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 Environmental Management Programme

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:	*Environmental Management Programme 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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Disclaimer

The opinions expressed in this Report have been based on the information supplied to Ndi Geological Consulting Services (Pty) Ltd 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 Consulting Services (Pty) Ltd has exercised all due care in reviewing the supplied information. Whilst Ndi Geological Consulting Services (Pty) Ltd 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 Consulting Services (Pty) Ltd 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 Consulting Services (Pty) Ltd '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 Consulting Services (Pty) Ltd had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

BA:	Basic Assessment
CARA:	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
DWS:	Department of Water and Sanitation
EA:	Environmental Authorisation
EAP:	Environmental Assessment Practitioner
ECO:	Environmental Control Officer
EMPr:	Environmental Management Programme
GNR:	Government Notice Regulation
HAS:	Hazardous Substances Act, 1993 (Act 85 of 1993)
HSRA:	Health and Safety Risk Assessment
I&APs:	Interested and Affected Parties
LoM:	Life of Mine
MDARDLEA:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
MPRDA:	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
MR:	Mining Right
MSDS:	Material Safety Data Sheets
NBC:	North Block Complex (Pty) Ltd
NCR:	Non-Conformance Reports
NEM: WA:	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NEMA:	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMA:	National Environmental Management Act, 1998 (Act 107 of 1998)
NHRA:	National Heritage Resources Act 1999 (Act 25 of 1999)
NHRA:	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA:	National Water Act, 1998 (Act 36 of 1998)
NWA:	National Water Act, 1998 (Act No. 36 of 1998)
OHS:	Occupational Health and Safety

OHSA:	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
PHRA:	Provincial Heritage Resources Agency
PPE:	Personal Protective Equipment
RoM:	Run of Mine
SAHRA:	South African Heritage Resources Agency
SCC:	Species of Conservation Concern
SHE:	Safety, Health and Environmental
UCEHSA:	Universal Coal Energy Holdings SA
uPVC:	Unplasticized Polyvinyl Chloride
WUA:	Water Use Authorisation

1 Introduction and Scope of Report

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 NEMA 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.

1.2 Purpose of the Environmental Management Programme (EMPr)

The purpose of this Environmental Management Programme (EMPr) is to ensure that the impacts of the proposed project are kept to the minimum. This EMPr is based on the principles of the NEMA, which include:

- To avoid, minimise, or correct pollution and degradation of the environment;
- To avoid or minimise waste and to re-use or re-cycle waste where possible;
- To apply a risk averse and cautious approach;

- To anticipate and prevent negative impacts on the environment (physical, biological, social, economic, and cultural). Where these impacts cannot be prevented, such impacts must be minimized or remedied;
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimized and remedied;
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must consider the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option; and
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

The NEMA stipulates that anyone who causes pollution or degradation of the environment is responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment. Other legislation that contains requirements which were taken into consideration in drafting the EMPr, include:

- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- National Water Act, 1998 (Act No. 36 of 1998) (NWA);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA); and
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA).

This EMPr among other things:

- Presents an action plan for the implementation of mitigation measures with the purpose of regulating the Contractor's conduct or method of working;
- Provides specific environmental guidance for construction and operation activities;
- Incorporates measures to manage and mitigate construction activities so that negative environmental impacts are avoided or reduced;
- Identifies and allocates responsibilities for specific actions associated with the management of construction activities to mitigate negative environmental impacts; and
- Provides an outline of the activities which require monitoring and the assessment thereof.

1.3 Report Index in Relation to the NEMA Regulations

Appendix 4 of GNR 326 published in terms of NEMA stipulates the minimal requirements and issues that need to be addressed in the EMPr. This report strives to address all these requirements as per regulations. Table 1-1 indicates the regulations that have been addressed and the section of the EMPr where these requirements can be found.

Table 1-1: Requirements of Appendix 4 of GNR 982

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EMPr	Section where addressed in the EMPr
Appendix 4 (a)	details of i. the EAP who prepared the EMPr; and ii. the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 3
Appendix 4 (b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 4
Appendix 4 (c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the	Figure 2-2

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EMPr	Section where addressed in the EMPr
	preferred site, indicating any areas that any areas that should be avoided, including buffers	
Appendix 4 (d)	a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- i. planning and design; ii. pre-construction activities; iii. construction activities; iv. rehabilitation of the environment after construction and where applicable post closure; and v. where relevant, operation activities;	Section 9
Appendix 4 (e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 9
Appendix 4 (f)	a description of proposed impact management actions, identifying the way the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to: i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; ii. comply with any prescribed environmental management standards or practices; iii. comply with any applicable provisions of the Act regarding closure, where applicable; and iv. Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	Section 9
Appendix 4 (g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 9 Section 10
Appendix 4 (h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 9 Section 10
Appendix 4 (i)	an indication of the persons who will be responsible for the implementation of the impact management actions	Section 9
Appendix 4 (j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 9
Appendix 4 (k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 9
Appendix 4 (l)	a program for reporting on compliance, considering the requirements as prescribed by the Regulations;	Section 9
Appendix 4 (m)	an environmental awareness plan describing the manner in which- i. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and ii. risks must be dealt with to avoid pollution or the degradation of the Environment.	Section 11
Appendix 4 (n)	Any specific information that may be required by the competent authority.	None
Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EMPr	Section 6
Appendix 4 (a)	details of iii. the EAP who prepared the EMPr; and iv. the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 3
Appendix 4 (b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 4

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EMPr	Section where addressed in the EMPr
Appendix 4 (c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers	Figure 2-2
Appendix 4 (d)	a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- vi. planning and design; vii. pre-construction activities; viii. construction activities; ix. rehabilitation of the environment after construction and where applicable post closure; and x. where relevant, operation activities;	Section 9
Appendix 4 (e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 9
Appendix 4 (f)	a description of proposed impact management actions, identifying the way the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to: v. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; vi. comply with any prescribed environmental management standards or practices; vii. comply with any applicable provisions of the Act regarding closure, where applicable; and viii. Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	Section 9
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Appendix 4 (n)	Any specific information that may be required by the competent authority.	None

2 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

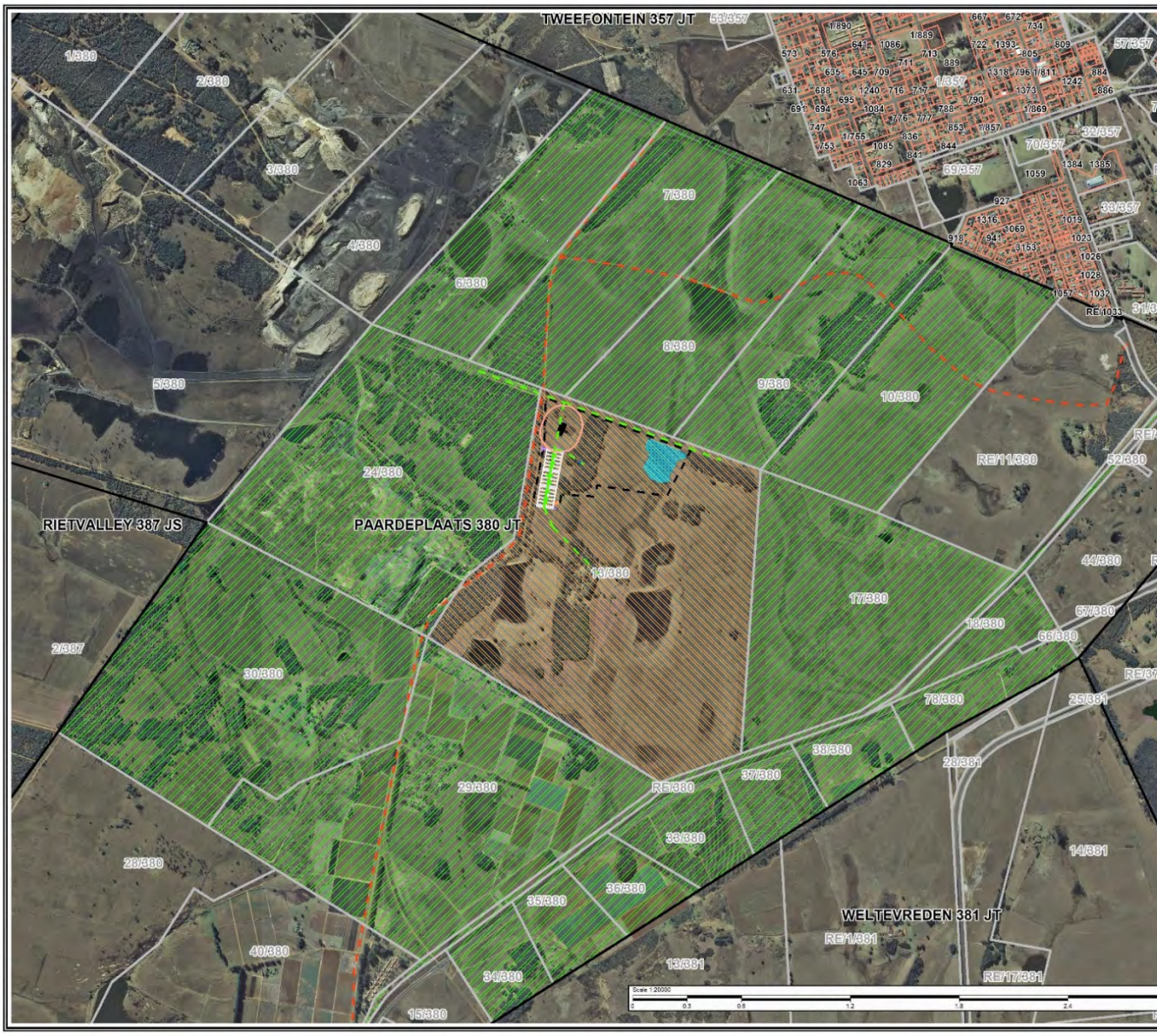

Figure 2-1. Table 2-1 provides a description of the proposed activities located on the property.

Table 2-1: List of Affected Farms and Farm Portions Illustrating the Relevant Activities

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

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

Table 2-2: 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 2-1: Project Location

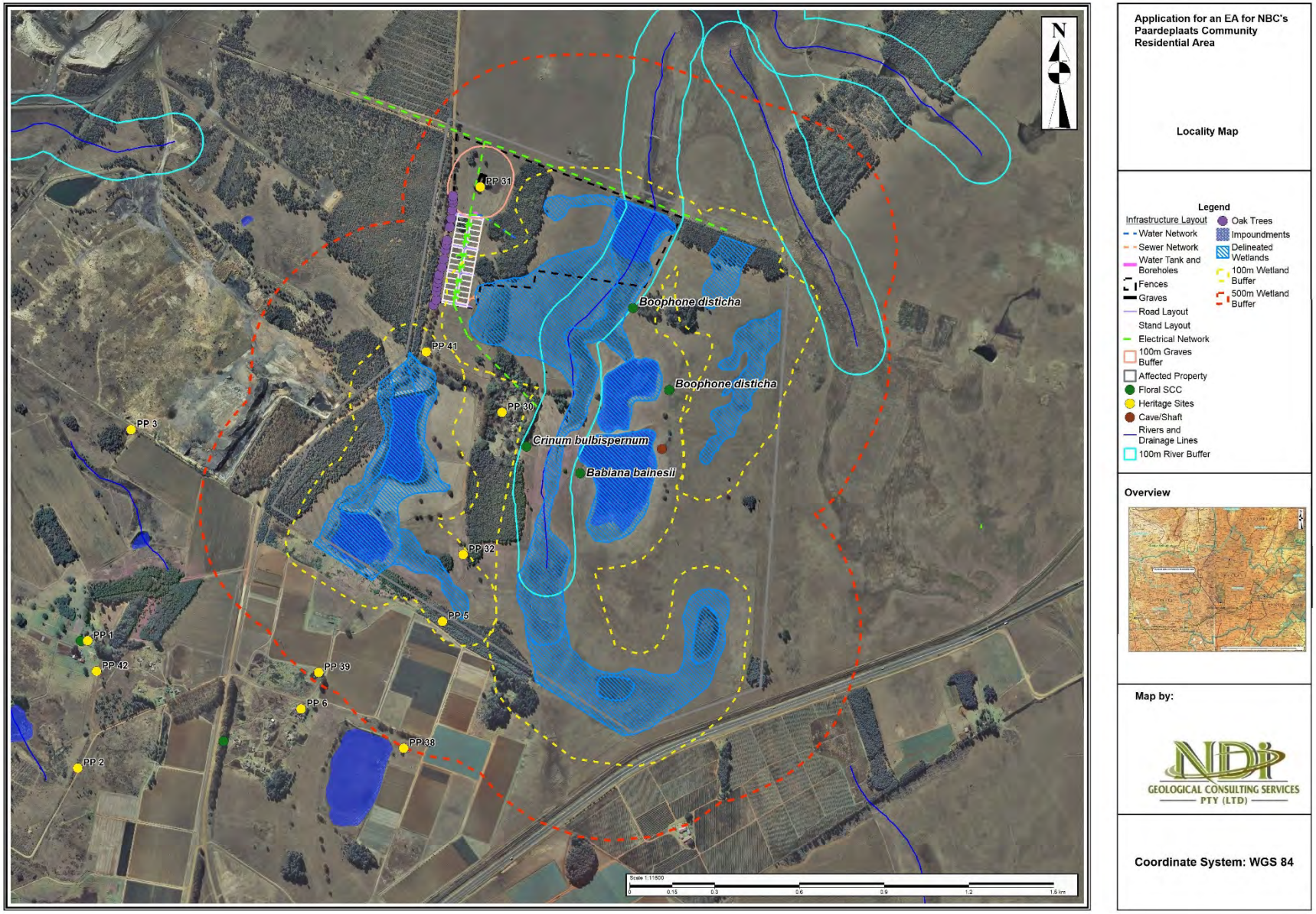

Figure 2-2: Sensitive Environments

3 Project Team

Ndi Geological has been appointed by NBC as the EAP. The project team members as stipulated in Table 3-1 can be contacted for the purposes of this project.

Table 3-1: Details of the Project Team

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.

4 Project Description

4.1 Project Layout

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.

The proposed project layout is provided in Figure 4-1.

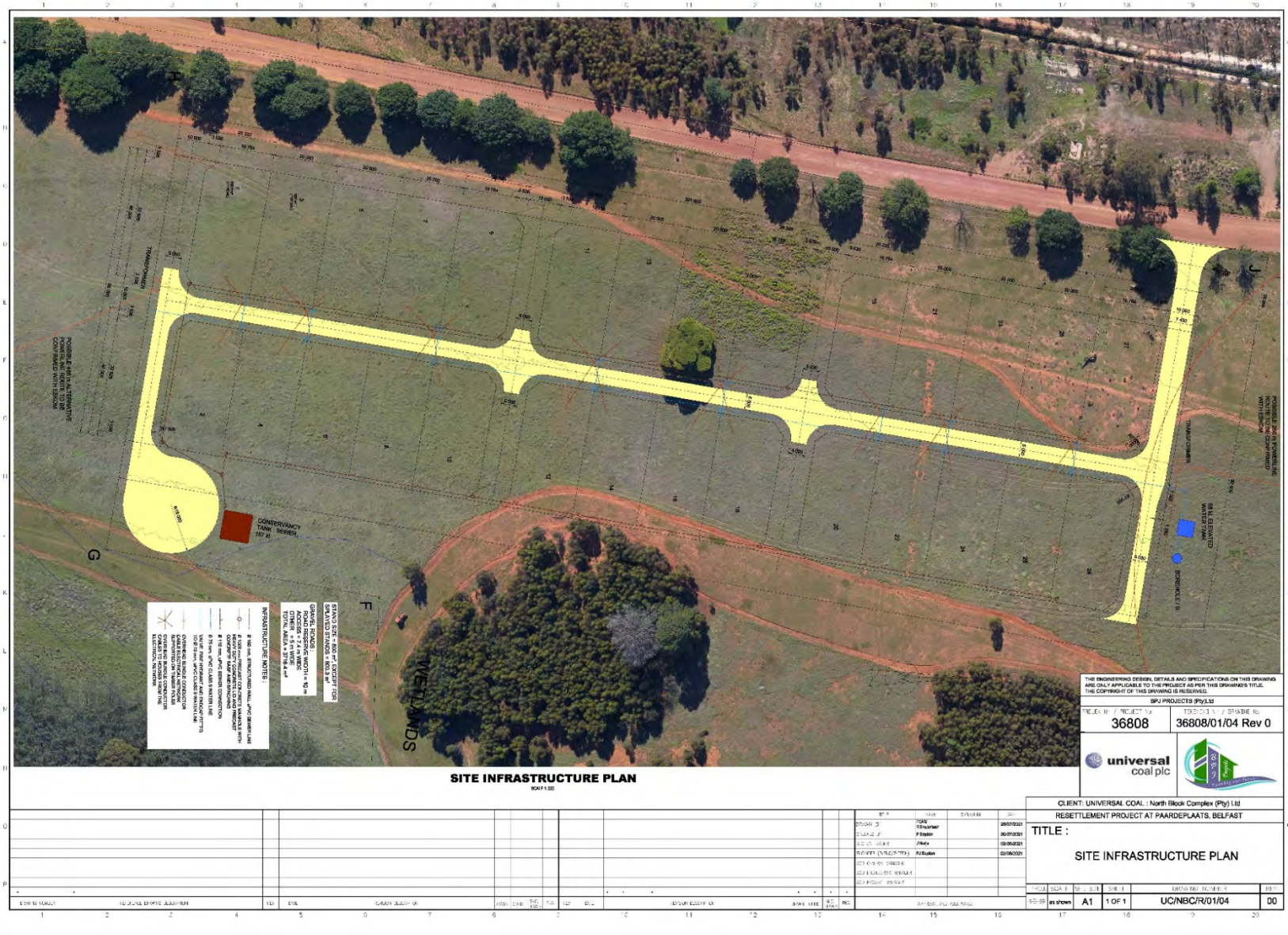

Figure 4-1: Proposed North Block Complex (Pty) Ltd Paardeplaats Community Residential Area Layout

4.2 Employment

NBC will make use of contactors during the construction phase, who will recruit local people where possible for construction of the NBC Paardeplaats Community Residential Area.

4.3 Site Establishment

The construction site camps will be located outside of any sensitive environmental areas and associated buffer zones, with hazard free accessibility from the main roads for delivery and access to the construction areas. All waste products will be removed from the construction sites to an approved and licensed disposal site. Rehabilitation of the construction sites will be to the same level as to prior establishment. Access to the respective construction site will be possible via pre-existing access roads.

All additives to be used are to be non-poisonous and environmentally sound. Batching of concrete for all purposes is to be done at the construction site camps in a regulated environmentally friendly way. All construction equipment and material will be stored at the site camps and outside sensitive environmental areas and associated buffer zones.

4.4 Services

4.4.1 Water for the proposed development

The water required for the development will be abstracted from groundwater.

4.4.2 Power

All machinery used during the construction will be diesel/petrol driven.

4.4.3 Sanitation

Chemical ablution facilities will be made available to the construction staff at all times during the construction period. These facilities will be serviced regularly, and the waste will be transported to a treatment facility off-site.

Thereafter, the development will be connected to a formal sewage reticulation system that forms part of the project.

4.4.4 Contractors Camp and Laydown Area

The contractor's camp and laydown areas shall be located outside any sensitive environmental areas and their associated buffer zones as identified by the Environmental Impact Assessment (EIA) and associated specialist studies.

4.4.5 Access Roads.

The existing access roads will be used throughout the construction and operational phases of the project. New roads will be constructed on site as part of site development (internal roads).

4.4.6 Stockpiles of Raw Materials

The stockpiles will be placed in such a way that they will not impact on any sensitive environmental areas, including the grave sites and associated 100m buffer and wetland areas and associated 100m buffer.

4.5 Construction Materials

Suitable excavated material will be stockpiled outside sensitive environmental areas and used as backfill where required.

Material not suitable for backfilling and all excess excavated material that is not required for backfilling will be disposed of at a registered landfill site. Batching of concrete for all purposes will be done at the construction site camps in a regulated environmentally friendly way. No batching will be allowed within sensitive environmental areas and their associated buffer zones.

4.6 Occupational Health and Safety

As a basic, all contractor employees and visitors will undergo induction training about health, safety and the environment. This training will be required prior to entering the site for the first time and will be required each time the conditions on-site change such that additional training is required.

Personal Protective Equipment (PPE) will be issued to all persons entering the construction site. PPE includes safety shoes, goggles, earplugs, gloves, hard hats, masks, etc. The PPE required will be dependent on the area that the person is working in, as well as the activity he/she is undertaking. The Contractor will conduct continuous rainfall projection monitoring to ensure the safety of the construction workers.

5 Organisational Structure

The purpose of this section is to define roles for personnel and allocate responsibilities in the implementation and monitoring of the EMPr. Once NBC receives an EA from MDARDLEA, NBC will be responsible for appointing an Engineer (Site Manager) who will be responsible for the final design and execution of the project. The Engineer will be responsible for the appointment of the Contractor who will be responsible to ensure that the EMPr is implemented. The reporting relationships and an indication of the institutional linkages on the project are set out in Figure 5-1.

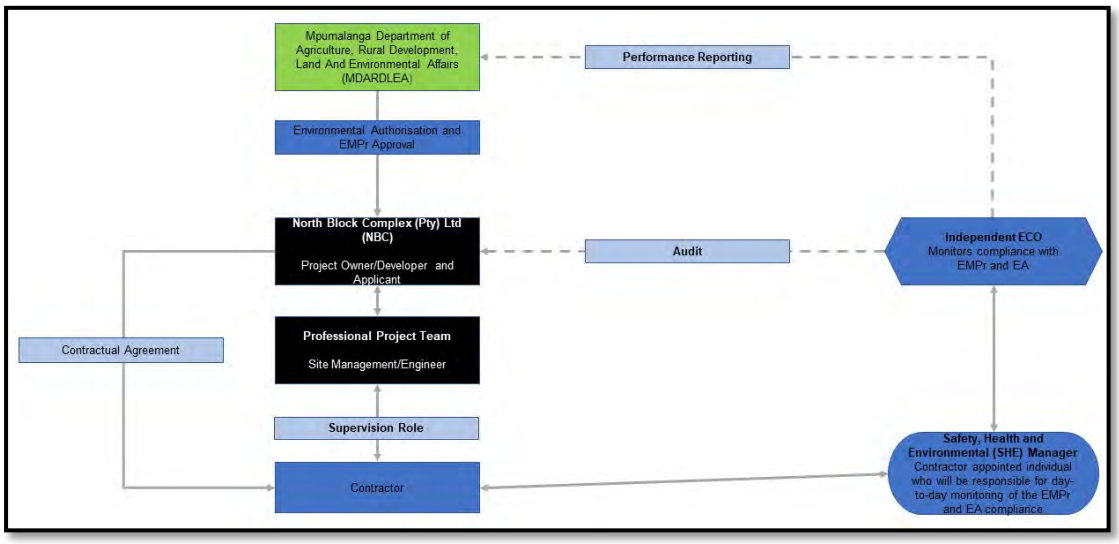

Figure 5-1: Institutional Arrangements

5.1 Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA)

The MDARDLEA plays a lead role in the implementation of environmental policies, legislation and regulations. Their role is to ensure that the construction of the NBC is implemented in a sustainable manner, in compliance with the relevant environmental legislation. MDARDLEA is responsible for approving the EMPr for the project and any revisions and amendments thereto.

5.2 Applicant: North Block Complex (Pty) Ltd (NBC)

The applicant shall:

- Organize, oversee and administer the construction and operation of the project and ensure that the operation is in accordance with the EA (once issued), this EMPr and all relevant laws, policies and regulations relating to the construction activities being undertaken at the project site.
- Make appropriate funding available for the construction, operation and maintenance of the NBC Paardeplaats Community Residential Area project.
- Make appropriate appointments of suitably qualified personnel including the site manager and contractors to operate the development in accordance with the EA requirements and conditions (once issued).
- Handle and deal with all complaints or problems and maintain a record of all such complaints.

- Ensure that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g., SHEQ personnel, fire-fighter, first-aider) to efficiently perform their tasks.
- Restore the environment in the event of negligence leading to damage to the environment.
- Ensure that the EMPr is included in contractual documents (e.g., Service Level Agreements) so that the all the contractor/s appointed are bound to the conditions/ requirements of the EMPr.
- Appoint an independent external auditor to undertake environmental audits as specified by the EA (once issued) and ensure that the external auditor submits the report to the relevant authority.
- The liability of any non–compliance with legal and other requirements shall ultimately be upon the applicant, NBC.

5.2.1 Site Manager/Engineer

The site manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and ensuring that all employees and contractors and sub-contractors are aware of the importance that the project proponent, NBC, attaches to safety and the environment.
- Ensuring that the project has a Safety, Health and Environmental (SHE) Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented, and that sufficient equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the SHE Officer prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the SHE Officer.

5.2.2 Safety Health and Environmental (SHE) Officer

The SHE Officer will be appointed by the Contractor during the construction phase. The responsibility of the SHE Officer include day to day overseeing of the implementation of the EMPr, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The SHE Officer is also responsible for monitoring compliance with the conditions of the EMPr and Environmental Authorisation that may be issued to NBC. The SHE Officer will:

- Be fully conversant with the EMPr;

- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them;
- Compilation of Method Statements together with the Contractor that will specify how potential environmental impacts in line with the requirements of the EMPr will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMPr are achieved;
- Convey the contents of this EMPr to the construction site staff and discuss the contents in detail with the Contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr;
- Take appropriate action if the specifications contained in the EMPr are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMPr;
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the EMPr;
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting;
- Ensuring that the list of transgressions issued by the Environmental Control Officer (ECO) is available on request; and
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
    - Public involvement / complaints;
    - Health and safety incidents;
    - Incidents involving hazardous materials stored on site; and
    - Non-compliance incidents.

5.3 Environmental Control Officer

An independent ECO must be appointed to monitor the compliance of the proposed project with the conditions of EA (should such authorisation be granted by MDARDLEA) during the construction phase. The ECO must also monitor compliance of the proposed project with environmental legislation and conditions of the EMPr. The ECO will;

- Be fully conversant with the EMPr;
- Be familiar with the recommendations and mitigation measures of the associated EMPr for the project;
- Compilation of a comprehensive project Health and Safety Risk Assessment (HSRA);
- Compilation of health and safety specifications based on risks identified;
- Reviewing and approval of health and safety plan(s) submitted by appointed Principal Contractor(s);
- Conducting monthly health and safety inspections and compiling monthly Occupational Health and Safety (OHS) reports;
- Conducting monthly health and safety audits with audit reports;
- Assisting the Developer/Contractor in the investigation of major accident/incidents;
- Monitoring of site activities for compliance to the Occupational Health and Safety Act (OHSA) and Regulations;

- Establishment and monitoring of project health and safety file;
- Monitoring the Contractor(s') health and safety performance; and
- Preparation of project close-out reports and submission of project health and safety files to the Client.
- Monitor the implementation of the EMPr during the construction and rehabilitation phases;
- Ensure site protection measures are implemented on site;
- Monitor that the Contractor, sub-contractors, construction teams and the Developer are in compliance with the EMPr at all times during the construction and rehabilitation phases of the project;
- Monitor all site activities monthly for compliance.
- Conduct monthly audits of the site according to the EMPr, and report findings to the Developer/Contractor;
- Attend monthly site meetings;
- Recommend corrective action for any environmental non-compliance at the site;
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions. These monthly reports are to be submitted to NBC and MDARDLEA; and
- Conduct once-off training with the Contractor on the EMPr and general environmental awareness.

It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of NBC and the SHE Officer.

5.4 Independent external auditor

An independent external auditor must be appointed by the applicant to audit compliance with the EA conditions (once issued) and the EMPr. If the frequency is not stipulated in the EA, the audits shall be undertaken biennial . The auditor must compile an audit report documenting all findings of the audit which must be submitted to the MDARDLEA. Accordingly, the Independent External Auditor will:

- Ensure that there is communication with the site regarding the auditing of the site.
- Submit biennial audit reports to NBC and the MDARDLEA or as specified in the EA (once issued). The report must include the following:
    - Specifically, state whether the conditions of EA and the EMPr are adhered to.
    - Include an interpretation of all available data regarding the operation of the NBC Paardeplaats Community Residential Area project and all its impacts on the environment.
    - Contain recommendations regarding non-compliance or potential non-compliance and must specify target dates for the implementation of the recommendations and whether corrective actions taken for the previous audit non-conformities was adequate.
    - Show monitoring results graphically and conduct a trend analysis.

5.5 Contractors

The Contractors will be responsible for the implementation of this EMPr and conditions of the EA and must ensure works on site are conducted in an environmentally sensitive manner and fully in accordance with the requirements of the EMPr, at all times. The appointed ECO should work closely with the contractor to ensure that the EMPr and EA are adhered to at all times.

6 Legal Review

6.1 Compliance with Legislation and Regulations

The contractor is required to comply with all relevant national and provincial legislation and regulations including:

- Atmospheric Pollution Prevention Act No. 45 of 1965 for the Control of noxious and offensive gases, smoke, dust and vehicular emissions;
- National Environmental Management: Air Quality Act 39 of 2004, List of Activities which result in Atmospheric Emissions which may have a Significant Detrimental Effect on the Environment – GN R893/2013:
    - Listed activities and associated minimum emission standards identified in terms of Section 21 of the National Environmental Management: Air Quality Act 39 of 2004;
- National Dust Control Regulations, 2013 GN R827/2013;
- Noise Control Regulations, 1992 GN R154;
- National Environmental Management Act No. 107 of 1998:
    - Section 30 Environmental Emergency Reporting Requirements; and
    - Environmental Impact Assessment Regulations, 2014 GN R982/2014.
- National Road Traffic Act, 1996 (Act No. 93 of 1996);
- National Environmental Management: Waste Act, 2009 (Act 59 of 2008):
    - Part 8: Contaminated land;
- National Water Act, 1998 (No. 36 of 1998) (NWA):
    - Section 20 Environmental Emergency Reporting Requirements.
- Occupational Health and Safety Act No. 85 of 1993: Controls the exposure of employees and the public to dangerous and toxic substances or activities.
    - Department of Labour;
- National Environmental Management: Biodiversity Act 10 of 2004:
    - Alien and Invasive Species Lists, 2014; and
    - Alien and Invasive Species Regulations, 2014.
- Conservation of Agricultural Resources Act 42 of 1983:
    - Conservation of Agricultural Resources Regulations GNR 1048/84;
- National Forest Act 30 of 1998 – Section 15 (Effect of declaration of protected trees).

6.2 Required Environmental Permits, Licences and Authorisations

6.2.1 Waste disposal

All hazardous waste generated during the construction and operational phases on site will only be disposed of to an appropriate licensed landfill site in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM: WA). Copies of the permits or licences of the landfill sites to be used must be obtained and kept on site before the commencement of construction. All general and hazardous waste generated on site shall be separated and

disposed of at the permitted waste disposal site in such a manner as not to cause any nuisance conditions or secondary pollution.

6.2.2 Storage of hazardous substances

Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards. This may include the Hazardous Substances Act, 1993 (Act 85 of 1993) (HAS), the Occupational Health and Safety Act, 1993 (Act 85 of 1993) (OHSA), relevant associated Regulations and applicable South African National Standard (SANS). The Contractor must ensure that all the relevant Material Safety Data Sheets (MSDS) are present on site always.

6.2.3 Protected Trees

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.

6.2.4 Alien Invasive Species

There is proliferation of alien invasive plant species, including *Eucalyptus* sp and *Populus* sp on the project site. The removal of the alien and weed species encountered on the construction area must take place to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (CARA) and Section 28 of the NEMA. 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.

6.2.5 Health and Safety

The necessary health and safety measures shall be implemented as required in terms of the OHSA.

6.2.6 Heritage Resources

The National Heritage Resources Act 1999 (Act 25 of 1999) (NHRA) requires permits for the removal of structures or elements of cultural significance on site. The heritage resources and palaeontology assessments conducted for the project found no heritage or palaeontology resources that will be affected by the proposed project. However, due to the nature of heritage and palaeontology resources, there are chances that some resources may have been missed during the assessment. Should any heritage and/or palaeontology resources be encountered, the chance find protocols compiled by the specialists must be implemented.

6.2.7 Water Use Authorisation (WUA)

There are wetland areas located within 500m of the proposed residential area and a Water Use Authorisation (WUA) will therefore be required from the Department of Water and Sanitation (DWS). 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.

7 Guidelines for the Environmental Management Programme

7.1 Environmental Code of Conduct

One of the objectives of the EMPr is to ensure that all the workforce, contractors, sub-contractors and construction staff have an understanding of environmental issues and potential impacts on site activities. This environmental code of conduct provides the basic rules that should be strictly adhered to. It is the responsibility of the Contractor to ensure that each contractor, sub-contractor and workforce understand and adhere to the Code of Conduct.

ENVIRONMENTAL CODE OF CONDUCT

ALL PERSONS ARE OBLIGED TO KEEP TO THE RULES OF THIS CODE OF CONDUCT

Ignorance, negligence, recklessness or a general lack of commitment resulting in environmental degradation or pollution shall not be tolerated!

ENVIRONMENTAL RULES

- **Do not waste electricity, water or consumables;**
- **Only use authorised accesses;**
- **Do not litter;**
- **Dispose solid waste to the correct waste containers provided;**
- **Prevent pollution;**
- **Use the toilet facilities provided;**
- **Do not dispose contaminated wastewater to the stormwater or the environment;**
- **Immediately report any spillage from containers, plant or vehicles;**
- **Do not burn or bury any waste in the sand;**
- **Do not trespass onto private properties;**
- **Strictly leave all animals alone. Never tease, catch or set devices to trap or kill any animal.**
- **Never damage or remove any trees, shrubs or branches unless it forms part of working instructions and authorisation has been received where necessary;**
- **Do not deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area;**
- **Know the firefighting procedure and locations of firefighting equipment; and**
- **Know the environmental incident procedures.**

7.2 General Guidelines

According to Section 28 of the NEMA, the prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase,

illegal activities, delays caused by archaeological finds, etc. is ultimately the responsibility of the NBC as the project developer.

The project site must be clearly defined and surveyed according to the project authorisation.

Proper site management and regular monitoring of site works must take place. Proper documentation and record keeping of all complaints and actions taken (as per the Incidents Register and Environmental Checklist) must be issued. Regular site inspections and good control over the construction process must be kept throughout the construction period.

7.3 Environmental Principles

The following environmental principles should always be considered during the pre-construction and the construction phase:

- The footprint of the construction activities must be kept as small as possible;
- As a minimum requirement, all relevant standards relating to international, national; provincial and local legislation will be adhered to; and
- Every effort will be made to implement the waste hierarchy of reduce, reuse, and/or recycle waste material generated on site.

7.4 Incidents and Non-Conformances

According to Section 30 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA): *"Incident" means an unexpected sudden occurrence including a major emission, fire or explosion leading to serious danger to the public or potential serious pollution of or detriment to the environment, whether immediate or delayed.*

In terms of the above definition:

- The Emergency response plan/method statement should be initiated in response to an incident as classified in Table 7-1. The incident must be reported to the ECO and MDARDLEA as per Section 30 (3) of NEMA. An emergency incident report required in terms of Section 30(5) of NEMA must be submitted to MDARDLEA's Environmental Management Inspectorate for processing.
- A chemical spill is defined as a potential liquid hydrocarbon or chemical spill or other release, which can create a hazard to life or property or create environmental damage. Examples include liquid hydrocarbons, compressor or other equipment lube oil, evaporative cooler acid water, liquid odorant, or other substances that contain controlled or hazardous substances. Spills and other environmental incidents have been classified according to the risk to the environment and appropriate responses are indicated in Table 7-1.

Table 7-1: Classification of Environmental Incident

Level	Definition	Response Required
Level 1	A Minor Emergency, which can be controlled, entirely by the personnel and facilities located within the immediate vicinity of the accident/incident site. These include events which cause minor property or equipment damage that are non-disruptive to operations, and do not pose a safety risk to personnel or property outside of the boundaries of the development footprint.	Record in the incidents register and managed accordingly

Level	Definition	Response Required
Level 2	A Level 2 Incident is defined as a Moderate Emergency, which is disruptive, but not extensive, and forces a portion of the employer operation to be suspended or shut down. A Level 2 Incident is a spill or hazardous product release which has the potential to cause harm to personnel, the public, or the environment and includes a chemical spill of more than 35ℓ to land; or any chemical spill to water resources.	Record in the incidents register and managed accordingly
Level 3 to 5 Incidents	A Level 3 to 5 Incident is defined as a Serious (3), Major (4) to Catastrophic (5) alert requiring the intervention of external support services and that can have serious impacts on ecology, humans and on the overall Project.	Report the incident to the ECO immediately. The ECO will submit an emergency incident report to MDARDLEA. The incident must also be recorded in the incidents register

In the above cases, it will be the decision of the site management and ECO as to whether work stoppage must be implemented. In most cases, work in the area where the incident occurred will be stopped until all safety clearances have been given unless there is a fatal accident, then the whole site will stop.

7.5 Penalties and Liabilities

Section 24F of NEMA deals with prohibitions relating to commencement or continuation of listed activities. It provides that:

1) Notwithstanding any other Act, no person may-
- *a) Commence an activity listed or specified in terms of Section 24(2)(a) or (b) unless the competent authority or the Minister responsible for mineral resources, as the case may be, has granted an environmental authorisation for the activity; or*
- *b) Commence and continue an activity listed in terms of Section 24(2) (d) unless it is done in terms of an applicable norm or standard.*

Section 49A of the Act deals with relevant offences. It provides that:

(1) A person is guilty of an offence if that person-
- *a) Commences with an activity in contravention of Section 24F (1)*

Section 49A of the Act deals with the penalties and provides that:

A person convicted of an offence in terms of Section 49A(1)(a) is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine and such imprisonment.

8 Quantitative Impact Assessment

8.1 Methodology

All specialists were required to assess each identified potential impact according to the 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 8-1. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity6, spatial scope7 and duration8 of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity9 and the frequency of the impact10 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 8-2.

[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 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 residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and paleontology. 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.

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 8-1: Criteria for Assessing Significance of Impacts

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 8-2: Interpretation of Impact Rating

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

8.2 Results

8.2.1 Impacts during Construction and Operational Phases

The identified potential positive and negative biophysical, socio-economic and cultural impacts are summarised in Table 8-3.

Table 8-3: 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

The results from the quantification of the identified potential impacts associated with the construction and operation of the project are summarised in Table 8-4**.**

Table 8-4: 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 *Satyrium 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 (-)

8.2.2 Potential Impacts Associated with the Decommissioning and Closure Phase

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.

9 Environmental Management Programme

Objectives were set as part of the EMPr to ensure that the EMPr is measurable. The following tables form the core mitigation measures appropriate to the planning, construction and operational phases of the project. The tables present the objectives to be achieved and the management actions that need to be implemented to mitigate the negative impacts and enhance the benefits of the project.

The planning section of this EMPr, refers to the period leading up to and prior to commencement of construction activities, and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified in the pre-construction phase.

The bulk of environmental impacts will have immediate effect during construction (e.g., noise, wetlands, biodiversity dust, water pollution etc). If the site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

Table 9-1: Environmental Programme for the Planning Phase

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
Project Contract and Programme				
• Contingencies for minimizing negative impacts anticipated to occur during the construction phase	• This EMPr must be included as part of the tender documentation thereby making it part of the required scope of work. The mitigation measures as set out in this EMPr are enforceable under the general conditions of contract. • The Contractor (s) must ensure that all the personnel on site are familiar with and understand the specifications contained in the EMPr. • The Contractors contract must contain a clause to the effect that the disposal of all construction related waste, must be managed, in accordance with the relevant legislation, including: o Waste Classification and Management Regulations, 2013 – GN R634/2013; o NEM: WA Section 19; o National Norms and Standards for Disposal of Waste to Landfill – GN R636/2013; o Regulations regarding Waste Disposal Sites – GN R1196/94; and o eMakhazeni Local Municipality Waste Management By-Laws. • The Contractor shall ensure that all waste is disposed of to an authorized waste management facility and all agreements with the service providers shall be kept on file and made available on request.	• Records in environmental file. • Signed declaration forms	• Prior to the commencement of construction activities	• Contractor (s) • Site Manager
Appointments and duties of project team and awareness training				
• Contingencies for avoiding or minimising negative impacts anticipated to occur during the construction phase. • Ensure environmental awareness and formalise Environmental responsibilities and implementation	• Before construction activities commence, the roles of the team members in the implementation of this EMPr shall be communicated. • All the relevant training and environmental induction must take place prior to the commencement of any construction activities. • Environmental inductions must be undertaken to ensure that all staff are aware and have a basic level of environmental awareness training. Areas that must be covered by the inductions include: o What is meant by the environment; o Why environmental management is important; o How day to day activities can be altered to ensure sound environmental management. o Social environmental responsibilities including: ✓ No use of Alcohol and drugs; ✓ Reduce noise levels; ✓ No access to areas outside of the project footprint; and • Use facilities (Toilets, eating areas, waste receptacles) that have been made available.	• Signed environmental training attendance registers in the environmental file. • Signed declaration forms	• Prior to the commencement of construction activities • As and when required	• Contractor (s) • Site Manager
Method Statements				
• Contingencies for minimising negative impacts anticipated to occur during the construction phase.	• Method Statements must be provided by the Contractor. All activities, which require method statements, may only commence once the method statements have been approved by the Site Manager. • The Contractor will provide job-specific training on an ad hoc basis when workers are engaged in activities which require method statements.	• Approved method statements and relevant pro forma documents • Training records	• Prior to the commencement of construction activities • As and when required	• Contractor (s) • Site Manager
Site Access and Demarcation				
• Contingencies for minimising negative impacts anticipated to occur during construction	• The overall project area must be discussed with the team prior to the commencement of the construction activities. This will take place in the form of a toolbox talk. • All site boundaries must be discussed and agreed upon before commencement of the construction phase. The Contractor shall make proposals as to the location of additional areas that may be required. • Trespassing onto adjacent private properties is strictly prohibited. • All environmentally sensitive features including the wetlands, graveyard, floral SCC and drainage lines lies and associated regulated/specialist determined buffer zones must be identified and indicated on a layout. These will be identified in the planning phase as part of the risk assessments.	• Demarcated areas kept to a minimal • Signed attendance registers of toolbox talks.	• Prior to the commencement of maintenance works. • As and when required	• Contractor (s) • Site Manager
Emergencies, non-compliance and communication				
• Contingencies for minimising negative impacts anticipated to occur during the	• Emergency preparedness is essential to ensure that incidents that may arise are adequately and timeously managed.	Method statements	• Prior to the commencement of maintenance works.	• Contractor (s)

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
construction phase	• The Site Manager and team must ensure that the workforce as well as appointed Contractors are aware of the procedures that are to be followed in the event of an emergency. This is to be done via the effective communication of method statements. It must be ensured that method statements on the protocols to be followed, and contingencies to be put in place, are available for the following potential incidents before maintenance works may commence: • Where contamination of soils from spills; and • Fire occurs, reporting as required in Section 30 of NEMA and Section 20 of NWA must be conducted. • Failure to adhere to the requirements of the EMPr by the Contractor will result in fines over and above the costs incurred for any remediation required because of the specific non-compliance. • The NEMA stipulates fines incurred due to non-compliance may include a fine of up R10 Million and/or 10 years imprisonment.		• As and when required	Site Manager
Lay down areas				
• Minimise dust fallout • Minimise unwarranted environmental damage outside the footprint • Maintain a clean and healthy working environment • Minimise impact to surrounding environment and properties	• Laydown areas shall be located outside sensitive environmental areas and their associated buffer zones. • All storage facilities must be located within the demarcated site boundaries. • Staff may not be accommodated on site. No temporary accommodation must be erected on the site.	• No signs of soil pollution • No laydown areas within demarcated sensitive environments (wetlands, drainage lines, graveyard, floral SCC and associated buffer zones) • No complaints from surrounding landowners or I&APs • No visible signs of litter • Method statements	• Daily	• Contractor (s) • Site Manager
Authorisations, Permits and Licences				
• Ensure that all project activities are lawful in terms of all the applicable environmental legislation	• All necessary authorisations, permits and licences must be obtained by NBC prior to the commencement of construction.	• No litigation due to unlawful activities	• Once off	• Applicant

Table 9-2: Environmental Programme for the Construction Phase

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
Socio – Economic				
• Increase Employment opportunities	• Encourage the local employment for the following: • Employment opportunities for local contractors during site clearance including vegetation clearance, and digging of foundations for the buildings and trenching for pipes, preparation, construction and decommissioning; o Secondary service provision of food, toilet hires, transport, and equipment; and o Appointment of contractors as drivers, cleaners and security personnel, if required.	• Limited employment of personnel from outside the local area • Procurement procedure that favors the use of locals	• As and when required	• Contractor • Site Manager • ECO
Stockpiles				
• Minimise disturbance and loss of soil • Avoid contamination of soils from hydrocarbons from vehicles and machinery • Minimise construction footprint • Maintain the integrity of topsoil for landscaping and rehabilitation • Containment of alien and invasive plant species growth • Avoid impacts on wetlands • Minimise contamination of storm water run-off	• All stockpiled material (this includes excavated material from the old dump area, fill material) must be easily accessible and shall be situated the outside sensitive environmental areas which include the wetlands, drainage lines, graveyard and associated buffer zones. • Stockpiles must not obstruct public pathways. • All temporarily stockpiling of material must be in such a way that the spread of materials and dust from stockpiles is minimised. This can be done by placing sandbags at the toe of the stockpile to curb the loss of topsoil. • The stockpiles may only be placed within the demarcated areas. The location of the stockpiles must be approved by the site manager prior to depositing the stockpiles. • Storm water run-off from stockpile sites and other related areas must only be directed into the storm water system if the necessary pollution prevention measures such as silt traps are in place and may not run freely into the immediate and surrounding environments. • An approved method statement on how storm water will be dealt with shall also be in place prior to commencement of construction activities. • Stockpiles shall be stabilized if signs of erosion are visible. • Topsoil stockpiles must be monitored for alien and invasive vegetation growth. Contractors must remediate as and when required in consultation with the Site Manager and/ECO. • Topsoil stockpiles must be clearly demarcated as no-go areas. • Stockpiles shall be convex and shall not exceed 2m.	• The footprint has not exceeded the required size. • No signs of erosion and soil contamination from hydrocarbons. • Relevant method statements. • Signed attendance registers in the environmental file for environmental inductions and toolbox talks.	• Daily • Monitored during wet weather and immediate actions taken.	• Contractor (s) • Site Manager • ECO
Materials Handling, Use and Storage				
• Ensure proper use, handling and storage of materials • Prevention of pollution of the environment	• The Contractor shall ensure that all delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the EMPr. • The Contractor shall ensure that the delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the EMPr. • Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. • The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials. • All manufactured and/ or imported material shall be stored within the Contractor's camp, and out of the rain. • All lay down areas outside of the construction camp shall be subject to the ECO's approval. • Imported gravel, fill, soil and sand materials shall be free of weeds, alien invasive seed matter, plant material, litter and contaminants and shall be obtained from sources approved by the ECO.	• No pollution of water resources including the drainage lines and wetlands • No complaints from I&APs • Method statements	• Daily	• Contractor (s) • Site Manager • ECO
Cement and concrete batching				
• Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution	• The proposed location of batching areas (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the final site layout plan and approved by the ECO. Batching areas shall not be located within any “no go” areas. • All wastewater generated from the operation and cleaning of concrete batching equipment and other sources of concrete shall be passed through a concrete wastewater settlement system. The water from this system shall not be allowed to flow into any “no go” area but must permeate through the ground before it reaches any such water course. The accumulated sludge in the settlement system must be regularly cleaned out and appropriately disposed of as solid waste.	• No pollution of water resources including drainage lines and wetlands • No complaints from I&APs • Method statements	• Daily	• Contractor (s) • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	• The Contractor shall ensure that minimal water is used for washing of concrete batching equipment. • Used cement bags shall be stored in weatherproof bins on site to prevent the generation of wind-blown cement dust and the bags from blowing away. • During construction, the contractor must ensure that concrete is mixed on mortar boards, all visible remains of concrete are removed and disposed of as waste and that all surplus aggregate is removed. • As part of the Pollution Control and Concrete Batching Method Statement, a plan detailing all actions to be taken to comply with the cement and batching requirements shall be submitted to the ECO.			
Oil and chemicals				
• Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution • 100 % compliance to national, provincial and local regulatory requirements.	• Method statements must be on file for the “handling and storage of oils and chemicals”, “fire”, and “emergency spills procedures”. • The chemicals must be confined to specific and secured areas, which must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks. • 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 bund walls. • All preventative servicing of earth moving equipment and construction vehicles shall be conducted off site. • Emergency areas shall be demarcated and protected with an impermeable surface. The area shall be situated outside any sensitive environmental areas including wetlands, graveyard, drainage lie sand their associated buffer zones. Runoff from this area shall be contained. • Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended and drip trays must be utilised. • The surface area of the drip trays will be dependent on the vehicle and must be large enough to contain any hydrocarbons that may leak from the vehicle while standing. • Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles at the construction site. • All personnel shall be trained, and training records shall be made available on request • All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material) • Waste manifests and safe disposal certificates must be filed as proof of safe disposal of any hydrocarbons removed from site.	• No pollution of water resources including wetlands and drainage lines • No litigation due to transgression of pollution control regulations • No complaints from I&APs • Method statements	• Daily	• Contractor • Site Manager • ECO
Use of hazardous materials				
• Prevention of pollution of soil, ground water resources and surrounding environments • Minimise chances of transgression of the legislation governing pollution	• No hazardous material shall be stored within sensitive environmental areas and associated buffer zones. • A spill kit must be available on site to deal with spills/ fire of the materials present should they occur. This must be done in line with the approved method statement dealing with chemicals and chemicals handling. • The Contractor and Site Manager must be aware of drainage channels, gullies etc. to ensure that chemicals are stored in such a way that runoff residues can be stopped from entering these.	• No pollution of the environment • No litigation due to transgression of pollution control acts	• As required	• Contractor (s) • Site Manager • ECO
Eating and camp areas				
• Control potential influx of vermin and flies • Neat workplace and hygienic environment • Minimise negative social impacts to residents and businesses	• Staff shall not be accommodated on site. No temporary accommodation must be erected on the site. • Designated restricted areas for eating during normal working hours must be set out at construction sites. Adequate closed refuse bins must be provided, no more than 50 m from construction sites. • No lighting fires are to be allowed on site. • The feeding, or leaving of food, for stray or other animals in the area are strictly prohibited. • Camp followers/informal traders shall not be allowed to congregate around the construction	• No staff accommodation at the site • No visual sign of vermin and flies • No litter around the camp areas • No complaints from I&APs	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	site. • Litter and concrete bags, etc. must be picked up daily and put into suitably closed bins.			
Toilets facilities on site				
• Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat • Minimise potential of diseases on site • Minimise potential to pollute soils, water resources and natural habitats	• A minimum of one chemical toilet must be provided per 15 persons. • The toilets must be kept in a clean, neat and hygienic condition. Toilet paper must be supplied at all toilets always. Toilet paper dispensers must be provided in all toilets. • Toilets must be easily accessible and a maximum of 30m from the works area to ensure they are utilised. • A reputable toilet-servicing company must be used. The company must issue proof that they are registered to handle the waste for transport to a licensed discharge facility. • The necessary agreement between the Service Provider and the Contractor for the removal of the sewage must be in place and shall be made available on request. • The necessary agreement between the Service Provider and the WWTW for the disposal of the sewage must be in place and made available on request. • Ablution facilities shall be serviced on a regular basis by an approved service provider to keep them in good, functional working order and in an acceptable state of hygiene, • Toilets must be secured to the ground to ensure they are not blown over during high winds or bumped over. • The Contractor shall also make available provisions for workers to wash their hands after using the toilets. • Where portable toilets are located within view of the public or neighboring residences or places of business, efforts should be taken to screen such facilities from view. • The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are properly stored and removed from Site. • Discharge of waste from toilets into the environment and burial of waste is strictly prohibited and must be treated at a registered wastewater treatment works. • Portable toilets shall be placed and maintained in such a way as to prevent the potential pollution of the ground and surface water resources. • No toilets shall be located sensitive environmental areas and associated buffer zones. • The contractor shall keep record, and provide such records upon request, of the location and volumes of waste disposed. • The use of pit latrines and soak-a-ways is prohibited. • Washing, whether of the person or of personal effects and acts of excretion and urination outside the facilities provided shall be strictly prohibited. • The Contractor shall take disciplinary action and implement penalties against any staff member found in contravention of this requirement.	• Workforce use toilets provided • No complaints received from I&APs as well as members of the workforce • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • Appropriate ratio of toilets to the number of persons working on site (1 toilet to 15 persons) • Documentation of any incidents that may have occurred and how the incident was managed	• As and when required • Monitor daily	• Contractor • Site Manager • ECO
Community Relations				
• Minimise conflict with affected and adjacent landowners and occupiers	• The Contractor shall erect and maintain information boards in the positions, quantities, designs and dimensions agreed to with the ECO. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the ECO. • The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was resolved. • The ECO and/or the NBC Stakeholder Liaison Officer shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.	• All complaints from the community are captured and addressed and kept on file.	• Daily	• Contractor • Site Manager • ECO
Excavation, hauling and placement				
• Ensure community safety • Minimise impacts on neighboring properties and landowners and occupiers.	• The contractor shall provide the engineer with detailed plans of intended construction processes prior to starting any cutting or filling or layering. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. • Particular attention shall also be given to the impact that such activities will have on the adjacent built environment.	• Method Statements • Plan of construction processes	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	• The contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity.			
Waste Management				
• Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&APs • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats	• An integrated waste management approach that is based on waste minimisation must be used and should incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of Section 20 (b) of the NEM: WA. • A method statement for "solid waste management" shall be compiled and kept in the environmental file. The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. • Handling of waste must include: *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 in 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* • Where it is not possible to remove debris from the site immediately, it will be stockpiled outside environmental sensitive areas. • General waste will be collected in an adequate number of litter bins located throughout the construction site. • Bins shall be emptied regularly to prevent the bins from overflowing. • All work areas shall be kept clean and tidy always. • 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 builder's rubble shall be disposed of to the wetland areas. • If builder's rubble is not removed immediately, it shall be stockpiled outside sensitive environmental areas. • Demolition waste and surplus concrete shall be disposed of responsibly. • Waste shall not be buried or burned on site. • 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 odor. *Disposal of hazardous waste* • No dumping shall be allowed in or near the construction site. • 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. • 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 builder's rubble shall be disposed of to an appropriate licensed landfill site. • The necessary permissions must be obtained to dispose of builders' rubble to the landfill site.	• Waste Manifests • Evidence of separation of waste (separate waste storage bins) • No complaints from I&APs • No littering on the site • No contamination of water resources • No runoff from the waste management areas being released into water resources • Method statement on waste reduction and management	• Daily	• Contractor • Site Manager • ECO
Noise				
• Maintain noise levels below "disturbing" as defined in the National Noise Regulations	• Noise levels during construction must be kept within 7dB of the baseline data.	• No complaints from surrounding landowners or I&APs	• Quarterly noise surveys	• Contractor

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
• Minimise the nuisance factor of the construction activity.	• All construction vehicles shall be in a good working order to reduce possible noise pollution. • Public Notices should be given to inhabitants near the project site informing them of the construction timeframes. • Correct PPE must always be worn by the personnel on site. • Vehicles with low noise levels to be used and the reverse signal to be replaced with a vibration type monitor. • Machinery with low noise levels and maintained in a good order to be used and to comply with the IFC's Health and Safety Regulations. • Machinery with low noise levels to be used and reverse siren to be replaced with a vibration type monitor. • Measure the environmental noise levels during the construction phase of the project to ensure compliance to the recommended noise levels. • Establish noise abatement measures for construction vehicles and activities. • Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment. • Work hours of 7am to 5pm must be strictly enforced unless permission is given for extended hours. Permission must not be granted without consultation with the residents and businesses. • Unnecessary noise such as loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. shall be strictly controlled. • Equipment must be operated with appropriate noise abatement accessories such as silencers and sound hoods, which must be correctly maintained; • 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; • Noisy activities must take place only during working hours. Residents of houses adjacent to the construction site must be informed by posting signage (informing of unusually noisy activities) prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites this is also applicable if working hours will be exceeded. • Equipment shall be switched off when not in operation. • Equipment must be operated within specifications and capacity (e.g., no overloading of machines); • Regular maintenance of equipment must be undertaken, particularly regarding lubrication. • Appropriate directional and intensity settings must be maintained on all hooters and sirens.	• Noise level within 7dB of the baseline levels • Quarterly noise monitoring reports • Method Statement		• Site Manager • ECO
Fires				
• Minimise risk of veld fires • Minimise destruction of natural fauna and flora • Maintain safety on site	• No fires shall be permitted on site. • No wood shall be collected, chopped or felled for fires from private or public property within the project area.	• No veld fires started by the contractor' s workforce • No claims from landowners for damages due to veld fires • Method statement	• Daily	• Contractor • Site Manager • ECO
Fauna				
• Minimise disturbance to animals • Minimise interruption of breeding patterns of birds. • Minimise destruction of habitat. • To minimise fragmentation of habitat for flora, fauna and avifauna.	• All activities on site must comply with the regulations of the: o National Environmental Management: Biodiversity Act 10 of 2004, and o NEMA. • Sensitive fauna habitats including the wetlands, grasslands and rock outcrops, particularly habitats for the endangered Grey crowned crane, must be identified and demarcated if construction work is required to occur within or near such areas. • Disturbance to fauna and their habitats must be minimized as far is possible. • Any bird nests located within the construction sites shall be reported to the Site Manager and the necessary specialist advice on how to handle the nests sought from suitably qualified ecologist. • Travelling at night should be avoided or limited as much as possible. No travelling at night should be allowed without approval by site manager; • Lights should be positioned 5m from the roads or paved areas. • A speed limit should be enforced (speed on site max 40 km/hour; outside of the site 60 km/hr,	• No complaints from Nature Conservation • No litigation concerning applicable animal protection acts • No measurable or visible signs of habitat destruction	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	in rain max 20 km/h). • No hunting or trapping of animals shall be permitted. 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. • No informal fires near construction areas shall be permitted. • A Method statement on how *Eucalyptus* sp and *Populus* sp will be controlled to prevent spreading to neighboring areas. • An alien vegetation control plan must be developed and implemented to manage alien plant species occurring within the study area. • 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.			
Heritage Resources				
• Limit the destruction of the heritage resources • The preservation and appropriate management of any archaeological finds should these be discovered during construction	- The Contractor's team must be alert and must inform their team leader and Site Manager should they come across any chance findings of heritage resources. The Chance Find Protocol must be implemented where chance finds occur 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 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	• No destruction of or damage to known archaeological sites • Permit from SAHRA Mpumalanga where chance find heritage resources are uncovered during construction	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	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. - The Site Manager must inform the local heritage agency within 24 hours should any findings be made. - Approval for the destruction and/or relocation of heritage resources must be applied for and issued, in writing, by the relevant authority (the Mpumalanga provincial heritage resource agency) as recommended by the Heritage specialist prior to commencement of construction activities. - Under no circumstances must archaeological artefacts or graves be removed, destroyed or interfered with without permission from SAHRA.			
Palaeontology Resources				
• Limit the destruction of the palaeontology resources • The preservation and appropriate management of should any palaeontology resources be discovered during construction	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 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.	• No destruction of or damage to known archaeological sites • Permit from SAHRA Mpumalanga where chance find heritage resources are uncovered during construction	• Daily	• Contractor • Site Manager • ECO
Flora				
• Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority • Prevent litigation concerning removal of floral SCC	• No uncontrolled fires shall be allowed on-site. • Careful consideration and prior approval must be sought where areas are cleared for use as laydown and/or storage areas. • No flora SCC such as *Boophone disticha, Crinum bulbispermum, Gladiolus dalenii,* and *Haemanthus humilis* located on Portion 3 may be removed without permits. • Construction footprints shall be demarcated prior to commencement of construction activities	• No litigation due to removal of vegetation without necessary permits • No alien and invasive plants on site • The footprint has not exceeded the demarcated footprint	• As and when required	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
• Encourage natural habitat fauna • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Minimise risk of veld fires • Minimise risk of fauna and flora destruction	and no construction activities shall be permitted outside of the demarcated footprint. • 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 shouldbe 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. • The construction footprint shall remain as small as possible. • Indiscriminate movement within drainage lines and wetlands and their associated buffer zones shall be strictly forbidden. • Access to the construction sites shall be limited to designated roadways to limit the ecological footprint of the proposed construction activities. • Monitoring should be implemented during the construction phase of the development to ensure that minimal impact is caused to the flora of the area. • The ECO should advise the construction team in all relevant matters to ensure minimum destruction and damage to the environment. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation. • Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. • Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling of trenches during pipeline construction. • Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist. • Should any floral or faunal SCC be located/observed, a suitably qualified specialist shall be consulted on a way forward. • The contractor shall compile an Alien and Invasive Plant (AIP) management plan to guide the proponent on the correct removal and control techniques. • Collection of plant material or medicinal purposes shall be strictly prohibited. • Rehabilitation measures must be implemented in areas where the soil surface was disturbed to limit alien and invasive plant recruitment and further soil erosion, which will lead to further faunal and floral habitat loss.	• All damaged areas successfully rehabilitated • No veld fires started by maintenance contractors work force • No claims from landowners for damages due to veld fires • An alien invasive species management plan on file • Method statement		
Traffic and Pedestrian Safety				
• To ensure road safety along the public roads and on-site and to increase awareness of slow-moving vehicles. • Warn the public of construction traffic, and to manage traffic on site.	• The Contractor shall comply with the traffic regulations on public roads. • Local speed limits and traffic laws shall apply always to minimise the occurrences of accidents on public roads. • Where possible, the transportation of construction materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents. • During construction the site shall be fenced off to prevent access. • Fencing shall be inspected weekly and maintained properly by the Contactor until construction is complete. • The Contractor shall ensure that signage, which should be pictorial and, in the vernacular, is erected on all boundary fences warning against entering the construction area.	• Where existing public roads are used to access the construction areas, adequate construction signage is in place to inform the public of increased construction activities in the affected areas by placing adequate signage. • Traffic signs should warn community road users of the presence of construction vehicles.	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
Wetlands and Aquatic Ecosystems				
• To minimise impacts on wetlands surrounding the development by construction activities.	• A method statement must be compiled that deals with how construction activities within the 100m buffer zone will be undertaken to minimise impacts on wetlands. • 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. • Measures must be put in place to attenuate water from infrastructure areas and reduce runoff. Attenuation measures during construction 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 must be undertaken 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. • 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 within the wetlands and the 100m buffer area. • 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. • No protected trees (*Satyrium longicauda*, *Disa* sp., and *Habenaria* sp.), *Eucomis autumnalis*, and a Watsonia sp) ay be removed from the wetlands without required permits. • 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. • Limit the footprint area of the construction activities within the 100m wetland buffer areas to a bare minimal to avoid increased silt loads and runoff velocities and volumes which may affect the hydrology of downstream wetland areas. • During construction all building materials should be kept out of the wetland areas as well as the associated buffer zones. • In the event of a breakdown, spill prevention measures must be implemented to prevent ingress of hydrocarbons • It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. • Re-fueling must take place on an impervious area to prevent ingress of hydrocarbons. • All spills must be immediately removed to the point on infiltration. Contaminated soil must be disposed of at a licenced hazardous waste disposal facility. • Upon rehabilitation, reseeding of indigenous grasses should be implemented in all impacted areas and strategic planting of grassland species should take place.	• No impact on wetland vegetation. • No silt pollution in wetlands as a result of construction activities. • Method Statement • No litigation for unlawful removal of protected trees	• Daily	• Contractor • Site Manager • ECO
Soil Erosion				
• Minimise loss of soil through erosion	• Cover disturbed soils as completely as possible, using vegetation or other materials. • Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. • If stockpiles are not going to be used immediately the stockpiles shall be rehabilitated to prevent erosion. • All steep slopes steeper than 1:3 or where the soils are more prone to erosion must be stabilised.	• No visible evidence of soil erosion.	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	• Implement sediment trapping, erosion and stormwater control. • Protect sloping areas that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas. • Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth; • Gravel roads must be well drained to limit soil erosion; • Minimize clearance of vegetation. Retain natural trees, shrubbery, and grass species wherever possible; • Implement a rehabilitation plan for the site, especially the old mining dumps and areas where depressions have formed on site; • Cover disturbed soils as completely as possible, using vegetation or other materials			
Soil and Groundwater				
• Minimise pollution of soil and ground water resources.	*Spill prevention* • All earthmoving vehicles and equipment shall be on a preventative maintenance schedule to ensure that the equipment is in a good working order to prevent oil and diesel leakages. • An inspection programme shall be implemented to ensure that all the mechanical equipment is inspected daily to ensure the optimal functioning of the equipment, and all leaks will be repaired immediately. • All containment areas shall be monitored for failures, leakages or overfilling of the bunded areas. • 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 • All bunded areas shall be designed for sufficient capacity to prevent spillages into the environment should a tank fail. • All oil and chemical drums shall be stored in an appropriately designed bunded area to contain any spillages from these drums. • Overfilling of equipment must be prevented and all personnel be made aware of this requirement. *Refueling* • Refueling of equipment shall occur in a designated area by trained personnel. • The only permitted method of fuel transfer, will be by means of a pump/controlled valve/tap/hose/funnel. • Fuel dispensing hoses must be of approved non-electrically conductive types with automatic shut off nozzles. • All fueling equipment will be inspected regularly and all leaks must be repaired immediately. • Absorbent spill clean-up materials shall be available at fueling areas and should be disposed of properly after use. • Fueling operations shall not be left unattended. • No temporary refueling depot or point shall be located within sensitive environmental areas and associated buffer zones. • Fuel required for the day-to-day activities shall be stored in a bunded area. Bunding must include the area adjacent to the tanks upon which vehicles must park during refueling. Soil contaminated by fuel spills must be cleaned up immediately and disposed of as hazardous waste. • Fuel at long-term depots must be stored in a bunded area, underlain by a concrete slab, sloped toward a sump for spillage removal. The bund must be able to accommodate at least the full volume of one of the containers. • Spills inside the bunded area and the contents of the oil trap/sump are to be treated as hazardous waste and disposed of accordingly. *Spill containment and counter measures* • Any effluent or hazardous spills will be contained to the smallest possible area and cleaned immediately, and the area rehabilitated, where necessary, as dictated by the type, size and severity of the spill. • 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.	• No visible signs of hydrocarbon pillages • No contamination of soil and groundwater resources.	• Daily	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	• Contaminated soil following spills should be disposed of at an appropriate licensed landfill site. • Spill kits or similar equipment will be made available at the point of use to contain any hydrocarbon and chemical spills to the smallest possible area. • The Service Provider will train the employees to use the spill kits. A spill response plan will be implemented, and employees trained accordingly to react effectively to address any spillages. • Large spillages of hazardous substances such as oil will initially be controlled by on-site emergency response personnel, who may be aided by professional contractor.			
Air Quality				
• Reduce dust fall out thereby reducing nuisance factor of the construction site and potential for depleted air quality. • Reduce visual impact • Minimise loss of valuable soil material	• A method statement must be available for "dust control". The method statement must provide information on the proposed source of water to be utilised for dust suppression and the details of the licenses acquired for such usage. • Point sources of dust must be controlled by regular watering of roads and works area, should the need arise. • Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance and spraying with water; • Concrete bags must not be allowed to blow around the site and spread cement dust. • All vehicles transporting material that can be blown off (e.g., soil, rubble etc.) must be covered with a tarpaulin. • The construction team must monitor the site for excessive dust conditions and apply the required remedial actions. • All forms of dust pollution must be managed in terms of the: o National Environmental Management Air Quality Act 39 of 2004. o National Dust Control Regulations, 2013 GN R827/2013. o eMakhazeni Local Municipality Air Pollution Control By –laws. • Putrescible waste must be handled, stored and disposed of before the probability of it generating odors. • Chemical toilets must be emptied / serviced on a regular basis. Proof of this must be provided to the Engineer. • A speed limit of 20 km/h shall apply to limit vehicle-entrained dust from the unpaved roads. • Dust suppression measures shall be implemented on dry weather days and periods of high wind velocities and may include reducing the frequency of disturbance and spraying with water. • All maintenance equipment must be scheduled for preventative maintenance to ensure the functioning of the exhaust systems to reduce excessive emissions and limit air pollution.	• No visible signs of dust. • No complaints from interested and Affected parties • No visible evidence of dust contamination on the surrounding environment • Method statement on dust control.	• Daily	• Contractor • Site Manager • ECO
Alien and Invasive Plant (AIP) species management				
• To minimise invasion of alien plants within the project area • Ensure that proliferation of Alien invasive weeds does not occur	• A Method statement on how alien and invasive plant species such as *Eucalyptus* sp and *Populus* sp will be controlled to prevent spreading to neighboring areas. • An Alien and Invasive Plant (AIP) management/eradication programme shall be developed as a guide on the correct removal and control techniques; o *Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.* o *Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.* o *Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.* o *Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Cat 3 plants to exist in riparian zones.* • Where possible, the management of alien invasive plant species shall be conducted in tandem with the construction activities.	• No alien invasive species in the project area. • A method statement on alien and invasive plant species management and eradication. • An alien and invasive species management plan.	• Monthly	• Contractor • Site Manager • ECO

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	• The least impact methods must be employed to remove vegetation. • Impacted sites shall be rehabilitated with suitable indigenous species in consultation with s suitably qualified ecologist. • Cleared sites will need to be closely monitored and maintained as disturbed areas become vulnerable to weed infestation due to dormant seed propagation due to suitable conditions. • Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish. • The following legislation shall also be considered to ensure compliance: o Alien and Invasive Species Lists, 2014 o Alien and Invasive Species Regulations, 2014 o Conservation of Agricultural Resources Regulations GNR 1048/84 o National Environmental Management Biodiversity Act 10 of 2004 o National Forest Act • The use of herbicides must be limited and may only be used under strict control and when no other alternative exists. • Priority species shall be identified to control and develop protocols for the removal of all alien species e.g., mechanical removal, chemical treatment or an integrated approach etc. Mechanical, methods must be favoured to chemical methods where possible for the removal of alien invasive species. Chemical removal shall only be undertaken by a suitably qualified and approved person.			
Hydrology and Stormwater Management				
• Minimise pollution of soil, ground water resources and surface water resources. • Minimise scarring of the soil surface and land features	• Adequate stormwater management shall be conducted on site to ensure that dirty water is kept separate from clean water. • In the event of pollution is caused because of construction activities, NBC, according to Section 20 of the National Water Act, 1998 (Act No. 36 of 1998) is to be responsible for all costs incurred by organizations called to assist in pollution control and/or to clean up polluted areas. • Run-off containing high sediment loads must not be released to drainage areas. • During construction, erosion protection berms shall be installed to prevent gully formation. Berms every 50 m should be installed where the track has a slope of less than 2%, every 25 m where the track slopes between 2% and 10%, every 20 m where the track slopes between 10% and 15% and every 10 m where the track slope is greater than 15%. • Exposed soils shall be protected by means of a suitable geotextile covering such as hessian sheeting. • Sediment control devices to be in place prior to the commencement of site preparation activities. • No construction activities shall be permitted outside the footprints of the construction sites. • All vehicles must remain on designated roads with no indiscriminate driving through the area. • All disturbed areas shall be re-vegetated with indigenous species. • Disturbance of the vegetation and stones/boulders shall be kept to the absolute minimum, ensuring that only the areas that are necessary for access purposes are disturbed. • 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.	• No visible signs of pollution • Method statements for management of water contamination • No directives from the DWS due to unlicensed construction activities within regulated areas. • No signs of siltation of water courses and drainage lines • Minimum loss of topsoil • No complaints from I&APs	• As and when required • Monitor daily	• Contractor • Site Manager • ECO
Visual				
• To reduce visual disturbances and to minimise the loss in sense of place • To minimise visual intrusion because of the project	• 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. • Dust suppression must be undertaken on an as and when required basis. • Clearance of the area shall be kept to a minimum possible footprint. • 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.	• No complaints from the I&APs	• Daily	• Contractor • Site Manager • ECO
Crime, safety and security				
• Reduce the risk of potential incidences • Minimise the potential impact on the	• Emergency Preparedness plans must be compiled in terms of Section 20 of National Water Act and Section 30 of NEMA.	• No incidences reported • No complaints from I&APs	• Daily	• Contractor • Site Manager

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
environment	• No site staff will be housed on site. • The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. • It must be ensured that all emergency procedures are in place prior to commencing construction work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. • A list of all emergency telephone numbers / contact persons must be kept up to date and all numbers and names shall be posted at relevant locations throughout the maintenance site. • The nearest emergency service provider must be identified, as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency center, as well as the police and ambulance services must be available on site. • Personal Protective Equipment (PPE) will be issued by all persons entering the construction site. PPE includes safety shoes, goggles, earplugs, gloves, hard hats, masks, etc. The PPE required will be dependent on the area that the person is working in, as well as the activity he/she is undertaking.			• ECO
Rehabilitation				
• To avoid the Potential Pollution of Storm water • Minimise pollution of the water resources.	• NBC is responsible for compliance with the provisions for Duty of Care and Remediation of Damage in accordance with Section 28 of National Environmental Management Act (NEMA), Act No. 107 of 1998. • The following main steps can be followed to rehabilitate the site *Levelling* • Denuded areas or elevated areas should be levelled. Levelling should ensure that surface water does not pond, and should also decrease the chance of erosion, decrease the flow velocity and the subsequent potential for sedimentation and vegetation loss. • Spoil piles may be levelled using a dozer operation or a truck and shovel operation. *Cover with topsoil* • After levelled areas have been inspected and approved by the site manager, topsoil may be replaced. The way topsoil and stockpiles are created and maintained is important with regards to the implementation of a successful rehabilitation process. Soil management practices must be adhered to reduce soil loss and to encourage rehabilitation post-construction. • The topsoil layer (0-50 cm) is important as it contains nutrients, organic material, seed, and communities of micro-organisms, fungi and soil fauna. The biologically active upper layer of soil is fundamental in the development of soils and the sustainability of the entire ecosystem. The correct handling of topsoil is vital in conserving the seed bank and nutrients which occur within this layer thereby ensuring successful rehabilitation. • Topsoil must only be used for rehabilitation purposes and not for any other use; • Previously excavated areas on the site should be backfilled with suitable fill material, top soiled, levelled to resemble the surrounding topography and slopes and scarified for re-vegetation/re-seeding; and • On steeper slopes rehabilitation measures may include systems such as soil terracing, berm creation, grass blocks, fascine work, gabion basket work, reno-mattresses, retaining block mechanisms, sandbags, boulder and rock placement, stone pitching, and grading. *Erosion control* The following management measures are proposed for the rehabilitation process: • Visual inspection of all exposed surfaces should be conducted for signs of erosion. If erosion channels are discovered, the site manager will compile and implement a plan to determine the cause of erosion, reducing erosion in the identified areas and preventing future erosion. Inspection of soil depth if erosion has taken place over a constant period is necessary. If the depth has deteriorated to less than 15cm it must be rectified; • Erosion can be repaired or minimised using gabions, reno-mattresses and planting of indigenous grasses; • Erosion control mechanisms must be established as soon as possible. Provision should be made for maintenance of the gabions, reno mattresses, and associated structures over the subsequent years; • A stormwater management plan must be developed with the aid of an engineer to ensure that water runoff is diverted off the site without pooling and stagnation or erosion.	• No visible signs of pollution • Minimum loss of topsoil • No erosion or siltation downstream	• As and when required • Within a year of construction	• Contractor • Site Manager

Objective	Mitigation and management measures and principles	Measurable Targets	Monitoring Frequency	Responsible Person
	• If compaction occurs, rectification can be done by application and mixing of manure, vegetation mulch or any other organic material into the area. Use of well cured manure is preferable as it will not be associated with the nitrogen negative period associated with organic material that is not composted; *Alien and invader plant species rehabilitation* The following basic principles apply to the control of AIS on the site during the rehabilitation process: • The Contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the concurrent rehabilitation phase. Alien invasive tree species should be eradicated; • Control involves killing/removal of the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion; • Institute an eradication/control programme for early intervention if invasive species are detected so that their spread to surrounding natural ecosystems can be prevented; • Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish; • Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds; During the rehabilitation of the site, the eradication and control of alien invasive species should be an on-going action. An alien eradication plan should be implemented. *Compaction rehabilitation measures* Soil compaction is often an effect of high traffic in development sites. It can become a major problem and can be recognised by excess surface moisture and slow drying soils due to deeper compaction preventing the percolation of water through the soil profile; Water runoff due to surface compaction preventing penetration and absorption (ponding of water), especially on banks and sloping surfaces; Large clear or sparsely covered areas devoid of a good vegetative cover due to hardened topsoil layers. • Rip and/or scarify all disturbed areas, including roads that are no longer in use (preferably before the rainy season). Do not rip and/or scarify areas under wet conditions, as the soil will not loosen. *Erosion and stormwater management objectives* Remedial actions must be established to ensure that potential erosion on site is addressed with an erosion control strategy towards rehabilitation. The mitigation measures to prevent soil erosion include: • A stormwater plan must be developed with the aid of an engineer to ensure that water runoff is diverted off the site without pooling and stagnation or erosion during the operational phase of the development; and • If compaction occurs, rectification can be done by application and mixing of manure, vegetation mulch or any other organic material into the area. Use of well cured manure is preferable as it will not be associated with the nitrogen negative period associated with organic material that is not composted.			

Table 9-3: Environmental Programme for the Operational Phase

Management Objective	Mitigation Measures	Measurable Targets/Monitoring Outcome	Monitoring Frequency	Responsible Person
Monitoring and Maintenance				
• Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&APs • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats	• The conditions of the development must be monitored for a period of one year after the development is complete to ensure that: o Erosion is not taking place; o The stormwater runoff measures are working; o An Environmental Complaints Register should be kept detailing complaints received, date, response and action taken; o Any maintenance where intrusive works are necessary should adhere to the mitigation measures put in place in the EMPr; and o Where such measures are impractical due to the nature, duration and extent of the works, a maintenance method statement should be developed prior to maintenance works being undertaken. • Final rehabilitation to be monitored by an ECO according to the stipulations of the EMPr	• No complaints from I&APs • No littering on the site • No contamination of water resources • No runoff from the area being released into water resources • Method statements	• Daily	• Contractor • Site Manager • ECO
Groundwater and Soil Resources				
• Minimise contamination of soil and groundwater resources	• All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. • All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. • Monitor the groundwater environment for hydrochemistry and hydrocarbons • No groundwater may be abstracted for use on site without approval from the DWS. • Monitor and maintain the integrity of infrastructure, including the pipelined to avoid leakages into the soil and groundwater	• No visible signs of hydrocarbon pillages • No contamination of soil and groundwater resources.	• On an as and when required	NBC
Hydrology and Stormwater				
• Minimise pollution of soil, ground water resources and surface water resources. • Minimise scarring of the soil surface and land features	• All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. • All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste • 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 drainage lines. • 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 (bunding, impervious storage base), and manage stormwater run-off. • Ensure contaminated surface run-off is either treated or contained in leak-resistant structures.	• No visible signs of pollution • No signs of siltation of water courses and drainage lines • No complaints from I&APs	• On an as and when required	• NBC
Air Quality and Climate Change				
• Reduce air quality impacts due to the project	• Dust suppression must be conducted during the operational phase of the project. Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance and spraying with water. • Dust control suppression shall be implemented on dry weather days and periods of high wind velocities. • Correct speed will be maintained at the proposed project site. • Putrescible waste must be handled, stored and disposed of before the probability of it generating odors.	• No visible dust plumes in the area • No complaints from the I&APs	• On an as and when required	• NBC
Noise				
• Minimise noise impacts due to the project activities	• Noise levels shall be kept to within the requirements of the Noise Control Regulations of 1992	• No complaints from I&APs	• On an as and when required	• NBC
Visual				
• Minimise visual impacts of the buildings	• Where possible, the buildings must be painted using colors that blend in with the existing structures in the area.	• No complaints from I&APs	• On an as and when required	• NBC
Biodiversity				
• Minimum loss of biodiversity due to ineffective management and control of alien invasive plant species	• All disturbed areas must be rehabilitated in tandem with construction activities. • Runoff water which typically contains seeds of exotic and garden variety plants should be diverted to storm water management services and infrastructures. • Management and control of alien invasive plant species must be implemented even during the operational phase of the project. • Landscaping of the gardens must include removal of weeds that pose a threat to indigenous vegetation.	• No alien invasive plant species on the site • Use of indigenous species for landscaping • Landscaping plan	• On an as and when required	• NBC

Management Objective	Mitigation Measures	Measurable Targets/Monitoring Outcome	Monitoring Frequency	Responsible Person
Wetlands				
• Minimum impacts on wetland resources	• All disturbed areas must be rehabilitated in tandem with construction activities. • Access to wetlands areas shall be strictly prohibited. • Soil erosion must be managed to minimise sedimentation of wetland areas. • Storm water generated around the project site will be diverted away to the clean water environment.	• No impact on wetland vegetation. • No silt pollution in wetlands	• On an as and when required	• NBC
Waste Management				
• Ensure proper and effective management of waste	• All waste generated from the project site will be collected in proper receptacles and removed by the eMakhazeni LM to a registered disposal facility e.g., sewage treatment plant, sold waste disposal site or hydrocarbon recycling or treatment facilities. *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; and • 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.	• Evidence of separation of waste (separate waste storage bins) • No complaints from I&APs • No littering on the site • No runoff from the waste management areas being released into water resources	• As per the municipal policy	• eMakhazeni Local Municipality

10 Monitoring and compliance

10.1 Monitoring

The monitoring of compliance to the EA and EMPr will be as per the EMPr in Section 9.

10.2 Reporting Procedures

10.2.1 Documentation

The following documentation must be kept on site in order to record compliance with the EMPr:

- An Environmental Management File which includes:
  - Copy of the EMPr;
  - Copy of the Environmental Authorisation;
  - Copy of all other licences/permits;
  - Copy of all rehabilitation plans;
  - Copy of the Stormwater Management Plan;
  - Copy of relevant legislation;
  - NBC SHE Policy;
  - Environmental Method statements compiled by the Contractor;
  - Non-conformance Reports;
- Environmental register, which shall include:
  - Communications Register–including records of complaints, and, minutes and attendance registers of all environmental meetings.
  - Monitoring Results – including environmental monitoring reports, register of audits, Non-Conformance Reports (NCR).
  - Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
  - Waste manifests.
- Waste Documentation such as Sewerage Disposal Receipts;
- Material Safety Data Sheets for all hazardous substances;
- Dust suppression register;
- Written Corrective Action Instructions; and
- Notification of Emergencies and Incidents.

10.2.2 Environmental Register

NBC will put in place an Environmental Register. The contractor will ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident.
- Causes of complaint/incident.
- Party/parties responsible for causing complaint/incident.
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident.
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents.

The above records will form an integral part of the Contractors' Records. These records will be kept with the EMPr and will be made available by NBC if so requested.

10.2.3 Non-Conformance Report

An NCR will be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the Contractor in writing. Preceding the issuing of an NCR, the Contractor must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g., non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of an NCR. The following information should be recorded in the NCR:

- Details of non-conformance;
- Any plant or equipment involved;
- Any chemicals or hazardous substances involved;
- Work procedures not followed;
- Any other physical aspects.
- Nature of the risk.
- Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account.
- Agreed timeframe by which the actions documented in the NCR must be carried out. The ECO should verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily. The ECO and Contractor should sign the Close-Out portion of the Non- Conformance Form and file it with the contract documentation.

10.2.4 Environmental Emergency Response

The Contractor's environmental emergency procedures must ensure appropriate responses to unexpected / accidental actions / incidents that could cause environmental impacts. Such incidents may include:

- Accidental discharges to land;
- Accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is aimed at responding specifically to environmental incidents and must ensure and include the following:

- Construction employees shall be adequately trained in terms of incidents and emergency situations;
- Details of the organisation (i.e., manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g., the fire department / on-site fire detail, spill clean-up services) shall be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

10.2.5 Method Statements

It is a statutory requirement to ensure the wellbeing of employees and the environment. To allow the mitigation measures in this document to be implemented, task-specific method statements should be developed for each set of tasks.

A Method Statement details how and when a process will be carried out, detailing possible dangers/risks, and the methods of control required.

- Type of construction activity;
- Timing and location of the activity;
- Construction procedures;
- Materials and equipment to be used;
- Transportation of the equipment to / from site;
- How equipment/material will be moved while on site;
- Location and extent of construction site office and storage areas;
- Identification of impacts that might result from the construction activity;
- Methodology and/or specifications for impact prevention / containment;
- Methodology for environmental monitoring;
- Emergency/disaster incident and reaction procedures (required to be demonstrated); and
- Rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor shall keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

As a minimum the following Method Statements will be required to be generated:

- Bunding;
- Construction site and office/yard establishment;
- Cement mixing / concrete batching/bentonite mixing;
- Contaminated water;
- Dust;
- Environmental awareness course(s);
- Environmental monitoring;
- Erosion control;
- Fire, hazardous and/or poisonous substances;
- Fuels and fuel spills (may form part of the item above);
- Storage, handling and decanting of diesel (may form part of the item above);
- Personnel, public and animal safety;
- Rehabilitation of modified environment(s);
- Solid and liquid waste management;
- Sources of materials (including MSDSs);
- Top-soil management;
- Stormwater Management; and
- Wash areas.

10.2.6 Public Communication and Liaison with I&APs

NBC must ensure that the adjacent landowners and land occupiers are informed and updated throughout the construction phases. Sufficient signage should be erected around the site (including at

the entrance), informing the public of the construction activities taking place. The signboards should include the following information:

- The name of the Contractor.
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

11 Awareness Training

The Contractor will be responsible for implementing an environmental awareness training programme to ensure that all the employees are acquainted with the requirements of this EMPr.

Environmental awareness involves communication campaigns for reaching various audiences, developing messages and selecting and/or producing the appropriate resources and media to reach these audiences. The aim of environmental awareness is to make construction and operational staff aware of specific issues related to their surroundings, including living and non-living elements, e.g., land, soil, plants, animals, air, water and other humans, as well as awareness of their built, social and economic surroundings, and the impacts of their actions on these. Awareness is a necessary but not a sufficient element of social change.

"The aims of awareness raising activities are more limited in scope than environmental education and the processes should not be confused. While they cannot, on their own, achieve the required educational outcomes outlined above, awareness-raising can be a component of broader and more in-depth education processes"

As a minimum the contractor will conduct awareness training for all new employees and subcontractors prior to commencement with construction work. All employees must be made aware of what the potential impact can be due to their work activities on the project.

Regular and frequent training which may include daily toolbox talks and safety meetings will be used to provide any additional training as and when required. Toolbox talk topics should include, but are not limited to:

- Waste management (Hazardous waste and general waste management);
- Chemicals handling and storage;
- Site clearance after maintenance;
- General Environmental management/awareness; and
- Ad hoc talks based on the outcomes of Risk Assessments.

Anyone who obtains access to the site for the first time will have to undergo awareness training. This will include any sub -consultants or sub-contractors. A register of all training provided must be kept on site.

Prepared by

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