Application for an Environmental Authorisation for the Proposed North Block Complex (Pty) Ltd Paardeplaats Community Residential Area on a Remainder of Portion 13 of Farm Paardeplaats 380JT in Belfast, eMakhazeni Local Municipality, Mpumalanga Province

Draft Basic Assessment Report

MDARDLEA Reference Number: To be confirmed

Report Prepared for

North Block
Complex (Pty) Ltd
NBC Colliery

Report Prepared by

GEOLOGICAL CONSULTING SERVICES
PTY (LTD)

October 2021

Title:	*Draft Basic Assessment Report for the Application for an Environmental Authorisation for the Proposed North Block Complex (Pty) Ltd Paardeplaats Community Residential Area, on a Remainder of Portion 13 of Farm Paardeplaats 380JT in Belfast, eMakhazeni Local Municipality, Mpumalanga Province*
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Executive Summary

Introduction

North Block Complex (Pty) Ltd (NBC) is a subsidiary of Universal Coal Energy Holdings SA (UCEHSA), which is owned by Universal Coal Plc. NBC consists of three (3) mining sections namely the Eerstelingsfontein Section, the Glisa Section, and the Paardeplaats Section. NBC is currently mining coal via opencast methods on Portion 30 of the Farm Paardeplaats 380 JT and intends to expand its opencast mining activities onto Portion 29 of the Farm Paardeplaats 380 JT, which fall within the approved Mining Right (MP 30/5/1/2/2/10090 MR) area. In order to expand mining operations onto Portion 29, NBC is proposing to develop a residential area for the relocation of the Paardeplaats Community.

The occupiers of Paardeplaats farm Portion 29 and 30 under Mining Right MP 30/5/1/2/2/10090 MR. Held by North Block Complex Proprietary Limited with registration number 2017/528665/07 which shall be referred to as “NBC or NBC Colliery”. Portion 29 Measuring 200.6021 hectares and Portion 130 measuring 200.6046 hectares, were identified for Involuntary Resettlement to facilitate and effect safe and unhazardous coal mining as prescribed by the Mine Health and Safety Act 29 of 1996. The project was commissioned to provide alternative housing and livelihood restoration to the affected households. The affected community resides on Portions 29 and 30 of Farm Paardeplaats No.380, Registration Division JT, Mpumalanga Province. NBC’s Mine is located at approximately 25° 41' 39" S and 30° 0' 53 " E. The affected community is located approximately 4 km southwest of Belfast This area falls within the jurisdiction of eMakhazeni Local Municipality and the Nkangala District Municipality situated in Mpumalanga Province. eMakhazeni Local Municipality comprises of 4 main towns: eMakhazeni (Belfast), Dullstroom, Entokozweni (Machadodorp) and Emgwenya (Waterval Boven) and is situated in the heart of Mpumalanga Province. It is bordered by Mbombela Local Municipality in the East and Steve Tshwete Local Municipality on the west. It is one of the six municipalities that fall within the Nkangala District Municipality. The eMakhazeni Local Municipality is a Category B municipality.

The proposed project triggers activities listed in Listing Notices 1 and 3 (LN 1 and 3) of the NEMA and will therefore require an EA from the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA). Since the project triggers activities in LN 1 and 3 of the NEMA, a Basic Assessment (BA) will be followed as stipulated in Government Notice Regulation (GNR) 326 of the NEMA**.**

Who is conducting the impact assessment and compiling the EMPr?

Ndi Geological Consulting Services (Pty) Ltd has been appointed by NBC as the independent Environmental Assessment Practitioner (EAP) to conduct the EA application process for the project.

The reports and documentation for the EA application process are being compiled and finalised for submission to the MDARDLEA for consideration and decision making. The MDARDLEA will consult with other government authorities as required in terms of Section 24(K) of the NEMA.

Who will evaluate the impact assessment and EMPr?

Before the proposed NBC Paardeplaats Community Residential Area project can proceed, approval must be obtained from the regulatory authorities. The Basic Assessment Report (this report) will be submitted to the Competent Authority (CA), MDARDLEA, for review and decision making as to whether the project may proceed or not.

Description of the Proposed Development

The residential area for the relocation of the Paardeplaats Community will consist of the following:

- 28 housing stands approximately 800m^2 in size (total area approximately 2.24 ha),
- Internal ten (10) m wide gravel roads;
- Two (2) transformers;
- A 157-kilolitre sewer conservancy tank;
- 160mm and 110mm Unplasticized Polyvinyl Chloride (uPVC) sewer pipelines;
- Two (2) possible alternative powerlines measuring 488m and 266m located to the north and south of the development;
- Boreholes for potable water provision;
- 75mm uPVC water lines;
- Perimeter fence; and
- A 56-kilolitre elevated water tank for potable water provision.

Construction of the houses and infrastructure will be undertaken by Contractors that will be appointed by NBC. The general construction activities will include:

- Site preparation;
- Earthworks: Establishment of foundations;
- Civil works:
    - Erection of structures and infrastructure associated with the project;
    - Foundation excavations and compaction;
    - Concrete work including the mixing of concrete;
    - Steelwork including grinding and welding; and
    - Rehabilitation of disturbed areas after general site construction is completed.

All waste will be re-used, recycled or disposed of only as a last resort at an appropriately licensed/registered facility depending on the type of waste.

Project Need and Desirability

The environmental right is contained in the Constitution of the Republic of South Africa, Act 108 of 1996 (hereafter referred to as “The Constitution”). Section 24 of the Constitution enshrines environmental rights in South Africa, which are interpreted to have a two-fold purpose. The first part guarantees a healthy environment to every person. The second part mandates the State to ensure compliance with the first part. The State is prohibited from infringing on the right to environmental protection and is further required to provide protection against any harmful conduct towards the environment.

The proposed relocation of NBC’s Paardeplaats Community will reduce potential negative environmental impacts on the households to be relocated, that may result from the mining activities from the Integrated Paardeplaats Section mining project.

The benefits to be accrued from the proposed project include:

- Indirect from the Integrated Paardeplaats Section mining project which will include:
    - Contribution to electricity generation for South Africa: NBC has an existing supply agreement with Eskom to supply steady and secure coal for selected Eskom coal fired power stations. The Integrated Paardeplaats Section will produce enough coal for NBC to meet its contractual obligations to Eskom and allow Eskom to continue with secure electricity supply for the country.
    - Revenue Generation: The NBC Integrated Paardeplaats Section has an estimated RoM supply rate of 1.7 Mtpa of export coal which equates to 1.0 Mtpa of export product, making it a desirable contributor to the coal export market.
    - Contribution at Local Levels: NBC Integrated Paardeplaats Section will contribute to ensuring that both primary and secondary employment opportunities associated with the mine would continue, positively impacting both the local and district municipalities.
    - Job Creation and Retention: NBC have 37 permanent employees whose jobs will be retained as a result of the continued mining operations. Mining activities will be contracted out with these jobs being created at the companies contracted to undertake the mining activities. It is envisaged that the workforce of the contractor will be made up of 239 workers of which 68 will come from the EMakhazeni LM, 129 from the remainder of the Nkangala DM, and 42 from the rest of South Africa (EIMS, 2015). Although mining activities will be contracted out, NBC management will be responsible for support services and line management of the Integrated Paardeplaats Section.
- Direct Socio-Economic Benefits from the project including:
    - Provision of housing to households: It is expected that the build back better principle will be implemented, resulting in an improved way of life.
    - Job Creation and Capital Value: The proposed project will result in the creation of approximately 66 job opportunities during the construction of various infrastructure. The capital value of the project is estimated to be R38 464 152.82 (including VAT).

The needs and desirability assessment of the proposed NBC Paardeplaats Community Residential Area project as per Notice 792 of 2012 is provided in Table ES-1.

Table ES-1: Need and Desirability Assessment of the proposed NBC Paardeplaats Community Residential Area project

Questions (Notice 792, NEMA, 2012)		Response
PART I: NEED		
1.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	N/A. The proposed project will be located in the property owned by NBC and has no bearing on the SDF.
2.	Should the development, or if applicable, expansion of the town/area	Yes. Authorising the project will enable NBC to implement the Integrated Paardeplaats Section mining project which will allow NBC to continue

Questions (Notice 792, NEMA, 2012)		Response
	concerned in terms of this land use occur here at this point in time?	with mining activities. The proposed project area is the only area available within the NBC mining areas that will not be affected by mining activities.
3.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	Yes. Authorising the project will enable NBC to implement the Integrated Paardeplaats Section mining project which will allow NBC to continue with mining activities, without endangering the communities located in the areas affected by the Integrated Paardeplaats Section mining project. The continuation of mining activities will contribute to the local communities, local municipality, the region and country at large.
4.	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	No, the proposed project includes the provision of services such as water, sewer reticulation systems and electricity. Potable water for the residential area will be provided from groundwater and electricity will be sourced from Eskom.
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	Not applicable. The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project. The proposed project will be located on a property owned by NBC and will have no bearing on the infrastructure planning of the municipality. Groundwater will be the source of water that will be required for the area and electricity will be sourced from Eskom.
6.	Is the project part of a national programme to address an issue of national concern or importance?	The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project. The National Development Plan (NDP) offers a long-term perspective, defines a desired destination and identifies the role different sectors of society need to play in reaching that goal. The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. At its core, the NDP aims to ensure the achievement of a “decent standard of living” for all South Africans by 2030. A decent standard of living

Questions (Notice 792, NEMA, 2012)		Response
		consists of the following core elements which the proposed project will contribute to: • Housing, water, electricity and sanitation: The proposed project will result in construction of 28 houses with electrical, water and sewage services, where the build back better principle will be applied. • Employment: The proposed project will result in the creation of 66 job opportunities.
PART II: DESIRABILITY		
7.	Is the development the best practicable environmental option for this land/site?	Yes. Authorising the project will reduce potential socio-economic impacts that may be incurred in terms of the Integrated Paardeplaats Section mining project not being implemented. The households to be relocated are currently located in areas that will be affected by the proposed Integrated Paardeplaats Section mining project. Not implementing the project will mean that the Integrated Paardeplaats projects will not be implemented, and all the benefits associated with the project as provided in Section 7.1 will not be realised.
8.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The project has no bearing on the IDP or SDF of the Emakhazeni Local Municipality, Nkangala DM and/or Mpumalanga Province. The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project on remainder of Portion 13 of Paardeplaats 380JT which is owned by NBC.
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No. The project will be located within the existing NBC property boundary and will have no implications on the integrity of the EMFs.
10.	Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes. The proposed residential area will be located within the NBC property boundary. The proposed location within Portion 13 of Paardeplaats is best as it is the only available area that will not be impacted by mining activities that will be implemented as part of the Integrated Paardeplaats Section mining project.

Questions (Notice 792, NEMA, 2012)		Response
11.	How will the activity of the land use associate with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The heritage and palaeontology assessment undertaken for the project found that the proposed project will not have any impacts on cultural, palaeontology or heritage resources. The biodiversity assessment shows that there are no floral Species of Conservation Concern (SCC) that will be directly affected by the proposed project. The proposed project will however be located within 500m of wetland areas. Mitigation measures will be implemented to ensure that impacts on wetlands and all sensitive environmental attributes will be minimised.
12.	How will the development impact on people's health and well-being? (E.g., In terms of noise, odours, visual character and sense of place, etc.)?	During construction, there will be particulate emissions (dust) related to debris handling, materials transportation, storage, handling and transfer; open areas (windblown emissions). Gas emissions are also expected to occur due to vehicle and construction equipment activity (exhaust fumes). These impacts are expected to be of medium and low significance and can be mitigated and managed to acceptable levels, with a post mitigation impact that is low. Movement of construction vehicles and machinery results in the production of construction related noise from construction vehicles and machineries which may cause a nuisance to people working and living in the vicinity of the project area. However, the implementation of appropriate mitigation measures such as the use of Personal Protective Equipment (PPE) and noise reducing technology would reduce the noise level impacts to remain within applicable and acceptable SANS levels (SANS 10103:2008). Occupational health and safety standards will apply. It is expected that the project will not have a significant impact on the visual character and sense of place, especially since the project will be located within the NBC property, which is approximately 1km away from the nearest visual receptor (Siyathuthuka settlement).
13.	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project on remainder of Portion 13 of Paardeplaats 380JT which is

Questions (Notice 792, NEMA, 2012)		Response
		owned by NBC. This will enable NBC to implement the Integrated Paardeplaats Section mining project without negatively impacting on communities located in the proposed mining area.
14.	Will the proposed land use result in unacceptable cumulative impacts?	No. It is expected that the project may result in low cumulative impacts on water, biodiversity and air quality. The impacts will be short lived, during the construction phase. It is however expected that implementation of the mitigation measures included in the EMPr will reduce the significance of the impact to very low/negligible.

Alternatives Considered

There are no site alternatives that were identified. This is due to the limitation in availability in space, the remaining areas on the property will be impacted by NBC mining activities.

The assessment will however include an assessment of the no-go option, as is required by the EIA Regulations.

Summary of the Baseline Environment

The overview of the biophysical and socio-economic environment in which the proposed project is located was assessed to:

- Understand the general sensitivity of and pressures on the affected environment;
- Inform the identification of potential issues and impacts associated with the proposed project, which was assessed in the impact assessment section of this BAR;
- Identify gaps in available information to inform specialist study requirements; and
- Start conceptualising practical mitigation measures.

This section has been compiled, based on the following:

- Available information from the existing specialist studies reports;
- Existing information on the environmental parameters of the area from previous EIAs;
- Agricultural GIS;
- SANBI; and
- South African Weather Service.

The environmental status quo is summarised in Table ES-2.

Table ES-2: Project Area Status Quo Assessment

Aspect	Description
Climate	The project is located in an area where:

Aspect	Description
	• In the summer months' maximum average daily temperatures are predicted to be 21°C - 24°C on average with a maximum of 30°C possible during hot days, dropping to a predicted 9°C - 13°C on average at night and 3°C minimum on cold nights. • During winter months the average day time temperature are predicted in the 16°C - 19°C range while cold winter night-time temperatures are predicted to drop to -1°C. Falling in a summer rainfall area, the project area is predicted to receive the most precipitation in the summer months of October - March. November - January are predicted to be the highest rainfall months with between 140 – 179 mm. February, March and October are predicted to receive 79 – 103 mm precipitation. All other months are predicted to receive less than 43 mm precipitation on average during the month
Topography	The topography of the project area is hilly, with an altitude ranging between approximately 1 855 and 1 920 metres above mean sea level (mamsl). The topography of the area slopes in a northerly direction towards a non-perennial tributary of the Grootspruit flowing from south to north approximately 13 km west of the site.
Geology	The project is situated within the Witbank Coal field in the northern part of the main Karoo Basin (Karoo Supergroup). The area is found in the Vryheid Formation (Ecca Group) and consist predominantly of fine, medium, and coarse-grained sandstone with sub-ordinate mudstone, shale, siltstone, and carbonaceous shale. The Dwyka Group tillite forms the base of the coal seam deposits. These formations were deposited during the Permian Period of the Paleozoic Era (230 to 280 million years ago) (GCS, 2011)
Soils, landuse and land capability	The soils within the project area are Reddish-brown, apedal, loamy sand to sandy loam topsoil on red (occasionally yellow brown), apedal, loamy sand to sandy loam subsoil, occasionally on mottled soft plinthite or weathering rock. The agriculture potential of the soils in the area is classified as very high.
Air Quality	A number of sensitive receptors have been identified in the immediate vicinity of the project area, which include Belfast, Siyathuthuka, and various homesteads within and around the area. Various sources of emissions exist, all of which may impact on the identified sensitive receptors include vehicle exhaust gases, veld fires, trucks passing on the roads, loading and offloading raw materials, wind erosion as a result of ROM material and topsoil stockpiles, material handling (loading, hauling and tipping) and other mining activities such as wind erosion and vehicle entrained dust.

Aspect	Description
	The latest results from NBC's dust monitoring (February 2021) show that dust fallout is complying with GNR827.
Surface Water	The Project area is located within the Olifants Water Management Area (WMA), in quaternary catchment area B41A. There are drainage lines/non-perennial rivers located approximately 500m to the east of the project area. However, there are no rivers, streams and/or drainage lines that are directly affected by the proposed residential area. There is a dam (Wilkie Farm Dam) that will be located within the fenced area of the residential development. The hydrogeological assessment undertaken for CIG Environmental Management Plan indicted that samples collected for the Wilkie Farm Dam was impacted by mining activities, with the Sulfates not complying with the Water Use Licence (WUL) limits.
Groundwater	The area is characterised by secondary aquifers with groundwater usually located in fractures, joints, bedding planes and within the weathered zone formed in the Ecca Group. Little to no flow occurs in the rock matrix of the Ecca Group. No evidence was found of structural controls (preferential pathways) on groundwater flow. The aquifer vulnerability and classification maps of South Africa classify the underlying aquifer as a minor aquifer which is moderately vulnerable. Although these aquifers seldom produce large quantities of water, they are important for both local supplies and in supplying base flow for rivers. The 1:500 000 Hydrogeological map shows that the area is underlain by an intergranular and fractured type of aquifer with an average borehole yield ranging between 0.1 and 0.5 litres per second (l/s). A hydrocensus conducted in 2019 identified one borehole (WBH) located on Portion 13 of Paardeplaats 380 JT. According to the groundwater study, the water from borehole WBH is used for domestic and stock watering purposes. And the EC and TDS are high, measured at 178.7mS/m and 1238mg/l respectively.
Wetlands	The wetlands delineation study conducted by WCS in 2021 found that there are wetlands located on Portion 13 of Paardeplaats 380JT. No infrastructure will be located within the wetland areas, but all infrastructure is located within 500m of the wetlands as well as the 100m buffer zone. Mitigation measures will be implemented to minimise the impacts on wetlands.
Biodiversity	Floral SCC, *Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis*, were recorded in the affected property, amongst rocky outcrops. These habitats host a high floral diversity and support very specialised vegetation communities and biota relative to their size. None of the identified SCC will be directly

Aspect	Description
	affected by the proposed infrastructure. There is also evidence that edge effects of the surrounding AIP sprawl are enclosing the remaining extent of the portion. *Eucalyptus* sp and *Populus* sp are encroaching and intervention is required to contain the spread. Portion 13 has previous recordings of the Grey Crowned Crane (an endangered species) and habitats that support numerous faunal species are located within this portion, including wetlands, grasslands and rocky outcrops. Numerous waterfowl were observed in the artificial dams as they serve as sustenance and breeding grounds for numerous avifaunal species.
Areas of Conservation Concern	The NBC is located in areas classified as Critical Biodiversity Areas (CBAs). In addition, according to the Important Bird Areas (IBA) database, the project area falls within the Steenkampsberg.
Visual	The project area is located within the jurisdiction of the eMakhazeni Local Municipality within the Nkangala District Municipality in the Mpumalanga Province. According to the visual impact assessment, sensitive receptors identified in the immediate vicinity of the study area and proposed project area have been listed below: • The town of Belfast, approximately 5km to the north of the project area, • The Informal settlement of Siyathuthuka, approximately 1km to the north of the area, and • Various Dispersed Homesteads.
Heritage Resources	A Heritage Impact Assessment (HIA) found no sites, features or objects of cultural significance within the project area. Two features of heritage significance were found close to the project area, but well outside the boundary and would therefore not be impacted on by the proposed development as follows: • A large informal cemetery is located approximately 100m north of the project area. It is well-known and securely fenced off. This feature has been reported on by previous researchers, e.g., Birkholtz (2021). It is therefore totally unlikely that it would be impacted on by the development. • A lane of oak trees was planted along the regional dirt road passing on the western side of the project area. It is unsure as to how old the trees are, as they cannot be seen on the 1964 version of the aerial photograph or the 1969 version of the topographic map. It follows this road south and then turn west towards an old farmstead. Based on the development plan, the trees will not be impacted on and be retained

Aspect	Description
Palaeontology Resources	A palaeontology assessment undertaken as part of the Mining Right Application included Portion 13 of Paardeplaats 380JT where the proposed project will be located. The site-specific field survey of the area found no visible evidence of fossiliferous outcrops.
Socio-Economy	The project area is located in the eMakhazeni LM which forms part of the Nkangala DM in Mpumalanga Province of South Africa. The unemployment rates in the Emakhazeni LM for males and females is 20% and 30% respectively. The main industry of employment in Mpumalanga as well as in the eMakhazeni LM is Manufacturing, Community, social and personal services and Wholesale and retail trade. The Community, social and personal services sector includes public administration and defence activities, education and health and social work. Other large employment sectors in the Emakhazeni LM are Wholesale and retail trade and Manufacturing. The pattern of overall unemployment rate in eMakhazeni has changed as compared to 2001 where the LM wase at 30% and in 2011, it was at 25.92 percent. Employment opportunities are favourable in the municipality, particularly for males, about 80% ofmales and 66% females were employed in 2011. Education is a major challenge in the area as about 30% of children in the area of school-going age do not have access to quality education (IPD, 2020). This is due to the rural nature of the area. The majority of schools are farm schools which are multi-graded, and that lack quality infrastructure and adequate human resources. The majority of primary schools are on the NSNP (National Schools Nutrition Programme) and the municipality welcomes the proposal of the Department of Education to extend the programme to high schools. There is only one tertiary education facility in the area, namely a Technical Vocational Education and Training (TVET) College at Emgwenya.

Impact Assessment Process

An Environmental Impact Assessment (EIA) seeks to identify the environmental consequences of a proposed project from the beginning, and helps to ensure that the project, over its life cycle, will be environmentally acceptable, and integrated into the surrounding environment in a sustainable way. Two parallel processes were followed: the environmental technical and impact assessment process and the stakeholder engagement process. A summary of the BA process is show in Figure ES-1.

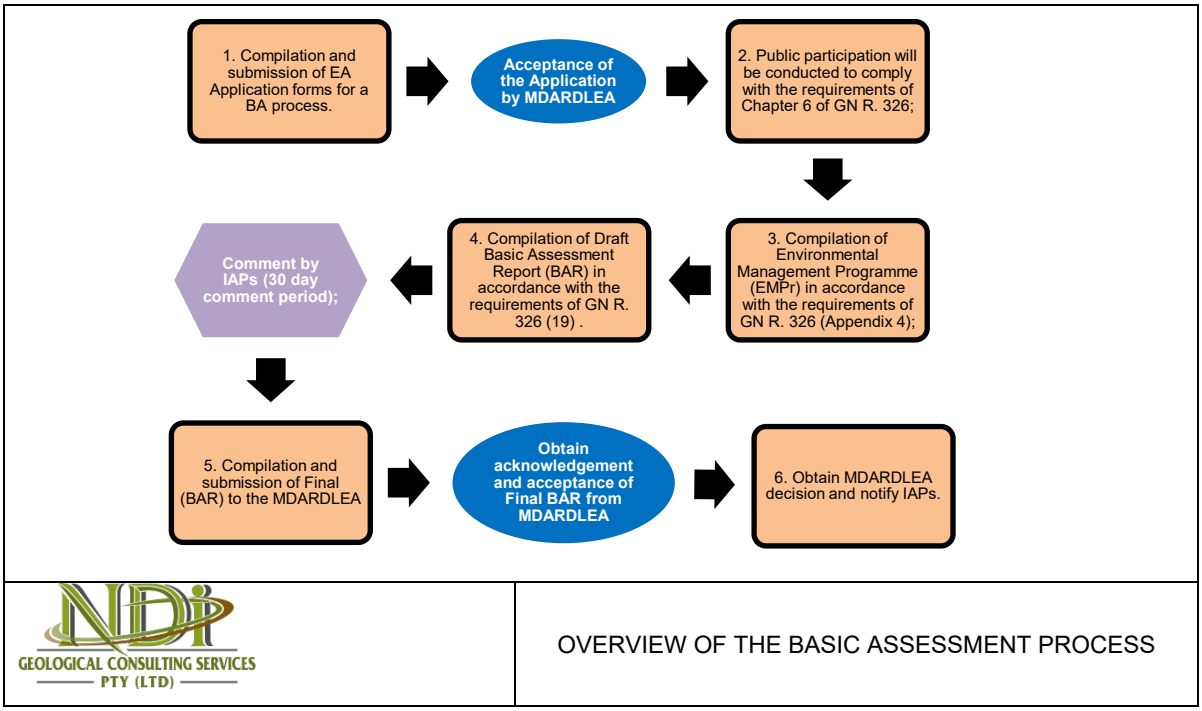

Figure ES-1: Overview the Basic Assessment Process

Stakeholder Engagement Process

The stakeholder engagement process, which was undertaken for this project, was aimed to comply with the relevant legislative requirements of the NEMA, as prescribed in Chapter 6 of the NEMA and GNR 982. The process included:

- Development of a stakeholder database;
- The compilation and management of the stakeholder database;
- Providing I&APs with the opportunity to participate in the impact assessment process and to register as an Interested and Affected Party (I&AP) as announced in September 2021 through the following means:
  - Letter of invitation to register was distributed to I&APs on 30 September 2021;
  - Bulk SMSes were sent to I&APs on 30 September 2021;
  - Media advertisements in English and Afrikaans were placed in the Middleburg Observer on 1 October 2021;
  - Site notices were erected at several places in and around the study area on 1 October 2021; and
  - Collation of comments received into a Comments and Responses Report (CRR).

The Draft Basic Assessment Report (draft BAR) will be made available for a 30-day commenting period between 18 October 2021 and 18 November 2021. All issues, comments and suggestions received from I&APs will be collated into a CRR. Where necessary, comments from I&APs will be incorporated into the Final BAR that will be submitted to the MDARDLEA for decision-making.

Specialist Studies

The Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool shows that the project site is of very high sensitivity for the agriculture, aquatic biodiversity, palaeontology and

terrestrial biodiversity themes, high sensitivity for agriculture, animal species, archaeological and civil aviation themes. All the themes classified as very high and high sensitivity require specialist assessments. There were specialist studies that were conducted for the NBC Consolidation EIA process (2021), which included an assessment of Portion 13 of Paardeplaats 380JT, where the proposed residential development will be located. Findings from these studies have been incorporated into this report and include:

- Terrestrial Biodiversity,
- Aquatic Biodiversity;
- Palaeontology Assessment;
- Hydrogeology;
- Air Quality Assessment; and
- Visual Impact Assessment.

In addition to the above, a heritage impact assessment and wetland delineation and assessment were conducted for the project. The main deliverable from each specialist was a Baseline and Impact Assessment Report with appropriate maps, drawings and figures.

Summary of the Impact Assessment Process

During the construction phase of the proposed project, impacts may occur on the environment should the EMPr not be adhered to. NBC and its contractors will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from medium and low to low and negligible significance.

There are no heritage and palaeontology resources that will be affected by the proposed project. Land use will not change. Several landowners and land occupiers within the proposed project area may be affected although on a temporary basis due to the increased movement of trucks and machinery. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the landowners and land occupiers are minimised.

Storm water runoff from the dirty water areas of the construction sites may have a detrimental impact on the surrounding water environment, including the wetlands located on Portion 13 of Paardeplaats 380JT should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, a stormwater management plan will be implemented, where dirty and clean water will be separated. The sediments will be treated should they contain hydrocarbon waste.

The employees will undergo training and will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the surrounding communities. Waste generated from the site will be collected in proper receptacles and disposed of in registered waste disposal sites.

Key findings of the environmental impact assessment include:

- All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to low and very low significance with implementation of mitigation measures and monitoring.
- Cumulative noise, visual and air quality (dust) impacts are deemed to not be significant (low) when proper mitigation measures are implemented.

- Vegetation loss is unavoidable during the construction phase of the project. This will however be limited to the footprint of the infrastructure.
- The biodiversity assessment identified some floral SCC (*Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis*) on the affected property, but not in the area where the project footprint is located. The biodiversity assessment identified some floral Species of Conservation Concern (SCC) (*Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis*) on the affected property, but not in the area where the project footprint is located. However, care must still be taken to manage any SCC on site. In addition, the wetland assessment identified at least three species of Orchid presumed to include (S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp.), *Eucomis autumnalis*, and a Watsonia sp., which are Mpumalanga Protected Species. Care must still be taken to manage any SCC that may be affected by the proposed project.
- There is current proliferation of alien invasive plant species, including *Eucalyptus* sp and *Populus* sp. The implementation of an Alien and Invasive Plant Species Management programme will result in elimination of the alien and invasive plant species on the site.
- There are wetlands located on the property which are habitats for Grey Crowned Crane (EN) which have been previously located on the property. It must be noted that the affected wetland is considered disturbed, characterised by alien and invasive plant species. It is therefore recommended that a GNR 704 100m buffer be instituted.

It is not expected that the NBC Paardeplaats Residential Area will be decommissioned in the near future, and should decommissioning be required, the impacts associated with the process will be similar to the ones associated with the construction phase of the project. It is expected that should decommissioning be required, an EIA will be conducted in compliance with the environmental legislation applicable at that time. As such, no impact assessment was conducted for the decommissioning and closure phase of the project.

The potential impacts evident from the detailed impact assessment (Section 10) of the proposed project are both positive and negative in nature and can be managed to acceptable levels. The summary of the quantitative impact assessment can be found in Table ES-3.

Table ES-3: Summary of potential Impacts

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
CONSTRUCTION	Social	Influx of job seekers will have a negative social impact on the landowners and land occupiers.	Medium Low (-)	Low (-)
		Unauthorised access to private property outside of the demarcated areas will result in conflict with landowners.	Medium Low (-)	Low (-)
		Increased traffic in the area will increase the likelihood of accidents on the roads, posing a health and safety issue for the landowners and land occupiers.	Medium Low (-)	Low (-)
		The influx of job seekers in the area may result in an increase in petty crimes.	Medium Low (-)	Low (-)
		Potential squatting of job seekers.	Medium Low (-)	Low (-)
		Potential impact on safety and security and increased conflict with landowners and land occupiers as a result uncontrolled lighting of fires on site, littering and driving irresponsibly.	Medium Low (-)	Low (-)
		Ineffective communication channels leading to community unrest.	Medium Low (-)	Low (-)
		Possible boost in short term local small business opportunities.	Medium Low (+)	Medium Low (+)
		Possible creation of short-term construction related jobs	Medium Low (+)	Medium Low (+)
	Groundwater	Local spillages of oils from vehicles and machinery leading to groundwater contamination.	Medium-High (-)	Low (-)
		Improper storage and handling of hazardous materials leading to groundwater contamination.	Medium-High (-)	Low (-)
	Surface Water	Potential deterioration in water quality as a result of accidental spillages of hazardous substances such as hydrocarbons from vehicles and machinery.	Medium-Low (-)	Low (-)
		Possible contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality.	Medium-Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
		Debris from poor handling of materials and/or waste blocking watercourses may result in flow impediment and pollution.	Low (-)	Low (-)
		Increase in silt load in runoff due to movement of vehicles on site may result in increased sedimentation of water courses.	Medium-Low (-)	Low (-)
		Deterioration of water quality as a result of improper handling/ of chemicals.	Medium-Low (-)	Low (-)
		Poor stormwater management leading to runoff from stockpiled material removed causing sedimentation of the water resources.	Medium-Low (-)	Low (-)
	Wetlands and Aquatic Ecosystems	Localised changes to the riparian areas as a result of vegetation clearing.	Medium-High (-)	Medium Low (-)
		Loss of habitat and wetland ecological structure as a result of site clearance activities and uncontrolled wetland degradation.	Medium-High (-)	Medium Low (-)
		Loss of floral SCC including S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp., *Eucomis autumnalis*, and a Watsonia sp that were identified in wetland areas on Portion 13.	Medium-High (-)	Medium Low (-)
		Impact on the wetlands systems as a result of changes to the sociocultural service provisions.	Medium-High (-)	Medium Low (-)
		Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland and riparian resources.	Medium-High (-)	Medium Low (-)
		Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland and riparian habitat.	Medium-High (-)	Medium Low (-)
		Impact on the hydrological functioning of the wetland systems.	Medium-High (-)	Medium Low (-)
	Heritage Resources	Although no heritage resources were identified, there is potential for chance findings of heritage resources.	Low (-)	Low (-)
	Palaeontological Resources	Although no palaeontological resources were identified, there is potential for chance findings of heritage resources.	Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
	Flora	Loss of localised biodiversity habitats within sensitive areas due to site clearance.	Medium-High (-)	Low (-)
		Loss of localised floral species diversity including RDL and medicinal protected species due to site clearance and establishment of infrastructure.	Medium-High (-)	Low (-)
		Potential spreading of alien invasive species as indigenous vegetation is removed, and pioneer alien species are provided with a chance to flourish.	Medium-High (-)	Low (-)
	Fauna	Vegetation clearance may result in loss of faunal habitat ecological structure, species diversity and loss of species of conservation concern.	Medium-High (-)	Low (-)
		Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.	Medium-High (-)	Low (-)
		Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal species trapping.	Medium-High (-)	Low (-)
		Movement of construction vehicles and machinery may result in collision with fauna, resulting in loss of fauna.	Low (-)	Low (-)
	Air Quality	Possible increase in dust generation, PM_{10} and $PM_{2.5}$ as a result of bulk earthworks, operation of heavy machinery, and material movement.	Low (-)	Low (-)
		Increase in carbon emissions and ambient air pollutants (NO_2 and SO_2) as a result of movement of vehicles and operation of machinery/equipment.	Low (-)	Low (-)
	Climate change	Emissions of Green House Gases as a result of the use of vehicles and machinery used during the construction activities.	Low (-)	Low (-)
	Visual	Scaring of the landscape as a result of the clearance of vegetation.	Low (-)	Low (-)
		Visual intrusion as a result of the movement of machinery and the establishment of the required infrastructure.	Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
		Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.	Low (-)	Low (-)
	Noise	The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity.	Low (-)	Low (-)
	Soil, Land use and Land Capability	Localised chemical pollution of soils as a result of vehicle hydrocarbon spillages and compaction.	Low (-)	Low (-)
		Localised clearing of vegetation and compaction of the construction footprint will result in the soils being particularly more vulnerable to soil erosion.	Low (-)	Low (-)
		Localised loss of resource and its utilisation potential due to compaction over unprotected ground/soil.	Low (-)	Low (-)
		Localised loss of soil and land capability due to reduction in nutrient status - de-nitrification and leaching due to stripping and stockpiling footprint areas.	Low (-)	Low (-)
	Traffic	Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion along the roads.	Medium Low (-)	Low (-)
	Waste Management	Potential water and soil pollution as a result of inappropriate waste management practices.	Medium Low (-)	Low (-)
OPERATIONAL	Groundwater	Leaks of sewer from pipelines may occur and also impact on the groundwater quality.	Medium-Low (-)	Low (-)
		Abstraction of groundwater may result in lowering of the groundwater tables and impact groundwater availability for other users.	Medium Low (-)	Low (-)
	Surface water	The possible potential impacts on surface water during the operational phases of the proposed project may be due to increased runoff from the infrastructure and roads. Leaks from the proposed sewer pipelines may occur and result in contaminated run-off from the site.	Low (-)	Low (-)
		Heavy rainfall events and associated sheet run-off has potential for contamination of off-site surface water due to uncontained on-site surface water run-off.	Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
		Accidental fires and extinguishing of on-site fires results in potential contamination of soil, groundwater, and surface water run-off during a fire event if contact fire-fighting water is not contained	Low (-)	Low (-)
	Biodiversity	Continued loss of floral and faunal habitat, species and SCC due to ineffective rehabilitation and edge effects.	Low (-)	Low (-)
		Run-off water from gardens typically contains seeds of exotic and garden-variety plants that pose a threat to indigenous vegetation and ecology.	Low (-)	Low (-)
		Improper rehabilitation during and post construction can result in proliferation of alien invasive plant species and continued loss of vegetation and habitats.	Medium-Low (-)	Low (-)
	Wetlands and Aquatic Ecosystems	Loss of habitat and wetland ecological structure as a result of continual wetland disturbance and uncontrolled wetland degradation	Medium-Low (-)	Low (-)
		Impact on the wetlands systems as a result of changes to the sociocultural service provisions through continued uncontrolled vegetation clearance, waste management and wetland disturbance	Medium-Low (-)	Low (-)
		Impact on the hydrological functioning of the wetland systems as a result of reduced wetland footprints and uncontrolled disturbance.	Medium-Low (-)	Low (-)
	Waste Management	Poor waste management during the resulting in contamination of surface runoff resulting in the deterioration of water quality of the watercourse.	Medium-Low (-)	Low (-)
		The operational phase of the project will result in increased generation of domestic waste that will need to be handled and disposed of.	Low (-)	Low (-)

Environmental Management Programme

The project specific EMPr for the construction and operation of the NBC Paardeplaats Community Residential Area project has been included in Appendix F. The mitigation measures included in the EMPr are deemed adequate to minimise and/or avoid degradation of the environment that may occur because of the proposed NBC Paardeplaats Community Residential Area project.

Conditions to be included in the EA

The EAP recommends that the NBC Paardeplaats Community Residential Area project be authorised and the following recommendations should be adhered to:

- Adequate storm water management must be incorporated into the design of the project in order to prevent erosion;
- The applicant must appoint an ECO who will oversee the implementation of the EMPr and submit annual compliance reports to the MDARDLEA;
- The proposed development footprint shall be kept to a minimum;
- All hazardous storage containers, storage areas and bunding areas for hazardous substances must comply with the relevant SANS standards to prevent leakage;
- Bulk storage of hydrocarbons must be stored in a dedicated area and must include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the substances;
- The time in which soils are exposed during construction activities should remain as short as possible;
- Exotic or invasive plants shall be controlled as they emerge;
- An alien vegetation control program must be developed and implemented within the riparian and all disturbed areas. After removal of alien vegetation, the affected areas must be re-assessed to determine the success of the program and any follow up measures that may be required.;
- All areas of disturbed and compacted soils need to be ripped and reprofiled;
- No dumping of waste shall be permitted. If any spills occur, they should be immediately cleaned up;
- All vehicles shall be inspected for leaks on a regular basis. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil;
- Site clearance must be conducted in a phased and restricted manned (where possible) to allow for any faunal species resent to move away from the study area;
- No trapping or hunting of faunal species is to take place during all phases of the proposed project; and
- Upon completion of construction activities, it must be ensured that indigenous vegetation is reintroduced and used for landscaping, where possible.

Conclusion

Ndi Geological has undertaken the impact assessment and compiled the EMPr for the proposed construction and operation of the NBC Paardeplaats Community Residential Area project in

accordance with the requirements of the NEMA. This has included a comprehensive stakeholder engagement process which has sought to provide I&APs with an adequate opportunity to participate in the project process and guide technical investigations that have taken place as part of this study.

To date, there are no fatal flaws that have been identified for the proposed project. The proposed relocation of the Paardeplaats Community to the NBC Paardeplaats Community Residential area is required so that the Integrated Paardeplaats Section mining project can be implemented. The no-go option would mean that the Integrated Paardeplaats Section mining project cannot be implemented, and all the benefits associated with the project will not be realised. The current proposed location is the only area within the NBC's Glisa and Paardeplaats areas available that is not and is not anticipated to be affected by mining activities.

An EMPr has been developed as part of this BA process to ensure the mitigation of identified impacts as far as practicable. It is anticipated that it will be possible to successfully mitigate the environmental impacts to acceptable levels and the implementation will be monitored and audited to determine the effectiveness of the measures implemented. The EMPr is considered adequate to assist the project in striving towards the principles of the NEMA.

Many of the impacts identified were classified as medium (-) to low (-) and insignificant (-) without mitigation. All the identified impacts can be mitigated to low (-), very-low (-) and insignificant (-) impact rating. The cumulative impacts were considered to be low.

The project team believes that the impact assessment undertaken for the construction and operation of the NBC Paardeplaats Community Residential Area project fulfils the process requirements of the NEMA. The EAP recommends that an EA be issued by the MDARDLEA and that the construction and operation of the NBC Paardeplaats Community Residential Area project should be conducted under duty of care and must be in accordance with the recommendations that were included in this BAR and the accompanying EMPr.

YOUR COMMENT ON THE BASIC ASSESSMENT REPORT

This Draft Basic Assessment Report (Draft BAR) will be available for comment for a period of 30 days from18 October 2021 to 18 November 2021. Copies of the Draft BAR been made available at the following public places for review:

Public Place	Locality	Telephone
Ndi Geological	OneDrive	A link will be created and shared with the stakeholders
Ndi Geological	Other Electronic Transfer Platforms	A link will be created and shared with the stakeholders
Ndi Geological Website	http://www.ndigeoservices.co.za	053 842 0687 ndi@ndigeoservices.co.za
eMakhazeni Public Library	Scheepers Street, Belfast	013 255 0437

I&APs are requested to provide comments and information on the following aspects of the proposed project:

1. Information on how I&APs consider that the proposed activities will impact on them or their socio-economic conditions;
2. Written responses stating their suggestions to mitigate the anticipated impacts of each activity;
3. Information on current land uses and their location within the area under consideration;
4. Information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied; and
5. How to mitigate the potential impacts on their socio-economic conditions and to make proposals as to how the potential impacts on their infrastructure can be managed avoided or remedied.

DUE DATE FOR COMMENT

18 November 2021

Please submit comments to the EAP:

Ndivhudzannyi Mofokeng
Ndi Geological Consulting Services (Pty) Ltd
38 Ophelia Street
Kimberley, 8301
Cell: 082 760 8420
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atshidzaho@gmail.com / ndi@ndigeoservices.co.za

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Disclaimer

The opinions expressed in this Report have been based on the information supplied to Ndi Geological Consulting Services (Pty) Ltd (Ndi Geological) by North Block Complex (Pty) Ltd (NBC). The opinions in this Report are provided in response to a specific request from NBC to do so. Ndi Geological has exercised all due care in reviewing the supplied information. Whilst Ndi Geological has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Ndi Geological does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features, as they existed at the time of Ndi Geological's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which Ndi Geological had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

BA:	Basic Assessment
BAR:	Basic Assessment Report
CARA:	Conservation of Agricultural Resources Act, 1993 (Act No. 43 of 1983)
CBA:	Critical Biodiversity Area
CFP:	Chance Find Protocol
CRR:	Comments and Responses Report
DEA:	Department of Environmental Affairs
DEAT:	Department of Environmental Affairs and Tourism
DFFE:	Department of Forestry, Fisheries and the Environment
DM:	District Municipality
DMR:	Department of Mineral Resources
DWS:	Department of Water and Sanitation
EA:	Environmental Authorisation
EAP:	Environmental Assessment Practitioner
EC:	Electrical Conductivity
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
EIS:	Environmental Importance and Sensitivity
EMPr:	Environmental Management Programme
ESAs:	Ecological Support areas
GDP:	Gross DomesticProduct
GHG:	Green House Gas
GIS:	Geographic Information System
GNR:	Government Notice Regulation
HC:	Hydrocarbons
HIA:	Heritage Impact Assessment

I&APs:	Interested and Affected Parties
IBA:	Important Bird Areas
IDP:	Integrated Development Plan
LM:	Local Municipality
LoM:	Life of Mine
MAE:	Mean Annual Evaporation
mamsl:	metres above mean sea level
MDARDLEA:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
MPRDA:	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA;	Mining Right Application
NBC:	North Block Complex (Pty) Ltd
NEM: AQA:	National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: WA:	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NEMA:	National Environmental Management Act, 1998 (At 107 of 1998)
NEMS:	NOAA Environmental Modelling System
NFA:	National Forestry Act, 1998 (Act No. 84 of 1998)
NFEPA:	National Freshwater Ecosystem Priority Areas
NHRA:	National Heritage Resources Act, (Act No. 25 of 1999)
NSNP:	National Schools Nutrition Programme
NT:	Near Threatened
NWA:	National Water Act, 1998 (Act 36 of 1998)
PAIA:	Promotion of Access to Information Act (Act No. 2 of 2000)
PES:	Present Ecological Status
PM:	Particulate matter
PM:	Particulate Matter
POPIA:	Protection of Personal Information Act
QDS:	Quarter Degree Squares

RoM:	Run of Mine
SAFAP:	Southern African Frog Atlas Project
SAHRA:	South Africa Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
SAPS:	South African Police Service
SARCA:	Southern African Reptile Conservation Assessment
SCC:	Species of Conservation Concern
SDF:	Spatial Development Framework
StatsSA:	Statistics South Africa
TDS:	Total Dissolved Solids
TSP:	Total Suspended Particles
TVET:	Technical and Vocational Education and Training
UCEHSA:	Universal Coal Energy Holdings SA
uPVC:	Unplasticized Polyvinyl Chloride
VIA:	Visual Impact Assessment
VOC:	Volatile Organic Compounds
WMA:	Water Management Area
WML:	Waste Management Licence
WUL:	Water Use Licence

1 Introduction

1.1 Background

North Block Complex (Pty) Ltd (NBC) is a subsidiary of Universal Coal Energy Holdings SA (UCEHSA), which is owned by Universal Coal Plc. NBC consists of three (3) mining sections namely the Eerstelingsfontein Section, the Glisa Section, and the Paardeplaats Section. NBC is currently mining coal via opencast methods on Portion 30 of the Farm Paardeplaats 380 JT and intends to expand its opencast mining activities onto Portion 29 of the Farm Paardeplaats 380 JT, which fall within the approved Mining Right (MP 30/5/1/2/2/10090 MR) area. In order to expand mining operations onto Portion 29, NBC is proposing to develop a residential area for the relocation of the Paardeplaats Community.

The occupiers of Paardeplaats farm Portion 29 and 30 under Mining Right MP 30/5/1/2/2/10090 MR. Held by North Block Complex Proprietary Limited with registration number 2017/528665/07 which shall be referred to as “NBC or NBC Colliery”. Portion 29 measuring 200.6021 hectares and Portion 30 measuring 200.6046 hectares were identified for involuntary resettlement to facilitate and effect safe and unhazardous coal mining as prescribed by the Mine Health and Safety Act 29 of 1996. The project was commissioned to provide alternative housing and livelihood restoration to the affected households. This area falls within the jurisdiction of eMakhazeni Local Municipality, and the Nkangala District Municipality situated in Mpumalanga Province. eMakhazeni Local Municipality comprises of 4 main towns: Emakhazeni (Belfast), Dullstroom, Entokozweni (Machadodorp) and Emgwenya (Waterval Boven) and is situated in the heart of Mpumalanga Province. It is bordered by Mbombela Local Municipality in the East and Steve Tshwete Local Municipality on the west. It is one of the six municipalities that fall within the Nkangala District Municipality. The Emakhazeni Local Municipality is a Category B municipality.

The proposed project triggers activities listed in Listing Notices 1 and 3 (LN 1 and 3) of the NEMA and will therefore require an Environmental Authorisation (EA) from the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA). Since the project triggers activities in LN 1 and 3 of the NEMA, a Basic Assessment (BA) will be followed as stipulated in Government Notice Regulation (GNR) 326 of the NEMA**.**

Ndi Geological Consulting Services (Pty) Ltd has been appointed by NBC as the independent Environmental Assessment Practitioner (EAP) to conduct the EA application process for the project.

The reports and documentation for the EA application process will be compiled and finalised in terms of the National Environmental Management Act, 1998 (At 107 of 1998) (NEMA) for submission to the MDARDLEA for consideration and decision making. Where required, the MDARDLEA will consult with other government authorities as required in terms of Section 24(K) of the NEMA.

1.2 Purpose of this study

An Environmental Impact Assessment (EIA) is defined as the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made. The aim of an EIA is to prevent substantial damage to the environment. The objectives of this study are to:

- Comply with the requirements of NEMA and associated Regulations;
- Identify and assess the environmental (biophysical, socio-economic, and cultural) impacts of activities associated with the construction and operation of the proposed NBC Paardeplaats

Community Residential Area project. The cumulative impacts of the proposed development will also be identified and evaluated;

- Identify and evaluate potential management and mitigation measures that will reduce the possible negative impacts of the proposed development and enhance the positive impacts;
- Compile monitoring, management, mitigation and training needs in the Environmental Management Programme (EMPr); and
- Provide the MDARDLEA with sufficient and accurate information to make a sound decision on the proposed development and set conditions that must be adhered to.

1.3 The Objectives of this Report

This Basic Assessment Report (BAR) was compiled with the aim to document the BA process that was conducted for the project. The Draft BAR will be made available to Interested and Affected Parties (I&APs) for their comments. All comments received will be considered and incorporated into a Final BAR that will be submitted to the MDARDLEA for decision making.

1.4 Report Index in Relation to the NEMA Regulations

Regulation 2, Appendix 1 of GNR 982 published in terms of NEMA and amended by GNR326 of 7 April 2017 stipulates the minimal requirements and issues that need to be addressed in the BAR. This report strives to address all these requirements as per the regulations. Table1-1 indicates the regulations that have been addressed and the section of the BAR where these requirements can be found.

Table1-1: Requirements of Appendix 1 of GNR 982

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
Appendix 1: 3 (1) (a)	Details of – the EAP who prepared the report; and the expertise of the EAP, including a curriculum vitae	Section 1.5.2
Appendix 1: 3 (1) (b)	The location of the activity, including – The 21-digit Surveyor General code of each cadastral land parcel; Where available, the physical address and farm name; Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties.	Section 4
Appendix 1: 3 (1) ®	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or On land where the property has not been defined, the coordinates within which the activity is to be undertaken; or.	Figure 2-1
Appendix 1: 3 (1) (d)	A description of the scope of the proposed activity, including – All listed and specified activities triggered and being applied for; A description of the activities to be undertaken, including associated structures and infrastructure.	Section 2
Appendix 1: 3 (1) ®	A description of the policy and legislative context within which the development is proposed including-	Section 5

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
	an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and have been considered in the preparation of the report; and how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	
Appendix 1: 3 (1) (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Section 7
Appendix 1: 3 (1) (g)	A motivation for the preferred site, activity and technology alternative.	Section 3
Appendix 1: 3 (1) (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	Section 3
	Details of all alternatives considered;	Section 3
	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 6
	A summary of the issues raised by interested and affected parties, and an indication of the way the issues were incorporated, or the reasons for not including them;	Section 6.8
	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 8
	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which the impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated.	Section 10
	The methodology used in deterring and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 10
	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects;	Section 10
	The possible mitigation measures that could be applied and level of residual risk;	Section 10
	The outcome of the site selection matrix;	N/A
	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and;	Section 3
	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 3

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
Appendix 1: 3 (1) (i)	a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— a description of all environmental issues and risks that were identified during the environmental impact assessment process; and an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 9.2.3
Appendix 1: 3 (1) (j)	An assessment of each identified potentially significant impact and risk, including— cumulative impacts; the nature, significance and consequences of the impact and risk; the extent and duration of the impact and risk; the probability of the impact and risk occurring; the degree to which the impact and risk can be reversed; the degree to which the impact and risk may cause irreplaceable loss of resources; and the degree to which the impact and risk can be avoided, managed or mitigated;	Section 10
Appendix 1: 3 (1) (k)	**where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;**	**Section 12**
Appendix 1: 3 (1) (l)	an environmental impact statement which contains— a summary of the key findings of the environmental impact assessment; a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 14
Appendix 1: 3 (1) (m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed [impact management objectives and the impact management outcomes for the development for inclusion in the EMPr;	Section 16
Appendix 1: 3 (1) (n)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 15
Appendix 1: 3 (1) (o)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 11
Appendix 1: 3 (1) (p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 16

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
Appendix 1: 3 (1) (q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A. The activity includes operational aspects.
Appendix 1: 3 (1) ®	An undertaking under oath or affirmation by the EAP in relation to- The correctness of the information provided in the report; The inclusion of the comments and inputs from I&APs and interested and affected parties; The inclusion of inputs and recommendations from the specialist reports where relevant; and Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Section 18
Appendix 1: 3 (1) (s)	where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not Applicable
Appendix 1: 3 (1) (t)	Any specific information required by the competent authority.	Not Applicable
Appendix 1: 3 (1) (u)	Any other matter in terms of Section 24(4)(a) and (b) of the NEMA	Not Applicable

1.5 Contact Details

1.5.1 Applicant

Table1-2 presents the details of the applicant and project owner.

Table1-2: Applicant Contact Details

Contact details of the Applicant:
North Block Complex (Pty) Ltd Physical Address: Spitzkop Road, Portion 5 of Paardeplaats Farm Belfast, 1100 Postal Address: North Block Complex (Pty) LTD, PO Box 275, Belfast, 1100 Contact Person: Nokuthula Cebekulu Tel: +27 (0) 10 900 0358 E mail: N.cebekhulu@universalcoal.com

1.5.2 Environmental Assessment Practitioner

Ndi Geological has been appointed by NBC as the EAP and the project team members as stipulated in Table1-3 can be contacted for the purposes of this project.

Table1-3: Details of the EAP

Contact details of the EAP:
Ndivhudzannyi Mofokeng Ndi Geological Consulting Services (Pty) Ltd 38 Ophelia Street Kimberley, 8301 Cell: 082 760 8420 Tel: 053 842 0687 Fax: 086 538 1069 atshidzaho@gmail.com/ndi@ndigeoservices.co.za

The EAP, Mrs Ndivhudzannyi is a registered EAP (EAPASA Reg Number 2020/1554) with a BSc (Hons) Earth Sciences in Mining and Environmental Geology. She has close to 10 years' experience in the exploration and open cast work in the mining industry. She has proven leadership skills from supervising exploration rigs (Reverse Circulation and percussion drilling). She has proven working experience in field exploration and mapping, borehole logging, borehole sampling, sample preparation for laboratory analysis, handling of GPS, supervisory duties within the field, geological report and progress report writing, including Prospecting Work Programmes and Environmental Management Plans, handling the Department of Mineral Resources (DMR) documents in general.

The Curriculum Vitae of the EAP is provided in Appendix A and Appendix B respectively.

1.5.3 Competent Authority Details

The details of the competent authorities are provided in Table1-4.

Table1-4: Competent Authority Details

Department	Contact Person	Contact Details	
MDARDLEA	Ms Dineo Tswai	Tel	076 644 1707
		Email	dtswai@mpg.gov.za

1.5.4 Local Authority Details

The project area is located within the jurisdiction of the Emakhazeni Local Municipality within the Nkangala District Municipality in the Mpumalanga Province. The project area is located 5 kilometres (km) south of the town of eMakhazeni (Belfast) and approximately 1 km south of the closest formal settlement, Siyathuthuka Township.

Details of the relevant municipality are provided in Table1-5.

Table1-5: Local and District Municipality Details

Department	Contact Person	Contact Details	
Nkangala District Municipality	Ms Margaret Skosana (Municipal Manager)	Tel	013 249 2006
		Email	Skosanam@nkangalam.gov.za
Emakhazeni Local Municipality	Mr G Mthimunye (Municipal Manager)	Tel	013 253 7628
		Email	mthimunyeg@emakhazeni.gov.za

Figure 1-1 provides an illustration of the relevant district and local municipalities surrounding the proposed project.

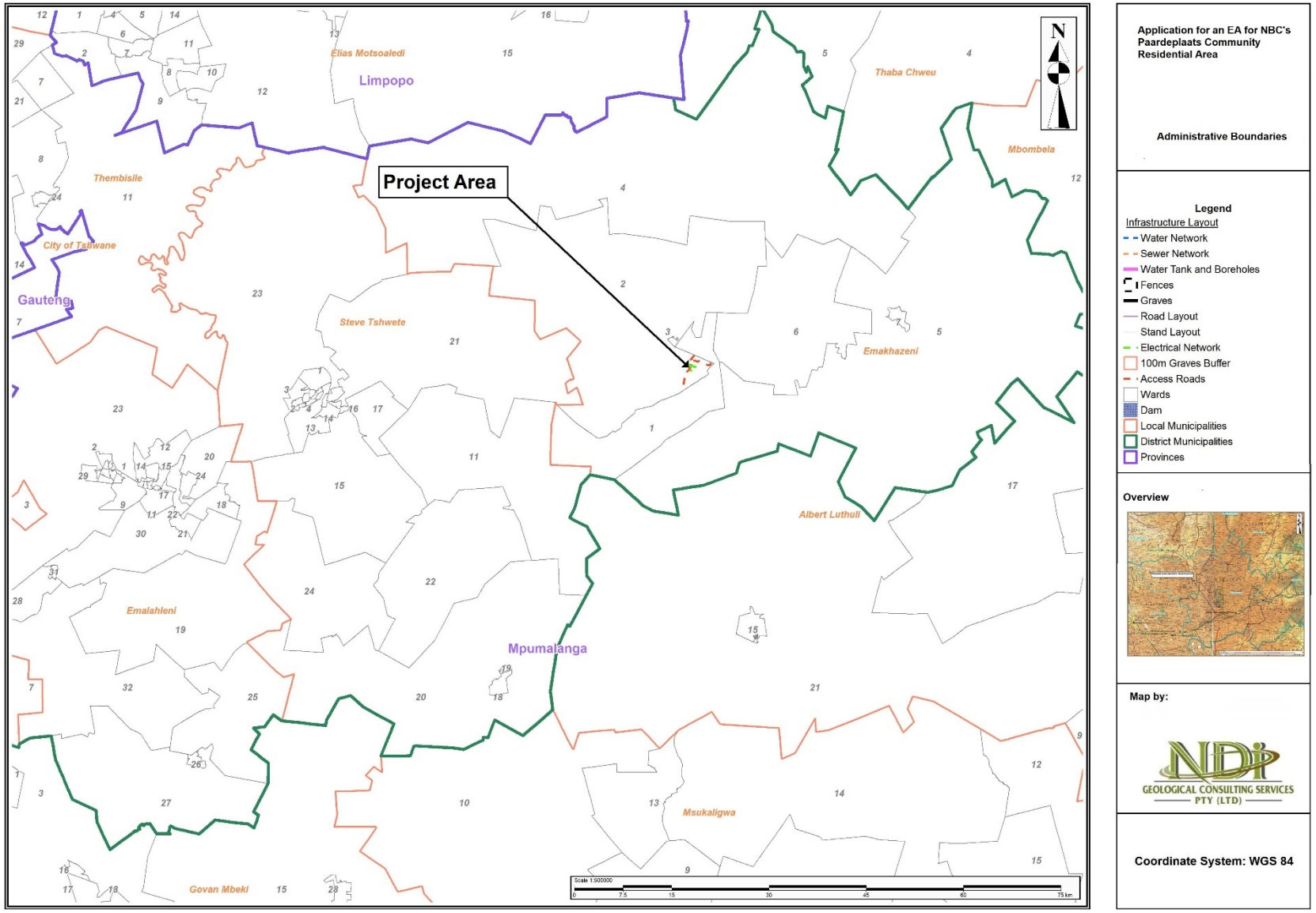


Figure 1-1: Relevant District and Local Municipalities Relevant to the Proposed Project

1.6 Environmental Authorisation Application Process

All activities that trigger activities listed in LN 1 and 3 require that a Basic Assessment (BA) process be followed. The BA process will entail:

- Pre-application meeting with the MDARDLEA per the requirements of the Department of Forestry, Fisheries and the Environment (DFFE) COVID-19 Directives of 5 June 2020;
- Project announcement through notification letters, advertisements and on-site notices;
- Compilation of a Draft BAR and draft EMPr for the public to comment on;
- Compilation and submission of the EA Application to the MDARDLEA;
- Stakeholder and I&APs review and comment of the draft BAR and EMPr for a period of 30 days; and
- Incorporation of stakeholder and I&APs comments into the final BAR and EMPr.

The MDARDLEA will have a maximum of 107 days to review and decide on the application.

The BA process will follow the procedure as prescribed in Regulations 19 to 20 and is summarised in Figure 1-2.

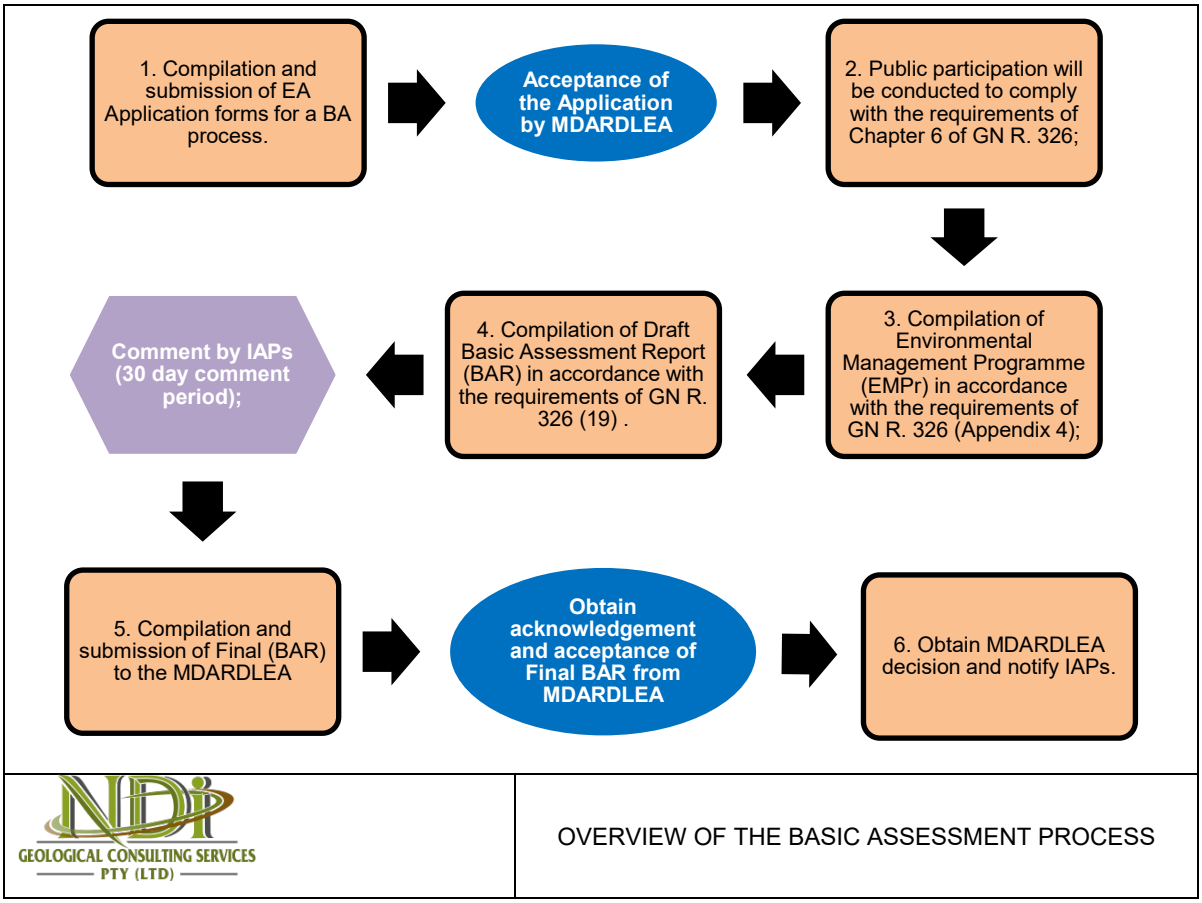


Figure 1-2: Overview the Basic Assessment Process

2 Project Description

2.1 Project Layout

The residential area for the relocation of the Paardeplaats Community which will consist of the following:

- 28 housing stands approximately 800m^2 in size (total area approximately 2.24 ha),
- Internal ten (10) m wide gravel roads;
- Two (2) transformers;
- A 157-kilolitre sewer conservancy tank;
- 160mm and 110mm Unplasticized Polyvinyl Chloride (uPVC) sewer pipelines;
- Two (2) possible alternative powerlines measuring 488m and 266m located to the north and south of the development;
- Boreholes for potable water provision;
- 75mm uPVC water lines;
- Perimeter fence; and
- A 56-kilolitre elevated water tank for potable water provision.

The proposed project layout is provided in in Figure 2-1.

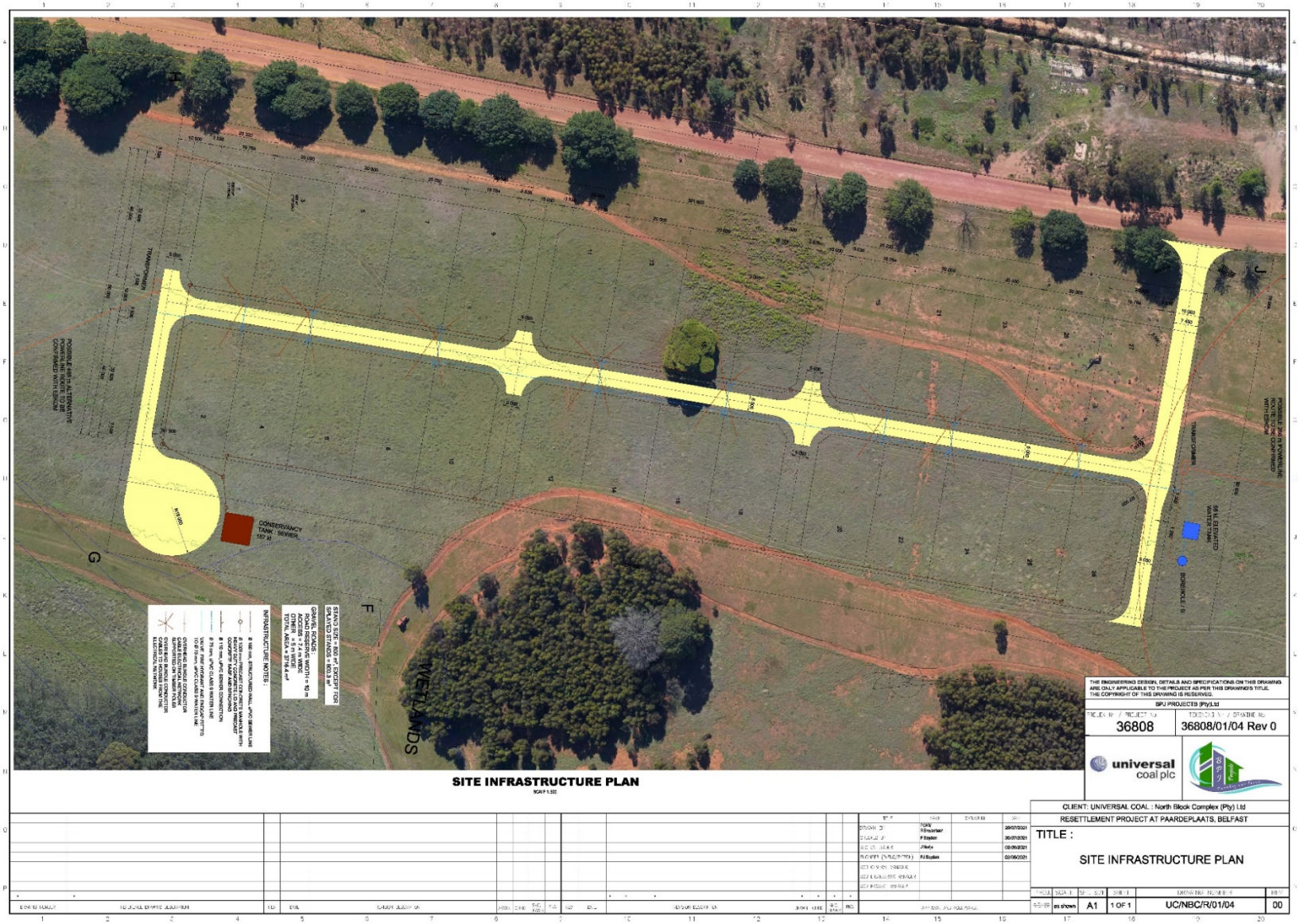


Figure 2-1: Proposed North Block Complex (Pty) Ltd Paardeplaats Community Residential Area Layout

2.2 Construction

Construction of the houses and infrastructure will be undertaken by Contractors that will be appointed by NBC. The general construction activities will include:

- Site preparation;
- Earthworks: Establishment of foundations;
- Civil works:
    - Erection of structures and infrastructure associated with the project;
    - Foundation excavations and compaction;
    - Concrete work including the mixing of concrete;
    - Steelwork including grinding and welding; and
    - Rehabilitation of disturbed areas after general site construction is completed.

All waste will be re-used, recycled or disposed of only as a last resort at an appropriately licensed/registered facility depending on the type of waste.

2.3 Employment

NBC will appoint contractors for the construction phase of the project. The contractor (s) responsible for the construction of the project will appoint a team manager and a supervisor who will ensure that:

- All work to be conducted has been assessed in terms of risk;
- Risk assessments are developed according to operating procedures;
- All personnel are trained on procedures;
- Employees' competence is tested and insured; and
- Rules and procedures are enforced.

3 Alternatives Considered

There are no site alternatives that were identified. This is due to the limitation in availability in space, the remaining areas on the property will be impacted by NBC mining activities.

The assessment will however include an assessment of the no-go option, as is required by the EIA Regulations.

4 Location of the Proposed Activity

The proposed NBC Paardeplaats Community Residential Area will be located on a Remainder of Portion 13 of farm Paardeplaats 380JT in Belfast, Emakhazeni Local Municipality within the Nkangala District Municipality of Mpumalanga Province. The proposed project is located on the farm portion as illustrated in Figure 4-1. Table 4-1 provides a description of the proposed activities located on the property.

Table 4-1: List of Affected Farms and Farm Portions Illustrating the Relevant Activities

Farm and 21 Digit Survey General Code	Portions	Owner	Proposed Activities
Paardeplaats 380JT	Remainder of Portion 13	NBC	Development of the NBC Paardeplaats Community Residential Area
T0JT00000000038000013			

The site coordinates are provided in Table 4-2:.

Table 4-2: Site Coordinates

Site Co-ordinates	Latitude (S):			Longitude (E):		
Central Point	25°	42'	46.83"	30°	0'	57.63"

The affected property is owned by the applicant, NBC.

Figure 4-1: Affected Property

5 Legal and Policy Framework

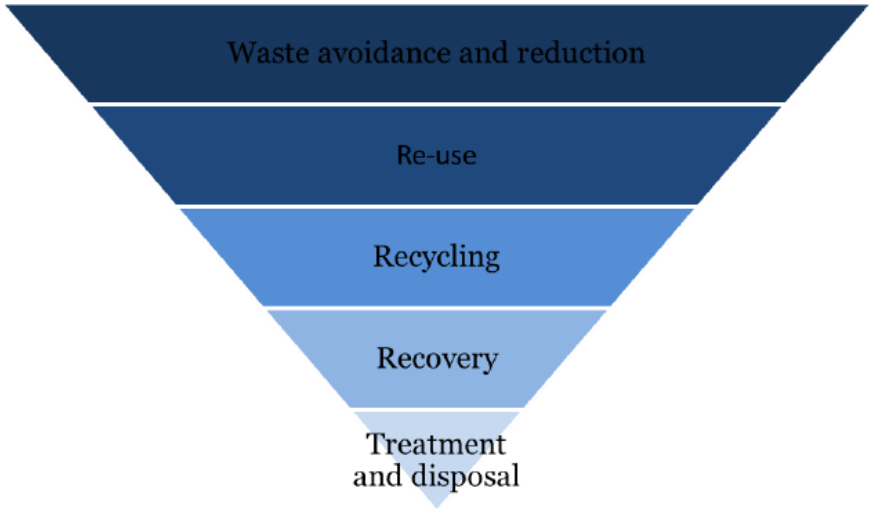
Table 5-1 provides a summary of the applicable legislation, policies and guidelines identified as relevant to the proposed NBC Paardeplaats Community Residential Area project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context, is provided. This list is not exhaustive but rather represents an indication of the most applicable pieces of legislation relevant to the project.

Table 5-1: Policy and Legislative Context of Proposed Project

Legislation	Description and Relevance	Responsible Authority
Constitution of the Republic of South Africa, (No. 108 of 1996)	Chapter 2 – Bill of rights Section 24 – Environmental Rights The proposed activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together be avoided, be minimised and mitigated to protect the environmental rights of South Africans.	N/A
Promotion of Access to Information Act (Act No. 2 of 2000) (PAIA	The Promotion of Access to Information Act (Act No. 2 of 2000) (PAIA) recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right. The purpose of the Act is to promote transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their right. The BA/EMPr process was undertaken in terms of the NEMA, where the associated stakeholder consultation process was aligned with the PAIA in the sense that all I&APs will be given an opportunity to register as an I&AP prior to the initiation of the project. All registered I&APs will in turn also be provided a fair opportunity to review and comment on any draft reports submitted to the competent authorities for decision making.	N/A
Protection of Personal Information Act (POPIA) which came into effect on 1 July 2021	The new Protection of Personal Information Act (POPIA) which came into effect on 1 July 2021 aims to promote protection of personal information. The stakeholder engagement process will be undertaken in a way that will ensure that personal information is protected as far as possible and that I&APs are provided an opportunity to choose how they prefer to have their personal information handled.	N/A
National Environmental Management Act (NEMA) (No. 107 of 1998)	Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment) Section 28 – Duty of care and remediation of environmental damage Environmental management principles will be incorporated into the BAR and EMPr, which the applicant will be required to comply with to ensure that negative impacts on the environment are avoided or kept to a minimum and that positive impacts are enhanced.	MDARDLEA

Legislation	Description and Relevance	Responsible Authority
National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the EIA Regulations 2014 (Government Notice (GN) 984), as amended	The EIA Regulations (GNR 982) were promulgated in terms of Sections 24 of the NEMA, to manage the process, methodologies and requirements for the undertaking of an EIA. The GNR 982 stipulates that the applicant for activities listed under GNR 983, 984 or 985 must appoint an independent EAP to manage the EIA process. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental impact on the environment, and which may not commence without an EA from the Competent Authority (CA). EA required for Listed Activities is subject to the completion of either a Basic Assessment (BA) process or full Scoping and Environmental Impact Assessment (S&EIA) with applicable timeframes associated with each process. The EA must be obtained prior to the commencement of those listed activities. The project triggers activities listed in LN 1 and 3 and will require an EA from the MDARDLEA. According to GNR 326 of the NEMA, activities listed in LN1 and 3 require that a BA be undertaken. The applicable listed activities that will be triggered by the project is provided in Table 5-2.	
Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series, Guideline 5: Assessment of the EIA Regulations, 2012 (Government Gazette 805)	Environmental impacts will be generated primarily in the construction phase of this project. These, together with associated operational phase impacts will be assessed as part of the proposed project EIA process.	
Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004	An Environmental Assessment is required for the proposed project as activities are triggered under LN 1 and 3.	
Review in Environmental Impact Assessment, Integrated Environmental Management, Information Series 13, Department of Environmental Affairs and Tourism (DEAT), Pretoria.		
DEA Integrated Environmental Management Guideline Series, Guideline 7: Public Participation in the Environmental Impact Assessment Process, 2012 (Government Gazette 807)	Public participation is a requirement of the EIA Process and will be conducted for the proposed project as stipulated in Chapter 6 of the NEMA.	

Legislation	Description and Relevance	Responsible Authority
National Water Act, 1998 (Act 36 of 1998) (NWA)	Section 21: Specifies a number of water uses that require Water Use Authorisation (WUA) in terms of Section 22(1) of the Act. A WUA process must be conducted to obtain authorisation for any of these activities unless the specific use is listed in Schedule 1 of the NWA or is an existing lawful use. Listed activities that require authorisation - a Water Use Licence (WUL) or General Authorisation (GA) (issued in terms of Section 39 of the NWA) through a registration and application process include: taking water from a water resource, impeding or diverting the flow of water in a watercourse and altering the beds, banks, course or characteristics of a watercourse. The competent authority for WUAs is the Department of Water and Sanitation (DWS). The proposed project falls within 500m of wetlands and therefore constitutes a water use as per Section 21 of the NWA. A Section 21 (c) and (i) Water Use Authorisation (WUA) will therefore be required. In addition, the project will abstract groundwater for potable use. A Section 21 (a) WUA will also be required. An integrated WUA application will be undertaken with the DWS for the Section 21 (c), (i) and (a) water uses.	Department of Water and Sanitation (DWS)
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA)	The objectives of NEM: WA involve the protection of health, wellbeing and the environment by providing reasonable measures for the minimisation of natural resource consumption, avoiding and minimising the generation of waste, reducing, recycling and recovering waste, and treating and safely disposal of waste as a last resort. In terms of the NEM: WA, all waste management activities must be licensed. According to Section 44 of the Act, the licensing procedure must be integrated with an EIA process in accordance with the Regulations GNR 982 (as amended) printed in terms of the NEMA. Government Notice 719, which was implemented on 3 July 2009, removed all waste management activities from the EIA regulations GNR 386 and GNR 387, resulting in new NEMA listed activities namely GNR 544 and GNR 545 which were further amended to form GNR 983, 984, and 985. In 2017 GNR 983, 984 and 985 were amended through GNR 324, 325 & 327. GNR 718 listed the waste management activities that require licensing. On 29 November 2013, GNR 718 was repealed and replaced by a new list of waste activities under GNR 921. A distinction is made between Category A waste management activities, which require a basic assessment, and Category B activities, which require a full EIA, and Category C waste management activities which do not require a waste management licence but compliance with relevant requirements or standards. On 24 July 2015, the waste management activities were further amended in GNR 633, which included the establishment or	MDARDLEA/DFFE

Legislation	Description and Relevance	Responsible Authority
	reclamation of a residue stockpile or residue deposit resulting from prospecting or mining activities as a listed activity. The project does not trigger activities listed in GNR921 of the NEM: WA and will therefore not require a Waste Management Licence (WML).The principles of the act, focusing on the waste hierarchy (Figure 5-1) of avoidance and reduction, re-use, recycling, recovery and treatment and disposal has been taken into consideration in the development of the EMPr during the EIA.  **Figure 5-1: Waste Hierarchy**	
National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004)	Air quality management Section 32 – Dust control. Section 34 – Noise control. Section 35 – Control of offensive odours. No listed activities in terms of NEM: AQA will be triggered because of the proposed project, however the principles of the act focusing on minimisation of pollutant emissions will be taken cognisance of in the development of the EMPr.	DFFE and eMakhazeni Local Municipality/Nkangala District Municipality

Legislation	Description and Relevance	Responsible Authority
The National Forestry Act, 1998 (Act No. 84 of 1998) (NFA)	The NFA protects against the cutting, disturbance, damage, destruction or removal of protected trees. A biodiversity assessment was undertaken as part of a previous EIA that included an assessment of the current project area, where floral SCC were identified. There were four (4) species of floral SCC that were identified on the affected property. These will however not be directly impacted by the residential area infrastructure. As such, no protected trees will be affected by the project and no permit will be required for the removal and/or relocation of the trees. Care must however be undertaken to ensure that no SCC that have been missed during the biodiversity assessment are affected. As such, mitigation measures for chance finds will be included in the EMPr.	DFFE
The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA)	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. The Act provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected The management and control of alien invasive species on the impacted areas during all the phases of the project will be governed by the NEM: BA. The NEM: BA ensures that provision is made by the site developer to remove any alien species, which have been introduced to the site or are present on the site. The biodiversity assessment identified several alien and invasive plant species on the proposed project site, including *Eucalyptus* sp and *Populus* sp. The management and control of these alien invasive plant species has been assessed and mitigation measures have been included in the EMPr.	DFFE/MDARDLEA
Conservation of Agricultural Resources Act, 1993 (Act No. 43 of 1983) (CARA)	Control measures for erosion Control measures for alien and invasive plant species The EMPr will include measures to control and manage alien invasive plant species located on the project site, which include *Eucalyptus* sp and *Populus* sp and how soil erosion will be minimised.	DFFE
National Heritage Resources Act, (Act No. 25 of 1999) (NHRA)	Heritage Permit for structures 60 years or older. The phase 1 Heritage Impact Assessment conducted for the project found no heritage resources that will be affected by the project. The EMPr however includes mitigation measures which would apply, should by chance graves and heritage resources be unearthed by the project.	Mpumalanga Heritage Resource Authority

Legislation	Description and Relevance	Responsible Authority
Restitution of Land Rights Act, 1994 (Act No. 22 of 1994), as amended in 2014.	Land Claims. The property where the proposed project is located is owned by the applicant, NBC.	Department of Rural Development and Land Reform

5.1 Provincial and Municipal Bylaws

The Nkangala District Municipality, eMakhazeni Local Municipality and the Mpumalanga Province have developed local bylaws and various policies relating to waste disposal, water, economic development, air quality, etc. The proposed project must ensure that such policies and bylaws are adhered to as far as possible during the construction and operation of the residential area and the associated infrastructure.

5.2 Guidelines

The following documents will be considered during the impact assessment process and compilation of the EMPr of the proposed project:

- Mpumalanga Provincial Biodiversity Management Plan;
- eMakhazeni Local Municipality Integrated Development Plan (IDP);
- Nkangala District Municipality Spatial Development Framework (SDF);
- DWS, 2010. Operational Guideline: Integrated Water and Waste Management Plan. Resource Protection and Waste;
- Department of Water Affairs and Forestry, 2006. Best Practice Guideline G1 Storm Water Management;
- Department of Water Affairs and Forestry, 2006. Best Practice Guideline G3. Water Monitoring Systems;
- Department of Water Affairs and Forestry, 2008. Best Practice Guideline G4: Impact Prediction;
- DEAT. 2002. Integrated Environmental Management, Information series 3: Stakeholder Engagement. Department of Environmental Affairs and Tourism (DEAT. 2002);
- DEAT. 2002. Integrated Environmental Management, Information series 12: Environmental Management Programmes. Department of Environmental Affairs and Tourism (DEAT. 2002);
- DEA. 2010. Companion to the EIA Regulations 2010 for Comment, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs;
- DEA. 2010. Companion to the EIA Regulations 2010 for Comment, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs;
- DEA. 2012. Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs;
- DEA. 2012. Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs; and
- Western Cape Department of Environmental Affairs and Tourism. 2010. EIA Guideline and Information Document Series: Guideline on Need and Desirability.

5.3 Listed Activities Triggered

The proposed project triggers the following activities in LN1 and 3 as provided in Table 5-2.

Table 5-2: Listed Activities triggered

Government Notice and Activity Number	Relevant Activity as per the relevant Listing Notice	Describe the portion of the development as per the project description that relates to the applicable listed activity
Listing Notice 1 (GNR 327): Activity 11	*The development of facilities or infrastructure for the transmission and distribution of* *electricity—* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or* *(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;* *excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.*	The proposed project includes the development of powerlines and transformers located to the north and south of the proposed residential area.
Listing Notice 1 (GNR 327): Activity 24	*The development of a road—* *(i) [a road] for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or* *(ii) [a road] with a reserve wider than 13.5 meters, or where no reserve exists where the road is wider than 8 metres;* *but excluding a road—* *(a) [roads] which [are] is identified and included in activity 27 in Listing Notice 2 of 2014;* *(b) [roads] where the entire road falls within an urban area; or* *(c) which is 1 kilometre or shorter.*	The proposed residential area will include the construction of internal roads which are 10m wide.
Listing Notice 1 (GNR 327): Activity 27	*The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—*	The footprint of the proposed residential area will be approximately 2.24 ha.
Listing Notice 3 (GNR 327): Activity 4	*The development of a road wider than 4 metres with a reserve less than 13.5 metres.* *f. Mpumalanga* *i. Outside urban areas:* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	The proposed residential area is located in an area classified as a Critical Biodiversity Area (CBA) and includes internal roads that will be 10m wide.
Listing Notice 3 (GNR 327): Activity 12	*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.*	The proposed residential area is located in an area classified as a CBA and will have a footprint of approximately 2.24 ha.

Government Notice and Activity Number	Relevant Activity as per the relevant Listing Notice	Describe the portion of the development as per the project description that relates to the applicable listed activity
	f. Mpumalanga *ii. Within critical biodiversity areas identified in bioregional plans; or*	

6 Stakeholder Engagement Process

Stakeholder engagement is a key element of the environmental decision-making process and is primarily aimed at affording I&AP's the opportunity to gain an understanding of the proposed project. In addition, the purpose of consultation with the landowners, key I&APs, and I&AP's is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether the project will affect them and provide the EAP team with local knowledge of the area and raise concerns relating to the biophysical, socio-economic and cultural impacts that may arise.

The stakeholder engagement process will be conducted in terms of NEMA, which provides clear guidelines for stakeholder engagement during an EIA as summarised in Table 6-1.

Table 6-1: NEMA Stakeholder Guidelines

NEMA Section	Applicability to Stakeholder Engagement
Chapter 1	Outlines the principles of environmental management, several pertaining to public consultation (e.g., Chapter 1, subsections (2), (3), (4) (f), (g), (h), (k), (q) and (r).
Chapter 6,	Regulations 39 – 44 of the amended EIA Regulations GNR) 326, promulgated on 8 December 2014, specify the minimum requirements for stakeholder engagement in an EIA process conducted under the NEMA.
Section 24J of the NEMA	In 2017, the Minister of Environmental Affairs published, Section 24J of the NEMA in terms of**,** Public Participation Guidelines which guide the Public Participation Process in order to give effect to Section (2)(4)(f), (o) and 24 (1A)(C) of the NEMA.

The guidelines listed in Table 6-1 will be incorporated into the stakeholder engagement process. This application will be submitted to the MDARDLEA for authorisation as the competent authority. Identified commenting authorities on this application include:

- Department of Water and Sanitation (DWS) – Regional Office;
- South Africa Heritage Resources Agency (SAHRA) – Provincial;
- eMakhazeni Local Municipality;
- Department of Agriculture & Land Administration; and
- Nkangala District Municipality.

6.1 Authority Pre-Application Consultation

A request for a pre-application meeting was submitted to the Department on 20 September 2021. At the time of compiling this report, a pre-application meeting had not been confirmed.

6.2 Stakeholder Identification Interested and Affected Parties

I&APs were identified using a Geographic Information System (GIS) and cadastral information to identify affected and adjacent properties. The affected and adjacent property owners were identified using the surveyor general website, www.deedsweb.gov.za. In addition, registered I&APs were also

sourced from responses to the advertisements, site notices and written notification to I&APs associated with the project.

The I&APs register will be maintained for the duration of the BA process where the details of stakeholders are captured and automatically updated upon communication to the EAP. The identification, registration, and comments from I&APs will be an on-going activity. A preliminary stakeholder database is included in Appendix C 1.

The affected properties are provided in Table 6-2.

Table 6-2: List of affected Farm and Farm Portions

Farm	Portions	21 Digit Survey General Code
Paardeplaats 380JT	13	T0JT00000000038000013

Table 6-3 provides a list of identified adjacent properties.

Table 6-3: List of the adjacent properties

Farm	Portions	21 Digit Survey General Code
Paardeplaats 380JT	78	T0JT00000000038000078
	38	T0JT00000000038000038
	7	T0JT00000000038000007
	10	T0JT00000000038000010
	9	T0JT00000000038000009
	17	T0JT00000000038000017
	18	T0JT00000000038000018
	30	T0JT00000000038000030
	33	T0JT00000000038000033
	35	T0JT00000000038000035
	6	T0JT00000000038000006
	8	T0JT00000000038000008
	24	T0JT00000000038000024
	34	T0JT00000000038000034
	36	T0JT00000000038000036
	29	T0JT00000000038000029
	37	T0JT00000000038000037
	Remainder	T0JT00000000038000000

Figure 6-1 shows the affected and adjacent properties.

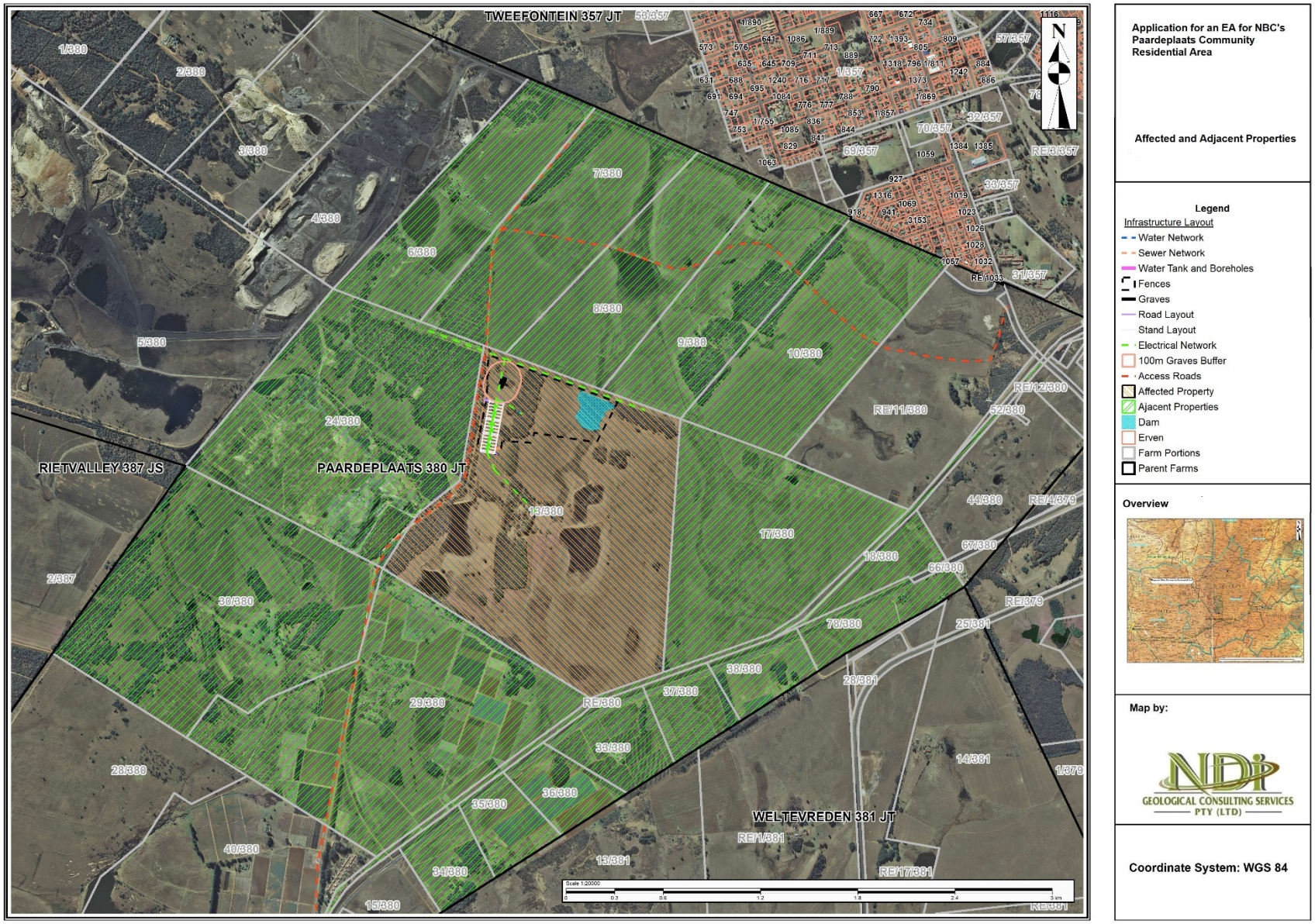


Figure 6-1: Affected and Adjacent Properties

6.3 Project Announcement Phase

Ndi Geological made use of various methods to inform stakeholder of NBC's intention to undertake the required and environmental processes and EA application. I&APs were provided with the opportunity to participate and register as I&AP's during the announcement phase of the project.

6.3.1 Distribution of Notification Letters

Notification letters were sent to all identified I&AP's (affected and adjacent landowners and land occupiers) informing them of the proposed project on 30 September 2021. I&APs were requested to provide consent for the EIA team to contact and communicate with them with respect to the project and where required disclose their information per the requirements of the Protection of Personal Information Act (POPIA) which came into effect on 1 July 2021. I&APs was made aware of the protection of their personal information as follows:

> *By registering as a stakeholder, you consent to Ndi Geological processing and, if necessary, disclosing your personal information which Ndi Geological undertakes to do in accordance with the Protection of Personal Information Act of 2021.*

The documentation from the project announcement phase is included in Appendix C 2.

6.3.2 Bulk SMSes

Bulk SMSes were sent to all the I&APs that provided Cellphone numbers on 30 September 2021.

6.3.3 Site Notice Placements

English and Afrikaans sites notice (Size A2: 600 mm X 420 mm) notifying I&APs of the proposed project were placed at conspicuous places in the project area on 1 October 2021. Table 6-4 provides a list of these site locations. Evidence of site notice placement is provided in Appendix C 3.

Table 6-4: Site Notice Location and Coordinates

Site Notice	Location	Coordinates	
		Latitude	Longitude
1	At the project site	25°42' 44.7" S	30°00'55.3" E
2	At the intersection of Paardeplaats access road and unknown road name	25°41' 45.8" S	30°01'17.9" E
3	Belfast Public Library	25°41' 35.7" S	30°02'03.7" E
4	Belfast Academy	25°41' 48.2" S	30°02'25.4" E
5	Belfast Post Office	25°41' 37.9" S	30°02'33.1" E
6	At the intersection of Paardeplaats access road and N4	25°44' 15.8" S	30°00'35.1" E

Figure 6-2 provides a map of the location of the site notices.

Figure 6-2: Site Notice Location

6.3.4 Newspaper Advertisements

English and Afrikaans newspaper advertisements notifying I&APs about the proposed project and the opportunity to participate in the BA process were placed in the Middleburg Observer on 1 October 2021. Copies of the newspaper advertisements are included in Appendix C 4.

6.4 Draft Basic Assessment Report Phase

The draft BAR was compiled in terms of the requirements of GNR 326. All comments received during the announcement phase of the stakeholder engagement process were incorporated into draft BAR and collated into a Comments and Responses Report (CRR). The draft BAR will be made available for a 30-day commenting period between 18 October 2021 and 18 November 2021.

The availability of the draft BAR will be announced by means of SMSes, letters and emails to registered I&APs. Copies of the draft BAR will be made available at the venues listed in Table 6-5.

Table 6-5: List of places where the draft BAR will be placed for public viewing

Public Place	Locality	Telephone
Ndi Geological	OneDrive	A link will be created and shared with the stakeholders
Ndi Geological	Other Electronic Transfer Platforms	A link will be created and shared with the stakeholders
Ndi Geological Website	http://www.ndigeoservices.co.za	053 842 0687 ndi@ndigeoservices.co.za

Should the COVID-19 Regulations permit, hard copies of the draft BAR will be made available at the venue listed in Table 6-6.

Table 6-6: The list of places hardcopies of the draft BAR will be placed for public viewing

Public Place	Locality	Telephone
eMakhazeni Public Library	Scheepers Street, Belfast	013 255 0437

The draft BAR will also made available to the competent and commenting authorities during the 30-day review and comment period.

Where necessary, comments and concerns received from I&AP's, including commenting authorities, will be incorporated and addressed in the Final BAR. All comments and concerns received from I&AP's and responses to those concerns will also be collated into the CRR prior to submission of the Final BAR to the MDARDLEA for final decision making.

Comments from I&APs are included in Appendix C 6.

6.5 Comments and Response Report

All issues and concerns raised by I&AP's during the EA application process, will be recorded and responded to in the CRR which will form part of the Final BAR to be submitted to the MDARDLEA for decision making. A copy of the CRR is provided in Appendix C 5.

6.6 Authority Consultation

Ongoing consultation with the different commenting authorities will be conducted during the EA application process. Further consultations with the competent authorities will be conducted should they become necessary. Other authorities that will be included are the local and district municipalities, ward councillors, and others identified in the introductory section of this Chapter. Copies of correspondence with commenting authorities are included in Appendix C 7.

6.7 Key Comments Received.

Table 6-7 provides a summary of the comments received to date following the newspaper adverts, site notices, written notification of the project and the Draft BAR review period. No comments have been received to date.

Table 6-7: Key Comments Received

The table will be updated once the Draft BAR has been submitted to I&APs for review and comment.

6.8 Comments and Response Report

All issues and concerns raised by I&AP's will be recorded and responded to in the CRR. A copy of the CRR is included as Appendix C 5. The CRR will be updated with comments received from and responses provided to I&APs during the draft BAR commenting period.

7 Need and Desirability of the Proposed Project

The environmental right is contained in the Constitution of the Republic of South Africa, Act 108 of 1996 (hereafter referred to as "The Constitution"). Section 24 of the Constitution enshrines environmental rights in South Africa, which are interpreted to have a two-fold purpose. The first part guarantees a healthy environment to every person. The second part mandates the State to ensure compliance with the first part. The State is prohibited from infringing on the right to environmental protection and is further required to provide protection against any harmful conduct towards the environment.

The proposed relocation of NBC's Paardeplaats Community will reduce potential negative environmental impacts on the households to be relocated that may result from the mining activities from the Integrated Paardeplaats Section mining project.

7.1 Integrated Paardeplaats Section mining project

The current location of the households requiring relocation is where the proposed consolidation of NBC's Glisa and Paardeplaats Sections will occur (Integrated Paardeplaats Section mining project). The proposed project will therefore enable NBC to implement consolidation project and continue with the mining project, resulting in accrual of all the benefits associated with the consolidation project including:

- Contribution to electricity generation for South Africa: NBC has an existing supply agreement with Eskom to supply steady and secure coal for selected Eskom coal fired power stations. The Integrated Paardeplaats Section will produce enough coal for NBC to meet its contractual obligations to Eskom. The Integrated Paardeplaats Section has an estimated RoM supply rate of 4.2 – 4.4 Mtpa which relate to 2.4 – 2.6 Mtpa of product. This provision aligns with the requirements of the NDP 2030 and will assist South Africa in meeting its planned development objectives.
- Revenue Generation: South Africa produces an average of 224 million tons of marketable coal annually, making it the fifth largest coal producing country in the world. Twenty five percent (25%) of our production is exported internationally, making South Africa the third largest coal exporting country. The overwhelming volume of coal exports are to India, with demand from other countries such as Pakistan and Sri Lanka. A further possible coal export market with China has the potential to positively impact the coal export marketof South Africa, especially since China is no longer accepting coal from Australia. The NBC Integrated Paardeplaats Section has an estimated RoM supply rate of 1.7 Mtpa of export coal which equates to 1.0 Mtpa of export product, making it a desirable contributor to the coal export market.
- Contribution at Local Levels: According to the eMakhazeni LM IDP (2019/2020), the leading sectors in terms of percentage contribution to the eMakhazeni LM economy are mining (27.1%), transport (26%) trade (8.4%) and community services (14.7%). Mining has remained the biggest contributor in Gross Domestic Product (GDP) in the municipality over the past few years. The desirability of continued mining operations, such as the NBC Integrated Paardeplaats Section, is high considering the impact that such an operation will have on the GDP of the eMakhazeni LM, not to mention the National GDP. Mining further contributes the second highest total number of employment opportunities in the eMakhazeni LM and Nkangala DM, second to agriculture in the LM and trade in the DM respectively(eMakhazeni IDP, 2020). This does not consider secondary employment opportunities generated by mining, such as catering services, transport services, laundry services, and environmental services, to list a few. The need for long-term mining projects is therefore significant in

ensuring that both primary and secondary employment opportunities associated with the mine would continue, positively impacting both the local and district municipalities.

- Job Creation and Retention: NBC have 37 permanent employees whose jobs will be retained as a result of the continued mining operations. Mining activities will be contracted out with these jobs being created at the companies contracted to undertake the miningactivities. It is envisaged that the workforce of the contractor will be made up of 239 workers of which 68 will come from the eMakhazeni LM, 129 from the remainder of the Nkangala DM, and 42 from the rest of South Africa (EIMS, 2015). Although mining activities will be contracted out, NBC management will be responsible for support services and line management of the Integrated Paardeplaats Section.

7.2 Project Specific Benefits

The proposed housing project will result in:

- Provision of housing to households: It is expected that the build back better principle will be implemented, resulting in an improved way of life.
- Job Creation and Capital Value: The proposed project will result in the creation of approximately 66 job opportunities during the construction of various infrastructure as provided in Table 7-1. The capital value of the project is estimated to be R38 464 152.82 (including VAT) as summarised in Table 7-1.

Table 7-1: Jobs to be created and Capital Value of the Project

Infrastructure	Capital value	Job estimates
Fence	R 477 825.00	18
Electricity	R 1 000 000.00	15
Building of houses	R 26 924 509.63 excl VAT	20
Services (Water + Sewage	R 5 044 754.78 excl VAT	13
Total	**R33 447 089.40 (excl VAT)**	**66**

Furthermore, local small businesses will benefit from supply of materials that will be required for the construction phase of the proposed project.

7.3 Assessment as per GNR792 of 2012

The needs and desirability assessment of the proposed NBC Paardeplaats Community Residential Area project as per GN 792 of 2012 is provided in Table 7-2.

Table 7-2: Need and Desirability Assessment of the Proposed NBC Paardeplaats Community Residential Area Project

Questions (Notice 792, NEMA, 2012)		Response
PART I: NEED		
15.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	N/A. The proposed project will be located in the property owned by NBC and has no bearing on the SDF.
16.	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occur here at this point in time?	Yes. Authorising the project will enable NBC to implement the Integrated Paardeplaats Section mining project which will allow NBC to continue with mining activities. The proposed project area is the only area available within the NBC mining areas that will not be affected by mining activities.
17.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	Yes. Authorising the project will enable NBC to implement the Integrated Paardeplaats Section mining project which will allow NBC to continue with mining activities, without endangering the communities located in the areas affected by the Integrated Paardeplaats Section mining project. The continuation of mining activities will contribute to the local communities, local municipality, the region and country at large.
18.	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	No, the proposed project includes the provision of services such as water, sewer reticulation systems and electricity. Potable water for the residential area will be provided from groundwater and electricity will be sourced from Eskom.
19.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	Not applicable. The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project. The proposed project will be located on a property owned by NBC and will have no bearing on the infrastructure planning of the municipality. Groundwater will be the source of water that will be required for the area and electricity will be sourced from Eskom.
20.	Is the project part of a national programme to address an issue of national concern or importance?	The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project.

Questions (Notice 792, NEMA, 2012)		Response
		The National Development Plan (NDP) offers a long-term perspective, defines a desired destination and identifies the role different sectors of society need to play in reaching that goal. The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. At its core, the NDP aims to ensure the achievement of a "decent standard of living" for all South Africans by 2030. A decent standard of living consists of the following core elements which the proposed project will contribute to: • Housing, water, electricity and sanitation: The proposed project will result in construction of 28 houses with electrical, water and sewage services, where the build back better principle will be applied. • Employment: The proposed project will result in the creation of 66 job opportunities.
PART II: DESIRABILITY		
21.	Is the development the best practicable environmental option for this land/site?	Yes. Authorising the project will reduce potential socio-economic impacts that may be incurred in terms of the Integrated Paardeplaats Section mining project not being implemented. The households to be relocated are currently located in areas that will be affected by the proposed Integrated Paardeplaats Section mining project. Not implementing the project will mean that the Integrated Paardeplaats projects will not be implemented, and all the benefits associated with the project as provided in Section 7.1 will not be realised.
22.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The project has no bearing on the IDP or SDF of the eMakhazeni Local Municipality, Nkangala DM and/or Mpumalanga Province. The objective of the project is to provide housing for communities affected by the Integrated Paardeplaats Section mining project on remainder of Portion 13 of Paardeplaats 380JT which is owned by NBC.

Questions (Notice 792, NEMA, 2012)		Response
23.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No. The project will be located within the existing NBC property boundary and will have no implications on the integrity of the EMFs.
24.	Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes. The proposed residential area will be located within the NBC property boundary. The proposed location within Portion 13 of Paardeplaats is best as it is the only available area that will not be impacted by mining activities that will be implemented as part of the Integrated Paardeplaats Section mining project.
25.	How will the activity of the land use associate with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The heritage and palaeontology assessment undertaken for the project found that the proposed project will not have any impacts on cultural, palaeontology or heritage resources. The biodiversity assessment shows that there are no floral Species of Conservation Concern (SCC) that will be directly affected by the proposed project. The proposed project will however be located within 500m of wetland areas. Mitigation measures will be implemented to ensure that impacts on wetlands and all sensitive environmental attributes will be minimised.
26.	How will the development impact on people's health and well-being? (E.g., In terms of noise, odours, visual character and sense of place, etc.)?	During construction, there will be particulate emissions (dust) related to debris handling, materials transportation, storage, handling and transfer; open areas (windblown emissions). Gas emissions are also expected to occur due to vehicle and construction equipment activity (exhaust fumes). These impacts are expected to be of medium and low significance and can be mitigated and managed to acceptable levels, with a post mitigation impact that is low. Movement of construction vehicles and machinery results in the production of construction related noise from construction vehicles and machineries which may cause a nuisance to people working and living in the vicinity of the project area. However, the implementation of appropriate mitigation measures such as the use of Personal Protective Equipment (PPE) and noise reducing technology would reduce the noise level impacts to remain

Questions (Notice 792, NEMA, 2012)		Response
		within applicable and acceptable SANS levels (SANS 10103:2008). Occupational health and safety standards will apply. It is expected that the project will not have a significant impact on the visual character and sense of place, especially since the project will be located within the NBC property, which is approximately 1km away from the nearest visual receptor (Siyathuthuka settlement).
27.	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. The objective of the project is to is to provide housing for communities affected by the Integrated Paardeplaats Section mining project on remainder of Portion 13 of Paardeplaats 380JT which is owned by NBC. This will enable NBC to implement the Integrated Paardeplaats Section mining project without negatively impacting on communities located in the proposed mining area.
28.	Will the proposed land use result in unacceptable cumulative impacts?	No. It is expected that the project may result in low cumulative impacts on water, biodiversity and air quality. The impacts will be short lived, during the construction phase. It is however expected that implementation of the mitigation measures included in the EMPr will reduce the significance of the impact to very low/negligible.

8 Description of the Baseline Environment

The following section presents an overview of the biophysical and socio-economic environment in which the proposed project is located, to:

- Understand the general sensitivity of and pressures on the affected environment;
- Inform the identification of potential issues and impacts associated with the proposed project, which was assessed in the impact assessment section of this BAR;
- Identify gaps in available information to inform specialist study requirements; and
- Start conceptualising practical mitigation measures.

This section has been compiled, based on the following:

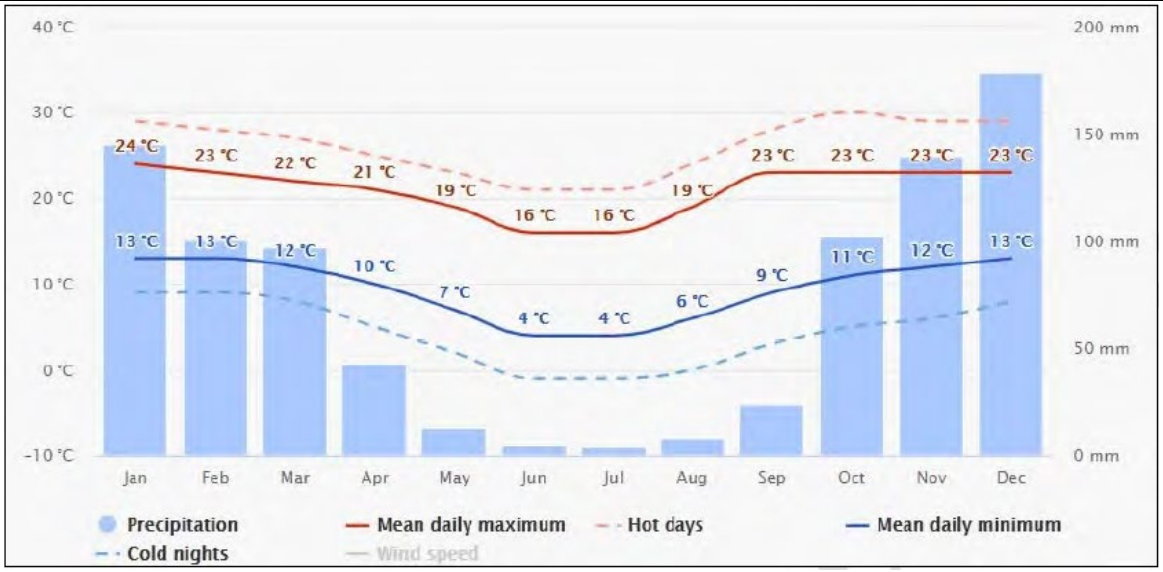
- Available information from the existing specialist studies reports;
- Existing information on the environmental parameters of the area from previous EIAs;
- Agricultural GIS;
- SANBI; and
- South African Weather Service.

8.1 Climate

According to the NOAA Environmental Modelling System (NEMS) weather model, the project is located in an area where:

- In the summer months' maximum average daily temperatures are predicted to be 21°C - 24°C on average, with a maximum of 30°C possible during hot days, dropping to a predicted 9°C - 13°C on average at night and 3°C minimum on cold nights.
- During winter months the average day time temperature are predicted in the 16°C - 19°C range while cold winter night-time temperatures are predicted to drop to -1°C.

Falling in a summer rainfall area, the project area is predicted to receive the most precipitation in the summer months of October – March. November - January are predicted to have the highest rainfall months with between 140 – 179 mm per month. February, March and October are predicted to receive 79 – 103 mm of rainfall per month (CIG, 2021). All other months are predicted to receive less than 43 mm precipitation on average per month (Figure 8-1).



GEOLOGICAL CONSULTING SERVICES PTY (LTD)

TEMPERATURE AND PRECIPICATION

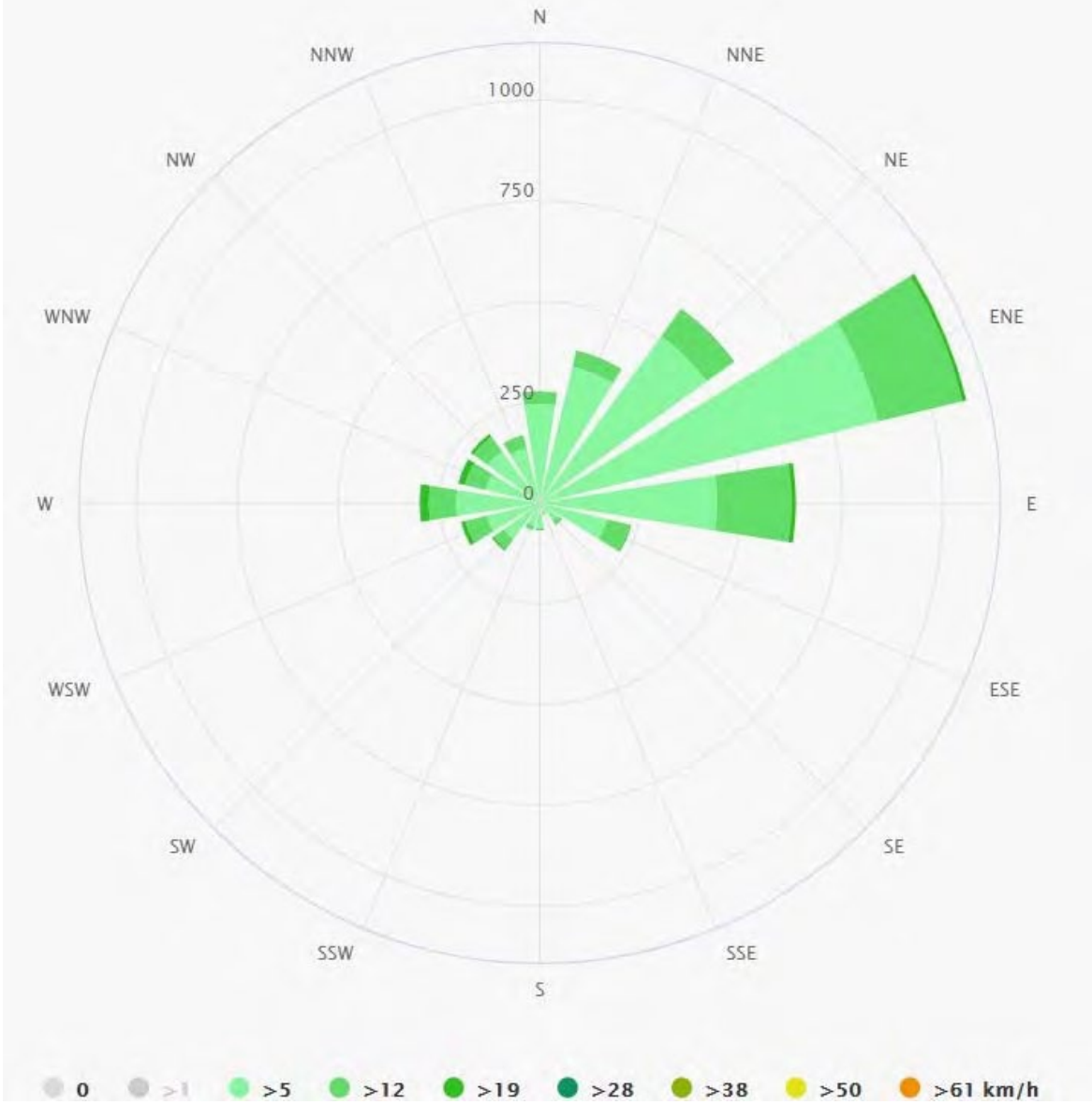
Figure 8-1: Average Temperature and Precipitation for the Project Area (CIG, 2021)

The highest precipitation days are predicted during the months of October - March. During these months, precipitation is predicted to only occur 16 - 24 days on average. The rest of the year precipitation is predicted to occur less than 9 days per month.

Evaporation losses exceed rainfall throughout the year in the project area which aligns with the warm and temperate nature of the area. The Mean Annual Evaporation (MAE) (Symons Pan) of the area is 1 500 mm (Bailey & Pitman, 2015).

8.2 Wind

A period wind rose for the project area is presented in Figure 8-2.



GEOLOGICAL CONSULTING SERVICES PTY (LTD)

TEMPERATURE AND PRECIPICATION

Figure 8-2: **Predominant Wind Direction for the** Project Area **(CIG, 2021)**

The meteorological data simulations run from the global NEMS weather model for the project area shows that:

- The predominant wind direction is predicted to occur mainly from the East-Northeast (ENE) for approximately 1 073 hours per year.
- A secondary direction is predicted from Northeast (NE) 592 hours per year and East (E) 635 hours per year, respectively, with wind speeds higher than 5 kilometres per hour (km/h).

8.3 Topography

The topography of the project area is hilly, with an altitude ranging between approximately 1 855 and 1 920 metres above mean sea level (mamsl) as shown in Figure 8-3. The topography of the area

slopes in a northerly direction towards a non-perennial tributary of the Grootspruit flowing from south to north approximately 13 km west of the site (CIG, 2021).

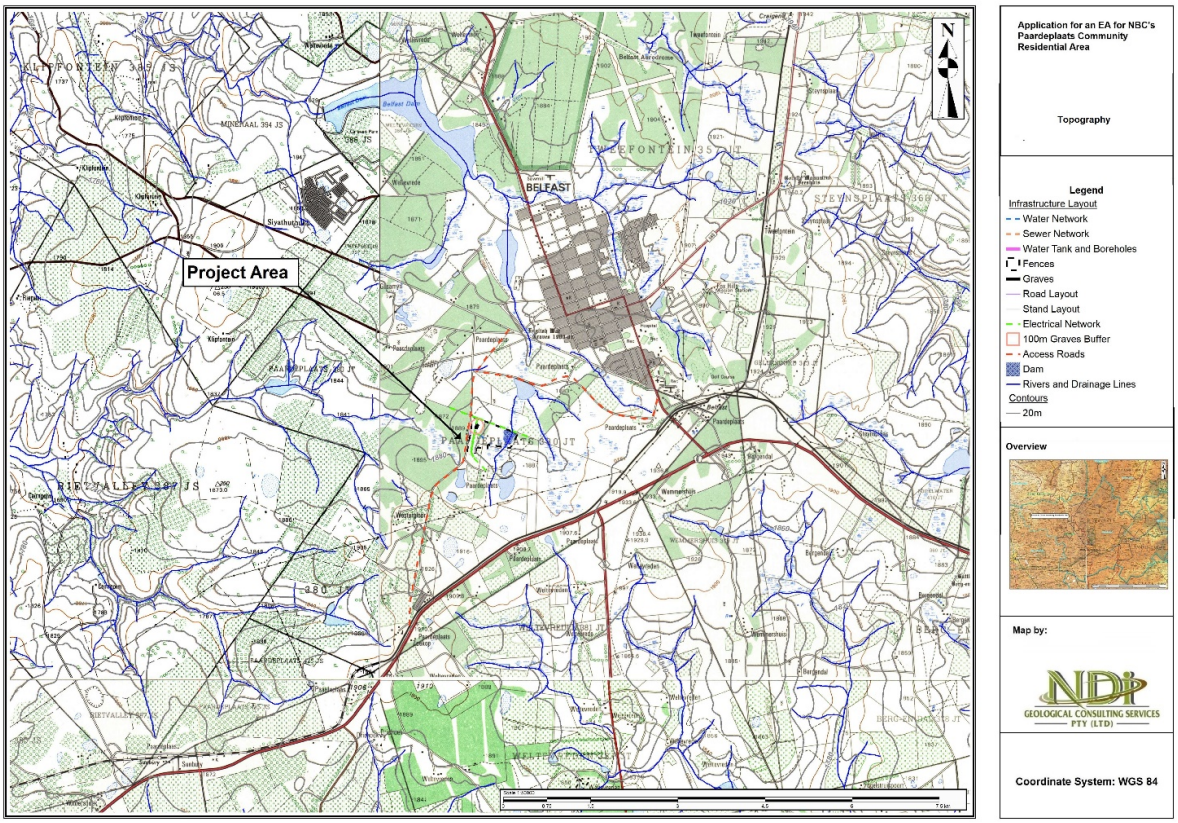


Figure 8-3: Topography

8.4 Geology

According to the 1:250 000 geological maps 2528 Pretoria and 2530 Barberton (Council for Geoscience, 1978 and 1986), the project is situated within the Witbank Coal field in the northern part of the main Karoo Basin (Karoo Supergroup). The area is found in the Vryheid Formation (Ecca Group) and consist predominantly of fine, medium, and coarse-grained sandstone with sub-ordinate mudstone, shale, siltstone, and carbonaceous shale (Figure 8-4). The Dwyka Group tillite forms the base of the coal seam deposits. These formations were deposited during the Permian Period of the Palaeozoic Era (230 to 280 million years ago) ((CIG, 2021))

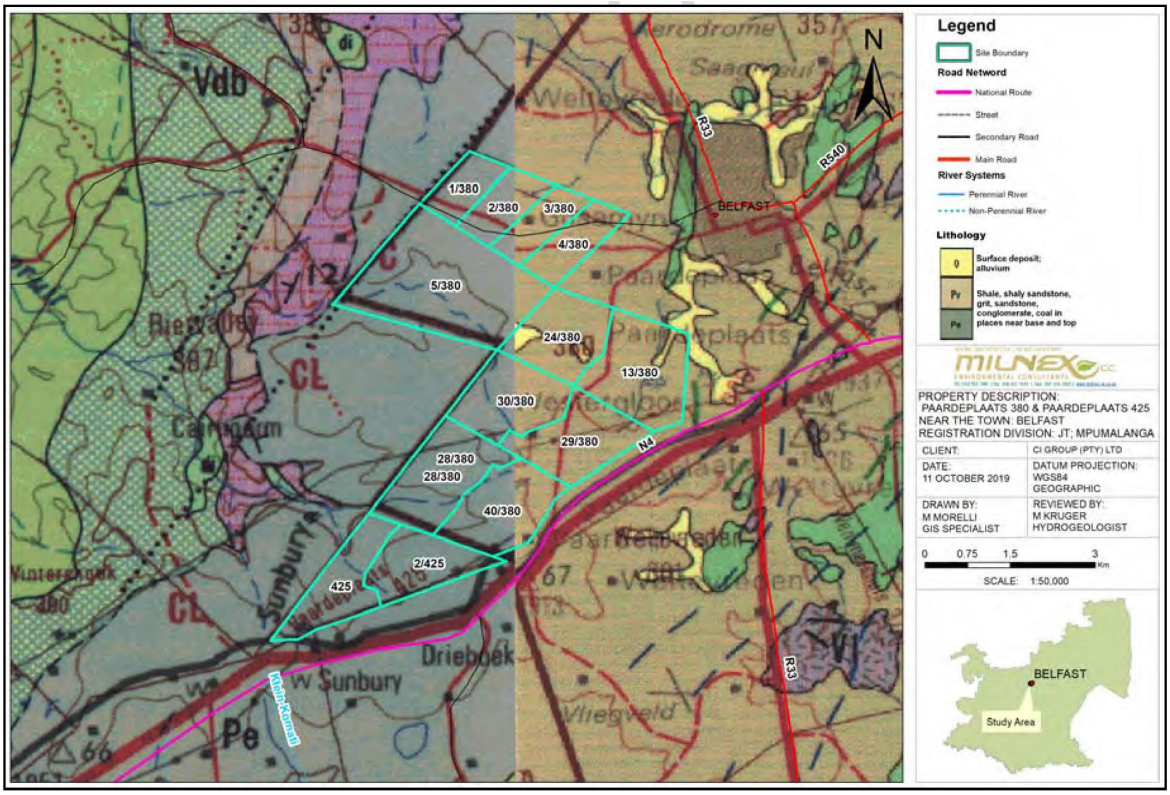


Figure 8-4: Geology (CIG, 2021)

The Vryheid Formation contains up to five (mineable) coal seams. The different lithofacies are mainly arranged in upward coarsening deltaic cycles. The permeabilities of the sandstones are usually very low. The main reason for this is that the sandstones are usually poorly sorted, and that their primary porosities have been lowered considerably by diagenesis. These sedimentary formations have been extensively intruded by dolerite dykes. General directions of the regional structures (dykes and faults) are south-southwest to north-northeast for the dykes and east to west for the faults, with some interconnection between faults as a result of north to south faulting. The slip faults were minor faults that occurred as a result of pressure relief and were mainly perpendicular to the main fault strike direction. The strata and coal seams encountered correlate with the rest of the Witbank coal fields (CIG, 2021).

8.5 Soils, Land-Use and Land capability

The soils within the project area are predominantly of the Red Yellow Apedal type, considered free draining. According to the CIG EIA Report, the section of Portion 13 where the project will be located is classified as summarised in Table 8-1 ((CIG, 2021)).

Table 8-1: Soil Map Units (CIG, 2021)

Map Unit	Depth (mm)	Dominant Soil Form(s)	Sub-Dominant Soil Form(s)	General Description of Soils Occurring	Agricultural Potential
dHu	800-1200	Hutton 1200	Hutton 1100 Clovelly 1200 Bainsvlei 1200	Reddish-brown, apedal, loamy sand to sandy loam topsoil on red (occasionally yellow brown), apedal, loamy sand to sandy loam subsoil, occasionally on mottled soft plinthite or weathering rock.	Very high

The agriculture potential of Portion 13 is classified as very high, with few to no limitations as provided in Table 8-2. The pre-mining land capability of the soils is provided in Figure 8-5.

Table 8-2: Agricultural Potential and Pre-mining Land Capability (CIG, 2021)

Soil Unit	Agriculture Potential	Limitation to Agric Activities	Capability Class
dHu	Very high	Few to none	Arable, high

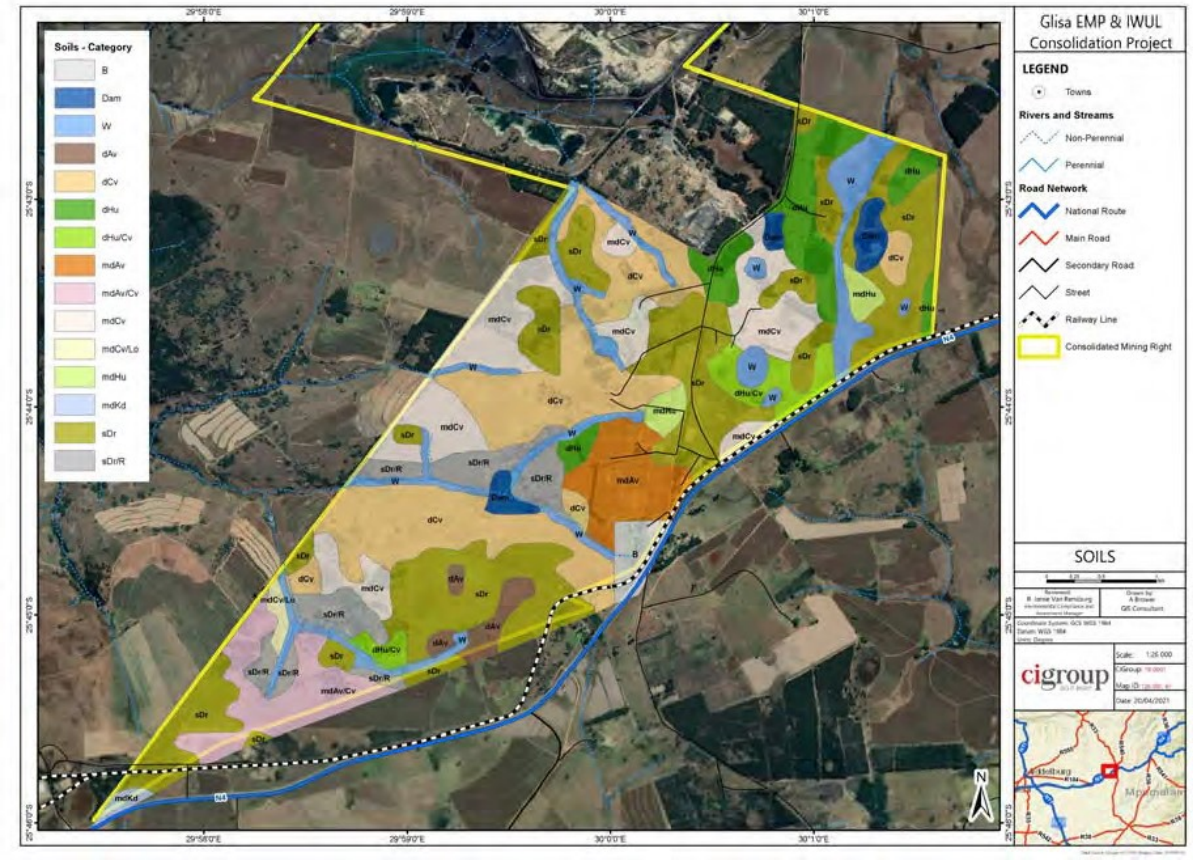


Figure 8-5: Soils

8.6 Air Quality

A number of sensitive receptors have been identified in the immediate vicinity of the project area. These include the town of Belfast, the informal settlement of Siyathuthuka, and various homesteads within and around the area (Eco Elementum, 2021). Various sources of emissions exist around the project area, all of which may impact on the identified sensitive receptors, including:

- Vehicle exhaust gases;
- Veld fires;
- Trucks passing on the roads, loading and offloading raw materials;
- Wind erosion as a result of Run of Mine (RoM) material and topsoil stockpiles;
- Material handling (loading, hauling and tipping); and
- Other mining activities such as wind erosion and vehicle entrained dust.

The NBC has been conducting dust monitoring since 2015. Dust fallout is measured against the National Dust Control Regulations (GNR 827), of the NEM: AQA (Table 8-3) (Eco Elementum, 2021).

Table 8-3: National Dust Control Regulations Standards.

Restriction Areas	30-Days Average Dust Fall Rate (D) (Mg/M^2/Day)	Permitted Frequency of Exceeding Dust Fall Rate
Residential area	D < 600	Two within a year, not sequential months
Non-residential area	600 < D < 1200	

The results of the February 2021 monitoring period show that the dust fallout is complying with the GNR827 limits as provided in Table 8-4.

Table 8-4: February 2021 Dust Fallout Results (Eco Elementum, 2021)

Site Description	Site Classification	Number of Days	Dust Fallout (Mg/M^2/Day)
Main Plant	Non-Residential	33	12
Opposite Blue Gum	Non-Residential	33	126
Road to Mahim Dam	Non-Residential	33	27
Mahim Dam	Non-Residential	33	8
Block C	Non-Residential	33	30
Next to Pan	Non-Residential	33	32
Pan	Non-Residential	33	25
PDP 1	Non-Residential	33	17
PDP 2	Non-Residential	33	33
PDP 3	Non-Residential	33	115
PDP 4	Non-Residential	33	16
PDP 5	Non-Residential	33	14

8.7 Surface Water

The Project area is located within the Olifants Water Management Area (WMA), in quaternary catchment area B41A as shown in Figure 8-6.

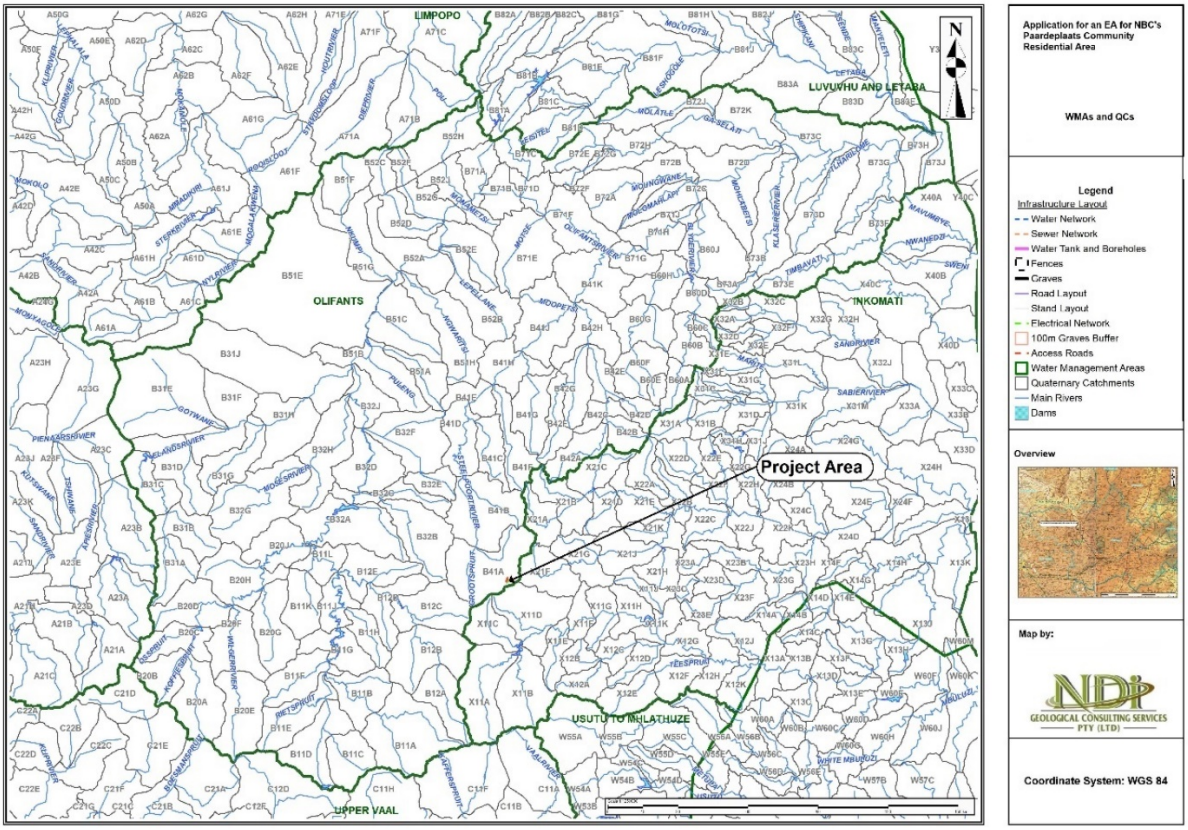


Figure 8-6: Water Management Area ad quaternary Catchments

The main rivers in the WMA include the Elands River, the Wilge River, the Steelpoort River, the Olifants River, and the Letaba River. The Olifants River originates to the east of Johannesburg and flows in a northerly direction before gently turning to the east. It is joined by the Letaba River before it enters into Mozambique. The site area is in the upper catchment region of the Steelpoort River, Grootspruit and Langspruit. There are no rivers, streams and/or drainage lines that are affected by the proposed residential area. A dam will be located within the fenced area of the residential development (Figure 8-7).

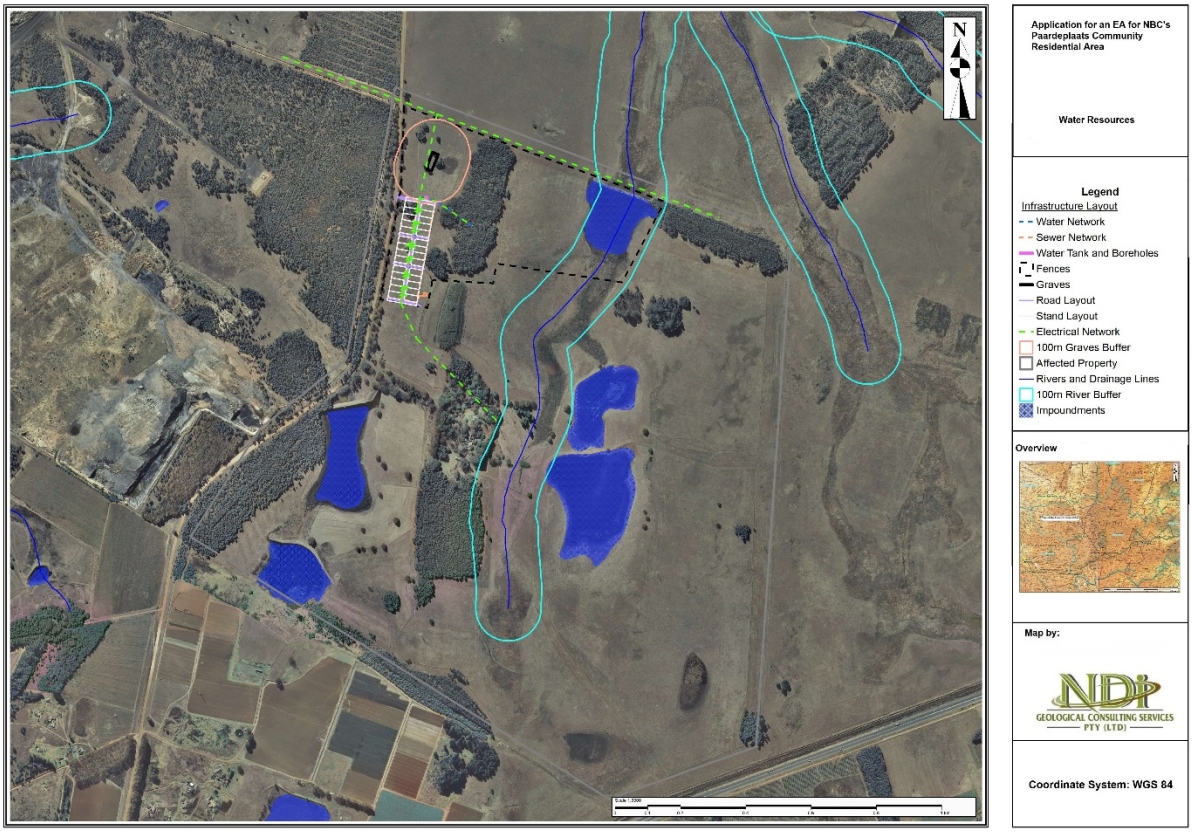


Figure 8-7: Surface Water Resources

8.8 Geohydrology

8.8.1 Aquifers

The area is characterised by secondary aquifers where groundwater is usually located in fractures, joints, bedding planes and within the weathered zone formed in the Ecca Group. Little to no flow occurs in the rock matrix of the Ecca Group. No evidence was found of structural controls (preferential pathways) on groundwater flow (MILNEX cc, 2021).

A total of seven (7) boreholes (GB1, GB1R, GB2 – GB7) were drilled by GCS (Pty) Ltd (GCS) in October 2010 (GCS, 2011a), with borehole depths ranging between 19 - 49 meters (m). Major water strikes were encountered between 14 – 33 m. The study found that groundwater flow in the aquifer occur within fault zones and at the bedding plane fractures of the coal seam roofs and floors, while flow in the lesser aquifer will occur at the bedding plane fracture of the contact between the weathered sandstone and carbonaceous shale (GCS, 2011a). Hodgson & Krantz (1998) list the annual recharge figure for the aquifer system as between 1 - 3% of the MAP (MILNEX cc, 2021).

The aquifer vulnerability and classification maps of South Africa classify the underlying aquifer as a minor aquifer which is moderately vulnerable. A minor aquifer can be fractured or potentially fractured rocks that do not have a high primary hydraulic conductivity, or other formations of variable hydraulic conductivity. Aquifer extent may be limited and water quality variable. Although these aquifers seldom produce large quantities of water, they are important for both local supplies and in supplying base flow for rivers ((MILNEX cc, 2021)).

8.8.2 Groundwater Yield

The 1:500 000 Hydrogeological map series 2530 Nelspruit (Du Toit et al., 1999) shows that the area is underlain by an intergranular and fractured type of aquifer with an average borehole yield ranging between 0.1 and 0.5 litres per second (l/s) (MILNEX cc, 2021).

8.8.3 Hydrocensus

A hydrocensus conducted in 2019 identified one borehole located on Portion 13 of Paardeplaats 380 JT. A summary of the borehole information is provided in Table 8-5 and the location of the borehole is shown on Figure 8-8.

Table 8-5: Hydrocensus Borehole Co-ordinates and Owner Details (2019) (CIG, 2021)

Borehole ID	Coordinates		Owner	Location	Comments
	Latitude	Longitude			
WBH	-25.720076	30.019218	Neville Wilkie	13/380	Borehole still in use

The static groundwater levels ranged from 0.15 - 31.6 meters below ground level (mbgl).

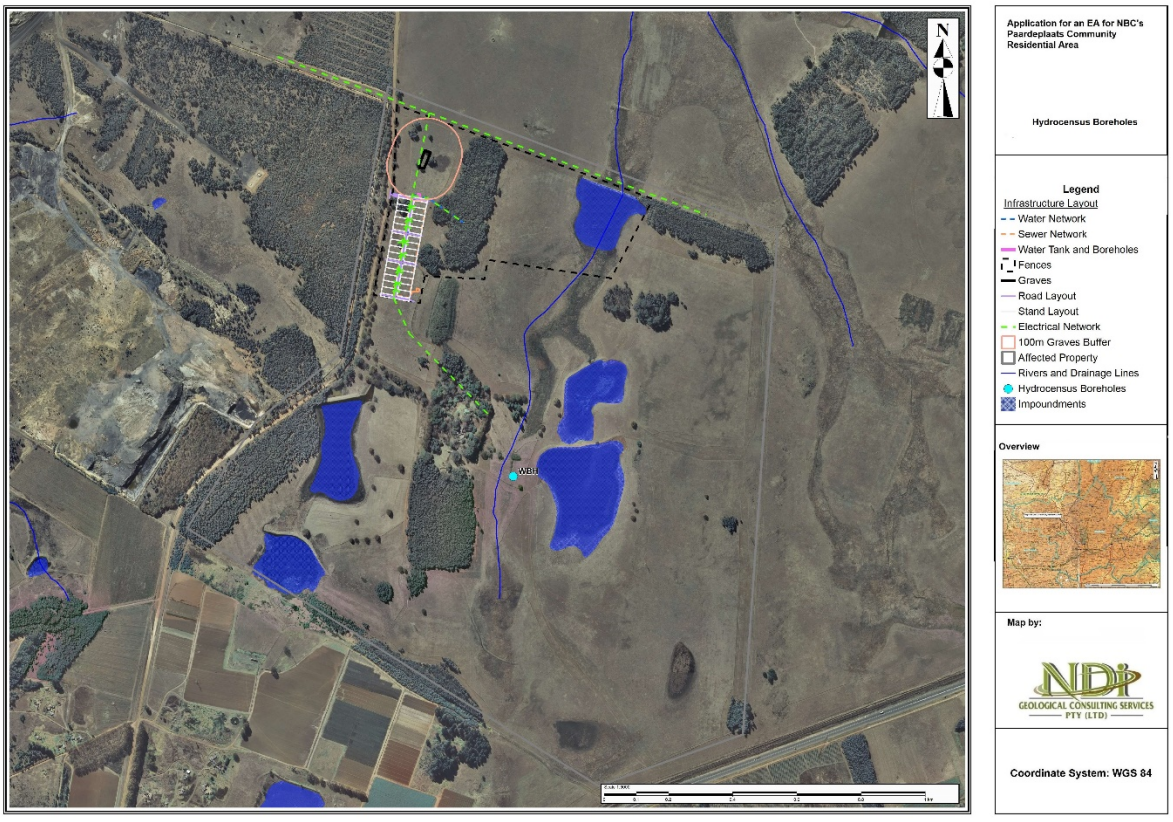


Figure 8-8: Hydrocensus Boreholes located on Project Area

8.8.4 Groundwater Quality

According to the groundwater study, the water from borehole WBH is used for domestic and stock watering purposes. The EC and TDS are high, measured at 178.7mS/m and 1238mg/l respectively (CIG, 2021).

8.9 Freshwater Systems

8.9.1 Bioregional Context

The study area is located within the Southern Temperate Highveld freshwater ecoregion, which is delimited by the South African interior plateau sub-region of the Highveld aquatic ecoregion, of which the main habitat type, in terms of watercourses, is regarded as Savannah-Dry Forest Rivers. Aquatic biotas within this bioregion have mixed tropical and temperate affinities, sharing species between the Limpopo and Zambezi systems. The Southern Temperate Highveld freshwater ecoregion is considered to be bio-regionally outstanding in its biological distinctiveness and its conservation status is regarded as Endangered. The ecoregion is defined by the temperate upland rivers and seasonal pans.

8.9.2 National Freshwater Ecosystem Priority Areas

According to the National Freshwater Ecosystem Priority Areas (NFEPA) database, the catchments were classified as a FEPA catchment on the basis of the catchment being considered a fish sanctuary for two species of fish, namely *Enteromius anoplus* (Chubbyhead Barb) and *Opsaridium peringueyi* (Southern Barred Minnow), and two river ecosystem types, namely Permanent/Seasonal Highveld Mountain and Upper Foothill streams (Figure 8-9) (Ecology International, 2021).

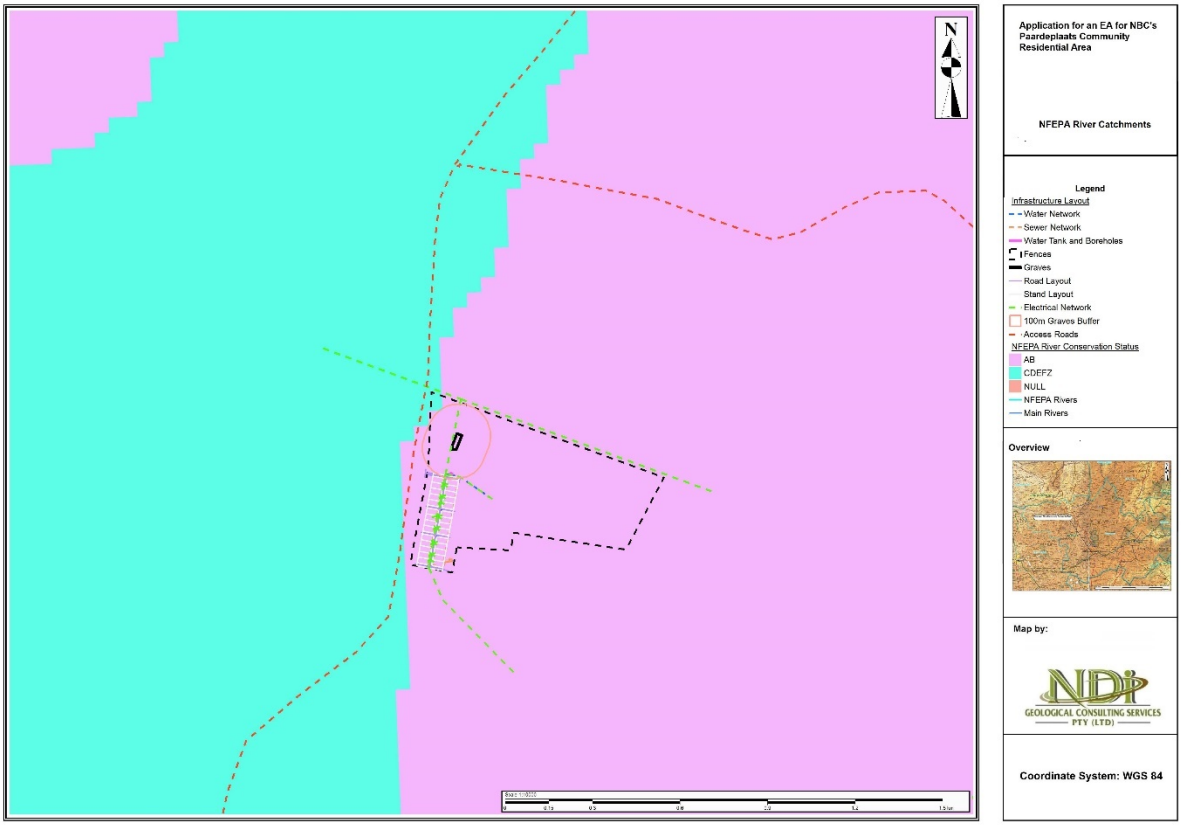


Figure 8-9: NFEPA Catchments

8.9.3 Mpumalanga Biodiversity Sector Plan

According to the freshwater component of the provincial biodiversity sector plan, the project area is associated with 'Heavily Modified' and 'Ecological Support Areas' (Figure 8-10).

Table 8-6 provides a summary of the attributes associated with the area under study.

Table 8-6: Summary of relevant site attributes (Ecology International, 2021)

Political Region	Mpumalanga
Level 1 Ecoregion	Highveld
Level 2 Ecoregion	11.02
Freshwater Ecoregion	Southern Temperate Highveld
Geomorphic Province	Northeastern Highveld
Geology	Madzaringwe Formation of the Permian coal-bearing Ecca group
Vegetation Type	Steenkampsberg Montane Grassland
Water Management Area	Olifants
Wetland Vegetation Type	Mesic Highveld Grassland Group 4 and 6
Secondary Catchment	B4
Quaternary Catchment	B41A
Watercourse	Unnamed tributaries of the Steelpoort River
Stream Order	Various
Slope Class	Source Zones
NFEPA Status	Wetland Cluster, River FEPA, Fish Support Area

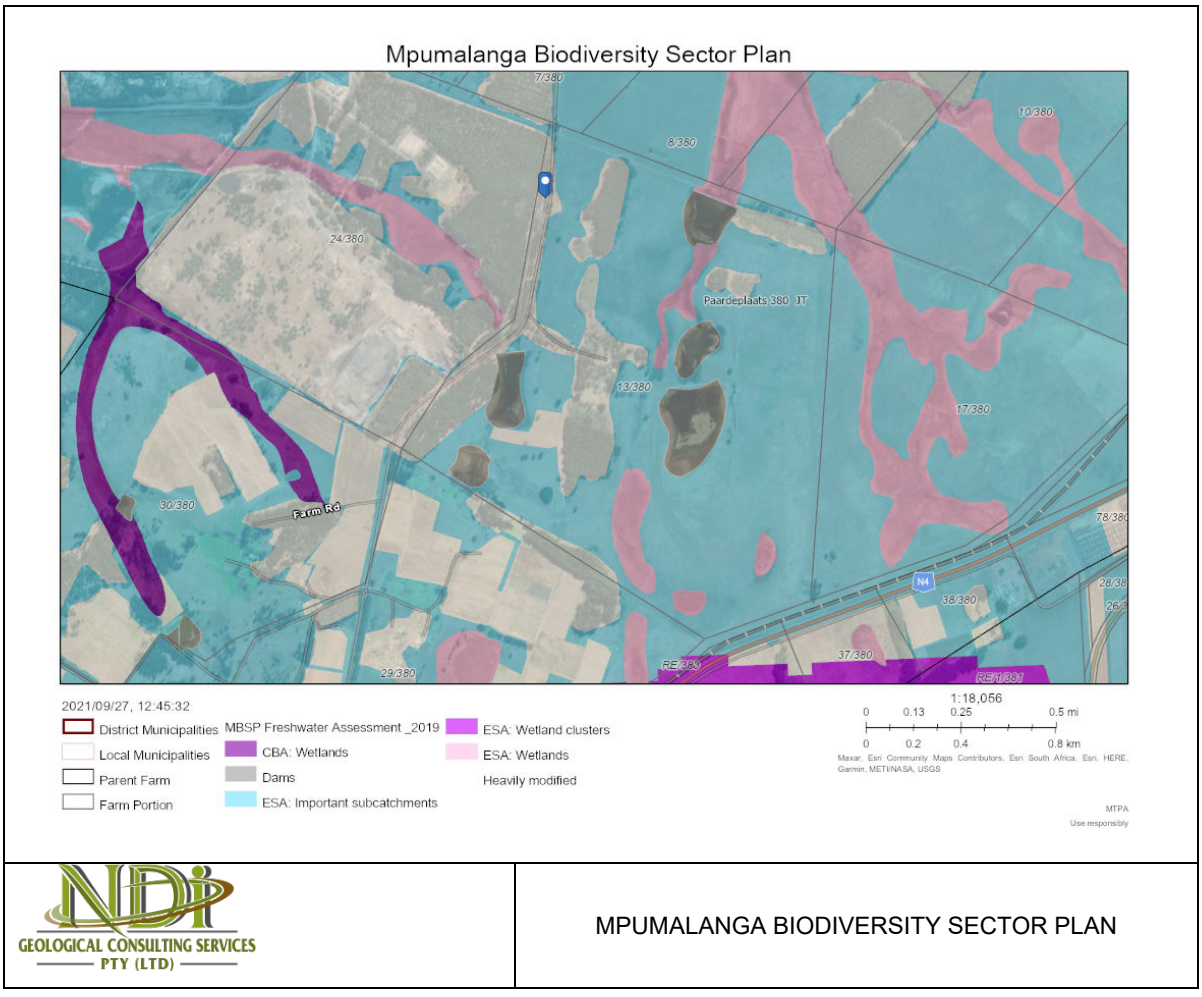


Figure 8-10: Mpumalanga Biodiversity Sector Plan (2019)

8.9.4 Wetlands

The wetlands delineation studies conducted by Wetland Consulting Services 2012 and 2021 found that there are wetlands located on Portion 13 of Paardeplaats 380JT. These include unchannelled valley bottom wetlands, hillslope seepage lakes, sheet rock wetlands and pans. No infrastructure will

be located within the wetland areas, but all infrastructure is located within 500m of the wetlands (Figure 8-11).

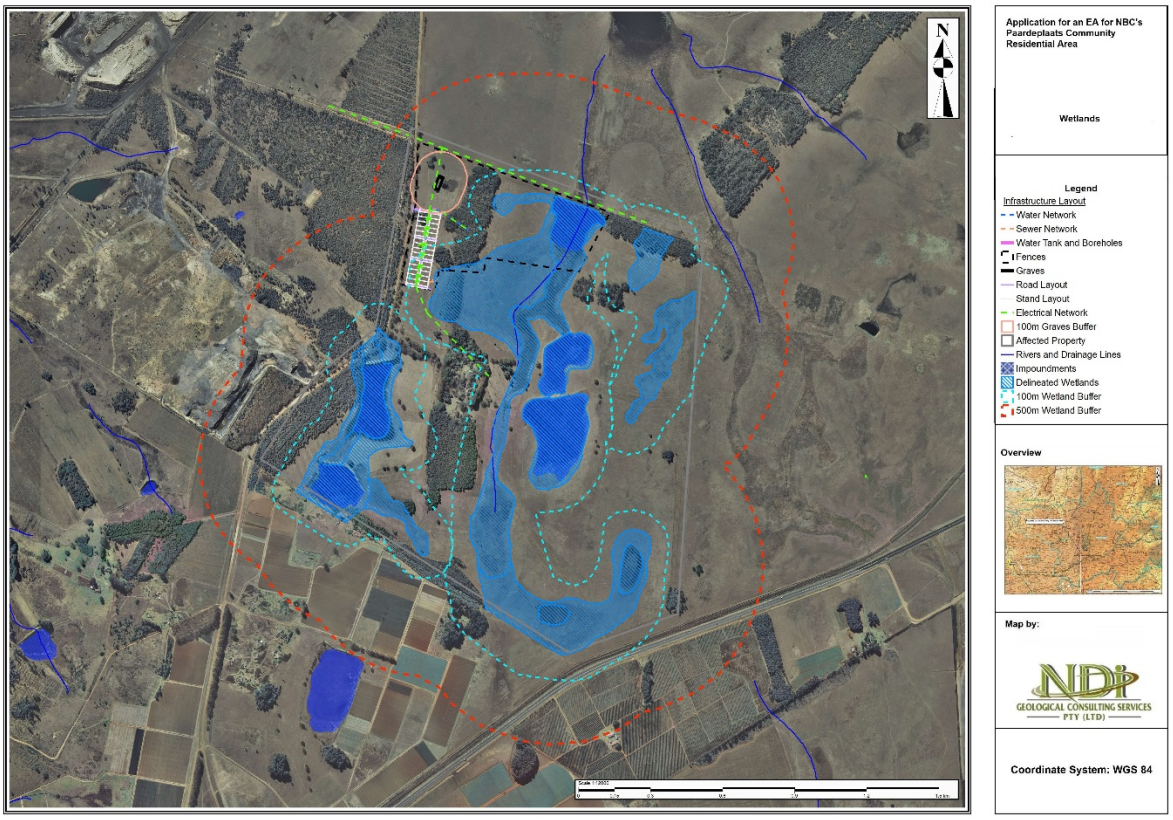


Figure 8-11: Wetlands relating to the Study Area

- Flora: The wetlands on site, though not labelled as such by Mucina and Rutherford (2006) most probably due to an issue of scale, are considered to conform to the Eastern Temperate Freshwater Wetlands (Mapping Unit AZf3 (Mucina and Rutherford, 2006)) vegetation type. The vegetation type is described as an intrazonal vegetation type occurring along water bodies with stagnant and slow flowing water and is embedded within the Grassland Biome of South Africa (Mucina and Rutherford, 2006). It occurs on flat landscapes and within shallow depressions characterised by mostly temporary water bodies that support zoned systems of aquatic and hygrophilous vegetation. Dominant species listed by Mucina and Rutherford (2006) are as follows:

    - Megagraminoid: *Cyperus congestus, Phragmites australis, Schoenoplectus corymbosus, Typha capensis.*
    - Graminoids: *Agrostis lachnantha, Carex acutiformis, Eleocharis palustris, Eragrostis plana, E. planiculmis, Fuirena pubescens, Helictotrichon turgidulum, Hemarthria altissima, Imperata cylindrica, Leersia hexandra, Paspalum dilatatum, P. urvillei, Pennisetum thunbergii, Schoenoplectus decipiens, Scleria dieterlenii* and *Setaria sphacelata.*
    - Herbs: *Centella asiatica, Ranunculus multifidus.*

  During the 2021 site visit a number of Mpumalanga Protected Species were identified within the wetlands on site included at least three species of Orchid presumed to include S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp.), *Eucomis autumnalis*, and a Watsonia sp. summary of the HGM units located on Portion 13 of Paardeplaats 380JT (WCS, 2021).Table 8-7 provides a list of plant species recorded within the wetlands on site.

Table 8-7: List of plant species recorded within the wetlands on site and in adjacent areas (WCS, 2021)

Species Name	Seepage	Valley bottom	Pan
Acacia mearnsi	Y	Y	
Agrostis lachnantha	Y	Y	Y
Andropogon eucomis	Y		Y
Aristida congesta	Y		
Arundinella nepalensis	Y		Y
Berkheya spp.	Y		
Carex spp.		Y	
Commelina africana	Y		
Conyza albida	Y		
Cymbopogon spp.	Y		
Cynodon dactylon	Y	Y	Y
Cyperus denudatus	Y	Y	Y
Cyperus esculentus	Y		
Cyperus spp.		Y	
Eleocharis dregeana		Y	Y
Eragrostis curvula	Y	Y	Y
Eragrostis gummiflua	Y		
Eragrostis montevidensis	Y		
Eragrostis plana	Y	Y	
Eragrostis racemosa	Y		
Eragrostis rigida	Y		
Eragrostis spp.	Y	Y	
Erica woodii	Y		
Eucalyptus spp.	Y		
Eucomis autumnalis	Y		
Eucomis pole-evansii		Y	

Species Name	Seepage	Valley bottom	Pan
Fuirena pubescens	Y	Y	Y
Gladiolus grassifolius	Y		
Haplocarpa scaposa	Y		
Helichrysum aureonitens	Y		
Helichrysum spp.	Y		
Helictotrichon turgidulum	Y		

- WET-EcoServices: The assessment of WET-Ecoservices provision of the wetlands showed that the wetlands on the site play an important role in the maintenance of biodiversity.

    - The wetlands represent the most extensive natural habitat remaining on site and are thus likely to provide the main refuge for a number of species. In addition, the wetlands are located within a vegetation type listed as Vulnerable, and within an area classified as “Important & Necessary” in the Mpumalanga Biodiversity Conservation Plan. A number of the wetlands on site have however been impacted by anthropogenic activities mostly related to agriculture that have resulted in a loss of biodiversity associated with the affected wetlands. Most notably the central regions of the site are impacted by intensive agriculture, while large portions of the site also previously formed part of plantations.
    - The water quality enhancement functions also rated highly in terms of nitrate, phosphate and toxicant removal, as well as sediment trapping. Especially the hillslope seepage wetlands and the unchannelled valley bottom wetlands that are characterised by extended residence time of flows within the wetlands due to the slow, diffuse nature of flows through the wetland provide good opportunity for water quality enhancement. In this regard the wetlands located downslope of intensive agricultural areas, e.g. wetland units 5, is especially important in terms of water quality enhancement.

Table 8-8 provides a summary of the results of the WET-EcoServices assessment.

Table 8-8: Summarised results of the WET-EcoServices assessment

Function	Unit 1	Unit 2	Unit 4	Unit 5	Average
Maintenance of biodiversity	**3**	**3.5**	**3.25**	**2.8**	**3.14**
Nitrate removal	**2.75**	**2.95**	**2.9**	**2.95**	**2.89**
Erosion control	**2.88**	**2.96**	**3.08**	**2.92**	**2.96**
Phosphate trapping	**2.24**	**2.4**	**2.92**	**2.76**	**2.58**
Toxicant removal	**1.92**	**2.62**	**3**	**2.91**	**2.61**
Sediment trapping	**2.12**	**2.29**	**2.51**	**2.39**	**2.33**
Streamflow regulation	**2.33**	**2.67**	**2.67**	**2.83**	**2.63**
Flood attenuation	**2.17**	**2.37**	**2.26**	**2.09**	**2.22**

Function	Unit 1	Unit 2	Unit 4	Unit 5	Average
Carbon storage	1.33	2	2	2.33	1.92
Tourism and recreation	1.14	1.86	2.43	2.71	2.04
Education and research	1.75	1.75	1.25	1.5	1.56
Water supply for human use	0.39	0.78	0.94	1.14	0.81
Natural resources	0.2	0.2	0.2	0.4	0.25
Cultivated foods	0	0	0.4	0	0.10
Cultural significance	0	0	0	0	0.00

  - Hydrological functions performed by the wetlands include the functions of flood attenuation and streamflow augmentation. Wetlands are able to play an important role in flood attenuation given their location in the landscape were flows accumulate and slow down due to lower gradients. The surface roughness of the wetlands due to increase plant cover and vigour further aids in slowing down flood flows and attenuating floods. The extensive hillslope seepage wetlands on site are however expected to play only a minor role in flood attenuation; at the start of the wet season largevolumes of water infiltrate the soils and the wetlands can play a role in flood attenuation. However, later in the rainy season when the soils in the seepage wetlands are already saturated, these areas encourage surface run-off and enhance floods rather than attenuate them. The main hydrological function of the hillslope seepage wetlands is the slow, diffuse release of water into downslope wetlands that extends from the wet season well into the dry season, highlighting the importance of these systems in stream flow augmentation.

- Present Ecological Status (PES): The wetlands on site have been subjected to a range of anthropogenic activities, mostly related to alien vegetation (including tree plantations), agriculture and construction of dams, which have resulted in the degradation of the wetland systems on site. The majority of the wetlands on site were classed as Moderately Modified (59 %), though a significant proportion of the wetlands were found to be Largely Modified (33 %). Only 8 % of wetlands were still considered to be in a Natural/Unmodified condition, consisting of the two small Pan wetlands and one Hillslope seepage wetland.
- Ecological Importance and Sensitivity (EIS) Assessment: the wetlands on site are mostly considered to be important from an ecological and hydrological perspective, and that the provision of direct human benefits generally is only of minor importance. An exception to this however is the provision of water for irrigation and also livestock watering purposes, and the use of wetlands for tourism purposes (it is understood that some of the dams had been built in the wetlands to provide opportunity for trout fishing). A majority of wetlands on site are considered of Moderate (57 %) importance and sensitivity and the remainder as being of High (43 %) importance and sensitivity.

8.10 Visual

The project area is located within the jurisdiction of the eMakhazeni Local Municipality within the Nkangala District Municipality in the Mpumalanga Province (Eco Elementum, 2021). According to the visual impact assessment, sensitive receptors identified in the immediate vicinity (Figure 8-12) of the study area and proposed project area have been listed below:

- The town of Belfast, approximately 5km to the north of the project area,
- The Informal settlement of Siyathuthuka, approximately 1km to the north of the area, and
- Various Dispersed Homesteads.

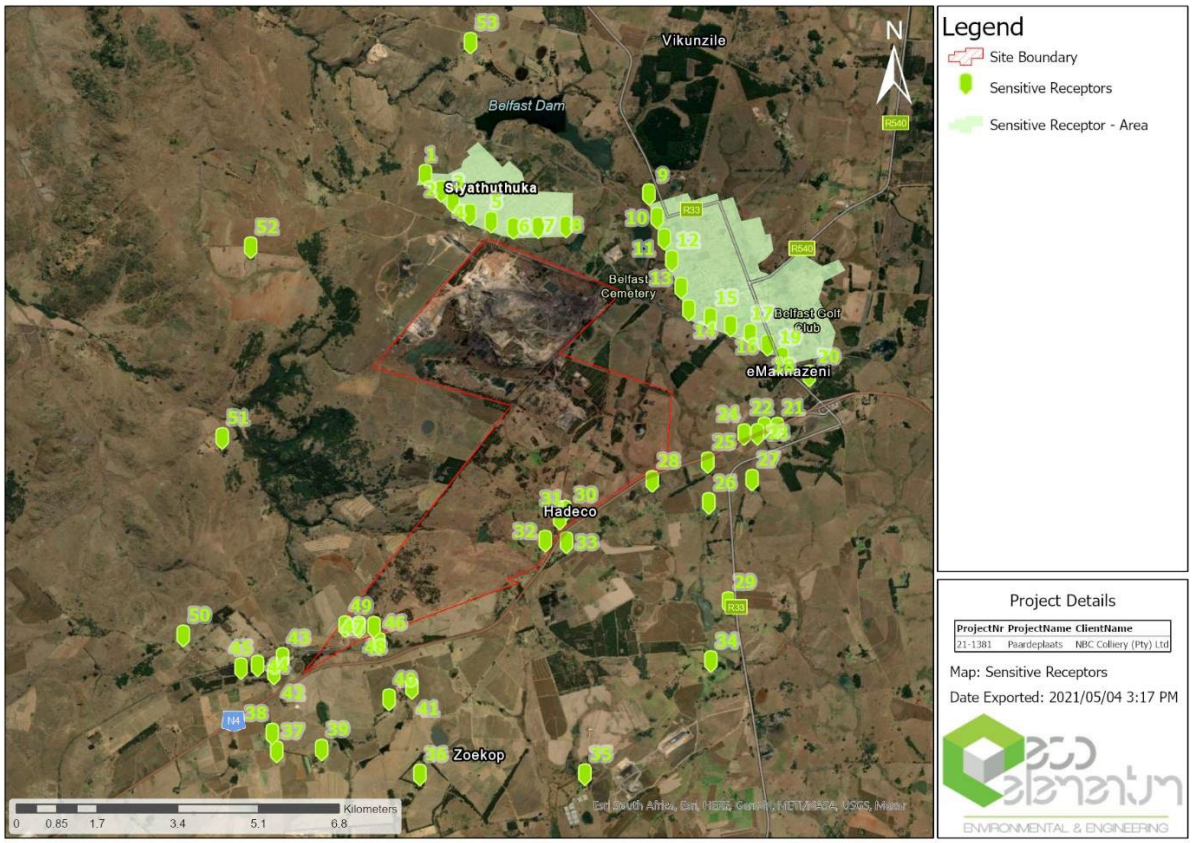


Figure 8-12: Sensitive receptors in the immediate area of the project area (Eco Elementum, 2021)

Due to current mining operations around the project area, it is expected that the project will not result in any significant additional visual impacts. The impact assessment section of the report includes an assessment of the visual impacts and the EMPr provides for practical mitigation measures that may be implemented to avoid and/or minimise the impacts.

8.11 Terrestrial Biodiversity

8.11.1 Protected Areas

According to the Important Bird Areas (IBA) database, the project area falls within the Steenkampsberg IBA (Figure 8-13). A very important wetland in the northern portion of this IBA, known as Middlepunt Vlei, provides habitat for the White-winged Flufftail (Critically Endangered) (*Sarothrura ayresi*), where the species has been regularly recorded in the Carex-dominated marshes and nests have been recently recorded in the area (CIG, 2021).

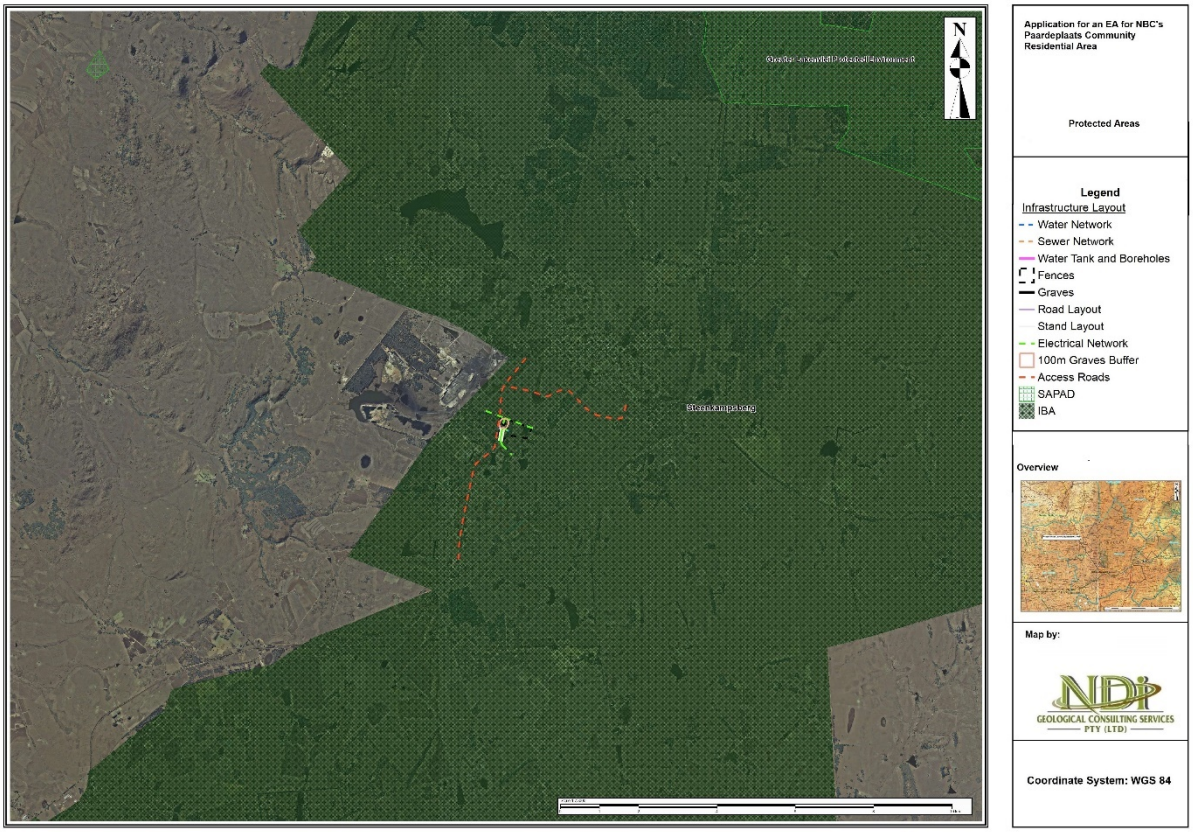


Figure 8-13: Important Biodiversity Areas

8.11.2 Regional Vegetation

The Project area is situated in the Grassland Biome and within the Mesic Highveld Grassland Bioregion. The project is situated within the Eastern Highveld Grassland vegetation type (Gm 12) (Figure 8-14), which is characterised by slightly to moderately undulating plains, including some low hills and pan depressions. According to the National List of Threatened Terrestrial Ecosystems, this vegetation type is considered to be Endangered, with approximately 55% of the vegetation type considered altered. It is considered to be poorly protected, with only 13 % of its' target percentage protected(Lötter, 2015). The primary factor responsible for this status is due to on-going cultivation activities within the area. The vegetation of the landscape is short dense grassland dominated by the usual highveld grass composition (*Aristida, Digitaria, Eragrostis, Themeda, Tristachya* etc) (Mucina & Rutherford, 2012). Table 8-9 provides a summary of the floral species expected to occur within this region (Digby Wells, 2021).

Table 8-9: Flora Species Characteristics of the Eastern Highveld Grassland

Plant Form	Species
Graminoids2	*Aristida aequiglumis, A. congesta, A. junciformis* subsp. *galpinii, Brachiaria serrata, Cynodon dactylon, Digitaria monodactyla, D. tricholaenoides, Elionurus muticus, Eragrostis chloromelas, E. capensis, E. curvula, E. gummiflua, E. patentissima, E. plana, E. racemosa, E. sclerantha, Heteropogon contortus, Loudetia simplex, Microchloa caffra, Monocymbium ceresiiforme, Setaria sphacelata, Sporobolus africanus, S. pectinatus, Themeda triandra, Trachypogon spicatus, Tristachya leucothrix, T. rehmannii, Alloteropsis semialata* subsp. *eckloniana, Andropogon appendiculatus, A. schirensis, Bewsia biflora, Ctenium concinnum, Diheteropogon amplectens, Harpochloa falx, Panicum natalense, Rendlia altera,*

Plant Form	Species
	Schizachyrium sanguineum, Setaria nigrirostris, Urelytrum agropyroides.
Herbs	*Berkheya setifera, Haplocarpha scaposa, Justicia anagalloides, Pelargonium luridum, Acalypha angustata, Chamaecrista mimosoides, Dicoma anomala, Euryops gilfillanii, E. transvaalensis subsp. setilobus, Helichrysum aureonitens, H. caespititium, H. callicomum, H. oreophilum, H. rugulosum, Ipomoea crassipes, Pentanisia prunelloides subsp. latifolia, Selago densiflora, Senecio coronatus, Hilliardiella oligocephala, Wahlenbergia undulata.*
Geophytic Herbs3	*Gladiolus crassifolius, Haemanthus humilis subsp. hirsutus, Hypoxis rigidula var pilosissima, Ledebouria ovatifolia.*
Succulent Herbs	*Aloe ecklonis.*
Low Shrubs	*Anthospermum rigidum subsp. pumilum, Seriphium plumosum.*

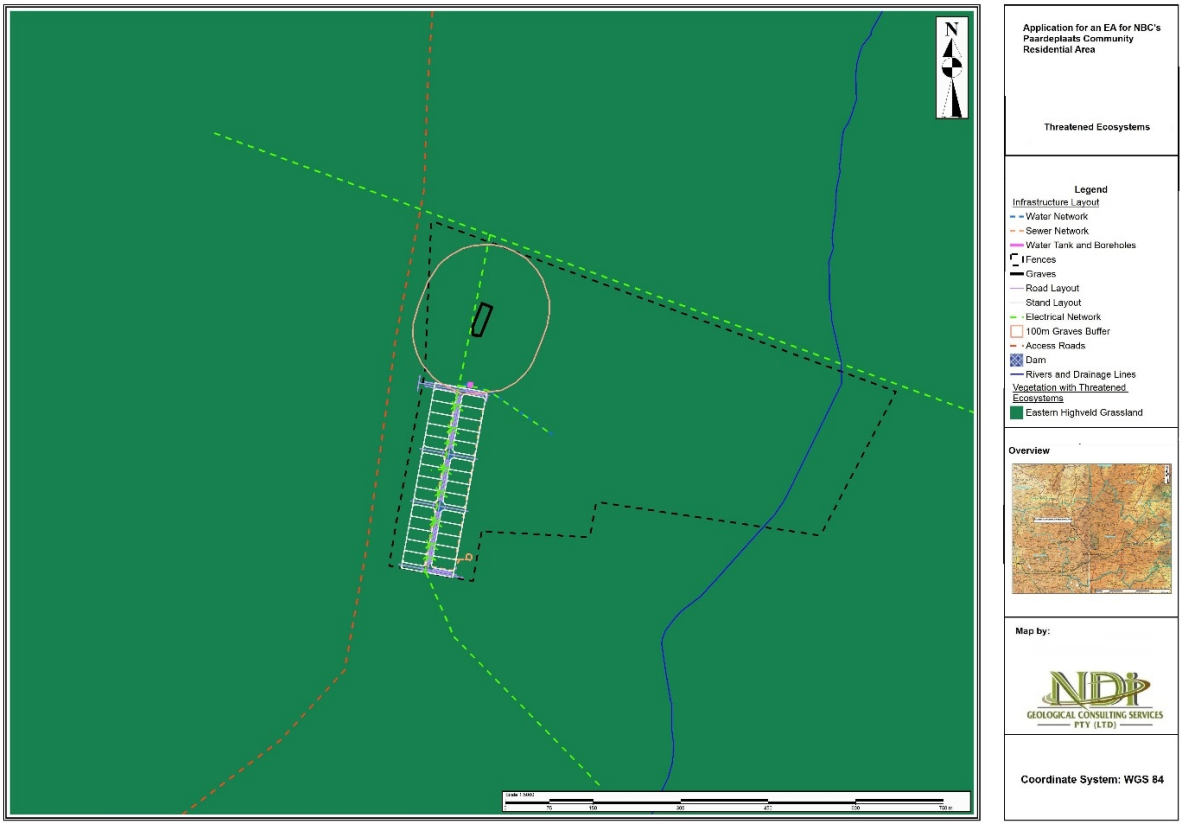


Figure 8-14: Vegetation of the Project area

8.11.3 Critical Biodiversity Areas

Areas of high biodiversity were identified from the Mpumalanga Province Biodiversity Sector Plan and includes, amongst others, Critical Biodiversity Areas (CBAs) and Ecological Support areas (ESAs). The affected area is located in an area classified as CBAs (areas that are required to meet biodiversity targets for species, ecosystems or ecological processes. These need to be kept in a natural or near-natural state, with no further loss of habitat or species) or heavily or moderately modified areas (Figure 8-15).

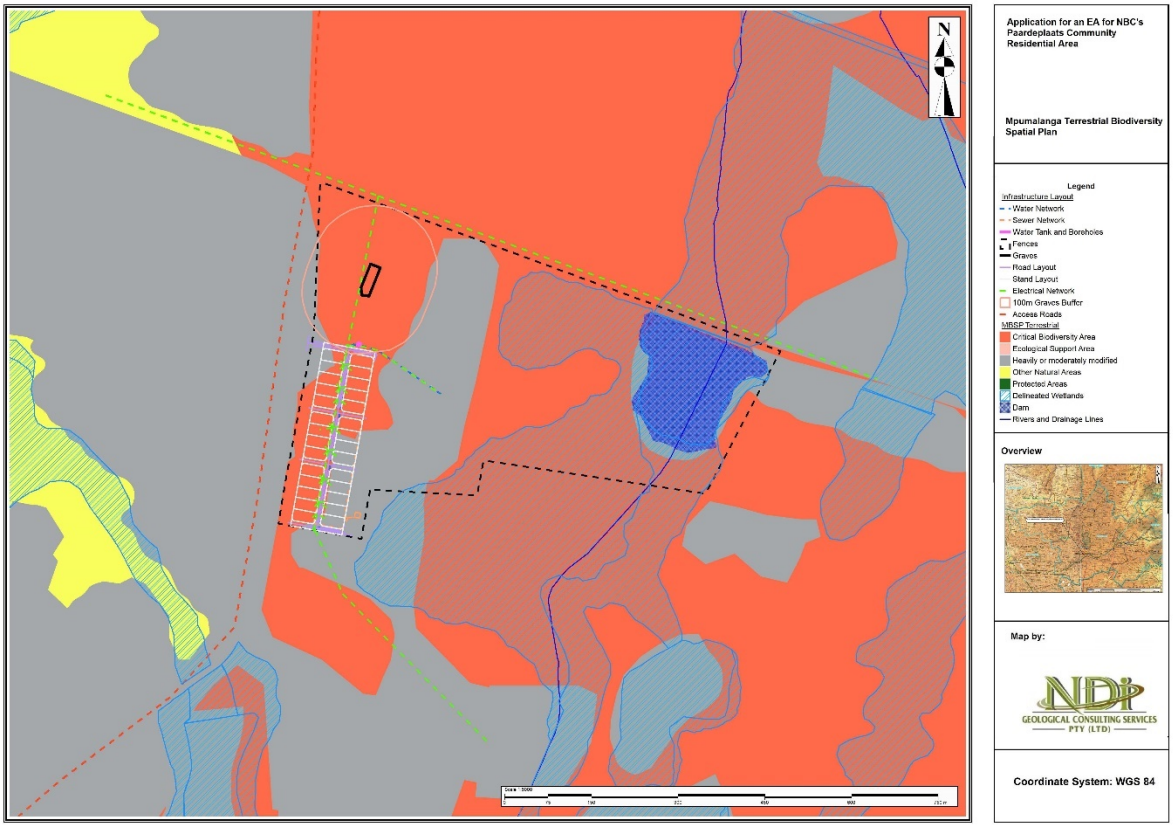


Figure 8-15: Critical Biodiversity Areas of the Project Area

8.11.4 Flora

The floral composition and distribution within the area has been significantly altered due to the historical and current land practises. As a result of these land use practises, large portions have been subjected to alterations and have transformed the natural habitat. As a result of the land uses, secondary grasslands have developed and constitute as part of a vegetation community (Digby Wells, 2021).

There are wetlands within the area which are distinguishable via their composition of wetland indicating species such as Red Cotton Wool Grass (*Imperata cylindrica*), *Cyperus sp*, *Juncus sp*. and *Schoenoplectus sp* (Sedges).

Floral SCC, *Boophone disticha, Crinum bulbispermum*, *Gladiolus dalenii,* and *Haemanthus humilis*, were recorded in this farm portion in and amongst rocky outcrops (Figure 8-16) (Digby Wells, 2021). These habitats host a high floral diversity and support very specialised vegetation communities and biota relative to their size.

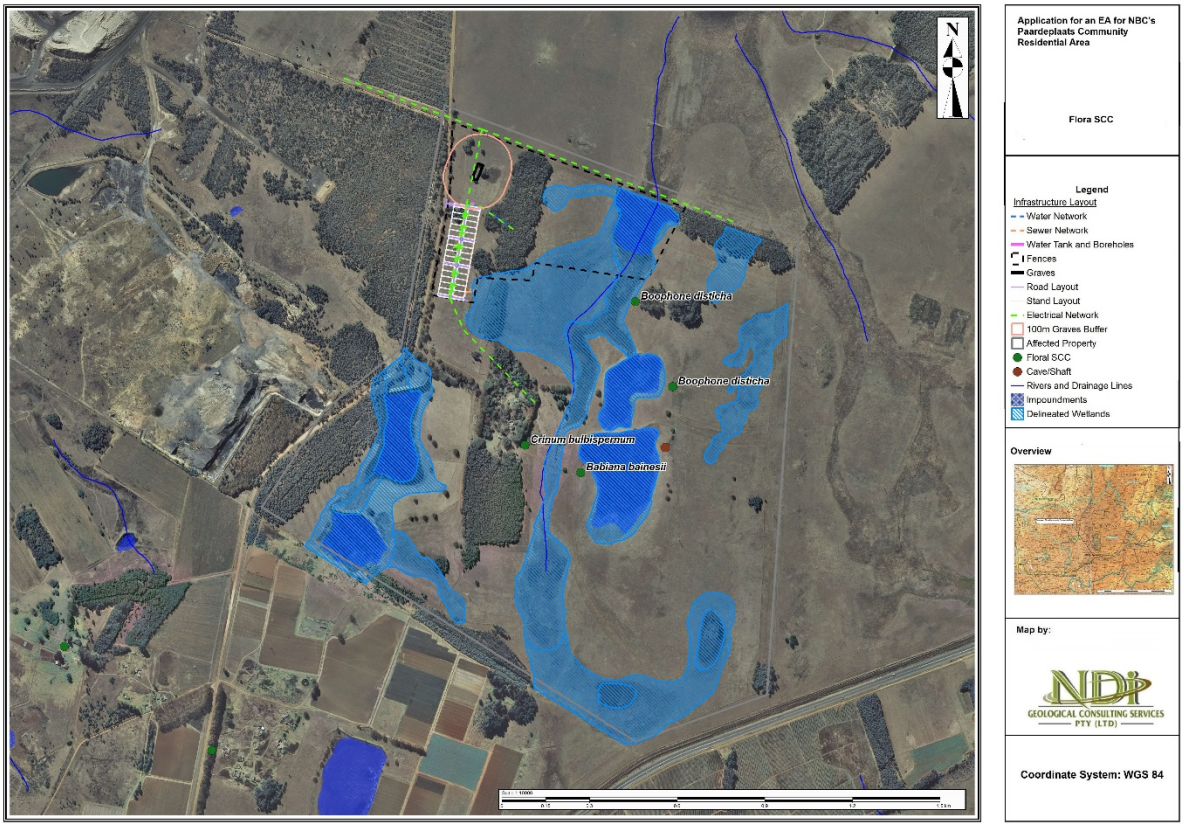


Figure 8-16: Location of Species of Floral Conservation Concern

8.11.5 Alien and Invasive Plant Species

The biodiversity assessment found evidence that edge effects of the surrounding AIP sprawl were enclosing the remaining extent of the portion. Dense stands of *Populus x canescens* were observed along with *Eucalyptus* sp on the margins of Portion 13 (Digby Wells, 2021).

8.11.6 Fauna

Portion 13 has previous recordings of the Grey Crowned Crane (Endangered). Habitats that support numerous faunal species are located within this portion and include wetlands, grasslands and rocky outcrops. Numerous waterfowl were observed in the artificial dams as they serve as sustenance and breeding grounds for numerous avifaunal species.

Wetland clusters are groups of wetlands (within a 1 km buffer) that are considered to function as a unit in the landscape, allowing for important ecological processes such as migration of frogs and insects between wetlands to take place. Numerous pans and wetlands have been identified within the greater area and thus provide ideal habitat (among others) for the SCC Giant African Bullfrog (Pyxicephalus adspersus); thus, this species is therefore likely to occur. This is a SCC due to the loss of habitat from negative anthropogenic activities. According to the IUCN the Giant African Bullfrog is listed as Near Threatened (NT) in South Africa.

Other faunal SCC likely to occur in the project area include:

- Mammals: Southern African Hedgehog (*Atelerix frontalis)* classified as not threatened, Leopard (*Panthera pardus)* classified as vulnerable;
- Birds: Blue Crane (*Anthropoides paradiseus)*, Wattled Crane (*Bugeranus carunculatus),* Southern Bald Ibis (*Geronticus calvus),* all of which are classified as vulnerable as well as the

Blue Korhaan (*Eupodotis caerulescens)* and the Lesser Flamingo (*Phoeniconaias minor)*, both of which are classified as near threatened.

- Amphibians: Wetlands which provide ideal habitat (among others) for the SCC Giant African Bullfrog (*Pyxicephalus adspersus*) are located on the affected property and this species is therefore likely to occur. This is an SCC due to the loss of habitat from negative anthropogenic activities, the Giant African Bullfrog is listed as Near Threatened (NT) in South Africa according to the IUCN.
- Reptiles: Of the potentially occurring reptile species, only the Coppery Grass Lizard (*Chamaesaura aenea*) has been assigned Red Data status (South Africa Reptile Conservation Assessment (SARCA), 2014). The Coppery Grass Lizard is classified as near threatened.
- Invertebrates: One SCC that is likely to occur is the MarshSylph (*Metisella meninx*) (Vulnerable according to Henning, G. A. (2009) South African Red Data Book: Butterflies).

8.12 Heritage Resources

A Heritage Impact Assessment (HIA) was undertaken for the proposed project. During the survey no sites, features or objects of cultural significance were identified within the project area (Schlkwyk, 2021). Two features of heritage significance were identified to be located close to the project area, but well outside the boundary and would therefore not be impacted on by the proposed development as follows:

- A large informal cemetery is located approximately 100m north of the project area. It is well-known and securely fenced off. This feature has been reported on by previous researchers, e.g., Birkholtz (2021). It is therefore totally unlikely that it would be impacted on by the development (Schlkwyk, 2021).
- A lane of oak trees was planted along the regional dirt road passing on the western side of the project area. The specialist could not establish how old the trees are, as they cannot be seen on the 1964 version of the aerial photograph or the 1969 version of the topographic map. It follows the access road south and then turn west towards an old farmstead. Based on the development plan, the trees will not be impacted on and be retained (Schlkwyk, 2021).

The location of the two features identified during the HIS is provided in Figure 8-17.

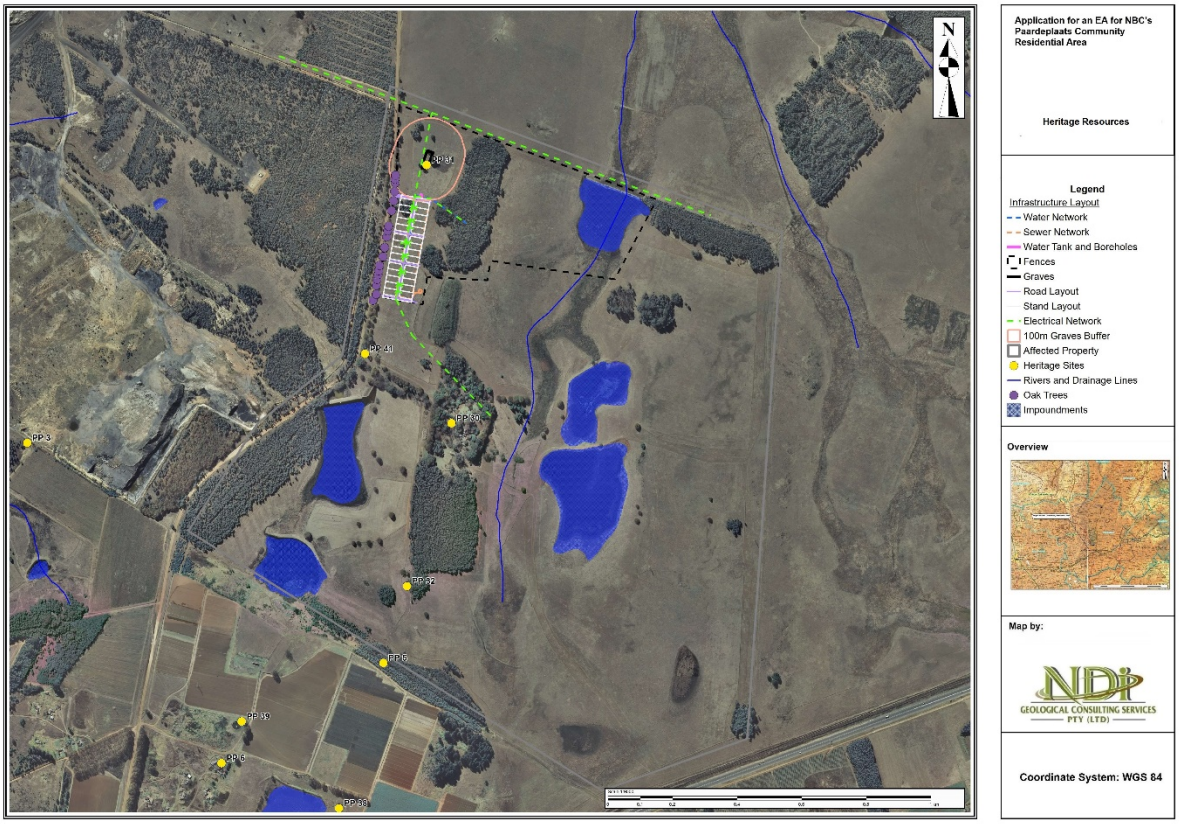


Figure 8-17: Graves and Oak Tree Lane at the Project Site

8.13 Palaeontology Resources

A palaeontology assessment undertaken as part of the Mining Right Application (MRA) included Portion 13 of Paardeplaats 380JT where the proposed project will be located. According to the study, the area is primarily underlain by the Permian Vryheid Formation of the Ecca Group (Karoo Supergroup) while two isolated patches of Quaternary alluvium is also present (Banzai Environmental, 2021).

According to the South African Heritage Resources Information System (SAHRIS) and DFFE Screening Tool, the Palaeontological Sensitivity of the Vryheid Formation is Very High (Figure 8-18 and Figure 8-19 respectively). This Formation is known for its rich assemblage of Glossopteris flora which is the source vegetation for this formation. Fish scales, non-marine bivalves and trace fossils are found in this formation (Banzai Environmental, 2021).

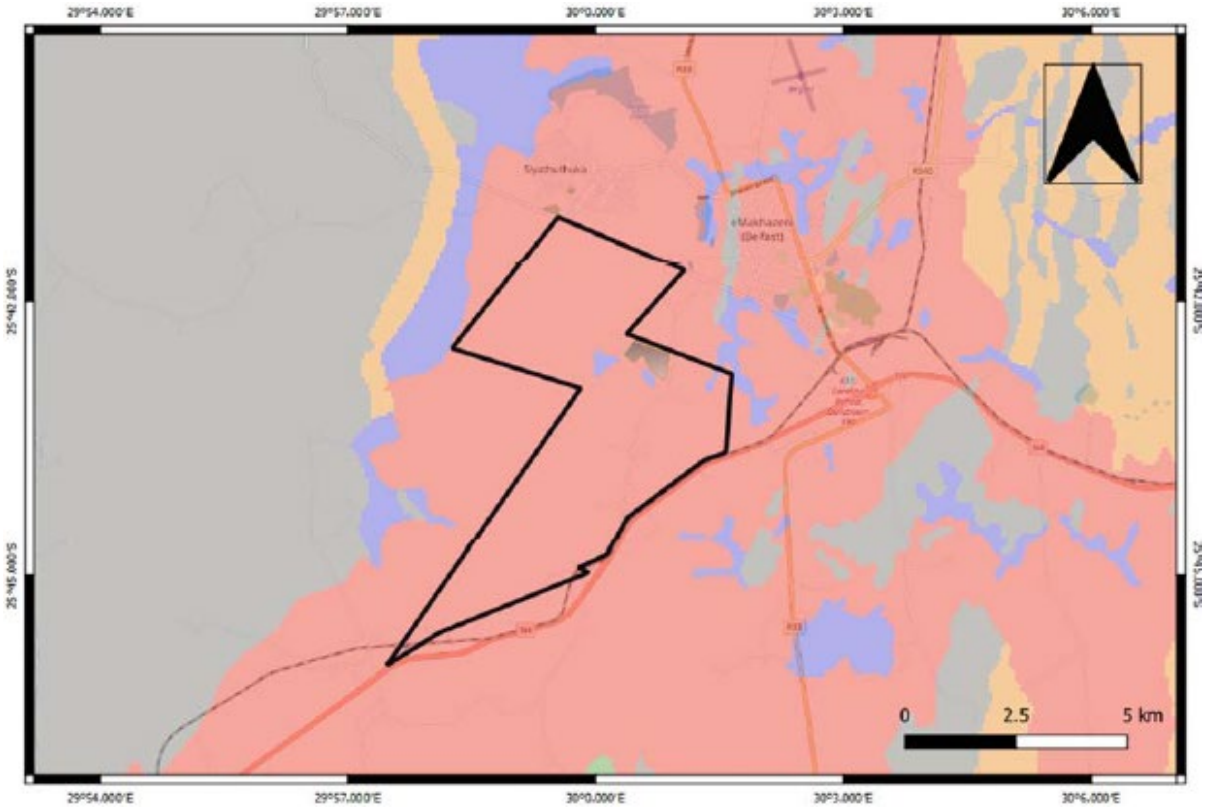


Figure 8-18: Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the proposed development in black

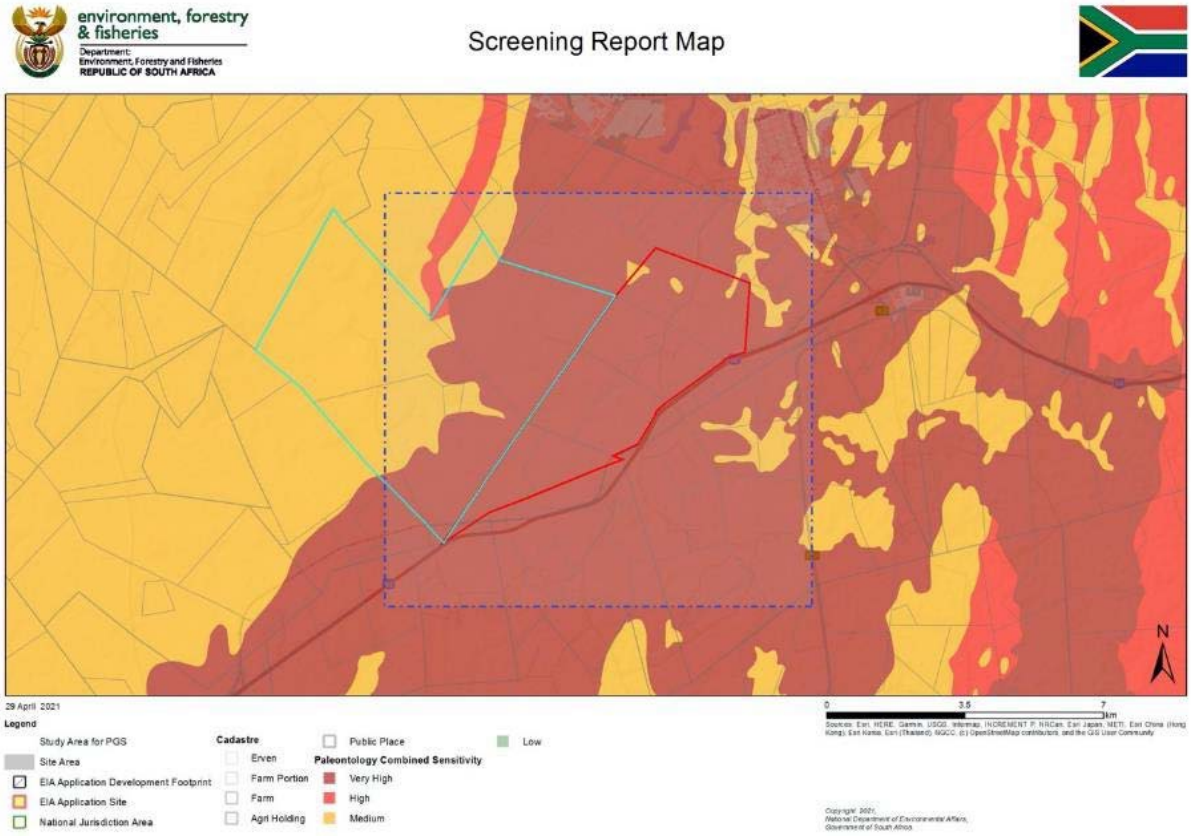


Figure 8-19: DFFE Environmental screening tool's depiction of the palaeontological sensitivity of the study area and surroundings

The site-specific field survey of the area conducted on 21 August 2021 found no visible evidence of fossiliferous outcrops. As such, an overall low palaeontological sensitivity was allocated to the area (Banzai Environmental, 2021).

8.14 Socio – Economical Environment

8.14.1 Regional Context

The project area is located in the eMakhazeni LM which forms part of the Nkangala DM in Mpumalanga Province of South Africa. Mpumalanga lies in eastern South Africa, north of KwaZulu-Natal and bordering Swaziland and Mozambique. It constitutes 6.5% of South Africa's land area. In the north it borders on Limpopo, to the west Gauteng, to the southwest the Free State and to the south KwaZulu-Natal. The capital is Mbombela. Mpumalanga Province is divided into three DMs, which are further subdivided into 17 LMs (CIG, 2021).

The Nkangala DM is one of the three DMs in Mpumalanga. Local municipalities forming part of the Nkangala DM are Delmas, Dr JS Moroka, eMalahleni, eMakhazeni, Steve Tshwete, and Thembisile, as well as the Mdala District Management Area. The district is approximately 17 000 square kilometre (km^2) and consists of about 165 towns and villages, with eMalahleni and Middelburg being the primary towns. The Nkangala DM has a population of approximately 1.1 million people, which constitutes almost a third of Mpumalanga's population. The Nkangala DM is at the economic hub of Mpumalanga and is rich in minerals and natural resources. The district's economy is dominated by electricity, manufacturing, and mining. Community services, trade, finance, transport, agriculture, and construction are also important sectors. Nkangala's IDP states that the district has extensive mineral deposits, including chrome and coal (CIG, 2021).

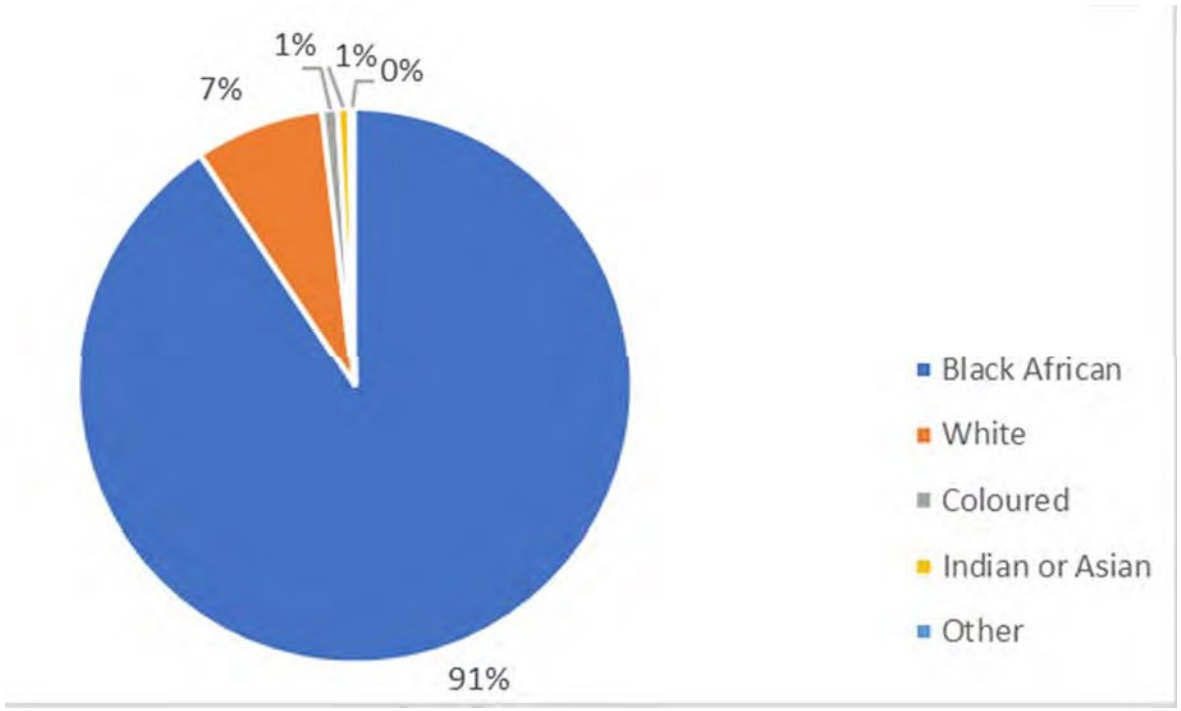
8.14.2 Local Context

The eMakhazeni LM is at the heart of the Mpumalanga province and is bordered by the Greater Groblersdal, Thaba-Chweu, Steve Tshwete, Albert Luthuli, and Mbombela Local Municipalities. The municipality is strategically located between the Pretoria/Johannesburg complex in Gauteng and Nelspruit in Mpumalanga and is situated on the N4 Maputo corridor. The dominant economic activity in the area is farming (IDP, 2020). Farming occupies the largest part of the physical area. There are a number of small towns in the area that serve as service centres for the agricultural sector, namely:

- eMakhazeni (Belfast) and Siyathuthuka;
- Dullstroom and Sakhelwe;
- Entokozweni (Machadodorp) and Emthonjeni;
- Waterval-Boven and Emgwenya.

8.14.3 Demographics

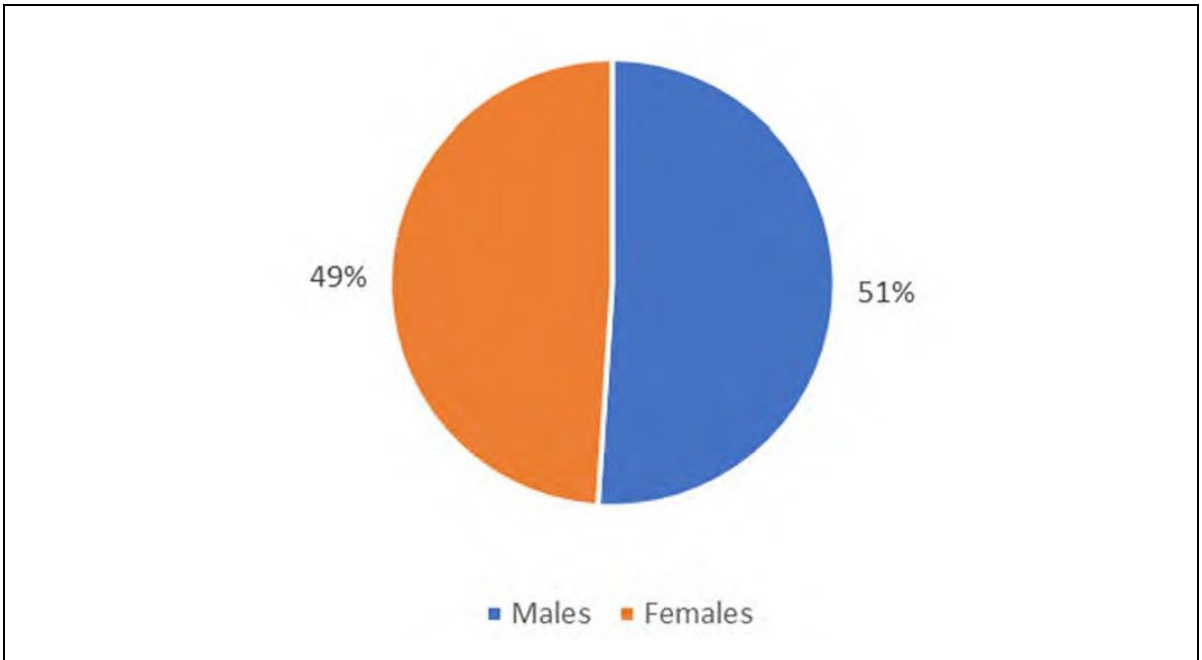
According to the 2011 census, Mpumalanga recorded a population size of 4 039 939, ranking it sixth out of the nine provinces, of which, 90.65% are Black Africa, 7.51% are White, 0.91% are Coloured, 0.69% are Indian or Asian and the remaining 0.24% are other (Figure 8-20) ((CIG, 2021)).



GEOLOGICAL CONSULTING SERVICES PTY (LTD)	POPULATION GROUPS

Figure 8-20: Population Groups (Stats SA, 2011)

The majority of the population is men, who form approximately 51.4% of the population (Figure 8-21). In 2011 census, the dominant home language in the eMakhazeni LM was SiSwati (28.35%), followed by IsiZulu (21.77%), isiNdebele (18.75%), and Afrikaans (10.66%).



GEOLOGICAL CONSULTING SERVICES PTY (LTD)	POPULATION STATS BY SEX

Figure 8-21: Sex (Stats SA, 2011)

8.14.4 Education

Education is a major challenge in the area as about 30% of children in the area of school-going age do not have access to quality education (IPD, 2020). This is due to the rural nature of the area.

The majority of schools are farm schools which are multi-graded, and that lack quality infrastructure and adequate human resources. The majority of primary schools are on the National Schools Nutrition Programme (NSNP) and the municipality welcomes the proposal of the Department of Education to extend the programme to high schools. There is only one tertiary education facility in the area, namely a Technical and Vocational Education and Training (TVET) College at Emgwenya. Table 8-10 gives a summary of the number and type of schools in the eMakhazeni LM (IDP, 2020).

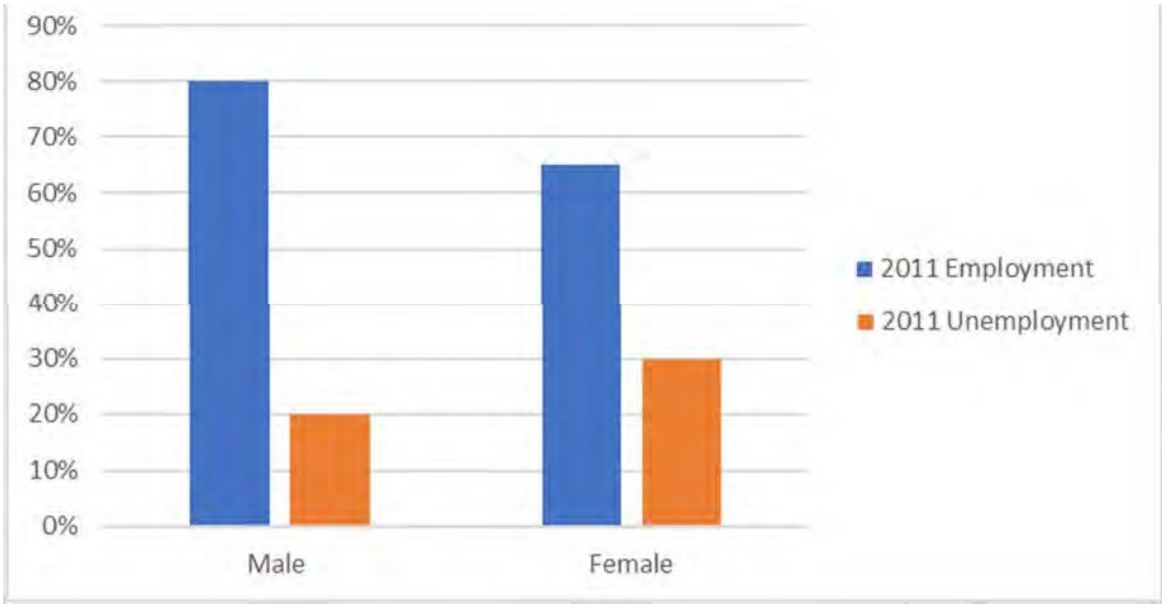
Table 8-10: Summary of schools in the eMakhazeni Local Municipality

Type of School	Number
Primary Schools (Farms)	7
Primary Schools (Farms)	13
Secondary Schools	5
Secondary Schools (Farms)	4
Private Schools	4
Schools for learners with special education needs	4
TVET	1
Total	35

8.14.5 Employment

The main industry of employment in Mpumalanga as well as in the eMakhazeni LM is manufacturing, community, social and personal services and wholesale and retail trade. The community, social and personal services sector includes public administration and defence activities, education and health and social work. Other large employment sectors in the eMakhazeni LM are wholesale and retail trade and manufacturing. The pattern of overall unemployment rate in eMakhazeni has changed as compared to 2001 where the LM was at 30% and in 2011, it was at 25.92 percent. Employment opportunities are favourable in the municipality, particularly for males, about 80% of males and 66% females were employed in 2011.

Figure 8-22 shows employment status for the population in the economically active group (15 to65 years old) and further indicate that there has been a reduction in the percentage of unemployedin the district between 2001 and 2011 for both males and females. The decline is similar for males and females, although employment remains higher for males than for females.



GEOLOGICAL CONSULTING SERVICES PTY (LTD)	EMPLOYMENT STAS

Figure 8-22: Employment status (StatsSA 2011).

8.15 Current Land Uses

The project area is situated approximately 5 km south of the town of eMakhazeni (Belfast). The closest settlement to the area is the Siyathuthuka Township, approximately 1 km north of area. The site is located within an area that consists of three main land uses, i.e., active mining areas, rehabilitated areas, and agricultural areas. Farming is the second largest land use occurring within the greater area. The mining areas are surrounded by farms to the east, west, and south. Farms within the area are predominantly used for monocultures such as maize as well as grazing land for cattle and sheep.

The Paardeplaats Properties are dominated by maize farming and grazing land for cattle, sheep, blesbok, and springbok. The area also contains irrigated land used by Hadeco for their highly specialised cold climate bulb operation.

9 Environmental Impact Assessment Approach

A basic environmental impact assessment was conducted for the project as required by GNR 326 of the NEMA. The impact assessment process entailed the following:

- Baseline characterisation (provided in Section 8);
- Identification of potential impacts; and
- Quantification of the significance of the identified potential impacts before and after implementation of mitigation measures.

9.1 Specialist Studies

According to the DFFE Screening Tool, the development site environmental sensitivities are as summarised in Table 9-1.

Table 9-1: Environmental Sensitivities

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

All the themes classified as very high and high sensitivity require specialist assessments. There were specialist studies that were conducted for the NBC Consolidation EIA process (2021), which included an assessment of Portion 13 of Paardeplaats 380JT, the property where the proposed residential development will be located. Findings from these studies have been incorporated int this report and include:

- Terrestrial Biodiversity,
- Aquatic Biodiversity;
- Palaeontology Assessment;
- Hydrogeology;
- Air Quality Assessment; and
- Visual Impact Assessment.

In addition to the above, a heritage impact assessment and wetland delineation and assessment were conducted for the project. The main deliverable from each specialist was a Baseline and Impact Assessment Report with appropriate maps, drawings and figures.

All the specialist studies that were used in the assessment have been included in Appendix E.

9.2 Impact Assessment Methodology

The main objective of the impact assessment is to identify the negative environmental impacts that can be avoided and/or mitigated and the benefits of the positive impacts that can be enhanced as a result of the proposed project.

A quantitative impact assessment methodology was used for the impact assessment. This method makes use of the basic risk assessment approach of deriving an expression for risk from the product of likelihood (probability) and consequences.

9.2.1 Baseline Characterisation of the Environment

The baseline characterisation of the environment (biodiversity, geohydrology, wetlands, air quality and hydrology) included in Section 8 of this BAR is based on existing information on the environmental parameters of the area, environmental databases and specialist studies.

9.2.2 Identification of Key Issues

Key potential environmental risks have been identified as part of the impact assessment through the stakeholder engagement process as well as existing information and project description.

The identified potential positive and negative biophysical, socio-economic and cultural impacts are summarised in Table 9-2..

Table 9-2: Summary of Potential Environmental Impacts Associated with the Proposed Development

Element of Environment	Potential Impact Descriptions
Socio-Economic	Possible limited and temporary job opportunities during the construction phase of the project.
Hydrogeology	Possible groundwater contamination.
Surface water	Possible surface water contamination.
Air Quality	Possible impact on air quality in the area.
Noise	Possible generation of noise during the construction phase of the project.
Visual	Possible visual impacts
Soils/Land Use/Land Capability	Possible impacts on soils and land use
Heritage Resources	Possible impacts on heritage resources
Palaeontology Resources	Possible impacts on palaeontology resources
Biodiversity	Possible disturbance and loss of biodiversity
Wetland	Possible impacts on wetlands and aquatic ecosystems

9.2.3 Quantitative Impact Rating (Significance)

All the identified potential impacts were assessed according to the following Impact Assessment Methodology as described below. This methodology has been utilised for the assessment of environmental impacts where the consequence (severity of impact, spatial scope of impact and duration of impact) and likelihood (frequency of activity and frequency of impact) have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact.

The first stage of any impact assessment is the identification of potential environmental activities[1], aspects[2] and impacts which may occur during the commencement and implementation of a project. This is supported by the identification of receptors[3] and resources[4], which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. Environmental impacts[5] (social and biophysical) are then identified based on the potential interaction between the aspects and the receptors/resources.

The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined in Table 9-3. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity[6], spatial scope[7] and duration[8] of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity[9] and the frequency of the impact[10] together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix table as shown in Table 9-3. This matrix thus provides a rating on a scale of 1 to 150 (low, medium low, medium high or high) based on the consequence and likelihood of an environmental impact occurring.

Natural and existing mitigation measures, including built-in engineering designs, are included in the pre-mitigation assessment of significance. Measures such as demolishing of infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

Table 9-3: Criteria for Assessing Significance of Impacts

[1]An ***activity*** is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organisation.
[2]An ***environmental aspect*** is an 'element of an organisations activities, products and services which can interact with the environment'. The interaction of an aspect with the environment may result in an impact.
[3]***Receptors*** comprise but are not limited to people or man-made structures.
[4]***Resources*** include components of the biophysical environment.
[5]***Environmental impacts*** are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and palaeontology. In the case where the impact is on human health or well-being, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.
[6]***Severity*** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
[7]***Spatial scope*** refers to the geographical scale of the impact.
[8]***Duration*** refers to the length of time over which the stressor will cause a change in the resource or receptor.
[9]***Frequency of activity*** refers to how often the proposed activity will take place.
[10]***Frequency of impact*** refers to the frequency with which a stressor (aspect) will impact on the receptor.

SEVERITY OF IMPACT	RATING
Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful	5

SPATIAL SCOPE OF IMPACT	RATING
Activity specific	1
Project area specific (within the property boundary)	2
Local area (within 5 km of the project area boundary)	3
Regional (Municipal area)	4
National	5

DURATION OF IMPACT	RATING
One day to one month	1
One month to one year	2
One year to ten years	3
Life of project	4
Post closure / permanent	5

CONSEQUENCE

FREQUENCY OF ACTIVITY / DURATION OF ASPECT	RATING
Annually or less / low	1
6 monthly / temporary	2
Monthly / infrequent	3
Weekly / life of operation / regularly / likely	4
Daily / permanent / high	5

FREQUENCY OF IMPACT	RATING
Almost never / almost impossible	1
Very seldom / highly unlikely	2
Infrequent / unlikely / seldom	3
Often / regularly / likely / possible	4
Daily / highly likely / definitely	5

LIKELIHOOD

Table 9-4: Interpretation of Impact Rating

Consequence

Likelihood														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	20	30	40	50	60	70	80	90	100	110	120	1	140	150

	High	76 to 150	Improve current management
	Medium High	40 to 75	Maintain current management
	Medium Low	26 to 39	
	Low	1 to 25	No management required

SIGNIFICANCE = CONSEQUENCE x LIKELIHOOD

10 Environmental Impact Assessment Results

Environmental impacts on the biophysical and socio-economic environment, which could potentially occur throughout the construction and operational phases of the proposed project are described in the following sections.

10.1 Preconstruction

The potential impacts associated with the planning phase (pre-construction phase) of the project include:

- Infrastructure placement and design leading to overall loss of biodiversity and impact on wetlands located in the vicinity of the proposed residential area; and
- Poor planning leading to an increased construction footprint.

Table 10-1: Quantitative Impact Assessment Results for the Planning Phase

Activity	Impact summary	Environmental Impact Significance Before Mitigation							Proposed mitigation	Environmental Impact Significance After Mitigation						
		Consequence			Probability	Frequency: Impact	Significance	Significance Rating		Consequence			Probability	Frequency: Impact	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency: Activity					Severity	Spatial	Duration	Frequency: Activity			
Planning of infrastructure placement and design within sensitive habitat	• Infrastructure placement and design leading to overall loss of protected floral species; and • Poor planning leading to an increased footprint.	2	1	3	1	2	18	Low (-)	• The proposed development footprint shall be kept to a minimum. • Prior to commencement of construction activities, the contractor and site manager will finalise the layout plan and indicate no-go areas, which will include the SCC, wetland areas and the graves. • No infrastructures shall be placed within delineated wetland areas. • Ensure that sound environmental management is in place during the planning phase. • Design of infrastructure should be environmentally and structurally sound and all possible precautions taken to prevent spillage and/or seepage to the surface and groundwater resources present	1	1	3	1	2	15	Low (-)

10.2 Construction Phase

10.2.1 Socio Economic

During the construction phase, there will be approximately 66 additional employment opportunities that will be attributed to the proposed NBC Community Residential project. In addition, small business will benefit through supply of required material for the construction of the residential area. The project capital value is estimated to be approximately R 38 464 152.82, which will contribute to eMakhazeni LM and Mpumalanga Province's GDP.

The negative socio-economic impacts that may be associated with the construction phase of the project include:

- Generation of dust potentially resulting in a health and nuisance impact;
- Impact on safety and security as a result of theft, the occurrence of additional trucks on the roads, uncontrolled lighting of fires on site, littering and driving irresponsibly;
- Health and safety risk as a result of the movement of construction vehicles increasing the risk of accidents; and
- Influx and unlawful occupation of the area by job seekers.

The cumulative impact on the socio-economic environment during the construction phase of the project will be low.

10.2.2 Groundwater

The use of earth moving machinery and construction vehicles on site poses the risk of chemical spillages including fuel and oils, which may leach into the groundwater. Care should be taken during the utilisation and storage of hydrocarbons and chemicals, which may have an impact on groundwater quality as a result of spillages and uncontrolled release.

The removal of vegetation from the area could furthermore lower the evapotranspiration rates, thereby allowing a greater volume of potentially contaminated water to percolate to the underlying aquifer in the event of an accidental spill from the machinery. It must however be noted that the removal of vegetation will be limited to the required footprints, therefore the impact on evapotranspiration is therefore expected to be negligible.

The cumulative impact on groundwater during the construction phase of the NBC Paardeplaats Community Residential Area project will be negligible

10.2.3 Hydrology and Surface water

There is a drainage line/non-perennial stream located on the property where the construction activities will take place. The possible potential impacts on surface water during the construction phase of the project are as follows:

- Ruoff from areas where accidental spillages of hazardous substances from construction vehicles used during construction, as well as from hazardous storage areas has occurred will result in surface water contamination.
- Contamination of runoff by poor materials/waste handling practices;
- Debris from poor handling of materials and/or poor waste management practises;
- Contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality; and

- Increase of surface runoff and potentially contaminated water that needs to be controlled in the areas where site clearing occurred.

Sedimentation could potentially occur in the drainage/non-perennial stream as runoff is naturally anticipated to pick up environmental debris as it crosses natural areas. Dust produced from movement of vehicles and machinery during the construction phase of the project has potential to settle in the drainage line/non-perennial stream, increasing turbidity which can affect downstream water courses. Increased turbidity is reversible and surface water should return to pre-impact turbidity levels once sediment levels are reduced. Settled sediments should naturally move downstream during periods of high flow flowing storm events.

10.2.4 Air Quality and Climate Change

The main pollutant of concern is Particulate Matter (PM) (Total Suspended Particles (TSP), PM_{10} and $PM_{2.5}$). Particulate matter emissions would result from construction activities. Gaseous emissions (SO_2, NO_x, CO_2, Hydrocarbons (HC) and Volatile Organic Compounds (VOC) would result from vehicle tailpipe emissions from trucks transporting the building materials to the construction site.

Air quality related impacts will primarily be from construction activities such as land clearing activities, including vegetation clearance and surface levelling (grading and scraping), and the off-loading and handling of building materials (bricks, cement, etc.) on-site.

The environmental impacts of wind-borne dust, gases and particulates from the construction activities associated with the proposed development will also have an impact on the vegetation of the area. When dust settles on plant material reducing the amount of light reaching the chlorophyll in the leaves, thereby reducing photosynthesis, which in turn reduces plant productivity, growth and recruitment.

The movement of vehicles and earth moving machinery may result in the production of carbon dioxide (Green House Gas (GHG)), which may have an impact on the climate in the area.

10.2.5 Noise

The use of vehicles and machinery during construction activities may result in an increase in ambient noise in the immediate vicinity of the project. The following activities will generate noise during the construction phase of the project:

- Ground works at the site;
- Foundations for the proposed buildings at the site;
- Building activities;
- Transportation of building material to and from the construction site;
- Shop fitting of the buildings and infrastructure;
- Use of emergency generators for lighting, if any; and
- Use of earthmoving machinery.

10.2.6 Visual

The following potential impacts on the visual character of the area as a result of the proposed project are envisaged during the construction phase of the project:

- Visual intrusion as a result of the movement of vehicles and machinery;
- Use of lighting at the construction sites; and

- Indirect visual impact due to vegetation clearance, dust generation, as a result of the movement of vehicles and materials, to and from the site area.

10.2.7 Soils, Land Use and Land Capability

The soils in the project area are reddish-brown, apedal, loamy sand to sandy loam topsoil on red (occasionally yellow brown), apedal, loamy sand to sandy loam subsoil, occasionally on mottled soft plinthite or weathering rock, with very high agriculture potential. The construction activities associated with the developments may result in widespread soil disturbance and is usually associated with accelerated soil erosion. Soil, sediments and associated contaminants are transported into water bodies such as wetlands and streams in the larger area, resulting in the loss or alteration of habitats for aquatic organisms, as well as changes in water quality. Soil erosion also promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous flora.

10.2.8 Biodiversity

Potential biodiversity impacts identified include:

Flora

The project may result in the following impacts on the floral environment during the construction phase:

- Destruction of potential floral habitats for SCC (*Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis*) as a result of site clearing, alien species, waste management and soil compaction;
- Vegetation clearance may lead to floral habitat loss of potential SCC;
- Impact on floral diversity as a result of site clearance, anthropogenic activity, and possible uncontrolled fires;
- Potential spreading of alien invasive species, including *Eucalyptus* sp and *Populus* sp. as a result of floral disturbance;
- Generation of waste and incorrect disposal from construction material leading to disturbance of natural vegetation; and
- Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.

Fauna

The project may result in the following impacts on the faunal environment during the construction phase:

- Loss of faunal habitat and ecological structure as a result of site clearing, alien invasive species, erosion, and general construction activities;
- Loss of faunal species due to collisions with construction vehicles and machinery;
- Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping;
- Impact on faunal species of conservational concern due to habitat loss and collision with construction vehicles;

- Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts on faunal habitat during the operation phase.

10.2.9 Heritage Resources

There were no heritage resources of cultural significance that were identified within the project area. Two features of heritage significance were identified to be located close to the project area, but well outside the boundary and would therefore not be impacted on by the proposed development. The heritage specialist found that since no sites, features or objects of cultural heritage significance were identified on the project area, there would be no impact as a result of the proposed development.

However, due to the nature of heritage resources, there is a chance that some resources may have been missed during the site surveys and literature reviews. Should any heritage resources be discovered during construction, the chance find protocol as contained in the HIA Report will apply.

10.2.10 Palaeontology Resources

Although the area where the proposed project will be located is classified by the South African Heritage Resources Information System and the DFFE screening tool as being having very high palaeontological sensitivity, the field work undertaken found no visible evidence of fossiliferous outcrops was identified. For this reason, an overall low palaeontological sensitivity was allocated to the area. The scarcity of fossil heritage indicates that the impact of the project will be of a low significance in palaeontological terms. However, as with heritage resources, chances remain that there may be fossil resources that were missed during the site surveys. The specialist specified that should any fossil remains be discovered during any phase of construction, either on the surface or exposed by excavations, the Chance Find Protocol must be implemented.

10.2.11 Aquatic Ecosystems and Wetlands

The removal of vegetation from the construction area and uncontrolled access to wetlands is also expected to have an impact on the provision of ecological and sociocultural services by aquatic ecosystems and wetlands. In addition, construction waste disposal and oil leakages from construction vehicles will alter biodiversity maintenance of the aquatic ecosystems and wetlands, which endangers the survival of aquatic ecosystem and riparian species inhabiting the area. Impacts on the aquatic ecosystems and wetlands will include:

- Loss of habitat and aquatic ecosystem and wetland ecological structure as a result of site clearance activities and uncontrolled aquatic ecosystem and wetland habitat degradation;
- Loss of floral SCC including S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp., *Eucomis autumnalis*, and a Watsonia sp that were identified in wetland areas on Portion 13;
- Impact on the aquatic ecosystem and wetland systems as a result of changes to the sociocultural service provisions though site clearance, waste management and disturbance;
- Impact on the hydrological functioning of the aquatic ecosystem and wetland systems;
- Vegetation clearance may result in soil erosion which will result in sedimentation of wetland areas;
- Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland habitat; and
- Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland resources.

10.2.12 Traffic

Most of the traffic will be associated with the delivery of construction material to the site and removal of waste from site. The material will be transported to the site via public roads, but that will only require a few trucks a day. Therefore, limited impact on public traffic is expected.

10.2.13 Waste Management

Poor waste management practices during the construction phase will result in:

- Contamination of surface runoff resulting in the deterioration of water quality of the water resources and wetlands; and
- Disposal of hazardous waste including hydrocarbon contaminated soils, rags etc. could result in the contamination of surface runoff resulting in the deterioration of water quality of the water resources and wetland.

The results of the waste management quantitative impact assessment for the construction phase are provided in Table10-2.

Table10-2: Quantitative Impact Assessment Results for the Construction Phase

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation						
		Consequence			Probability	Frequency: Impact	Significance	Significance Rating	Management and Mitigation Measures	Consequence			Probability	Frequency: Impact	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency: Activity					Severity	Spatial	Duration	Frequency: Activity			
Social	Influx of job seekers will have a negative social impact on the landowners and land occupiers.	2	2	3	2	2	28	Medium Low (-)	• Encourage the local employment for the following: o Employment opportunities for local SMME contractors during site clearance, preparation, sourcing construction material and construction. o Secondary service provision of food, toilet • Random and regular alcohol and drug testing shall be conducted on all personnel responsible for operating machinery and driving construction vehicles to ensure the safety of the public. • Security and safety should be emphasized. • Recruitment will not be undertaken on site. • Liaise with the South African Police Service (SAPS) and existing forums in order to implement effective crime prevention strategies. • No construction workers shall be allowed to access private properties without the owner's knowledge and consent. • No fires are allowed on the site, unless in areas demarked and managed for this purpose. • All workers will be made aware of fire risks. • NBC will continue to make use of its stakeholder engagement liaison personnel to address any potential conflicts arising from the proposed project. • Limit the aerial extent of the disturbance to the footprint of the proposed development, including the laydown areas surrounding the primary footprint.	1	1	1	1	2	9	Low (-)
	Unauthorised access to private property outside of the demarcated areas will result in conflict with landowners.	2	2	3	2	2	28	Medium Low (-)		1	1	1	1	2	9	Low (-)
	Increased traffic in the area will increase the likelihood of accidents on the roads, posing a health and safety issue for the landowners and land occupiers.	2	2	3	2	2	28	Medium Low (-)		1	1	1	1	2	9	Low (-)
	The influx of job seekers in the area may result in an increase in petty crimes.	2	2	3	2	2	28	Medium Low (-)		1	1	1	1	2	9	Low (-)
	Potential squatting of job seekers.	2	2	3	2	2	28	Medium Low (-)		1	1	1	1	2	9	Low (-)
	Potential impact on safety and security and increased conflict with landowners and land occupiers as a result uncontrolled lighting of fires on site, littering and driving irresponsibly.	2	2	3	2	2	28	Medium Low (-)		1	1	1	1	2	9	Low (-)
	Ineffective communication channels leading to community unrest.	2	2	3	2	2	28	Medium Low (-)		1	1	1	1	2	9	Low (-)
	Possible boost in short term local small business opportunities.	3	1	3	2	2	28	Medium Low (+)		3	1	3	2	2	28	Medium Low (+)
	Possible creation of short-term construction related jobs	3	1	3	2	2	28	Medium Low (+)		3	1	3	2	2	28	Medium Low (+)
Groundwater	Local spillages of oils from vehicles and machinery leading to groundwater contamination.	3	2	3	3	3	48	Medium-High (-)	• No washing of vehicles shall be allowed outside demarcated areas. The bays will be clearly demarcated and will not be allowed to contaminate any surface runoff. • Sufficient areas shall be provided for the maintenance and washing of vehicles. • Refueling of vehicles will only be allowed in designated areas. • All construction equipment shall be parked in demarcated areas. • Drip trays shall be used when equipment is not used for some time. • On surface bulk storage of hydrocarbons must be situated in a dedicated area which will include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the material.	2	1	2	2	2	20	Low (-)
	Improper storage and handling of hazardous materials leading to groundwater contamination.	3	2	3	3	3	48	Medium-High (-)		2	1	2	2	2	20	Low (-)

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation						
		Consequence			Probability	Frequency: Impact	Significance	Significance Rating	Management and Mitigation Measures	Consequence			Probability	Frequency: Impact	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency: Activity					Severity	Spatial	Duration	Frequency: Activity			
									• Bund areas shall contain 110% of the stored volume. • Bund areas must be impermeable. • Bund areas must have a facility such as a valve/sump to drain or remove clean stormwater. • Contaminated water shall be pumped into a container for removal by an approved service provider. • Regular inspections shall be carried out to ensure the integrity of the bundwalls. • All preventative servicing of earth moving equipment and construction vehicles shall be undertaken off site. • Runoff from this area shall be contained. • Spill kits shall be made available, and all personnel shall be trained on how to use the kits and training records shall be made available on request.							
Surface Water	Potential deterioration in water quality as a result of accidental spillages of hazardous substances such as hydrocarbons from vehicles and machinery.	3	2	2	2	3	35	Medium-Low (-)	• Ensure the clean and dirty water segregation. • Spill kits to be made available at areas of possible spillages of hazardous substances. • Remediation of spillages must be conducted on a continual basis. • Contaminated runoff will be contained and re-used where necessary. • No direct discharge of polluted water to the environment is permitted. • Ensure that topsoil is properly stored, away from the streams and drainage areas. • No construction activities are allowed within 100 metres from the nearby steams without authorisation from the DWS. • Vehicle and personnel movement within watercourses/ wetland areas/riparian areas shall be strictly prohibited. • Ensure that topsoil is properly stored, away from sensitive environmental areas which include the wetland areas, the streams and heritage sites; • Vehicle and personnel movement within watercourses and drainage areas shall be strictly prohibited; • Adequate stormwater management must be incorporated into the design of the project in order to prevent contamination of water courses and wetlands from dirty water.	2	1	2	2	2	20	Low (-)
	Possible contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality.	3	2	2	2	3	35	Medium-Low (-)		2	1	2	2	2	20	Low (-)
	Debris from poor handling of materials and/or waste blocking watercourses may result in flow impediment and pollution.	2	2	2	2	2	24	Low (-)		1	1	3	1	2	15	Low (-)
	Increase in silt load in runoff due to movement of vehicles on site may result in increased sedimentation of water courses.	2	3	2	3	2	35	Medium-Low (-)		2	2	2	2	2	24	Low (-)
	Deterioration of water quality as a result of improper handling/ of chemicals.	2	3	2	3	2	35	Medium-Low (-)		2	2	2	2	2	24	Low (-)
	Poor stormwater management leading to runoff from stockpiled material removed causing sedimentation of the water resources.	2	3	2	3	2	35	Medium-Low (-)		2	2	2	2	2	24	Low (-)
Wetlands and Aquatic Ecosystems	Localised changes to the riparian areas as a result of vegetation clearing.	3	3	3	3	3	54	Medium-High (-)	• All delineated wetlands and their associated 100m buffer should be designated as “No-Go” areas and be off limits to all unauthorised vehicles and personnel, with the exception of approved construction and operational areas. • Adequate stormwater management must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system. • No clearance of protected tree species shall be undertaken without the required permits. • Measures must be put in place to attenuate water from infrastructure areas and reduce runoff. Attenuation measures during construction	2	2	3	2	2	28	Medium Low (-)
	Loss of habitat and wetland ecological structure as a result of site clearance activities and uncontrolled wetland degradation.	3	2	3	3	3	48	Medium-High (-)		2	2	3	2	2	28	Medium Low (-)
	Loss of floral SCC including S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp., *Eucomis autumnalis*, and a Watsonia sp that	3	2	3	3	3	48	Medium-High (-)		2	2	3	2	2	28	Medium Low (-)

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	were identified in wetland areas on Portion 13.								are to include but are not limited to - the use of sandbags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes. • All stockpiles must be protected from erosion, stored on flat areas where runoff will be minimised, and be surrounded by bunds. Stockpiles must also only be stored for the minimum amount of time necessary. • Delay vegetation clearing and clear only the minimum area required at any one time. • All erosion noted within the project footprint should be remedied immediately and included as part of an ongoing rehabilitation plan. • Active rehabilitation, re-sloping, and re-vegetation of disturbed areas immediately after construction and operational activities. • Ensure that no incision and canalisation of the wetland features present takes place as a result of the proposed activities. • All erosion noted within the project footprint should be remedied immediately and included as part of the ongoing rehabilitation plan. and • Erosion berms should be installed on roadways and downstream of stockpiles to prevent gully formation and siltation of the freshwater resources. • No construction activities shall be allowed within 500 m of wetlands and/or riparian zones without authorisation from the DWS. • No vehicles may be allowed to indiscriminately drive through the riparian areas or within the wetlands. • All disturbed areas shall be re-vegetated with indigenous species. • All construction materials shall be kept out of the wetlands and riparian areas. • Active rehabilitation, re-sloping, and re-vegetation of disturbed areas immediately after construction and operational activities. • Implement and maintain alien vegetation management programme. • All vehicles shall be regularly inspected for leaks. Re-fueling must take place outside the project area, on a sealed surface area to prevent ingress of hydrocarbons into topsoil and aquatic ecosystems.							
	Impact on the wetlands systems as a result of changes to the sociocultural service provisions.	3	3	3	3	3	54	Medium-High (-)		2	2	3	2	2	28	Medium Low (-)
	Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland and riparian resources.	3	3	3	3	3	54	Medium-High (-)		2	2	3	2	2	28	Medium Low (-)
	Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland and riparian habitat.	3	3	3	3	3	54	Medium-High (-)		2	2	3	2	2	28	Medium Low (-)
	Impact on the hydrological functioning of the wetland systems.	3	3	3	3	3	54	Medium-High (-)		2	2	3	2	2	28	Medium Low (-)
Heritage Resources	Although no heritage resources were identified, there is potential for chance findings of heritage resources.	2	1	2	2	2	20	Low (-)	Implement the Chance Find Protocol (CFP) as follows: • A heritage practitioner should be appointed to develop a heritage induction program and conduct training for the ECO, as well as team leaders, in the identification of heritage resources and artefacts; • An appropriately qualified heritage consultant should be identified to be called upon if any possible heritage resources or artefacts are identified; • Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities be halted; • The qualified archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and impact on the heritage resource; • The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the	1	1	1	1	1	6	Low (-)

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									material and data are recovered; • Should the heritage consultant conclude that the find is a heritage resource protected in terms of the NHRA (1999) Sections 34, 35, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), he or she should notify SAHRA and/or the relevant PHRA; • Based on the comments received from SAHRA and/or the PHRA, the heritage consultant would present the relevant terms of reference to the client for implementation; • Construction/Operational activities can commence as soon as the site has been cleared and signed off by the archaeologist. If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits and have their own requirements that must be adhered to. If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law. Once it has been decided to relocate particular graves, the following steps should be taken: • Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law. • Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law. • Local radio stations can also be used to try contact family members. This is not required by law but is helpful in trying to contact family members. • During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased. • An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law. • Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law. • Once the permit has been received, the graves may be exhumed and relocated. • All headstones must be relocated with the graves as well as any items found in the grave.							
Palaeontological Resources	Although no palaeontological resources were identified, there is potential for chance findings of heritage resources.	2	1	2	2	1	20	Low (-)	If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the CFP must be implemented by the Environmental Control Officer (ECO) as follows: • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding	1	1	1	1	1	6	Low (-)

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									must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ECO or site manager. The ECO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS coordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. • Upon receipt of the preliminary report, the Heritage Agency will inform the ECO (or site manager) whether a rescue excavation or rescue collection by a paleontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ECO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.							

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		Severity	Spatial	Duration	Frequency: Activity					Severity	Spatial	Duration	Frequency: Activity			
Flora	Loss of localised biodiversity habitats within sensitive areas due to site clearance.	3	2	3	3	3	48	Medium-High (-)	*Development footprint* • The construction footprint must be kept as small as possible in order to minimise impact on the surrounding environment (edge effect management). • Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint. Where possible / feasible, any remaining natural areas should be utilised as part of the landscaping of the proposed development. • Smaller species that are not as readily able to move out of an area ahead of ground clearing activities such as scorpions and reptiles will be less mobile during rainfall events and cold days (winter). As such should any be observed in the construction site during clearing and construction activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction personnel are to be educated about these species and instructed not to kill them. Smaller scorpion species and harmless reptiles should be carefully relocated by a suitably nominated construction person. For larger venomous snakes, a suitably trained specialist, or on-site personnel, should be contacted to carry out the relocation of the species, should it not move off on its own. • Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal. • No hunting or trapping of faunal species is to be allowed by construction personnel. • Care should be taken during the construction of the proposed development to limit edge effects to surrounding natural habitat. This can be achieved by: o Demarcating all footprint areas prior to construction activities. o No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas and should be taken to a registered waste disposal facility. o All soils compacted as a result of construction activities outside of the final operational area should be ripped, profiled and reseeded. o Manage the spread of AIP species, which may affect remaining natural habitat within surroundingareas. • No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed as a result of the construction activities should be disposed of at an appropriate registered dump site away from the development footprint. No temporary dump sites should be allowed in areas with natural vegetation. Waste disposal containers and bins must be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be carefully collected and disposed of at a separate waste facility. • If any spills occur, they should be immediately cleaned up to avoid	2	2	2	2	2	24	Low (-)
	Loss of localised floral species diversity including RDL and medicinal protected species due to site clearance and establishment of infrastructure.	3	2	3	3	3	48	Medium-High (-)		2	2	2	2	2	24	Low (-)
	Potential spreading of alien invasive species as indigenous vegetation is removed and pioneer alien species are provided with a chance to flourish.	3	2	3	3	3	48	Medium-High (-)		2	2	2	2	2	24	Low (-)
Fauna	Vegetation clearance may result in loss of faunal habitat ecological structure, species diversity and loss of species of conservation concern.	3	2	3	3	3	48	Medium-High (-)		2	2	2	2	2	24	Low (-)
	Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.	3	2	3	3	3	48	Medium-High (-)		2	2	2	2	2	24	Low (-)

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	Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal species trapping.	3	2	3	3	3	48	Medium-High (-)	soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practiced, preventing the ingress of hydrocarbons into the topsoil. and • Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area. *Alien Vegetation* • Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed.	2	2	2	2	2	24	Low (-)
	Movement of construction vehicles and machinery may result in collision with fauna, resulting in loss of fauna.	2	2	2	2	2	24	Low (-)	• Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the construction phase of the development, and a 30m buffer surrounding the study area should be regularly checked for AIP proliferation and to prevent spread into surrounding natural areas. and • Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility which complies with legal standards. *Fires* • Informal fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed. *Floral and Faunal SCC* • The relocation success of floral SCC, if any, should be monitored during the construction phase to ensure immediate actions can be taken if it becomes evident that relocation is not successful. • No collection of floral SCC or medicinal floral species must be allowed by construction personnel. • Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed development footprint area. • No trapping or hunting of fauna whatsoever must be allowed. • It is recommended that the perimeter fence allows for movement of small mammals, such as palisade fencing, as opposed to solid constructions such as walls. Should the perimeter be walled in, it is recommended that small openings be left to allow for continuous movement of small mammal species. Such openings must be continuously monitored and cleared of debris to ensure continued movement is possible. and • Should the presence of any faunal SCC be noted, or their breeding sites be located, within the development footprint a suitably qualified specialist should be consulted on the best way to proceed. *Rehabilitation* • Any areas that have been left bare as a result of the construction activities should be rehabilitated using indigenous species.	1	1	1	1	1	6	Low (-)
Air Quality	Possible increase in dust generation, PM_{10} and $PM_{2.5}$ as a result of bulk earthworks, operation	2	2	2	2	2	24	Low (-)	• Dust suppression measures shall be implemented, and these may include spraying with water.	1	2	1	1	2	12	Low (-)

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		Severity	Spatial	Duration	Frequency: Activity					Severity	Spatial	Duration	Frequency: Activity			
	of heavy machinery, and material movement.								• Where practical rehabilitation should be undertaken in tandem with the construction activities. • A speed limit of 40 km/hr. shall apply to limit vehicle entrained dust from the unpaved road. • All construction equipment must be scheduled for preventative maintenance to ensure the functioning of the exhaust systems to reduce excessive emissions and limit air pollution. • Dust control suppression shall be implemented on dry weather days and periods of high wind velocities. • Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance and spraying with water. • Materials transported on public roads must be covered. *Odours:* • Putrescible waste must be handled, stored and disposed of before the probability of it generating odours. • Chemical toilets must be emptied / serviced on a regular basis. Proof of this must be provided to the Engineer.							
	Increase in carbon emissions and ambient air pollutants (NO_2 and SO_2) as a result of movement of vehicles and operation of machinery/equipment.	2	2	2	2	2	24	Low (-)		1	2	1	1	2	12	Low (-)
Climate change	Emissions of Green House Gases as a result of the use of vehicles and machinery used during the construction activities.	2	2	2	2	2	24	Low (-)	• All the vehicles shall undergo maintenance on a regular basis to ensure the combustion engine vehicle efficiency.	2	2	2	2	1	18	Low (-)
Visual	Scaring of the landscape as a result of the clearance of vegetation.	2	1	2	2	2	20	Low (-)	• The number of construction vehicles and machinery to be used shall be kept to a minimum. • Movement of vehicles shall be kept to outside busy hours to minimise the visual impacts on the residents. • Materials transported on public roads must be covered. • Dust suppression measures must be implemented to minimise nuisance dust. • Where possible, rehabilitation of the work areas shall be undertaken in tandem with construction to ensure that areas stripped of vegetation are kept to a minimum.	1	1	1	1	2	9	Low (-)
	Visual intrusion as a result of the movement of machinery and the establishment of the required infrastructure.	2	1	2	2	2	20	Low (-)		1	1	1	1	2	9	Low (-)
	Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.	2	1	2	2	2	20	Low (-)		1	1	1	1	2	9	Low (-)
Noise	The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity.	2	2	2	2	2	24	Low (-)	• Adjacent landowners must be advised of any work that will take place outside of normal working hours, that may be disruptive (e.gw. noise) in advance. • Surrounding communities must be notified in advance of noisy construction activities. • All equipment should be provided with standard mufflers. • Muffling units on vehicles and equipment must be kept in good working order. • Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment. • Where possible, operation of several equipment and machinery simultaneously must be avoided. • All equipment must be kept in good working order, with immediate attention being paid to defective silencers, slipping fanbelts, worn bearings and other sources of noise. • Equipment must be operated within specifications and capacity (e.g., no overloading of machines).	1	1	1	2	1	9	Low (-)

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									• Regular maintenance of equipment must be undertaken, particularly with regard to lubrication. • Equipment shall be switched off when not in operation. • Appropriate directional and intensity settings must be maintained on all hooters and sirens. • The Contractor must ensure that the employees conduct themselves in an appropriate manner while on site. and • Noise/vibration producing activities shall be limited to daylight hours (Monday to Friday 07H00 to 17H30 and Saturday 07H00 -14H00). • No noise/vibration producing activities shall be undertaken on Saturdays on farms unless this has been agreed to by the farmer.							
Soil, Land use and Land Capability	Localised chemical pollution of soils as a result of vehicle hydrocarbon spillages and compaction.	2	1	2	2	2	20	Low (-)	• Contaminated soil shall be removed and disposed of to an appropriate licensed landfill site in terms of NEM: WA or can be removed by a service provider that is qualified to clean the soil. • The time in which soils are exposed during construction activities should remain as short as possible. • Erosion control measures shall be implemented where deemed necessary. • In general, all steep slopes steeper than 1:3 or where the soils are more prone to erosion must be stabilised. • If stockpiles are not going to be used immediately the stockpiles shall be rehabilitated to prevent erosion. • Runoff from stockpiles shall be detained in order to support growth of vegetation. • Runoff from the stockpiles shall be suitably managed to ensure that the runoff volumes and velocities are similar to pre disturbed levels. • Vegetation shall be used to promote infiltration of water into the stockpile instead of increasing runoff. • A monitoring programme will be implemented if the stockpiles are not used within the first year whereby the vegetation of the stockpiles is monitored in terms of basal cover and species diversity. • If it is noticed that the vegetation on the stockpiles is not sustainable, appropriate corrective actions shall be taken to rectify the situation. • Stockpiles shall be maintained until the topsoil is required for rehabilitation purposes. • Topsoil stockpiles shall be monitored regularly to identify alien vegetation, which shall be removed as soon as possible to prevent further distribution of any alien vegetation.	1	1	1	2	1	9	Low (-)
	Localised clearing of vegetation and compaction of the construction footprint will result in the soils being particularly more vulnerable to soil erosion.	2	1	2	2	2	20	Low (-)		1	1	1	1	2	9	Low (-)
	Localised loss of resource and its utilisation potential due to compaction over unprotected ground/soil.	2	1	2	2	2	20	Low (-)		1	1	1	1	2	9	Low (-)
	Localised loss of soil and land capability due to reduction in nutrient status - de-nitrification and leaching due to stripping and stockpiling footprint areas.	2	1	2	2	2	20	Low (-)		1	1	1	1	2	9	Low (-)
Traffic	Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion along the roads.	2	3	2	2	2	28	Medium Low (-)	• Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads. • On internal roads, speed limits will be reduced to 40 km/h or less to reduce dust and noise generation. • The number of construction vehicles and trips shall be kept to a minimum. and • Where possible the transportation of construction materials and	2	2	2	1	2	18	Low (-)

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									rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents.							
Waste Management	Potential water and soil pollution as a result of inappropriate waste management practices.	2	3	2	2	2	28	Medium Low (-)	• Waste management will be undertaken in line with the NEM: WA Waste Management Hierarchy, ensuring re-use and recycling of waste as much as possible. Where re-use, recycling or disposal of waste is required, the following shall apply: *Separation of waste:* • All waste shall be separated into general waste and hazardous waste. • Hazardous waste shall not be mixed with general waste and in doing so increase the quantities of hazardous waste to be managed. • General waste can further be separated into waste that can be recycled and or reused. • No littering shall be allowed in and around the site, a sufficient number of bins shall be provided for the disposal of waste. • Where necessary dedicate a storage area on site for collection of construction waste. *Storage of waste:* • No stockpiling of debris shall be permitted within 100 m of any water courses and drainage lines, or within 500 m of wetland and riparian areas. • General waste will be collected in an adequate number of litter bins located throughout the construction site. • Bins must have lids in order to keep rainwater out. • Bins shall be emptied regularly to prevent them from overflowing. • All work areas shall be kept clean and tidy at all times. • All waste management facilities will be maintained in good working order. • Waste shall be stored in demarcated areas according to type of waste. • Runoff from any area demarcated for waste will be contained, treated and reused. • Flammable substances must be kept away from sources of ignition and from oxidizing agents. • No construction rubble shall be disposed of to the riparian area. • If construction rubble is not removed immediately, it shall be stockpiled outside the 1:100-year floodline and outside the sensitive wetland and riparian areas. • Demolition waste and surplus concrete shall be disposed of responsibly. • Waste shall not be buried or burned on site. and • The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour. *Disposal of hazardous waste:* • No dumping shall be allowed in or near the construction site.	2	2	2	1	2	18	Low (-)

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									• Hazardous containers shall be disposed of at an appropriate licensed site. • Hazardous waste will be removed and managed by an approved service provider. • A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste. and • The safe disposal certificate shall be stored and provided on request. *Disposal of general waste:* • No dumping shall take place in or near the construction site. • All general waste shall be disposed of to the nearest licensed landfill site. • Demolition waste and builders rubble shall be disposed of to an appropriate licensed landfill site. and • The necessary permissions must be obtained to dispose of builders' rubble to the landfill site.							

10.3 Operational Phase

Impacts during the operational phase will result largely due to improper or inadequate maintenance of the infrastructure, particularly the sewer pipelines and where there are operational failures which may result in the leaking of or overflow of the pipelines.

10.3.1 Socio-Economic

During the operational phase of the proposed development the following potential positive impacts are likely to occur:

- The relocation of the NBC Paardeplaats community will allow NBC to implement the Integrated Paardeplaats Section mining project and continue with mining of ore. The benefits from the Integrated Paardeplaats Section mining project will include job creation and job security for the current personnel, contribution to electricity supply by meeting its obligations to supply Eskom Power Station with the required coal and contribution to the local, regional and national GDP.
- The proposed project is expected to provide the relocated households with better facilities than they currently have, improving their quality of life.

10.3.2 Groundwater

Leaks of sewer from pipelines may occur and impact on the groundwater quality.

10.3.3 Hydrology and Surface Water

The possible potential impacts on surface water during the operational phases of the proposed project may be due to increased runoff from the infrastructure and roads. Leaks from the proposed sewer pipelines may occur and result in contaminated run-off from the site.

10.3.4 Biodiversity

Improper rehabilitation during and post construction can result in proliferation of alien invasive plant species and continued loss of vegetation and habitats. Run-off water from gardens typically contains seeds of exotic and garden-variety plants that pose a threat to indigenous vegetation and ecology.

10.3.5 Wetlands and Aquatic Ecosystems

In addition to the impacts on aquatic habitats as explained above, the operation phase of the project is expected to have the following impacts on wetlands and aquatic ecosystems:

- Loss of habitat and wetland ecological structure as a result of continual wetland disturbance and uncontrolled wetland degradation;
- Impact on the wetlands systems as a result of changes to the sociocultural service provisions through continued uncontrolled vegetation clearance, waste management and wetland disturbance; and
- Impact on the hydrological functioning of the wetland systems as a result of reduced wetland footprints and uncontrolled disturbance.

10.3.6 Waste Management

Poor waste management practices during the operational phase will result in:

- Contamination of surface runoff resulting in the deterioration of water quality of the watercourse.

- Improper disposal of hazardous waste could result in the contamination of surface runoff resulting in the deterioration of water quality of the watercourse.

Table10-3: Quantitative Impact Assessment Results for the Operational Phase

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation						
		Consequence			Probability		Significance (Degree to which impact may cause irreplaceable loss of resources/damage)	Significance Rating		Consequence			Probability		Significance (Degree to which impact may cause irreplaceable loss of resources/damage)	Significance Rating
		Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact				Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact		
Groundwater	Leaks of sewer from pipelines may occur and also impact on the groundwater quality.	2	3	2	2	2	28	Medium-Low (-)	• Monitor the groundwater environment for possible contamination • Pipelines shall be regularly monitored and maintained in good working order.	2	2	2	1	2	18	Low (-)
	Abstraction of groundwater may result in lowering of the groundwater tables and impact groundwater availability for other users.	2	3	2	3	2	35	Medium Low (-)	• No groundwater may be abstracted for use on site without approval from the DWS. • Monitor groundwater levels of surrounding boreholes	2	2	2	2	2	24	Low (-)
Surface water	The possible potential impacts on surface water during the operational phases of the proposed project may be due to increased runoff from the infrastructure and roads. Leaks from the proposed sewer pipelines may occur and result in contaminated run-off from the site.	2	2	2	2	2	24	Low (-)	• Pipelines shall be regularly monitored and maintained in good working order. • Surface water monitoring shall be undertaken downstream of the project area. • Storm water generated around the project site will be diverted away to the clean water environment. • All hydrocarbons will be stored on protected storage areas away from the streams. • Fire-fighting water- (sufficient storage, correct additives, impermeable storage containers), and contact water (run-off contained, remove or treat contained contact water) management. • Design and construct and manage stormwater run-off. • Ensure contaminated surface run-off is either treated or contained in leak-resistant structures.	1	2	1	1	2	12	Low (-)
	Heavy rainfall events and associated sheet run-off has potential for contamination of off-site surface water due to uncontained on-site surface water run-off.	2	2	2	2	2	24	Low (-)		1	2	1	1	2	12	Low (-)
	Accidental fires and extinguishing of on-site fires results in potential contamination of soil, groundwater, and surface water run-off during a fire event if contact fire-fighting water is not contained	2	2	2	2	2	24	Low (-)		1	2	1	1	2	12	Low (-)
Biodiversity	Continued loss of Loss of floral and faunal habitat, species and SCC due to ineffective rehabilitation and edge effects.	2	1	2	2	2	20	Low (-)	*Development footprint* • No dumping of litter or garden refuse must be allowed on-site. As such it is advised that vegetation cuttings from landscaped areas be carefully collected and disposed of at a separate waste facility. *Alien Vegetation* • All disturbed areas must be rehabilitated in tandem with construction activities. • Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. • Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas. • Landscaping of the gardens must include removal of weeds that pose a threat to indigenous vegetation. • Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which complies with legal standards. *Floral and Faunal SCC* • Should the presence of any floral SCC and/or faunal SCC be noted, or their breeding sites be located within the operational footprint, a suitably qualified specialist should be consulted on the best way to proceed.	1	1	2	2	1	12	Low (-)
	Run-off water from gardens typically contains seeds of exotic and garden-variety plants that pose a threat to indigenous vegetation and ecology.	2	2	2	2	2	24	Low (-)		1	1	2	2	1	12	Low (-)
	Improper rehabilitation during and post construction can result in proliferation of alien invasive plant species and continued loss of vegetation and habitats.	2	3	2	2	2	28	Medium-Low (-)		2	2	2	1	2	18	Low (-)

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation						
		Consequence			Probability		Significance (Degree to which impact may cause irreplaceable loss of resources/damage)	Significance Rating		Consequence			Probability		Significance (Degree to which impact may cause irreplaceable loss of resources/damage)	Significance Rating
		Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact				Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact		
Wetlands and Aquatic Ecosystems	Loss of habitat and wetland ecological structure as a result of continual wetland disturbance and uncontrolled wetland degradation	2	3	2	2	2	28	Medium-Low (-)	• Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. • Access to the wetland areas must be strictly prohibited. • Stormwater management must be implemented to prevent erosion and the associated sedimentation of the aquatic system. • Alien and invasive plant monitoring and control must be implemented to ensure the AIP do not encroach int the wetland areas. • No waste may be disposed of in wetland areas.	2	2	2	2	2	24	Low (-)
	Impact on the wetlands systems as a result of changes to the sociocultural service provisions through continued uncontrolled vegetation clearance, waste management and wetland disturbance	2	3	2	2	2	28	Medium-Low (-)		2	2	2	2	2	24	Low (-)
	Impact on the hydrological functioning of the wetland systems as a result of reduced wetland footprints and uncontrolled disturbance.	2	3	2	2	2	28	Medium-Low (-)		2	2	2	2	2	24	Low (-)
Waste Management	Poor waste management during the resulting in contamination of surface runoff resulting in the deterioration of water quality of the watercourse.	3	3	2	2	2	32	Medium-Low (-)	*Storage of waste* • General waste will be collected in an adequate number of litter bins; • Bins must have lids in order to keep rainwater out; • Bins shall be emptied regularly to prevent the bins from overflowing; • Waste shall be stored in demarcated areas according to type of waste; • Flammable substances must be kept away from sources of ignition and from oxidizing agents; • Waste shall not be buried or burned on site; and • The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour. *Disposal of hazardous waste* • No dumping shall be allowed on site; • Hazardous containers shall be disposed of at an appropriate licensed site; *Disposal of general waste* • All general waste shall be disposed of to the nearest licensed landfill site.	2	2	2	2	2	24	Low (-)
	The operational phase of the project will result in increased generation of domestic waste that will need to be handled and disposed of.	2	2	3	1	2	21	Low (-)		1	1	1	1	1	6	Low (-)

10.4 Decommissioning

It is not expected that the project will be decommissioned in the near future. At this point of the project planning process, the necessity for and timing of the decommissioning of the proposed project is unknown. Like construction phase impacts, decommissioning impacts are inherently temporary in duration. The MDARDLEA will be appropriately notified and consulted prior to decommissioning taking place. An application in terms of the prevailing EIA Regulations at the time when decommissioning will be required for the relevant EA will be lodged if applicable.

Like the construction phase, it is expected that the decommissioning phase may result in short lived impacts on:

- Biodiversity, including potential proliferation of Alien Invasive Plant Species;
- Ambient air quality,
- Hydrology and groundwater;
- Aquatic ecosystems and wetlands;
- Socio-economic;
- Traffic;
- Waste Management; and
- Increase in ambient noise levels.

Although the impacts during the decommissioning phase are expected to be the same as for the construction phase, the significance of the impacts is expected to be lower than for the construction phase.

10.5 Cumulative Impacts

Incomparable activities can result in several complex effects on the natural biophysical and social environment. These impacts are mainly identified as direct and immediate effects on the environment by a single entity affecting a variable of the environment. These direct impacts have the potential to combine and interact with other activities, depending on the surrounding environmental state and land use. These impacts may aggregate or interact with other impacts to cause additional effects, not easily quantified when assessing an individual entity.

The NEMA, 2014, specifically requires that cumulative impacts be assessed. This section provides a description and analysis of the potential cumulative effects of the proposed NBC Paardeplaats Community residential area, and past and present projects hereby considering the effects of any changes on the:

- Biophysical; and
- Socio – Economic conditions.

For the analysis of cumulative effects to be utilised as a useful tool for decision makers and I&APs, it must be limited to the effects that can be meaningfully evaluated, rather that expanding on resources or receptors that are no longer affected by the development or are not of interest to the I&APs. Two important aspects require consideration prior to the evaluation of cumulative effects:

- The determination of an appropriate spatial and temporal boundaries for evaluation of cumulative effects of the project; and
- The evaluation of relevant projects for consideration in the cumulative effects' analysis.

Spatial and temporal boundaries for analysis of cumulative effects are dependent on several factors, including:

- The size and nature of the project and its potential effects;
- The size, nature and location of past and (known) future projects and activities in the area,
- The aspect of the environment impacted by the cumulative effect; and
- The period of occurrence of effects.

The spatial extent of the cumulative impact analysis is generally aligned with the zone of influence of the project and other projects in the vicinity. Most impact will be localised; however, others may be experienced on a regional scale. This is taken into consideration during the assessment of cumulative impacts. It is reasonably straightforward to identify significant past and present projects and activities that may interact with the project to produce cumulative impacts, and in many respects, these are taken into account in the descriptions of the biophysical and socio- economic baseline.

10.5.1 Groundwater and Surface Water Impacts

The potential groundwater and surface water quality impacts associated with the construction and operation of the project relate to the potential contamination because of leakages from vehicles and machinery as well as potential leakages from pipelines, particularly the sewer pipelines. Mitigation measures have been proposed for the impacts on ground water and surface water contamination. It is expected that with the implementation of the mitigation measures the impacts will be reduced to an acceptable level. The hydrological and surface water cumulative impacts resulting from the construction and operation of the project will be negligible.

10.5.2 Air Quality Impacts

Most of the land use in the vicinity of the NBC where the project is located is mostly agriculture, veld and mining in nature. It is known that air pollutants enter the environment from mining activities. The potential air quality impacts associated with the construction and operation of the project relate to the potential generation of $PM_{2.5}$, PM_{10} and fugitive dust emissions because of vehicular and machinery movements.

Mitigation measures have been proposed to mitigate these adverse impacts. It is expected that the implementation of these mitigation measures will reduce this impact to an acceptable standard and that the cumulative air quality impacts from the construction and operation of the project will be negligible.

10.5.3 Noise Impacts

The potential noise nuisance associated with the construction and operation of the project relates to the movement of vehicles and operation of machinery on site. Mitigation measures have been proposed to avoid and/or reduce the nuisance noise impacts. It is expected that with the implementation of the mitigation measures this impact will be reduced to an acceptable level.

10.5.4 Wetlands and Aquatic Ecosystems

There are wetlands located on Portion 13 of Paardeplaats 380JT, where the proposed project will be located. According to the wetland assessment, the freshwater ecology of this area has historically been heavily impacted as a result of various cumulative impacts as a result of extensive mining activities in the area. In addition, other impacts to the freshwater resources present in the vicinity of the proposed project include agricultural cultivation and grazing activities. Although the infrastructure will not directly impact on the wetlands, there is potential for edge effects, should access to wetland

areas not be controlled and managed. This would result in cumulative impacts on wetlands and aquatic ecosystems including fragmentation of the systems, altered hydrology and terrain profiles, loss of biodiversity and altered vegetation structures. However, implementation of mitigation measures will reduce the potential impacts on the wetlands, including the cumulative wetland impacts.

10.5.5 Biodiversity

The further removal of habitat/vegetation types to allow construction/mining will bring about a reduction of natural areas, and the increase of the edge effect. The impacts on the ecology of the area will be significant. It is expected that there will be great losses of vegetation and flora along with associated faunal habitat. The primary impacts will be fragmentation and edge effects with a reduction in movement of remaining naturally occurring wildlife and isolation of pockets of vegetation.

There are floral SCC located on Portion 13 of Paardeplaats 380JT, where the proposed project will be located. The proposed house stands, and infrastructure will not impact on the identified SCC. It must however be noted that there is potential for SCC to have been missed during the biodiversity assessment that may be impacted on by the proposed project, which may lead to cumulative loss of SCC. Grey crowned crane, an endangered bird species has also been recorded on the property. Habitats that support numerous faunal species are located on this portion, including wetlands, grasslands and rocky outcrops. Numerous waterfowl were observed in the artificial dams as they serve as sustenance and breeding grounds for numerous avifaunal species.

Mitigation measures have been proposed to avoid and/or minimise impacts on biodiversity SCC and it is expected that the implementation of mitigation measures will reduce the impacts to within acceptable levels.

11 Assumptions, uncertainties and gaps in knowledge

11.1 General

Ndi Geological has exercised all due care in reviewing the supplied information. Ndi Geological made use of recent specialist studies (except for a HIA that was conducted specifically for this project), that although not for this project, included assessments of the area where the proposed project will be located. Whilst Ndi Geological has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data.

Opinions presented in this report apply to the information about the site and the project are as it existed at the time of Ndi Geological's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this report, about which Ndi Geological had no prior knowledge nor had the opportunity to evaluate.

All the data and information supplied to Ndi Geological is assumed to be accurate and reflective of the current condition of the affected area. It is assumed that the baseline information scrutinised and used to explain the environmental profile is accurate.

It is also assumed that NBC will comply with all legislation pertaining to the activities of this proposed project and that all permits and licenses that may be required will be identified and applied for prior to commencement of construction activities.

The public involvement process has been sufficiently effective in identifying the critical issues needing to be addressed in the BAR / EMPr Report by the EAP. The public involvement process has sought to involve key I&APs, including the Competent Authority (MDARDLEA). Wherever possible the information requested, and comments raised by I&APs has been sufficiently addressed and incorporated into the BAR / EMPr Report for review and comment. These requests and any further comments will be tracked and recorded in the CRR contained in Appendix C 5.

Ndi Geological assumes that NBC will implement the measures and will adhere to any monitoring procedures contained in the EMPr. A monitoring and evaluation system, including auditing, will be established and operationalised to track the implementation of the EMPr ensuring that management measures are effective to avoid, minimise and mitigate impacts and that corrective action is being undertaken to address shortcomings and/or non-conformances.

The following assumptions and limitations apply to the different specialist studies that were conducted for the project area.

11.2 Specialist

11.2.1 Heritage Resources

The investigation has been influenced by the following:

- It is assumed that the description of the proposed project, provided by the client, is accurate;
- It is assumed that the public consultation process undertaken as part of the EIA is sufficient and that it does not have to be repeated as part of the HIA;
- It is assumed that the information contained in existing databases, reports and publications is correct;
- The unpredictability of buried archaeological remains;

- The vegetation cover encountered during a site visit can have serious limitations on ground visibility, obscuring features (artefacts, structures) that might be an indication of human settlement;
- No subsurface investigation (i.e., excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities.

11.2.2 Palaeontology

The focal point of geological maps is the geology of the area and the sheet explanations were not meant to focus on palaeontological heritage. Many inaccessible regions of South Africa have never been reviewed by palaeontologists and data is generally based on aerial photographs alone.

Locality and geological information of museums and universities databases have not been kept up to date or data collected in the past have not always been accurately documented.

Comparable Assemblage Zones in other areas is sourced to provide information on the existence of fossils in an area which was not documented in the past. When using similar Assemblage Zones and geological formations for Desktop studies it is generally assumed that exposed fossil heritage is present within the footprint.

A field-assessment was thus undertaken to improve the accuracy of the desktop assessment.

11.2.3 Hydrogeology

Groundwater models are inherently simplified mathematical representations of complex aquifer systems, and this simplification therefore inevitably limits the accuracy with which groundwater systems can be simulated in general and lead to numerous sources of error and uncertainty. Model error commonly stems from practical limitations of grid spacing, time discretisation, parameter structure, insufficient calibration data, and the effects of processes not simulated by the model. These factors, alongside unintentional errors in field observations and measurements, result in uncertainty in the model predictions. Limitations of models are the result of generalisations, interpretations and assumptions made in attempting to simulate the natural environment. The Model Limitations and Exclusions were as follows:

- An Australian Modelling Guideline Class 1 was assigned to the model due to the available data and the calibration which was achieved against heads. No information on fluxes (inflows) as well as an independent measurement of the recharge was available. Class 1 models are often used to provide an initial assessment of the problem and it is subsequently refined and improved to higher classes as additional data is gathered (often from a monitoring campaign that illustrates groundwater response to a development).
- Model error and uncertainty are not uniformly distributed. Majority of the data available is located around the mining areas. Because there are only a limited number of boreholes and other hydrogeological data available to characterise the aquifer system, a level of uncertainty exists regarding how representative the measured values are of the average properties in the areas without data.
- The heterogeneous subsurface within the relatively large model area, results in hydraulic conductivity being simulated as uniform broad areas and may not reflect the true complexity of the geology.

Nevertheless, models are a simplified approximation of reality. All efforts have been made to base the model on sound assumptions and was calibrated to observed data, however the results obtained from this exercise should be considered in accordance with the assumptions made. Limitations of models

are the result of generalisations, interpretations and assumptions made in attempting to simulate the natural environment. The following limitations is true for the numerical groundwater model:

- The top of the aquifer is represented by the surface topography and used to construct a representative spatial extent;
- The model simulates the fractured rock environment as an equivalent porous medium, which is an overall simplification of the flow process.
- No intermine flow or impacts of other adjacent mining related activities were included.
- No groundwater abstraction of external users was simulated.
- Recharge rates were assumed as constant throughout the simulated period; therefore, no wet-dry cycles are simulated;
- Detailed geology as well as faults and dykes were not included;
- Hydraulic conductivities for the aquifers were assumed to be isotropic. The model furthermore simulates the fractured rock environment as equivalent porous medium, which is an overall simplification of the flow process.

11.2.4 Freshwater Ecosystem Assessment

To obtain a comprehensive understanding of the dynamics and diversity of the wetlands/watercourses present within the study area and its immediate surrounds, studies should include investigations through the different seasons of the year, over a number of years, and extensive sampling of the area. This is particularly relevant where seasonal limitations to biodiversity assessments exist for the area of the proposed activity. Due to project time constraints inherent with EA application processes, such long-term research is seldom feasible, and information contained within this report is based on a single field survey conducted during a single season as well as review of biodiversity-related studies conducted by the mine over the years. Where possible, additional information was added from available sources and previous studies conducted in the area.

Furthermore, detailed assessment of the wetlands/watercourses within and in the vicinity of the study area was not carried out as part of this assessment and historical wetland studies and delineations were reviewed, scrutinised and amended based on the observations of the site visit carried out from the 13 – 16 April 2021. It is therefore possible that some discrepancies in the delineation and data provided may occur in some places.

11.2.5 Biodiversity

Whilst every effort is made to cover as much of the site as possible, representative sampling was completed as per the nature of this type of investigation. The major limitation associated with the sampling approach is the narrow temporal window of sampling. Ideally, a site should be visited several times during the different seasons to ensure a comprehensive fauna and flora species list. However, due to time and cost restraints, this is not always possible. It is therefore possible that some plant and animal species that are present on site were not recorded during the field investigations. In order to overcome this limitation, the list of species observed during the site visit is supplemented with species of conservation concern that are known to occur in the area.

In the absence of a detailed soil map (1:10 000 scale), it is difficult to (with high confidence) map the extent of the natural grassland communities as vegetation reflects the soil conditions.

In order to obtain a comprehensive understanding of the dynamics of terrestrial communities, as well as the status the status of endemic, rare or threatened species in my area, faunal assessments should always consider investigations at different time scales (across seasons/years) and through replication.

However, due to time constraints such long-term studies are not feasible and more often based on instantaneous sampling bouts.

The Southern African Reptile Conservation Assessment (SARCA) and the Southern African Frog Atlas Project (SAFAP) provide distribution data and the Quarter Degree Squares (QDS) resolution. Expected species list may therefore represent an overestimation of the diversity expected as very specific habitat types may be required by a species which may be present in a QDS but not necessarily on the study site within the QDS. Conversely, many large areas in South Africa are poorly sampled for herpetofauna and expected species lists may therefore underestimate the species diversity. All possible attempts were made to refine the expected species list based on species-specific habitat requirements and a deeper understanding of the habitat types and quality of the study area which was obtained during the summer survey.

The scope of work for the biodiversity assessment did not cover wetland delineation and assessments. Previous assessments by De Castro & Brits c.c. and Wetland Consulting Services (Pty) Ltd were used as reference guides in the development of this study.

11.2.6 Visual

The assumptions and limitation for the visual assessment were as follows:

- Assumptions: The core study area can be defined as an area with a radius of not more than 10 km from the structures and a total study area with a radius of 15 km from the structures. This is because the visual impact of structures beyond 10 km would be so reduced that it can be considered negligible even if there is direct line of sight.
    - It is assumed that there are no alternative locations for the structure and that the visual assessment, therefore, assessed only the proposed site.
    - The height of the Visual Impact Assessment (VIA) is based on the heights as stipulated in Table 6.
    - Geographic location within the mining boundary of infrastructure.
    - The assessment was undertaken during the planning stage of the project and is based on the information available at that time.
- Limitations: - Visual perception is by nature a subjective experience, as it is influenced largely by personal values. For instance, what one-viewer experiences as an intrusion in the landscape, another may regard as positive. Such differences in perception are greatly influenced by culture, education and socio-economic background. A degree of subjectivity is therefore bound to influence the rating of visual impacts. In order to limit such subjectivity, a combination of quantitative and qualitative assessment methods was used. A high degree of reliance has been placed on GIS-based analysis viewshed, visibility analysis, and on making transparent assumptions and value judgements, where such assumptions or judgements are necessary.

  The viewshed generated in GIS cannot be guaranteed as 100% accurate. Some viewpoints, which are indicated on the viewshed as being inside of the viewshed, can be outside of the viewshed. This is due to the change of the natural environment by surrounding activities as well as natural vegetation that play a significant role and can have a positive or negative influence on the viewshed.

12 Summary of Specialist Findings and Recommendations

The summary of findings and recommendations from specialist studies is provided in Table 12-1.

Table 12-1: Summary of Specialist Findings and Recommendations

Specialist Study	Recommendations	Where incorporated in the BAR
Palaeontology	The proposed development is primarily underlain by the Permian Vryheid Formation of the Ecca Group (Karoo Supergroup) while two isolated patches of Quaternary alluvium is also present. According to the South African Heritage Resources Information System, the Palaeontological Sensitivity of the Vryheid Formation is Very High. This Formation is known for its rich assemblage of Glossopteris flora which is the source vegetation for this formation. Fish scales, non-marine bivalves and trace fossils are found in this formation. A site-specific field survey of the development footprint was conducted on foot and by motor vehicle on 21 August 2021. No visible evidence of fossiliferous outcrops was identified. For this reason, an overall low palaeontological sensitivity is allocated to the development footprint. The scarcity of fossil heritage at the proposed development footprint indicates that the impact of the proposed development will be of a low significance in palaeontological terms. It is therefore considered that the proposed development is deemed appropriate and will not lead to detrimental impacts on the palaeontological reserves of the area. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils. If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected (if possible, *in situ*) and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that correct mitigation (recording and collection) can be carry out by a palaeontologist.	Section 8 of the BAR Section 10 of the BAR Section 9 of the EMPr
Heritage Resources	The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age and Iron Age) occupation and a much later colonial (farmer) component. The second component is an urban one, most of which developed during the last 150 years or less.	Section 8 of the BAR Section 10 of the BAR Section 9 of the EMPr

Specialist Study	Recommendations	Where incorporated in the BAR
	During the survey no sites, features or objects of cultural significance were identified within the project area. Two features of heritage significance were identified to be located close to the project area, but well outside the boundary and would therefore not be impacted on by the proposed development. - A large informal cemetery is located approximately 100m north of the project area. It is well-known and securely fenced off. This feature has been reported on by previous researchers, e.g., Birkholtz (2021) and it is presumed that it is well-known to the mining authorities. o It is therefore totally unlikely that it would be impacted on by the development. - A lane of oak trees was planted along the regional dirt road passing on the western side of the project area. It is unsure as to how old the trees are, as they cannot be seen on the 1964 version of the aerial photograph or the 1969 version of the topographic map. It follows this road south and then turn west towards an old farmstead. o Based on the development plan, the trees will not be impacted on and be retained. Should 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. The appropriate steps to take are indicated in Section 9 of the report, as well as in the Management Plan: Burial Grounds and Graves, with reference to general heritage sites,	
Wetlands and Aquatic Ecosystems	Portion 13 of the Farm Paardeplaats supports extensive wetland habitat, with roughly a third of the site classified as wetland habitat. The wetland habitat varies from Natural/Unmodified to Largely Modified (PES categories A to D) and is considered to be of Moderate to High importance and sensitivity based on the updated 2021 assessment results. The intention of Universal Coal is to relocate a community to Portion 13. The proposed development is likely to intrude into, and impact on wetlands. The wetlands in this area also considered to be some of the most intact and botanically diverse within Portion 13, with numerous Mpumalanga protected species observed. The proposed location in the north western corner of Portion 13 provides an area outside wetland habitat and also partially overlaps with a disturbed area characterised by alien trees, though this footprint also partially overlaps with a delineated Hillslope seepage wetland. At a first glance, the project area would seem to be a more favourable location from a wetland perspective, though some small adjustments to the exact development footprint are recommended. In this regard	Section 8 of the BAR Section 10 of the BAR Section 9 of the EMPr

Specialist Study	Recommendations	Where incorporated in the BAR
	attention is also drawn to legislation under the National Environmental Management Act (NEMA) and the National Water Act (NWA), specifically GN509:	
Air Quality	Based on the results presented the following further recommendations are outlined: - It is recommended that ambient air quality monitoring be expanded to include the recommended locations to get a baseline condition prior to the onset of the operations and in order to establish the level at which the proposed operations are noted to impact on the ambient air quality. - Fallout monitoring should be continued for the life of mine to better assess the level of nuisance dust associated with the related operations. Sampling of fallout should be expanded. - Expansion of dust fallout monitoring is recommended. - PM10 and PM2.5 dust monitoring must also be undertaken at the same sites as mentioned under the previous bullet but also in and around potential fugitive emission sources to determine mitigation measures and focus management efforts. The impacts from dust fallout and Particulate matter can be reduced by implementing dust control measures. The highest intensity of the construction work should be carried out during the summer months and not over the harsh winter months as can result in increased dispersion of fugitive dust. The mine should ensure that the areas are continuously watered or revegetated to reduce the volume of fugitive dust emitted from wind erosion.	Section 8 of the BAR Section 10 of the BAR Section 9 of the EMPr
Visual	The Visual Impact due to the associated structure can be seen as having a MODERATE impact on the surrounding environment and inhabitants before mitigation measures are implemented. After mitigation, the visual impact can be seen as MODERATE. The visual impact from the structure can be sufficiently mitigated to a point where it can be seen as insignificant. Thus, mitigation measures are very important and one of the most significant mitigation measures are the rehabilitation of the area after mining has been concluded. If the rehabilitation of the impact is not done correctly and the final landform do not fit into the surrounding area, then the visual impact will remain high and become a concern. However, with correct rehabilitation, the impact will be minimal and there should be no visual impact after the landform has been restored.	Section 8 of the BAR Section 10 of the BAR Section 9 of the EMPr
Biodiversity: Flora	- Restriction of vehicle movement over sensitive areas to reduce degradation of untouched areas. - Minimise unnecessary removal of the natural vegetation cover outside the development footprint.	Section 8 of the BAR Section 10 of the BAR

Specialist Study	Recommendations	Where incorporated in the BAR
	- After rehabilitation the area must be fenced, and animals should be kept off the area until the vegetation is self-sustaining and established. - All floral SCC must be identified and located in a pre-screening assessment prior to construction. Permits will be required to relocate and / or destroy the identified protected floral species within the Project area. As recommended in Section 9, replanting of suitable and indigenous flora during the rehabilitation phase as a means to re-vegetate the area after decommissioning the mine. - Reconstruct faunal habitat refugia, such as placement of waste overburden material that will imitate a rocky outcrop habitat to provide refugia for cryptic species such as herpetofauna. Rock refugia must be replaced; - If removal of wetlands is to occur in this portion, provisions for a Wetland Rehabilitation Plan (as mentioned above) will need to me made; - Water contamination may occur due to the surrounding mining activities thus water contamination prevention is essential and will entail the following: - All dirty water will have to be drained which includes processed, storm and waste waters; - Maintenance of trenches, ensuring no seepage into local aquifers. - Remove used oil and other hazardous liquid wastes for appropriate disposal by a contractor at licensed disposal sites. - Continually remove all categorised AIP species to prevent spread. Veld management should also ensure that any other weedy species, whether alien or not, should be managed; - Avoidance of highly sensitive wetland habitats and rocky outcrops; - Permits are required for the removal and/or destruction of the floral SCC identified within this portion; - Fire management plan is recommended in case of uncontrolled fires during the dry season; and - Ensure subsistence hunting and poaching is not taking place. This can be done by regular and periodic monitoring of fences and internal areas for snares, and suspicious human activity.	Section 9 of the EMPr

13 Environmental Management Programme

The project specific EMPr for the construction and operation of the NBC Paardeplaats Community Residential Area project has been included in Appendix F. The mitigation measures included in the EMPr are deemed adequate to minimise and/or avoid degradation of the environment that may occur because of the proposed NBC Paardeplaats Community Residential Area project.

14 Environmental Impact Statement

This section of the report presents the outline of the key findings of the Impact Assessment. A Basic Environmental Impact Assessment has been conducted in accordance with the NEMA regulations which included the required PPP aimed at the key Organs of State and the identified I&APs. Where potential biophysical or social impacts have been identified, mitigation and management measures have been proposed to control and monitor the magnitude of impacts associated with the various aspects of the proposed project.

The identified impacts are manageable through the implementation of mitigation measures contained in the EMPr.

14.1 Summary of Key Findings of the EIA

During the construction phase of the proposed project, impacts may occur on the environment should the EMPr not be adhered to. NBC and its contractors will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from medium and low to low and negligible significance.

There are no heritage and palaeontology resources that will be affected by the proposed project. Land use will not change. Several landowners and land occupiers within the proposed project area may be affected although on a temporary basis due to the increased movement if trucks and machinery. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the landowners and land occupiers are minimised.

Storm water runoff from the dirty water areas of the construction sites may have a detrimental impact on the surrounding water environment, including the wetlands located on Portion 13 of Paardeplaats 380JT should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, a stormwater management plan will be implemented, where dirty and clean water will be separated. The sediments will be treated should they contain hydrocarbon waste.

The employees will undergo training and will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the surrounding communities. Waste generated from the site will be collected in proper receptacles and disposed of in registered waste disposal sites.

Key findings of the environmental impact assessment include:

- All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to low and very low significance with implementation of mitigation measures and monitoring.
- Cumulative noise, visual and air quality (dust) impacts are deemed to not be significant (low) when proper mitigation measures are implemented.
- Vegetation loss is unavoidable during the construction phase of the project. This will however be limited to the footprint of the infrastructure.
- The biodiversity assessment identified some floral SCC (*Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis*) on the affected property, but not in the area where the project footprint is located. The biodiversity assessment identified some floral Species of Conservation Concern (SCC) (*Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis*) on the affected property, but not in the area where the project footprint is located. However, care must still be taken to manage any SCC on site. In addition, the wetland assessment identified at least three species of Orchid presumed to

include (S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp.), *Eucomis autumnalis*, and a Watsonia sp., which are Mpumalanga Protected Species. Care must still be taken to manage any SCC that may be affected by the proposed project.

- There is current proliferation of alien invasive plant species, including *Eucalyptus* sp and *Populus* sp. The implementation of an Alien and Invasive Plant Species Management programme will result in elimination of the alien and invasive plant species on the site.
- There are wetlands located on the property which are habitats for Grey Crowned Crane (EN) which have been previously located on the property. please don't include land management plan or make any reference to it. It should also not be attached to any reports

It is not expected that the NBC Paardeplaats Residential Area will be decommissioned in the near future, and should decommissioning be required, the impacts associated with the process will be similar to the ones associated with the construction phase of the project. It is expected that should decommissioning be required, an EIA will be conducted in compliance with the environmental legislation applicable at that time. As such, no impact assessment was conducted for the decommissioning and closure phase of the project.

The potential impacts evident from the detailed impact assessment (Section 10) of the proposed project are both positive and negative in nature and can be managed to acceptable levels.Table14-1 provides a summary of findings from the impact assessment.

Table14-1: Summary of Potential Environmental Impacts Associated with the NBC Paardeplaats Community Residential Area project

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
CONSTRUCTION	Social	Influx of job seekers will have a negative social impact on the landowners and land occupiers.	Medium Low (-)	Low (-)
		Unauthorised access to private property outside of the demarcated areas will result in conflict with landowners.	Medium Low (-)	Low (-)
		Increased traffic in the area will increase the likelihood of accidents on the roads, posing a health and safety issue for the landowners and land occupiers.	Medium Low (-)	Low (-)
		The influx of job seekers in the area may result in an increase in petty crimes.	Medium Low (-)	Low (-)
		Potential squatting of job seekers.	Medium Low (-)	Low (-)
		Potential impact on safety and security and increased conflict with landowners and land occupiers as a result uncontrolled lighting of fires on site, littering and driving irresponsibly.	Medium Low (-)	Low (-)
		Ineffective communication channels leading to community unrest.	Medium Low (-)	Low (-)
		Possible boost in short term local small business opportunities.	Medium Low (+)	Medium Low (+)
		Possible creation of short-term construction related jobs	Medium Low (+)	Medium Low (+)
	Groundwater	Local spillages of oils from vehicles and machinery leading to groundwater contamination.	Medium-High (-)	Low (-)
		Improper storage and handling of hazardous materials leading to groundwater contamination.	Medium-High (-)	Low (-)
	Surface Water	Potential deterioration in water quality as a result of accidental spillages of hazardous substances such as hydrocarbons from vehicles and machinery.	Medium-Low (-)	Low (-)
		Possible contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality.	Medium-Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
		Debris from poor handling of materials and/or waste blocking watercourses may result in flow impediment and pollution.	Low (-)	Low (-)
		Increase in silt load in runoff due to movement of vehicles on site may result in increased sedimentation of water courses.	Medium-Low (-)	Low (-)
		Deterioration of water quality as a result of improper handling/ of chemicals.	Medium-Low (-)	Low (-)
		Poor stormwater management leading to runoff from stockpiled material removed causing sedimentation of the water resources.	Medium-Low (-)	Low (-)
	Wetlands and Aquatic Ecosystems	Localised changes to the riparian areas as a result of vegetation clearing.	Medium-High (-)	Medium Low (-)
		Loss of habitat and wetland ecological structure as a result of site clearance activities and uncontrolled wetland degradation.	Medium-High (-)	Medium Low (-)
		Loss of floral SCC including S*atyrium longicauda*, *Disa* sp., and *Habenaria* sp., *Eucomis autumnalis*, and a Watsonia sp that were identified in wetland areas on Portion 13.	Medium-High (-)	Medium Low (-)
		Impact on the wetlands systems as a result of changes to the sociocultural service provisions.	Medium-High (-)	Medium Low (-)
		Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland and riparian resources.	Medium-High (-)	Medium Low (-)
		Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland and riparian habitat.	Medium-High (-)	Medium Low (-)
		Impact on the hydrological functioning of the wetland systems.	Medium-High (-)	Medium Low (-)
	Heritage Resources	Although no heritage resources were identified, there is potential for chance findings of heritage resources.	Low (-)	Low (-)
	Palaeontological Resources	Although no palaeontological resources were identified, there is potential for chance findings of heritage resources.	Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
	Flora	Loss of localised biodiversity habitats within sensitive areas due to site clearance.	Medium-High (-)	Low (-)
		Loss of localised floral species diversity including RDL and medicinal protected species due to site clearance and establishment of infrastructure.	Medium-High (-)	Low (-)
		Potential spreading of alien invasive species as indigenous vegetation is removed, and pioneer alien species are provided with a chance to flourish.	Medium-High (-)	Low (-)
	Fauna	Vegetation clearance may result in loss of faunal habitat ecological structure, species diversity and loss of species of conservation concern.	Medium-High (-)	Low (-)
		Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.	Medium-High (-)	Low (-)
		Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal species trapping.	Medium-High (-)	Low (-)
		Movement of construction vehicles and machinery may result in collision with fauna, resulting in loss of fauna.	Low (-)	Low (-)
	Air Quality	Possible increase in dust generation, PM_{10} and $PM_{2.5}$ as a result of bulk earthworks, operation of heavy machinery, and material movement.	Low (-)	Low (-)
		Increase in carbon emissions and ambient air pollutants (NO_2 and SO_2) as a result of movement of vehicles and operation of machinery/equipment.	Low (-)	Low (-)
	Climate change	Emissions of Green House Gases as a result of the use of vehicles and machinery used during the construction activities.	Low (-)	Low (-)
	Visual	Scaring of the landscape as a result of the clearance of vegetation.	Low (-)	Low (-)
		Visual intrusion as a result of the movement of machinery and the establishment of the required infrastructure.	Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
		Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.	Low (-)	Low (-)
	Noise	The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity.	Low (-)	Low (-)
	Soil, Land use and Land Capability	Localised chemical pollution of soils as a result of vehicle hydrocarbon spillages and compaction.	Low (-)	Low (-)
		Localised clearing of vegetation and compaction of the construction footprint will result in the soils being particularly more vulnerable to soil erosion.	Low (-)	Low (-)
		Localised loss of resource and its utilisation potential due to compaction over unprotected ground/soil.	Low (-)	Low (-)
		Localised loss of soil and land capability due to reduction in nutrient status - de-nitrification and leaching due to stripping and stockpiling footprint areas.	Low (-)	Low (-)
	Traffic	Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion along the roads.	Medium Low (-)	Low (-)
	Waste Management	Potential water and soil pollution as a result of inappropriate waste management practices.	Medium Low (-)	Low (-)
OPERATIONAL	Groundwater	Leaks of sewer from pipelines may occur and also impact on the groundwater quality.	Medium-Low (-)	Low (-)
		Abstraction of groundwater may result in lowering of the groundwater tables and impact groundwater availability for other users.	Medium Low (-)	Low (-)
	Surface water	The possible potential impacts on surface water during the operational phases of the proposed project may be due to increased runoff from the infrastructure and roads. Leaks from the proposed sewer pipelines may occur and result in contaminated run-off from the site.	Low (-)	Low (-)
		Heavy rainfall events and associated sheet run-off has potential for contamination of off-site surface water due to uncontained on-site surface water run-off.	Low (-)	Low (-)

Phase	Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation	Environmental Impact Significance After Mitigation
		Accidental fires and extinguishing of on-site fires results in potential contamination of soil, groundwater, and surface water run-off during a fire event if contact fire-fighting water is not contained	Low (-)	Low (-)
	Biodiversity	Continued loss of Loss of floral and faunal habitat, species and SCC due to ineffective rehabilitation and edge effects.	Low (-)	Low (-)
		Run-off water from gardens typically contains seeds of exotic and garden-variety plants that pose a threat to indigenous vegetation and ecology.	Low (-)	Low (-)
		Improper rehabilitation during and post construction can result in proliferation of alien invasive plant species and continued loss of vegetation and habitats.	Medium-Low (-)	Low (-)
	Wetlands and Aquatic Ecosystems	Loss of habitat and wetland ecological structure as a result of continual wetland disturbance and uncontrolled wetland degradation	Medium-Low (-)	Low (-)
		Impact on the wetlands systems as a result of changes to the sociocultural service provisions through continued uncontrolled vegetation clearance, waste management and wetland disturbance	Medium-Low (-)	Low (-)
		Impact on the hydrological functioning of the wetland systems as a result of reduced wetland footprints and uncontrolled disturbance.	Medium-Low (-)	Low (-)
	Waste Management	Poor waste management during the resulting in contamination of surface runoff resulting in the deterioration of water quality of the watercourse.	Medium-Low (-)	Low (-)
		The operational phase of the project will result in increased generation of domestic waste that will need to be handled and disposed of.	Low (-)	Low (-)

14.2 Cumulative Impacts

All potential cumulative impacts identified are expected to be low.

14.3 No-go alternative

The no-go option will mean that the project will not be implemented. As was noted in Section 1.1, the current relocation of the NBC Paardeplaats community is required so that the Integrated Paardeplaats Section mining project can be implemented. The no-go option would mean that the Integrated Paardeplaats Section mining project cannot be implemented, and all the benefits associated with the project as noted in Section 7.1 will not be realised. In addition, the project specific benefits of the proposed NBC Paardeplaats Community Residential area project will also not be realised (Section 7.2).

Although the no-go option means that the socio-economic benefits associated with the Integrated Paardeplaats Section mining project and the residential area will not be realised, it also means that negative environmental impacts associated with the construction and operation of the proposed project (Section 10) will not occur.

15 Conditions to be included in the EA

The EAP recommends that the proposed NBC Paardeplaats Community Residential Area be authorised, and the following recommendations should be adhered to:

- Adequate storm water management must be incorporated into the design of the project in order to prevent erosion.
- The applicant must appoint an ECO who will oversee the implementation of the EMPr and submit annual compliance reports to the MDARDLEA.
- The proposed development footprint shall be kept to a minimum.
- All hazardous storage containers, storage areas and bunding areas for hazardous substances must comply with the relevant SANS standards to prevent leakage.
- Bulk storage of hydrocarbons must be stored in a dedicated area and must include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the substances.
- The time in which soils are exposed during construction activities should remain as short as possible.
- Exotic or invasive plants shall be controlled as they emerge.
- An alien vegetation control program must be developed and implemented within the riparian and all disturbed areas. After removal of alien vegetation, the affected areas must be re-assessed to determine the success of the program and any follow up measures that may be required.
- All areas of disturbed and compacted soils need to be ripped and reprofiled.
- No dumping of waste shall be permitted. If any spills occur, they should be immediately cleaned up.
- All vehicles shall be inspected for leaks on a regular basis. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil.
- Site clearance must be conducted in a phased and restricted manned (where possible) to allow for any faunal species resent to move away from the study area.
- No trapping or hunting of faunal species is to take place during all phases of the proposed project.
- Upon completion of construction activities, it must be ensured that indigenous vegetation is reintroduced and used for landscaping, where possible.

16 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

Through the implementation of the identified proposed mitigation measures, it is anticipated that the identified impacts can be managed and mitigated effectively. All the impacts were assessed to have significance ranging between medium-high and low without the implementation of mitigation measures. All the identified impacts will have a reduced significance of low when the mitigation measures have been implemented.

The EMPr seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment and surrounding communities will be mitigated, controlled and monitored. The EMPr will address the environmental impacts and possible unplanned events during each phase of the project (construction and operational). Due regard must be given to environmental protection during the entire project process. Several environmental recommendations are made to achieve environmental protection.

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts, assess their significance and implement appropriate mitigation and management measures to avoid, minimise and/or remediate the associated impacts where they cannot completely be avoided. This will be achieved by:
    - Providing sufficient information to strategically plan the proposed NBC Paardeplaats Community Residential Area project as to avoid unnecessary social and environmental impacts;
    - Provide sufficient information and guidance to plan the project activities in a manner that will reduce impacts (social, physical and biological) as far as is practically possible;
    - Ensure an approach that will provide the necessary confidence in terms of environmental compliance; and
- Implement an adequate monitoring programme to:
    - Ensure that mitigation and management measure are effective;
    - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts; and
    - Reduce duration of any potential negative impacts.

17 Reasoned opinion as to whether the proposed activity should or should not be authorised

It is the considered opinion of the EAP that the activity should be authorised. The proposed NBC Paardeplaats Community Residential Area project is located in an area already impacted on because of the various mining and agriculture activities around the area. Ndi Geological has undertaken the impact assessment and compiled the EMPr for the proposed construction and operation of the project. This has included a comprehensive stakeholder engagement process which has sought to provide I&APs with an adequate opportunity to participate in the project process and guide technical investigations that have taken place as part of this study. To date, no objections have been received from I&APs.

The proposed relocation of the Paardeplaats Community to the NBC Paardeplaats Community Residential area is required so that the Integrated Paardeplaats Section mining project can be implemented. The no-go option would mean that the Integrated Paardeplaats Section mining project cannot be implemented, and all the benefits associated with the project as noted in Section 7.1 will not be realised. It must also be noted that the current proposed location is the only area within the NBC's Glisa and Paardeplaats areas available that is not and is not anticipated to be affected by mining activities.

According to the impact assessment undertaken for the proposed project, the significance of the potential impacts associated with the project varies between medium to low to insignificant. The significance of the impacts can be reduced to low, very low and insignificant when the mitigation measures are implemented.

The project will also have positive impacts, albeit short lived, due to the employment to be created as well as a short-term boost to local businesses during the construction phase of the project.

The I&APs will also be requested to review and comment on the draft BAR. All comments to be received during the Public Participation Process will be included in the final BAR and EMPr. These comments will be addressed as far as possible to the satisfaction of the I&APs.

The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPr. In consideration of the layout plan and the management and mitigation measures contained within the EMPr compiled for the project, which are expected to be effectively implemented, there will be significant reduction in the significance of potential impacts.

Considering the information available, there are no fatal flaws that have been identified for the proposed project. As such, the EAP is of the opinion that the project should be authorised.

18 Undertaking of Oath by the EAP

Section 16 (1) (b) (iv), and Appendix 3 Section 2 (j) of the EIA Regulations, 2014 (promulgated in terms of the NEMA), require an undertaking under oath or affirmation by the EAP in relation to:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from I&APs and I&APs; and
- Any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs.

Ndi Geological and the EAPs managing this project hereby affirm that:

- To the best of our knowledge the information provided in the report is correct, and no attempt has been made to manipulate information to achieve a particular outcome. Some information, especially pertaining to the project description, was provided by the applicant and/or their sub-contractors. In this respect, Ndi Geological's standard disclaimer pertaining to information provided by third parties applies.
- To the best of our knowledge all comments and inputs from I&APs and I&APs have been captured in the report and no attempt has been made to manipulate such comment or input to achieve a particular outcome. Written submissions are appended to the report while other comments are recorded within the report. For the sake of brevity, not all comments are recorded verbatim, and in instances where many I&APs have made similar comments, they are grouped together, with a clear listing of who submitted which comment(s).
- Information and responses provided by the EAP to I&APs are clearly presented in the report. Where responses are provided by the applicant (not the EAP), these are clearly indicated.

19 Conclusion and Recommendations

Ndi Geological has undertaken the impact assessment and compiled the EMPr for the proposed construction and operation of the NBC Paardeplaats Community Residential Area project in accordance with the requirements of the NEMA. This has included a comprehensive stakeholder engagement process which has sought to provide I&APs with an adequate opportunity to participate in the project process and guide technical investigations that have taken place as part of this study.

To date, there are no fatal flaws that have been identified for the proposed project. The proposed relocation of the Paardeplaats Community to the NBC Paardeplaats Community Residential area is required so that the Integrated Paardeplaats Section mining project can be implemented and would mean that the Integrated Paardeplaats Section mining project cannot be implemented, and all the benefits associated with the project will not be realised. The current proposed location is the only area within the NBC's Glisa and Paardeplaats areas available that is not and is not anticipated to be affected by mining activities.

An EMPr has been developed as part of this BA process to ensure the mitigation of identified impacts as far as practicable. It is anticipated that it will be possible to successfully mitigate the environmental impacts to acceptable levels and the implementation will be monitored and audited to determine the effectiveness of the measures implemented. The EMPr is considered adequate to assist the project in striving towards the principles of the NEMA.

Many of the impacts identified were classified as medium (-) to low (-) and insignificant (-) without mitigation. All the identified impacts can be mitigated to low (-), very-low (-) and insignificant (-) impact rating. The cumulative impacts were considered to be low.

The project team believes that the impact assessment undertaken for the construction and operation of the NBC Paardeplaats Community Residential Area project fulfils the process requirements of the NEMA. The EAP recommends that an EA be issued by the MDARDLEA and that the construction and operation of NBC Paardeplaats Community Residential Area project should be conducted under duty of care and must be in accordance with the recommendations that were included in this BAR and the accompanying EMPr.

20 References

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Prepared by

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Ndivhudzannyi Mofokeng

Environmental Assessment Practitioner

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices**.**

Appendices

Appendix A: Curriculum Vitae of the Project Team

Appendix B: Project Experience

Appendix C: Stakeholder Engagement

Appendix C 1: Stakeholder Database

Appendix C 2: Announcement Phase Notifications

Appendix C 3: Site Notices

Appendix C 4: Newspaper Advertisements

Appendix C 5: Comments and Responses Report

Appendix C 6: Stakeholder Communications

Appendix C 7: Authority Communication

Appendix D: DFFE Screening Tool Report

Appendix E: Specialist Studies Reports

Appendix F: Environmental Management Programme