submitted and made available for a **30-day** public review period. The comments received during this period have been captured in a Comments and Responses Report (CRR) that will be submitted with this Final Scoping Report.

Once the Final Scoping Report (FSR) has been submitted to the DMRE, the Department must either accept or reject the Scoping Report within **43 days**. Once confirmation of acceptance has been received from the DMRE, the EIA Phase commences and will run for a period of **106 days**, in which time stakeholders will be afforded a **30-day** period in which to review and comment on the S&EIR documentation.

Upon submission of the Environmental Impact Assessment / Environmental Management Programme (EIA/EMPr) document the Competent Authority will have **107 days** to reach a decision on the project (Record of Decision (RoD)). The RoD is otherwise referred to as the EA which authorises the activities to

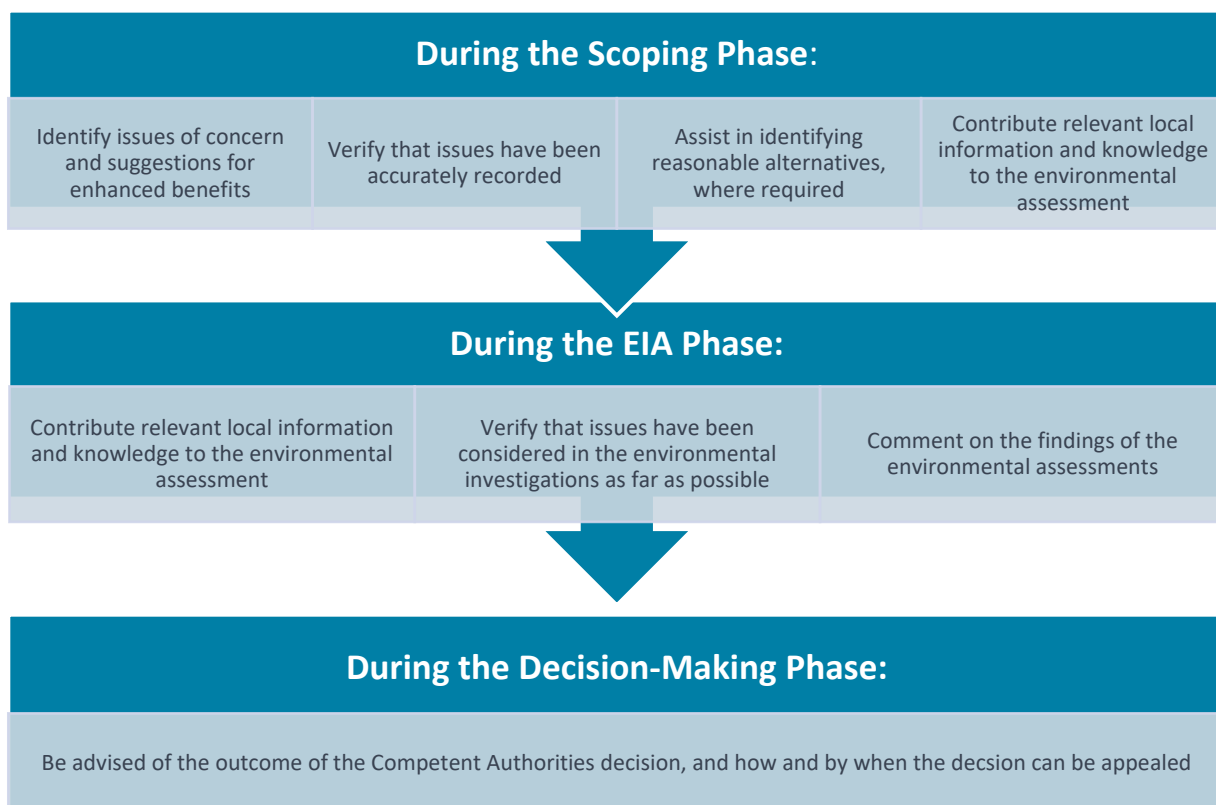
proceed. The decision to grant the EA may be appealed (within **20 days**) by any party, including the Applicant, following the process outlined in the National Appeal Regulations (GNR 993 of 8 December 2014) published in terms of the NEMA.

If significant changes to the EIA/EMPr are required which significant changes were not consulted on during the initial public participation process, a notice may be submitted to the DMRE stating that the EIA/EMPr will be submitted within 156 days from date of acceptance of the Scoping Report. During the aforesaid 156-day period, stakeholders will be afforded a further 30-day period in which to review the amended EIA/EMPr documentation.

1.4.4 Public Participation Process

The Public Participation Process (PPP) has been designed to comply with the regulatory requirements set out in the EIA Regulations of 2014 (as amended). The PPP provides the opportunity for communication between agencies making decisions and the public. This communication can be an early warning system for public concerns, a means through which accurate and timely information can be disseminated, and can contribute to sustainable decision-making (IAP2, 2006).

Kongiwe encourages stakeholders to provide input into the S&EIA. The sharing of information forms the basis of PPP, with an aim to encourage the public to have meaningful input into the decision-making process from the onset of the project. Stakeholders can become involved in the project in the following ways:



The Draft Scoping Report (DSR) was available for public comment from **4 June 2019 to 8 July 2019**. The project team conducted a public meeting with stakeholders at the Bramfischerville Multipurpose Centre, Cnr Loerie Blaar & Methlokgo Phase 2, Bramfischerville, on the **20th June 2019**. During the meeting, the DSR content was presented and discussed. Comments received during the DSR comment period has been captured in the CRR and made available in this Final Scoping Report.

1.5 Details of the Environmental Consultant

Kongiwe is a contemporary, problem-solving consultancy specialising in solving real-world environmental challenges. We pride ourselves in using the latest technology available to realise pragmatic solutions for our clients. The company was created with the essential intent: *‘To solve environmental challenges for a world driven towards a sustainable future.’*

With offices in both Johannesburg and Pretoria, South Africa, our team of professional Environmental Scientists are highly trained in various environmental disciplines and have significant, hands-on experience in an array of projects across numerous industries. The company has extensive environmental and project management experience in multiple sectors, with significant experience in South Africa, as well as internationally. **Kongiwe** focuses on the integration of environmental studies and processes into larger engineering and mining projects. Moreover, **Kongiwe** provides clients with strategic environmental assessments and compliance advice, the identification of environmental management solutions and mitigation / risk minimising measures throughout the project lifecycle.

1.5.1 Contact Person and Corresponding Address

Details of the EAP:

Table 1-1: Details of EAP

Name of Practitioner	Ashleigh Blackwell
Tel No	+27 (10) 140 6508
Cell No	079 895 14 56
e-mail address	ablackwell@kongiwe.co.za

Ashleigh is a registered SACNASP Environmental Consultant with over 3 years working experience in the Environmental Sector. Being multiskilled within her role, Ashleigh is responsible for managing the various environmental processes, including licencing and permitting, within Kongiwe Environmental. Ashleigh completed her BSc (Hons) in Ecology and Soil Science at the University of Stellenbosch and is currently completing her Masters (MSc) in Soil Science through the University of Pretoria. She is a registered member of the Soil Science Society of South Africa (SSSSA) and has attended certified workshops and training courses in Environmental Law, Soil Surveyance and Soil Classification, waste management and water use licencing. Her core responsibilities include:

- Project Management;
- Environmental Impact Reporting;
- Project Risk Assessment;
- Environmental Due Diligence;
- Environmental Auditing;
- Environmental Control Officer;
- GIS Mapping; and
- Soils, Land Use and Agricultural Reporting.

❖ Expertise of the Peer Review (Pr.Sci.Nat)

Table 1-2: Details of EAP

Name of Practitioner	Gerlinde Wilreker, Kongiwe Environmental (Pty) Ltd
Tel No	+27 (10) 140 6508
Fax No	083 476 6438
e-mail address	gwilreker@kongiwe.co.za

❖ Expertise of the Peer Reviewer

Gerlinde Wilreker has an M.Sc. in Environmental Management from the previous Rand Afrikaans University (RAU), now the University of Johannesburg, and is a registered Professional Natural Scientist (Environmental Management) (Registration No:400261/09). She has over twelve years’ work experience, predominantly in the mining industry. Qualifications in Appendix A.

❖ Summary of the Peer Reviewers Past Experience

Gerlinde Wilreker has over 12 years’ work experience as an environmental consultant, predominantly in the mining industry. Her practical experience in the mining and construction industry has given her a depth of knowledge regarding project processes from pre-feasibility phase through to implementation. She is adept at working in different contexts, and problem-solving with her team to meet client needs. She has particular expertise in relation to Environmental Authorisation Processes in terms of the South African legal regime.

2 Project Description

2.1 Description and Location of the Property

In terms of locality, The Soweto Cluster dumps can be subdivided into 3 sites to be reclaimed:

- ❖ Site 1: The large 2L24 slimes dam (Vlakfontein Dump) which covers an area of approximately 273.64 hectares (Ha).
- ❖ Site 2: Three northern deposits (2L20; 2L21 and 2A8), which cover an approximate area of 59.58 Ha, and;
- ❖ Site 3: Four north easterly deposits:(2L16; 2L17; 2L18 and 2A6), which cover an approximate area of 97.14 Ha.

The three sites (collectively known as the Soweto Cluster) are in ward 49 and ward 127 of the City of Johannesburg Metropolitan Municipality. The Soweto Cluster is situated adjacent to the suburb of Bramfischerville and approximately 2km from Roodepoort. The slimes dams and dumps are located within the City of Johannesburg Metropolitan Municipality (CoJMM) and surrounded by predominantly industrial, commercial, residential and undeveloped land.

The following infrastructure is encountered in the area:

- ❖ National and provincial roads (R41, M77 and R558);
- ❖ Residential and commercial properties;
- ❖ Industrial properties;
- ❖ Power lines;
- ❖ Water reticulation systems; and
- ❖ Historic Mine Dumps

2.1.1 Description of the Properties affected by the Project

The properties of interest for the reclamation of the Soweto Cluster are illustrated by Figure 2-2.

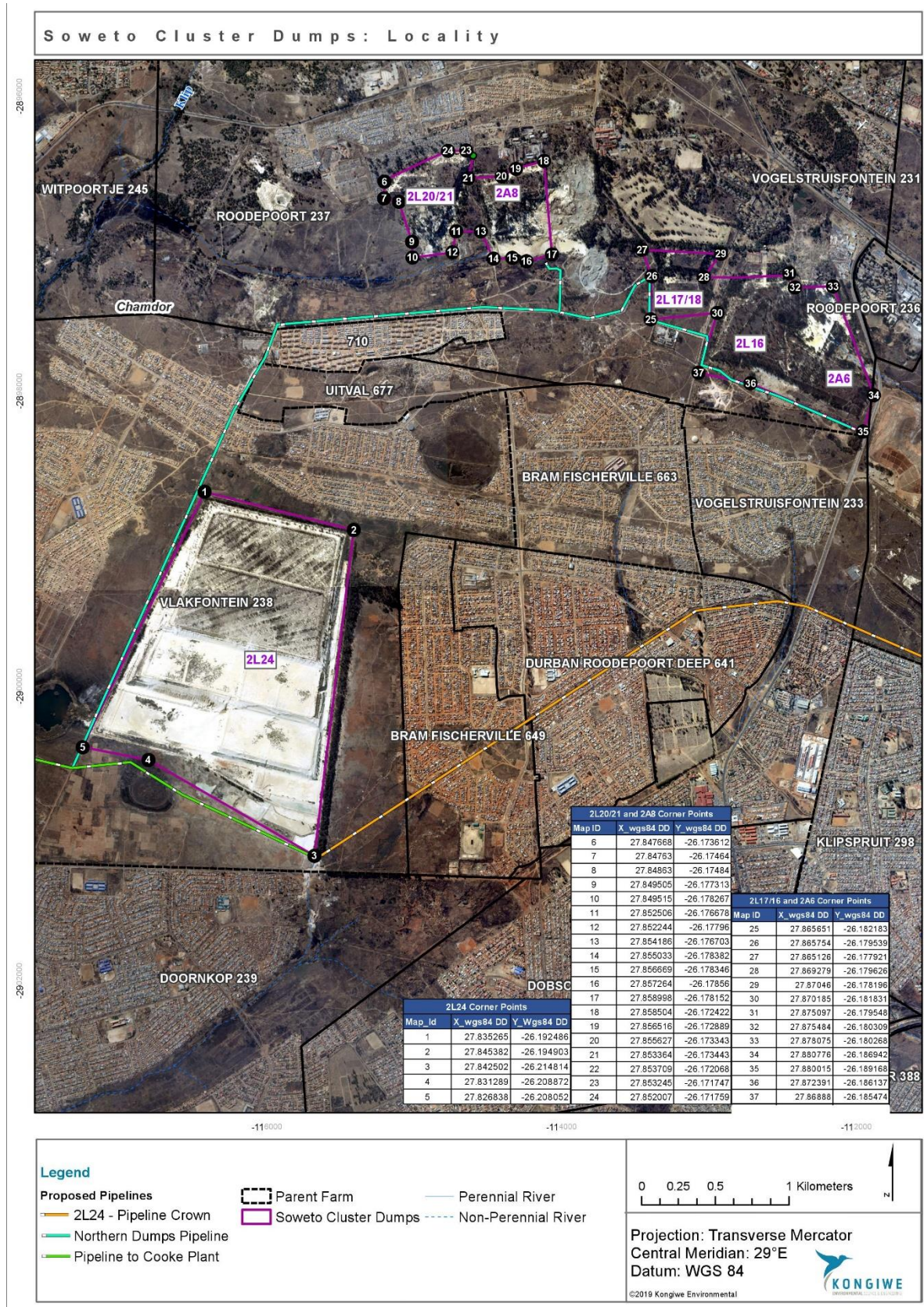


Figure 2-1: Locality map depicting the location of the project area.

This is a “Brownfield Project” as it is the reclamation of historic tailings deposits with partly existing infrastructure. The potential negative and positive impacts of the Proposed Project on the environmental and social aspects will be objectively considered through studies undertaken by specialist professionals during the EIA phase. The locality of the project is indicated in Figure 2-2.

The Soweto Cluster, where reclamation will take place, is located on farms Roodepoort 237 IQ and Vlakfontein 238IQ. The majority of the other properties have been identified as directly affected landowners for the pipeline alternatives of the project.

Table 2-1: Description of the Property.

Farm Names	Farm Name:	Farm ID	Portion	Landowner
	Braamfischerville	649 IQ	2	No Windeed information available. This is being investigated through the deeds office.
	Braamfischerville	649 IQ	3	No Windeed information available. This is being investigated through the deeds office.
	Braamfischerville	649 IQ	1	No Windeed information available. This is being investigated through the deeds office.
	Doornkop	239 IQ	131 (RE)	Randfontein Estates Ltd
	Doornkop	239 IQ	130 (RE)	Randfontein Estates Ltd
	Doornkop	239 IQ	39	Provincial Government of Gauteng
	Doornkop	239 IQ	38	City of Johannesburg Metropolitan Municipality
	Durban Roodepoort Deep	641 IQ	2	No Windeed information available. This is being investigated through the deeds office.
	Durban Roodepoort Deep	641 IQ	0 (RE)	No Windeed information available. This is being investigated through the deeds office.
	Luipaardsvlei	243 IQ	141	No Windeed information available. This is being investigated through the deeds office.
	Luipaardsvlei	243 IQ	14 (RE)	Rand Uranium (Pty) ltd
	Luipaardsvlei	243 IQ	13	Rand Uranium (Pty) ltd
	Luipaardsvlei	243 IQ	96 (RE)	No Windeed information available. This is being investigated through the deeds office.
	Luipaardsvlei	243 IQ	7 (RE)	Rand Uranium (Pty) ltd

Luipaardsvlei	243 IQ	10	Rand Uranium (Pty) Ltd
Luipaardsvlei	243 IQ	88	Rand Uranium (Pty) Ltd
Luipaardsvlei	243 IQ	134 (RE)	Randfontein Estates Gold Mining Co Witwatersrand Ltd
Luipaardsvlei	243 IQ	43	Rand Uranium (Pty) Ltd
Paardekraal	226 IQ	215	Transnet Ltd No Windeed information available. This is being investigated through the deeds office.
Paardekraal	226 IQ	245	Industrial Zone (Pty) Ltd
Paardekraal	226 IQ	2 (RE)	Industrial Zone (Pty) Ltd
Paardekraal	226 IQ	5 (RE)	Industrial Zone (Pty) Ltd No Windeed information available. This is being investigated through the deeds office.
Paardekraal	226 IQ	26	Transnet Ltd
Paardekraal	226 IQ	212 (RE)	Transnet Ltd
Roodepoort	237 IQ	1	Dino Prop (Pty) Ltd
Roodepoort	237 IQ	5 (RE)	Dino Prop (Pty) Ltd
Roodepoort	237 IQ	1 (RE)	Dino Prop (Pty) Ltd No Windeed information available. This is being investigated through the deeds office.
Roodepoort	237 IQ	495	City of Johannesburg Metropolitan Municipality
Roodepoort	237 IQ	495/237	City of Johannesburg Metropolitan Municipality
Roodepoort	237 IQ	401 (RE)	Dino Prop (Pty) Ltd
Roodepoort	237 IQ	1	Dino Prop (Pty) Ltd
Vlakfontein	238 IQ	1 (RE)	DRD Gold Ltd City of Johannesburg Metropolitan Municipality
Vlakfontein	238 IQ	94 (RE)	City of Johannesburg Metropolitan Municipality No Windeed information available. This is being investigated through the deeds office.
Vlakfontein	238 IQ	92	Quarrytown Ltd
Vlakfontein	238 IQ	4	Quarrytown Ltd
Vogelstruisfontein	233 IQ	46	No Windeed information available. This is being investigated through the deeds office.
Vogelstruisfontein	233 IQ	38	Ablesun Inv (Pty) Ltd
Vogelstruisfontein	231 IQ	161	Rand Leases Securitisation (Pty) Ltd No Windeed information available. This is being investigated through the deeds office.
Vogelstruisfontein	231 IQ	227	Rand Leases Securitisation (Pty) Ltd No Windeed information available. This is being investigated through the deeds office.

	Vogelstruisfontein	231 IQ	17 (RE)	Fleurhof Extension 2 (Pty) Ltd
	Zuurbult	240 IQ	240	No Windeed information available. This is being investigated through the deeds office.

Application Area (ha)	2L24 covers an area of approximately 273.64 hectares (Ha); 2L20; 2L21 and 2A8 cover an approximate area of 59.58 Ha; 2L16; 2L17; 2L18 and 2A6 cover an approximate area of 97.14 Ha.
Magisterial District	Ward 49 and Ward 127 of the City of Johannesburg Metropolitan Municipality
Distance and Direction from Nearest Town	The site is within the City of Johannesburg. Bramfischerville, Dobsonville, Witpportjie and Roodepoort are located immediately around the Soweto Cluster.

21-digit Surveyor General Code for each Farm Portion	Farm Name:	Farm ID	Portion	SG Code
	Braamfischerville	649 IQ	2	TOIQ00000000064900002
	Braamfischerville	649 IQ	3	TOIQ00000000064900003
	Braamfischerville	649 IQ	1	TOIQ00000000064900001
	Doornkop	239 IQ	131 (RE)	TOIQ00000000023900131
	Doornkop	239 IQ	130 (RE)	TOIQ00000000023900130
	Doornkop	239 IQ	39	TOIQ00000000023900039
	Doornkop	239 IQ	38	TOIQ00000000023900038
	Durban Roodepoort	641 IQ	2	
	Deep			TOIQ00000000064100002
	Durban Roodepoort	641 IQ	0 (RE)	
	Deep			TOIQ00000000064100000
	Luipaardsvlei	243 IQ	141	TOIQ00000000024300141
	Luipaardsvlei	243 IQ	14 (RE)	TOIQ00000000024300014
	Luipaardsvlei	243 IQ	13	TOIQ00000000024300013
	Luipaardsvlei	243 IQ	96 (RE)	TOIQ00000000024300096
	Luipaardsvlei	243 IQ	7 (RE)	TOIQ00000000024300007
	Luipaardsvlei	243 IQ	10	TOIQ00000000024300010
	Luipaardsvlei	243 IQ	88	TOIQ00000000024300088
	Luipaardsvlei	243 IQ	134 (RE)	TOIQ00000000024300134
	Luipaardsvlei	243 IQ	43	TOIQ00000000024300043

Paardekraal	226 IQ	215	TOIQ0000000022600215
Paardekraal	226 IQ	245	TOIQ0000000022600245
Paardekraal	226 IQ	2 (RE)	TOIQ0000000022600002
Paardekraal	226 IQ	5 (RE)	TOIQ0000000022600005
Paardekraal	226 IQ	26	TOIQ0000000022600026
Paardekraal	226 IQ	212 (RE)	TOIQ0000000022600212
Roodepoort	237 IQ	1	TOIQ0000000023700014
Roodepoort	237 IQ	5 (RE)	TOIQ0000000023700005
Roodepoort	237 IQ	1 (RE)	TOIQ0000000023700005
Roodepoort	237 IQ	495	TOIQ0000000023700001
Roodepoort	237 IQ	495/237	TOIQ0000000023700495
Roodepoort	237 IQ	401 (RE)	TOIQ0000000023700495
Roodepoort	237 IQ	1	TOIQ0000000023700401
Vlakfontein	238 IQ	1 (RE)	TOIQ0000000023800001
Vlakfontein	238 IQ	94 (RE)	TOIQ0000000023800001
Vlakfontein	238 IQ	92	TOIQ0000000023800092
Vlakfontein	238 IQ	4	TOIQ0000000023800004
Vogelstruisfontein	233 IQ	46	TOIQ0000000023300046
Vogelstruisfontein	233 IQ	38	TOIQ0000000023300038
Vogelstruisfontein	231 IQ	161	TOIQ0000000023100161
Vogelstruisfontein	231 IQ	227	TOIQ0000000023100227
Vogelstruisfontein	231 IQ	17 (RE)	TOIQ0000000023100017
Zuurbult	240 IQ	240	TOIQ0000000024000000

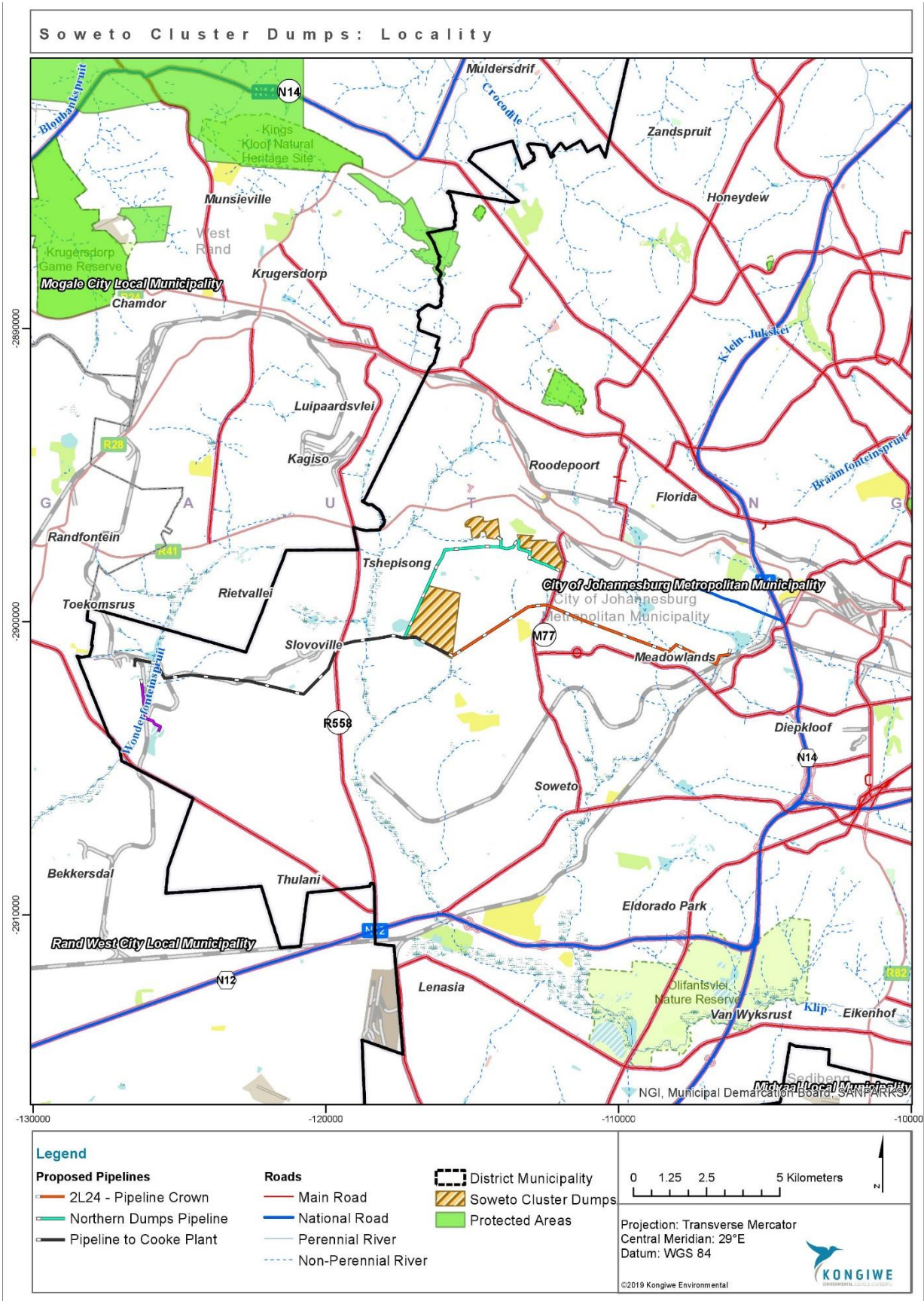


Figure 2-2: Locality map depicting the location of the project area.

2.2 Description of the current Land Uses Applicable

The Soweto Cluster is situated in an urban area, located next to the suburb of Bramfischerville in Soweto. The Soweto Cluster project area is classified in the Gauteng Provincial Environmental Management Framework (GPEMF) (2014) as 3b. 3b Zones are described as Built-up land (residential, CBD, etc.) with a strong mining and/or industrial character.

2.3 Known Mining Rights held in the Area

The assessment of cumulative impacts is required under the EIA Regulations 2014 (as amended in 2017) promulgated in accordance with Section 44 of the NEMA. In support of the above, Kongiwe will assess the impact of the Proposed Project in context of other similar activities in the local area. This will be undertaken during the EIA Phase of the project.

The Soweto Cluster is surrounded by several active and historic mining activities. The active mining activities vary in ownership but are primarily quarries (sand and silica mining) and gold mines (Harmony; Doornkop Gold Mine, Sibanye-Stillwater, Mintails Group, and Lancaster Gold Mine). The historic mining presence is also made clear by several other unrelated mine dumps scattered around the proposed project site.

2.4 Description of the Activities to be Undertaken and the Infrastructure Plan

It is the intention of Crown Gold, an operating subsidiary of DRD, to reclaim and reprocess the Soweto Cluster. The project will reclaim slime dumps 2L24; 2L20; 2L21; 2L16; 2L17 and 2L18, as well as sand dumps 2A6 and 2A8. Crown Gold intends to make use of current infrastructure as well as other assets held by DRD and its main shareholder Sibanye Stillwater for the recovery and reclamation process.

A pump station (or reclamation station) will be established on each of the sites which will pump the resultant slurry through new and existing pipelines to the determined plant where it will be reprocessed. Three alternative processing plants, with capacity to recover 500 000 tons to 1.2 million tons of slurry per month, will be investigated for the proposed project. These are the Ergo Plant, Cooke Plant and the West Rand Central Processing Plant (CPP). The ultimate disposition will take place onto one of the authorised TSFs (Brakpan/Withok TSF, Cooke TSF or Pits, the West Rand Regional TSF which is still to be constructed).

In terms of locality, Site 1 covers an area of approximately 273.64 hectares (ha). Site 2 covers an approximate area of 59.58 ha and Site 3 covers an approximate area of 97.14 ha. The dumps are located in the magisterial district of the CoJMM and are situated adjacent to the suburbs of Bramfischerville and Thulani in Soweto, and Matholesville in Roodepoort.

Major routes around the mine dumps are the R41 which runs east to west from Randfontein towards the Johannesburg CBD; the M77 which runs north to south from the R41 through Soweto to the M68; and the R558 which runs north to south from Krugersdorp towards Lenasia. The suburbs of Bramfischerville, Dobsonville, Witpoortjie and Roodepoort are located immediately around the Soweto Cluster.

As far as possible, existing access roads will be utilised, and where this is not possible, these will be constructed as a two-by-two roadway, operating in both directions. Where access roads are to be constructed, these will be 4m wide gravel road with storm water earth channels and mitre drains to protect the road structure from flood damage. Intersections will be properly designed to provide safe entry and exit into the mining area. Approvals from the provincial road’s authority will be obtained where necessary.

Power will be supplied by Eskom and potable water will be purchased from Rand Water, with a contingency for portable JoJo tanks or connection to existing water pipeline infrastructure.

In terms of process water, the water cycle operates as a closed circuit, meaning that limited make-up water will be required for the reclamation of the Soweto Cluster. Water required for the reclamation activities will be recovered from either of the three TSF’s mentioned above, or from water sourced from existing mine shafts or Wastewater Treatment Facilities in the area.

The life of mine for the proposed project is expected to be approximately 20 years. An estimated amount of 500 000 tons/month ramping up to 1.2 million tons/month of slurry is expected to be pumped from the Soweto Cluster to one of the above mentioned plants for beneficiation. Three 500 mm slurry pipelines and three 500 mm return water pipelines will be investigated for construction. These pipelines are linked to the plant alternatives considered above.

Information that provides perspective on the scale of the Proposed Project is presented in the table below. It should however be noted that this information may be refined further during the EIA Phase.

Table 2-2: Project perspective and technical details.

Group	Specific	Details
Mining	Target Mineral	Gold, uranium, nickel, silver, pyrites and all associated minerals in mine tailings dams and dumps.
	Mineable Area	The 2L24 dump cover an area of approximately 273.64 hectares (Ha); and 2L20; 2L21 and 2A8 cover an approximate area of 59.58 Ha; 2L16; 2L17; 2L18 and 2A6 cover an approximate area of 97.14 Ha. A total of 430.36 Ha.
	Depth of minerals	Only surface reclamation will be taking place.
	Extent of area for infrastructure	TBC
	Product	Gold will be the primary product during the reclamation of the dams, although uranium, nickel, silver and associated metals in the tailings are also licenced.
Resource use	Water demand	Process water in a closed circuit for hydraulic mining and mining activities

Group	Specific	Details
	Power demand	Eskom
Employment	Staff allocation: construction	Continual Development
	Operating Times	7 days a week- 24hrs a day

2.5 Listed and Specified Activities

Listed activities are activities identified in terms of Section 24 of NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the Competent Authority (CA). An EA is required for any listed activity and is subject to the completion of an environmental process, either a Basic Assessment (BA) or a S&EIA.

Table 2-3 below contains all the listed activities identified in terms of NEMA, NEM:WA, and the EIA Regulations of 2014 (GN R982 of December 2014, as amended by GNR 326 of April 2017) and Listing Notices 1, 2 and 3 (GN R983, GN R984 and GN R985 of December 2014, as amended by GNR 327, GNR 325, and GNR 324 of April 2017, respectively) which may be triggered by the Proposed Project, and for which an application for EA has been submitted. The table also includes a description of those project activities which relate to the applicable listed activities.

The **DMRE** will act as the CA on the project.

The Commenting Authorities for the Soweto Cluster Dumps Reclamation Project are:

- ❖ Gauteng Department of Agriculture and Rural Development (GDARD);
- ❖ Department of Environmental Affairs (DEA);
- ❖ Department of Water and Sanitation (DWS);
- ❖ Department of Environment, Forestry and Fisheries (DEFF);
- ❖ Department of Public Works;
- ❖ National Nuclear Regulator (NNR);
- ❖ Department of Health (DoH);
- ❖ South African Heritage Resource Agency (SAHRA), and;
- ❖ City of Johannesburg Metropolitan Municipality (CoJMM).

Table 2-3: Listed Activities Triggered by the Proposed Project.

Name of activity <i>Mining (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, stormwater control, berms, roads pipelines, power lines, conveyors, etc.)</i>	Aerial extent of the activity (ha)³ <i>Ha or m² Expressed in m² unless otherwise stated</i>	Listed activity <i>Mark with an X where applicable or affected.</i>	Applicable listing notice <i>GNR 983, 984 and 985 as amended by GNR 327, GNR 325 or GNR 324</i>	Waste management authorisation <i>(Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)</i>	Water use license authorisation⁴
Access roads routed from existing entry points.		X	GNR 983 – 24 GNR 985 – 4		
Temporary Site infrastructure (offices, change house, workshops).		X			
Reclamation of historic mineral deposits				GNR 921 – B (2)	21(c) & (i)
Satellite pump station / Reclamation Station		X	GNR 984 – 6	GNR 921 -B (2)	21(c) & (i)
Slurry receiving facility		X	GNR 983 – 12; 13 GNR 984 – 6 GNR 985 – 2;14	GNR 921 -B (1)	21(g)
Screening facility at the pump station		X	GNR 984 – 6	GNR 921 -B (2)	
Storage		X	GNR 984 – 6	GNR 921 -B (2)	

³ The total area of the mining and associated areas is approximately 430.36 hectares.

⁴ Water use licences in terms of Section 21 of that National Water Act, 1998, will be required for various of the Listed Activities. These have not been specifically listed in this Application, but the necessary application will be submitted to the Department of Water and Sanitation

Name of activity <i>Mining (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, stormwater control, berms, roads pipelines, power lines, conveyors, etc.)</i>	Aerial extent of the activity (ha)³ <i>Ha or m²</i> <i>Expressed in m² unless otherwise stated</i>	Listed activity <i>Mark with an X where applicable or affected.</i>	Applicable listing notice GNR 983, 984 and 985 as amended by <i>GNR 327, GNR 325 or GNR 324</i>	Waste management authorisation <i>(Indicate whether an authorisation is required in terms of the Waste Management Act).</i> <i>(Mark with an X)</i>	Water use license authorisation⁴
Transfer pumps in series		X	GNR 984 – 6	GNR 921 -B (2)	
Power supply (Substations, transformers and 11kV powerlines)					
Stormwater systems, including:					21(c) & (i)
Paddocks					Pre-existing water use
Process water pipeline		X	GNR 983 – 9;19		21(c) & (i)
Overland slurry pipeline		X	GNR 983 – 10;19 NR 984 – 7		21(c) & (i)

2.6 Environmental Authorisation Application: Activities and Infrastructure

2.6.1 Infrastructure intended for the project

The following infrastructure will be utilised on site:

- ❖ Overland slurry pipelines of 500 mm in diameter;
- ❖ Overland return water pipelines of 500 mm in diameter;
- ❖ Reclamation pump stations;
- ❖ Water infrastructure, stormwater systems and spillage handling systems;
- ❖ Electricity reticulation;
- ❖ Administration buildings, including change houses and ablution facilities;
- ❖ Emergency Stormwater Dam;
- ❖ Access roads, routed from existing entry points; and
- ❖ Construction contractors' yards (temporary facilities).

2.6.2 Method of Reclamation

Hydraulic Mining of Slimes Dams:

The proposed mining method which will be used to remove the slimes dams are referred to as top-down hydraulic mining. This technique uses high-pressure water monitors (or mobile tracked hydraulic monitors) to deliver a high-pressure water jet to hydraulically excavate unconsolidated tailings material within the slimes dams. The water from the cannon mixes with the tailings and forms a slurry with a high solids content. The slurry then flows under gravity along trenches at the base of the dump to a collection sump which is positioned at the lowest elevation of the bench being mined.

At the sump, finger screens remove any debris that may impact pumping operations, and a penstock will control water flow into the sump. The position of the collection sump will change as the reclamation progresses. To control the volume of water reporting to the reclamation station, flapper valves are used to hold and release slurry contained in the collection sump. This slurry is then pumped via new and existing pipelines to one of the three alternative processing plants where the slurry is prepared and treated for gold extraction and beneficiation.



Figure 2-3: Mobile tracked hydraulic monitor on a tailings facility in South Africa

Mechanical removal of Sand Dumps:

The sand dumps will be mechanically removed. Front end loaders are used to load the sand from the dump onto a conveyor belt. The conveyor belt then feeds the sand over a screen, to remove oversize material while water is sprayed to turn the sand into a slurry. This slurry is pumped via new and existing pipelines to one of the three alternative processing plants where it is prepared and treated for gold extraction and beneficiation.

Mining will take place in predetermined benches (or 'cuts') and will move unidirectionally until the entire dump has been reclaimed. Generally, 30 m cuts are made for reclamation as per Figure 2-4 below.

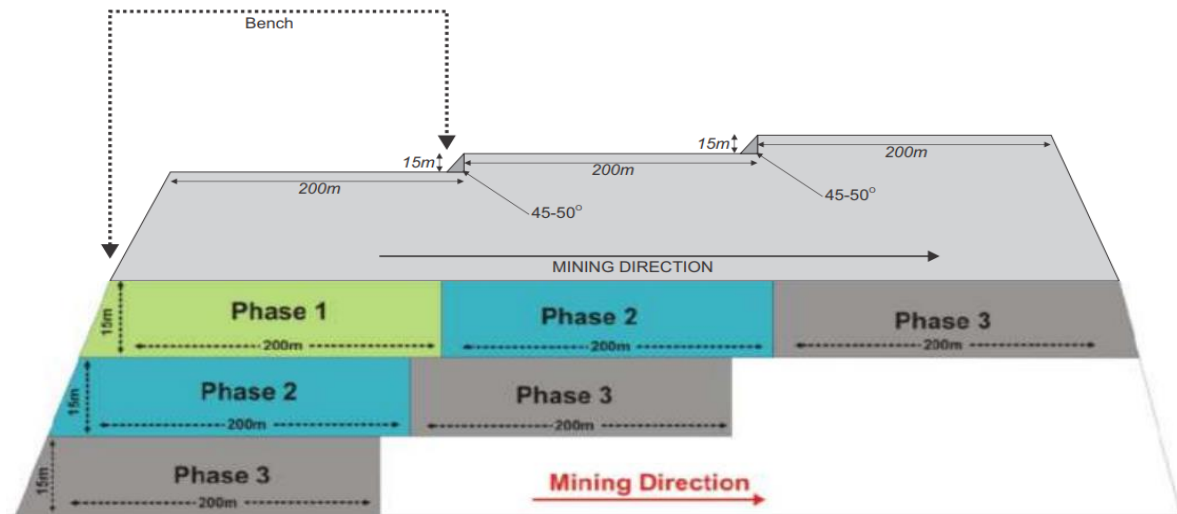


Figure 2-4: Typical mining widths proposed for a gold reclamation project (Source: www.drdgold.com/investors-and-media/circulars/cpr-samrec-wrtrp-26022018.pdf).

2.6.3 Rehabilitation

Once the Soweto Cluster has been reclaimed, rehabilitated, cleared of radiation and closure has been received from the DMRE, the end land use of the site is at the discretion of the landowner. Since the Soweto Cluster is situated in an urban area in Johannesburg, it is anticipated that the land would be utilised for future development.

2.6.4 The Period required for Environmental Authorisation:

The anticipated period required for EA is **20 years**.

2.6.5 Works Schedule

The anticipated life span of the project is approximately 20 years. It is expected that there would be a 5 year construction and ramp-up period which would include, stabilising sections of the 2L24 dam to mitigate dust emissions and surface water runoff, the placement of infrastructure and site preparation, a 10 year Life of Operation (LOO) where active hydraulic mining and mechanical removal would take place, a 2 year ramp-down period and 3 years to rehabilitate the reclaimed sites.

3 Policy and Legislative Context

This chapter provides an overview of the policy and legislative context relevant to the reclamation of the Soweto Cluster. It identifies all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to the planned activities and are to be considered in the assessment process which may be applicable or have relevance to the Proposed Project.

The foundation for Environmental Preservation is entrenched in the **Constitution of South Africa (Act No. 108 of 1996)**. Following the birth of democracy in South Africa, legislative and environmental policies and regulations have undergone a large transformation, and various laws and policies were promulgated with a strong emphasis on environmental concerns and the need for sustainable development. The Constitution provides environmental rights (contained in the Bill of Rights, Chapter 2 (Section 24)) and includes implications for environmental management. The environmental rights are guaranteed in Section 24 of the Constitution, and state that:

“Everyone has the right –

- ❖ *To an environment that is not harmful to their health or well-being and*
- ❖ *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that*
 - *Prevent pollution and ecological degradation;*
 - *Promote conservation and*
 - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

To ensure that the various spheres of the social and natural environmental resources are not overlooked, additional legislation and regulations have been promulgated in addition to those contained within the Constitution. The additional legislature and regulations ensure that there remains a key focus on various industries or components of the environment, and to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.

Table 3-1: Applicable National Legislation and Guidelines

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p><u>The Constitution of South Africa, 1996 (Act 108 of 1996)</u></p> <p>Section 24 of the Act states that everyone has the right to an environment that is not harmful to their health or well-being; to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development.</p> <p>Section 32 of the Act states that every person has a right to information held by the State and to information held by other people that is required in the exercise or protection of a right.</p> <p>Lastly, Section 33 of the Act states that everyone has a right to just and procedurally fair administrative action.</p>	<p>As per the Requirements of NEMA and the NEMA EIA Regulations, alternative activities that are less taxing on the environment and resources must be investigated where possible. The DSR was available for public review & Draft EIA Report will be made available for public review (as per the PPP section of this report). The Appeal Process will be described to all stakeholders through the EA notification described in the PPP section of this report.</p>
<p><u>The One Environmental System</u></p> <p>In terms of the One Environmental System established by the NEMLAA, an EA in respect of a reclamation operation must be issued within 300 days of the application being submitted. This system aims to streamline the licensing processes for environmental authorisations and water use.</p>	<p>Crown Gold proposes to reclaim the Soweto Cluster dumps and submit the required documents within the prescribed timeframes.</p>
<p><u>Mine Health and Safety Act (MHSA), Act 29 of 1996 (as amended):</u></p> <p>Although the Mineral and Petroleum Resources Development Act, 2002, does not apply to this project, Crown Gold operates in accordance to the MHSA and associated regulations. This includes creating a safe and healthy work environment and providing the necessary protection and training to staff to ensure their health and safety is not compromised.</p> <p>Hazardous substances will be adequately stored and labelled. All regulations pertaining to safe use, handling, processing, storage, transport and disposal of hazardous substances; protection of equipment, structures and water sources and the surface of land; dumps and structures connected to reclamation operations; the monitoring and control of those environmental aspects which may affect the health and safety of persons will be applied on site.</p>	<p>Although not strictly addressed in the Scoping Report or EMP, protecting the environment contributes to a safe working environment. MHSA regulations will be worked into the mine’s Code of Practice (COP) and Standard Operating Procedures (SOPs).</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>Regulations pertaining to provision of water, ablution facilities and staff health and safety will be applied on site.</p>	
<p><u>National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)</u></p> <p>The overarching principle of the NEMA is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making to ensure the development serves present and future generations. Section 2 of NEMA provides for the NEMA principle which apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and in conjunction with other appropriate and relevant considerations. The NEMA principles serve as the general framework within which environmental management and implementation plans must be formulated and serve as a guideline by reference to which any organ of state must exercise any function when taking any decision in terms of the NEMA or any statutory provision concerning the protection of the environment.</p> <p>NEMA authorises the Minister of the DEA to issue Regulations relating to the administration of the Act⁵, which has been done with the publication of the EIA 2014 Regulations, as amended. Section 24(2) allows the Minister to identify activities which may not commence without environmental authorisation from the competent authority. This identification has been done in accordance with listing notices referred to as Listing Notice 1, Listing Notice 2 and Listing Notice 3. The NEMA also allows the Minister to determine which authority will be the competent authority to receive and evaluate applications for EAs.</p> <p>Listing Notice 1 identifies activities of limited scale and effect, which need to be assessed by a fairly simple process referred to as a BA, where after a Basic Assessment Report (BAR) is submitted to the competent authority. Listing Notice 2 identifies activities of significantly greater magnitude, which require evaluation through an initial Scoping Phase followed by an EIA and an EMPr. This process is generally referred to as the S&EIR process. Listing Notice 3 relates to activities limited to specified geographical areas and matters of concern to the various provinces which</p>	<p>It is the objective of this application to align to NEMA.</p> <p>The NEMA is the overarching Act governing sustainable development and the NEMA principles apply to all prospecting and mining operations (which included reclamation activities) and any matter or activity relating to such operation.</p> <p>Listed activities as per the EIA 2014 Regulations, as amended, have been identified (refer to Chapter 2, subsection 2.5).</p>

⁵ Sections 24(5) and Section 44

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>require a BAR process to be dealt with by the provincial authority concerned.</p> <p>Regulation 16(1) prescribes the general application requirements and states that an application for an EA must be made on the official application form obtainable from the DMRE (the competent authority) and must, amongst others, include proof of payment of the prescribed application fee.</p> <p>Regulation 21 provides for the submission of the Scoping Report to the DMRE (the CA) for consideration and states that the scoping report must contain all the information set out in Appendix 2 to the EIA 2014 Regulations, as amended. In terms of regulation 22, the DMRE must, after considering the Scoping Report, either accept the report, with or without conditions and advise the applicant to proceed with the plan of study for EIA or refuse the EA. Once the Scoping Report is accepted by the DMRE, the applicant must submit the EIA Report inclusive of specialist reports and an EMPr which have been subjected to a PPP. The timeframes for submission of the Scoping Report and the EIA Report inclusive of the timeframes within which the DMRE must consider the reports and approve the EA are prescribed in regulations 21 to 24 of the EIA 2014 Regulations.</p> <p>Once a decision on the EA application has been reached, the DMRE (the competent authority) must notify the applicant in writing of the decision and give reasons for the decision.</p>	
<p><u>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA)</u></p> <p>As part of the waste management matters dealt with in the NEM: WA, waste activities have been identified in GN 921 of 29 November 2013⁶: List of Waste Management Activities that have, or are likely to have, a Detrimental Effect on the Environment. GN R921 provides that the waste management activities listed in Category A and B thereof may not commence, be undertaken or conducted without a Waste Management Licence (WML). Activities listed in Category C of GN 921 may only be commenced with, undertaken or conducted in accordance with the National Norms and Standards published in terms of the NEM: WA.⁷</p>	<p>Listed activities as per the NEM: WA regulations have been identified (refer to Chapter 2, subsection 2.5).</p>

⁶ Published in Government Gazette 37083

⁷ The following National Norms and Standards have been published: Norms and Standards for Storage of Waste, 2013 (GN 926 of 29 November 2013); Standards for Extraction, Flaring or Recovery of Landfill Gas, 2013 (GN 924 of 29 November 2013); and Standards for Scrapping or Recovery of Motor Vehicles, 2013 (GN 925 of 29 November 2013)

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>Category A activities require a BAR process while Category B Activities require a S&EIR process. It should be noted that although previously residue deposits and residue stockpiles were regulated in terms of the MPRDA Regulations and in particular Regulation 73, the National Environmental Laws Amendments Act 25 of 2014 (NEMLAA) deleted section 4(b) from the NEM:WA and residue stockpiles and residue deposits therefore fall within the ambit of the NEM:WA and its various regulations. Activity B 4(11) of GN 921, as amended by GN 633 of 24 July 2015 now refers to “the establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)”. Since the Soweto Cluster is comprised of historic mineral deposits, the MPRDA does not apply and Activity B4(11) will likewise not apply. However, it must be noted that Schedule 3, Category A (Hazardous Waste) of NEM:WA itself adopts a definition for residue stockpiles precisely similar to the definition proposed for the MPRDA 3rd Amendment which never came into force. Accordingly, the Soweto Cluster must be regarded as waste accordingly and recovery operations would require a waste management licence, but in terms of Section 20 of the NEM:WA, not Activity B 4(11).</p> <p>In addition to the requirement for a WML for the mine discard dump (historic mineral deposits), the mine is likely to trigger the following waste activities, all of which require a Category B WML:</p> <ol style="list-style-type: none"> 1) The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage; 2) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the MPRDA. <p>The EA and WML are being dealt with as an integrated application.</p>	
<p><u>National Water Act, 1998 (Act No. 36 of 1998) (NWA)</u></p> <p>In terms of the NWA, the national government, acting through the Minister of Water and Sanitation, is the public trustee of South Africa’s water resources, and must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons (section 3(1)).</p>	<p>An IWULA and IWWMP will be required for the reclamation of the Soweto Cluster and will be submitted to the DWS.</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>In terms of the NWA a person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA.</p> <p>Section 21 of the NWA defines water uses which are governed in terms of the Act and for which a WUL is required. In terms of section 40(1) of the NWA “a person who is required or wishes to obtain a licence to use water must apply to the relevant responsible authority for a licence.” These water uses, in terms of Section 21, are as follows:</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 contemplated in Section 36; (e) engaging in a controlled activity identified as such in Section 37(1) or declared under Section 38(1); (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 water which contains waste from, or which has been heated in, any industrial or power generation process; (i) altering the bed, banks, course or characteristic 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>It is not likely that sub-sections (a), (d), (e), (f), (g), (h), (j) or (k) will apply to the Proposed Project.</p> <p>Water uses associated with the reclamation activities, <u>may</u> include the development of Pollution Control Dams</p>	

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>(paddocks), construction and operation of a tailings storage facility (TSF), dust suppression and the storage and use of process and potable water. These water uses will require an IWUL and will be reassessed once final placement and conceptual designs have been completed.</p> <p>The IWULA must be prepared and submitted in accordance with the Water Use Licence Application and Appeals Regulations 2017 published in GNR 267 on 24 March 2017 and must generally be supported by a Technical Report and Integrated Water and Waste Management Plan (IWWMP) with conceptual design drawing of all water related infrastructure including infrastructures that could potentially contaminate the receiving environment.</p>	
<p><u>National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEM:BA)</u></p> <p>The NEM:BA provides for the management and conservation of South Africa’s biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. SANBI website and GIS tools were utilised to determine whether any nationally protected and threatened ecosystems occur on site. Therefore, NEMA Listing Notice 3 activities have been included in the EA application.</p> <p>The Proposed Project falls within the Gauteng Province, which has a provincial Biodiversity Assessment Protected Area Expansion Strategy. This strategy has been incorporated and considered throughout the compilation of this report.</p>	<p>NEM:BA was used to inform the activities triggered by Listing Notice 3 (refer to Chapter 2, subsection 2.5).</p>
<p><u>National Environmental Management: Protected Areas Act (NEM:PAA), Act 57 of 2003 as amended</u></p> <p>The National Environmental Management Protected Areas Act (No. 57 of 2003) (NEM:PAA) concerns the protection and conservation of ecologically viable areas representative of South Africa’s diversity and its natural landscapes and seascapes, and includes <i>inter alia</i>:</p> <ul style="list-style-type: none"> ❖ The establishment of a national register of all national, provincial and local protected areas; ❖ The management of those areas in accordance with national standards; and ❖ Inter-governmental co-operation and public consultation in matters concerning protected areas. <p>Sections 48 to 53 of the NEM:PAA lists restricted activities that may not be conducted in a protected area. Section</p>	<p>SANBI website and GIS tools were utilised to determine if the project area overlaps with CBAs. Some sections of the project area were rated as Critical Biodiversity Area (CBA); Protected Area (PA) and Ecological Support Area (ESA); Parts of the pipeline routes traverse areas of biodiversity importance. Therefore, it is anticipated that some restrictions will apply to the reclamation in terms of protected areas (pending ground</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>48 states that no person may conduct commercial prospecting or mining activities in a:</p> <ul style="list-style-type: none"> ❖ Special nature reserve or nature reserve; ❖ Protected environment without the written permission of the Minister and the Cabinet member responsible for minerals and energy affairs; and <p>Protected area referred to in Section 9:</p> <ul style="list-style-type: none"> ❖ (b) world heritage sites; and (d) specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act (No. 84 of 1998); 	<p>truth verification).</p> <p>The Regulations were utilised to determine the need for any additional listed scheduled activities under GNR 985.</p>
<p><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></p> <p>The NHRA aims to promote good management of cultural heritage resources and encourages the nurturing and conservation of cultural legacy so that it may be bestowed to future generations.</p> <p>The Act requires all developers (including mines) to undertake cultural heritage studies for any development exceeding 0.5 ha. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be disturbed by development activities.</p> <ul style="list-style-type: none"> ❖ The South African Heritage Resources Agency (SAHRA) will need to approve the heritage assessment undertaken as part of the impact assessment process. 	<p>A Heritage Impact Assessment will be undertaken as part of the EIA Phase and the assessment will be uploaded on the SAHRA web site along with the EIA Report.</p>
<p><u>Conservation of Agricultural Resources Act (No. 43 of 1983)</u></p> <p>The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) includes the use and protection of land, soil, wetlands and vegetation and the control of weeds and invader plants. This is the only legislation that is directly aimed at conservation of wetlands in agriculture. The Act contains a comprehensive list of species that are declared weeds and invader plants dividing them into three categories. These categories are as follows:</p> <ul style="list-style-type: none"> ❖ Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible; ❖ Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions 	<p>The protection of land, soil, wetlands and vegetation and the control of weeds and invader plants will be contained within the EIA Report.</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>and prohibited within 30m of the 1:50 year floodline of any watercourse or wetland; and</p> <ul style="list-style-type: none"> ❖ Category 3: Declared invader species that may remain but must be prevented from spreading. No further planting of these species is allowed. <p>In terms of the Act, landowners are legally responsible for the control of alien species on their properties. Failure to comply with the Act may result in various infringement consequences and in some instances imprisonment and other penalties for contravening the law.</p>	
<p><u>The South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998)</u></p> <p>The National Road Traffic Regulations, 2000 places specific duties on the consignor and consignee of dangerous goods. A consignor means the person who offers dangerous goods for transport (i.e. hazardous waste) and a consignee is the person who accepts dangerous goods, which have been transported in a vehicle. Both consignor and consignee must comply with the requirements of several SANS standard specifications and codes of practice relevant to dangerous goods which have been incorporated into the regulations.</p> <p>The mine owner is responsible for:</p> <ul style="list-style-type: none"> ❖ Offloading of the dangerous goods; ❖ Providing the dangerous goods offloading supervisor; and ❖ Ensuring that the loading and offloading are carried out by qualified employees trained in the relevant procedures. <p>Crown Gold must, in line with Section 54 of the Act and GN R225, provide evidence that the company has appointed responsible personnel to oversee the off-loading of dangerous goods at its operations. A driver of a vehicle transporting dangerous goods is required to undergo training at an approved training body.</p>	<p>The requirements of the Act and Regulations will be considered when assessing the project impacts and developing the associated mitigation measures in the EIA Phase.</p>
<p><u>Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA)</u></p> <p>The SPLUMA was promulgated in May 2015. SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making in this field. SPLUMA will also assist municipalities to address historical spatial imbalances and the</p>	<p>The Soweto Cluster Dumps are already in existence and falls within an Urban development Zone.</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.</p>	
<p><u>Hazardous Substances Act, 1973 (Act No. 15 of 1973)</u></p> <p>The Regulations for Hazardous Chemical Substances apply to an employer or a self-employed person who carries out work at a workplace which may expose any person to the intake of hazardous chemical substances at that workplace. Regulations 14 and 15 provide for the labelling, packaging, transportation and storage and the disposal of hazardous chemical substances respectively. These regulations set out specific requirements which form part of an employer’s duty to provide and maintain, as far as reasonably practicable, a working environment that is safe and without risk to the health of his or her employees.</p>	<p>The requirements of the Act and Regulations will be considered when assessing the project impacts and developing the associated mitigation measures in the EIA Phase.</p>
<p><u>The National Development Plan, 2030</u></p> <p>The NDP strives to ensure a tightening of the accountability chain, where, in relation to this EIP, environmental noncompliance in terms of Section 16(1)(b) of NEMA is addressed at all levels of government.</p> <p>The environmental sustainability and resilience objectives include, inter alia:</p> <ul style="list-style-type: none"> ❖ Implementing a set of indicators for natural resources, accompanied by publication of annual compliance reports; ❖ Achieving the peak (in 2025) plateau and decline trajectory for greenhouse gas (GHG) emissions coupled with the entrenchment of an economy-wide carbon price; ❖ Improving disaster preparedness for extreme climate events. Gauteng is severely affected by drought; and <p>Increasing investment in new agricultural technologies, research and the development of adaptation strategies for the protection of rural livelihoods and expansion of commercial agriculture.</p>	<p>The requirements of this Plan will be considered when assessing the project impacts and developing the associated mitigation measures in the EIA Phase.</p>
<p><u>Action Plan of the Environmental Initiative of the New Partnership of Africa’s Development, 2003.</u></p> <p>This Action Plan was established with the aim of encouraging sustainable development, conservation and acceptable use of biodiversity in Africa. It has been recognised that a healthy and productive environment is a prerequisite for the success of New Partnership of Africa’s Development (NEPAD), together with the need to</p>	<p>As the Proposed Project may affect the local biodiversity, this action plan will be considered.</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>systematically address and sustain ecosystems, biodiversity and wildlife. Six areas have been identified:</p> <ul style="list-style-type: none"> ❖ Combating land degradation, drought and desertification; ❖ Conserving Africa’s wetlands; ❖ Preventing and controlling invasive alien species; ❖ Conservation and sustainable use of coastal and marine resources; ❖ Combating climate change in Africa; and ❖ Cross-border conservation and management of natural resources. 	
<p><u>Mining and Biodiversity Guideline, 2013.</u></p> <p>This guideline is founded on six fundamental principles:</p> <ul style="list-style-type: none"> ❖ Apply the law; ❖ Use the best available biodiversity information; ❖ Engage relevant stakeholders thoroughly; ❖ Use best practice in EIA to identify, assess and evaluate impacts on biodiversity; ❖ Apply the mitigation hierarchy when planning any mining-related activities and develop robust EMPs; and ❖ Ensure effective implementation of EMPs, including adaptive management. <p>❖ The guideline stipulates the requirements for both utilising and integrating biodiversity information and informants into the assessment of impacts (i.e. this S&EIA process) of mining (and reclamation) on biodiversity and ecosystem services and recommends good practice throughout the project’s life cycle.</p>	<p>As the Proposed Project may affect the local biodiversity, this guideline document will inform the impact assess process to be completed as part of the EIA Phase.</p>
<p><u>South Africa’s National Biodiversity Strategy and Action Plan</u></p> <p>The National Biodiversity Strategy and Action Plan (NBSAP) sets out a framework and a plan of action for the conservation and sustainable use of South Africa’s biological diversity and the equitable sharing of benefits derived from this use. The NBSAP was prepared by the former Department of Environmental Affairs and Tourism (DEAT), during the period May 2003 to May 2005. The goal of the NBSAP is to conserve and manage terrestrial and aquatic</p>	<p>The Proposed Project is cognisant of the obligation to protect and preserve the integrity of the environment as well as its biodiversity. Principles of this plan will be taken into consideration during the EIA Phase.</p>

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>biodiversity to ensure sustainable and equitable benefits to the people of South Africa, now and in the future. In support of this goal, five key strategic objectives (SOs) have been identified, each with a number of outcomes and activities. The schematic below represents the objectives and their interconnection in achieving the NBSAP “Goal”, although the project is related to reclamation, the following would still apply:</p> <div data-bbox="389 475 1261 1182" data-label="Diagram"> <pre> graph TD SO1[SO1: An enabling policy and legislative framework integrates biodiversity management objectives into the economy] SO2[SO2: Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector] SO3[SO3: Integrated terrestrial and aquatic management across the country minimises the impacts of threatening processes on biodiversity, enhances ecosystem services and improves social and economic security] SO4[SO4: Human development and well-being is enhanced through sustainable use of biological resources and equitable sharing of the benefits] SO5[SO5: A network of conservation areas conserves a representative sample of biodiversity and maintains key ecological processes across the landscape and seascape] GOAL[GOAL: Conserve and manage terrestrial and aquatic biodiversity to ensure sustainable and equitable benefits to the people of South Africa, now and in the future] SO1 <--> SO2 SO1 --> SO3 SO1 --> SO4 SO1 --> SO5 SO2 --> SO3 SO2 --> SO4 SO2 --> SO5 SO3 <--> SO4 SO4 <--> SO5 SO3 --> GOAL SO4 --> GOAL SO5 --> GOAL </pre> </div> <p>Through the NSBA, it is recognised that biodiversity cannot be conserved through protected area networks only. All stakeholders, from private landowners and communities to business and industry must get involved in biodiversity management. NBSAP further identified mining as one of the activities that causes habitat transformation and degradation, and seriously threatens aquatic and terrestrial biodiversity. The strategy therefore promotes the inclusion of biodiversity considerations in mining regulations, guidelines and best practice</p>	

Applicable Legislation and Guidelines used to compile the report.	Reference where Applied
<p>codes to mitigate negative impacts and encourage sustainable mining practices through partnerships</p>	
<p><u>Best Practice Guideline Series</u></p> <p>The Department of Water and Sanitation has developed a number of best practice guidelines for water resource protection in the South African mining industry. The best practice guidelines include international principles and approaches towards sustainability. There best practice guidelines include <i>viz.</i>:</p> <ul style="list-style-type: none"> ❖ A water management hierarchy; ❖ General water management strategies, techniques and tools; and <p>Guidelines for mining related activities and aspects.</p>	<p>The guidelines define and document best practices for water and waste management associated with reclamation project and will be considered throughout the S&EIA process and reporting.</p>
<p><u>Promotion of Access to Information Act, 2000</u></p> <ul style="list-style-type: none"> ❖ The PAIA gives effect to the constitutional right of access to any information held by the state and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith. 	<p>The requirements of the Act will be considered when assessing and involving the public and registered interested and affected parties.</p>
<p><u>National Environmental Management Act; National Appeal Regulations, 2014</u></p> <p>The purpose of these regulations is to regulate the procedure contemplated in section 43(4) of the National environmental management act relating to the submission, processing and consideration of a decision on an appeal. This Act is used to help guide and understand the appeal process and the procedures may follow.</p>	<p>The requirements of the Act will be considered if an appeal may need to be or is lodged for the project.</p>

Table 3-2: Applicable Provincial and Local Policies, Guidelines and By-Laws

Policies, Guidelines and By-Laws	
<p><u>Gauteng Mine Residue Areas Strategy, 2012</u></p> <p>The aim of the project as a whole is to make more land available from the mine dumps in Gauteng to be used for other purposes, in line with government priorities. The objectives for the project are as follows:</p>	<p>The Proposed Project is in line with the objectives of the Strategy. The guidelines of the Strategy will be considered throughout</p>

Policies, Guidelines and By-Laws	
<ul style="list-style-type: none"> ❖ To evaluate current pollution problems caused by mining activities and suggest how they should be addressed; ❖ To quantify the amount of land under mining activities and classify them in terms of impacts and potential for reclamation; ❖ To investigate which mining areas could be made available to be used for other purposes; and ❖ To provide preliminary and conceptual recommendations on the short-term priorities for the reclamation of the mining sites which could be economically sustainable. 	<p>the S&EIA process and reporting.</p>
<p><u>Gauteng Nature Conservation Bill, 2014</u></p> <p>The Bill was established in 2014, and contains the following objectives:</p> <ul style="list-style-type: none"> ❖ To provide for the sustainable utilization and protection of biodiversity within Gauteng; ❖ to provide for the protection of wild and the management of alien animals; protected plants; aquatic biota and aquatic systems; ❖ To provide for the protection of invertebrates and the management of alien invertebrates; ❖ To provide for professional hunters, hunting outfitters and trainers; ❖ To provide for the preservation of caves, cave formations, cave biota and karst systems; ❖ To provide for the establishment of zoos ❖ To provide for the powers and establishment of Nature Conservators; ❖ To provide for administrative matters and general powers; and to provide for matters connected therewith. 	<p>Aspects of this Bill are applicable to the Proposed Project. Where applicable, these will be considered throughout the S&EIA process and will be included within the reporting documents.</p>
<p><u>Gauteng Conservation Plan Version 3.3</u></p> <p>The main purposes of C-Plan 3.3 are:</p> <ul style="list-style-type: none"> ❖ To serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process; ❖ To inform protected area expansion and biodiversity stewardship programmes in the province; ❖ To serve as a basis for development of Bioregional Plans in municipalities within the province. 	<p>Aspects of this Plan are applicable to the Proposed Project. Where applicable, these will be considered throughout the S&EIA process and will be included within the reporting documents.</p>

Policies, Guidelines and By-Laws	
<p>C-Plan 3.3 is a valuable tool to ensure adequate, timely and fair service delivery to clients of GDARD, and is critical in ensuring adequate protection of biodiversity and the environment in Gauteng Province.</p>	
<p><u>Gauteng Environmental Implementation Plan, 2016</u></p> <p>The purpose of the EIP is to:</p> <ul style="list-style-type: none"> ❖ Coordinate and harmonise environmental policies, plans and programmes and decisions to (i) minimise the duplication of procedures and functions; and (ii) promote consistency in the exercise of functions that may affect the environment; ❖ Give effect to the principle of cooperative governance in Chapter 3 of the Constitution; ❖ Secure the protection of the environment across the country as a whole; ❖ Prevent unreasonable actions in respect of the environment that is prejudicial to the economic or health interests of other provinces or the country as a whole; and ❖ Enable monitoring of the achievement, promotion and protection of a sustainable environment. 	<p>Aspects of this Plan are applicable to the Proposed Project. Where applicable, these will be considered throughout the S&EIA process and will be included within the reporting documents.</p>
<p><u>Gauteng Growth and Development Agency Strategic Plan 2014-2019</u></p> <p>The main purpose of the GGDA Strategic Plan is:</p> <ul style="list-style-type: none"> ❖ Addressing the persistent racial imbalances regarding ownership and general configuration of Gauteng’s economy; ❖ Addressing the spatially distorted economic development legacy of apartheid rule; ❖ Broadening the base of economic development beyond the Province’s dominant metropolitan municipal areas; ❖ The socio-economic transformation envisaged for the second phase of transition to a national democratic society; and ❖ Achieving the outcomes of creating decent work, economic inclusion and equality. 	<p>The Proposed Project will contribute towards employment creation within the Province and will also contribute positively towards economic growth within the region through both its development and operation.</p>
<p><u>Johannesburg Spatial Development Framework, 2040</u></p>	<p>Where applicable, this document will be</p>

Policies, Guidelines and By-Laws	
<p>The Spatial Development Framework thus seeks to address five major issues in Johannesburg’s spatial and social landscape:</p> <ul style="list-style-type: none"> • Increasing pressure on the natural environment and green infrastructure. • Urban sprawl and fragmentation. • Spatial inequalities and the job-housing mismatch. • Exclusion and disconnection emanating from: <ul style="list-style-type: none"> • high potential underused areas (the mining belt and the Modderfontein area); • securitisation and gated developments, and disconnected street networks (high cul-de-sac ratios and low intersection densities). • Inefficient residential densities and land use diversity. 	<p>considered and consulted throughout the S&EIA process and will be included within the reporting documents.</p>
<p><u>Mining Belt West Framework</u></p> <p>To attain this overall vision of a restructured urban space, the City is committed to concentrating capital funding and a range of interventions over the medium to long term in the Corridors of Freedom. The detailed planning for this has been captured in Strategic Area Frameworks for Louis Botha, Empire-Perth and Turffontein Corridors as well as precinct plans for Jabulani, Nancefield Station, Kliptown, Orlando Ekhaya and Orlando East within the Soweto Corridor. Planning for the Mining Belt is currently underway.</p> <p>The Strategic Area Framework provides 1) the desired spatial response to the intent of the Corridors of Freedom vision by providing development guidelines and parameters such as housing typologies, development controls, densities and land use mix and 2) the projects and programs required to realise this spatial vision. In short, the Strategic Area Frameworks:</p> <ul style="list-style-type: none"> • Provide spatial context for future development • Guide investment decisions • Identify requirements and opportunities for transformation. • The Corridors of Freedom represent a significant key opportunity to address and successfully implement the developmental goals of the City as outlined in the Joburg Growth and Development Strategy 2040. The approach 	<p>The removal and reclamation of the Soweto Cluster dumps will unlock land for future development. This is in line with the Mining Belt West Framework as well as the Corridor’s of Freedom Strategic Framework.</p>

Policies, Guidelines and By-Laws	
<p>outlined in the Strategic Area Framework</p> <p>Therefore recognises the potential of the Corridors to realise a number of high level outcomes and long-term benefits:</p> <ul style="list-style-type: none"> • Improved urban efficiencies • Viable public transport service • Reduced car dependency and shorter trip lengths • More people closer to work, shopping and leisure opportunities • Lower per capita infrastructure cost • Efficient service provision • Accessibility to economic and social opportunities • Economic, social and environmental sustainability • Reduced energy consumption and carbon emissions – environmental benefit and improved health and quality of life • Neighbourhoods supported with full range of social amenities • Higher land productivity • Residents will have a wider range of choices of housing – more rental in well located areas • Residential and economic activities in areas where public transport is present • Solid basis and support for long-term investment • Increased land value and social value in critical areas of the city • Enhanced liveability of neighbourhoods with improved public spaces • Spatial and social transformation • Housing options for range of income group • Connected neighbourhoods • Curtailed urban sprawl, with densification and infill-development overcoming the burden of fragmentation of urban areas 	

Policies, Guidelines and By-Laws	
<ul style="list-style-type: none"> Restructuring (Spatially and economically) the apartheid city toward a more integrated city form, which seeks to make the city more accessible to disadvantaged groups More efficient relationship between low-income housing, informal economies and public transport Integrative development that can benefit areas beyond the limit of the study area 	
<p><u>The Centre for Environmental Rights - Mining and your Community: Know your Environmental Rights</u></p> <p>To exploit a mineral, mining companies must get permission to mine from the government. This is known as an Environmental Authorisation. To get permission, the mining company is required to assess the environment and learn about the community and consult with everyone who will be affected by the proposed mining. The Guide published in 2014 by the CER discusses what rights communities and individuals who are affected by mining have, and what laws and processes must be followed by a mining company before it can start mining.</p>	<p>Even though the recovery of the Soweto Cluster is not mining governed by the MPRDA, this FSR incorporates the recommendations and guidelines listed in the guide when undertaking PP. All PP is implemented according to the requirements listed in the NEMA EIA Regulations of 2017.</p> <p>Refer to Chapter 6 for an overview of Public Participation to be undertaken.</p>
<p><u>The Gauteng Province Environmental Management Framework, 2014</u></p> <p>The Gauteng Department of Agriculture and Rural Development (GDARD) decided to produce an Environmental Management Framework for the whole of Gauteng. The objective of the GPEMF is to guide sustainable land use management within the Gauteng Province. The GPEMF, inter alia, serves the following purposes:</p> <ul style="list-style-type: none"> To provide a strategic and overall framework for environmental management in Gauteng; Align sustainable development initiatives with the environmental resources, developmental pressures, as well as the growth imperatives of Gauteng; Determine geographical areas where certain activities can be excluded from an EIA process; and Identify appropriate, inappropriate and conditionally compatible activities in various Environmental Management Zones in a manner that promotes proactive decision-making. 	<p>Aspects of this management framework are applicable to the Proposed Project. Where applicable, these will be considered throughout the S&EIA process and will be included within the reporting documents.</p>
<p><u>The Public Participation Guidelines in terms of the National Environmental Management Act, 1998 Environmental</u></p>	<p>This guideline was used to ensure that all of</p>

Policies, Guidelines and By-Laws	
<p><u>Impact Assessment Regulations, 2017</u></p> <p>This document aims to assist with the participation process of all interested and affected parties regarding any proposed project. This guideline provides information and guidance for proponents or applicants, interested and affected parties, competent authorities and environmental assessment practitioners on the public participation requirements of the act, as well as provides information on the characteristics of a vigorous and inclusive public participation process.</p>	<p>the required steps are followed to ensure that a complete and successful public participation process is conducted.</p>
<p><u>Integrated Environmental Management Guideline on Need and Desirability, 2017</u></p> <p>This document assists Environmental assessment practitioners on the best practice as well as how to meet the peremptory requirements prescribed by the legislation as well as sets out both the strategic and statutory context for the consideration of the need and desirability of a development involving any one of the NEMA listed activities. This document further sets out a list of questions which should be addressed when considering need and desirability of a proposed development.</p>	<p>This guideline was used to ensure that the need and desirability of the project was correctly considered and that the need and desirability of the project was thoroughly considered.</p>

4 The Need and Desirability of the Project

The Integrated Environmental Management Guideline of the Department of Environmental Affairs on need and desirability, indicates that by addressing the need and desirability of a development, sustainable development is promoted. This guideline ensures that environmental reports answer questions relating to the ecological sustainability and justifiable economic as well as social development that may arise from the proposed projects.

The reclamation and reprocessing of the Soweto Cluster dumps aims to address the influence of historical underground mining operations that occurred within Soweto on the Witwatersrand plateau. These historic operations have littered the greater Witwatersrand area with mine dumps (slimes dams and sand dumps) and other accumulations of slimes. These mine dumps have become pollution sources, safety risks to surrounding communities and a limitation to spatial development.

4.1 Need and Desirability

The overall objective of this project is to recover residual gold from tailings within eight existing deposits spread across three sites (2L24; 2L20; 2L21; 2L16; 2L17; 2L18; 2A6 and 2A8). The resultant slurry from the reprocessing plant will be deposited on one of three Tailing Storage Facilities (Brakpan/Withok TSF, Cooke TSF or Pits, the West Rand Regional TSF which is still to be constructed). This will allow for the rehabilitation and clearance of land currently occupied by the Soweto Cluster Dumps.

The land being cleared could be a secondary or consequential product. The clearing of land and subsequent removal of the mine dumps is extremely important and a positive benefit. It is envisioned that the removal of these dumps could significantly reduce a source of water, land and dust pollution, as well as costs associated with the dumps' maintenance. The land would be cleared to ground level and thereafter be available for future use.

The proposed project would also directly and indirectly contribute to the Country's Gross Domestic Product (GDP), as well as enhance and further support workers and contractors employed or contracted to Crown Gold.

Overall, the Proposed Project is in line with the objectives of the Gauteng Mine Residue Area Strategy (2012), as well as the GGDA, the City of Johannesburg Strategic Development Framework and the Mining Belt West Framework. The reclamation and rehabilitation of the Soweto Cluster dumps will mitigate the current environmental, health and social impacts, as well as unlock land for potential future development.

4.2 Environmental Pollution

The historic mine dumps are known pollutants which impact the air, the underlying and surrounding soils as well as the water in the area. When it comes to the air pollution, particulate matter (PM) resulting from these areas can travel for vast distances, impacting not only the immediate area but also the surrounding

extent. The impact on the soil tends to remain localized to the dumps, of concern is the pollution caused by Acid Mine Drainage (AMD), heavy metals and sulphates from dump seepage.

Human health risks associated with dust are usually caused by fine particulate matter. Fine particulate matter originates from several sources which include dust from roads and carbon from combustion. The inhalation of particulate matter can cause damage to lung tissue, these particles can also be composed of numerous hazardous substances which add to the associated human health risk. Radiological pollution may also negatively affect areas surrounding the mine dumps. Collectively, the dust problem poses a health risk and reduces the quality of life for many citizens. Furthermore, this undermines the credibility of the mining industry as a responsible corporate citizen (GDARD, 2012, p16). The approval of this project would eliminate the Soweto Cluster Dumps as a source of pollution upon completion and provide management to these dumps which are currently neglected and unmanaged.

According to the Gauteng Department of Agriculture and Rural Development (GDARD, 2011), water pollution from abandoned mines are commonly associated with the problem of AMD, which usually refers to the 'point source' of pollution produced by the decant of contaminated water from shafts or inclines connecting the mine void to the surface. Some mine dumps, especially tailing dams, are closely associated with these underground mine voids, so the issue of water ingress into those voids, via fissures arising from the geotechnically unstable surface, is of great importance. Unfortunately, many older tailing dams were placed in riverbeds or over dolomites which allowed seepage directly into groundwater. The broader issue associated with the project remains the 'diffuse sources' of pollution represented by the sand dumps and slimes dams, and their possible interactions with precipitation, seepage, surface-water runoff and shallow groundwater. A long term sustainable solution is needed for issues related to the AMD, elevated heavy metal and sulphate concentrations attributed to historic mine dumps. This project would contribute to a solution, by removing a part of said diffuse source of pollution.

Soil contamination, including the mere presence of dumps, tailings and slimes dams on the surface environment, constitutes a pollution hazard. Individuals may be contaminated or exposed to elevated levels of pollution after they have gained unauthorised entrance to a mine site. This contamination may also be applicable to individuals who live adjacent to mines, or in some cases where individuals have built residence and settlements on contaminated dumps of abandoned mines. Direct access to mine sites may also expose the public to risk due to direct external gamma radiation, radon exposure, inhalation and ingestion of radionuclides and chemotoxic metals, as well as the physical dangers inherent to mining sites (GDARD, 2012, pg16).

4.3 Safety and Security

According to GDARD (2012), most historic mine dumps have an element of lawlessness to them and should be considered as badlands where state penetration is minimal. Apart from theft, other issues that are commonly associated with the historic mine dumps include illegal mining (so-called Zama-Zamas) and illegal settlements near the unsupervised properties. Furthermore, it is well documented that these dumps (as they stand) pose safety risks for law enforcement, affected landowners and adjacent communities. The

proposed project will assist with managing the area leading to a safer and more controlled site.

4.4 The Limitation of Spatial Development

Gauteng is South Africa's smallest but most densely populated province, housing 24% of the country's population. 97% of the province's population is urbanised, which has resulted in an increased requirement for land in urban spaces (GSDF, 2016).

Significant areas of land in Gauteng are devoted to and/or impacted upon by current and historical mining activities. The main 'gold mining belt' stretches from east to west across the centre of the province. However, gold mining has declined over the past few decades, leaving behind a legacy of TSF's. According to the Gauteng Strategic Development Framework (GSDF) (2016), one of the solutions to an ever-growing demand for spaces in the province is by unlocking the mining belt and using these areas for their development potential.

4.5 The Gold Industry of South Africa

South Africa has been undergone a long-term decline in gold output, the share of South Africa's world gold production decreased from 14% to about 5%. This trend continued in 2018. The overall decrease of gold production may be as a result of unreliable electricity-supply constraints, rising administered prices, labour issues, as well as waning productivity rates impeding its operational performance.

The reprocessing and reclamation of the Soweto Cluster dumps will retrieve gold from the sand dumps and slime dams. The revival of gold processing and recovery will add valuable tonnage into a declining market and promote economic growth and sustainability for the local economy.

5 Period for which the Environmental Authorisation is Required

The environmental authorisation (EA) is required for **20 years**. Subsequent amendments can be lodged as the operational structures change accordingly.

6 Description of the Process Followed to Reach the Preferred Site

This assessment is conducted using desktop and mapping data to ensure that the reclamation areas and other site infrastructure can be suitably positioned within the site boundary and approved servitude areas. This desktop assessment provides a holistic overview and understanding of the current status quo of the site, possible areas of environmental sensitivity and areas that are potential no-go areas. Environmental sensitivities which might be identified and mapped for the project may include the following:

- ❖ **Low Sensitivities:** Low sensitivity areas are likely to be transformed with the risk of significant ecological impact being very low.
 - Areas that are already heavily modified
- ❖ **Medium Sensitivities:** Medium sensitivity areas are likely to contain natural vegetation without any known highly sensitive features.
 - Areas of natural vegetation
 - Protected environments that have been modified
- ❖ **High Sensitivities:** High sensitivity areas are likely to contain some sensitive ecological features or processes that need to be addressed before development can be considered.
 - Grazing areas and pastures
 - Sensitive areas that are species specific
 - Non-perennial and perennial pans and watercourses identified under the National Freshwater Ecosystem Priority Area (NFEPA)
 - Farm dams
 - Sensitive areas with landscape and local corridors
- ❖ **Very High Sensitivities:** Very high sensitivity areas are potentially unsuited for development owing to their high ecological importance.
 - Areas of cultivated land
 - Areas identified under the Gauteng Conservation Plan (GCP) as “Optimal” or “Irreplaceable” Critical Biodiversity Areas (CBA).
 - Areas identified under the GCP as “Species Specific” Ecologically Sensitive Areas (ESA).
 - Areas identified under the Gauteng Biodiversity Sector Plan as “National Park/Nature Reserve” and a “Protected Environment: Natural” Protected Areas (PA).

Following the completion of the specialist studies during the EIA Phase of the project, the infrastructure Plans and the pipeline route will be amended if necessary, and where practical and feasible, based on specialist recommendations to have the least possible negative environmental impacts.

6.1 The Consideration of Alternatives

In accordance with the requirements outlined in Appendix 2 of the EIA Regulations 2014, as amended, a consideration of reasonable and feasible alternatives, including site and technology alternatives and the “do-nothing” alternative must be undertaken. Each alternative is to be accompanied by a description and

comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy. When no feasible and/or reasonable alternatives can be identified and investigated in terms of a comparative assessment during the Scoping Phase, the EIA Report will then not contain a section with alternatives.

The EIA Regulations 2014, as amended, define alternatives as the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- ❖ The property on which or location where it is proposed to undertake the activity;
- ❖ The type of activity to be undertaken;
- ❖ The design or layout of the activity;
- ❖ The technology to be used in the activity;
- ❖ The operational aspects of the activity; and
- ❖ The option of not implementing the activity.

Although a collection of alternatives may exist for the Proposed Project, only feasible alternatives have been considered for this FSR and are discussed in greater detail below. Kongwe will strive to seek alternatives that maximise efficient and sustainable resource utilisation and minimise environmental impacts.

6.1.1 The property on which or location where it is proposed to undertake the activity

The Proposed Project is the reclamation and reprocessing of already existing dumps (2L24; 2L20; 2L21; 2L16; 2L17; 2L18; 2A6 and 2A8). Therefore, there can be **no alternative sites**.

Currently the slimes dams and sand dumps are passive mineral disposal areas with no other land use or development associated with them. The goal of reclamation will be to return the sites to a condition that most resembles the pre-mining condition. Once the Soweto Cluster has been reclaimed, rehabilitated, cleared of radiation and a closure has been obtained, the end land use of the site is at the discretion of the landowner. Since the Soweto Cluster is situated in an urban area in Johannesburg, it is anticipated that the land could be made available for future urban development.

6.1.2 The type of activity to be undertaken

The only optional activity for Crown Gold is to reclaim and reprocess the existing Soweto Cluster dumps.

Gold reclamation and processing is the recovery and treatment of gold surface tailings generated from historical underground mining operations. According to DRDGold (2016), the retreatment business is high-volume and low-risk. Vast quantities of material are processed monthly through its various plants to recover gold from pre-existing (or historical dumps) at a recovery rate that varies depending on the site being reclaimed.

The depleting quantity and quality of gold recovered from underground mining operations in the province versus the extensive safety and environmental risks, as well as the labour and electricity costs associated with the activity has seen an underlining increase in the attractiveness of gold tailings reclamation. This, together with the incentive to find a solution to legacy issues related to historic mine dumps, has led to the ‘Preferred Activity’.

Table 6-1: The advantages and disadvantages of reclaiming and reprocessing Soweto Cluster – Preferred:

OPTION	ADVANTAGE	DISADVANTAGE
Re mining and reprocessing of the Soweto Cluster Dumps (Preferred)	<ul style="list-style-type: none"> ❖ Low-technical-risk nature of tailings retreatment projects sets them apart from traditional underground operations ❖ Not labour intensive. ❖ Minimal safety issues. ❖ Easy access to surface tailings, as well as lower labour and operating costs. ❖ Boost to local economy. ❖ Removal of pollution source after rehabilitation and cessation of project. 	<ul style="list-style-type: none"> ❖ Potential profits rely on substantial volumes of material. ❖ Potential negative environmental effects during construction and operational phase of the project. ❖ Not labour intensive.

6.1.3 The Design and Layout of the Activity

The current layout plan for Soweto Cluster is indicated in Figure 6-1. The layout plan is dictated by the existing location of Soweto Cluster and the associated infrastructure, including new (proposed) and existing pipelines. The routes of these pipelines are limited to existing servitude routes or wayleaves in favour of Crown Gold or its associates, where not existing, new servitudes, usufructs or wayleaves will be sort.

Emergency stormwater paddocks will be required, this will be reinstated around the dumps. The paddocks are provided to capture stormwater overflow from the dumps in the event of a rain event, and for pump station overflows. If water accumulates within the stormwater paddock below the pump stations it will be pumped back into the reticulation circuit.

The alternative layout plans for all other ancillary infrastructure will be assessed by specialist studies and will be addressed in the EIA phase.

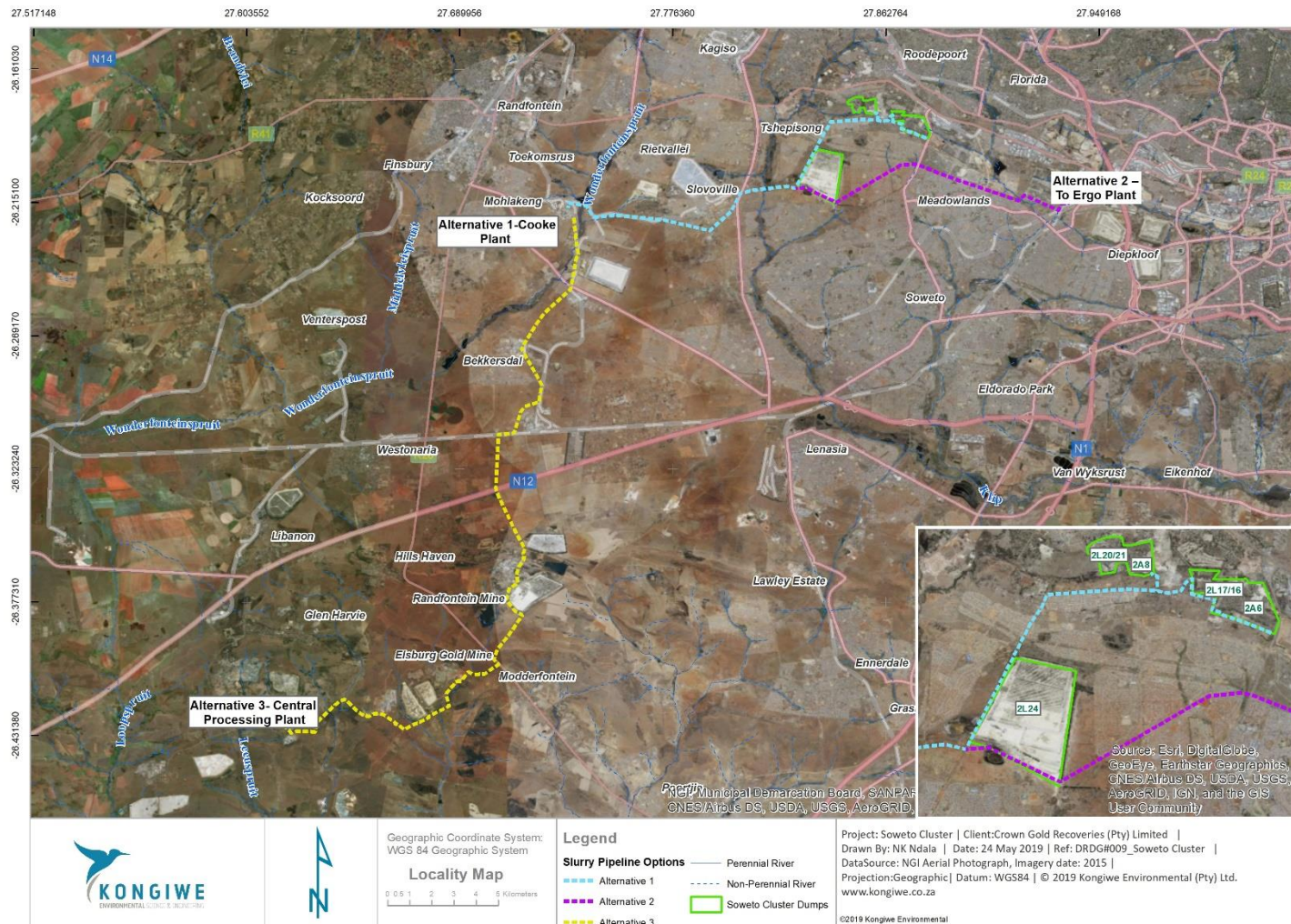


Figure 6-1: Proposed project layout indicating the plant alternatives and pipeline alternatives

6.1.4 The Technology to be Used in the Activity

The reclamation of the Soweto Cluster is the “Preferred Activity”, however there are two different methods of reclamation that should also be considered as two different materials are going to be reclaimed. The reclamation methods that exist are the Hydraulic Mining for the removal of slimes dams; and the Mechanical removal of the sand dumps. Other technology options which will be considered by Crown Gold for the reclamation of the Soweto Cluster are: Recycling initiatives, water conservation and electricity alternatives. These technology alternatives are discussed in greater detail below.

Hydraulic Mining:

Hydraulic mining is a method which uses a mobile, high-pressure water monitor to erode the slime dams in sections, washing the unconsolidated tailings material downstream (slurry) which is collected in a sump. Slimes dams are generally segregated by the coarseness of the material and grade of gold, and if a particular area of a dam is too coarse for pumping then blending is required. Once the required slurry density is obtained in the sump, and screening has prevented large objects from passing, the slurry is then pumped to thickeners and the underflow is reprocessed in a licenced processing plant. Waste material , after processing is then deposited onto a licenced TSF. A typical flow sheet for the reprocessing of a slimes dam is shown below:

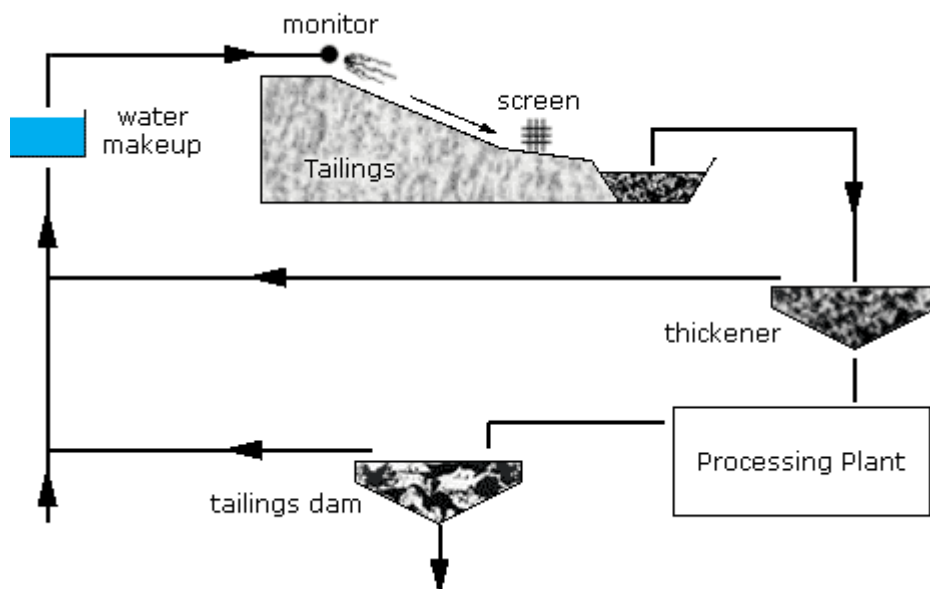


Figure 6-2: A typical flow sheet for the reprocessing of a slimes dam

Mechanical Removal:

The sand dumps will be removed via bulldozers and front-end loaders. These machines remove the sand from the dumps and load it on to a system of conveyor belts and transfer chutes. These then deliver the

sand to a screening and slurring section, which is where the coarse oversize material and grit is removed in a multi-stage screening process (usually wet screening for the finer screen sizes). The material will then be stirred into a suspension in an agitator and pumped from a pump station on site to the processing plant.

The concept of this method of reclamation is simple, but practical difficulties have arisen due to a variety of compounding factors. Firstly, the dumps have been used in the past for disposal of all sorts of refuse. Metallic scrap in the form of drill steel, rails and metal sleepers has been a major cause of belt damage, and coarse rock and vegetation have caused blocked chutes and damage to plant equipment when introduced to the system, resulting in operating problems, delays and additional costs. Secondly, the nature of the deposit further complicates reclamation such that where a dump has alternating layers of sand and slime, the footing required for the placement of equipment is not stable.

Crown Gold believes that it will implement the best available technology in the best possible combination, in a way which is cost effective for this specific project. Best practices (as utilised in the industry) have been selected and, where applicable, SANS standards and legislative requirements will be followed in design, construction and management of infrastructure and activities on site.

Table 6-2: The advantages and disadvantages of hydraulic mining and mechanical removal

OPTION	ADVANTAGE	DISADVANTAGE
Hydraulic Mining	<ul style="list-style-type: none"> ❖ Cost effective ❖ Easier to transport slurry for processing. ❖ Compatible with existing infrastructure. ❖ Lowered risks when compared to other methods of reclamation 	<ul style="list-style-type: none"> ❖ Dust emissions which are to be mitigated ❖ Not very labour intensive, thus new employment opportunities are limited ❖ May cause environmental impacts if not done responsibly.
Mechanical Removal	<ul style="list-style-type: none"> ❖ Effective for short distances ❖ Low rates for re-mining ❖ Suited to short-life projects ❖ Does not carry high capital costs ❖ Ability for more employment opportunities. ❖ Best used in combination with Hydraulic mining operations 	<ul style="list-style-type: none"> ❖ Dust emissions with sand reclamation ❖ Stability of the dump ❖ Not considered effective for long haul trips to the plant

Recycling, Water and Electricity

The reclamation of the Soweto Cluster Dumps will, in its operational phase, implement recycling policies and measures for optimal utilisation of resources and minimisation of waste generation. Potable water will be purchased from Rand Water, with a contingency for portable JoJo tanks or connection to existing water pipeline infrastructure. In terms of process water reticulation, the water cycle operates as a closed circuit, meaning that limited make-up water will be required for the reclamation of the Soweto Cluster.

Water required for the reclamation activities will be recovered from either of the three TSF's mentioned above, or from water contained in existing mine shafts and wastewater treatment facilities. Fuel types will be investigated, and energy conserving measures will be implemented where necessary.

Process alternatives imply the investigation of alternative processes or technologies that can be used to achieve the same goal. This includes using environmentally friendly designs or materials and re-using scarce resources like water and non-renewable energy sources. The preferred options, in terms of recycling, water and energy have been described below for the Proposed Project.

6.1.5 The Operational Aspects of the activity

Three operational alternatives are being considered for the transport of slurry and return water, the processing plant to be used for gold recovery, and the related depositional facility for unprocessed tailings material. These alternatives have been described in detail below, with Figure 6-1 above, to visualise the alternative concepts. The final preferred alternative will be reported on in greater detail in the EIA phase of the project following recommendations and findings from independent specialist studies.

- ❖ **Alternative 1:** Soweto Cluster is reclaimed, and slurry is transported through new pipelines from 2L24 to the Cooke Plant, south of the Soweto Cluster. Deposition will take place on the Cooke Tailings Storage Facility (TSF) which is adjacent to the plant or into the pits.
- ❖ **Alternative 2:** Soweto Cluster is reclaimed, and slurry is transported through a new pipeline which will run east of dump 2L24 where it will connect to an existing pipeline network currently being utilised for other reclamation projects. The existing pipeline will then transport the slurry to the Ergo Plant in the East Rand. Deposition will take place on the Brakpan/Withok Tailings Storage Facility, south of the Ergo Plant.
- ❖ **Alternative 3:** Soweto Cluster is reclaimed, and slurry is transported through new pipelines to the Cooke Plant (as per Alternative 1), and then to the CPP (with the option to bypass the Cooke Plant in the future). The pipeline from Cooke Plant to CPP has been authorised already but is not existing. Deposition will then take place on the Regional Tailings Storage Facility, which is authorised but not yet constructed.

Table 6-3: The advantages and disadvantages of each operational alternative considered

OPTION	ADVANTAGE	DISADVANTAGE
<i>Alternative 1: Cooke Plant, Cooke Tailings Storage Facility and associated slurry and return water pipeline (s)</i>	<ul style="list-style-type: none"> ❖ Near the Soweto Cluster. ❖ The plant and deposition facility are existing. ❖ Welded, HDPE lined pipelines. ❖ The pipelines do not traverse a great distance. 	<ul style="list-style-type: none"> ❖ There is an existing watercourse which runs between Cooke Plant and Cooke TSF. ❖ Potential for tampering with infrastructure which could lead to mechanical failures and spillages.
<i>Alternative 2: Ergo Plant, Brakpan/Withok Tailings Storage Facility and associated</i>	<ul style="list-style-type: none"> ❖ The proposed pipeline to be constructed will not traverse a great distance. 	<ul style="list-style-type: none"> ❖ The proposed new pipeline will traverse populated areas and a watercourse.

<p><i>slurry and return water pipeline (s)</i></p>	<ul style="list-style-type: none"> ❖ Existing pipeline infrastructure will be utilised to transport slurry to the Ergo Plant. ❖ The Plant has the capacity to recover the intended quantities of gold. ❖ The Brakpan/Withok TSF is currently used as the preferred deposition facility for most reclamation clean-up projects. ❖ Welded, HDPE lined pipelines. 	<ul style="list-style-type: none"> ❖ Potential for tampering with infrastructure which could lead to mechanical failures and spillages ❖ Security could be an issue during the construction of the above-ground pipeline.
<p><i>Alternative 3: Central Processing Plant (CPP), the Regional Tailings Storage Facility and associated slurry and return water pipeline(s)</i></p>	<ul style="list-style-type: none"> ❖ The plant and depositional facility are not located within populated areas 	<ul style="list-style-type: none"> ❖ Transport of slurry will be over a great distance ❖ Multiple watercourses would be crossed ❖ The plant and deposition facility are not yet constructed, thus existing infrastructure cannot be utilised

6.1.6 The “No-Go” option

The Option of the project not proceeding would mean that the environmental and social status would remain the same as current. This implies that both negative and positive impacts would not take place. As such, the short-term negative impacts on the environment would not transpire; equally so, the long term positive impacts such as environmental pollution source removal, economic development, skills development, and the availability of land for re-development would not occur. The only alternative land use is to leave the dumps as they stand; there is no other potential use of the space as the project area is a cluster of polluting historic mine dumps that impact upon the surrounding biophysical and social environment.

The “No-Go” Option also assumes the continuation of the current land use, implying the absence of any reclamation activities and associated infrastructures. The means that the attraction of the gold reserves located within the dumps could potentially enhance Illegal mining, and if left as is, population settlement on or around the dumps could occur.

The ‘No Project’ alternative is not preferred due to the anticipated benefits of the proposed reclamation project. The expected indirect benefits resulting from the reclamation of the Soweto Cluster include:

- ❖ Removal of a source of pollution and radiation in the area.
- ❖ The potential to unlock land for redevelopment, as read in the Metropolitan Spatial Development Vision.
- ❖ Continued supply of gold to the local and national markets, and therefore contribution to local, provincial and national economy.

7 Public Participation report

The public participation process offers stakeholders a fair opportunity to be informed about the Proposed Project, to raise issues of concern and to make suggestions for enhanced project benefits. This Public Participation Process (PPP) is being undertaken to ensure compliance with the environmental Authorisation, Waste Management Licence Application and the integrated Water use Licence Application (IWULA) process.

7.1 Objectives of the Public Participation Process

The PPP objectives for this project are to:

- ❖ Ensure that stakeholders are informed about the Proposed Project;
- ❖ Provide stakeholders the opportunity to participate in the process and provide comment;
- ❖ Draw on local knowledge by identifying environmental and social concerns associated with the Proposed Project;
- ❖ Involve stakeholders in identifying ways in which concerns can be addressed;
- ❖ Verify that stakeholder comments have been recorded; and
- ❖ Comply with the legal requirements.

The PPP has four phases of consultation with Stakeholders during the environmental regulatory process. These are presented in Table 7-1 below:

Table 7-1 : PPP activities

PROJECT PHASE	DESCRIPTION OF ACTIVITIES
Pre-scoping Phase	<ul style="list-style-type: none"> ❖ Identification of stakeholders; ❖ Providing project information to stakeholders; ❖ Consultation with stakeholders; and ❖ Obtaining comments, suggestions and concerns from stakeholders.
Scoping Phase	<ul style="list-style-type: none"> ❖ Distribution and placement of project announcement materials; ❖ Consultations with the directly affected landowners ❖ Updating of the stakeholder database; ❖ Availability of the Scoping Report for public review and comment; ❖ Providing I&APs with further details on the Proposed Project and associated specialist studies; ❖ Consultation with stakeholders; ❖ Obtaining further comments, suggestions and concerns from stakeholders; and ❖ Inform specialists and the applicant about stakeholder comments.
EIA Phase	<ul style="list-style-type: none"> ❖ Provide feedback about the specialist studies conducted and mitigation measures proposed by means of consultation with stakeholders; ❖ Make the relevant environmental reports available for public review and comment;

	<ul style="list-style-type: none"> ❖ Consultation with key stakeholders; ❖ Provide opportunity for stakeholders to comment on specialist findings, impacts assessments and recommendations; ❖ Verify that comments raised by stakeholders have been accurately recorded; and ❖ Inform specialists and the applicant of stakeholder comments.
Decision Making Phase	<ul style="list-style-type: none"> ❖ Once the competent authority has come to a decision regarding the authorisation of the project, all registered stakeholders will be notified of the decision made and the appeal process to be followed.

7.2 Identification of Stakeholders

To ensure representation of stakeholders, the methods below were utilised to develop a comprehensive stakeholder database.

- ❖ WinDeed searches were undertaken for farm portions in and around the project site to verify land ownership and obtain contact details;
- ❖ Desktop and online research;
- ❖ Stakeholder networking and discussions to source additional stakeholder details:
 - This entailed telephonic consultations and meetings with landowners, National, Provincial and Local Government, community organisations and other representatives; and
 - Site visits will be undertaken in an effort to identify stakeholders for which no contact details could be obtained.

Stakeholders identified who are affected by or interested in the Proposed Project are grouped into the following broad categories:

- ❖ Government: National, Provincial, District and Local Authorities;
- ❖ Parastatals: Various semi-Government entities, Organs of State;
- ❖ Landowners: Directly or indirectly affected and adjacent property owners;
- ❖ Land occupiers: Directly or indirectly affected and adjacent;
- ❖ Surrounding communities;
- ❖ Agriculture and Water: Farmers’ associations, entities responsible for water management and/or regulation;
- ❖ Non-Governmental Organisations (NGOs): Environmental organisations, community-based organisations; and
- ❖ Business and industry: small to medium enterprises, mines, industrial and large business organisations.

A stakeholder database has been compiled and will be updated throughout the environmental regulatory process (refer to Appendix C1 for a copy of the stakeholder database).

7.3 Land Claims

A formal enquiry, which contained a list of all the directly and indirectly affected land portions for the project, was submitted to the Gauteng Department of Rural development and Land Reform (GDRDLR), Land Claims Commission, on **Friday, 31 May 2019** (refer to Appendix C2). Feedback from the land claims commission is pending.

7.4 Public Participation Materials

Considering the legislative requirements and good practice, the following documents below have been developed and distributed to stakeholders. The various PPP information materials which were used as part of the Environmental Impact Assessment (EIA) process are included as appendices to this report.

Background Information Document

The Background Information Document (BID) (Appendix C3) provided important information regarding the following:

- ❖ A project description of the proposed Soweto Cluster dumps reclamation Project;
- ❖ The Environmental Impact Assessment and the Public Participation Process to be undertaken in support to the reclamation process and relevant contact details of the public participation practitioners;
- ❖ An Integrated Water Use Licence Application process;
- ❖ Details about how stakeholders can register as an Interested and Affected party (I&AP) and be kept informed about the project developments;
- ❖ The public review and comment period for the Draft Scoping Report (DSR); and
- ❖ Invitation to attend the public meeting.

The BIDS were emailed, and hand delivered to the affected and surrounding landowners. The BID is available on Kongiwe's website (under public documents).

Newspaper Advertisements

A newspaper advert (Appendix C4) was placed in ***The Star***, on **Monday, 3 June 2019**. The advert includes the following details:

- ❖ Brief project description;
- ❖ Information about the required legislation, the competent authorities and details of the appointed EAP;
- ❖ The venues where the DSR could be accessed;
- ❖ The details of the public meeting;
- ❖ Registration as Stakeholders;

- ❖ The contact details of the public participation office.

Site Notices

Similar to the advertisement, the site notice provides an overview of the project, and highlights the applicable legislation for the EIA process. It also stipulates the PPP to be followed and where relevant information could be obtained from. Moreover, the site notice invites stakeholders to formally register as an Interested and Affected Party on the project.

Notification LETTER with a Comment and Registration Form

A notification letter was sent to stakeholders on **Friday, 31 May 2019** to inform them about the proposed project, applicable legislation and competent authorities. The letter also shared details of the public meeting and invited stakeholders to register formally as Stakeholders. A Comment and Registration Form was also provided for stakeholders to use for formal registration as Stakeholders or to submit comments. (See Appendix C6)

Telephonic Discussions

Stakeholders were also consulted by means of telephonic discussions. Furthermore, these discussions aided with the process of invitations to the Public Meeting.

7.5 Stakeholder Consultations

One-on-One and Focus Group Meetings

Both one-on-one and focus group meetings have been conducted during the scoping phase of the project. The aim of these meetings were to engage with key stakeholders (Competent and Commenting authorities), introduce the project team, the proposed project, and to obtain initial comments which can be used to inform specialist studies and project planning going forward. Refer to Appendix C7 for a list of meetings and consultations that were undertaken. Minutes of these meetings have been compiled and distributed to stakeholders.

All comments raised by stakeholders during these meetings have been captured into the Comment and Response Report (CRR). Responses to comments were provided in line with the overall project scope and available information.

Public Meeting

The aim of consultation during the Scoping Phase is focused on the formal EIA process, specialist impact studies terms of reference and addressing stakeholder comments already submitted. A public meeting was held on **Thursday, 20th June May 2019 at 10H00 at the at the Bramfischerville Multipurpose Centre,**

Cnr Loerie Blaar & Methlokgo Phase 2, Bramfischerville. The purpose of the meeting was to discuss the proposed project, contents of the Draft Scoping Report and to provide stakeholders with an opportunity to raise their concerns/comments. Minutes from the public meeting has been compiled and distributed to all stakeholders who attended.

Authorities, NGOs, Landowners / land occupiers and community members were mobilised by means of telephonic consultation and distribution of emails and sms's two weeks prior to the public meeting, to promote attendance.

All comments raised by stakeholders have been captured in the CRR. Stakeholder comments have been closely considered and addressed, where applicable, by the project team to ensure that the scope for specialist studies to be undertaken is well defined. Responses will be provided to the comments raised by stakeholders and included in the CRR throughout the PPP.

Comment sheets and electronic copies of the Draft Scoping Report was made available at the public meeting.

Availability of the Draft Scoping Report for Public Review and Comment

This Draft Scoping Report (DSR) was made available to stakeholders on the Kongiwe Environmental website and in public places for a 30-day comment period from **Tuesday, 4th of June 2019 to Monday, 8 July 2019**. Notification of the availability of the documentation for review was distributed on **Friday, 31 May 2019**.

Table 7-2: Public places where the Draft Scoping Report can be accessed

Location	Physical Address	Contact person
Hard copies		
Bramfischerville Public Library	Cnr Loerie Blaar & Methlokgo Phase 2, Bramfischerville	Ms Patricia Mathe Tel: (011) 765 4025
Roodepoort Public Library	Cnr Berlandina & Hodgson Streets	Ms Monique Ramabulana Tel: (011) 763 1031
Electronic copies		
Kongiwe Environmental website	www.kongiwe.co.za/ public documents	Sibongile Bambisa / Vanessa Viljoen
For a CD copy please contact the stakeholder engagement team (Sibongile Bambisa/ Vanessa Viljoen), Tel: (012) 003 6627, Email: stakeholders@kongiwe.co.za		

The DSR was distributed to the Competent Authority (Department of Mineral Resources) and key Commenting Authorities.

Key Commenting Authorities that have received copies of the DSR are as follows:

- ❖ Department of Water and Sanitation (DWS);

- ❖ National Nuclear Regulator (NNR);
- ❖ City of Johannesburg Metropolitan Municipality (CoJMM);
- ❖ Gauteng Department of Agriculture and Rural Development (GDARD);
- ❖ National Department of Health (DoH);
- ❖ South African Heritage Resources Agency (SAHRA);
- ❖ Department of Public Works; and
- ❖ Department of Environment, Forestry and Fisheries (DEFF)

Table 7-3 below provides details of the activities that formed part of the Draft Scoping Phase.

Table 7-3: Summary of PP activities during the Draft Scoping Phase

Activity	Details	Reference in Draft Scoping Report
Pre-scoping Phase		
Identification of stakeholders	Stakeholders, were identified by means of WinDeed searches, stakeholder networking and research for the compilation of a stakeholder database.	Appendix C1 Stakeholder database
Identification of land claims	A formal enquiry, which contained a list of all the directly affected land portions for the project, was submitted to the Land Claims Commission Gauteng Regional Office at the GDRDLR, Friday, 31 May 2019. Feedback pending.	Appendix C2 Land claims letters
Development of the Background Information Document	The BID was developed and emailed to the full stakeholder database on Friday, 31 May 2019. The BID was also distributed at stakeholder meetings and is available on Kongiwe's website.	Appendix C3 BID
Placement of media advertisements	An advertisement was placed in <i>The Star</i> (Regional Newspaper) on Monday, 3 June 2019.	Appendix C4 Advertisements
Placement of site notices	Site notices were put up in publicly accessible places within proximity of the project area Tuesday, 4 June 2019. A copy of a Site Notice was also placed at the <ul style="list-style-type: none"> ❖ Bramfischerville Public Library ❖ Roodepoort Public Library A site notice placement report and map has been developed, indicating the exact locations where site notices were placed, with photos and GPS coordinates.	Appendix C5 Site notice report and placement map

Activity	Details	Reference in Draft Scoping Report
Announcement of the project and Draft Scoping Report	<p>The announcement letter was emailed to the full database on Friday, 31 May 2019 to:</p> <ul style="list-style-type: none"> ❖ Announce availability of the Scoping Report; ❖ Share details of the public meeting; ❖ Indicate where the Scoping Report will be available for public review and comment; and ❖ Communicate the public review and comment period. <p>The Draft Scoping Report and the BID were made available on Kongiwe’s website http://www.kongiwe.co.za/publications-view/public-documents/</p>	<p>Appendix C6 Announcement Letter Appendix C3 BID</p>
Stakeholder meetings	<p>One-on-one meetings and Focus Group meetings have been held with Authorities and Directly Affected Landowners throughout the scoping phase. Minutes from these meetings will be compiled and distributed to all stakeholders.</p> <p>An overview of the Proposed Project has been discussed, and stakeholder comments has been captured and responded to in the CRR. This will accompany the Final Scoping Report.</p>	<p>Appendix C7 List of meetings & Meeting Minutes</p>
Public Meeting	<p>A Public meeting was held with stakeholders on Thursday 20th June 2019 at 10H00 at the at the Bramfischerville Multipurpose Centre, Cnr Loerie Blaar & Methlokgo Phase 2, Bramfischerville. Minutes of this meeting have been distributed to all stakeholders on the database.</p> <p>Minutes from this meeting will be captured in a Comments and Responses (CRR) which will accompany the Final Scoping Report.</p>	

7.6 Consultation Undertaken as part of the Final Scoping Phase

The aim of consultation during the Final Scoping Phase will be to focus on the formal EIA process, specialist impact studies, terms of reference and addressing stakeholder comments already submitted.

Notification of the availability of the documentation for review will be distributed. In the submission of the FSR, Stakeholders will have the opportunity to verify that their comments which were captured during the Draft Scoping phase, and to review responses provided by the project team.

Table 7-4: Summary of PPP activities to be undertaken during the Final Scoping Phase

Activity	Details
Update of stakeholder information	The stakeholder database will be updated with new Stakeholders who formally registered, attended stakeholder meetings or submitted comments.
Placement of the Final Scoping Report	<p>The Final Scoping Report will be placed at the following public place:</p> <ul style="list-style-type: none"> ❖ Bramfischerville Public Library ❖ Roodepoort Public Library <p>The Final Scoping Report will also be made available on the Kongiwe Environmental website http://www.kongiwe.co.za/publications-view/public-documents/.</p>
Announcement of the Final Scoping Report	<p>Announcement letter of availability of the Final Scoping Report for comment will be emailed to the full stakeholder database.</p> <p>This report will be available on the Kongiwe Environmental website http://www.kongiwe.co.za/publications-view/public-documents/</p>

7.7 Consultation with Stakeholders during the Impact Assessment Phase

Consultation with stakeholders during the EIA Phase will revolve around Stakeholders providing comments on specialist study findings, recommendations and mitigation measures proposed. These studies and recommendations will be included as part of the Environmental Impact Assessment Report and the Environmental Management Programme EIA/EMPr. A public meeting will also be held to present the findings of the specialist studies and to get comments from Stakeholders.

7.8 Consultation during the Decision-Making Phase

Once the competent authority has come to a decision regarding the authorisation of the project, all registered Stakeholders will be notified of the decision made and the appeal process to be followed.

8 The Baseline Environment

8.1 Climate

The Soweto Cluster dumps are situated south of Roodepoort and fall within the Highveld climatic zone characterised by summer rainfall. The project area has a mean maximum temperature of around 26°C in January (summer), dropping to average maximum temperature of around 16°C in June (winter). The area is characterised by warm to hot days with occasional summer thunderstorms and cool evenings. Winters in the Highveld have mild and dry days and cold, frosty nights. The area receives mean annual Precipitation of about 600 to 750 mm. See Figure 8-1 below.

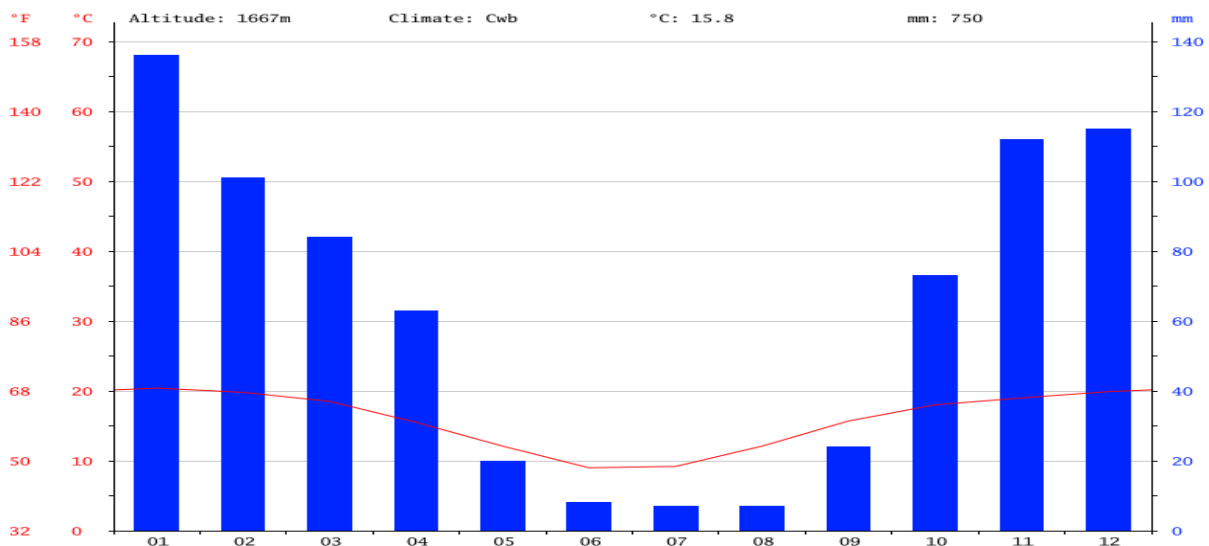


Figure 8-1: Weather by Month Soweto (Source: <https://en.climate-data.org/africa/south-africa/gauteng/soweto-523/#climate-graph>)

During the autumn months (March to May), predominant wind direction is from the north-northeast and northwest. In spring and summer, the predominant wind direction is from the northerly direction. During the winter the wind tends to be from the northwest and south-southeast.

8.2 Topography

The Highveld inland plateau has an elevation varying from 1 400 m to 1 800 m (Johannesburg 1 757 m) and prominent morphological features in the area include historic mine dumps which rise to about 50 - 60 m above ground. The local terrain morphology has been classified as undulating plains (GPEMF, 2014).

8.3 Geology

The Soweto Cluster is located within the Central Rand Goldfields of the Witwatersrand Supergroup. The geology of the Central Rand Goldfield's is unique and economically significant in South Africa's history (Figure 8-2). The geology underlying the project area consist of the Turffontein and Johannesburg Subgroups of the Central Rand Group.

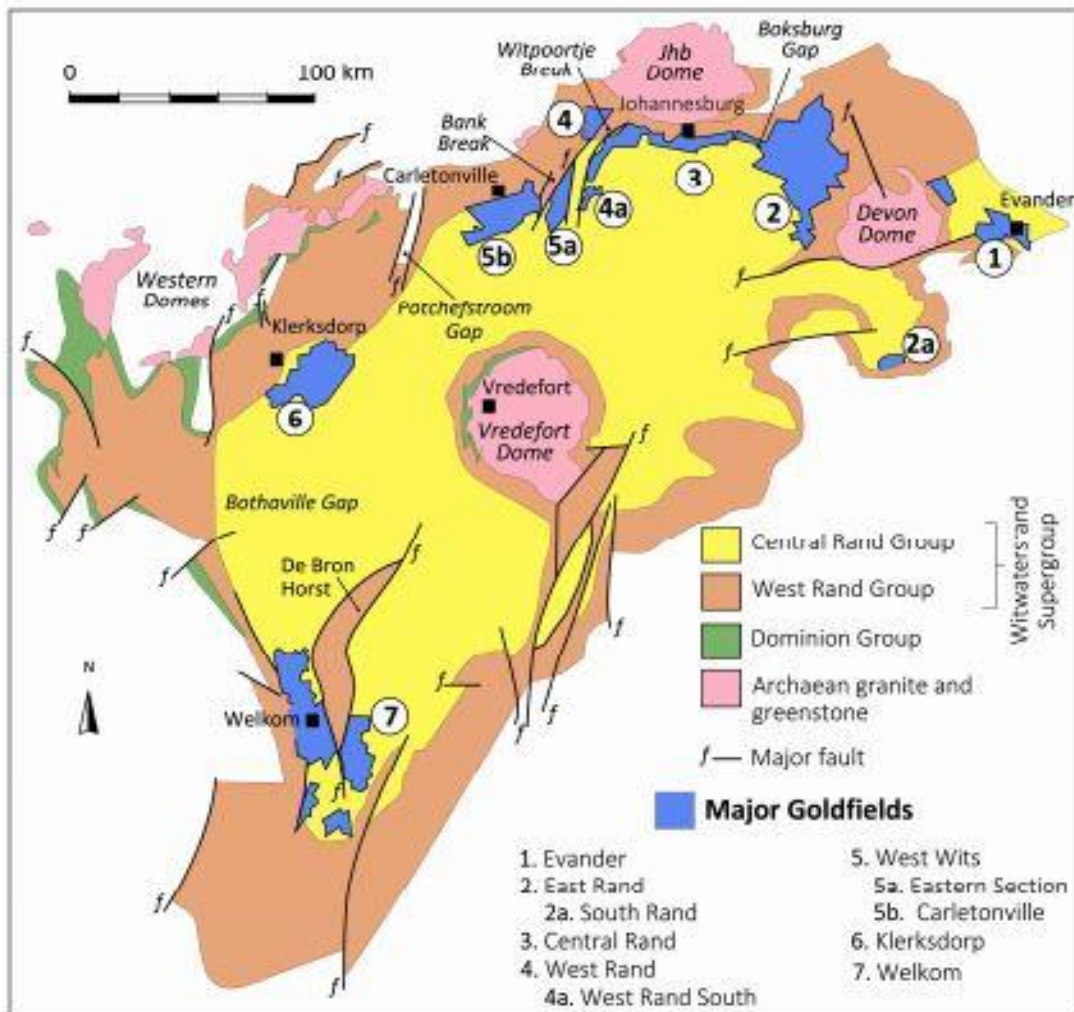


Figure 8-2: The geology of the Witwatersrand Basin stripped of younger cover and showing the position of the seven major goldfields (Source: Tucker *et al.*, 2016).

The Witwatersrand Supergroup comprises a lower “West Rand Group (WRG)” and an upper “Central Rand Group (CRG)” (SACS, 1980). The continuity of the major geological units, marker horizons and individual conglomerate reef horizons around the auriferous northern and western basin edges, are features of the Witwatersrand as exemplified by the major stratigraphic units of the Central Rand Group.

The WRG comprises the lower Hospital Hill Subgroup; middle Government Subgroup and upper Jeppestown Subgroup. The shales of the WRG are characterised by the presence of magnetite bearing

interlayers. These layers played a significant role during deep basin exploration, as they were used as magnetic markers.

The CRG contains by far the bulk of the gold mineralisation. It is divided into a lower Johannesburg Subgroup and an upper Turffontein Subgroup. These Subgroups are separated by the Booyens Shale Formation, often called the “Upper Shale marker” in the Welkom Goldfield. The Central Rand Group comprises a number of formations which, although varying in thickness, can be traced and correlated, with a few exceptions, in all the goldfields. The gold-bearing conglomerate reefs tend to occur in clusters which are informally referred to as “reef groups”. All of the important gold reefs lie on prominent unconformity surfaces, many of which can be traced around the entire basin.

Another characteristic of the Witwatersrand mining area is a series of cross-cutting lineaments representing faults and dykes. The dykes are not 100% impermeable. Fault appearance varies from a hairline width to large breccia filled widths. Faults are commonly filled with intrusive material (Biccard and Jeppe, 1946). The geology underlying the project area consist of the Turffontein and Johannesburg Subgroups of the Central Rand Group.

8.4 Soils, Land Capability and Land Use

8.4.1 Soils

The soil composition of South Africa is vast and unique and is composed of 73 soil forms. Soil forms are defined by the nature of the topsoil (organic, humic, vertic, melanic, silicic, Calcic, duplex, podzolic, plinthic, oxidic, gleyic, cumulic, lithic and anthropic) (Fey, 2010). The proposed study area is underlain by a quartzite rock layer. Vertic, Melanic, Duplex, Plinthic, Oxidic, Gleyic, Cumulic and lithic soils all have a possibility of being present in the proposed study area (Fey, 2010).

A Soil Impact Assessment report was compiled for the proposed project areas, for a Digby Wells (2014b) EIA/EMP. This report found that the dominant soils in the project area are Hutton (Hu) and Clovelly (Cv) forms. These types of soils tend to have a moderate to high agricultural potential, but due to the historic mining in the area the fertility and agricultural potential of the proposed project area’s soils have been significantly modified and degraded

8.4.2 Land Capability

Due to the mining and industrial history of the area, the land has been significantly modified and degraded. Thus, the area is ideal for supporting future development and commercial use, following completion of the reclamation of the Soweto Cluster.

8.4.3 Land Use

The land uses in the immediate vicinity of the project site are generally urban land uses. These land uses include industrial activities, residential areas, transport systems and historic mine dumps.

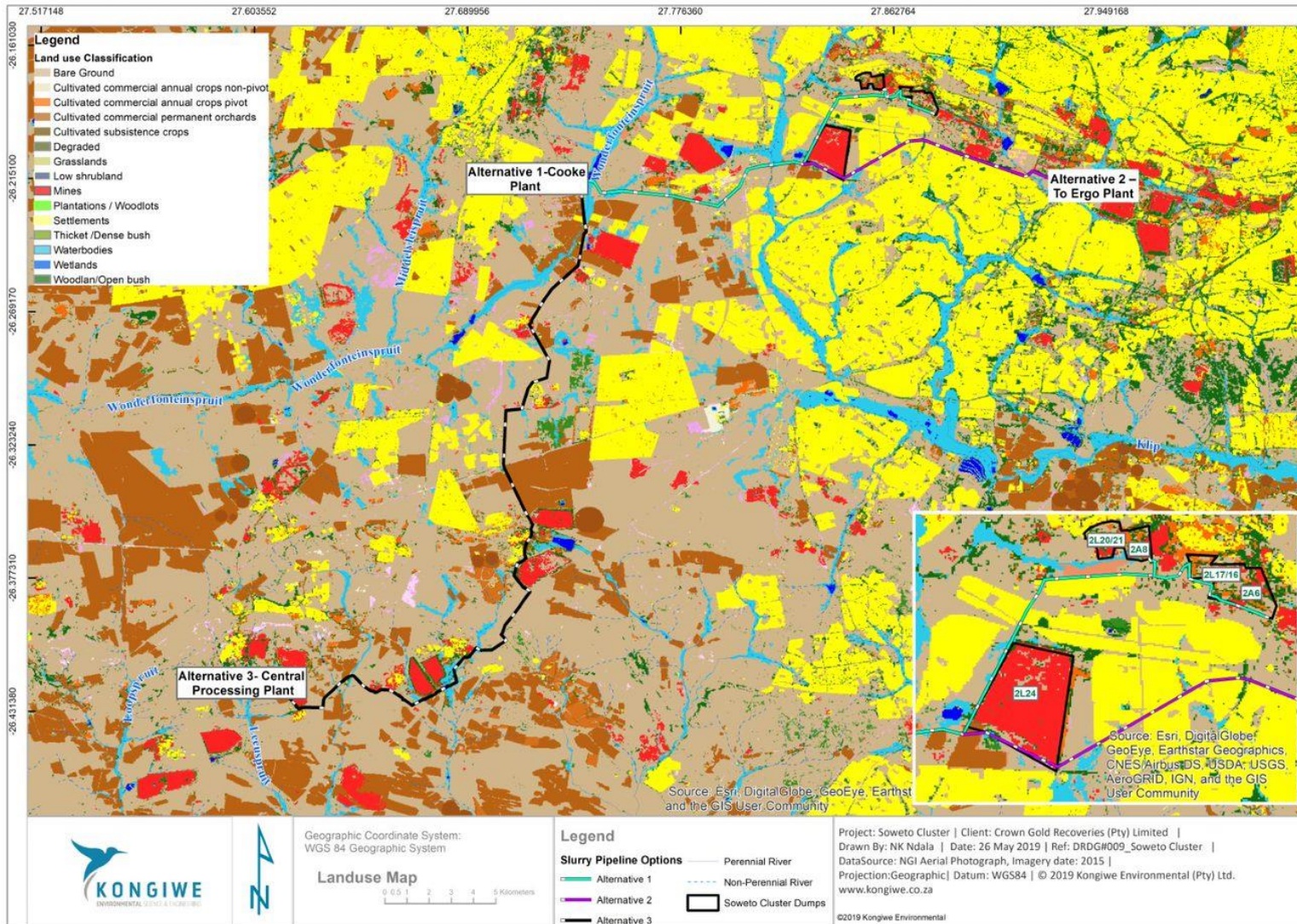


Figure 8-3: Land uses of the Proposed Project site and surrounding areas.

8.5 Surface Water and Ground Water

8.5.1 Surface Water

The water sources of South Africa are vital to the health and prosperity of its people, the sustenance of its natural heritage and to its economic development. The Orange/Vaal River Basin extends over four countries, covering an area of 964 000km². The proposed project area is located in the Upper Vaal Management Area, which is one of the 19 WMA included into Orange/Vaal River Basin. The Upper Vaal WMA is the most developed, industrialised and populous of the Orange/Vaal WMAs (DWAF, 2002). Large quantities of water are transferred into this WMA from the Usutu to Mhlatuze and the Thukela WMAs as well as from the Senqu (Orange) River in Lesotho. This WMA releases similar quantities of water into the Vaal River which leads to the Middle Vaal and Lower Vaal WMAs. Water is also transferred from here to the Crocodile West, Marico and Olifants WMAs (DWAF, 2002).

The quaternary catchment, C22A has a surface area of 548 km² (DWS, 2018). The Klip River drains this catchment, flowing in a southerly direction. The Klip River then flows in a south-westerly direction past the town of Meyerton, and into the Vaal River above the Vaal Barrage, near the town of Vereeniging. The Klip River is situated to the west of the proposed project area and has several unnamed tributaries. The river has a defined wetland along its watercourse and flows through several dams along its course.

C22A has a Mean Annual Runoff (MAR) of 26.87 million cubic metres (MCM). Surface water quality monitoring data will be obtained from Crown Gold and assessed in detail during the EIA phase of the Project.

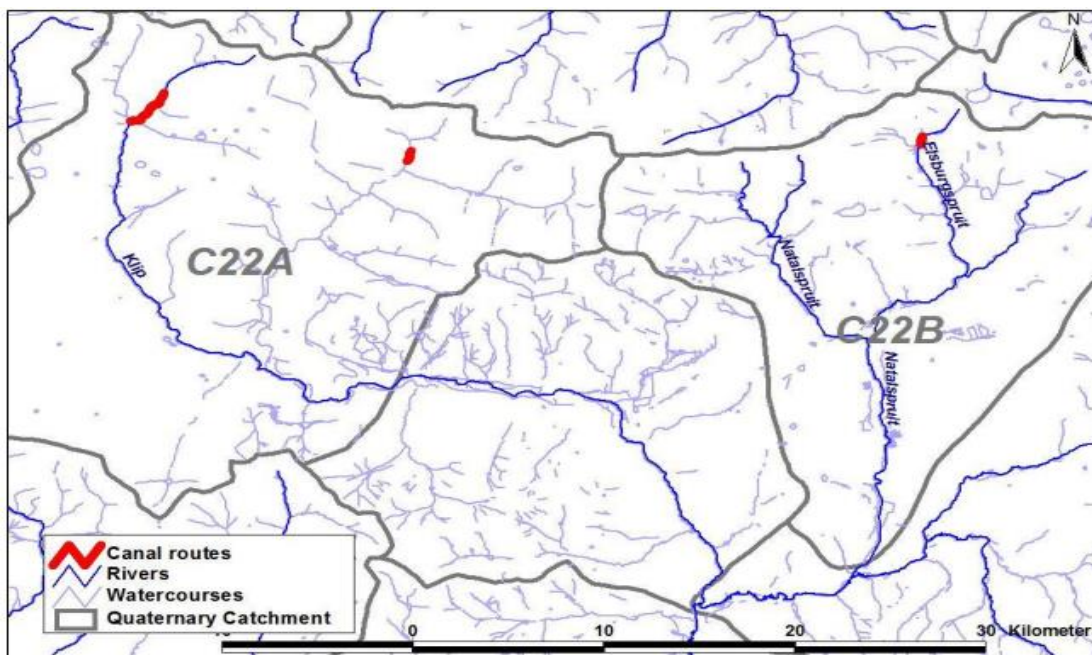


Figure 8-4: Regional catchments around the project location.

8.5.2 Groundwater

The proposed study area is underlain by predominantly both sedimentary (shale, sandstone and conglomerate) and igneous rocks (andesite). These rocks are low in primary permeability and porosity. Groundwater occurrence is generally associated with fractures and joints which develop along bedding plans in the sedimentary rocks, and weathering and fracturing in the igneous rocks. The groundwater recharge is estimated to be 95 mm per annum and the proposed project area has a harvest potential 11 200mm³/km²/annum (Vegter, 1995).

The area has a moderate groundwater yield potential, since 80% of the boreholes, sourced in previous studies, produces less than 2 l/s at a depth of between 10 and 25m below the surface.

The groundwater levels vary between depths of 3 m to 30 m in the Central Rand Compartment (Scott, 1995). However, the presence of historical mining activities around the proposed site multiplies the effects on the groundwater. Firstly, it led to the dewatering of the underlying aquifers when the underground workings were dried and secondly, the physical presence of the mine dumps could artificially raise the water table due to the additional groundwater storage capacity of the tailing's material.

8.6 Fauna and Flora

Gauteng is the smallest of South Africa's nine provinces, but despite this, Gauteng is rich in biodiversity. The Province is situated in two biomes (both the Savanna and the grassland biome). Approximately 80% of the province's area is designated as Highveld Grassland, this is one of the richest primary grasslands in the world. This grassland is also particularly poorly conserved (less than 2% protected) (Pfab *et al.*, 2017). The province has an estimated 2183 plant taxa, 125 mammal species, 488 bird species, 21 amphibians and 92 reptile species. At least 11 taxa are endemic to the province.

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2014) (Gauteng C-Plan) classified areas within the province based on its contribution to reach the conservation targets within the province. The Gauteng C-Plan uses the following terms to categorise the various land used types according to their biodiversity and environmental importance:

- ❖ Critical Biodiversity Area (CBA);
- ❖ Ecological Support Area (ESA);
- ❖ Other Natural Area (ONA);
- ❖ Protected Area (PA); and
- ❖ Moderately or Heavily Modified Areas (MMA's or HMA's).

According to the Gauteng C-plan and available desktop information, much of the project area is identified as unclassified, although the pipeline area falls within an important CBA. The data used for this analysis is often captured remotely, and the data used is referenced to 2011, thus an important aspect of this study will be to ground-truth the boundaries of these areas.

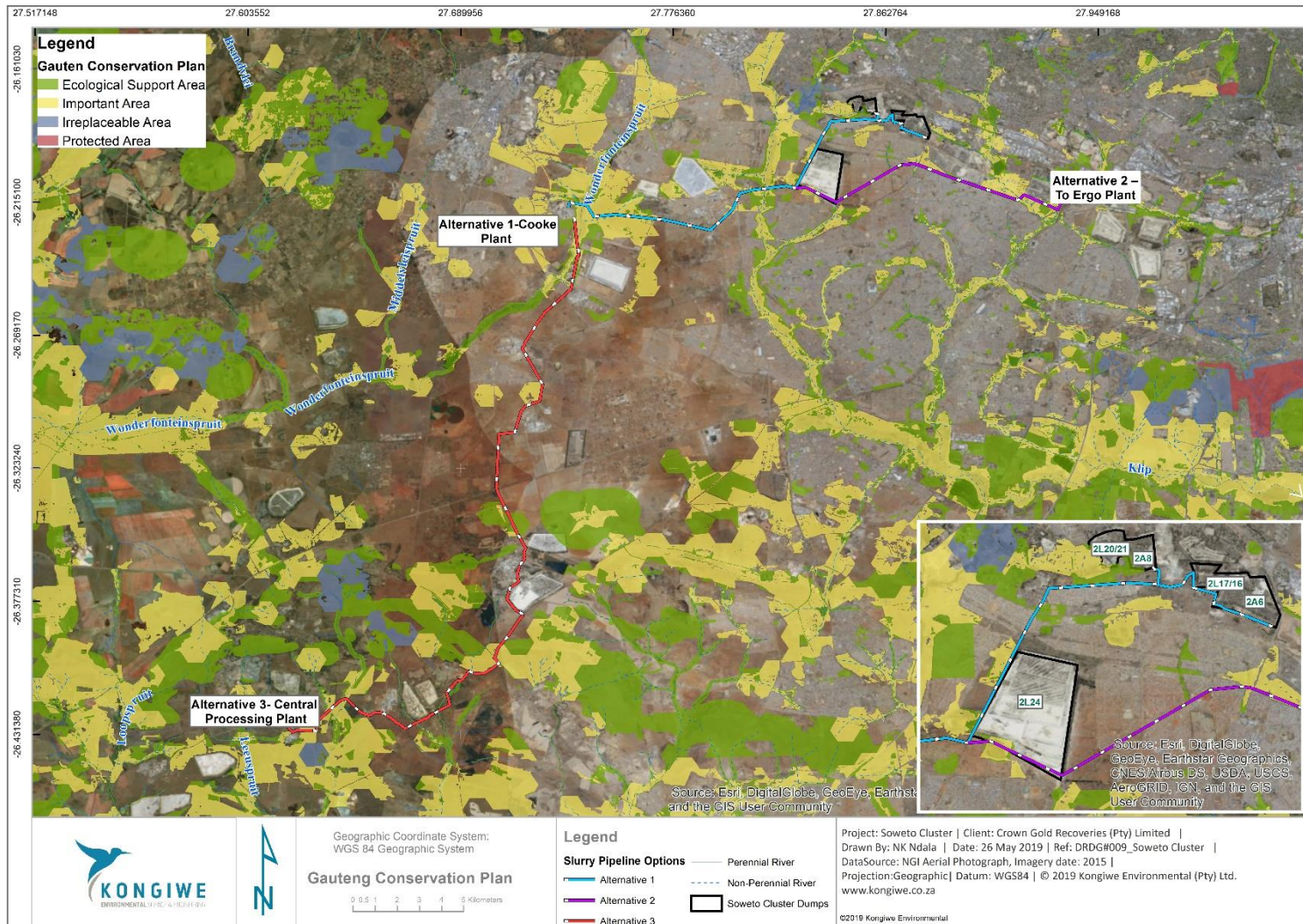


Figure 8-5: The Soweto Cluster project area superimposed on the Gauteng C-plan.

8.6.1 Flora

The Gauteng province falls within two vegetation biomes, namely the Grassland and Savanna biomes. The province is represented by 17 vegetation types. These two biomes incorporate various bioregions like the Dry Highveld Grassland, Mesic Highveld Grassland and Central Bushveld. These areas also have several types of azonal vegetation types interspersed between the different vegetation types, these are the Highveld Alluvial Vegetation and Eastern Temperate Freshwater Wetlands (which are associated with riparian zones of rivers and wetlands).

The Soweto Cluster is situated within the grassland biome. This biome is centrally located in southern Africa and adjoins most of the biomes except for the desert, fynbos and succulent Karoo biomes (Mucina and Rutherford, 2006). The grassland biome comprises many different vegetation types.

The project area is situated within one vegetation type; namely Soweto Highveld Grassland according to Mucina and Rutherford (2006) (Figure 8-6). This vegetation type (Soweto Highveld Grassland) occurs on gently undulating landscapes on the Highveld plateau and supports short to medium-high, dense, tufted grassland dominated by *Themeda triandra* and accompanied by a variety of other grasses like *Elionurus muticus*, *Eragrotis racemose*, *Heteropogon contortus* and *Tristachya leucothrix*. This Soweto Highveld Grassland vegetation type is formally classified as an Endangered vegetation type.

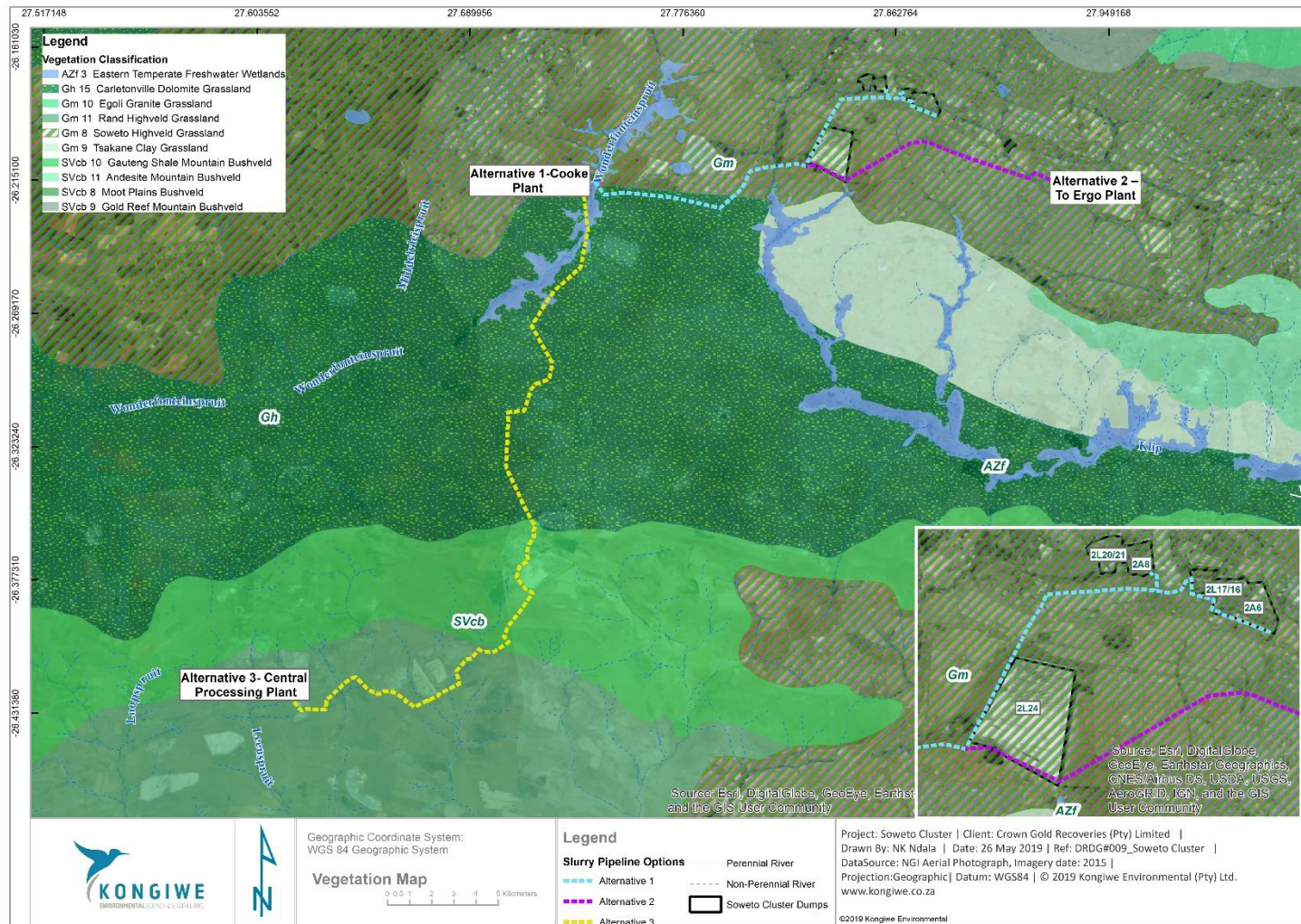


Figure 8-6: The Soweto Cluster project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland.

8.6.2 Fauna

Mammals:

As mentioned above the Gauteng is relatively prosperous in biodiversity, but this resource tends to be poorly conserved. The province boasts a possibility of 125 mammal species. The prevalence of all these species occurring in the proposed site is slim due to the availability of habitats for survival and anthropogenic influences which have led to the current altered state of the local project area.

The proposed project area has an extremely altered and degraded habitat due to the historical mining activities that occurred within the proposed project area. Due to this, the possibility of many species being supported by the remaining habitat is quite low. The area is said to be rich in small mammal diversity with 98 mammalian species possibly occurring in the Soweto cluster and surrounding areas. The probability of these species being present at any given time in the project area is low, although it is expected that smaller mammals (rodents, etc) and highly-mobile mammals (e.g. bats) are more likely to inhabit the proposed site. A previous study conducted on the proposed project areas, found one mammal with a low conservation concern, the yellow mongoose.

Birds:

The South African Bird Atlas Project 2, stated that the Gauteng province has 488 different types of bird species present. The proposed project area has been previously found to be relatively rich with avifaunal diversity, with 403 bird species expected to occur within the project area. Not all these species would occur within the proposed development site due to an unavailability of various specific habitat types.

A previous study (Digby Wells, 2014b) within the project area identified 23 bird species within the proposed site. These species were identified in the vicinity of less disturbed areas. This study stated that during the time of the assessment potential bird activity was reduced as it was conducted after the main summer rains.

Reptiles:

Southern Africa has the richest reptile diversity in Africa consisting of 498 species and the local occurrence of reptiles are closely dependant on broadly defined habitat types. Gauteng has approximate 92 reptile species that have previously been classified in the province. A Digby Wells study (2014b) stated that 52 known reptile species have a distribution range that may correlate with the proposed project area. The potential diversity of species present within the area was limited in this study due to ecological degradation and transformed state of the proposed project area, due to the large-scale historic mining that occurred.

With help from the community in the area a previous study (Digby Wells, 2014b) found that 3 reptile species possibly may occur in the proposed project area; *Bitis arietans* (Puff adder), *Hemachatus haemachatus* (Rinkhals) and *Lamphrophis aurora* (Aurora house snake).

Amphibians:

Similarly to reptiles, amphibians are closely dependant on specific habitat types. In the province of Gauteng there has previously been 21 amphibian species listed. A previous study (Digby Wells, 2014b) of the project area stated that 16 amphibian species are known to occur in the project area, this is based on a list of species previously recorded within the region. A previous study on the project area stated that due to the prevailing habitat present at the proposed site, no suitable amphibian habitat was found, and no species were recorded. This indicates a severely degraded area due to the historic mining activity that took place.

8.7 Wetlands

The proposed project area falls within the C22A WMA which is linked to the Klip River. The proposed project area has been significantly degraded by the presence of historic mining activities and urban developments and activities. The quaternary catchment C22A has been allocated a PES score of 'Moderate' based on the degraded natural environment (DWAF, 2003).

The Soweto Cluster is surrounded by several wetland areas. These have been classified as hydrogeomorphic (HGM) units; channelled valley bottom and valley bottom without a channel, as well as depression/pans and hillslope seeps. These HGM units have been awarded a ranking of five or six according to NFEPA. Wetlands that have received a ranking of five are wetlands that are located within a sub-quaternary catchment that is associated with impacted wetlands, according to the working for Wetlands programme. The Orlando Dam, New Canada Dam, the Bloudam, Florida Lake, and the Fleurhof Dam are all major dams that are located near the project area (Digby Wells, 2014b).

8.8 Air Quality

Soweto has been identified as an air pollution hot spot area, this means that the area tends to be characterised by poor ambient air quality, which frequently exceeds the South African Air Quality Standards (Valsamakis, 2015). Numerous studies have found that air pollution in cities have a major negative impact on the health of both the environment and the surrounding community. Repeated exposure to air pollutants over long periods of time may potentially cause several respiratory, cardiovascular, reproductive and gastrointestinal health problems.

Particulate Matter exists in the atmosphere as either solid or liquid particles varying in chemical composition and size, these particles can be considered as either primary or secondary pollutants. Particles can be classified by their aerodynamic properties into coarse particles, PM₁₀ and fine particles, PM_{2.5} (Harrison and Van Grieken, 1998). The fine particles contain the secondarily formed aerosols such as sulphates and nitrates, combustion particles and re-condensed organic and metal vapours. The coarse particles contain earth crust materials and fugitive dust from roads and industries (Fenger, 2002). It is the amount of fine dust and the chemical and mineralogical composition of the dust which will dictate the potential for health impacts (Schwegler, 2006).

The respective size of the particle is important because that determines where in the respiratory system that particle may cause harm. Particles with a diameter equal to or less than 10 µm and 2.5 µm (commonly referred to as PM₁₀ and PM_{2.5}) are of the perfect size to cause harm within the upper and lower portions of the respiratory tract of the exposed individual, which may lead to cardiovascular and respiratory illness (Kampa and Castanas, 2008).

The graph (Valsamakis, 2015) below, measured PM₁₀ ambient concentrations in Thokoza Park, near the Soweto Cluster dumps, illustrates the high ambient concentrations of PM₁₀ in in the area, with exceedances of the NAAQS.

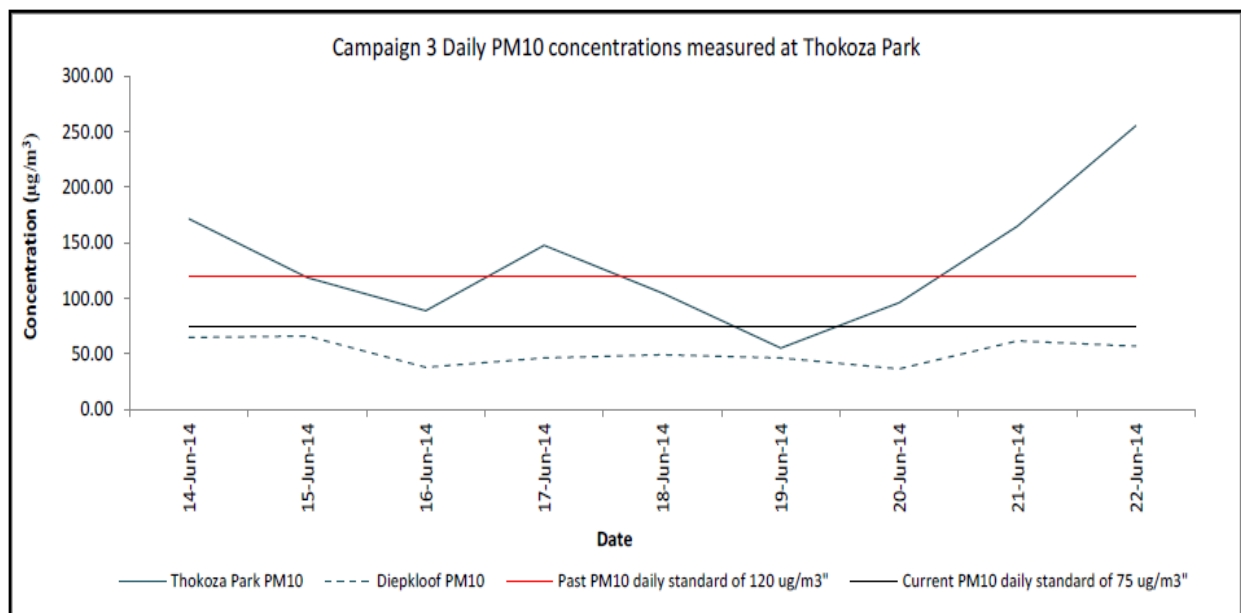


Figure 8-7: Daily average PM₁₀ concentrations for Thokoza Park, Soweto.

8.9 Climate and Sustainability

The potential future effects of climate change are complex and subject to other drivers that make precise prediction difficult. The current understanding is that Southern Africa will on average increase in temperature and experience decreased winter and spring rainfall (IPCC, 2007a). The Intergovernmental Panel on Climate Change (IPCC) has predicted that by 2050, climate change in South Africa could result in a 1°C to 3°C increase in mean temperature and a 5-10% decrease in rainfall over the summer rainfall regions. These changes have large scale knock-on effects and will affect which plants can survive within a given area, which alters natural vegetation ranges and alters habitat as well as impacts on what food crops can be produced. Changes in rainfall may also impact on water supply and lead to increased desertification. These changes will have a wide array of impacts on the social, economic and natural environment in Gauteng (GPEMF, 2014).

There are many mechanisms currently being tested globally by countries attempting to reduce their emissions in line with international pledges and agreements. South Africa’s treasury department has been

circulating concept and draft plans examining carbon taxation to encourage businesses to reduce their climate related emissions (World Bank Group 2016).

8.10 Noise

Natural sounds are a part of the environmental noise surrounding humans. Ambient sound levels are significantly affected by the area where the sound measurement location is situated. When the sound measurement location is situated within an urban area, close to industrial plants or areas with a constant sound source (ocean, rivers, etc.), seasons and even increased wind speeds have an insignificant to massive impact on ambient sound levels.

The expected ambient noise levels surrounding the proposed project area will be representative of urban and suburban districts. The major noise sources in the area include; vehicular traffic on the national and provincial roads in the areas, noises from the local communities; Thulani, Meadowlands West, Bramfischerville and Matholesville and other industrial noises from nearby active mining sites.

There are several potential noise sources associated with the Proposed Project during both the construction and operational phase.

8.10.1 Construction Phase

The level and character of the construction noise will vary during the construction phase. Different activities, with different equipment, take place at different times and phases of the operation. The main construction related noises that are expected are listed below:

- ❖ Transport of workers, components & equipment to site – brought to site by means of flatbed trucks;
- ❖ Digging of foundations for infrastructure and pipeline support – Tractor Loader Backhoe (TLB);
- ❖ Development of stormwater infrastructure – TLB/Excavator; and
- ❖ Civil work to install the substation / transformer, screens, tanks and pump station – cement truck, flatbed trucks (with mobile crane);

8.10.2 Operational Phase

The level and character of the noise during this phase is generally constant as it does not involve mobile equipment movement around the site. The noises expected during this phase are listed below:

- ❖ General operational noises;
- ❖ TLB/Excavator being operated;
- ❖ The slurry pumps;
- ❖ Vibrating screens; and
- ❖ Water Dozers and site equipment.

Noise can be defined as "unwanted sound", and an audible acoustic energy that adversely affects the physiological and/or psychological well-being of people, or which disturbs or impairs the convenience or peace of any person. Figure 8-8 illustrates the acceptable zone sound levels as set out by SANS. Ambient noise levels will be further assessed during the EIA phase and appropriate mitigation measures applied where applicable.

1	2	3	4	5	6	7
Type of district	Equivalent continuous rating level ($L_{Req,T}$) for noise dBA					
	Outdoors			Indoors, with open windows		
	Day/night $L_{R,dn}^a$	Daytime $L_{Req,d}^b$	Night-time $L_{Req,n}^b$	Day/night $L_{R,dn}^a$	Daytime $L_{Req,d}^b$	Night-time $L_{Req,n}^b$
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts with one or more of the following: workshops; business premises; and main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

Figure 8-8: Acceptable Zone Sound Levels for noise in districts (from SANS 10103:2008)

8.11 Traffic

The Soweto Cluster is located in an area with an existing road network. Major routes surrounding the project area are the R41 running east and west from Randfontein towards the Johannesburg CBD; the M77 running north and south from the R41 through Soweto to the M68; and the R558 running north and south from Krugersdorp towards Lenasia.

Road Classification

The Road Classification and Access Management (RCAM) guideline 2010 provides for roads classification into

the following six class systems:

- ❖ Class 1 Principal arterial
- ❖ Class 2 Major arterial
- ❖ Class 3 Minor arterial
- ❖ Class 4 Collector
- ❖ Class 5 Local street
- ❖ Class 6 Walkway

The first three classes (the arterials) are mobility roads, the second three classes are activity/access streets. Regarding the Proposed Project, mobility roads will include the R41, M77, M68 and R558.

It is anticipated that a Traffic Impact Assessment will be required to assess the impact that the additional trucking may have on the project area.

8.12 Visual

The proposed project site has been disturbed by the legacy of historic mining in the area. This then means that the proposed operation will result in the removal of a visual disturbance source. The surrounding area around the dumps are lacking in natural vegetation that would help to screen off the proposed operation. The proposed site is also visible from the nearby residential and industrial areas as well as from the major and minor road routes surrounding the proposed site. The visual impacts expected from the Proposed Project will be further assessed during the EIA phase.

8.13 Heritage and Palaeontology

Heritage Sensitivity

As a historical mining site, no significant heritage resource sites or places of historical significance that could be impacted by the Proposed Projects are expected at the Soweto Cluster site. However, mine dumps are sometimes regarded as landmarks with significant cultural heritage. Heritage sensitivity will further be assessed during the EIA phase.

Palaeontological Sensitivity

The Proposed Project is underlain by the Turffontein and Johannesburg Subgroups (with a Zero Palaeontological Sensitivity). These subgroups generally consist of quartzites and conglomerates formed by braided river systems, as well as pyritic sands, insignificant shales, and volcanics as well as debris-flow diamictites. Rock formations with a zero palaeontological sensitivity are unfossiliferous.

No palaeontology study is required.

8.14 Socio-Economic

The reclamation of the Soweto Cluster dumps has the potential to result in both positive and negative social impacts. As such, it is important that the socio-economic baseline conditions are understood to ensure accurate identification and assessment of potential impacts associated with the Proposed Project.

Gauteng is the largest urban economy in Africa, with a population estimated to be 13.3 million, (Gauteng Spatial Development Framework 2030) (GSDF). In terms of land area, Gauteng is the smallest province in South Africa but also densely populated. Gauteng accounts for only 1.5% of the land area. below provides an overview of the socio-economic baseline information for Gauteng province.

Table 8-1: Socio-economic baseline information: Gauteng at a glance

DESCRIPTION	STATISTICS
Demographics	
Population size	13 399 724 (about one-quarter of the figure in South Africa)
Population by size	Majority of the population (64%) is made up of the population group between the ages of 18-64.
Language	Isizulu is the most spoken language, approximately 3 022 844.
Migration	Approximately 93.9% of the population is born in South Africa (slightly less than the rate in South Africa)
Households	
Number of households	4 951 135, with 62% of the population residing in formal dwellings
Service Delivery	
Access to water services	96.8% are getting water from a regional or local service provider (about 10% higher than the rate in South Africa.
Access to electricity	7.4% have no access to electricity.
Toilet facilities	89% have access to flush or chemical toilets.
Education	
Educational level	78.7% have completed grade 9 or higher (about 10% higher than the rate in South Africa. 52.4% have completed Matric.
Employment	
Employment status	51% are employed (about 1.3 times the rate in South Africa).
Unemployment status	26.63%
Economics	
Economic sectors	Manufacturing sector providing 14% of the total provincial output, followed by construction at 3%, mining at 2% and agriculture at under 0.5%.
Average annual income	R57 500 nearly double the amount on South Africa

Information extracted from Stats SA: Census 2011 and the Community Survey: 2016

Soweto

According to Statistics South Africa (2011) there is an estimated population of 1 271 628 people in Soweto. This population is living in an estimated 355 351 households. 9.3% of the residents aged over 20 years have a higher education and only 55% of the residents have piped water inside their residents. 93% have access to electricity and lighting and around 91% have access to a flush toilet connected to a sewerage system.

Black Africans make up 98.5% of the population, with the most popular language spoken is IsiZulu (37.1%). A large portion of the population of Soweto are in the lower income groups, with close to 19% of the

population earning absolutely no income, and only 3% of the total population earning more than R307 600 a year.

Key Challenges with CoJ

According to the IDP review 2018/2019, the city conducts a public participation process to facilitate community consultation sessions. The purpose of the community consultation sessions are to provide feedback and afford community members to raise issues of concern. Based on the overview of issues/concerns from community members it seems the issue of access to sustainable human settlements is a common concern in all the regions. Other challenges that the CoJ is experiencing include:

- ❖ An uncontrolled influx of people in the Inner City - increased scale of urban growth;
- ❖ Housing backlogs contributing to the increased rise in illegal occupation in key residential areas;
- ❖ Service delivery breakouts- due to a lack of infrastructure maintenance and infrastructure backlogs are increased by a continual influx of migrants;
- ❖ High unemployment rate;
- ❖ Income inequality and poverty; and
- ❖ Housing backlogs contributing to the increased rise in illegal occupation in key residential areas.

A Social Impact Assessment study will be conducted during the EIA Phase, with additional information such as qualitative information from comments received during in-depth interviews, assessment of anticipated impacts, proposed mitigation measures and recommendations that the applicant might have to consider as the project progress.

9 Potential Impacts Identified during the Scoping Phase

9.1 Methodology for determining the Significance of Environmental Impacts

This part of the document focuses on the identification of the major potential impacts the activities, processes and actions may have on the surrounding environment. Table 9-1 will be inserted into the EIA report once all specialist studies have been completed. The table represents compliance with the EIA Regulations of 2014 in terms of assessing the significant of direct, indirect, cumulative and residual impacts. Each specialist has been requested to include Table 9-1 whilst compiling his reports to streamline the coherence of the EIA Report.

Potential environmental impacts (physical, biological, social and economic) associated with the Proposed Project listed in Table 9-1. The significance of these impacts will be systematically assessed and rated, using the assessment methodology described in Section 9.1, once the results of the various specialist studies are available. The EIA will include a full risk assessment of all environmental impacts. The EIA/EMPr Report will set out mitigation measures to be implemented during the Construction, Operational, Decommissioning and Closure and Post-Closure Phases in accordance with NEMA requirements.

Table 9-1: Typical tables used to identify and classify the significance of identified impacts

Nature of The Impact: Describe the Impact in Respect to The Activity to be Undertaken		
	Impact Rating Without Mitigation	Impact Rating With Mitigation
Extent (Local, Regional, International)		
Duration (Short term, Medium term, Long term)		
Magnitude (Major, Moderate, Minor)		
Probability (Definite, Possible, Unlikely)		
Calculated Significance Rating (Low, Medium, High)		
Impact Status: (positive or negative)		
Reversibility: (Reversible or Irreversible)		
Irreplaceable loss of resources: (Yes or No)		
Can impacts be enhanced: (Yes or No)		
Residual impacts ❖ (List these below)		
Cumulative Impacts ❖ (List these below)		
Mitigation measures		

Table 9-2 below will be used during the EIA Phase to describe the identified impacts of the Proposed Project, as well as the relevant mitigation measures proposed by specialist studies.

Table 9-2: Potential Impacts Identified for the Project

ENVIRONMENTAL COMPONENT	COMPONENT TYPE	POTENTIAL IMPACT	SPECIALIST STUDY PLANNED FOR EIA
Physical Environment (non-living)	Hydrology (including wetlands, surface water and ground water) Soils	<ul style="list-style-type: none"> ❖ Potential for acid mine drainage (AMD), increased heavy metal concentration and increased sulphate concentration. ❖ Changes to water quality. ❖ Release of contaminated water to the environment. ❖ Changes in natural surface water flow parameters. ❖ Disruption stream banks and wetlands. ❖ Changes to water regime of wetlands and affected streams. ❖ Further downstream movement of a pollution plume within the weathered zone aquifer. ❖ Soil contamination. ❖ The removal of the slime dams and sand dumps will lead to the removal of a major pollution source. 	Surface Water Impact Assessment Groundwater Impact Assessment Wetland Impact Assessment
Biological Environment (living)	Ecology and Biodiversity (including fauna and flora)	<ul style="list-style-type: none"> ❖ Disturbance of sites of conservation importance. ❖ Loss of migration corridors, and access to nesting and refuge areas, watering points, food supplies. ❖ Displacement of animal species ❖ Removal of invasive species from the slimes dams and sand dumps. 	Biodiversity Impact Assessment
Cultural Environment	Heritage Resources	<ul style="list-style-type: none"> ❖ Should heritage resources be present in the area, the reclamation project could potentially impact these. 	Heritage Impact Assessment
Social and Economic Environment	Employment	<ul style="list-style-type: none"> ❖ Continued employment and job security ❖ Continued investment in local economy 	Social Impact Assessment

	Land-use	<ul style="list-style-type: none"> ❖ Land use will change to an active mine reclamation site. ❖ Restoration and unlocking of land for future land uses. ❖ Management and control of the area 	Social Impact Assessment
	Visual	<ul style="list-style-type: none"> ❖ Changes to landscape character, visual appeal and sense of place of the area. ❖ Removal of a visual impact 	Visual Impact Assessment
	Noise	<ul style="list-style-type: none"> ❖ Increase in ambient noise levels. ❖ Disturbances to sensitive receptors. 	Noise Impact Assessment
	Illegal Mining	<ul style="list-style-type: none"> ❖ Mitigating illegal mining in the project are through the removal of the dumps 	Social Impact Assessment
	Air Quality	<ul style="list-style-type: none"> ❖ Possible Increase in dust levels in areas where mechanical removal occurs. ❖ Fallout dust nuisances. ❖ Decreased dust levels in areas where hydraulic reclamation occurs. ❖ Air quality impacts on fauna and flora. ❖ Health impacts due to fine particulate emissions and gaseous emissions. ❖ The air quality will improve and dust pollution within the area will decrease once the unmanaged dumps and dams have been removed. 	Air Quality Impact Assessment

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it shows the primary impact characteristics, as defined above, used to evaluate impact significance.

The impact significance rating system is presented in Table 9-3, Table 9-4, and Table 9-5 involves three parts:

- ❖ **Part A:** Define impact consequence using the three primary impact characteristics of magnitude, spatial scale/ population and duration;
- ❖ **Part B:** Use the matrix to determine a rating for impact consequence based on the definitions identified in Part A; and
- ❖ **Part C:** Use the matrix to determine the impact significance rating, which is a function of the impact consequence rating (from **Part B**) and the probability of occurrence.

9.1.1 Part A: Defining Consequence in Terms of Magnitude, Duration and Spatial Scale

Use these definitions to define the consequence in Part B.

Table 9-3: Consequence Rating Methodology

IMPACT CHARACTERISTICS	DEFINITION	CRITERIA
Magnitude	Major -	Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded
	Moderate -	Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded
	Minor -	Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded
	Minor +	Minor improvement; change not measurable; or threshold never exceeded
	Moderate +	Moderate improvement; within or better than the threshold; or no observed reaction
	Major +	Substantial improvement; within or better than the threshold; or favourable publicity
Spatial scale or population	Site or local	Site specific or confined to the immediate project area
	Regional	May be defined in various ways, e.g. cadastral, catchment,

IMPACT CHARACTERISTICS	DEFINITION	CRITERIA
		topographic
	National/ International	Nationally or beyond
Duration	Short term	Up to 18 months.
	Medium term	18 months to 5 years
	Long term	Longer than 5 years

9.1.2 **Part B:** Determining Consequence Rating

Rate consequence based on definition of magnitude, spatial extent and duration.

Table 9-4: Consequence Rating Methodology

		SPATIAL SCALE/ POPULATION			
		Site or Local	Regional	National/ international	
MAGNITUDE					
Minor	DURATION	Long term	Medium	Medium	High
		Medium term	Low	Low	Medium
		Short term	Low	Low	Medium
Moderate	DURATION	Long term	Medium	High	High
		Medium term	Medium	Medium	High
		Short term	Low	Medium	Medium
Major	DURATION	Long term	High	High	High
		Medium term	Medium	Medium	High
		Short term	Medium	Medium	High

9.1.3 **Part C:** Determining Significance Rating

Rate significance based on consequence and probability.

Table 9-5: Significance Rating Methodology

		CONSEQUENCE		
		Low	Medium	High
PROBABILITY (of exposure to impacts)	Definite	Medium	Medium	High
	Possible	Low	Medium	High
	Unlikely	Low	Low	Medium

9.2 Possible Positive and Negative Impacts identified

The table below identifies the positive and negative impacts associated with each alternative identified for the Proposed Project:

Table 9-6: Positive and negative impacts regarding project alternatives for the Project

OPTION	POSITIVE IMPACTS	NEGATIVE IMPACTS
The property on which or location where it is proposed to undertake the activity		
The Proposed Project is the reclamation and reprocessing of already existing dumps (2L24; 2L20; 2L21; 2L16; 2L17; 2L18; 2A6 and 2A8). Therefore, there can be no alternative sites.		
The Type of Activity to be undertaken		
1. Alternatives to reclaiming and treating existing gold dumps.		
Re mining and reprocessing of the Soweto Cluster Dumps (Preferred)	<ul style="list-style-type: none"> ❖ Low-technical-risk nature of tailings retreatment projects sets them apart from traditional underground operations ❖ Not labour intensive. ❖ Minimal safety issues. ❖ Easy access to surface tailings, as well as lower labour and operating costs. ❖ Boost to local economy. ❖ Removal of pollution source after rehabilitation and cessation of project. 	<ul style="list-style-type: none"> ❖ Potential profits rely on substantial volumes of material. ❖ Potential negative environmental effects during construction and operational phase of the project. ❖ Not labour intensive.
The Design and Layout of the Activity		
None – No reasonable and feasible alternatives exist for the Proposed Project.		

OPTION	POSITIVE IMPACTS	NEGATIVE IMPACTS
Technology to be used in the Activity		
<p>The reclamation of the Soweto Cluster is the “Preferred Activity”, however there are two different methods of reclamation that should also be considered as two different materials are going to be reclaimed. The reclamation methods that exist are the Hydraulic Mining for the removal of slimes dams; and the Mechanical removal of the sand dams. Other technology options which will be considered by Crown Gold for the reclamation of the Soweto Cluster are: Recycling initiatives, water conservation and electricity alternatives. These technology alternatives are discussed in greater detail below.</p> <p>Recycling, Water and Electricity</p> <p>The reclamation of the Soweto Cluster Dumps will, in its operational phase, implement recycling policies and measures for optimal utilisation of resources and minimisation of waste generation. Potable water will be purchased from Rand Water, with a contingency for portable JoJo tanks or connection to existing water pipeline infrastructure. In terms of process water reticulation, the water cycle operates as a closed circuit, meaning that limited make-up water will be required for the reclamation of the Soweto Cluster. Water required for the reclamation activities will be recovered from either of the three TSF’s mentioned above, or from dirty water contained from existing mine shafts. Fuel types will be investigated and energy conserving measures will be implemented where necessary.</p>		
1. Technological Alternatives Considered		
Hydraulic Mining	<ul style="list-style-type: none"> ❖ Cost effective ❖ Easier to transport slurry for processing. ❖ Compatible with existing infrastructure. ❖ Lowered risks when compared to other methods of reclamation 	<ul style="list-style-type: none"> ❖ Dust emissions which are to be mitigated ❖ Not very labour intensive, thus new employment opportunities are limited ❖ May cause environmental impacts if not done responsibly.
Mechanical Removal	<ul style="list-style-type: none"> ❖ Effective for short distances ❖ Low rates for re-mining ❖ Suited to short-life projects ❖ Does not carry high capital costs ❖ Ability for more employment opportunities. ❖ Best used in combination with Hydraulic mining operations 	<ul style="list-style-type: none"> ❖ Dust emissions with sand reclamation ❖ Stability of the dump ❖ Not considered effective for long haul trips to the plant
The operational aspects of the activity		
<p>Three operational alternatives are being considered for the transport of slurry and return water, the processing plant to be used for gold recovery, and the related depositional facility for unprocessed tailings material. These alternatives have been described in detail in Chapter 6. The final preferred alternative will be reported on in greater detail in the EIA phase of the project following recommendations and findings from independent specialist studies.</p>		

1. Three Operational Alternatives Considered		
Alternative 1: Cooke Plant, Cooke Tailings Storage Facility and associated slurry and return water pipeline (s)	<ul style="list-style-type: none"> ❖ In close proximity to the Soweto Cluster. ❖ The plant and deposition facility are existing. ❖ Welded, HDPE lined pipelines. ❖ The pipelines do not traverse a great distance. 	<ul style="list-style-type: none"> ❖ There is an existing watercourse which runs between Cooke Plant and Cooke TSF. ❖ Potential for tampering of infrastructure which could lead to mechanical failures and spillages.
Alternative 2: Ergo Plant, Brakpan/Withok Tailings Storage Facility and associated slurry and return water pipeline (s)	<ul style="list-style-type: none"> ❖ The proposed pipeline to be constructed will not traverse a great distance. ❖ Existing pipeline infrastructure will be utilised to transport slurry to the Ergo Plant. ❖ The Plant has the capacity to recover the intended quantities of gold. ❖ The Brakpan/Withok TSF is currently used as the preferred deposition facility for the majority of reclamation clean-up projects. ❖ Welded, HDPE lined pipelines 	<ul style="list-style-type: none"> ❖ The proposed new pipeline will traverse populated areas and a watercourse. ❖ Potential for tampering of infrastructure which could lead to mechanical failures and spillages ❖ Security could be an issue during the construction of the above-ground pipeline.
Alternative 3: Central Processing Plant (CPP), the Regional Tailings Storage Facility and associated slurry and return water pipeline(s)	<ul style="list-style-type: none"> ❖ The plant and depositional facility are not located within populated areas 	<ul style="list-style-type: none"> ❖ Transport of slurry will be over a great distance ❖ Multiple watercourses would be crossed ❖ The plant and deposition facility are not yet constructed, thus existing infrastructure cannot be utilised
No-Go Option		
<p>The Option of the project not proceeding would mean that the environmental and social status would remain the same as current. This implies that both negative and positive impacts would not take place. As such, the short term negative impacts on the environment would not transpire; equally so, the long term positive impacts such as environmental pollution source removal, economic development, skills development, and the availability of land for re-development would not occur. The only alternative land use is to leave the dumps as they stand; there is no other potential use of the space as the project area is a cluster of polluting historic mine dumps that impact upon the surrounding biophysical and social environment.</p> <p>The “No-Go” Option also assumes the continuation of the current land use, implying the absence of any reclamation activities and associated infrastructures. The means that the attraction of the gold reserves located within the dumps could potentially enhance Illegal mining, and if left as is, population settlement on or around the dumps could occur.</p> <p>The ‘No Project’ alternative is not preferred due to the anticipated benefits of the proposed reclamation project.</p>		

The expected indirect benefits resulting from the reclamation of the Soweto Cluster include:

- ❖ Removal of a source of pollution and radiation in the area.
- ❖ The potential to unlock land for redevelopment, as read in the Metropolitan Spatial Development Vision.
- ❖ Continued supply of gold to the local and national markets, and therefore contribution to local, provincial and national economy.

9.3 Cumulative Impacts

Due to the existence of other tailing dumps and industrial parks in the region, cumulative impacts and their assessment are of great importance. The identification and assessment of cumulative impacts will be undertaken, and mitigation measures suggested during the detailed EIA level investigation. The impact identification and calculation methodology employed by all specialists incorporates cumulative impacts in a quantitative manner to determine the final impact score and corresponding rating.

9.4 Application of Possible Mitigation Measure

Mitigation measures are implemented to ensure that the identified impacts from the Proposed Project activities are reduced as far as possible. Mitigation measures will be provided in the specialist reports to be undertaken in the EIA Phase of the project. Specialist will be informed to be cognisant of the following mitigation measure objectives:

- ❖ To find more environmentally sound ways of undertaking specific activities;
- ❖ To enhance any environmental and social benefits of a proposed activity;
- ❖ To avoid, minimise or remedy negative environmental impacts; and
- ❖ To ensure that any residual negative environmental impacts are environmentally acceptable.

The identification of appropriate mitigation measures will be conducted in a hierarchal manner:

1. Preventative measures will be identified to avoid, where possible, negative impacts that may arise as a result of the proposed activity;
2. Measures will be identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and
3. Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further (Department of Environmental Affairs, 2006).

Proposed mitigation measures will be communicated to the applicant for review as part of draft EMPr. The applicant will comment on the feasibility and practicality of implementing the mitigation measures. The mitigation measures may be adjusted based on the applicant’s comments.

9.5 Outcome of the Site Selection Matrix. The Final Site Layout Plan

The finalisation of specialist studies and recommendations made within the EIA Specialist Study reports will help to inform a final site layout plan. At the time of compiling this FSR, preliminary site layout plans have been included in **Appendix B** and these maps have been presented as part of the pre-application process with stakeholders.

9.6 Motivation where no Alternative Sites were Considered

Alternatives considered during this FSR, as per Chapter 6 above, and the site selected, was chosen based on economic and environmental criteria. The sites are already existing and the method of removal is the best option.

9.7 Statement motivating the Preferred Site

The preferred sites were chosen as per Chapter 6.

10 Plan of Study for the Environmental Impacts Assessment

10.1 Alternatives to be Considered, including the “No-Go” Option

Alternatives to be considered during the EIA phased will be informed by the Alternatives described in Chapter 6 above.

10.2 Aspects to be Assessed as part of the Environmental Impact Process

The following scope of work will be confirmed during the EIA phase. This includes:

- ❖ Confirmation of slurry pipeline routes and deposition pipeline routes
- ❖ Confirmation of project alternatives to be assessed;
- ❖ Confirmation of transport routes;
- ❖ Investigation into the potential job creation opportunities for the project;

The following Specialist Studies will be mobilised and form part of the EIA/EMP Report:

- ❖ Terrestrial Ecology
- ❖ Wetlands;
- ❖ Surface Water;
- ❖ Groundwater;
- ❖ Air Quality;
- ❖ Heritage;
- ❖ Social Impact;
- ❖ Health Impact
- ❖ Noise; and
- ❖ Traffic.

10.3 Terms of Reference for Specialist Studies

Table 10-1 outlines the studies proposed during the EIA Phase of the project and the proposed scope of work to be undertaken as part of the S&EIA process:

Table 10-1: Terms of Reference for Specialist Studies.

STUDY	TERMS OF REFERENCE
<p>Terrestrial Ecology</p>	<p><u>Impact Assessment</u></p> <p>1. The terrestrial biodiversity impact assessment report will consist of the following:</p> <ul style="list-style-type: none"> ❖ Assess impacts of ongoing and proposed activities on biodiversity of the project area; ❖ Assess whether proposed activities are likely to have significant impacts on biodiversity and specifically species of conservation concern; ❖ Identify practically implementable mitigation measures to reduce the significance of proposed activities on biodiversity; ❖ Assess residual and cumulative impacts after implementation of mitigation measures; and ❖ Compilation of biodiversity management and monitoring plan. <p>The outcome of the impact assessment phase will be an integrated biodiversity impact assessment report detailing the findings of each of the various sub-specialist studies. The impact assessment report will provide an integrated assessment of the significance of the potential impacts on the biodiversity of the project area with specific emphasis on observed red data species. The report will identify suitable mitigation measures and assess the revised significance of potential impacts on biodiversity post-implementation of mitigation measures. The integrated biodiversity impact assessment report will also include a biodiversity monitoring programme.</p>
<p>Wetland Study</p>	<p><u>Impact Assessment</u></p> <p>The water resource impact assessment will consist of the following:</p> <ul style="list-style-type: none"> ❖ Assess impacts of ongoing and proposed activities on the local water resources; ❖ Assess whether proposed activities are likely to have significant impacts on the water resources; ❖ Identify practically implementable mitigation measures to reduce the significance of proposed activities on the water resources; and ❖ Assess residual and cumulative impacts after implementation of mitigation measures.

STUDY	TERMS OF REFERENCE
<p>Surface Water</p>	<p>A full, detailed hydrological assessment will be undertaken for the EIA Phase of the project.</p> <p><u>Impact Assessment:</u></p> <p><u>1. Flood Lines</u></p> <p>The flood peaks for the 1:50- and 1:100-year return intervals will be calculated for the contributing catchment area associated with each river. Flood peak determination will factor in regional rainfall and relevant catchment characteristics influences. Based on the provided elevations, and utilising the calculated flood peaks, the flood lines for current conditions will be generated using the HEC-RAS one dimensional backwater flow model. The model is able to simulate the effects of various control points/obstructions located within the watercourse. It assumed that topographical data at an acceptable resolution of the site will be provided.</p> <p><u>2. Conceptual Stormwater Management Plan</u></p> <p>Based on the information gathered during the desktop review and the site walkover, a conceptual stormwater management plan will be developed for the Project. ‘Dirty’ and ‘clean’ contributing catchments will be discretised based on topographical fall, associated activities. Furthermore, the discretisation of the catchments will factor in existing stormwater infrastructure and the overall functionality and the most practical and feasible implementation of the final stormwater management plan. Based on the discretised catchments, the required stormwater management drainage elements (including channels, pipes, berms, and pollution control dams) will be defined to ensure appropriate stormwater management according to the management principles outlined in the GN704 and BPGs.</p> <p><u>3. Water and Salt Balance</u></p> <p>An annual average static water balance associated with the mine will be developed using Excel, based on a Process Flow Diagram (PFD) developed in conjunction with the Client. The PFD will indicate sources and movement of water within the mine and projected volumes. A final project site plan is required to finalise the water balance. The salt balance calculations will be based on the volumes</p>

STUDY	TERMS OF REFERENCE
	<p>calculated within the water balance and water quality data provided. If available, Total Dissolved Solids (TDS) data will be used to calculate the salt balance, unless the Client would prefer for this to be based on an alternative parameter for which data are available.</p> <p><u>4. Water Quality Analysis and Monitoring Data</u></p> <p>A surface water quality analysis will be undertaken, and a monitoring programme will be developed for the mine to allow for the appraisal of impacts to surface water as a result of onsite activities and to allow for the formulation of various management actions associated with the protection of water resources. Sampling locations, methodology, sampling frequency and an analytical programme (i.e. analytes) will be rationalised as part of the assessment. Water quality data obtained from the site will be compared against the relevant DWS water quality standard limits. A water quality monitoring plan will be developed to determine key water quality monitoring points, chemical monitoring suites and the frequency of water quality sampling and analysis.</p>
<p>Ground Water Assessment</p>	<p><u>Impact Assessment:</u></p> <p>The Impact Assessment phase will involve several tasks, as explained below. The results will help characterise the underlying aquifer systems and define potential impacts on the local aquifers, but also groundwater users and sensitive receptors in the Project area</p> <p><u>1. Data Review</u></p> <p>During this task all available data for the project area will be collated and reviewed. This includes geological, hydrogeological, groundwater monitoring, meteorological data and National Groundwater Archive data. A review will be conducted, and interpretations performed to establish a conceptual idea of the hydrogeological nature of the area and what risks currently exists.</p> <p><u>2. Hydrocensus</u></p> <p>During the hydrocensus important data pertaining to the current groundwater conditions and use will be collected. This will include localities of current groundwater abstraction points (boreholes, hand dug wells or springs), ownership, current usage volumes and</p>

STUDY	TERMS OF REFERENCE
	<p>types, equipment and groundwater levels; outside the Client’s water monitoring network. Groundwater samples (5 samples) will be taken from selected boreholes. The hydrocensus will include:</p> <ul style="list-style-type: none"> ❖ A groundwater use assessment within a 1-kilometre radius of the Soweto Cluster; and ❖ Sampling of accessible boreholes and springs. A spectrum of determinants will be analysed. The samples will be sent to a SANAS accredited laboratory for inorganic analyses. ❖ This data together with its spatial distribution will determine the current water resource and environmental status and serve as reference to the proposed reclamation. ❖ Data from the Department of Water and Sanitation will be sourced to help define water use and borehole localities in the area. <p>3. <u>Reporting</u></p> <p>An impact assessment report will present the results and interpretations of the groundwater desktop and hydrocensus assessments, with an indication of potential current impacts. The impact assessment report will include the following:</p> <ul style="list-style-type: none"> ❖ Characteristics of the local groundwater environment, including current groundwater use and groundwater qualities; ❖ Definition of the local geology and potential roles the structural geology and depth of weathering may play in surface water-groundwater interactions; ❖ Identification of potential hydrogeological impacts and sensitive receptors associated with the reclamation activities; and ❖ A groundwater monitoring network that will effectively monitor the groundwater quality and level changes during the reclamation phase and after closure.
<p>Air Quality</p>	<p><u>Baseline Assessment</u></p> <p>The baseline assessment will consist of a desktop assessment. The objective will be to inform the subsequent Air Quality Impact Assessment Study and will include the following:</p>

STUDY	TERMS OF REFERENCE
	<ul style="list-style-type: none"> ❖ Literature review of air pollutant emissions from Tailing Facilities. ❖ Literature review of potential health effects associated with these emissions. ❖ Outlining of relevant air quality legislation and ambient air quality standards. ❖ Description of the site location, topography, general surroundings of the site, as well as the relevant site-specific environment. ❖ Establishment of the baseline air quality from Air Quality Management Plans and Air Quality Monitoring Reports in the area. ❖ Description of the nature of other major sources of air pollution in the study area. ❖ Sourcing and evaluation of local meteorological data to determine the prevailing meteorological conditions. ❖ Sourcing and evaluation of Weather and Research Forecasting Model (WRF) meteorological data to facilitate modelling. <p>The baseline assessment will include:</p> <ul style="list-style-type: none"> ❖ Site Location and Topography ❖ Air Quality Legislation and Standards ❖ Health Effects of Particulate Pollutants ❖ Regional Meteorological Overview ❖ Ambient Air Quality ❖ Local Meteorology <p><u>Impact Assessment</u></p> <p>Preparation of the Air Quality Impact Assessment will include and be based on the information from the baseline assessment and will also include:</p> <ul style="list-style-type: none"> ❖ Compilation of an emissions inventory – a list of activities which are sources of air pollution in the project. ❖ Characterisation of the emission sources and the pollutants emitted from them. ❖ Calculations of emission rates from the sources identified in the emissions inventory.

STUDY	TERMS OF REFERENCE
	<ul style="list-style-type: none"> ❖ Preparation of Met data for modelling. <p>Determining and preparing the input parameters for modelling:</p> <ul style="list-style-type: none"> ❖ Source type. ❖ Source dimensions: lateral, vertical. ❖ Source location and orientation. ❖ Emission rate. ❖ Receptor grid. ❖ Dispersion modelling of the emissions, using the AERMOD model, in order to predict maximum ground level concentrations of particulate pollutants resulting from the activities and in order to determine the zones of influence around the emission sources accordingly. ❖ Presentation of model outputs/results in the form of contour plots and a summary of the results. ❖ Evaluation of the results of the air dispersion modelling against NAAQS as set out by the Department of Environmental Affairs (DEA). ❖ Assessment of any potential cumulative impacts in terms of the NAAQS. ❖ Provision of practical and implementable mitigation measures by which to manage and reduce the identified impacts where necessary. ❖ A recommendation in terms of an air quality monitoring programme if necessary.
Heritage	<p><u>Impact Assessment:</u></p> <p>The Heritage Scoping Report will be compiled in compliance with NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (No. 107 of 1998). The HIA process consists of three steps:</p> <p><u>1. Literature Review and initial site analysis:</u></p>

STUDY	TERMS OF REFERENCE
	<p>The background information to the field survey relies greatly on the Heritage Background Research which was undertaken through archival research and evaluation of aerial photography and topographical maps of the study area.</p> <p><u>2. Physical Survey:</u></p> <p>A physical survey is subsequently conducted on foot through the Proposed Project area by a qualified heritage specialist/s (e.g. an archaeologist and a palaeontologist)) and is aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.</p> <p>3. The final step involves the recording and documentation of relevant heritage resources identified in the physical survey, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.</p> <p>The significance of heritage sites is based on four main criteria in accordance with site integrity (i.e. primary vs. secondary context), amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures), and density of scatter (dispersed scatter):</p> <ul style="list-style-type: none"> ❖ Low - <10/50m² ❖ Medium - 10-50/50m² ❖ High - >50/50m² ❖ Uniqueness; <p>Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:</p> <ul style="list-style-type: none"> ❖ A - No further action necessary; ❖ B - Mapping of the site and controlled sampling required; ❖ C - No-go or relocate development activity position; ❖ D - Preserve site, or extensive data collection and mapping of the site; and

STUDY	TERMS OF REFERENCE																																
	<p>❖ E - Preserve site.</p> <p>Impacts on these sites by the development will be evaluated as follows:</p> <p>Site significance classification standards prescribed by the SAHRA (2006) and approved by the ASAPA for the Southern African Development Community (SADC) region, were used for the purpose of this report.</p> <table border="1" data-bbox="542 587 1960 970"> <thead> <tr> <th>FIELD RATING</th> <th>GRADE</th> <th>SIGNIFICANCE</th> <th>RECOMMENDED MITIGATION</th> </tr> </thead> <tbody> <tr> <td>National Significance (NS)</td> <td>Grade 1</td> <td>-</td> <td>Conservation; National Site nomination</td> </tr> <tr> <td>Provincial Significance (PS)</td> <td>Grade 2</td> <td>-</td> <td>Conservation; Provincial Site nomination</td> </tr> <tr> <td>Local Significance (LS)</td> <td>Grade 3A</td> <td>High Significance</td> <td>Conservation; Mitigation not advised</td> </tr> <tr> <td>Local Significance (LS)</td> <td>Grade 3B</td> <td>High Significance</td> <td>Mitigation (Part of site should be retained)</td> </tr> <tr> <td>Generally Protected A (GP.A)</td> <td>-</td> <td>High / Medium Significance</td> <td>Mitigation before destruction</td> </tr> <tr> <td>Generally Protected B (GP.B)</td> <td>-</td> <td>Medium Significance</td> <td>Recording before destruction</td> </tr> <tr> <td>Generally Protected C (GP.A)</td> <td>-</td> <td>Low Significance</td> <td>Destruction</td> </tr> </tbody> </table>	FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION	National Significance (NS)	Grade 1	-	Conservation; National Site nomination	Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination	Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised	Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)	Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction	Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction	Generally Protected C (GP.A)	-	Low Significance	Destruction
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<p>Social Impact Assessment</p>	<p>Social Impact Assessment:</p> <p>The objective of the Social Impact Assessment is to is to:</p> <ul style="list-style-type: none"> ❖ Assess the social impacts of the Proposed Project including any impacts on local infrastructure and services; ❖ Recommend mitigation measures to minimise adverse impacts and maximise benefits of the Project; and ❖ Facilitate the consideration of alternatives. <p>The SIA will use both quantitative and qualitative data collection techniques. In terms of the quantitative data, data from Statistics SA was used to understand the local social circumstances of the Proposed Project area. This method was used to gather baseline information for the purposes of the Scoping report. The qualitative method includes focus group meetings and in-depth interviews</p>																																

STUDY	TERMS OF REFERENCE
	<p>will be conducted to understand the affected communities’ perceptions, how they view themselves and the environment around them. Qualitative data will be collected as the project progresses. The SIA will use the following sets of data to inform the study:</p> <ul style="list-style-type: none"> ❖ An investigative site visit; ❖ Interviews with Ward Councillors, municipal officials, directly affected land owners/occupiers ❖ Statistics South Africa data; ❖ A literature review of the Integrated Development Plan and the Spatial Development Framework; and ❖ Scan and analysis of the Comments and Responses Report and various specialist studies (Compiled by Kongiwe Environmental)
<p>Health</p>	<p><u>Health Impact Assessment</u></p> <p>The following deliverables will be provided for the Health Impacts Assessment:</p> <ol style="list-style-type: none"> 1. A single HIA Report directed by the Guideline document on Environmental Health Impacts of Development Projects in South Africa generated by the Department of Health (DoH) in 2014. 2. A standardised approach will be considered for the HIA to ensure that evidence-based recommendations supported the impact assessment. To ensure compliance with the IFC performance standards, and especially PS4, the methodology outlined in the Good Practice Note for HIA from the IFC, was adopted (IFC, 2009). <p>Achieving the above-mentioned deliverable requires the use and adherence to the following process:</p> <ul style="list-style-type: none"> ❖ Screening (preliminary evaluation to determine the necessity of an HIA); ❖ Baseline investigation identifying the range of potential Project-related health impacts and defining the terms of reference for the HIA, based on published literature, local data and broad stakeholder consultation and how these may be influenced by the Project. ❖ Risk assessment (qualitative and quantitative appraisal of the potential health impacts in relation to defined communities and the Project development, including stakeholder participation) -this will be conducted during impact assessment phase;

STUDY	TERMS OF REFERENCE
	<ul style="list-style-type: none"> ❖ Appraisal and mitigation based on the findings of the risk assessment); ❖ Implementation and monitoring; and ❖ Evaluation and verification of performance and effectiveness (key step to analyse the HIA process)
<p>Noise</p>	<p><u>Baseline Assessment/statement:</u></p> <p>A noise baseline assessment/noise statement must be completed for the following reasons:</p> <ul style="list-style-type: none"> ❖ If there are potential noise-sensitive receptors staying within 1,000 m from a proposed industrial activity (SANS 10328:2008) ❖ It is a controlled activity in terms of the NEMA regulations and an ENIA is required, because: ❖ It may cause a disturbing noise that is prohibited in terms of section 18(1) of the Government Notice 579 of 2010; and ❖ It is generally required by the local or district authority as part of the environmental authorization or planning approval in terms of Regulation 2(d) of GN R154 of 1992. <p>In addition, the South African National Standard (SANS) 10328:2008 (Edition 2) specifies the methodology to assess the potential noise impacts on the environment due to a proposed activity that might impact on the environment. This standard also stipulates the minimum requirements to be investigated for Scoping purposes. These minimum requirements are:</p> <ul style="list-style-type: none"> ❖ The purpose of the investigation; ❖ A brief description of the project; ❖ A brief description of the existing environment; ❖ The identification of the noise sources; ❖ The identified noise sources that were not taken into account and the reasons why they were not investigated; ❖ The identified noise-sensitive developments and the estimated impact on them; ❖ Any assumptions made with regard to the estimated values used; ❖ An explanation, either by a brief description or by reference, of the methods that were used to estimate the existing and predicted rating levels; ❖ The location of the measurement or calculation points, i.e. a description, sketch or map;

STUDY	TERMS OF REFERENCE
	<ul style="list-style-type: none"> ❖ Estimation of the environmental noise impact; ❖ Alternatives that were considered and the results of those that were investigated; ❖ A list of all the interested or affected parties that offered any comments with respect to the environmental noise impact investigation; ❖ A detailed summary of all the comments received from interested or affected parties as well as the procedures and discussions followed to deal with them; ❖ Conclusions that were reached; ❖ Recommendations, i.e. if there could be a significant impact, or if more information is needed, a recommendation that an environmental noise impact assessment be conducted; and
<p>Traffic Impact Assessment</p>	<p>The Impact Assessment Methodology assists in evaluating the overall effect of a proposed activity on the environment. The environmental impact is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the environmental practitioner through the process of the environmental impact assessment. The impact evaluation of predicted impacts is undertaken through an assessment of the significance of the impacts.</p> <p>Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact. Significance is calculated using the Ratings Table which will be used in the Impact Assessment.</p> <p>Impact assessment takes account of the nature, scale and duration of the effects on the environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:</p> <ul style="list-style-type: none"> ❖ Planning (Not applicable in this instance – no traffic impact) ❖ Construction ❖ Operation

STUDY	TERMS OF REFERENCE
	<ul style="list-style-type: none"> ❖ Decommissioning (Not evaluated during site selection, will cope with short term traffic of less intensity than compared to constructing traffic) ❖ Closure and Rehabilitation <p>Where necessary, the proposal for mitigation or optimisation of an impact is detailed. A brief discussion of the impact and the rationale behind the assessment of its significance is included. A rating system is used to classify the impacts. The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used.</p>

10.4 Methodology Proposed

The EIA will be undertaken according to the method detailed below. This methodology is compliant with the NEMA 2014 EIA Regulations, as amended in 2017.

Generally, the impact assessment is divided into three parts:

- ❖ **Issue identification** – each specialist will be asked to evaluate the ‘aspects’ arising from the project description and ensure that all issues in their area of expertise have been identified;
- ❖ **Impact definition** – positive and negative impacts associated with these issues (and any others not included) then need to be defined – the definition statement should include the activity (source of impact), aspect and receptor as well as whether the impact is direct, indirect or cumulative. Fatal flaws should also be identified at this stage; and
- ❖ **Impact evaluation** – this is not a purely objective and quantitative exercise. It has a subjective element, often using judgement and values as much as science-based criteria and standards. The need therefore exists to clearly explain how impacts have been interpreted so that others can see the weight attached to different factors and can understand the rationale of the assessment.

To understand the impact evaluation, the sensitivity of the receiving environment, the effect on the receiving environment and the significance of the impacts, these three points above need to be clearly described. The impact assessment methodology that will be used during the EIA Phase is described in Chapter 9.

10.4.1 Assessment of the Duration of Significance

Duration of significance of impacts will be assessed using the following criteria, where the duration of time relates to how long that impact will occur for during that phase of the project. Specific durations will be allocated to each project phase in the EIA document where the detailed impact assessment rating will be undertaken. For example, for the operational phase:

- ❖ Short term: Up to 18 months;
- ❖ Medium term: 18 months to 5 years; and
- ❖ Long term: Longer than 5 years.

10.4.2 Stages at which the Competent Authority will be Consulted

The DMRE and Commenting Authorities will be consulted at various stages during the EIA process. This includes:

- ❖ Pre-application meetings;
- ❖ Announcement and Scoping Phase; and
- ❖ EIA Phase.

10.4.3 Public Participation to be Undertaken during the EIA Phase

Stakeholder engagement during the EIA Phase involves a review of the findings of the impact assessment presented in the EIA Report for public comment which will be made available. Stakeholders will be notified using the following:

- ❖ Media advertisements in the same newspapers used during the Scoping Phase to announce the availability of the EIA Report for public comment;
- ❖ Registered stakeholders will be informed by way of personal letters/ SMS distributed by mail and e-mail in advance of the report being available; and
- ❖ Stakeholders will be invited to attend one of two public meetings where the contents of the EIA Report will be presented, and stakeholders will have an opportunity to comment. Details of the meetings will be confirmed closer to the time of the meetings.

Following the availability of the EIA Report, meetings with relevant stakeholders will be undertaken. During the EIA Phase, stakeholders will be invited to comment on the EIA Report in any of the following ways:

- ❖ By raising comments during key stakeholder/ public meetings where the content of the EIA Report will be presented;
- ❖ By completing comments sheets available with the report at public places, and by submitting additional written comments, by email, fax or by telephone, to Kongiwe;
- ❖ The EIA Report will be available for comment for a period of 30 days at public places in the project area, sent to stakeholders who request a copy, and placed on the Kongiwe website.

All comments and issues raised during the 30-day public comment period will be incorporated into the final EIA Report to be submitted to the competent and commenting authorities. Description of the information to be provided to stakeholders includes:

- ❖ The project description (final site layout, all alternatives investigated) and the surrounding baseline environment;
- ❖ Findings from the specialist studies undertaken;
- ❖ Potential biophysical and socio-economic impacts during construction, operations, closure and decommissioning phases of the project;
- ❖ Management/ mitigation measures developed to address the potential impacts;
- ❖ The closure objectives, plan and financial provision; and
- ❖ Details on how stakeholders can comment on the EIA Report.

10.4.4 Tasks to be Undertaken during the Environmental Impact Phase

The plan of study for the EIA Report is set out below for review by the authorities and stakeholders. The rationale for the different levels of study for the various environmental components will be taken from the issues raised by stakeholders, the expected severity of impacts and the level of confidence required in

their prediction. The level of information required to develop adequate, practical management and mitigation measures was also a consideration in determining the terms of reference of studies.

Within the EIA Phase, the EIA Report, IWUL and stakeholder engagement activities will run concurrently. During the EIA Phase, the following will be undertaken:

- ❖ Specialists will conduct and complete specialist impact assessments. Workshops will be held with specialists to workshop all potential impacts and integrate specialist studies;
- ❖ Stakeholder engagement materials will be prepared (advertisements, notification letters, site notices), and public meetings, focused group meetings and consultation with affected landowners will be undertaken;
- ❖ An EIA Report will be compiled, and management measures and commitments workshopped with Crown Gold;
- ❖ The EIA Report will be made available for public review and comment; and
- ❖ The revised EIA Report, including public comments and responses, will be submitted to authorities for decision-making.

10.4.5 Mitigation, Management and Monitoring of Identified Impacts

The summary of potential issues identified during the Scoping Phase of the project have been indicated in Section 9.4.5. These impacts require further investigation during the EIA Phase. Section 9 provides an indication of the independent specialist studies, field surveys and assessments that are required to form part of the EIA Phase. The specialist studies will consider the footprint proposed for the Soweto Cluster Reclamation project, including all associated infrastructure. With this information, the Proposed Project will be able to fully assess and investigate the feasible and reasonable alternatives proposed in **Chapter 6**.

The potential impacts identified for the reclamation of the Soweto Cluster have been described below. It is important to note that these impacts have not been ground-truthed or rated for significance. The impacts have been described based on what the current status of the sites, as well as existing information assessed at a desktop level. The below impacts, and other identified impacts, will be fully described during the Environmental Impact Assessment (EIA) phase.

The possible mitigation measures that could be applied and the level of risk is depicted as follows:

Table 10-2: High Level Mitigation Measures for Potential Impacts Identified for the reclamation of the Soweto Cluster

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
CONSTRUCTION		
<p>Construction of infrastructure, temporary infrastructure, pipelines and potential roads.</p> <p>All necessary activities involved with site preparation including site clearing.</p>	<p>Socio-economic:</p> <ul style="list-style-type: none"> ❖ Potential to further contractor opportunities; ❖ Disruption of movement patterns and other displacement impacts; ❖ Project-induced population influx ; ❖ Local & regional economic development; and ❖ Increase in the availability of land <p>The removal of Soweto Cluster will result in a certain short-term impact, however, it is envisaged that the long term impact will be positive.</p>	<ul style="list-style-type: none"> ❖ Attempt to extend goods and services from local businesses who are BBBEE compliant and currently contracted by DRDgold subsidiaries. ❖ If jobs are available, Crown Gold should ensure that local communities are made aware of the employment opportunities by means of a structured stakeholder engagement programme. ❖ Develop skills development and training targets for local procurement and include these in contractor management plans; ❖ Successfully complete the removal of all dumps/dams and the rehabilitation of the remaining footprints to prevent the creation of new/more contaminated areas; and ❖ Assess end-land uses for each individual rehabilitated site. Rehabilitation must be consistent with the relevant end land-use objectives
	<p>Air quality: Short term air quality impacts could arise from:</p> <ul style="list-style-type: none"> ❖ Increased particulate matter (PM₁₀ and PM_{2.5}) load in the atmosphere leading to deteriorated air quality. <p>The removal/reclamation of the Soweto Cluster will result in the reduction of current air quality issues. There is a long term positive</p>	<ul style="list-style-type: none"> ❖ Regular, light watering of unpaved roads; ❖ Strict speed control on unpaved roads; ❖ Wet suppression wherever possible, ❖ Wind-speed reduction barriers around construction sites.

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
	<p>impact envisaged.</p> <p>Noise: Construction activities will result in a short term increase in noise levels.</p> <p>The Soweto Cluster is located within an urban area, noise impacts are anticipated to only contribute to the surrounding ambient sound levels for a short period of time.</p> <p>Surface Water: Potential pollution from:</p> <ul style="list-style-type: none"> ❖ Increase sedimentation on downstream watercourses due to exposed surfaces resulting in siltation of surface water resources. ❖ Mixing of upstream clean water runoff with dirty water runoff from cleared site areas. ❖ Potential for flooding of pipeline structures at river crossings. ❖ Seepages/spillages of excess rainfall stored on the dumps/dams and the existing Paddocks. <p>The removal/reclamation of the dumps will result in the removal of a source of environmental pollution.</p> <p>Groundwater: Decrease in surface and groundwater quality as a result of water.</p> <p>The removal/reclamation of the Soweto Cluster will result in the removal of a source of environmental pollution.</p>	<ul style="list-style-type: none"> ❖ Undertake construction operations during working hours only. ❖ Construction equipment should be properly maintained and switched off when not operational. ❖ Regular planned vehicle services are considered best practise. ❖ Comply with the Gauteng Noise Control Regulations <ul style="list-style-type: none"> ❖ The runoff from the upstream clean water catchment is to be diverted away from the proposed infrastructure. ❖ Infrastructure to be established should be outside any modelled flood lines. ❖ Surface water quality monitoring must be implemented according to a detailed plan. ❖ Dirty water runoff should be captured and contained within the dedicated storage facility such as the existing paddocks. ❖ To minimise seepage and the effects of ponding, water volumes should be contained when necessary, pumped out and re-used where required during the construction phase of the project. <ul style="list-style-type: none"> ❖ Surface water management measures must ensure that runoff and dirty water spills are contained; ❖ Implement a detailed groundwater monitoring plan for the project as described in the ground water impact report.

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
	<p>Wetland: Potential loss and disturbance of wetland and aquatic habitat due to site preparation and clearing of vegetation. There could also be Alien plant infestation due to the disturbance.</p> <p>The removal of the Soweto Cluster will reduce the risk of AMD seepage, and the removal of the environmental point source in the long term.</p>	<ul style="list-style-type: none"> ❖ Adhere to any prescribed buffers should any be recommended; ❖ Adhere to the recommendations proposed in the surface water and groundwater reports; ❖ Minimise the footprint of any areas disturbed during construction; ❖ Locate all temporary offices, constructors' camps, laydown areas, ablution facilities etc. a minimum of the prescribed distance from any delineated sensitive watercourse/wetland (should wetlands exist). ❖ Develop and implement a construction stormwater management plan prior to the commencement of site clearing activities; ❖ A rehabilitation Plan for disturbed wetland must be in place as prescribed by the wetland specialist study.
	<p>Heritage:</p> <ul style="list-style-type: none"> ❖ Construction activities could cause damage to or destroy any physical heritage resources that may be present in the development footprint areas; <p>The installation of pipelines and power lines outside of existing servitudes will cause damage to or destroy any physical heritage resources that may be present within the development footprint.</p>	<ul style="list-style-type: none"> ❖ Conduct heritage impact assessment to identify heritage sites within the project area ❖ If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken.
	<p>Traffic:</p>	<ul style="list-style-type: none"> ❖ Traffic signage at site access points

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
	<ul style="list-style-type: none"> ❖ Increase in traffic volumes on existing traffic network ❖ Cumulative impact on the road surface condition <p>This impact is expected to be localised and short term.</p> <p>Visual:</p> <ul style="list-style-type: none"> ❖ Stockpiling of bulldozed/stripped vegetation and other waste streams from site clearance and preparation will add features to the surface thereby changing the topography. ❖ Pipelines above-ground may be visually intrusive. <p>Visual impacts are expected to be short term, as stockpiles should be removed post-construction.</p>	<ul style="list-style-type: none"> ❖ Upgrade gravel roads where required. <ul style="list-style-type: none"> ❖ Stockpiles are to be removed and/or flattened and/or shaped. Mitigation will be determined in the EIA phase. ❖ Limit the footprint area of pipeline infrastructure where possible
	<p>Fauna and Flora:</p> <ul style="list-style-type: none"> ❖ Direct loss of floral species/vegetation types and biodiversity. ❖ Direct habitat loss for species that has established on the dumps <p>Alien vegetation recruitment.</p>	<ul style="list-style-type: none"> ❖ Minimise disturbance and destruction of areas that are not going to be directly reclaimed. ❖ In the case of red data plants, relocation permits may be required. ❖ The ecosystem present must be preserved, this includes areas not directly affected by project activities, and can be achieved by limiting project activities to areas where they are essential. ❖ The risk of habitat fragmentation must be reduced through preservation of natural corridors. ❖ Rehabilitation plans must be initiated during construction to minimise disturbed areas. ❖ Follow any local and national policies and plans regulating and protecting biodiversity in the project area.

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
OPERATION		
Reclamation of the Soweto Cluster	<p>Socio-economic: These are anticipated to be the same as those impacts predicted during the construction phase.</p>	<ul style="list-style-type: none"> ❖ These should be read with what is proposed as mitigation measures for the Construction Phase.
	<p>Air quality: These are anticipated to be the same as those impacts predicted during the construction phase. As the dumps will be hydraulically mined, this could create dust fall out.</p>	<ul style="list-style-type: none"> ❖ Regular, light watering of unpaved roads; ❖ Strict speed control on unpaved roads; ❖ Ensuring that tailings material is removed to 'red earth' before moving on to the next section (this will reduce the area of fine material exposed to wind erosion).
	<p>Noise: Potential impacts include:</p> <p>Potential for noise disturbance from the operation of the reclamation station and pipelines.</p>	<ul style="list-style-type: none"> ❖ Comply with the Gauteng Noise Control Regulations; ❖ If complaints are received about the noise from the pump station, then noise barriers could potentially be installed between the pump station and the specific complainant. ❖ Regular service maintenance on the pumps and pipelines to mitigate water hammer noise as well as maintaining a constant flow rate during pumping of water and slurry. ❖ Machines and vehicles used during reclamation must be serviced to ensure noise suppression mechanisms are effective. ❖ Machines and vehicles should be switched off when not in use.
	<p>Surface Water: Potential impacts include:</p> <ul style="list-style-type: none"> ❖ Overflow of the collection sumps to the downstream surface water resources. ❖ Overflow dirty of the water collected in the dumps during a 	<ul style="list-style-type: none"> ❖ The pumps located at each of the sumps should be installed within closed off/bunded areas to contain material spillages. ❖ In times of power failure, manual monitoring of the sump associated with the reclamation station should be carried out. ❖ Overflow channels should be constructed so as to contain any

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
	<p>severe weather event.</p> <p>Decrease of salt loads reporting to the waterbodies/watercourse in the area due to reduction in discharges</p>	<p>spillages that do occur into the pollution control area.</p>
	<p>Groundwater: Seepage from the dumps and existing paddocks could negatively influence the groundwater quality in the underlying aquifers during the operational phase.</p>	<ul style="list-style-type: none"> ❖ These are expected to be the same as the mitigation measures proposed for the Construction phase. Mitigation would thus include: <ul style="list-style-type: none"> ○ Continuous monitoring of groundwater quality.
	<p>Wetlands and Aquatics: Potential impacts include:</p> <ul style="list-style-type: none"> ❖ Continued loss of water input into surrounding watercourses ❖ Pipeline could pollute the watercourse if failure of the pipeline occurs; ❖ Potential for sedimentation and salt loading in the watercourse ❖ Potential to discharge treated water, if required. <p>The pipelines are designed to minimise spillages and failure as far as possible.</p>	<ul style="list-style-type: none"> ❖ Adhere to any prescribed buffers, should any be recommended; ❖ Adhere to the recommendations proposed in the surface water and groundwater reports; ❖ Minimise the footprint of any areas disturbed during construction; ❖ Locate all temporary offices, constructors' camps, laydown areas, ablution facilities etc. a minimum of the prescribed distance from any delineated sensitive watercourse/wetland (should wetlands exist). ❖ Develop and implement a construction stormwater management plan prior to the commencement of site clearing activities; ❖ A rehabilitation plan for disturbed wetland must be in place as prescribed by the wetland specialist study. ❖ Dust suppression for dirt roads will decrease the windblown sediments, this should be read with the Air Quality Impact

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
	<p>Heritage: During operation, the sources of risk to heritage resources are primarily restricted to the processes associated with the hydraulic reclamation of the historical dumps.</p> <p>This will be confirmed by a Heritage Impact Assessment.</p> <p>Traffic: These are expected to be the same as for construction.</p> <p>Visual: Reclaiming of the dumps will result in the dumps/dams decreasing in height. This is expected to have a moderate positive impact on the topography</p>	<p>Assessment during the EIA Phase.</p> <ul style="list-style-type: none"> ❖ Conduct heritage impact assessment to identify heritage sites within the project area ❖ If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken ❖ Mitigation measures for the construction phase apply here ❖ None.
	<p>Fauna and Flora: The major impacts are expected during construction. During operation, the following impact could occur:</p> <ul style="list-style-type: none"> ❖ Disturbance of local biodiversity during operation and routine maintenance. <p>Potential for windblown particulates to pollute habitat quality.</p>	<ul style="list-style-type: none"> ❖ Minimise disturbance and destruction of areas that are not going to be directly reclaimed. ❖ Create awareness regarding environmental preservation amongst all personnel involved in the Soweto Cluster reclamation project. ❖ If required monitor surrounding vegetation to assess the affect the reclamation activities on the said vegetation.
DECOMMISSIONING		
<p>Completed Reclamation of the Soweto Cluster.</p> <p>Rehabilitation to Red</p>	<p>Socio-economic: Potential impacts include:</p> <ul style="list-style-type: none"> ❖ Improved Quality of life. ❖ Increased access to land. 	<ul style="list-style-type: none"> ❖ Appointment of workforce and investment in the local economy where applicable during rehabilitation.

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
Earth and the removal of infrastructure.	Potential for dependency on the Project for sustaining the local economy.	
	Air quality: The final rehabilitation of the dumps/dams will make use of heavy machinery and vehicles similar to the construction phase. The landscaping and transportation of material to and off site will result in fugitive dust generation. It is anticipated that this will be very short term.	<ul style="list-style-type: none"> ❖ Monitoring dust levels on site, at upwind and downwind locations preferably at discrete receptors (if identified).
	Noise: Potential for noise disturbance when rehabilitating. However, with the rehabilitation activities using similar machinery and vehicles than the construction phase, it is expected that the noise impact during this phase will be similar.	<ul style="list-style-type: none"> ❖ Refer to the construction phase mitigation measures.
	Surface Water: Potential impacts include: <ul style="list-style-type: none"> ❖ Water pollution from accidental spillages of decommissioned infrastructure. Residual water pollution from rehabilitated infrastructure footprints post closure	<ul style="list-style-type: none"> ❖ Ensure that the pipelines are emptied of all residual material before decommissioning. ❖ Ensure the consideration of the durability and longevity of water management designs, e.g. provision of erosion protection for long-term control of erosion and potential pollution to water resources during decommissioning. ❖ It should be ensured that the potential future impacts from the reclamation of the dumps/dams has been identified. ❖ The final topography should be planned, as far as possible, to be free-draining.
Groundwater: If Seepage continues, this could negatively influence the groundwater quality in the underlying aquifers	<ul style="list-style-type: none"> ❖ These are expected to be the same as the mitigation measures proposed for the Construction and operation phase. 	

ACTIVITY	POTENTIAL IMPACT	MITIGATION MEASURES
	<p>Wetlands and Aquatics: Potential impacts include those associated with removing site infrastructure, including pipelines.</p>	<ul style="list-style-type: none"> ❖ Rehabilitation of the footprints must be done according to the Rehabilitation Plan. ❖ Pipelines must be flushed clean and rendered safe for decommissioning and removal. ❖ Decommissioning and rehabilitation should be done in the dry season.
	<p>Heritage: No sources of risk to heritage resources are envisaged for the decommissioning phase of the project at this stage. However, if structures older than 60 or 100 years at the time of decommissioning exist, these may be impacted upon by decommissioning.</p>	<ul style="list-style-type: none"> ❖ Conduct heritage impact assessment to identify heritage sites within the project area ❖ If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken
	<p>Traffic: These are expected to be the same as for construction.</p>	<ul style="list-style-type: none"> ❖ Mitigation measures for the construction phase apply here
	<p>Visual: The reclaimed dumps/dams will no longer be visible. Infrastructure will also be removed. This is expected to have a moderate positive impact on the topography</p>	<ul style="list-style-type: none"> ❖ None.
	<p>Fauna and Flora: No impacts are envisioned during this stage.</p>	<ul style="list-style-type: none"> ❖ Follow a detailed rehabilitation plan. ❖ Minimise disturbed areas. ❖ Follow any local and national policies and plans regulating and protecting biodiversity in the project area.

10.5 Other Information Requirements

10.5.1 Impact on the Socio-economic Conditions of any Directly Affected Parties

A Social Impact Assessment will be undertaken and finalised during the EIA Phase. Potential Social impacts have been included in Table 10-2.

10.5.2 Impact on any National Estate referred to in Section 3(2) of the National Heritage Resources Act

Heritage Sensitivity

As a historical mining site, no significant heritage resource sites or places of historical significance that could be impacted by the Proposed Projects are expected within the Soweto Cluster and proposed project area. However, mine dumps are sometimes regarded as landmarks with significant cultural heritage. Heritage sensitivity will further be assessed during the EIA phase.

Palaeontological Sensitivity

The Proposed Project is underlain by the Turffontein and Johannesburg Subgroups (with a Zero Palaeontological Sensitivity). These subgroups generally consist of quartzites and conglomerates formed by braided river systems, as well as pyritic sands, insignificant shales, and volcanics as well as debris-flow diamictites. Rock formations with a zero palaeontological sensitivity are unfossiliferous.

No palaeontology study is required.

11 Declaration of Independence

11.1 Undertaking Regarding Correctness of Information

I, **Ashleigh Blackwell**, herewith undertake that the information provided in the foregoing report is correct.



Signature of EAP

DATE: 28th June 2019

11.2 Undertaking Regarding Level of Agreement

I, **Ashleigh Blackwell**, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.



Signature of EAP

DATE: 28th June 2019

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