



**KWADIWA AFRICA**  
POWER IN INNOVATION

# REPORT

## FINAL BASIC ASSESSMENT REPORT FOR THE PROPOSED ELECTRISURV CC BENEFICIATION PLANT

**Reference: 1/3/1/16/1N-236**

Electrisurv  
Surveying CC

October 2020

Project Number: K217002

**Reference: 1/3/1/16/1N-236**



**PROJECT NAME**

**APPLICATION FOR ENVIRONMENTAL  
AUTHORISATION: THE PROPOSED ELECTRISURV CC  
BENEFICIATION PLANT**

**DOCUMENT NO: K217002-01-**

**PROJECT NAME**

**Final Basic Assessment Report**



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## LIST OF ACRONYMS AND ABBREVIATIONS

%:	Percentage
°C:	degrees Celsius
AMD:	Acid Mine Drainage
m <sup>3</sup> /annum:	cubic metres per annum
Mm <sup>3</sup> /annum:	million cubic metres per annum
BID:	Background Information Document
BA:	Basic Assessment
BAR:	Basic Assessment Report
CBD:	Central Business District
CARA:	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
DEA:	Department of Environmental Affairs
DMR:	Department of Mineral Resources
EAP:	Environmental Assessment Practitioner
Electrisurv:	Electrisurv Surveying CC
EA:	Environmental Authorisation
ECA:	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
EIA:	Environmental Impact Assessment
EMP:	Environmental Management Programme
GIS:	Geographic Information Systems
GN:	Government Notice Regulation
GGP:	Gross Geographic Product
ha:	hectare
I&APs:	Interested and affected parties
km:	kilometre
km <sup>2</sup> :	square kilometre
Kwadiwa Africa:	Kwadiwa Africa (Pty) Ltd
LED:	Local Economic Development
mS/m:	millisiemens/meter
mg/l:	milligram per litre
M:	meter
MAP:	Mean Annual Precipitation
MAR:	Mean Annual Runoff
MAE:	Mean Annual Evaporation
MW:	Megawatts
mamsl:	metres above mean sea level
mm:	millimetre
mm/month:	millimetre per month
mm/year:	millimetre per year
MPRDA:	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MDARDLEA:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
Mtpa:	million tonnes per annum
NEMA:	National Environmental Management Act, 1998 (Act 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

NHRA:	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NDM:	Nkangala District Municipality
NWA:	National Water Act (Act 36 of 1998)
NW:	North west
PCD:	Pollution control dam
PES:	Present Ecological Status Category
PHRA:	Provincial Heritage Resources Authority (PHRA)
PPP:	Public Participation Process
RoM:	Run of Mine
SE:	South east
SAHRA:	South African Heritage Resources Agency
WMA:	Water Management Area
WULA:	Water Use Licence Application

## SPECIALIST DECLARATION OF INDEPENDENCE

The Environmental Assessment Practitioner General declaration:

I Vumile Ribeiro, declare that –

- ◆ I act as the independent environmental practitioner in this Basic Assessment Application;
- ◆ I will perform the work relating to the audit in an objective manner, even if this results in views and findings that are not favourable to the auditees;
- ◆ I declare that there are no circumstances that may compromise our objectivity in performing such work;
- ◆ I have expertise in conducting environmental compliance audits, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- ◆ I will comply with the Act, Regulations and all other applicable legislation;
- ◆ I have not and will not engage in, conflicting interests in the undertaking of the activity;
- ◆ I will provide the competent authority with access to all information at our disposal regarding the audit, whether such information is favourable to the auditee or not; will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- ◆ I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

I ~~do~~ do not have and will not have any vested interest (either business, financial, personal or other) in the activity other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.

<b>Signature of the environmental assessment practitioner:</b>	<i>V. Ribeiro</i>
<b>Designation:</b>	Environmental Consultant
<b>Qualifications:</b>	Post Graduate Degree (Hons): BSoc Sci Environmental Analysis and Management
<b>Name of company:</b>	Kwadiwa Africa (Pty) Ltd
<b>Experience (years):</b>	14 years
<b>Date:</b>	October 2020



## FOREWORD

Kwadiwa Africa (Pty) Ltd (Kwadiwa Africa) is committed to Environmental Quality. Environmental Quality refers to the total environment, and 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 the land to which South Africa 'belongs' is preserved, protected, and sustained, and not unacceptably exploited or degraded.

All members of this project team are committed to protecting the environment and encouraging its sustainability. To promote Environmental Quality, Kwadiwa Africa has conducted this basic assessment as an unbiased, independent and external auditor.

## 1 INTRODUCTION

### *1.1. Project Need and Desirability*

Coal, because of its strategic importance is one of the five minerals selected by the DMR for local beneficiation as it is considered critical to the on-going development of South Africa (Beneficiation Strategy for the Minerals Industry, June 2011).

Coal remains strategically critical to the South African economy with 253.1 million tonnes per annum (Mtpa) produce in 2016 (Chamber of Mines, 2018) of which 181.4 Mtpa were sold internally. South Africa is the world's 6th largest coal exporter at 77 Mtpa (<http://www.worldstopexports.com/coal-exports-country>).

South Africa's energy is predominately coal fuelled. Eskom's existing coal fired power stations are critical in terms of electricity production and in meeting the growing energy requirements of South Africa as a whole. As a result, coal mining, beneficiation and supply is of paramount importance to South Africa for continued electricity generation to meet the rising energy demands of the country in the short, medium and long term.

Demand exists in the market for a competitive alternative to coal supply. Electrಿಸurv aims to address this demand through its production of coal by its beneficiation process which will be supplied to a number of clients including Eskom and the local community. The operation therefore provides for a demand in the market by providing a product with significantly less air pollution.

Electrಿಸurv Surveying CC (Electrಿಸurv) intends to establish a coal beneficiation plant on Farm Kromdraai 292 JS Portion 2 in the Emalahleni Local Municipality (refer Plan 1, Appendix A). Run of Mine (RoM) will be received via road from different sources within South Africa and the treated to the necessary requirements. The processed coal will then be sold to different local clients.

The ROM is loaded into the primary crusher with the use of a front loader before been feed to the screening and washing section. The material is treated through a series of vibrating screens, cyclones, water and mixing tanks before been stockpiled into product stockpiles before been loaded into trucks and distributed to clients.

## 1.2. Approach to the Basic Assessment Study

The required environmental study is the undertaking of a Basic Assessment (BA) process which is being conducted in 3 phases namely:

- ◆ Phase 1: Project inception;
- ◆ Phase 2: Basic Assessment and Environmental Management Programme (EMPr); and
- ◆ Phase 3: Authority review and response.

The Basic Assessment Report (BAR) has been compiled in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (herein referred to as NEMA), as read with the amended EIA Regulations of GN R983, GN R984 and R985, a Basic Assessment process should be undertaken and an Environmental Authorisation (EA) must be obtained from the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) prior commencement of any of the listed activities. The content requirements for the basic assessment report are listed in Table 1 with the relevant sections of the report for easy reference.

**Table 1: Content of Basic Assessment Report**

<b>Content of Basic Assessment Report</b>	<b>Chapter</b>
(a) Details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP to carry out scoping procedures.	1.3
(b) A description of the proposed activity.	3
(c) A description and a map of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is (i) a linear activity, a description of the route of the activity; or (ii) an ocean-based activity, the coordinates where the activity is to be undertaken.	Plan 3, Appendix A
(d) A description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	6
(e) An identification of all legislation and guidelines that have been considered in the preparation of the basic assessment report.	2
(f) Details of the public participation process conducted in terms of regulation 21(2)(a) in connection with the application including: <ul style="list-style-type: none"> <li>(i) the steps that were taken to notify potentially interested and affected parties of the proposed application;</li> <li>(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given;</li> <li>(iii) a list of all persons, organizations or organs of state that were registered in terms of regulation 55 as interested and affected parties in relation to the application; and</li> <li>(iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues</li> </ul>	5
(g) A description of the need and desirability of the proposed activity	1.1
(h) A description of any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community that may be affected by the activity.	4

Content of Basic Assessment Report	Chapter
(i) A description and assessment of the significance of any environmental impacts, including: <ul style="list-style-type: none"> <li>i. Cumulative impacts that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the activity.</li> <li>ii. The nature of the impact.</li> <li>iii. The extent and duration of the impact.</li> <li>iv. The probability of the impact occurring.</li> <li>v. The degree to which the impact can be reversed.</li> <li>vi. The degree to which the impact may cause irreplaceable loss of resources; and</li> <li>vii. The degree to which the impact can be mitigated.</li> </ul>	8
(j) Any environmental management and mitigation measures proposed by the EAP.	8
(k) Any inputs and recommendations made by specialists to the extent that may be necessary.	-
(l) A draft Environmental Management Programme containing the aspects contemplated in regulation 33.	Appendix D
(m) A description of any assumptions, uncertainties and gaps in knowledge.	1.4
(n) A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	9
(o) Any representations and comments received in connection with the application or the basic assessment report.	-
(p) The minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants.	Appendix C
(q) Any responses by the EAP to those representations, comments and views.	Appendix C
(r) Any specific information required by the competent authority; and	-
(s) Any other matters required in terms of sections 24(4)(a) and (b) of the ct.	-

### 1.3. Details of the Environmental Assessment Practitioner (EAP)

Kwadiwa Africa has been requested by Electrisurv to apply for Environmental Authorisation for Listed Activities triggered under the NEMA (Act 107 of 1998). The particular of the EAP undertaking the BAR process is supplied in Table 2. Refer to Appendix B for the EAP's curriculum vitae.

**Table 2: Contact details of the EAP**

<b>Name of Practitioner:</b>	<b>Vumile Ribeiro</b>
<b>Telephone:</b>	<b>+27 82 767 2786</b>
<b>Email:</b>	<a href="mailto:vribeiro@kwadiwafrica.co.za">vribeiro@kwadiwafrica.co.za</a>
<b>Expertise:</b>	Vumile is an Environmental Consultant specialising in EIA and WULA for mining projects, electricity supply (generation, transmission and distribution), road infrastructure, as well as water management projects. Vumile's skills

	<p>include consultation in the field of legal requirements as prescribed by the NWA.</p> <p>Vumile holds a Bachelor of Social Sciences (Honours) degree in Environmental Analysis and Management from the University of Pretoria, and is currently completing her Masters Degree (at the University of the Witwatersrand) in Environmental Science focusing on Air Quality: The Respiratory Health Impacts of Open-cast Coal Mining. Vumile has 13 years of professional experience in Environmental Assessment and Planning and Management. Vumile is well versed in Environmental Impact Assessments, Environmental Auditing, GIS and Remote sensing, as well as Environmental Law practices.</p>
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#### ***1.4. An Undertaking Under Oath or Affirmation by the EAP***

In undertaking the draft BAR, the EAP took into consideration the requirements stipulated in the EIA Regulation of December 2014 (as amended in April 2017), as well as other relevant Acts and regulations. This will also apply in undertaking the final BAR phases. The EAP hereby confirms that with the information available at the time of preparing this report, the following has been considered:

- ◆ The correctness of the information provided in this BAR;
- ◆ The inclusion of comments and inputs from stakeholders and interested and affected parties (I&APs); and
- ◆ Any information provided by the EAP to the I&APs and any responses by the EAP to comments or inputs made by I&APs.

Refer to Page 7 for the declaration of the EAP.

## **2 LEGAL REQUIREMENTS**

There are a number of regulatory requirements at local, provincial and national level with which the proposed project must conform. Some of the key laws and regulations include:

- ◆ Constitution of the Republic of South Africa (Act 108 of 1996)
- ◆ National Environmental Management Act (Act 107 of 1998), as amended (NEMA)
- ◆ EIA Regulations 2017 (Vol. 604 30, No. 39343), promulgated in terms of NEMA
- ◆ National Water Act (Act 36 of 1998) (NWA)
- ◆ National Heritage Resources Act (Act 25 of 1999) (NHRA)
- ◆ National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA)
- ◆ National Environmental Management: Waste Act (Act 59 of 2008) (NEM: WA)
- ◆ National Environmental Management: Protected Areas (Act 57 of 2003) (NEM: PAA)
- ◆ Mpumalanga Tourism and Parks Agency (Act 5 of 2005) (MTPA)
- ◆ Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA)

A brief summary of Kwadiwa Africa understanding of the relevant Acts and Regulations that are applicable to this study is provided below. Note that other legislative requirements may also pertain to the project. As such, the summary provided below is not intended to be definitive or exhaustive, and serves only to highlight key environmental legislation and obligations.

The legislative guidelines directing the project are outlined in further detail in Table 3.

**Table 3: Legislation and guidelines application to the proposed project**

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
<p><b><u>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</u></b></p> <p>Section 24 of the Constitution provides 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 –</p> <ul style="list-style-type: none"> <li>i. Prevent pollution and ecological degradation;</li> <li>ii. Promote conservation; and</li> <li>iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</li> </ul>	<p>The implementation of the mitigation and management measures to minimise and prevent negative impacts associated with the project, while promoting justifiable socio-economic development.</p>	<p>The environmental management objectives of the project prevent environmental damage and to support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development.</p>
<p><b><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></b></p> <p>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the overarching legislation that protects and regulates the management of heritage resources in South Africa.</p>	<p>As the site is currently disturbed by previous mining and industrial activities, no heritage resources are expected on site.</p>	

<p>The Act requires that Heritage Resources Agency's in this case the South African Heritage Resources Agency (SAHRA) and Provincial Heritage Resources Authority (PHRA), be notified as early as possible of any developments that may exceed certain minimum thresholds.</p>		
<p><b><u>National Environmental Management Act, 1998 (Act No. 107 of 1998)</u></b></p> <p>The National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA), as amended, was set in place in accordance with section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that:</p> <p><i>The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.</i></p> <p>The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.326 were promulgated on 07 April 2017.</p>		<p>This Basic Assessment Report has been compiled in accordance with the requirements of the NEMA EIA Regulations as amended.</p>

<p>Together with the EIA Regulations, the Minister also published GN R.326 (Listing Notice No. 1), GN R.327 (Listing Notice No. 2) and GN R.328 (Listing Notice No. 3) in terms of sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended.</p>		
<p><b><u>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</u></b></p> <p>In terms of the closure process the applicant must submit an EMP to the DMR and consult with Interested &amp; Affected Parties (I&amp;APs) for comment regarding the Project.</p>	<p>In terms of Section 16 (3) (b) of the EIA Regulation (2017), any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority. This Report has been compiled as per the requirements of the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA).</p>	<p>This Basic Assessment Report has been compiled in accordance with the requirements of the NEMA EIA Regulations, 2017, with the environmental management objective to protect ecologically sensitive areas.</p>
<p><b><u>Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA)</u></b></p> <p>CARA aims to provide for the conservation of the natural agricultural resources of the country through the maintenance of the production potential of land, by combatting and preventing erosion and the weakening of water sources. In addition, this Act aims to protect vegetation, while combatting weeds and invader plants</p>	<p>Mitigation measures have been included for the potential impacts on soils and land capability. The mitigation measures will comply with the CARA.</p>	<p>Section 12 of the CARA details the maintenance of soil conservation in which every land user will be responsible for the maintenance and conservation of soil. The mitigation measures recommended as part of this Basic Assessment Report aim to prevent the compaction, erosion and degradation of the soil resources.</p>



<p><b><u>Environmental Conservation Act, 1989 (Act No. 73 of 1989) (ECA)</u></b></p> <p>ECA makes provision for guidelines pertaining to noise control and measurements. The regulations refer to the use of the South African National Standards 10103:2008 (SANS) guidelines for the Measurement and Rating of Environmental Noise with Respect to Land Use, Health, and Annoyance and to Speech Communication.</p>	<p>Mitigation measures have been included for the potential impacts due to the generation of noise. The mitigation measures will comply with the ECA.</p>	<p>The proposed project will not exceed the SANS 10103: 2008 limits for baseline noise measurements, thus conforming to the requirements of the ECA.</p>
<p><b><u>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)</u></b></p> <p>The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM: BA) regulates the management and conservation of the biodiversity of South Africa within the framework provided under NEMA. This Act also regulates the protection of species and ecosystems that require national protection and also considers the management of alien and invasive species. This Act works in accordance with the framework set under NEMA. The following regulations which have been promulgated in terms of the NEM:BA are also of relevance:</p> <ul style="list-style-type: none"> <li>◆ Alien and Invasive Species Lists, 2014 published (GN R.599 in GG 37886 of 1 August 2014);</li> </ul>	<p>Mitigation measures have been included for the potential impacts on flora and fauna and the biodiversity of the project site. The mitigation measures will comply with the NEM: BA.</p>	<p>The mitigation and management measures to be implemented as part of the project aim to manage and conserve biological diversity, as well as to minimise alien invasive species <u>as per the AIP Management Plan (Appendix D)</u>:-</p>

<ul style="list-style-type: none"><li>◆ National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations; and</li><li>◆ National list of Ecosystems Threatened and in need of Protection under Section 52(1) (a) of the Biodiversity Act (GG 34809, GN R.1002, 9 December 2011).</li></ul>		
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### 3 PROJECT DESCRIPTION

Electrisurv Surveying CC (Electrisurv) intends to establish a coal beneficiation plant in the eMalahleni Local Municipality. Run of Mine (RoM) will be received via road from different sources within South Africa and the treated to the necessary requirements. Raw material is treated to the necessary requirements to produce various products which are then sold to different local clients. The operation includes a washing, crushing and screening plant.

Coal will be delivered by truck to the Electrisurv Wash Plant from different surrounding mines for further processing. Electrisurv seeks to operate a wash plant with a filter press where screening, crushing, and coal washing takes place.

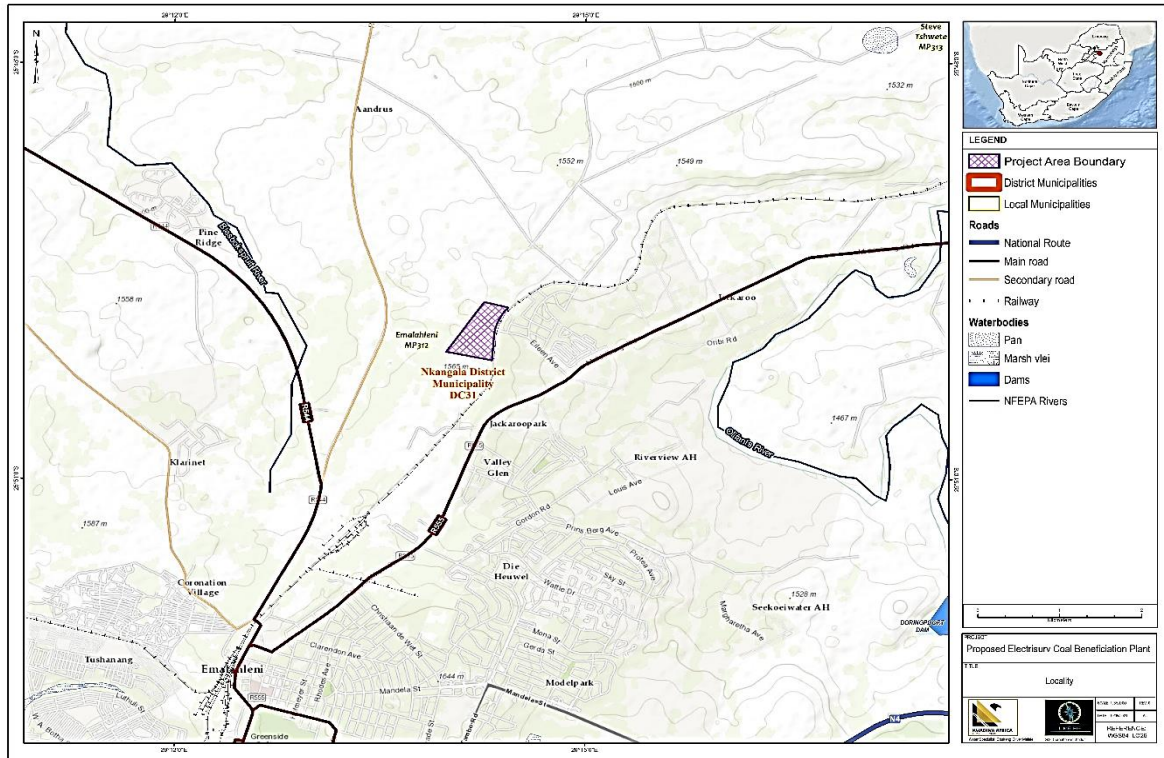
The process involves the use of low-quality raw material (Run of Mine coal or ROM) is received via road and is transported to the jigging Plant. The ROM is loaded into the primary crusher with a front-end loader. The material is fed via a conveyor belt system through to a secondary crusher and then finally into the screening and jigging section and then finally dumped on to the various stockpiles where a front-end loader is used to load the final product onto the different trucks for distribution to the clients. The coal is processed and produces any grade coal. The waste from the beneficiation plan will be pumped into the settling (slurry) dams and left to dry.

The proposed infrastructure for the Project is:

- ◆ Washing plant;
- ◆ Screening plant;
- ◆ Pollution Control Dam;
- ◆ Weigh bridge; and
- ◆ Administration buildings.

#### ***3.1 Location of Activity***

Electrisurv will construct a coal beneficiation plant on Farm Kromdraai 292 JS, Portion 2. The proposed project area is located within eMalahleni Town in Mpumalanga, next to the eMalahleni railway station. The site is located north of the eMalahleni town centre, which falls within the eMalahleni local municipality of the Nkangala District municipality in the Mpumalanga Province. The project footprint area will cover an extent of approximately 28.84 Hectares. Please refer to the locality map below (Figure 1).



The location of the proposed project is described further in [Table 4](#).

**Table 4: Location of the overall activity**

<b>Farm Name:</b>	Kromdraai 292 JS Portion 2
<b>Application Area (Ha):</b>	28.84 ha
<b>Magisterial District:</b>	Nkangala District Municipality (NDM) eMalahleni Local Municipality
<b>Distance and direction from nearest town:</b>	The application area is located 6 km North of eMalahleni, Mpumalanga
<b>21-digit Surveyor General Code for each farm portion:</b>	T0JS00000000029200004

The regional and local settings are indicated in Plan 1 and Plan 2 (Appendix A) respectively. The project location is approximately 10 km north of eMalahleni.

### 3.2 Land Tenure

The farm portion is currently privately owned by the applicant, Mr FJ du Preez.

### 3.3 Current Land Use

Predominant land uses in the area include coal mining, cultivation, and grazing as well as residential - Clarinet settlement nearby. The proposed project site was utilized historically for industrial activities and is disturbed. Figure 3-1 shows the current disturbed nature of the

proposed site. The best land use class description for the site currently is “Mines: Extraction Sites: Open Cast & Quarries” which is described as “non-vegetated, active and/or non-active extraction pits associated with surface-based mining activities, including open-cast mines, quarries, and road-side borrow pits etc.” (South African National Land-Cover Report & Accuracy Assessment, 2018).







*Figure 3-1: Historically disturbed proposed project site*

### **3.4 Coal Beneficiation**

Raw material is treated to the necessary requirements to produce various products which are then sold to different clients. Coal will be delivered by truck to the Electrಿಸurv Wash Plant from different surrounding mines for further processing. Electrಿಸurv seeks to operate a wash plant with a filter press where screening, crushing, and coal washing takes place.

The process involves the use of low-quality raw material (ROM) is received via road and is transported to the jigging Plant. The ROM is loaded into the primary crusher with a front-end loader. The material is fed via a conveyor belt system through to a secondary crusher and then finally into the screening and jigging section and then finally dumped on to the various stockpiles where a front-end loader is used to load the final product onto the different trucks for distribution to the clients. The coal is processed and produces any grade coal. The waste from the beneficiation plan will be pumped into the settling (slurry) dams and left to dry. Key infrastructure that will be constructed includes:

- ◆ A process water storage tank which will forms part of the Coal Washing Plant
- ◆ Access control & roads
- ◆ Ablution facilities
- ◆ Weighbridges
- ◆ Offices with parking area
- ◆ Water tanks
- ◆ Workshops

- ◆ Wash bays
- ◆ Waste management area with waste skips
- ◆ Bulk diesel tanks
- ◆ Coal stockpile
- ◆ One borehole
- ◆ Pollution control dam (PCD)
- ◆ Biofilter and Biofilter dam which forms part of the domestic wastewater management system, to contain treated domestic wastewater before re-use within the Coal Washing Plant
- ◆ Silt trap
- ◆ Clean and dirty water trenches
- ◆ Stormwater drains
- ◆ Pipeline infrastructure which facilitates the conveyance of raw water to the Washing Plant.

The major water users will be the Washing Plant (since no mining activities will be taking place). Other users include the workshops and domestic users of potable water

The following activities are anticipated to take place:

- ◆ Hauling of coal to the Washing Plant area and washing as well as stockpiling of coal product.
- ◆ Disposal of dust slurry generated at the Washing Plant in the settling dams.
- ◆ Transport of coal product.
- ◆ The utilisation of pollution control measures.
- ◆ Utilisation of ablution facilities and the domestic wastewater treatment system.
- ◆ The utilisation of the water supply system.

### ***3.5 Surrounding Economic Activities***

Mpumalanga is the second-smallest province in South Africa after Gauteng and is located in the north-eastern part of the country bordering Swaziland and Mozambique to the east. It covers an area of 79 490 km<sup>2</sup> and has a population of approximately 4 million, representing 7.8% of the South African population. Severe poverty is evident in the province and is the result of its geographic characteristics and historical racial inequalities (Stats SA, 2011).

Mpumalanga's economy is based largely on the rich natural resources of the region. Main economic activities include the production of petrochemicals and chemical products, agriculture, mining (Mpumalanga accounts for 83% of South Africa's coal production), power generation, forestry, and food processing. There is significant potential for further development in these sectors, as well as in tourism. This potential is enhanced by the province's favourable location in relation to the Maputo harbour being only 100 km from the Mozambique border, the substantial Gauteng market within proximity, and good rail and road infrastructure which allows easy access to ports at Durban and Richards Bay (de Waal, 2005).

As previously mentioned, the NDM is one of the three district municipalities in Mpumalanga Province and covers a total area of approximately 16 892 km<sup>2</sup>. The total population of NDM in



2011 was recorded at 1 308 129, constituting approximately 32% of Mpumalanga's population. The population growth rate of the district was 2.5% between the period 2001 and 2011, according to Stats SA 2011.

The eMalahleni and Middelburg areas are home to the major economic activity concentrations in NDM. The south-western regions of NDM are referred to as the Energy Mecca of South Africa, due to the large deposits of coal reserves and associated power stations, particularly the eMalahleni and Steve Tshwete local municipalities. The regeneration of some of the mothballed power stations pose opportunities for the mining and energy sectors, as well as the regeneration of some of the smaller towns in the district such as Delmas, Hendrina and Arnot. Greater portions of the district, particularly the Dr. JS Moroka and Thembisile Hani municipal areas, are characterised by subsistence agriculture according to NDM Integrated Development Plan (IDP) 2013-2014.

## 4 PROJECT 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.

Limited alternatives may exist for the project may exist for the Proposed Project. The most feasible of these alternatives have been considered for this DBAR and are discussed in greater detail below.

The Department of Environmental Affairs (DEA) EIA guidelines necessitate the consideration of various development alternatives as part of the EIA process. The consideration of project alternatives is a key requirement of an EIA as it provides a basis for choice for the competent authority and I&APs. In the NEMA EIA Regulations, alternatives in relation to a proposed activity are defined as "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;

- ◆ type of activity to be undertaken;
- ◆ design or layout of the activity;
- ◆ technology to be used in the activity; and
- ◆ operational aspects of the activity.

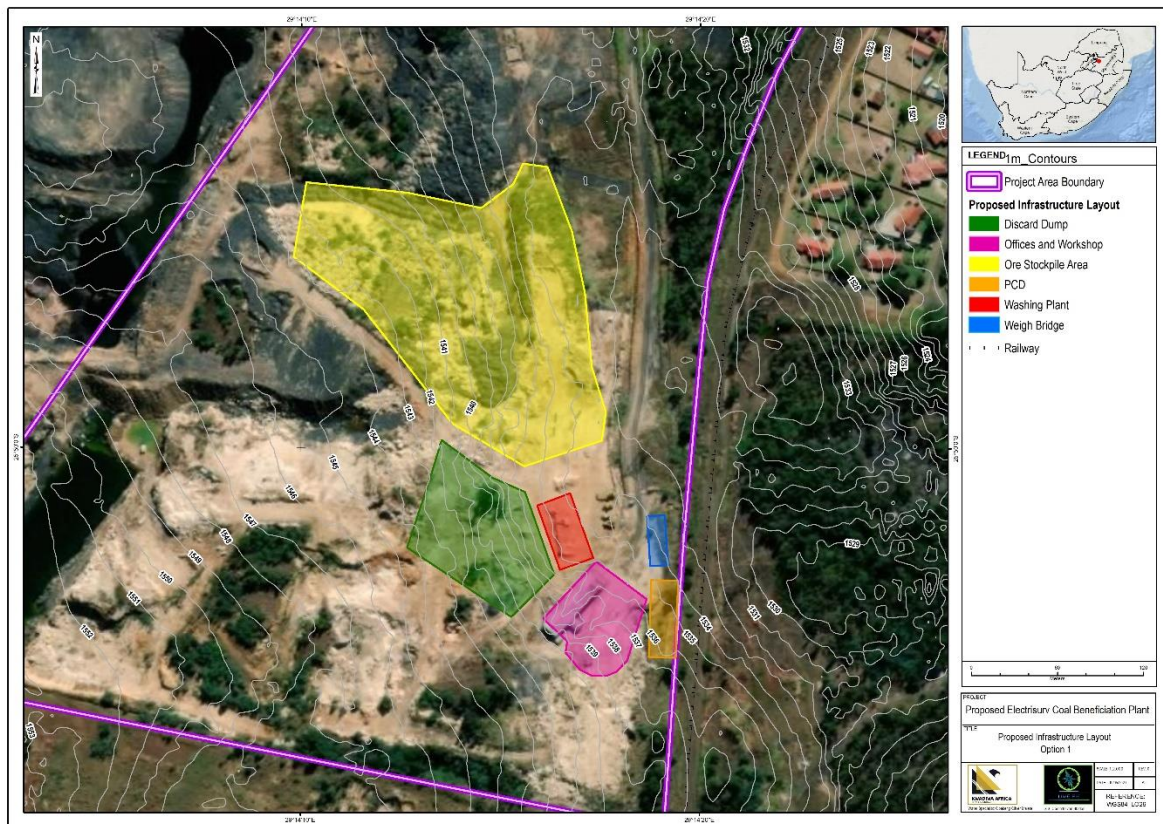
Alternatives that are considered must be reasonable and feasible and should have the potential to reduce negative impacts that may occur due to the proposed project. Alternatives are considered as a means of reaching the same need and purpose as the originally proposed project in a way that minimises the impacts and maximises the benefits. The anticipated environmental impacts which these alternatives may pose have been discussed below.

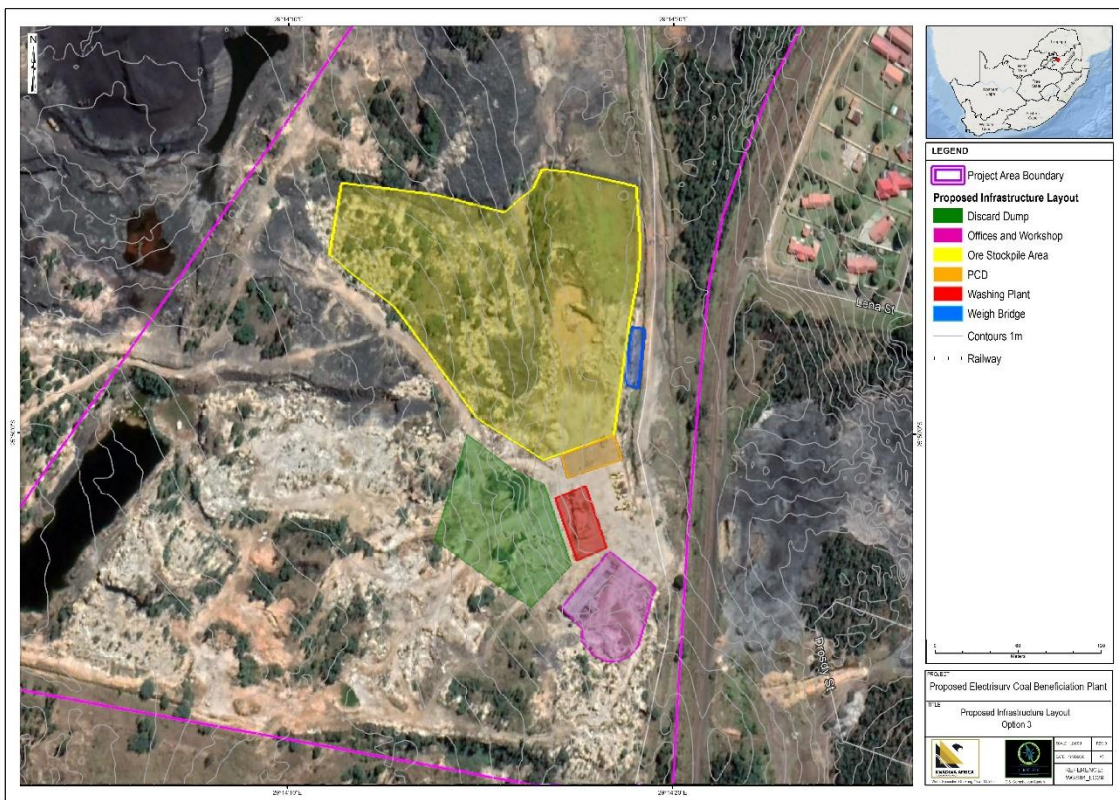
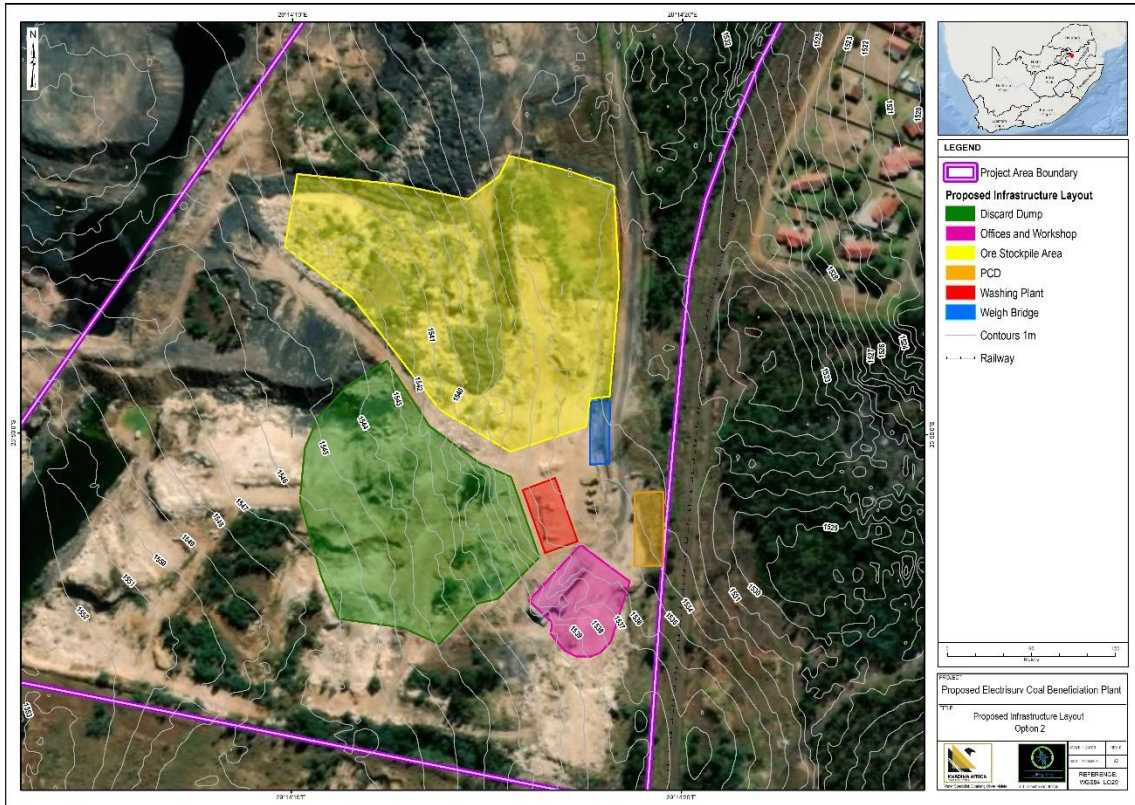
### 4.1 Location Alternatives

Historically the site has been used for various mining activities. The land use of the farm portion is now considered to be predominantly one of mining and related activities. The property is also located centrally to coal suppliers and therefore there is no practical development alternative for the proposed project area.

### 4.2 Site Layout Alternatives

Three site layout alternatives were considered. Layout option 2 is the preferred option.





### **4.3 Technology Alternatives**

There are main types of technology which could be used for coal beneficiation, namely:

- ◆ A dry coal separator uses less water than a conventional wet processing alternative. The main and most obvious advantage of dry processing of coal is that no water is required. Dry processing is, however, not applicable on all mines and with all coal types and quantities and is thus not well suited to this project will coal will be received from various suppliers and blended.
- ◆ Wet washing: This is the conventional processing alternative employed at most processing facilities and is the preferred alternative to Electrisurv as the technology is readily available and is tried and tested.

### **4.4 Do Nothing / No-Go Alternative**

The option of the project not proceeding would mean that the environmental condition of the historically impacted site would remain unchanged. The opportunity to develop the coal washing plant and have an active land user to monitor and manage historical and current environmental impacts would be lost.

## **5 PUBLIC PARTICIPATION**

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 and the integrated Water use Licence Application (IWULA) process.

Public participation is the involvement of all parties who are either potentially interested or affected by a proposed development. The principal objective of public participation is to inform and enrich decision-making. Public participation plays a key role in the Environmental Impact Assessment process where it informs the public of the proposed activity and invites people to register as interested and affected parties (I&APs) and provide any comment or information that may be of use during the environmental impact assessment. The role of the public participation during the BA phase is to allow the registered I&APs to comment on the Draft BA Report before submission to the relevant decision-making authority. This allows I&APs to evaluate whether their concerns have been appropriately addressed.

One of the general objectives of integrated environmental management laid down in Section 23(2)(d) of NEMA is to “ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment”. An inadequate and non-transparent public participation process (PPP) has the potential to provide a negative decision and perception regarding the proposed project. The EIA Regulations (2010) places a lot of emphasis on the public participation process and have been revised to contain comprehensive guidelines to

involve the public in the EIA process. The primary aims of the public participation process include:

- ◆ Meaningful and timeous participation of interested and affected parties (I&APs);
- ◆ Identification of issues and concerns of key stakeholders and I&APs with regards to the proposed development, i.e. focus on important issues;
- ◆ Promotion of transparency and an understanding of the proposed project and its potential environmental (social and biophysical) impacts;
- ◆ Accountability for information used for decision-making;
- ◆ Serving as a structure for liaison and communication with I&APs;
- ◆ Assisting in identifying potential environmental (social and biophysical) impacts associated with the proposed development; and
- ◆ Inclusivity (the needs, interests and values of I&APs must be considered in the decision-making process).

### ***5.1 Details of the Public Participation Process Followed***

Notice of the Basic Assessment process has been given by:

- ◆ placing a site notice on the farm fence;
- ◆ posting and emailing written notice and Background Information Document (BID) regarding the proposed development to Interested and Affected Parties, including neighbours and Ward councillor, competent authority and other relevant Government departments on the 14<sup>th</sup> of September 2020.
- ◆ placing an advertisement in the Witbank News newspaper (on 18<sup>th</sup> of September 2020), which allowed potential Interested and Affected Parties to register and to submit comments within a 30-day period regarding the Basic Assessment of the proposed project;
- ◆ a copy of the Draft Basic Assessment Report will be placed on the Kwadiwa Africa Website and at the eMalahleni Main Library on the 21<sup>st</sup> of September 2020.
- ◆ letters notifying, I&APs of the release of the Draft Basic Assessment Report for 30-day review period was be sent out on the 18<sup>th</sup> of September 2020.
- ◆ the Draft Basic Assessment Report is also available on the project website: <https://kwadiwafrica.co.za/public-documents/>
- ◆ all comments raised by I&APs during the review of the BID were captured and addressed within the Draft BA Report;
- ◆ the Draft BAR will be distributed for 30-days to registered I&APs and organs of state. Comments from I&APs on the Draft BAR will be addressed and incorporated into the Final BAR which will be submitted to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) for decision-making.

## ***5.2 Summary of Issues Raised by I&APs***

No issues have been raised thus far, comments are anticipated once the Draft Basic Assessment Report (DBAR) (this report) has been circulated to all stakeholders and I&AP's. Issues and concerns raised by I&AP's will be integrated into the Comments and Responses Report and they will be recorded and reflected in the Final Basic Assessment Report.

Interested and affected parties registered by completing registration forms and forwarding comments by email, fax and/or telephone. The I&APs comments will be captured on the CRR, acknowledged and forwarded to the relevant specialists for their consideration. A final BAR will be compiled inclusive of public participation information. The Final BAR will be submitted to competent authority for decision making. Notification of the decision by the competent authority will be communicated to all I&AP's.

## **6 GENERAL DESCRIPTION OF THE STUDY AREA**

### ***6.1 Soils, Land Use and Land Capability***

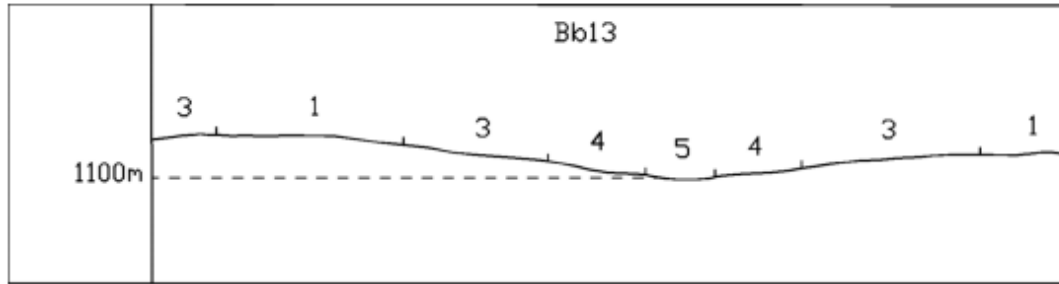
#### **6.1.1 Soils and Land Type**

Land type information and maps relevant to the terrain, soils and climate of the area were obtained from the Institute for Soil, Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 – 2006). A land type denotes an area that can be shown at 1:250 000 scale and that displays a marked degree of uniformity with respect to terrain form, soil pattern and climate. One land type differs from another in terms of one or more of terrain form, soil pattern and climate.

The land types occupying the proposed project area are the Bb 13 and Bb 11 land types of the 2528 and 2628 Pretoria and East Rand Land Type maps (Land Type Survey Staff, 1989). The presence of a plinthic catena dominates these land types,. A very large area of Mpumalanga Province is occupied by plinthic catena that in its perfect sequence is represented by (in order from highest to lowest in the upland landscape crest, midslope and foot slope positions). Red well drained soils for example Hutton soil types, yellow Clovelly soils in the midslope landscape position and less well drained soil in foot slope and valley bottom positions such as the Fernwood and Longlands soil forms. In addition, shallow Glencoe and Dresden soils, underlain by hard plinthite, occur in some places within the landscape.

#### **Dominant Soil Forms contained in Land Type Bb 13**

The underlying geology of land type Bb 13 consists of sandstone, grit, shaly sandstone and shale of the Ecca Group, Karoo Sequence. The area occupied by the Bb 13 land type is 40 316 ha. The Bb 13 land type is, is dominated by 40 % crest and 45 % midslope positions, the remainder (15 %) is occupied by valley bottom landscape positions see the representative terrain form sketch in Figure 2



**Figure 2: Representative terrain form sketch of land type Bb 13**

The Bb13 Land type is dominated by deep well drained yellow-brown apedal soils, with about 70% of the land type having these soils; they have an average slope of around 3 %.

The following list of soil types occurs within the crest (40%) in this land type:

- ◆ Clovelly (Cv) – 45%
- ◆ Avalon (Av) – 15%
- ◆ Other shallow soil types such as the Glencoe (Gc) soil – 40%

The following list of soil types occurs within the midslope (45%) in this land type:

- ◆ Clovelly (Cv) – 35%
- ◆ Avalon (Av) – 35%
- ◆ Other shallow soil types such as the Glencoe (Gc) soil – 30%

**Dominant Soil Forms contained in Land Type Bb 11**

Soils of this land type originate from sedimentary parent material of sandstone, grit and shale of the Ecca Group. Soil patterns identified for this land type area associated with landscapes in which a plinthic catena forms part of the landscape. Plinthic soils manifest as a Soft Plinthic B horizon or as a Hard Plinthic B horizon. Plinthic subsoils can be summarised as:

- ◆ Soils commonly associated with periodic water saturation within 1.5m of the soil surface;
- ◆ A subsurface horizon that consists of 25% or more of an iron rich, humus-poor mixture of kaolinitic clay with quartz, as well as other constituents.
- ◆ Soils in a horizon with which “mottling” occurs as result of accumulation in iron and manganese oxides associated with the fluctuating water table.

Soils in the horizon that are capable of changing irreversibly to a hardpan or to irregular aggregates on exposure to repeated wetting and drying with free access to oxygen.

## **6.1.2 Land Use**

The current land use was identified by aerial imagery during the desktop assessment and by on-site inspection. The current land use is mainly restricted to historical mining and related activities with limited agricultural activities as described in section 3.3. The area is characterised by fast growing urban and industrial development, specifically housing and mining.

The surrounding landscape can be described as undulating and draining to the east towards the Olifants River.

## **6.1.3 Land Capability**

Schoeman et al (2000) defined land capability to be determined by the collective effects of soil, terrain and climatic features. The defined land capability shows the most intensive long-term use of land for rain-fed agriculture and at the same time indicate the permanent limitations associated with the different land-use classes. The classification system is made up of four orders and eight classes namely:

- ◆ Order A: Arable land – high potential land with few limitations (Classes I and II);
- ◆ Order B: Arable land – moderate to severe limitations (Classes III and IV);
- ◆ Order C: Grazing and forestry land (Classes V, VI and VII);
- ◆ Order D: Land not suitable for agriculture (Class VIII).

The land capability of the area is dominated by Class V (grazing). Land in Class V has little or no erosion hazard but have other limitations impractical to remove that limit its use largely to pasture, range, woodland or wildlife food and cover. Limitations restrict the kind of plants that can be grown and prevent normal tillage of cultivated crops. Pastures can be improved and benefits from proper management can be expected. Land is nearly level. Some occurrences are wet or frequently flooded. Other are stony, have climatic limitations, or have some combination of these limitations.

Examples of Class V are:

- ◆ Valley bottoms subject to frequent flooding that prevents the normal production of cultivated crops;
- ◆ Nearly level land with a growing season that prevents the normal production of cultivated crops;
- ◆ Level or nearly level stony or rocky land; and
- ◆ Ponded areas where drainage for cultivated crops is not feasible but which are suitable for grasses or trees



## 6.2 Regional Climate

Mpumalanga’s weather is naturally defined by the topography of the province. The low-lying subtropical region is on the eastern part of the province and is wetter than the high lying savannah grassland region which is on the western part of the province.

The proposed project falls under the western part of the province. Summer rainfall dominates this Highveld escarpment, with an average range of temperatures between winter and summer falling around 19°C.

In eMalahleni, the climate is warm and temperate in winter there is much less rainfall in eMalahleni than in summer. The average annual temperature in eMalahleni is 15.4 °C. About 693 mm of precipitation falls annually.

The driest month is July with 6 mm. Most precipitation falls in January, with an average of 119 mm.

The warmest month of the year is January with an average temperature of 20.1 °C. In July, the average temperature is 8.7 °C. It is the lowest average temperature of the whole year.

### 6.2.1 Rainfall

The proposed project falls under the western part of the province. Summer rainfall dominates this Highveld escarpment, with an average range of temperatures between winter and summer falling around 19°C. In eMalahleni, the climate is warm and temperate in winter there is much less rainfall in eMalahleni than in summer. The average annual temperature in eMalahleni is 15.4 °C. About 693 mm of precipitation falls annually.

### 6.2.2 Evaporation

Evaporation data has been received from the SA Weather Services for Station number 0478867 at Bethal and B1 E001 near the Witbank Dam. The annual average evaporation for the period 1968 to 1987 is 1 702 mm/year. The minimum evaporation of 59.6mm was recorded in March 1976, while the maximum of 264.4 mm was recorded during December 1972. Monthly evaporation is presented above in Table 5. It is important to note here that evaporation exceeds rainfall for all months of the year and the area could therefore be classified as water deficit.

**Table 5: Evaporation data**

EVAPORATION (mm/month)	
Bethal 0478867 (1968 – 987)	Witbank Dam B1E001
179.8	178
151.1	149
147.8	147
111.1	113

EVAPORATION (mm/month)	
94.8	95
79.2	77
132.0	112
167.0	145
186.6	175
167.6	165
195.9	182
141.8	135.2
<b>1 701.9</b>	<b>622</b>

### 6.3 Air Quality

The proposed project is located within the Highveld Priority Area as declared by the minister at the end of 2007. This requires that an Air Quality Management Plan for the area is to be developed. The plan includes the establishment of emission reduction strategies and intervention programmes based on the findings of a baseline characterisation of the area. The management plan was published by the DEA in 2011 and included 7 goals:

- ◆ Goal 1: By 2015, organisation capacity in government is optimised to efficiently and effectively maintain, monitor and enforce compliance with ambient air quality standards and dust fallout limit values.
- ◆ Goal 2: By 2020, industrial emissions are equitably reduced to achieve compliance with ambient air quality standards and dust fallout limit values.
- ◆ Goal 3: By 2020, air quality in all low-income settlements is in full compliance with ambient air quality standards.
- ◆ Goal 4: By 2020, all vehicles comply with the requirements of the National Vehicle Emissions Strategy.
- ◆ Goal 5: By 2020, a measurable increase in awareness and knowledge of air quality exists.
- ◆ Goal 6: By 2020, biomass burning, and agricultural emissions will be 30% less than current.
- ◆ Goal 7: By 2020, emissions from waste management are 40% less than current.

### 6.6 Surface hydrology

The site generally slopes towards the south east, with the highest elevation being 1 553 metres above mean sea level (mamsl) in the north western corner of the site and the lowest elevation being 1540 (mamsl) in the south eastern corner of the site (where the catchment dam is situated). The gradient was calculated at approximately 1:50.

- ◆ Topography: Site slopes northwest to south east
- ◆ Topographical fall: Towards the south east  
1 553 mamsl in NW to 1 540 mamsl in SE
- ◆ Water Management Area (WMA): Olifants (WMA 4)

◆ Catchment:	Olifants River
◆ Sub-catchment:	Upper Olifants River
◆ Catchment area:	376 km <sup>2</sup> .
◆ Mean Annual Runoff (MAR):	11.2 million m <sup>3</sup> /annum.
◆ Mean Annual Evaporation (MAE):	1 700 mm.
◆ Quaternary catchment:	B11J (SA Water Resource of South Africa, 1990)
◆ Surface water resources:	Olifants, Klein Olifants, Blesbokspruit
◆ Water supply:	eMalahleni Municipality
◆ Water authority:	Department of Water and Sanitation, Mpumalanga (Bronkhorstspruit office)
◆ Water Management Area (WMA):	Olifants, WMA 4
◆ Surface Water User Survey:	As municipal water is supplied to the area and surroundings, there are no surface water users other than the natural system that needs to be maintained.

The natural environment has been significantly modified from its original state by mining and agricultural activities. Therefore, a Present Ecological Status Category (PES) C has been assigned to the catchment for the purpose of the Reserve.

## **6.4 Groundwater**

### **6.4.1 Regional Hydrogeology**

The groundwater systems in the Mpumalanga Coal Fields have been discussed extensively by Hodgson et al. (1998) and Grobbelaar et al. (2004). Three distinct superimposed groundwater systems are present. They are the upper weathered Ecca aquifer, the fractured aquifers within the Ecca sediments that were not weathered and the aquifer below the Ecca sediments.

### **6.4.2 The Weathered Aquifer**

The Ecca sediments are weathered to depths between 5 m and 12 m below the surface throughout the area. The upper aquifer is associated with this weathered zone, and water is often found within a few metres below the surface. This aquifer is recharged by rainfall and recharge is estimated to be in the order of 1% to 3% of the MAP (Mean Annual Precipitation), based on work in other parts of the country by Kirchner et al. (1991) and Bredenkamp (1995).

### 6.4.3 Fractured Ecca Aquifer

Underneath the weathered aquifer is the fractured aquifer. The pores within the Ecca sediments are well cemented and do not allow any significant flow of water. All groundwater movement, therefore, occurs along with secondary structures, such as fractures and joints in the sediments. These structures are better developed in competent rocks such as sandstone, hence the better water-yielding properties of the latter rock type.

### 6.4.4 Aquifer Characterization

A medium level confidence preliminary determination of the groundwater component of the ecological Reserve and the basic human needs Reserve was undertaken (DWAf, 26/8/3/495; 15 March 2007).

*The groundwater quality component of the Reserve is presented below (*

*Table 6* and was based on one data set.

**Table 6: Groundwater quality reserve**

Parameter	Ambient Groundwater Quality	Basic Human Needs Reserve	Groundwater Quality Reserves
pH	5.1	5.0 – 9.5	5.0 – 9.5
Electrical Conductivity (mS/m)	61.5	70	68
Calcium (mg/l) as Ca	10.4	<150	11
Magnesium as Mg (mg/l)	10.7	<100	12
Sodium (mg/l) as Na	70	<200	77
Chloride (mg/l) as Cl	96	<200	106
Sulphate as SO <sub>4</sub> (mg/l)	56	<400	62
Nitrate as NO <sub>3</sub> <sup>-</sup> (mg/l)	<0.1	<20	<0.1
Fluoride (mg/l) as F	0.1	<1	0.1
Toxics		<TWQR	

TWQR = Target Water Quality Range

### 6.4.5 Potential Pollution Source Identification

Deterioration of groundwater quality on the site and in the immediate vicinity of the operations due to seepage from unlined facilities containing potential contamination sources (slurry and contaminated water).

### 6.5 Flora and Fauna

The study area was determined to be severely modified from the natural state. Images presented in Figure 3 present the current state of the study area. The area has been modified by existing activities and the biodiversity of the areas is low. A memo was compiled by 9eroSeven Consultants (Pty) Ltd in this regard and has been appended to this Report.



Figure 6-34: Current state of the study area

### 6.6 Sensitive Sites

The closest area which could possibly be classified as a wetland area is in Jackaroo Park (approximately 2 km away). Some graveyards exist in proximity to the proposed site but will not be affected by the operations.

#### 6-66.7 Socio-Economic Environment

Electrisurv is situated within the eMalahleni municipal area in the Nkangala District. The eMalahleni Local Municipality represents one of six (6) local municipalities in the Nkangala District.

The eMalahleni Municipality is strategically located in provincial context and in relation to the national transport network. It is situated in close proximity to the City of Johannesburg, City of Tshwane and Ekurhuleni Metropolitan Municipality in Gauteng, and it is connected to these areas by the N4 and N12 freeways and a railway network. These freeways converge in eMalahleni Municipality, from where the N4 extends to Nelspruit, the provincial capital and ultimately to Maputo in Mozambique. The N4 freeway and the railway line which runs parallel

with and adjacent to it from Gauteng to Mozambique constitute the Maputo Corridor. The corridor forms part of a transcontinental corridor initiative, aimed at linking Walvis Bay on the west coast of Africa with Maputo on the east coast, thereby creating strategic linkages for trade and tourism between Namibia, Botswana, South Africa and Mozambique.

The southern parts of the eMalahleni Municipality form part of the precinct referred to as the Energy Mecca of South Africa, due to its rich deposits of coal reserves and power stations such as Kendal, Matla, Duvha and Ga-Nala. The southward road and rail network connect the eMalahleni area to the Richards Bay and Maputo harbours, offering export opportunities for the coal reserves.

### **6.6-16.7.1 Demography**

According to the Statistic SA census taken in 2011, 395 466 people were recorded. The largest ethnic groups under eMalahleni Local Municipality is Black African with approximately 81.3%, Whites with approximately 15.7%, Coloureds with approximately 1.8%, Asians with approximately 0.9% and other with approximately 0.3%. Number of households equals to 119 874 (3.31 people per household).

### **6.6-26.7.2 Unemployment and employment**

Dependency and unemployment rates are very high in the area. The census done in 2011 found that approximately 190 662 people were economically active, with 138 548 of the economically active people being employed and 52 114 unemployed.

The relatively low-income levels are an indication of high poverty level and result in an increased dependency on social aid e.g. housing subsidies and child grants.

### **6.6-36.7.3 Spatial structure**

The eMalahleni Municipality can be described as an urban and rural area, consisting of large farms, dispersed urban settlements, coal mines and power stations. eMalahleni is seen as the main urban centre in the municipality, with the other activity nodes/towns in the municipal area represented by:

- ◆ Ogies and Phola;
- ◆ Ga-Nala and Thubelihle;
- ◆ Rietspruit;
- ◆ Van Dyksdrift; and
- ◆ Wilge.

#### **6-6-46.7.4 Business activities**

The primary business centre in eMalahleni is the eMalahleni Central Business District (CBD), which includes offices, retail, general business and commercial uses. There are also decentralised nodes in the eMalahleni area with mainly retail uses, like the Highveld Mall, Saveways Shopping Centre and Klipfontein Shopping Centre. The casino in eMalahleni (The Ridge) adjacent to the Highveld Mall offers a hotel, restaurants and entertainment centre.

#### **6-6-56.7.5 Industrial activities**

There are number of major industrial areas in eMalahleni, mostly concentrated in and around eMalahleni City. This also represents the largest concentration of industrial activity in the Nkangala District. Undermining, however, poses a major constraint to the expansion of these areas, which is problematic in view of the fact that there is a need for industrial land in eMalahleni, both in terms of land for heavy industries (approximately 20 to 50 ha) and for light industries, service industries and high-tech industries.

#### **6-6-66.7.6 Mining**

Mining occurs throughout the central and southern portions of the eMalahleni area, with large sections of the municipal area affected by shallow undermining and/or mineral rights. Many of the mines have closed down for a variety of reasons.

This has had a significant impact on the environment, resulting in sinkhole formation, subsidence, underground fires, and seepage of water and AMD from underground workings. It has also had a significant economic impact, with some of the mining towns closing down and people being retrenched.

#### **6-6-76.7.7 Electricity**

Due to the rich coal reserves in the eMalahleni Municipality, Eskom developed the Kendal, Ga-Nala, Matla, Wilge and Duvha power stations during the 1970's and 1980's to provide in future electricity needs. This has led to the establishment of towns at Ga- Nala, Thubelihle and Wilge and the growth of these townships. Wilge is no longer operational.

Kendal is the largest power station with capacity of 4 032 MW. The chimneys at the Duvha power station are the highest manmade structures in Africa. These smokestacks are each 300 m tall, 30 m higher than the Hillbrow tower in Johannesburg. Coal is a limited resource and there are plans to convert to gas in future to feed the power stations.

#### **6-76.8 Agriculture**

The non-urban areas of the eMalahleni Municipality consist mainly of farms and agricultural holdings. The agricultural holdings are found on the periphery of the urban settlements. In

terms of agriculture, stock farming (sheep and cattle) and maize farming occur through the area and especially along the river drainage basins.

### ~~6.7.1~~6.8.1 Economic profile

The eMalahleni economy is dominated by electricity as the main contributor to the GGP (Gross Geographic Product) of the area. The electricity sector dominates the local economy whilst the mining activities contribute significantly. The manufacturing and community services sectors are respectively the third and fourth most important sectors in the local economy.

### ~~6.7.2~~6.8.2 Electrism socio-economic contribution

- ◆ Training will be provided to employees resulting in an improvement of the local skills base;
- ◆ The local and national economy will be supported through the procurement of goods and services required by the mine.

## 7 IMPACT ASSESSMENT METHODOLOGY

The assessment of impacts is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The assessment will consider impacts arising from the proposed activities of the project both before and after the implementation of appropriate mitigation measures.

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- ◆ **Nature:** A brief written statement of the environmental aspect being impacted upon by a particular action or activity.
- ◆ **Extent:** The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale;
- ◆ **Duration:** Indicates what the lifetime of the impact will be;
- ◆ **Intensity:** Describes whether an impact is destructive or benign;
- ◆ **Probability:** Describes the likelihood of an impact actually occurring; and
- ◆ **Cumulative:** In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

*Table 7: Criteria to be used for the rating of impacts*



CRITERIA	DESCRIPTION			
<b>EXTENT</b>	<b>National (4)</b> The whole of South Africa	<b>Regional (3)</b> Provincial and parts of neighbouring provinces	<b>Local (2)</b> Within a radius of 2 km of the construction site	<b>Site (1)</b> Within the construction site
<b>DURATION</b>	<b>Permanent (4)</b> Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	<b>Long-term (3)</b> The impact will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	<b>Medium-term (2)</b> The impact will last for the period of the construction phase, where after it will be entirely negated	<b>Short-term (1)</b> The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
<b>INTENSITY</b>	<b>Very High (4)</b> Natural, cultural and social functions and processes are altered to extent that they permanently cease	<b>High (3)</b> Natural, cultural and social functions and processes are altered to extent that they temporarily cease	<b>Moderate (2)</b> Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	<b>Low (1)</b> Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
<b>PROBABILITY OF OCCURRENCE</b>	<b>Definite (4)</b> Impact will certainly occur	<b>Highly Probable (3)</b> Most likely that the impact will occur	<b>Possible (2)</b> The impact may occur	<b>Improbable (1)</b> Likelihood of the impact materialising is very low

**Table 8 Significance rating of classified impacts**

<b>Low impact (4 - 6 points)</b>	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
<b>Medium impact (7 - 9 points)</b>	Mitigation is possible with additional design and construction inputs.
<b>High impact (10 - 12 points)</b>	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
<b>Very high impact (13 - 16 points)</b>	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
<b>Status</b>	Denotes the perceived effect of the impact on the affected area.
<b>Positive (+)</b>	Beneficial impact.
<b>Negative (-)</b>	Deleterious or adverse impact.
<b>Neutral (/)</b>	Impact is neither beneficial nor adverse.

The suitability and feasibility of all proposed mitigation measures will be included in the assessment of significant impacts. This will be achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented. Mitigation measures identified as necessary will be included in an EMP (Appendix D) which forms part of the Basic Assessment Report.

## **8 IMPACT ASSESSMENT AND MITIGATION MEASURES**

This section aims to identify the potential positive and negative impacts (both biophysical and social) associated with the proposed project and considers the construction, operational and decommissioning phases (refer Table 9 to Table 11).

## 8.1 Construction Impacts

Table 9: Potential construction phase impacts

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION
<p><b>Soil Resources:</b></p> <ul style="list-style-type: none"> <li>◆ Alteration of topography due to stockpiling of material, debris, waste material on site and establishment of lay-down areas.</li> <li>◆ Contamination of soils due to spillage, leakage, incorrect handling of chemicals, oils, paints, fuel etc.</li> <li>◆ Exposed soil susceptible to erosion</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Low (-6)</b></p>	<ul style="list-style-type: none"> <li>◆ Existing construction lay-down area must be utilized.</li> <li>◆ All site disturbances must be limited to the areas where equipment will be installed.</li> <li>◆ All stockpiles must be restricted to designated areas.</li> <li>◆ Spill kits must be available on site to clean up spills and leaks.</li> <li>◆ All diesel-operated equipment must be provided with drip trays and should be maintained in good working order.</li> <li>◆ Used oil and grease from equipment must be disposed of at a hazardous waste site.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Short-term (-1)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Low (-4)</b></p>

<p><b>Water Resources:</b></p> <ul style="list-style-type: none"> <li>◆ Contamination of ground water due to spillage, leakage, incorrect storage and handling of chemicals; oils; lubricants, cement, fuels and other hazardous materials.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time.</li> <li>◆ The integrity of the impervious surface and bunded area must be inspected regularly and any maintenance work conducted must be recorded in a maintenance report.</li> <li>◆ All diesel-operated equipment must be provided with drip trays and should be maintained in good working order.</li> <li>◆ Spill kits must be available on site to clean up spills and leaks.</li> <li>◆ Employees should record and report any spillages to the responsible person.</li> <li>◆ Employees and contractors must be trained on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages.</li> <li>◆ An Emergency Preparedness and Response Plan must be developed and implemented should an incident occur.</li> <li>◆ Access to storage areas on site must be restricted to authorised employees only.</li> <li>◆ Washing of containers, equipment must be conducted at designated washing areas.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Low (-5)</b></p>
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		<ul style="list-style-type: none"> <li>◆ Train employees and contractors on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages.</li> </ul>	
<p><b>Flora &amp; Fauna:</b> Loss of natural vegetation and faunal habitat as a result of vegetation clearing</p>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Medium-term (-2) <b>Intensity:</b> Low (-1) <b>Probability:</b> Possible (-2)  <b>Significance: Low (-6)</b></p>	<ul style="list-style-type: none"> <li>◆ Existing construction lay-down area must be utilized.</li> <li>◆ All site disturbances must be limited to the areas where equipment will be installed.</li> <li>◆ All stockpiles must be restricted to designated areas.</li> </ul>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Short-term (-1) <b>Intensity:</b> Low (-1) <b>Probability:</b> Improbable (-1)  <b>Significance: Low (-4)</b></p>
<p><b>Air Quality:</b> The following activities have been identified as possible sources of fugitive dust during construction operations at the site:</p> <ul style="list-style-type: none"> <li>◆ Debris handling.</li> <li>◆ Emissions from construction machinery and equipment.</li> </ul>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Medium-term (-2) <b>Intensity:</b> Moderate (-2) <b>Probability:</b> Possible (-2)  <b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ Dust must be suppressed on the site, by, for example, the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off.</li> <li>◆ All site workers during construction will need to wear the appropriate PPE to avoid excessive exposure to dust particles.</li> <li>◆ Equipment used by the contractor must be maintained in good working order to prevent emission of fumes.</li> </ul>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Short-term (-1) <b>Intensity:</b> Low (-1) <b>Probability:</b> Improbable (-1)  <b>Significance: Low (-4)</b></p>
<p><b>Noise:</b> During the construction phase there might be an increase in noise pollution. The following possible sources of noise could potentially generate noise pollution during construction:</p> <ul style="list-style-type: none"> <li>◆ Construction equipment.</li> </ul>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Medium-term (-2) <b>Intensity:</b> Moderate (-2) <b>Probability:</b> Possible (-2)</p>	<ul style="list-style-type: none"> <li>◆ Maintain silencer units in vehicles and equipment in good working order.</li> <li>◆ Construction staff working in areas where the 8-hour ambient noise levels exceed 85 dBA must have the appropriate Personal Protective Equipment (PPE).</li> </ul>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Short-term (-1) <b>Intensity:</b> Low (-1) <b>Probability:</b> Improbable (-1)</p>

	<b>Significance: Medium (-7)</b>		<b>Significance: Low (-4)</b>
<p><b>Waste:</b></p> <p>Waste generation during the construction phase will have a negative impact on the environment, if not controlled adequately. Waste on site includes domestic waste, spent grinding material, mixed</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ The Contractor must familiarise themselves with the definitions of waste and the handling, storage, transport and disposal of waste as prescribed in the applicable environmental legislation.</li> <li>◆ General waste disposal bins should be made available for employees to use throughout the construction phase.</li> <li>◆ General waste will be disposed of at an approved waste disposal facility.</li> <li>◆ Evidence of correct disposal must be kept.</li> <li>◆ Building rubble must be disposed of at an appropriate licensed site.</li> <li>◆ Hazardous materials will be generated if there are spillages during construction and maintenance periods. This waste should be cleaned up using absorbent material provided in spill kits on site.</li> <li>◆ Absorbent materials used to clean up spillages should be disposed of in a separate hazardous waste bin.</li> <li>◆ The storage area for hazardous material must be concreted, bunded, covered, labelled and well ventilated.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Low (-6)</b></p>

		<ul style="list-style-type: none"> <li>◆ Provide employees with appropriate PPE for handling hazardous materials.</li> <li>◆ All hazardous waste will be disposed of in a registered hazardous waste disposal facility.</li> </ul>	
<p><b>Employment:</b></p> <p>Very limited opportunities exist for manual labour for unskilled tasks. In this case, the appointed contractor would be required to make use of local workers.</p>	<p><b>Extent:</b> Local (+2)  <b>Duration:</b> Short-term (+1)  <b>Intensity:</b> Low (+1)  <b>Probability:</b> Possible (+2)</p> <p><b>Significance: Low (+6)</b></p>	<ul style="list-style-type: none"> <li>◆ All labour (skilled and unskilled) and contractors should be sourced locally where possible.</li> <li>◆ Recruitment at the construction site will not be allowed.</li> </ul>	<p><b>Extent:</b> Local (+2)  <b>Duration:</b> Short-term (+1)  <b>Intensity:</b> Low (+1)  <b>Probability:</b> Possible (+2)</p> <p><b>Significance: Low (+6)</b></p>

## 8.2 Operational Impacts

Table 10: Potential operational phase impacts

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION
<p><b>Soils Resources:</b></p> <ul style="list-style-type: none"> <li>◆ Contamination of soils due to spillage, leakage, incorrect storage and handling of chemicals; oils; lubricants, cement, fuels and other hazardous materials.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ Spill kits must be available on site to clean up spills and leaks.</li> <li>◆ All diesel-operated equipment must be provided with drip trays and should be maintained in good working order.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Medium (-6)</b></p>

		<ul style="list-style-type: none"> <li>◆ Used oil and grease from equipment must be disposed of at a hazardous waste site.</li> </ul>	
<p><b>Water Resources:</b></p> <p>Contamination of ground water due to spillage, leakage, incorrect storage and handling of chemicals; oils; lubricants, cement, fuels and other hazardous materials.</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ Bund or contain all dirty and waste containment areas, reuse or recycle where possible.</li> <li>◆ Annual inspections of PCDs</li> <li>◆ GNR 704 compliance</li> <li>◆ Water quality monitoring of the River upstream and downstream of the Project site.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Medium (-6)</b></p>
<p><b>Flora &amp; Fauna:</b></p> <p>Impacts of operational activities on fauna.</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ Minimise noise to limit its impact on sensitive fauna.</li> <li>◆ Operational areas to be demarcated and workers to stay within these areas.</li> <li>◆ Create awareness of the importance of fauna and ecosystem functioning.</li> <li>◆ Workers to stay within demarcated operational areas.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Medium (-6)</b></p>
<p><b>Air Quality:</b></p> <p>The following activities have been identified as sources of fugitive dust during operations at the site:</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p>	<ul style="list-style-type: none"> <li>◆ Dust must be suppressed on the site, by, for example, the regular application of water. Water used for this purpose must be used in</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p>



<ul style="list-style-type: none"> <li>◆ Emissions from handling of coal material.</li> <li>◆ Traffic on gravel roads</li> </ul>	<p><b>Significance: Medium (-8)</b></p>	<p>quantities that will not result in the generation of run-off.</p> <ul style="list-style-type: none"> <li>◆ All site workers during operations will need to wear the appropriate PPE to avoid excessive exposure to dust particles.</li> <li>◆ Equipment used by the operator must be maintained in good working order to prevent emission of fumes.</li> </ul>	<p><b>Significance: Medium (-6)</b></p>
<p><b>Noise:</b></p> <p>During the operational phase there might be an increase in noise pollution. The following possible sources of noise could potentially generate noise pollution during operations:</p> <ul style="list-style-type: none"> <li>◆ Operational equipment and vehicles.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-8)</b></p>	<ul style="list-style-type: none"> <li>◆ Maintain silencer units in vehicles and equipment in good working order.</li> <li>◆ Operational staff working in areas where the 8-hour ambient noise levels exceed 85 dBA must have the appropriate Personal Protective Equipment (PPE).</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Medium (-6)</b></p>
<p><b>Waste:</b></p> <p>Waste generation during the operational phase will have a negative impact on the environment, if not controlled adequately. Waste on site includes domestic waste, spent grinding material, mixed</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-8)</b></p>	<ul style="list-style-type: none"> <li>◆ The Operator must familiarise themselves with the definitions of waste and the handling, storage, transport and disposal of waste as prescribed in the applicable environmental legislation.</li> <li>◆ General waste disposal bins should be made available for</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (-3)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Medium (-6)</b></p>

		<p>employees to use throughout the construction phase.</p> <ul style="list-style-type: none"> <li>◆ General waste will be disposed of at an approved waste disposal facility.</li> <li>◆ Evidence of correct disposal must be kept.</li> <li>◆ Hazardous materials will be generated if there are spillages during construction and maintenance periods. This waste should be cleaned up using absorbent material provided in spill kits on site.</li> <li>◆ Absorbent materials used to clean up spillages should be disposed of in a separate hazardous waste bin.</li> <li>◆ The storage area for hazardous material must be concreted, bunded, covered, labelled and well ventilated.</li> <li>◆ Provide employees with appropriate PPE for handling hazardous materials.</li> <li>◆ All hazardous waste will be disposed of in a registered hazardous waste disposal facility.</li> </ul>	
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<p><b>Employment:</b></p> <p>Extremely limited opportunities exist for manual labour for unskilled tasks using local workers where feasible.</p>	<p><b>Extent:</b> Local (+2)  <b>Duration:</b> Long-term (+3)  <b>Intensity:</b> Low (+1)  <b>Probability:</b> Possible (+2)</p> <p><b>Significance: Medium (+8)</b></p>	<ul style="list-style-type: none"> <li>◆ All labour (skilled and unskilled) and contractors should be sourced locally where possible.</li> <li>◆ Recruitment at the construction site will not be allowed.</li> </ul>	<p><b>Extent:</b> Local (+2)  <b>Duration:</b> Long-term (+3)  <b>Intensity:</b> Low (+1)  <b>Probability:</b> Possible (+2)</p> <p><b>Significance: Medium (+8)</b></p>
<p>Cumulative Impact:</p>			
<p><b>Water resources:</b></p> <p>Impacts as a result of leakage of wastewater and final Iso-octanol product into ground water resources.</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (3)</p> <p><b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Low (-6)</b></p>	<ul style="list-style-type: none"> <li>• The bunded area must be inspected regularly and any maintenance work conducted must be recorded in a maintenance report.</li> <li>• Absorbent materials used to clean up spillages should be disposed of in a separate hazardous waste bin.</li> <li>• Employees must be provided with appropriate PPE and spill kits for handling hazardous materials.</li> <li>• Train employees on the correct handling of spillages and precautionary measures that need to be implemented to minimize potential spillages.</li> <li>• Emergency plans and procedures should be</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Long-term (3)</p> <p><b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Low (-6)</b></p>

		<p>implemented in the event of spillage.</p> <p>All incidents must be reported to the responsible officer as soon as it occurs.</p>	
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### 8.3 Decommissioning Impacts

At this point of the project planning process, the necessity for and timing of decommissioning of the proposed project is not known. If decommissioning of the coal beneficiation plant does occur, all appropriate legal procedures will be followed e.g. giving notice to the relevant authorities. Furthermore, an application in terms of Listing Notice 1 of the EIA Regulations (2014) as amended for the relevant Environmental Authorisation will be lodged if applicable. However, like construction impacts, de-commissioning impacts are inherently temporary in duration.

Table 11: Potential decommissioning phase impacts

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION
<p><b>Soil Resources:</b></p> <ul style="list-style-type: none"> <li>◆ Contamination of soils due to spillage, leakage, incorrect storage and handling of chemicals; oils; lubricants, cement, fuels and other hazardous materials.</li> <li>◆ Impact of land capability.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Low (-6)</b></p>	<ul style="list-style-type: none"> <li>◆ Existing lay-down areas must be utilized.</li> <li>◆ All stockpiles must be restricted to designated areas.</li> <li>◆ Spill kits must be available on site to clean up spills and leaks.</li> <li>◆ All diesel-operated equipment must be provided with drip trays</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Short-term (-1)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Low (-4)</b></p>

		<p>and should be maintained in good working order.</p> <ul style="list-style-type: none"> <li>◆ Used oil and grease from equipment must be disposed of at a hazardous waste site.</li> <li>◆ Topsoil replacement should be done systematically, slopes should be kept low to prevent run-off and erosion.</li> <li>◆ Avoid compaction of the topsoil.</li> </ul>	
<p><b>Water Resources:</b></p> <ul style="list-style-type: none"> <li>◆ Contamination of soils due to spillage, leakage, incorrect storage and handling of chemicals; oils; lubricants, cement, fuels and other hazardous materials.</li> <li>◆ Restoration of water quality and quantity.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Low (-6)</b></p>	<ul style="list-style-type: none"> <li>◆ The rehabilitated site will have a positive impact on water resources.</li> <li>◆ Disturbed areas should be vegetated and contoured to allow for good drainage.</li> <li>◆ Regular inspection and monitoring of water quality should be implemented for a period of at least 3 years post operations to determine if any negative residual impacts have occurred.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Short-term (-1)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Low (-4)</b></p>
<p><b>Flora &amp; Fauna:</b></p> <ul style="list-style-type: none"> <li>◆ Destruction of vegetation.</li> <li>◆ Establishment and increase in alien vegetation.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Possible (-2)</p>	<ul style="list-style-type: none"> <li>◆ Reinstatement of vegetation cover through rehabilitation in disturbed areas.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Short-term (-1)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p>

	<b>Significance: Low (-6)</b>	<ul style="list-style-type: none"> <li>◆ Care must be taken no to destroy rehabilitated areas.</li> <li>◆ All alien plant species should be removed before they become established and bear seed or flowers <u>(refer Appendix D)</u>.</li> </ul>	<b>Significance: Low (-4)</b>
<p><b>Air Quality:</b></p> <p>The following activities have been identified as possible sources of fugitive dust during construction operations at the site:</p> <ul style="list-style-type: none"> <li>◆ Debris handling.</li> <li>◆ Emissions from rehabilitation machinery and equipment.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ Dust must be suppressed on the site, by, for example, the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off.</li> <li>◆ All site workers during construction will need to wear the appropriate PPE to avoid excessive exposure to dust particles.</li> <li>◆ Equipment used by the contractor must be maintained in good working order to prevent emission of fumes.</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Short-term (-1)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Low (-4)</b></p>
<p><b>Noise:</b></p> <p>During the decommissioning phase there might be an increase in noise pollution. The following possible sources of noise could potentially generate noise pollution during construction:</p>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Medium-term (-2)  <b>Intensity:</b> Moderate (-2)  <b>Probability:</b> Possible (-2)</p> <p><b>Significance: Medium (-7)</b></p>	<ul style="list-style-type: none"> <li>◆ Maintain silencer units in vehicles and equipment in good working order.</li> <li>◆ Rehabilitation staff working in areas where the 8-hour ambient noise levels exceed 85 dBA must</li> </ul>	<p><b>Extent:</b> Site (-1)  <b>Duration:</b> Short-term (-1)  <b>Intensity:</b> Low (-1)  <b>Probability:</b> Improbable (-1)</p> <p><b>Significance: Low (-4)</b></p>

<p>◆ Rehabilitation equipment.</p>		<p>have the appropriate Personal Protective Equipment (PPE).</p>	
<p><b>Waste:</b> Waste generation during the decommissioning phase will have a negative impact on the environment, if not controlled adequately. Waste on site includes domestic waste, spent grinding material, mixed</p>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Medium-term (-2) <b>Intensity:</b> Moderate (-2) <b>Probability:</b> Possible (-2)  <b>Significance: Medium (-7)</b></p>	<p>◆ The Contractor must familiarise themselves with the definitions of waste and the handling, storage, transport and disposal of waste as prescribed in the applicable environmental legislation.</p> <p>◆ General waste disposal bins should be made available for employees to use throughout the construction phase.</p> <p>◆ General waste will be disposed of at an approved waste disposal facility.</p> <p>◆ Evidence of correct disposal must be kept.</p> <p>◆ Building rubble must be disposed of at an appropriate licensed site.</p> <p>◆ Hazardous materials will be generated if there are spillages during construction and maintenance periods. This waste should be cleaned up using absorbent material provided in spill kits on site.</p> <p>◆ Absorbent materials used to clean up spillages should be</p>	<p><b>Extent:</b> Site (-1) <b>Duration:</b> Medium-term (-2) <b>Intensity:</b> Low (-1) <b>Probability:</b> Possible (-2)  <b>Significance: Low (-6)</b></p>

		<p>disposed of in a separate hazardous waste bin.</p> <ul style="list-style-type: none"> <li>◆ The storage area for hazardous material must be concreted, bunded, covered, labelled and well ventilated.</li> <li>◆ Provide employees with appropriate PPE for handling hazardous materials.</li> <li>◆ All hazardous waste will be disposed of in a registered hazardous waste disposal facility.</li> </ul>	
<p><b>Employment:</b> Very limited opportunities exist for manual labour for unskilled tasks. In this case, the appointed contractor would be required to make use of local workers.</p>	<p><b>Extent:</b> Local (+2) <b>Duration:</b> Short-term (+1) <b>Intensity:</b> Low (+1) <b>Probability:</b> Possible (+2)  <b>Significance: Low (+6)</b></p>	<ul style="list-style-type: none"> <li>◆ All labour (skilled and unskilled) and contractors should be sourced locally where possible.</li> </ul> <p>Recruitment at the construction site will not be allowed.</p>	<p><b>Extent:</b> Local (+2) <b>Duration:</b> Short-term (+1) <b>Intensity:</b> Low (+1) <b>Probability:</b> Possible (+2)  <b>Significance: Low (+6)</b></p>



## 9 ENVIRONMENTAL IMPACT ASSESSMENT

This Basic Assessment study for the proposed coal beneficiation plant has been compiled in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (herein referred to as NEMA), as read with the amended EIA Regulations of GN R983, GN R984 and R985.

This Basic Assessment study provides an assessment of both the benefits and potential negative impacts anticipated because of the proposed project. From the heritage perspective, the identified impacts are low given that the site has been historically disturbed by mining and industrial activities. The biodiversity specialist indicated that the construction of the proposed project will result in various impacts of low significance to the flora and fauna occurring in the vicinity of the new infrastructure, which can be reduced to negligible levels through the application of mitigation measures. Given the presence of existing habitat degradation in places and significant levels of disturbance, it is anticipated that the proposed project can be constructed within the project area with acceptable levels of impact. Both positive and negative environmental impacts were identified and assessed for the proposed development.

It can be concluded from the findings conclude that there are **no environmental fatal flaws** that could prevent Electrisurv from continuing with the implementation of the proposed coal beneficiation plant project, provided that the recommended mitigation and management measures contained in the preceding chapter and Environmental Management Programme (EMP) are implemented (refer to Appendix D). ***Thus, from all the findings of this report, it is recommended that Environmental Authorisation be granted for the proposed coal beneficiation plant description provided in Chapter 3.***

The EMP would be used to ensure compliance with management measures. The implementation of this EMP for the entire life cycle of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project. This is the view and recommendation of the Environmental Assessment Practitioner based on the findings of this Basic Assessment study.

Positive impacts associated with construction will include:

- ◆ Local economic growth and development;
- ◆ Employment opportunities and skills development; and
- ◆ Improved road networks.

It is perceived that these impacts will have a sustainable benefit. It must be ensured that the construction phase, in no way, hampers the health of any of the ecological systems or items of heritage significance identified on site, and that post-construction rehabilitation leaves the surrounding environments in an as good, if not better, state. After the construction phase of the project, the contractors must ensure that all hazardous materials are removed from the site and that Rehabilitation Plan is drawn up and approved by the Project Manager and the ECO in according to the requirements of the EMP.

The Project Manager and Contractor is to ensure that an Alien Plant Management Programme ([refer to Appendix D for additional information](#)) is drawn up and approved by the Project Manager and the ECO and implemented during the construction phase and must be maintained during the construction defects/liability period. It is also critically important that drainage lines are kept free of alien plant infestation.

Kwadiwa Africa (Pty) Ltd recommends that the proposed road construction be considered for approval subject to the following general recommendations:

- ◆ EMPr for this application be made a binding document for the contractors and managers on site;
- ◆ An independent ECO should be present during construction to monitor the implementation of the EMPr and the environmental authorisation once issued;
- ◆ Compliance with the mitigation measures outlined in this BA report and EMPr;
- ◆ Development should be done in a manner that does not further alter the natural watercourses (rivers and wetlands) and their catchments. This includes protecting and maintaining current wetlands before additional water inputs can be implemented.
- ◆ All sensitive areas such as wetlands or ridges should be avoided and not disturbed without the appropriate authorisations.
- ◆ Adequate measures must be put in place to prevent polluted runoff water from entering the soil, thus preventing surface and groundwater pollution;
- ◆ All relevant legislation and requirement of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
- ◆ In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of section 30 of NEMA.
- ◆ Should heritage features, archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- ◆ In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of NEMA.
- ◆ The site after construction must be rehabilitated back to its original state as per the Environmental Management Programme, if not possible to a state that conforms to the principles of sustainable development.

## **10 REFERENCES**

Department of Mineral Resources, Beneficiation Strategy for the Minerals Industry, June 2011.

National Environmental Management: Air Quality Act: Highveld Priority Area Air Management Plan ,2011

Nkangala District Municipality Integrated Development Plan 2017 (Stats SA, 2011).

Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations

## **APPENDIX A - PLANS**

Plan 1 – Regional setting

Plan 2 – Local setting

Plan 3 – Proposed project layout

## **Appendix B – EAP Curriculum Vitae**

### Appendix C - Environmental Management Programme

Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards
Soil Resources	Water management pipelines exceeding 1000 m in length with an internal diameter of more than 0.36m and a peak throughput of 120 litres per second	2000m <sup>2</sup>	◆ Alteration of topography due to stockpiling of material, debris, waste material on site and establishment of lay-down areas	Construction	Extent: Site (-1) Duration: Long-term (-3) Intensity: LOW (-1) Probability: Possible (-2)	<ul style="list-style-type: none"> <li>◆ Existing construction lay-down area must be utilized.</li> <li>◆ All site disturbances must be limited to the areas where equipment will be installed.</li> <li>◆ All stockpiles must be restricted to designated areas.</li> <li>◆ Spill kits must be available on site to clean up spills and leaks.</li> <li>◆ All diesel-operated equipment must be provided with drip trays and should be maintained in good working order.</li> <li>◆ Used oil and grease from equipment must be disposed of at a hazardous waste site.</li> <li>◆ Topsoil replacement should be done systematically, slopes should be kept low to prevent run-off and erosion.</li> <li>◆ Avoid compaction of the topsoil.</li> <li>◆ <u>Rehabilitation of the site provides an opportunity to improve the land capability of the site and restore the land use from a heavily disturbed "Mining extraction sites" use to agricultural use which is compatible with surrounding areas</u></li> </ul>	Preventative & Corrective	Extent: Site (-1) Duration: Long-term (-3) Intensity: LOW (-1) Probability: Improbable (-1)  Significance: Medium (-6)	Conservation of Agricultural Resources Act (Act 43 of 1983)
	Pollution control dam (PCD) will be constructed	2000m <sup>2</sup>	◆ Contamination of soils due to spillage, leakage, incorrect handling of chemicals, oils, paints, fuel etc.	Construction Operational Decommissioning	Significance: Medium (-7)				
	Diesel storage on site up to 100 cubic metres	100m <sup>2</sup>	◆ Exposed soil susceptible to erosion	Construction					
	Development of internal transport roads wider than 8m in width	1.6ha	◆ <u>Impact of land capability and alteration of the land use</u>	Decommissioning					
	Widening of internal transport roads	1.6ha							

Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards
Water Resources	Water management pipelines exceeding 1000 m in length with an internal diameter of more than 0.36m and a peak throughput of 120 litres per second	2000m <sup>2</sup>	Contamination of ground water due to spillage, leakage, incorrect storage and handling of chemicals; oils; lubricants, cement, fuels and other hazardous materials.	Construction Operational Decommissioning	Extent: Site (-1) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability: Possible (-2)  Significance: Medium (-7)	<ul style="list-style-type: none"> <li>◆ All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time.</li> <li>◆ The integrity of the impervious surface and bunded area must be inspected regularly and any maintenance work conducted must be recorded in a maintenance report.</li> <li>◆ All diesel-operated equipment must be provided with drip trays and should be maintained in good working order.</li> <li>◆ Spill kits must be available on site to clean up spills and leaks.</li> <li>◆ Employees should record and report any spillages to the responsible person.</li> <li>◆ Employees and contractors must be trained on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages.</li> <li>◆ An Emergency Preparedness and Response Plan must be developed and implemented should an incident occur.</li> <li>◆ Access to storage areas on site must be restricted to</li> </ul>	Preventative & Corrective	Extent: Site (-1) Duration: Medium-term (-2) Intensity: LOW (-1) Probability: Improbable (-1)  Significance: Low (-5)	National Water Act (Act 36 of 1998)
	Pollution control dam (PCD) will be constructed	2000m <sup>2</sup>							
	Diesel storage on site up to 100 cubic metres	100m <sup>2</sup>							
	Development of internal transport roads wider than 8m in width	1.6ha							
	Widening of internal transport roads	1.6ha							

Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards
						<p>authorised employees only.</p> <ul style="list-style-type: none"> <li>◆ Washing of containers, equipment must be conducted at designated washing areas.</li> <li>◆ Train employees and contractors on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages.</li> <li>◆ Bund or contain all dirty and waste containment areas, reuse or recycle where possible.</li> <li>◆ Annual inspections of PODs</li> <li>◆ GNR 704 compliance</li> <li>◆ Water quality monitoring of the River upstream and downstream of the Project site.</li> </ul>			
			<ul style="list-style-type: none"> <li>◆ Restoration of water quality and quantity.</li> </ul>	Decommissioning	<p>Extent: Site (-1)                      Duration: Medium-term (-2)                      Intensity: LOW (-1)                      Probability: Possible (-2)                      Significance: Low (-6)</p>	<ul style="list-style-type: none"> <li>◆ The rehabilitated site will have a positive impact on water resources.</li> <li>◆ Disturbed areas should be vegetated and contoured to allow for good drainage.</li> <li>◆ Regular inspection and monitoring of water quality should be implemented for a period of at least 3 years post operations to determine if any negative residual impacts have occurred.</li> </ul>	Corrective	<p>Extent: Site (-1)                      Duration: Short-term (-1)                      Intensity: LOW (-1)                      Probability: Improbable (-1)                      Significance: Low (-4)</p>	
Flora & Fauna	Water management pipelines exceeding 1000 m in length with an internal	2000m <sup>2</sup>	Loss of natural vegetation and faunal habitat as a result of vegetation clearing	Construction	<p>Extent: Site (-1)                      Duration: Medium-term</p>	<ul style="list-style-type: none"> <li>◆ Existing construction lay-down area must be utilized.</li> <li>◆ All site disturbances must be limited to the areas</li> </ul>	Preventative & Corrective	<p>Extent: Site (-1)                      Duration: Short-term (-1)</p>	National Environmental Management Biodiversity



Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards							
	diameter of more than 0.36m and a peak throughput of 120 litres per second	2000m <sup>2</sup>	Impacts of operational activities on fauna.	Operational	(-2) Intensity: LOW (-1) Probability: Possible (-2)  Significance: Low (-6)	where equipment will be installed. ♦ All stockpiles must be restricted to designated areas. ♦ Minimise noise to limit its impact on sensitive fauna. ♦ Operational areas to be demarcated and workers to stay within these areas. ♦ Create awareness of the importance of fauna and ecosystem functioning. ♦ Workers to stay within demarcated operational areas. ♦ Reinstatement of vegetation cover through rehabilitation in disturbed areas. ♦ Care must be taken not to destroy rehabilitated areas. ♦ All alien plant species should be removed before they become established and bear seed or flowers (refer Appendix D).	Preventative	Intensity: LOW (-1) Probability: Improbable (-1)  Significance: Low (-4)	Act (Act. 10 of 2004)							
	Pollution control dam (PCD) will be constructed	100m <sup>2</sup>														
	Diesel storage on site up to 100 cubic metres	1.6ha														
	Development of internal transport roads wider than 8m in width	1.6ha														
	Widening of internal transport roads										♦ Destruction of vegetation. ♦ Establishment and increase in alien vegetation.	Decommissioning	Extent: Site (-1) Duration: Long-term (-3) Intensity: LOW (-1) Probability: Possible (-2)  Significance: Medium (-7)		Extent: Site (-1) Duration: Long-term (-3) Intensity: LOW (-1) Probability: Improbable (-1)  Significance: Medium (-6)	
Air quality	Development of internal transport roads wider than 8m in width	1.6ha	The following activities have been identified as possible sources of fugitive dust during construction operations at the site: ♦ Debris handling. ♦ Emissions from construction machinery and equipment.	Construction	Extent: Site (-1) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability: Possible (-2)	♦ Dust must be suppressed on the site, by, for example, the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off.	Preventative Preventative	Extent: Site (-1) Duration: Short-term (-1) Intensity: LOW (-1) Probability: Improbable (-1)	National ambient air quality standards (GNR 1210 of 2009)							
	Widening of internal transport roads	1.6ha														

Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards
			<p>The following activities have been identified as sources of fugitive dust during operations at the site:</p> <ul style="list-style-type: none"> <li>◆ Emissions from handling of coal material.</li> <li>◆ Traffic on gravel roads</li> </ul>	Operational	<p>Significance: Medium (-7)</p> <p>Extent: Site (-1) Duration: Long-term (-3) Intensity: Moderate (-2) Probability: Possible (-2)</p> <p>Significance: Medium (-8)</p>	<ul style="list-style-type: none"> <li>◆ All site workers during construction will need to wear the appropriate PPE to avoid excessive exposure to dust particles.</li> <li>◆ Equipment used by the contractor must be maintained in good working order to prevent emission of fumes.</li> </ul>		<p>Significance: Low (-4)</p> <p>Extent: Site (-1) Duration: Long-term (-3) Intensity: LOW (-1) Probability: Improbable (-1)</p>	
			<p>The following activities have been identified as possible sources of fugitive dust during construction operations at the site:</p> <ul style="list-style-type: none"> <li>◆ Debris handling.</li> <li>◆ Emissions from rehabilitation machinery and equipment.</li> </ul>	Decommissioning	<p>Extent: Site (-1) Duration: Medium-term (-2) Intensity: Moderate (-2) Probability: Possible (-2)</p> <p>Significance: Medium (-7)</p>			<p>Significance: Medium (-6)</p> <p>Extent: Site (-1) Duration: Short-term (-1) Intensity: LOW (-1) Probability: Improbable (-1)</p> <p>Significance: Low (-4)</p>	
Noise	<p>Water management pipelines exceeding 1000 m in length with an internal diameter of more than 0.36m and a peak throughput of 120 litres per second</p> <p>Pollution control dam (PCD) will be constructed</p> <p>Diesel storage on site up to 100 cubic metres</p> <p>Development of internal transport</p>	<p>2000m<sup>2</sup></p> <p>2000m<sup>2</sup></p> <p>100m<sup>2</sup></p> <p>1.6ha</p>	<p>During the construction phase there might be an increase in noise pollution. The following possible sources of noise could potentially generate noise pollution during construction:</p> <ul style="list-style-type: none"> <li>◆ Construction equipment/Operational equipment/Decommissioning equipment</li> </ul>	<p>Construction</p> <p>Operational</p> <p>Decommissioning</p>	<p>Extent: Site (-1) Duration: Long-term (-3) Intensity: Moderate (-2) Probability: Possible (-2)</p> <p>Significance: Medium (-8)</p>	<ul style="list-style-type: none"> <li>◆ Maintain silencer units in vehicles and equipment in good working order.</li> <li>◆ Construction staff working in areas where the 8-hour ambient noise levels exceed 85 dBA must have the appropriate Personal Protective Equipment (PPE).</li> </ul>	Preventative	<p>Extent: Site (-1) Duration: Long-term (-3) Intensity: LOW (-1) Probability: Improbable (-1)</p> <p>Significance: Medium (-6)</p>	Noise control regulations in terms of section 25 of the Environment Conservation Act, 1989 (act no. 73 of 1989)

Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards
	roads wider than 8m in width  Widening of internal transport roads	1.6ha							
Waste	Water management pipelines exceeding 1000 m in length with an internal diameter of more than 0.36m and a peak throughput of 120 litres per second  Pollution control dam (PCD) will be constructed  Diesel storage on site up to 100 cubic metres  Development of internal transport roads wider than 8m in width  Widening of internal transport roads	2000m <sup>2</sup>  2000m <sup>2</sup>  100m <sup>2</sup>  1.6ha  1.6ha	Waste generation during the respective phase will have a negative impact on the environment, if not controlled adequately. Waste on site includes domestic waste, spent grinding material, mixed	Construction  Operational  Decommissioning	Extent: Site (-1) Duration: Long-term (-3) Intensity: Moderate (-2) Probability: Possible (-2)  Significance: Medium (-8)	<ul style="list-style-type: none"> <li>◆ The Contractor/operator must familiarise themselves with the definitions of waste and the handling, storage, transport and disposal of waste as prescribed in the applicable environmental legislation.</li> <li>◆ General waste disposal bins should be made available for employees to use throughout the construction phase.</li> <li>◆ General waste will be disposed of at an approved waste disposal facility.</li> <li>◆ Evidence of correct disposal must be kept.</li> <li>◆ Building rubble must be disposed of at an appropriate licensed site.</li> <li>◆ Hazardous materials will be generated if there are spillages during construction and maintenance periods. This waste should be cleaned up using absorbent material provided in spill kits on site.</li> <li>◆ Absorbent materials used to clean up spillages should be disposed of in a separate hazardous waste bin.</li> </ul>	Preventative	Extent: Site (-1) Duration: Long-term (-3) Intensity: Low (-1) Probability: Improbable (-1)  Significance: Medium (-6)	National Environmental Management Waste Act (Act 59 of 2008)

Aspects	Activities	Size and Scale of Disturbance	Potential Impact	Phase	Significance if not Mitigated	Mitigation Measures	Mitigation Type	Significance if Mitigated	Compliance with Standards
						<ul style="list-style-type: none"> <li>◆ The storage area for hazardous material must be concreted, bunded, covered, labelled and well ventilated.</li> <li>◆ Provide employees with appropriate PPE for handling hazardous materials.</li> <li>◆ All hazardous waste will be disposed of in a registered hazardous waste disposal facility.</li> </ul>			
Employment	N/A	N/A	Very limited opportunities exist for manual labour for unskilled tasks. In this case, the appointed contractor would be required to make use of local workers.	Construction Decommissioning	Extent: Local (+2) Duration: Short-term (+1) Intensity: Low (+1) Probability: Possible (+2)  Significance: Low (+6)	<ul style="list-style-type: none"> <li>◆ All labour (skilled and unskilled) and contractors should be sourced locally where possible.</li> <li>◆ Recruitment at the construction site will not be allowed.</li> </ul>	Preventative	Extent: Local (+2) Duration: Short-term (+1) Intensity: LOW (+1) Probability: Possible (+2)  Significance: Low (+6)	Social and Labour Plan
			Extremely limited opportunities exist for manual labour for unskilled tasks using local workers where feasible.	Operational	Extent: Local (+2) Duration: Long-term (+3) Intensity: LOW (+1) Probability: Possible (+2)  Significance: Medium (+8)			Extent: Local (+2) Duration: Long-term (+3) Intensity: LOW (+1) Probability: Possible (+2)  Significance: Medium (+8)	

## **APPENDIX D – VEGETATION AND ALIEN INVASIVE PLANT MANAGEMENT PLAN**

The establishment of natural vegetation is a necessary component of the decommissioning and rehabilitation phase. The overall objectives for the establishment of natural vegetation of reshaped areas are to:

- ◆ Prevent erosion;
  - ◆ Avoid soil loss;
  - ◆ Restore the land to the agreed land capability;
  - ◆ Reduce sedimentation into aquatic ecosystems such as rivers and streams;
  - ◆ Re-establish eco-system processes (succession) to ensure that a sustainable land use can be established without requiring excessive fertiliser additions; and
  - ◆ Restore the biodiversity of the area as far as possible.
- In order to ensure vegetation establishment, the following should be done:
- ◆ Rehabilitated areas should be properly prepared;
  - ◆ Woody patch cavities should be in-filled with suitable growth medium; and
  - ◆ Growth properties should be improved by the addition of organic matter and fertilizer, where required.

Alien invasive species tend to out-compete the indigenous vegetation; this is due to the fact that they are vigorous growers that are adaptable and able to invade a wide range of ecological niches (Bromilow, 1995). They are tough, can withstand unfavourable conditions and are easily spread which is detrimental to rehabilitation of vegetation. Alien Invasive Plants (AIPs) directly compete with rehabilitating vegetation and could result in increasing costs of revegetation in the long term. In addition, various invasive species are required by law to be removed. Methods should be used that are appropriate for the species concerned, as well as to the ecosystem in which they occur. When performing the controlling methodology for weeds and invaders, damage to the environment must be limited to a minimum. One of the most cost-effective and sustainable options is to utilise biocontrol. Biocontrol makes use of a natural enemy of the AIP in its native country to help reduce the population in the country it invades (see the Agricultural Research Council website for more information on Biocontrol). If mechanical and chemical means need to be used, AIPs must be continually removed after rehabilitation has occurred for at least three growing seasons to ensure the seed bank is depleted. Continual monitoring will be needed for seeds that are likely to be blown in from adjacent areas.

- ◆ There must be no planting of alien plants anywhere within the project area;
- ◆ The transportation of soils or other substrates infested with alien species should be strictly controlled;
- ◆ Benefits to local communities as a result of the alien plant control programme should be maximised by not only ensuring that local labour is employed, but by also ensuring that cleared alien trees are treated as a valuable wood resource that can be utilised; and
- ◆ It is considered essential that appropriate veld management (particularly appropriate grazing levels and burning frequencies) should be applied to areas of secondary indigenous vegetation (e.g. secondary grassland of historically cultivated areas), and especially the grassland and wetland vegetation of untransformed habitats. Appropriate grazing levels and burning frequencies will not only ensure that good vegetation condition and biodiversity levels are maintained but will also serve to control the spread and increase in cover of palatable alien species such as *Paspalum dilatatum*.

In order to manage alien invasive species the following should be done:

- ◆ Mechanical methods including tree felling, hand pulling & ring barking should be implemented;
- ◆ Chemical control methods including selective/ non-selective, contact/ systemic herbicides as per regulations should be implemented;
- ◆ Category 1(a), & 1(b) of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) listed species should be target for eradication;
- ◆ Preventative measures should be undertaken within the mine site area where natural vegetation occurs to combat bush encroachment and invasion of alien species which may result in the deterioration of natural resources; and
- ◆ Regular vegetation monitoring of the site should take place.