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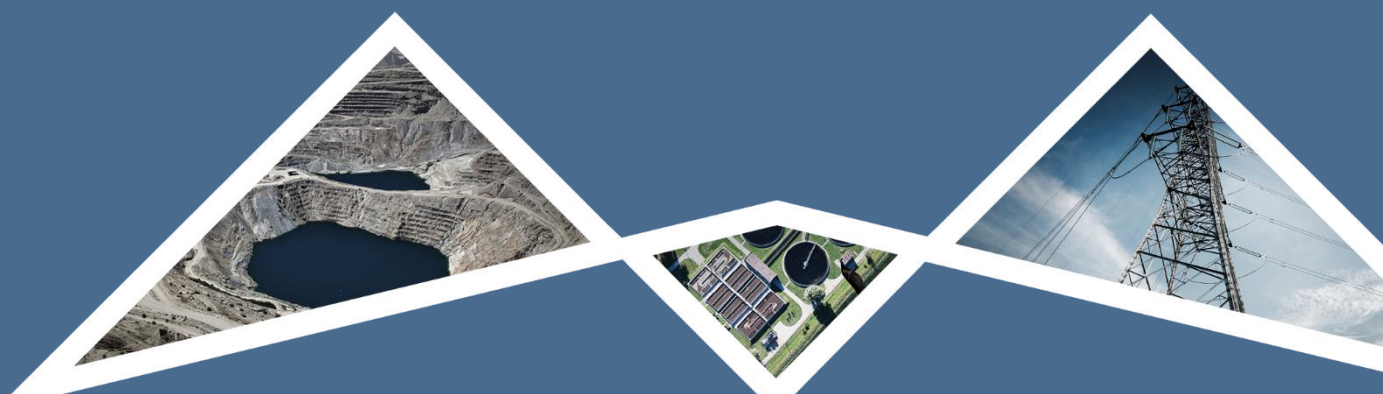
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## ENVIRONMENTAL MANAGEMENT PROGRAMME

THE PROPOSED NUVEST RECOVERY SOLUTIONS (PTY) LTD CHEMICAL  
PLANT ON LAND PARCEL 110, BATOLIET ROAD IN MEYERTON,  
GAUTENG PROVINCE

GDARDE REF: 002-23-24-E3717

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Appendix A: EAPs CV



## List of Abbreviations

BAT	:	Best Available Technology
BPEO	:	Best Practicable Environmental Option
BPM	:	Best Practicable Means
CBA	:	Critical Biodiversity Area
DEA	:	Department of Environmental Affairs
DFFE	:	Department of Forestry, Fisheries and the Environment
DSTI	:	Daily Safety Task Instruction
DWAF	:	Department of Water Affairs and Forestry (now DWS)
DWS	:	Department of Water and Sanitation
EA	:	Environmental Authorisation
EAP	:	Environmental Assessment Practitioner
ECO	:	Environmental Control Officer
EO	:	Environmental Officer
EIA	:	Environmental Impact Assessment
EIMS	:	Environmental Impact Management Services (Pty) Ltd
EMF	:	Environmental Management Framework
EMPr	:	Environmental Management Programme
EPRP	:	Emergency Preparedness and Response Plan
ESA	:	Ecological Support Area
GDARDE	:	Gauteng Department of Agriculture, Rural Development and Environment
HCl	:	Hydrochloric acid
HSE	:	Health, Safety and Environment
I&AP	:	Interested and Affected Party
ISO	:	International Standards Organisation
Cl <sub>2</sub>	:	Chlorine
MES	:	Minimum Emissions Standard
NAAQS	:	National Ambient Air Quality Standards
NDCR	:	National Dust Control Regulations
NEMA	:	National Environmental Management Act (Act No. 107 of 1998)
NEMAQA	:	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEMBA	:	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEMWA	:	National Environmental Management: Waste Act (Act No. 59 of 2008)



NFA	:	National Forests Act (Act 84 of 1998)
NWA	:	National Water Act (Act No. 36 of 1998)
OHSA	:	Occupational Health and Safety Act (Act No. 85 of 1993)
PM	:	Particulate Matter
PPE	:	Personal Protective Equipment
PPP	:	Public Participation Process
SABS	:	South African Bureau of Standards
SANAS	:	South African National Accreditation System
SWMP	:	Storm Water Management Plan
TOPS	:	Threatened or Protected Species

## Definitions

**Aspect** - Element of an organisation's activities, products or services that can interact with the environment.

**Auditing** - A systematic, documented, periodic and objective evaluation of how well the Environmental Management Programme (EMPr) is being implemented and is performing with the aim of helping to safeguard the environment by facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems, while keeping track of their compliance with the Environmental Authorization.

**Clearing of vegetation** - Clearing refers to the removal of vegetation through permanent eradication and in turn no likelihood of regrowth. 'Burning of vegetation (e.g. fire- breaks), mowing grass or pruning does not constitute vegetation clearance, unless such burning, mowing or pruning would result in the vegetation being permanently eliminated, removed or eradicated.

**Contractor** - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

**Corrective (or remedial) action** - Response required in addressing an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

**Degradation** - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

**Developer** - Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the EA (Environmental Authorisation) and EMPr.

**Environment** - The surroundings within which humans exist and that are made up of land, water and atmosphere of the earth, micro-organisms, plant and animal life: or any part or combination of the two and the interrelationships among them, the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Environmental Impact Assessment (EIA)** - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.



**Environmental Management System (EMS)** - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Organisation for Standardisation.

**Environmental Policy** – A statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

**Habitat** - A habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.

**Hazardous substance** - is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995.

**Impact** - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time, space, magnitude and intensity.

**Indigenous species** - Flora and Fauna species that are naturally found in an area.

**Infrastructure** - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage, etc.

**Integrated Environmental Management**- This is a philosophy used in the assessment of and management of the environment, during all actions, plans, activities, etc. that could affect the environment. Its aim is to ensure sustainability.

**Method statement** - means a written submission by the Contractor to the Project Manager in response to this EMP or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification.

The method statement must cover as a minimum, applicable details regarding:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

**Mitigation** - Measures designed to avoid, reduce or remedy adverse impacts. Actions that limit, stop or reverse the magnitude and/or rate of long-term effect on the environment.

**Natural environment** - Encompasses all living and non-living things occurring naturally on Earth or some region thereof. It is an environment that encompasses the interaction of all living species. Climate, weather, and natural resources that affect human survival and economic activity.





**Policy** - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people or an organisation's values and goals.

**Process** - Development usually happens through a process - a number of planned steps or stages.

**Resources** - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

**Slope**- means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units.

**Solid waste**- means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

**Spoil**- means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works.

**Topsoil**- means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil.

**Works**- means the works to be executed in terms of the Contract.



# 1 INTRODUCTION

NuVest Recovery Solutions (hereafter NuVest) proposes to develop a chemical plant located on 110 Batoliet Road in Meyerton, within the Sedibeng District Municipality, Gauteng Province (**Figure 1**). The proposed plant production capacity is based on producing 10 tons a day (t/day) of chlorine. The plant will have a bulk storage capacity of approximately 17 473 tonnes with a maximum single storage capacity of 4 617 tonnes (13 074m<sup>3</sup>) of chemicals within the facility. The chemical plant will specialize in the production of sodium hydroxide (NaOH), chlorine (Cl<sub>2</sub>), and hydrogen (H<sub>2</sub>) through the chlor-alkali process. These three intermediate products will then be further processed to produce hydrochloric (HCl) acid, bleach (12-13% sodium hypochlorite solution), and caustic lye (47% solution in water). No chlorine or hydrogen will be stored on site. Other chemicals (not produced on site) will be delivered in road tankers and offloaded into the bulk tanks before decanting into Intermediate Bulk Containers (IBCs) and or polycans.

Environmental Impact Management Services (Pty) Ltd. (EIMS) has been appointed by EcoPartners (Pty) Ltd on behalf of NuVest as the Environmental Assessment Practitioners (EAPs) to assist with undertaking the necessary application processes (including the statutory public participation) and to compile and submit the required documentation in support of application for:

- Environmental Authorisation (EA) in accordance with the NEMA- Listed activity/ies:
  - GNR984 Listing Notices 2; Activity 4 and 6
- Additional identified listed activities:
  - Atmospheric Emissions Licence in accordance with the requirements of the National Environmental Management: Air Quality Act (Act 39 of 2004) – Category: 7; Sub-Categories 7.1, 7.2, and 7.7.

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including but not limited to the applicant and the competent authority (CA).

## 2 SCOPE OF THIS DOCUMENT

An Environmental Management Programme (EMPr) is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented, and that the positive benefits of the projects are enhanced. This EMPr has been compiled as a guideline, in accordance with the Environmental Impact Assessment Regulations (GN R982 of 2014 as amended) for the requirements of an EMPr, to establish the mitigation and management measures that need to be implemented to avoid, reduce and minimise potential environmental impacts arising out of any of the phases applicable to the project.

It should be noted, however, that an EMPr is a working document that should be updated on a regular basis, as and when necessary. The EMPr thus supports an on-going proactive mitigation approach and duty of care to the environment. The EMPr shall allow for risk minimization and will ensure legal compliance. This EMPr will also allow the user to make minor amendments to ensure continual revision and improvement of risk mitigation through the continual re-assessment of risks associated with the activity.

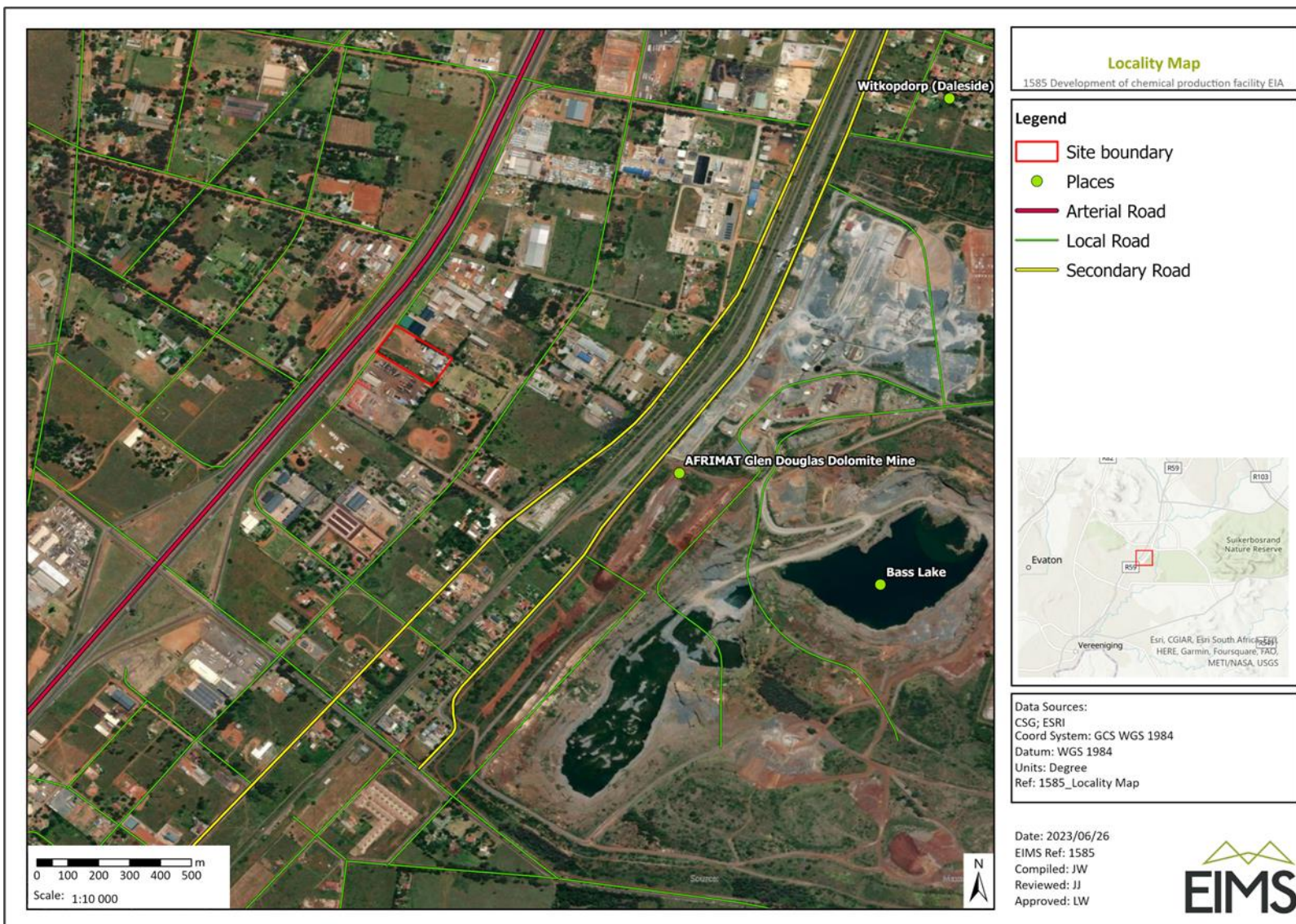


Figure 1: Locality of the proposed Nuvest Chemical Plant



### 3 DOCUMENT STRUCTURE

Table 1: EMPr Structure

Appendix 4 Reference	Description	Section in EMPr
<b>Appendix 4(1)(1)(a):</b>	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 4
<b>Appendix 4(1)(1)(b):</b>	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Section 5
<b>Appendix 4(1)(1)(c):</b>	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 should be avoided, including buffers.	Section 2
<b>Appendix 4(1)(1)(d):</b>	A description of the impact management outcomes, 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 14
<b>Appendix 4(1)(1)(f):</b>	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) 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 14
<b>Appendix 4(1)(1)(g):</b>	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 14
<b>Appendix 4(1)(1)(h):</b>	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 14
<b>Appendix 4(1)(1)(i):</b>	An indication of the persons who will be responsible for the implementation of the impact management actions.	Section 14
<b>Appendix 4(1)(1)(j):</b>	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented.	Section 14
<b>Appendix 4(1)(1)(k):</b>	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).	Section 14
<b>Appendix 4(1)(1)(l):</b>	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	Section 11



Appendix 4 Reference	Description	Section in EMPr
<b>Appendix 4(1)(1)(m):</b>	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 in order to avoid pollution or the degradation of the environment.	Section 13
<b>Appendix 4(1)(1)(n):</b>	Any specific information that may be required by the competent authority.	N/A



## 4 REQUIREMENTS AND DETAILS OF THE EAP

In terms of Regulation 13 of the EIA Regulations (GN R. 982) as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

### 4.1 DETAILS OF THE EAP

EIMS is appointed by EcoPartners (Pty) Ltd on behalf of NuVest Recovery Solutions (Pty) Ltd to assist in preparing and submitting the Environmental Authorisation application form, the Scoping and Environmental Impact Assessment Reports and to conduct the required public participation process in support of the proposed chemical plant located on 110 Batoliet Road in Meyerton, Gauteng Province. EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS is an independent specialised environmental consulting firm offering the full spectrum of environmental management services across all sectors within the African continent. EIMS has successfully completed many hundreds of assignments over the years with an excess of 28 years' experience in conducting EIA's for both the government and private sector. Please refer to the EIMS website ([www.eims.co.za](http://www.eims.co.za)) for examples of EIA documentation currently available. In terms of Regulation 13 of the NEMA EIA Regulations (GNR 982) 2014 as amended, an independent EAP, must be appointed by the applicant to manage the application for an environmental authorisation. EIMS and the compiler of this report are compliant with the definition of an EAP as defined in Regulations 1 and 13 of the NEMA EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

The contact details of the EIMS consultant (EAP) who compiled this Report are presented in **Table 2** and the detailed CV is provided in **Appendix A**.

Table 2: Details of the Environmental Assessment Practitioner.

<b>Principal EAP:</b>	<b>Mr. Vukosi Mabunda</b>
<b>Tel No:</b>	+27 11 789 7170
<b>Fax No:</b>	+27 86 571 9047
<b>E-mail:</b>	vukosi@eims.co.za
<b>Professional Registrations:</b>	<ul style="list-style-type: none"><li>• Registered Environmental Assessment Practitioner with Environmental Assessment Practitioner Association of South Africa – EAPASA (Reg. No: 134178)</li><li>• Professional Natural Scientist with the South African Council for Natural Scientific Professions – SACNASP (Reg. No: 2019/867).</li></ul>



## 4.2 EXPERTISE OF THE EAP

This EMPr was prepared by Vukosi Mabunda, a Registered Environmental Assessment Practitioner (EAP) employed by EIMS. His CV is included as **Appendix A** of this report. Mr Vukosi Mabunda is currently an Environmental Assessment Practitioner (EAP) and a Geographic Information Systems (GIS) Specialist with 6 years' working experience. Vukosi is a Registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA). He is one of the few dual registered professionals with SACNASP as a Professional Geospatial Scientist and Professional Environmental Scientist. Vukosi has dual professional background in Geographic and Environmental Sciences with a Master of Science Degree in Geography obtained in 2021 from the University of Johannesburg. In addition to his experience in Environmental Compliance Monitoring and applications for Water Use License Applications, Vukosi has successfully completed numerous environmental impacts assessments for both linear and footprint developments as indicated in his CV (**Appendix A**).

## 5 DESCRIPTION AND SCOPE OF THE PROPOSED PROJECT

The section below provides a detailed description for the proposed Nuvest Chemical Plant Project. Most of the key information presented in this chapter was obtained from the Applicant. The aim of the project description is to describe the proposed activities planned to take place at the facility. Furthermore, the project description is designed to facilitate the understanding of the proposed project related activities which are anticipated to lead to the impacts as identified and assessed in the EIA Report and this EMPr. Impacts relating to these aspects were identified and mitigation measures and management procedures proposed in Section 14 of this EMPr.

### 5.1 PROJECT DESCRIPTION

NuVest Recovery Solutions (hereafter NuVest) plans to develop a chemical manufacturing plant in Meyerton, Gauteng Province. Currently the facility imports and locally sources dry and liquid chemicals. The dry chemicals are stored in the dry chemicals warehouse before dispatch to clients. The liquid chemicals are mostly acids i.e., nitric acid, sulphuric acid, phosphoric acid etc. The acids are delivered in road tankers and directly offloaded into Intermediate Bulk Containers (IBCs) which are moved into the liquid warehouse for storage before dispatch (refer to **Section 3** of the EIR for the detailed project description).

The proposed plant production capacity is based on producing 10t/day of chlorine. The plant will have a bulk storage capacity of approximately 17 473 tonnes with a maximum single storage capacity of 4 617 tonnes (13 074m<sup>3</sup>) of chemicals within the facility. The chemical plant will specialize in the production of sodium hydroxide (NaOH), chlorine (Cl<sub>2</sub>), and hydrogen (H<sub>2</sub>) through the chlor-alkali process. These three intermediate products will then be further processed to produce hydrochloric (HCl) acid, bleach (12-13% sodium hypochlorite solution), and caustic lye (47% solution in water). No chlorine or hydrogen will be stored on site. Other chemicals (not produced on site) will be delivered in road tankers and offloaded into the bulk tanks before decanting into IBCs and or polycans.

The plant is intended to produce caustic soda solution, hydrogen gas, chlorine as primary products from the electrolysis of brine. Solid salt will be dissolved in water to form saturated brine, which is fed into the electrolyser. The hydrogen and chlorine gas leaving the electrolyser are used to make hydrochloric acid. Part of the chlorine and the caustic solution are used in the production of sodium hypochlorite. The proposed plant will include a tank farm for storage of bulk chemicals produced. Other chemicals (not produced on site) will be delivered in road tankers and offloaded into the bulk tanks before decanting into IBCs and or polycans. The size of the bulk storage tanks will either be 50m<sup>3</sup>, 100m<sup>3</sup>, 150m<sup>3</sup>, 250m<sup>3</sup>, 100m<sup>3</sup>, or 2 500m<sup>3</sup> based on preliminary calculations and there will be a total of 10 bulk tanks. A basic preliminary site layout diagram is given in **Figure 2** with the detailed tank farm chemicals indicated in **Figure 3** and **Table 3**. The proposed facility will consist of the following facilities as indicated in **Figure 2**:

- Site Office
- Warehouse;



- Receiving and dispatching areas;
- IBC Storage;
- Main Plant; and
- Tank Farm (28 Chemical Tanks).

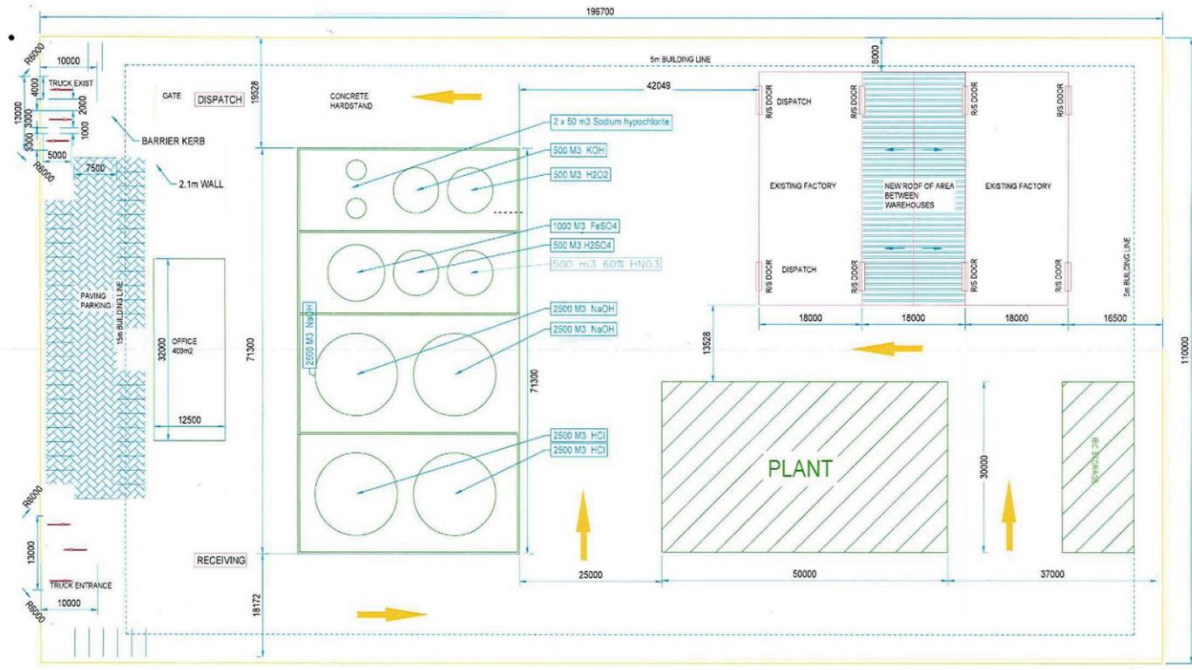


Figure 2: Proposed Layout of Nuvest Chemical Plant

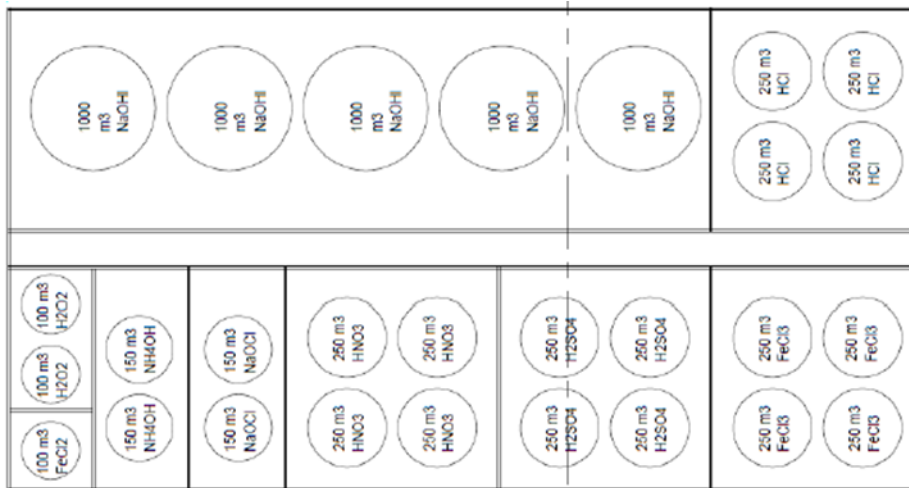


Figure 3: Proposed tank farm layout of the NuVest Chemical Plant





Table 3: Proposed material storage at the Nuvest Chemical Facility Tank Farm.

Material	Formula	Tank Capacity (tons)	Quantity of Tanks	Total Storage Capacity (tons)	Maximum Single Storage Capacity (tons)
Nitric acid 57%	HNO <sub>3</sub>	50	3	150	370
Hydrogen Peroxide 40%	H <sub>2</sub> O <sub>2</sub>	20	2	40	112
Hydrochloric acid 33%	HCl	300	4	1200	300
Ammonium hydroxide	NH <sub>4</sub> OH	150	2	300	150
Sodium Hypochlorite	NaClO	181	2	362	180
Sodium Hydroxide	NaOH	2130	5	10650	2130
Sulphuric acid	H <sub>2</sub> SO <sub>4</sub>	460	4	1840	460
Ferrous Chloride	FeCl <sub>2</sub>	109	1	109	193
Ferric Chloride	FeCl <sub>3</sub>	700	4	2800	700
Diesel	C <sub>12</sub> H <sub>23</sub>	22	1	22	22
<b>TOTAL</b>		<b>4122</b>	<b>28</b>	<b>17473</b>	<b>4617</b>

## 5.2 LISTED AND SPECIFIED ACTIVITIES TRIGGERED

In terms of Section 24(2) of NEMA, the Minister and/or any MEC in concurrence with the Minister may identify activities which require authorisation as these activities may negatively affect the environment. Environmental Impact Assessment (EIA) Regulations were promulgated in 2014 and amended in 2021 in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998 and consist of the following:

- *Regulation 982* provide details on the processes and procedures to be followed when undertaking an Environmental Authorisation process (also referred to as the EIA Regulations);
- *Listing Notice 1* (Regulation 983) defines activities which will trigger the need for a Basic Assessment process;
- *Listing Notice 2* (Regulation 984) defines activities which trigger an Environmental Impact Assessment (EIA) process. If activities from both R 983 and R 984 are triggered, then an EIA process will be required; and
- *Listing Notice 3* (Regulations 985) defines certain additional listed activities for which a Basic Assessment process would be required within identified geographical areas.

The above regulations were assessed to determine whether the proposed project will trigger any of the above listed activities, and if so, which Environmental Authorisation Process would be required. The triggered listed activities are presented in **Table 4** and require authorisation in terms of GNR 984 Listing Notice 2 of the NEMA EIA Regulations 2014 as amended. A Scoping and EIA process is therefore required in line with all the requirements of the NEMA EIA Regulations, 2014, as amended.



Table 4: Listed Activities in terms of NEMA EIA Regulations, 2014 as amended and NEMAQA Section 21.

Activity No	Activity Description	Applicability
<b>National Environmental Management Act Environmental Impact Assessment Regulations - Listing Notice 2 (GNR 984)</b>		
<b>Activity 4</b>	The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	The proposed chemical plant processes involve the storage and handling of dangerous goods (i.e., Sulphuric acid, Nitric acid, Ferrous sulphate, etc.) where such storage occurs in containers with a combined capacity of at least 13 074 cubic metres.
<b>Activity 6</b>	The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding– (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	Dust and gases are key pollutants of concern associated with the operations at the proposed chemical plant and will be emitted from the following key sources including, heavy construction activities, chemical storage tanks, and stack emissions/breathing vents. As such, the operation of the proposed chemical plant triggers sub-categories 7.1 (production and or use in manufacturing of chlorine), 7.2 (production of acids) and 7.7 (production of caustic soda) in terms of Section 21 of the National Environmental Management Air Quality Act (NEMAQA) (No. 39 of 2004) and thus require an Atmospheric Emission License.
<b>National Environmental Management: Air Quality Act: Section 21 List of activities: Category 7: Inorganic Chemicals Industry</b>		
<b>7.1</b>	Production and/or use in manufacturing of ammonia, fluorine, fluorine compounds, hydrogen cyanide and chlorine gas (Excluding metallurgical processes related activities regulated under category 4).  All installations producing and/or using more than 100 tons per annum of any of the listed compounds.	The proposed chemical plant involves the processing and/or use of chlorine gas (byproduct) greater than 1 000m <sup>3</sup> or 350 tons per annum.
<b>7.2</b>	The production, bulk handling and/or use in manufacturing of hydrofluoric, hydrochloric, nitric and sulphuric acid (including oleum) in concentration exceeding 10%. Processes in which oxides of sulphur are emitted through the production of acid sulphites of alkalis or alkaline earths or through the production of liquid sulphur or sulphurous acid. Secondary production of hydrochloric acid through regeneration.  All installations producing, handling and/or using more than 100 tons per annum of any of the listed compounds (Excluding metallurgical processes related activities regulated under category 4).	The proposed chemical plant involves the production and/or processing of acids (i.e., hydrochloric, sulphuric and nitric acids) at approximately 6 000m <sup>3</sup> per month or 25 000 tons per annum.
<b>7.7</b>	Production of caustic soda.  All installations producing more than 10 tons per month	The proposed chemical plant involves the production and/or processing of sodium hydroxide at approximately 5 000m <sup>3</sup> or 1 700 tons per month.



## 6 ENVIRONMENTAL MANAGEMENT APPROACH

The compilation of an EMPr for an activity which is likely to result in significant environmental impacts is typically compiled at the culmination of a thorough investigation into the receiving environment and the identification and assessment of likely environmental impacts (i.e. EIA). This EMPr forms part of a Scoping and EIA process NEMA. This EMPr aims to comply with the requirement of Appendix 4 of the EIA Regulations (GNR 982). These requirements are systematically addressed in the subsequent sections of this report. The primary objectives of the EMPr are as follows:

- To promote sustainability and describe an action programme to mitigate negative impacts as far as possible;
- To be a practical document that sets out both the goals and actions required in mitigation. Though the term “mitigation” can be broad in definition, it means in this context to “allay, moderate, palliate, temper or intensify.” Mitigation of a negative impact means that its effect is reduced. Mitigation of a positive impact means that its effect is increased or optimised; and
- To indicate responsibilities for the implementation of these action items within the EMPr.

This EMPr shall be deemed to have contractual standing on the basis that its contents and specifically objectives are a detailed expansion of the environmental risks and consequent requirements of the EA (if, and when issued). Where relevant the Applicant is responsible for delegating responsibility for compliance to designated parties (internal or external). Such delegation must be legally binding to the extent relevant.

The objectives and targets in this EMPr are further guided by the NEMA, and specifically by GNR982. Thus, the underlying principles of sustainable development are the ultimate objectives and target of this report. The EMPr has included measures to ensure the development activity complies with the following principles, as instilled in the NEMA, amongst others:

- i. That the disturbance of ecosystems and loss of biological diversity are minimised and remedied;
- ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- iii. That waste is avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;
- iv. That a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and
- v. That negative impacts on the environment and on people’s environmental rights be anticipated, prevented and remedied.

## 7 ENVIRONMENTAL MANAGEMENT PRINCIPLES

NEMA establishes a general framework for environmental law, in part by prescribing national environmental management principles that must be applied when making decisions that may have a significant impact on the environment. These principles are briefly summarised below:

### 7.1 HOLISTIC PRINCIPLE

The Holistic principle, as defined by NEMA (Section 2(4) (b)) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below in **Section 7.2**). Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is a whole into which a project is introduced. If the indications are that the project could have major



adverse effects, the project must be reconsidered and where appropriate re-planned or relocated to avoid an adverse impact or to ensure a beneficial impact.

## **7.2 BEST PRACTICABLE ENVIRONMENTAL OPTION**

When it is necessary to undertake any action with environmental impacts, the different options that could be considered for the purpose must be identified and defined. The Best Practicable Environmental Option (BPEO) is defined in NEMA as “the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.” Other guidelines typically used for environmental management in terms of other legislation include BPM which is the Best Practicable Means and BAT which is the Best Available Technology.

## **7.3 SUSTAINABLE DEVELOPMENT**

The concept of sustainable development was introduced in the 1980’s with the aim to ensure that the use of natural resources is such that our present needs are provided without compromising the ability of future generations to meet their own needs. The constitution of South Africa is built around the fact that everyone has the right to have the environment protected through reasonable legislative and other measures that secure ecologically sustainable development. The National Environmental Principles included in the NEMA require development to be socially, environmentally and economically sustainable.

## **7.4 PREVENTATIVE PRINCIPLES**

The preventative principle is fundamental to sustainable development and requires that the disturbance to ecosystems and the pollution, degradation of the environment and negative impacts on the environment be avoided, or, where they cannot be altogether avoided, are minimised and remedied.

## **7.5 THE PRECAUTIONARY PRINCIPLE**

The precautionary principle requires that where there is uncertainty, based on available information, that an impact will be harmful to the environment, it is assumed, as a matter of precaution, that the said impact will be harmful to the environment until such time that it can be proven otherwise. The precautionary principle requires that decisions by the private sector, governments, institutions and individuals need to allow for and recognise conditions of uncertainty, particularly with respect to the possible environmental consequences of those decisions. In South Africa, the Department of Human Settlements, Water and Sanitation (then DWAF) adopted a BPEO guideline in 1991 for water quality management and in 1994 in the Minimum Requirements document for waste management.

In terms of DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, the precautionary principle is defined as, “Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation.” Here the precautionary principle assumes that a waste or an identified contaminant of a waste is “both highly hazardous and toxic until proven otherwise.”

In the context of the EIA process in South Africa, the precautionary principle also translates to a requirement to provide sound, scientifically based, information that is sufficient to provide the decision making authority with reasonable grounds to understand the potential impacts on the environment, the extent thereof and how impacts could be mitigated. If such information is not adequate for this purpose, the relevant authority cannot be satisfied as is required and then the authority should require that further information be collected and provided.

## **7.6 DUTY OF CARE AND CRADLE TO GRAVE PRINCIPLE**

In terms of the NEMA Section 28, “Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”



By way of example, the principle of “duty of care” in terms of waste management emphasises the responsibility to make sure that waste is correctly stored and correctly transported, as it passes through the chain of custody to final point of disposal. This means that waste must always be stored safely and securely. The company removing and disposing of waste also holds the responsibility to hold the relevant licenses, and that waste is transported alongside the necessary paperwork.

“Cradle to Grave” refers to the responsibility a company takes for the entire life cycle of a product, service or program, from design to disposal or termination. In terms of the DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, “any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, he retains responsibility for the waste generated or handled.” This places responsibility for a waste on the Generator and is supported by the “Cradle to Grave” principle, according to which a “manifest” accompanies each load of Hazardous Waste until it is responsibly and legally disposed. This manifest is transferred from one transporter to the next along with the load, should more than one transporter be involved. Once the waste is properly disposed of at a suitable, permitted facility, a copy of the manifest must be returned to the point of origin.” Duty of Care offers one strategy to implement sustainable development.

## 7.7 POLLUTER MUST PAY PRINCIPLE

The “polluter pays principle” holds that the person or organisation causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. It is noted that the polluter will not always necessarily be the generator, as it is possible for responsibility for the safe handling, treatment or disposal of waste to pass from one competent contracting party to another. The polluter may therefore not be the generator but could be a disposal site operator or a transporter. Through the ‘duty of care’ principle, however, the generator will always be one of the parties held accountable for the pollution caused by the waste. Accordingly, the generator must be able to prove that the transferral of management of the waste was a responsible action. The polluter pays principle acceding to NEMA dictates that “the cost of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.”

## 8 DUTY OF CARE RESPONSIBILITIES

Section 28 of the NEMA makes provision for duty of care, and remediation of environmental damage. The binding principles are described below:

1. Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, as far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.
  - (1A) Subsection (1) also applies to a significant pollution or degradation that-
    - a) occurred before the commencement of this Act;
    - b) arises or is likely to arise at a different time from the actual activity that caused the contamination; or
    - c) arises through an act or activity of a person that results in a change to pre-existing contamination.
2. Without limiting the generality of the duty in subsection (1), the persons on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which-



- a) any activity or process is or was performed or undertaken; or
  - b) any other situation exists, which causes, has caused or is likely to cause significant pollution or degradation of the environment.
3. The measures required in terms of subsection (1) may include measures to-
- a) investigate, assess and evaluate the impact on the environment;
  - b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment;
  - c) cease, modify or control any act, activity or process causing the pollution or degradation;
  - d) contain or prevent the movement of pollutants or the cause of degradation;
  - e) eliminate any source of the pollution or degradation; or
  - f) remedy the effects of the pollution or degradation.

## 9 FAILURE TO COMPLY WITH ENVIRONMENTAL CONSIDERATIONS

Within the provisions of the relevant environmental legislation, there are a number of penalties for non-compliance or offences. Below a few extracts are presented for information purposes, however these must not be read in isolation and the reader is reminded that there are other Acts, or sections of Acts, that may be applicable to the relevant project:

- NEMA Section 49B(1): A person convicted of an offence in terms of section 49A(1)(a), (b), (c), (d), (e), (f) or (g) is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine or such imprisonment- this includes commencing with a listed activity without an EA or the non-compliance with conditions of any EA and associated EMPr;
- NEMA Section 49B(2): A person convicted of an offence in terms of section 49A(1)(i), (j) or (k) is liable to a fine not exceeding R5 million or to imprisonment for a period not exceeding 5 years, and in the case of a second or subsequent conviction to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, and in both instances to both such fine and such imprisonment;
- NEMA Section 49B(3): A person convicted of an offence in terms of section 49A(1)(h), (l), (m), (n), (o) or (p) is liable to a fine or to imprisonment for a period not exceeding one year, or to both a fine and such imprisonment;
- NWA Section 151 (1c): No person may fail to comply with any condition attached to a permitted water use under this Act;
- NWA Section 151 (2): Any person who contravenes any provision of subsection (1) is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment;
- NEM:BA Section 102 (1): A person convicted of an offence in terms of section 101 is liable to a fine not exceeding R10 million, or an imprisonment for a period not exceeding ten years, or to both such a fine and such imprisonment;
- NEM:WA Section 68 (1): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;



- NEM:WA Section 68 (2): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;
- NEM:WA Section 68 (3): Any person convicted of an offence referred to in section 67(1)(m) is liable to a fine or to imprisonment for a period not exceeding six months or to both a fine and such imprisonment;
- NEM:WA Section 68 (4): A person who is convicted of an offence in terms of this Act and who persists after conviction in the act or omission that constituted the offence commits a continuing offence and is liable on conviction to a fine not exceeding R1 000 or to imprisonment for a period not exceeding 20 days, or to both such fine and such imprisonment, in respect of each day that person persists with that act or omission.

It is recommended that a procedure for non-compliances (i.e. incentives or disincentives for conformance and non-conformance with the EMPr requirements) must be employed to ensure that the EMPr is adequately implemented. The system to be used must be determined before construction commences, included in the tender documents and contracts, and made clear to all project workers. The system may include that the independent Environmental Control Officer (ECO) can be authorized to impose spot fines on the Contractor and/or his subcontractors for any of the defined transgressions. Such fines should be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations.

## 10 ROLES AND RESPONSIBILITIES

**The Applicant / Developer is responsible for ensuring overall compliance with the provisions of the EMPr.** Implementation is the key to the success of the EMPr. In order to ensure that the EMPr and its mitigation measures are implemented, roles and responsibilities need to be clearly defined and documented prior to commencement. This section serves as a guide on which party is normally responsible for certain tasks. Specific roles are designated in the specific environmental management and mitigation requirements in this EMPr.

### 10.1 THE PROJECT APPLICANT/PROPONENT

The Applicant is the principal party (Proponent) of the project. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr falls primarily upon the Applicant and must therefore be built into all contractor's contractual agreements. The Applicant's role typically includes:

- Provide for all necessary supervision during the execution of the project including appointment of key personnel to act on his/her behalf during the different phases of the project phase (e.g. project manager). The key personnel will be tasked with ensuring that the various contractors/developers comply with the necessary provisions of the EA, AEL and EMPr;
- Ensure that a suitably qualified, competent Environmental Officer (EO) is appointed who will be responsible for among others, ensuring compliance (on a monthly basis) with the EMPr, EA and AEL throughout the construction of the relevant project components;
- Appoint a suitably qualified, competent Environmental Control Officer (ECO) who will undertake periodic audits on the various contractors works and/or land parcels under development;
- Notify the relevant competent authority of changes in the development resulting in significant environmental impacts;
- Assess the various contractor's environmental performance during construction, in consultation with the ECO;
- Ensure compliance with regulations;



- To implement the projects as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To comply with special conditions as stipulated by surrounding landowners during the negotiation process (if any); and
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

Therefore, ultimately, the Applicant is responsible for the development and implementation of the EMPr and, where relevant, ensuring that the conditions in the EA and AEL are satisfied. Where construction activities are contracted out (e.g. to contractors and subcontractors), the liability associated with non-compliance still rests with the Applicant (unless otherwise agreed upon between the authorities, the Applicant and the contracting parties). The Applicant (and not the contractor) is therefore responsible for liaising directly with the relevant authorities with respect to the preparation and implementation of the EMPr and meeting authorisation conditions.

## 10.2 THE PROJECT MANAGER

During the development, it is envisaged that there may be a number of contractors and sub-contractors undertaking various activities on the project. The Project Manager would oversee all contractors and sub-contractors from a project management point of view. The roles of the Project Manager typically include the following:

- The Project Manager acts on behalf of the Applicant regarding the administration of contracts to sub-contractors, etc.;
- Provides and/or approves scheduling, aspects of co-ordination and estimating;
- Ensures implementation of the project plan within cost, time and quality constraints;
- Ensures that implementation of EMPr is executed as planned; and
- Keeps the asset owner informed of progress made during the life cycle of the project.

### 10.2.1 THE ENVIRONMENTAL CONTROL OFFICER

The ECO must be appointed by the Applicant and should be independent from the Applicant and the Contractors. The ECO should have appropriate training and/or experience in the implementation of environmental management specifications. The ECO must preferably have a tertiary qualification in an Environmental Management or appropriate field. The ECO provides feedback to the Project Manager regarding all environmental matters. The ECO's key role is auditing the implementation of the EMPr. For the purposes of implementing the conditions contained herein, the Applicant should appoint the ECO well before the start of construction. The ECO is responsible for the auditing function as well as the clarification of environmental conditions contained in this EMPr to anyone working on the site.

The ECO roles include:

- Recommendations for review and update of the EMPr;
- Liaison between the Applicant, Contractors, authorities and other lead stakeholders on high importance environmental concerns;
- Conducting a pre-construction survey of the site prior to construction;
- Review the site induction training to ensure environmental issues receive adequate attention and important site-specific issues are included;
- Conduct environmental audits of the site/contractors including relevant documentation on a monthly basis;





- Validating the regular site inspection reports, which are to be prepared by the relevant contractor EO's;
- Maintain a record of all non-conformances and incidents to ensure that measures are put in place to remedy such;
- Maintain a public consultation register in which all complaints are recorded, as well as action taken; and
- Verification that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules.

### 10.3 THE CONTRACTOR

The contractor is usually a third party appointed by the applicant/project manager to undertake the actual construction of the project. In some cases, the development components may also be undertaken by third party developers with their own contractors and sub-contractors. For the purposes of this section, any contractor on site (regardless of who appointed them) is referred to as the "contractor".

The relevant contractors are answerable to the Project Manager and ECO for all environmental issues associated with the project. Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria. The principal contractor/s, any other contractors and sub-contractors will be required to comply with the provisions contained herein, and accordingly, the EMPr and its provisions must form part of any contractual arrangements between the applicant and contractors, and contractors and their sub-contractors, etc. The contractor must comply with EMPr during construction and ensure that all his employees and sub-contractors appointed by him/her are familiar with the EMPr. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr must be contractually bound to the appointed contractor.

The Contractors role includes:

- Provide all necessary supervision during the execution of the project;
- Appoint a suitably qualified, competent EO that will be responsible for amongst others, ensuring daily compliance with the EMPr, EA and AEL during the construction phase;
- To implement the projects as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To fulfil all obligations as per the agreed contract;
- To comply with special conditions as stipulated by surrounding Landowners during the negotiation process (if any); and
- Ensure that the Contractors staff and employees have received the appropriate environmental awareness training prior to commencing construction.

### 10.4 THE ENVIRONMENTAL OFFICER

The applicant or the principal contractor shall appoint an Environmental Officer (EO), who is responsible for the on-site implementation of the EMPr. The Contractor's EO ensures that all sub-contractors working under the Contractor and sub-contractors abide by the requirements of the EMPr.

The EO roles will include:

- Preparing activity based Environmental Method Statements where applicable and where required by the EMPr;
- Establishing and maintaining an environmental incident register;



- Taking required corrective action within specified time frame in respect of non-conformances and environmental incidents;
- Assist in finding environmentally acceptable solutions to construction problems;
- Attendance at HSE meetings, toolbox talks and induction programmes (where relevant);
- Inspect the site as required to ensure adherence to the management actions of the EMPr on a daily basis;
- Report any complaints to the ECO to be captured in the complaint register;
- Liaise with the construction team on issues related to implementation of, and compliance with the EMPr;
- Ensure adequate and compliant waste management; and
- Ensuring that environmental signage and barriers are correctly placed and maintained.

## 10.5 THE AUTHORITIES

The authorities that should be involved include the Gauteng Department of Agriculture, Rural Development and the Environment. The authorities may be required to perform the following roles:

- Review Monitoring and Audit reports, if required;
- Review whether there is compliance by the Applicant and Contractor with the terms of the EMPr and permit/license conditions. Whenever necessary, the authorities should assist the Applicant in understanding and meeting the specified requirements; and
- The authorities may perform random controls to check compliance. In case of persistent non-compliance, the Applicant will be required to provide an action plan with corrective measures, and have it approved by the authorities.

## 11 ENVIRONMENTAL MANAGEMENT SYSTEM

The purpose of this EMPr is to ensure that the environment is carefully considered during the design, construction, operations, and decommissioning phases, and that negative impacts are minimised or prevented, and positive impacts enhanced. At the same time, the EMPr should provide a logical extension of the EIA, specialist studies, or any other technical planning and assessment documentation, to ensure that recommendations are implemented, and that the project does not deviate from the environmental profile that formed the basis of the assessment.

### 11.1 RECORD KEEPING

The Applicant, or the Project manager (if assigned) is therefore responsible for the identification, storage, protection, retrieval, retention and disposal of records as part of the EMPr. Records must be legible, identifiable, and traceable.

### 11.2 RESPONDING TO NON-COMPLIANCES

Non-compliance will be identified and managed through the following four key activities including:

- Inspections of the site and activities across the site;
- Audits of the site and relevant documentation as well as specific activities; and
- Reporting on a monthly basis.

Non-compliance with the EMPr or any other environmental legislation, specifications or standards shall be recorded by the EO in the non-conformance register. This register shall be maintained by the EO and will be sent to the Applicant/ECO and Contractor on a regular basis monthly, and the Applicant/ECO shall ensure that the responsible party takes the necessary corrective actions. Non-conformances may only be closed out in the



register by the EO upon confirmation that adequate corrective action has been taken and/or documented proof provided. The register should be used to measure overall environmental performance.

### 11.3 ENVIRONMENTAL INCIDENTS

For the purposes of this project, an environmental incident can be divided into three levels, i.e. major, medium and minor. All Major and Medium environmental incidents shall be recorded in the EO’s non-conformance and incident register. Minor incidents shall be recorded by the contractor, and by the Applicant (operational phase) in their own incident register. Definitions and explanations of environmental incidents are provided in **Table 5**.

Table 5: Description of incidents and non-conformances for the purpose of the project.

<b>Non-Conformance</b>	Any deviation from work standards, practices, procedures, regulations, management system performance etc. that could either directly or indirectly lead to injury or illness, property damage, damage to the workplace environment, legal transgression or a combination of these.
<b>Major Environmental Incident</b>	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread, long-term, irreversible significant negative impact on the environment and/or has a high risk of legal liability. A major environmental incident usually results in a significant pollution and may entail risk of public danger. Major environmental incidents usually remain an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc. Major environmental incidents may be required to be reported to the authorities. The EO shall make the final decision as to whether a particular incident should be classified as a Major incident. An example of a Major environmental incident would be a significant spillage (e.g. 500 litres) of fuel.
<b>Medium Environmental Incident</b>	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread or localised, short term, reversible significant negative impact on the environment and/or has a risk of legal liability. A medium environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of medium environmental incidents should be reversible within a short to medium term with or without intervention. The EO shall make the final decision as to whether a particular incident should be classified as a Medium incident. An example of a Medium environmental incident would be a large spill of fuel (e.g. >50 litres) onto land.
<b>Minor Environmental Incident</b>	An incident or sequel of incidents, whether immediate or delayed, where the environmental impact is negligible immediately after occurrence and/or once-off intervention on the day of occurrence. An incident where there is unnecessary wastage of a natural resource is also classified as a minor environmental incident. An example would be leaking water pipes that result in the wastage of water. A minor environmental incident is not reportable to authorities. An example of a minor incident is day to day spills of fuel or oil onto the ground where the spill is less between one (1) and five (5) litres.

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to the EO, and shall be recorded in the incident registers;
- The EO shall record the incident in the non-conformance and incident register and advise on the appropriate measures and timeframes for corrective action;
- An incident report shall be completed by the relevant party responsible for the incident for all medium and major incidents and the report shall be submitted to the Project Manager and EO within 5 calendar days of the incident;



- The EO shall investigate all incidents and identify any required actions to prevent a recurrence of such incidents; and
- In the event of an emergency incident (unexpected sudden occurrence), including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the Applicant shall notify the relevant authorities in accordance with Section 30(3) of the NEMA. The Applicant shall engage the EO who shall assess all major incidents and shall advise the Applicant when any such incident must be reported to the authorities as per the above requirement.

## 12 REVIEW AND REVISION OF THE EMPr

It is important to note that this EMPr is made legally binding on the Applicant through the EA and the approval of the EMPr by the decision-making authority. It is important to consider that the EMPr is a dynamic document which may require such alteration and /or amendment as the project evolves. Conditions under which the EMPr would require revision include:

- Changes in legislation;
- Occurrence of unanticipated impacts or impacts of greater intensity, extent and significance than predicted;
- Inadequate mitigation measures (i.e. where environmental performance does not meet the required level despite the implementation of the mitigation measure);
- Secondary impacts occur because of the mitigation measures; and
- Instances where the implementation of the specified management, as a result of changes in circumstances, may become impractical or unreasonable to implement.

The Applicant in consultation with the EO should be responsible for ensuring that the registration and updating of all relevant EMPr documentation is conducted. It shall be the responsibility of the Applicant, in consultation with the EO, to ensure that all personnel are performing according to the requirements of the document control procedure, and to initiate the revision of controlled documents, when required by changes in process or operations.

The EO must undertake a risk assessment of any proposed changes to the EMPr. This risk assessment must be included in the applicable monthly audit report, and where applicable supported by the necessary proof of public consultation. It is important to note that if alterations and/or amendments are required; these may only be affected with written approval from the competent authority and in accordance with the relevant legal processes.

## 13 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPr and protection of the environment.

The Applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental and Occupational Health and Safety (OHS) requirements. To obtain buy-in from staff, individual Employees need to be involved in:

- Identifying the relevant risk;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.



The Applicant shall ensure that adequate environmental and OHS training takes place including training on handling and storage of dangerous goods. All employees shall be given an induction presentation on environmental awareness and OHS. Where possible, the presentation needs to be conducted in the language of the employees.

### 13.1 EMERGENCY RESPONSE PLAN

The Applicant must identify potential emergencies and develop procedures for preventing and responding to them. There are several options for dealing with high priority impacts and risks, as the paradigm has two components, probability and consequence. The design of control measures rests on understanding the cause and effect. Best practise is to intervene with the ultimate factors where feasible, rather than treat the outcomes. Emergency response therefore has the option of reducing probability or reducing the consequence while reducing the probability is the preferred option. Below are some common emergency preparedness approaches:

- Treat consequence if a risk eventuates, when the risk becomes an issue;
- Combine reducing the probability and treating the consequence;
- Offset environmental losses by investing in other assets;
- Not manage some of the risks because there are too many; and
- Make provision to manage residual impacts or issues that arise because of shortcomings in risk identification and rating, avoidance and mitigation or because a rare event has occurred.

Residual impacts are those impacts that despite reducing the probability and consequence might still occur. In these cases, parties will have to be compensated, pollution cleaned up and damage to the environment remediated.

The Applicant is required to update the existing or develop and implement a new suitable Emergency Preparedness and Response Plan prior to commencing work. The Applicant must ensure that the Emergency Preparedness and Response Plan makes provision for environmental emergencies, including, but not limited to;

- Fire Prevention;
- Fire Emergency Response;
- Spill prevention;
- Spill Response;
- Accidents to Employees; and
- Use of hazardous substances and materials, etc.

The Applicant and Contractor must ensure that lists of all emergency telephone numbers/contact persons (including fire control) are kept up to date and that all numbers and names are posted at relevant locations throughout the lifespan of the project. **The Applicant must notify the local emergency services, Provincial and National authorities within 48 hours of any incidents that activated the emergency procedures.**

**The overall site ERP should cover the major hazard risks assessed in the MHI report i.e., toxic release, fires and explosions.** There should be a distinction on the plan of action for small quantity releases and large catastrophic releases impacting public outside the site boundary. The sections dealing with each hazardous material e.g. hydrochloric acid, hydrogen chloride, chlorine, hydrogen, nitric acid etc, must be clearly identifiable.

Depending on the source and the nature of the risks, there may be a need to be an indication that the nature of the emergency may require changes in the location of assembly points or actions to be taken once there. E.g., Depending on the wind direction of the day, a toxic vapour cloud may move towards the designated assembly point resulting in gassing injuries or even fatalities for everyone in the path of the toxic gas.



## 13.2 SPILL RESPONSE PROCEDURE

The Contractor must ensure that all Employees, staff and labourers are informed and instructed regarding implementation of spill prevention measures and spill response procedures. In the event of a spill, the following general requirements shall apply, and the detailed spill procedure must cater for these requirements;

- Immediately reporting of spills by all Employees and/or visitors to the relevant supervisor and EO (this requirement must be including in induction training);
- Take immediate action to contain or stop the spill where it is safe to do so;
- Contain the spill and prevent its further spread (e.g. earth berm or oil absorbent materials for spill to land or by deploying booms and/or absorbent material for a spill to water);
- Dispose of any contaminated soil or materials according to appropriate waste disposal procedure. Note: Waste from spills of hazardous materials shall be disposed of as hazardous waste at a suitably licensed waste disposal facility;
- The Contractor's EO shall record details of the spill in their respective incident registers;
- Photographic evidence shall be obtained of the spill clean-up.

In the case of large spills, the services of a specialist spill response agency shall be required, who shall advise on appropriate clean-up procedures and follow-up monitoring (if required). The incident procedures as defined in Section 14 shall also apply.

The Applicant must also, (as per Section 30 of the NEMA) notify the Director-General (DWS, DFFE and DMRE), South African Police Services, Provincial Environmental Authority, the Local Municipality, and any persons whose health may be affected of the nature of an incident including:

- Any risks posed to public health, safety and property,
- Toxicity of the substance or by products released by the incident and
- Any step taken to avoid or minimise the effects of the incident on public health and the environment.

## 13.3 MEASURES TO CONTROL OR REMEDY ANY CAUSES OF POLLUTION OR DEGRADATION

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed activities taking place on the project are provided below:

- Limit the size of the area to be disturbed as far as is practically possible;
- Ensure topsoil and subsoil are provided with adequate storm water runoff measures;
- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates;
- Ensure the timeous clean-up of any spills;
- Implement a waste management system for all waste streams present on site;
- Investigate any I&AP claims of pollution or contamination as a result of the project activities; and
- Rehabilitate the site in line with the requirements of the rehabilitation / decommissioning plan.

## 14 IMPACT MANAGEMENT AND MITIGATION MEASURES

This section provides management and mitigation measures that need to be implemented at the relevant phases of the proposed project to ensure that the identified impacts are effectively managed and mitigated to avoid or minimise degradation of the surrounding environment and to positively impact the socio-economic aspects of



the area. **Table 6** below encapsulates the management and mitigation measures for all identified impacts. This table also includes the party responsible for ensuring compliance with each management or mitigation measure, the party responsible for monitoring (and frequency thereof) compliance and the performance indicators that can be utilized to ensure that the target for each management and mitigation measure is achieved. **It must be noted that although the applicant does not plan for the facility to ever close and decommission, conditions have been provided should there be unforeseen events that leads to closure and decommissioning.**



Table 6: Impact Management and Mitigation Measures

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
<b>14.1 COMPLIANCE</b>							
<b>14.1.1 LEGAL COMPLIANCE WITH LEGISLATION</b>							
A	<p>A copy of the Environmental Authorisation EMPr and legal documents (i.e. AEL) must be kept on site. Copies of all other project permits / licenses must be acquired and kept on site. The following documents must be prepared and kept on site</p> <ul style="list-style-type: none"> <li>• Copy of this EMPr along with a signed declaration of understanding of the contents of the EMPr;</li> <li>• Site daily diary / instruction book / incident reports;</li> <li>• Copies of Environmental Audit Reports</li> <li>• A Complaints register</li> <li>• Proof of Environmental training undertaken by the ECO</li> <li>• Proof of Environmental training undertaken by the Contractor</li> <li>• Schedules for environmental audits</li> <li>• Non-compliance and corrective action reports compiled by the Contractor</li> <li>• Method statements signed by the Contractor and approved by the Eco and the Engineer.</li> </ul>	<p>Planning Construction Operation Decommissioning</p>	<p>Ongoing during all the life of the project.</p>	<p>Applicant</p>	<p>Applicant must obtain all required environmental authorisations and licenses prior to construction activities. EO: daily EO: monthly during construction and annually during operation phase.</p>	<p>Ensures compliance with relevant legislation, regulations and bylaws.</p>	<p>An on-site legal compliance register should be kept on site and updated when required. Contractor's agreements should include a section on the need to comply with relevant legislation and regulations.</p>
B	<p>Identify and comply with all relevant national, provincial and local legislation, including associated regulations and bylaws including MHI Regulations of 2022 and shall establish and maintain procedures to keep track of, document</p>	<p>Planning Construction Operation Decommissioning</p>	<p>Identification of legislation, regulations and bylaws during the planning phase. Ongoing compliance during the life of the project.</p>	<p>Applicant</p>	<p>The applicant must comply with other legislation such as MHI Regulations of 2022 and ensure compliance on a regular basis ensure compliance with any</p>	<p>Ensures compliance with relevant legislation, regulations and bylaws.</p>	<p>An on-site legal compliance register should be kept on site and updated when required. Contractor's agreements should include a section on the need to comply with relevant legislation and regulations.</p>





Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	and ensure compliance with environmental legislative changes.				changes in legislation, regulations or bylaws. No monitoring requirements.		
C	Should there be changes in legislation and/or regulations the Applicant shall take the necessary actions to incorporate such changes and to pass these requirements on to the Contractors.	Planning Construction Operation Decommissioning	Ongoing during all the life of the project.	Applicant	The applicant must on a regular basis ensure compliance with any changes in legislation, regulations or bylaws. No monitoring requirements.	Ensures compliance with relevant legislation, regulations and bylaws.	An on-site legal compliance register should be kept on site and updated when required. Contractor's agreements should include a section on the need to comply with relevant legislation and regulations.
D	As a minimum, the NuVest is required by regulation to have a Major Incident Prevention policy in place before construction of the plant and a Process Safety Management System submitted to the Chief Inspector by 31 <sup>st</sup> January 2026.	Planning Construction Operation	Required before construction. Ongoing during all the life of the project	Applicant	The applicant must comply with this legislation and provide proof of compliance.	Ensures compliance with relevant legislation, regulations and bylaws.	An on-site legal compliance register should be kept on site and updated when required. Contractor's agreements should include a section on the need to comply with relevant legislation and regulations.
<b>14.1.2 COMPLIANCE WITH THIS EMPr</b>							
A	This EMPr should be adhered to during the lifetime of the project and updated when needed as per <b>Section 12</b> of this report. The Applicant is responsible for the maintenance, update and review of the EMPr. The ECO shall include any recommendations for proposed amendments/ alterations of the EMPr to the Applicant who shall engage the competent authority, to the extent required, with regards to such changes.	Planning Construction Operation Decommissioning	Ongoing during the life of the project.	Applicant	EO: daily EO: monthly during construction, decommissioning phase. Annually during operation phase.	Ensures compliance with this EMPr.	The EO should capture any non-compliance or incidents in an incident register. The EO should conduct monthly site inspections during construction, annual inspections during the operation phase and report on incidents or non-compliances as per Sections 11.2 and 11.3 of this EMPr. The EO shall advise in writing on any required changes to the EMPr.
<b>14.1.3 APPOINTMENT OF PROJECT TEAM</b>							
A	The Applicant is responsible to appoint a Project Manager and/or Community Liaison Officer (CLO) to assist in appointing contractors and managing of processes. The contractors should be	Planning Construction Operation (only if required)	Project manager, Contractors and Community Liaison Officer should be appointed during the	Applicant Project Manager CLO	Applicant (prior to construction and decommissioning and when necessary)	Appoint suitably qualified project team sourced locally as far as reasonably possible.	Contract with contractors which includes qualifications and experience.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	suitably qualified for the job and should preferably be sourced locally as far as reasonably possible.	Decommissioning	Planning and prior to the Decommissioning Phases. If a breach in contract from a contractor exists, a new appointment can be made on the Applicants discretion.				
B	A suitably qualified and independent ECO must be appointed to monitor and to provide environmental advisory services on site. The Contractor must appoint a suitably experienced EO to manage daily environmental issues on site.	Planning Construction Operation Decommissioning	Project manager and Contractors should be appointed during the Planning and prior to the Decommissioning Phases.	Applicant Project Manager	Applicant (prior to construction and decommissioning and when necessary)	Appoint suitably qualified ECO and ESR / EO	Contract / Letter of Appointments which includes qualifications and experience.

## 14.2 PLANNING AND DESIGN

### 14.2.1 IMPACTS ON AIR QUALITY

A	If dust becomes a nuisance during the construction phase, wind barriers should be placed on site. If it is apparent that dust / wind is an issue during the operational phase, then feasible measures must be implemented to control / manage impacts on air quality. It is recommended that emission stacks be installed, where feasible, and to investigate whether the stack height should be above the height of the nearest building as per recommended practise. It is further recommended that annual stack emissions testing be conducted to ensure that emissions of PM, Cl <sub>2</sub> and HCl (where applicable) at the proposed plant do not exceed the applicable MES. If exceedances do occur, then emission reduction measures should be investigated for the	Planning Construction Operation	Wind barriers and stacks be installed should be installed before construction and during operational phase if necessary.	Applicant Project Manager	Applicant (before construction phase) EO weekly ECO monthly	Installed adequate wind barriers and stacks	Adequate and functional wind barriers and stacks present on site.
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Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	specific pollutants where exceedances are observed.						
	Design of tank farm to adhere to the applicable South African National Standard (SANS 310)						
<b>14.2.2 IMPACTS ON EXISTING INFRASTRUCTURE AND SERVICES</b>							
A	Construction to be done under supervision of a registered engineer. Identify all infrastructure and services within proximity of the proposed facility during the planning phase and attempt to plan around the identified infrastructure and services as far as reasonably possible. If any construction sensitive infrastructure and services (underground or above-ground) exist, they should be clearly marked, and contractors should avoid these. The Developer will be liable for any damages to infrastructure.	Planning	During the planning phase and implementation during the construction phase.	Applicant Project Manager Contractor	EO (once-off prior to construction and monthly during construction)	No existing infrastructure is damaged or existing services are halted without notice because of construction.	EO daily diary and incident register should indicate no damage to existing infrastructure and that no services were halted without notification. Clearly marked existing infrastructure that needs to be avoided during construction.
B	If any services are to be temporarily halted during construction the relevant landowner and/or affected parties must be notified timeously (at least two weeks prior) prior to the service disruption. Appropriate alternative supply must be arranged for the service recipients if repair will require a significant amount of time.	Planning Construction	During the planning and construction phases.	Applicant Project Manager	EO daily	Identification of surrounding infrastructure and services to prevent damage or the halting of important services.	Evidence of written communication with surrounding occupiers specifically addressing existing infrastructure and services.
<b>14.2.3 IMPACTS ON TRAFFIC</b>							
A	There must be an erection of signage warning motorists about the presence of construction vehicles in the area. The Applicant, Project Manager and contractors should ensure that all construction vehicles using public roads	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Contractors	EO daily	Ensure that no unreasonable traffic delays are caused because of the project and that all traffic	All construction vehicles have road worthy certificates. EO daily diary and complaints register should have no traffic complaints.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	are in a roadworthy condition, that they adhere to the speed limits and that their loads are secured and that all local, provincial and national regulations are adhered to. The Applicant/ Contractor must ensure that regular users of the nearby roads are not unreasonably delayed due to construction activities.					regulations are adhered to.	
B	If any damage is caused to nearby public roads or within the Business Park because of construction, the Applicant should notify the relevant authorities and communicate with them on a solution to repair the damage.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager	EO daily	To prevent damage to roads and to ensure that if damage occurs because of activities relating to the plant that it is remediated as soon as possible.	If damage was caused, evidence of written communication to the relevant authorities to obtain a resolution to the damage as soon as possible.
C	Construction vehicles must be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation, and to minimise disruption of local traffic.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager	EO daily	To prevent damage to roads and to ensure that if damage occurs because of activities relating to the plant that it is remediated as soon as possible.	If damage was caused, evidence of written communication to the relevant authorities to obtain a resolution to the damage as soon as possible.
D	Construction activities that require the use of local public roads may not significantly disrupt traffic. The Developer must ensure that no additional trucks more than what the road network can handle without significant increase to the traffic are allowed to and from the facility.	Construction	Ongoing throughout construction phase.	Applicant Project Manager	EO weekly	To ensure less disturbance of traffic flow in the area and prevent nuisance to fellow road users.	EO and ECO checklists and complaints registers.
<b>14.2.4 IMPACTS DUE TO COMMUNICATION INEFFICIENCY</b>							
A	Clear and transparent communication with relevant authorities and all affected and surrounding I&APs about the proposed project and activities as well as possible vacancies. Keep a register with any complaints from	Planning	Prior to construction.	Applicant Project Manager	EO (daily during planning and construction phase)	To ensure that the authorities and community are aware of the proposed project, to give them a chance to raise any	EO to fill in any complaints or concerns from the surrounding community into the complaints register. Written communication to address the complaints and concerns, if any were received.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	stakeholders/ I&APs and address them appropriately.					comments or concerns and to reply to those comments and concerns. To obtain CVs of possible employees and contractors.	Evidence of communication about the project to the surrounding communities and authorities. If CVs are received, these need to be saved in a database for consideration (where reasonable).
<b>14.3 HEALTH, SAFETY AND SECURITY</b>							
<b>14.3.1 SITE ACCESS</b>							
A	Site must be fully fenced-off at all times. Access to the site should be controlled.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager	EO daily	To ensure security for employees and contractors on-site and to prevent theft and vandalism. Access should also be controlled for safety of anyone entering the premises and to account for everyone entering.	A daily visitors register should be completed by visitors.
B	No person shall be allowed to stay on the site, except for any security that might be patrolling at night.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager	EO daily	To prevent vandalism and theft. To ensure safety of the employees and visitors.	All visitors should sign the visitors register when they leave the premises. No reports from security of visitors or employees staying on-site.
<b>14.3.2 STORAGE AND HANDLING OF DANGEROUS GOODS</b>							
A	All regulations and guidelines relating to Storage and Handling of Dangerous Goods including: <ul style="list-style-type: none"> <li>• Fire Services Act (Act 99 of 1956); and</li> <li>• Occupational Health and Safety Act (Act 85 of 1996); and</li> <li>• Major Hazard Installation Regulations (2022) must be adhered to.</li> </ul>	Planning Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager	EO daily ECO monthly	To create a safe environment for all construction workers and employees with little to no fire and other health risks.	An on-site legal compliance register should be kept on site and updated when required. This register should include the Fire Services Act and Occupational Health and Safety Act. Fire extinguishers should be placed at all pre-identified sites.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
B	<p>The Applicant must take measures to protect his or her workers' health and safety against hazards that may result from the production, processing, use, handling, storage or transportation of articles or substances. Therefore, NuVest is required to:</p> <ul style="list-style-type: none"> <li>• Identify potential hazards which may be present while work is being done, something is being produced, processed, used, stored or transported, and any equipment is being used;</li> <li>• Establish the precautionary measures that are necessary to protect his or her workers against the identified hazards and provide the means to implement these precautionary measures;</li> <li>• Provide the necessary information, instructions, training and supervision while keeping the extent of workers' competence in mind;</li> <li>• Not permit anyone to carry on with any task unless the necessary precautionary measures have been taken;</li> <li>• Take steps to ensure that every person under their control complies with the requirements of the act;</li> <li>• Enforce the necessary control measures in the interest of health and safety;</li> <li>• See to it that the work being done and the equipment used, is under the general supervision of a worker who has been trained to understand the hazards associated with the work; and</li> </ul>	Planning Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Safety Officer	OHS Officer daily EO weekly ECO monthly	Ensures compliance with relevant legislation, regulations and bylaws. Achieve zero incidents occurrence and/or loss of manhours due to safety issues.	Induction and training records. A comprehensive Material Safety Data Sheet present on site. Emergency Response Plan. Visual observations.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<ul style="list-style-type: none"> <li>Such a worker must ensure that the precautionary measures are implemented and maintained.</li> </ul>						
C	Applicant must ensure compliance with SANS 10108, e.g. consider having explosion proof electrical equipment to prevent any explosions from hydrogen gas release that may lead to domino impact on the chlorine pipelines.	Planning Construction Operation	During the life of the project.	Applicant Project Manager	EO (quarterly) ECO (quarterly)	Developer should ensure that process safety standards are considered at every stage i.e. during final design, construction and commissioning for risk reduction.	Low occurrence of incidents. No complaints from the community related to safety.
D	The required PPE shall always be worn on site. Safety signs indicating required PPE must be erected at the relevant sites on the plant.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Contractor	EO daily	To promote health and safety and prevent unnecessary harm to employees.	Signs of required PPE that should be worn at all relevant stations. No complaints in the complaints register relating to employees or construction workers not wearing the required PPE. PPE should be part of the induction and training presentation. A signed register of all construction workers and employees that attended the induction and training presentation.
E	Provisions should be made to ensure dangerous goods that are not compatible with other substances (including other dangerous goods) are stored and handled separately from the other substances so that a loss of containment or any other interaction cannot cause a serious incident. All chemicals handled or stored on site should be classified and labelled according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).	Planning Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Safety Officer	OHS Officer daily EO weekly ECO monthly	Ensures compliance with relevant legislation, regulations, guidelines and bylaws.	A comprehensive Material Safety Data Sheet present on site. Visible hazardous substances labels. Visual observations.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
F	Firefighting equipment should be within proximity of the hazardous materials storage area.	Operation	During the operation phase	Applicant Project Manager	EO daily	Firefighting equipment close to the hazardous materials storage area to allow for quick response in case of fire.	EO to take notes in the daily diary if firefighting equipment is not serviced on time or available at the hazardous materials storage area.
G	All regulations relating to the storage and use of hazardous materials including hazardous e-waste (i.e. LCD monitors, tablets, OLED desktop monitors, laptops, Computers, and printers etc.) should be complied with.	Operation	During the entire operation phase.	Applicant Project Manager	EO daily	Prevent any harm to employees or damage to property relating to the storage of hazardous materials.	EO should take photos of and note any non-conformance with regards to the storage of hazardous waste in the daily diary.
H	Induction and training on the MSDS and safe operating procedures should be done for all employees working with or in the vicinity of hazardous materials on the possible hazards and handling of the materials.	Operation	Prior to the operation operations. When required during operation if new contractors or employees are employed.	Applicant Project Manager EO	EO (prior to operation, annually, and whenever new contractors or employees are employed)	Prevent any harm to employees relating to the handling of hazardous materials.	The training and induction presentation should include a section on the safe handling of hazardous materials. A training and induction register should be signed by all employees or contractors that attended the presentation.
I	First aid equipment should be within proximity of the hazardous materials storage area and supplemented as required. Staff responsible for first aid must be trained on first aid response and proof thereof be kept on site.	Operation	Prior to operation and when supplementation is required during operation.	Applicant Project Manager	EO (quarterly)	The availability of first aid equipment for use in a quick response if an employee is harmed.	First aid equipment is readily available within proximity of the hazardous materials storage facility and completely supplied.
J	The tanks, warehouse and any facility containing hazardous material including hazardous e-waste materials should be stored in appropriate containers and fully banded to avoid any leakage/spillages. These materials should also be stored in a suitably identified area.	Operation	During the entire operation phase.	Applicant Project Manager	EO daily	Prevent any harm to employees and environment or damage to property relating to inappropriate storage and/or handling of hazardous materials.	EO should take photos of and note any non-conformance with regards to the storage and handling of hazardous waste in the daily diary. EO should also take photos and notes of major spillages and any leaks in storage containers.
K	Employees must be made aware that no alcohol/drugs are allowed on site and	Construction Operation Decommissioning	During the life of the project.	Applicant Project	EO daily	Contributes to the health and safety of all construction workers	No complaints in the complaints register relating to employees or construction workers that are





Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	no workers under the influence are permitted on site.			Manager Contractor		and employees on-site and on the road.	under the influence or that have alcohol or drugs in their possession. Alcohol and substance usage should be part of induction and training presentation. A signed register of all construction workers and employees that attended the induction and training presentation.
L	Employees must be made aware that no open fires will be permitted on site.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Contractor	EO daily	Prevent the spread of unregulated fires which could cause environmental damage, explosions or harm to construction workers, employees or the general public.	No complaints in the complaints register relating to employees or construction workers starting fires. If evidence of an open fire is found the EO must take photos and note it in the daily diary. Fire hazards should be part of the induction and training presentation. A signed register of all construction workers and employees that attended the induction and training presentation.
M	A site plan of the area must be made available on-site indicating important areas such as dangerous good storage areas, operation areas, parking spaces, offices and emergency exits.	Operation	During the entire operation phase.	Applicant Project Manager	EO daily	To ensure employees and visitors do not get lost and stumble into unsafe spaces. To indicate exits in case of an emergency.	A clear site plan in a visible position near the entrance of the plant.
N	A Safe Distribution of Hazardous Goods and Chemicals Procedure in line with the Hazardous Substances Act (Act No.15 of 1973) must be compiled and implemented. The Procedure must include the following as a minimum: <ul style="list-style-type: none"> <li>• Induction for collection &amp; delivery personnel;</li> </ul>	Operation	During the entire operation phase.	Applicant Project Manager Contractor OHS Officer	OHS Officer daily EO daily	Prevent chemical burns, explosions, fires, and harm to the general public.	Comprehensive and adequate Safe Distribution of Hazardous Goods and Chemicals Procedure. Training and induction records. Zero safety incidents related to storage and handling of hazardous substances. No complaints from the community relating to safety incidents.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<ul style="list-style-type: none"> <li>• Step-by-step collection and delivery process;</li> <li>• Speed restrictions and signage on site;</li> <li>• Required PPE for collection and delivery process;</li> <li>• MSDS;</li> <li>• Designated storage locations of various hazardous substances;</li> <li>• Potential risks that may occur and Mitigation;</li> <li>• Regular monitoring storage areas, collection and deliveries;</li> <li>• Emergency Response Plan.</li> </ul>						
O	<p>The following general requirements must be met:</p> <ul style="list-style-type: none"> <li>• All manufactured and/or imported materials must be stored in an appropriate manner within the designated area;</li> <li>• Tanks and containers must be situated in a bunded area, the volume of which must be at least 110% of the proposed volume of the tank or container;</li> <li>• Any water that collects in the bund must not be allowed to stand and must be removed and the hydrocarbon digestion agent within must be replenished;</li> <li>• Symbolic safety signs depicting “No Smoking”, “No Naked Flames” and “Danger” are to be prominently displayed in and around the storage areas;</li> <li>• Regular inspections must be carried out to detect leaks and spillages. All storage facilities must be maintained as regularly as is necessary to ensure they meet the original specification.</li> </ul>	Operation	During the entire operation phase.	Applicant Project Manager Contractor OHS Officer	OHS Officer daily EO daily ECO monthly	Prevent chemical burns, explosions, fires, and harm to the general public and contamination of soils, surface / groundwater.	Comprehensive and adequate Safe Distribution of Hazardous Goods and Chemicals Procedure. Training and induction records. Zero safety incidents related to storage and handling of hazardous substances. No complaints from the community relating to safety incidents.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<ul style="list-style-type: none"> <li>All equipment (tank / container) that leaks must be repaired immediately.</li> <li>Ensure that spill kits and absorbent material are readily available at the hazardous storage areas to absorb any spills.</li> </ul>						

## 14.4 EMERGENCY RESPONSE AND DISASTER MANAGEMENT

### 14.4.1 FIRE PREVENTION AND RESPONSE PROCEDURE

A	<p>A fire and explosion emergency preparedness and evacuation plan must be developed and implemented for the operational phase of the project:</p> <ul style="list-style-type: none"> <li>Basic firefighting equipment must be kept at strategic points throughout the chemical plant. All personnel must receive training of the equipment and the accepted fire escape measures in case of emergency;</li> <li>Suitable PPE and/or Explosion Protection Equipment must be made available to all employees and worn at all times especially those working in the tank farm.</li> <li>Emergency exits and assembly points must be clearly marked for the project, and all personnel must be made aware of these and use them in cases of emergency; and</li> <li>Emergency response contact details must be placed in visible and common areas inside the chemical plant.</li> </ul>	<p>Planning Construction Operation Decommissioning</p>	<p>Fire and explosion risks should be identified prior to construction. A response plan must be drafted prior to construction and ready to be implemented throughout the life of the project.</p>	<p>Applicant Project Manager Contractor</p>	<p>EO monthly ECO monthly</p>	<p>Proper planning, an efficient and readily available fire response plan and firefighting equipment at the predefined locations can prevent/ mitigate a major fire hazard.</p>	<p>Fire response plan is completed and kept up to date. All firefighting equipment is in place and serviced.</p>
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### 14.4.2 ACCIDENTAL SPILLAGE PROCEDURE

A	<p>A spill response plan should be in place in the event of accidental spillages of hazardous chemicals (petrol, diesel and</p>	<p>Construction Operation Decommissioning</p>	<p>An emergency response plan in case of spillage should be drafted prior to</p>	<p>Applicant Project Manager</p>	<p>EO monthly ECO monthly</p>	<p>An adequate spill incident response plan in case of</p>	<p>A completed spill incident response plan prior to construction.</p>
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Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<p>oil). Accidental spillages should be cleaned up immediately by the contractor or relevant employee, placed in sealed containers and disposed of at a licensed waste disposal site including:</p> <ul style="list-style-type: none"> <li>• Regular monitoring of the tank farm facility and generators must be undertaken to check for any potential spills or leakages of diesel;</li> <li>• Any maintenance defects to the facility that may lead to leakages of diesel must be undertaken immediately upon identification;</li> <li>• The diesel generators in use should be serviced as required to ensure that future spillages are prevented; and</li> <li>• The designated diesel storage and generator areas must be a hard concrete surface with bunds to ensure that any leakages are contained to the area and do not spread to the environment.</li> </ul>		<p>construction. Implementation should occur during all other phases in case of spillages.</p>	Contractor		<p>spillages can help minimise the amount of dangerous chemicals entering the environment.</p>	
<b>14.5 SOCIO-ECONOMIC IMPACTS</b>							
<b>14.5.1 EMPLOYMENT CREATION AND JOB LOSSES</b>							
A	<p>Employ people from the surrounding local communities and SMMEs as far as reasonably possible. Use existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities and informing the</p>	<p>Construction Operation Decommissioning</p>	<p>Prior to the relevant phases and when new employment opportunities are made available.</p>	<p>Applicant Project Manager</p>	<p>Applicant (once of before each phase or when new employment opportunities are made available).</p>	<p>Employment of contractors and employees from surrounding communities will contribute to City of Johannesburg Local Municipality goal of reducing</p>	<p>Contracts between the Applicant and qualified contractors/employees from the local communities as far as reasonably possible. Evidence of written communication between the Applicant and existing community structures about available job opportunities.</p>



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	Applicant of possible contractors in the local community.					unemployment as well as positively contribute to certain livelihoods in the community through income generation.	
B	Ensure contributions are made for employees to the Unemployment Insurance Fund (UIF) where required.	Construction Operation Decommissioning	Prior to the relevant phases and when new employment opportunities are made available for permanent employees.	Applicant Project Manager	Applicant and EO (once of before each phase or when new employment opportunities are made available).	Contributions to the UIF for all employees (excluding contractors) will ensure that employees have a income source if they are not able to work anymore.	Salary slips indicating contribution to UIF.

## 14.6 NOISE GENERATION

### 14.6.1 GENERATION OF NOISE THAT COULD BE HARMFUL OR A NUISANCE

A	All plant and construction equipment to be kept in good repair to ensure that point source noise emissions are reduced.	Construction Operation Decommissioning	During construction, operation and decommissioning phases.	Applicant Project Manager Contractor	EO daily	Fully serviced vehicles on-site will prevent unnecessary noise pollution.	The project manager should ensure that vehicles get serviced on-time. Service records for all vehicles should be available on-site. The EO should record any excessive noise in the daily diary.
B	Applicant should consider noise abatement measures / equipment to be installed on machines where possible to reduce operational noise as much as possible.	Operation	Operation	Applicant project Manager Contractor	EO daily	Prevent noise nuisance to surrounding occupiers.	The EO should inspect equipment daily.
C	Comply with the relevant South African National Standards (e.g., SANS 10103) and other noise control legislation. The ECO has the discretion to instruct that monitoring be undertaken.	Construction Operation Decommissioning	During the life of the project.	Applicant project Manager Contractor	EO daily	The methods and guidelines to assess working environments with respect to acoustic comfort, excellence, and with respect to possible annoyance	The EO should ensure that this standard is complied with.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
						by noise and speech communication should be employed to prevent annoyance and communication disruption.	
D	The Environment Conservation Act (Act 73 of 1989) (ECA), Section 25 of the Act and the Noise Regulations (GNR 154 of 1992) promulgated under this section, are still in effect. These regulations serve to control noise and general prohibitions relating to noise impact and nuisance. These regulations need to be complied with.	Construction Operation Decommissioning	During the life of the project.	Applicant project Manager Contractor	EO daily	Compliance with the noise regulations will prevent unnecessary noise nuisance.	Construction vehicles, equipment and facilities maintained in good working condition and no noise nuisance is generated from the activities. No noise complaints in the complaints register.
E	All construction activities should take place during the day from 07:00-17:00 Monday to Friday, unless otherwise agreed to by the Developer, Contractor and adjacent landowners.	Construction Operation Decommissioning	During the life of the project.	Applicant project Manager Contractor	EO daily	Compliance with the noise regulations will prevent unnecessary noise nuisance.	The EO should ensure that the regulations are complied with.
F	Noise amplifying activities such as playing loud music by the construction personnel must be avoided on site at all times, only noise related to the construction and operational activities can be allowed.	Construction Operation Decommissioning	During the life of the project.	Applicant project Manager Contractor	EO daily	Compliance with the noise regulations will prevent unnecessary noise nuisance.	The EO should ensure that the regulations are complied with.
G	A complaints register must be developed and maintained by the site Environmental Officer. Any noise related complaints received from the community must be formally registered and addressed immediately and sufficiently by the Contractor or Applicant.	Construction Operation Decommissioning	During the life of the project.	Applicant project Manager Contractor	EO daily	Compliance with the noise regulations will prevent unnecessary noise nuisance.	The EO should ensure that the regulations are complied with.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
<b>14.7 WASTE MANAGEMENT</b>							
<b>14.7.1 MANAGEMENT OF GENERAL, HAZARDOUS AND OPERATION WASTE AND SEWAGE</b>							
A	Site staff should use supplied ablution facilities. A minimum of one toilet must be provided per 15 persons.	Construction Operation Decommissioning	Prior to each phase and when new contractors or employees are employed.	Applicant Project Manager Contractor EO	EO daily	Prevention of excretion and urination other than in supplied ablution facilities. Prevention of overuse of toilets.	No complaints from contractors or employees relating to a lack of ablution facilities in the complaints register. Clean ablution facilities. EO should note any indiscriminate excretion or urination in the daily diary.
B	No waste releases into the environment should be permitted.	Construction Operation Decommissioning	During the entire life of the project.	Applicant Project Manager Contractor	EO daily	To prevent pollution and keep a clean environment.	EO to take photos and note any illegal waste release into the environment in the daily diary.
C	Toilet paper should always be supplied at all toilets. Toilet paper dispensers shall be provided in all toilets.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Contractor	EO daily	Promote comfortable ablution facilities.	Toilet paper should always be stocked in all toilets.
D	A dedicated waste collection and storage facility must be prepared, and this should be emptied and collected wastes disposed of on a regular basis. Wastes, including hazardous unused e-waste, must be disposed of at suitably licensed waste disposal facilities.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Contractor	EO daily	Ensure easy management and collection of all wastes on a regular basis. Ensures compliance with certain waste management regulations.	All waste (except for small amounts of waste in bins at designated areas in the offices and operation areas) should be accounted for in a dedicated storage area until collection. No bins or skips should overflow with waste. Confirmation that the waste disposal facility is licensed.
E	Vermin / weatherproof bins must be provided in sufficient numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up and emptied regularly to avoid overfilling and other associated nuisances.	Construction Operation Decommissioning	During the life of the project.	Applicant Project Manager Contractor	EO daily	Prevent quick, uncontrollable build-up of domestic waste in bins. Prevent pollution of domestic waste through use of weatherproof and vermin proof bins. Prevent unpleasant odour build-up.	Well secured and sturdy domestic waste bins which are not overflowing on-site. No unpleasant odour build-up near these bins.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
F	Site must be checked daily to ensure that the site is free from litter and unnecessary wastes.	Construction Decommissioning	During the entire construction, decommissioning phases.	Applicant Project Manager Contractor	EO daily	To keep the environment clean from litter and waste.	No waste or litter lying in or around any of the construction sites.
G	Hazardous wastes must be stored in a secure location, isolated from direct contact with the soils and covered where necessary.	Construction Operation Decommissioning	During the entire life of the project.	Applicant Project Manager Contractor	EO daily	To protect the environment from any pollution relating to hazardous waste.	A designated secured location for hazardous waste on-site, which is isolated from the ground and covered where necessary.
H	No waste is to be left on site whether it is biodegradable or not. Unutilised construction materials are to be removed once construction has ended.	Construction Decommissioning	At the end of construction, decommissioning phases.	Applicant Project Manager Contractor	EO (once-off after the relevant phases)	To protect the environment from any pollution and to promote an aesthetically pleasing environment.	No waste/ unutilised construction materials left on-site after the construction or decommissioning phases.
I	<p>Compliance with the Waste Management By-law of the Midvaal Municipality:</p> <ul style="list-style-type: none"> <li>The waste generator shall ensure that all the waste management service providers and subcontractors in relation to waste generated on site are in possession of Accreditation Permits.</li> <li>The waste generator shall ensure waste information is recorded accordingly as may be requested by the Municipality for the council waste management information system.</li> <li>Any person generating domestic waste, business waste and dailies, other than waste which has been designated by the Council as recyclable as contemplated in section 8(4) (iii) , must place such waste, in an approved receptacle.</li> </ul>	Construction Operation Decommissioning	During the entire life of the project.	Applicant Project Manager Contractor	Annually	To protect the environment from any pollution relating to hazardous waste.	A designated secured location for hazardous waste on-site, which is isolated from the ground and covered where necessary.





Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<ul style="list-style-type: none"> <li>• The occupier and/or owner or in the case of more than one, the owners of, premises on which business waste or domestic waste is generated shall within seven days after commencement of the generation of such waste notify the Council in writing;</li> <li>• All private entities/contractors removing waste (including garden service businesses) from premises within Midvaal Local Municipality shall register with the Council. No waste removal service may be conducted without prior registration;</li> <li>• The owner must submit proof of safe disposal certificate by the private entities/contractors on an approved sanitary landfill site to the Council on a regular monthly basis;</li> <li>• Waste generated within the Council's jurisdiction must be disposed in a licensed facility;</li> <li>• The owner or occupier of premises on which business, industrial or recyclable waste is generated, must ensure that until such time as such waste is collected by a licensee from the premises on which it was generated; the waste is stored in a bulk container or other approved receptacle; and no nuisance or health risk, including but not limited to dust, is caused by the waste in the course of generation, storage or collection.</li> </ul>						



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<ul style="list-style-type: none"> <li>No person may carry on an activity which will generate special industrial, hazardous or health care risk waste, without notifying the Council in writing, prior to the generation of such waste, of the composition of such waste, the estimated quantity to be generated, the method of storage, the proposed duration of storage, the manner in which it will be collected and disposed of, and the identity of the licensee who will remove such waste;</li> <li>Only a licensee may transport special industrial, hazardous and health care risk waste and must do so in accordance with the requirements of the conditions of the licence issued to him or her under Chapter 6 as well as in the relevant SANS codes; and</li> <li>Furthermore, it is the responsibility of the developer to ensure best waste management practices which waste avoidance, reuse, reduce and recycle and if not possible ensure cradle to grave.</li> </ul>						
<b>14.8 TERRESTRIAL BIODIVERSITY</b>							
<b>14.8.1 VEGETATION AND HABITATS</b>							
A	Construction camps and laydown areas (if needed) must be located at an easily accessible point and within disturbed areas.	Planning Construction	Ongoing throughout construction phase.	Project manager, EO	At the start of the project and ECO monthly.	To reduce environmental damage and fragmentation which may result from the	Visual observation that the construction camp sites are located in designated areas, approved by the Project Manager away from environmentally sensitive areas identified onsite.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
						establishment of construction camp.	
B	The Contractor must submit a Method Statement (MS) indicating the final layout including construction camps and laydown areas (if applicable).	Planning Construction	During the construction phase.	Project manager, EO	At the start of the construction phase.	To ensure that construction camps and laydown areas are placed in correct placed as approved by the Project Manager.	Method statements submitted to the ECO, environmental file.
C	Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.	Construction Operation	During the construction phase.	Project manager, EO	EO daily, ECO monthly.	To prevent the loss of indigenous vegetation throughout the project site and prevent the invasion by alien vegetation.	Visual observations onsite and weekly ECO checklists.
D	Dedicated entrance and exist gates and walking paths must be made use of.	Construction Operation	During the construction phase.	EO & Design Engineer	EO daily, ECO monthly.	To prevent the loss of indigenous vegetation in areas that are not designated walking paths and to maintain the integrity of environmental sensitive areas onsite.	Visual observations, weekly EO checklist, ECO checklists.
E	All laydown, chemical toilets etc. should be restricted to low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No storage of vehicles or unused equipment will be allowed outside of the designated project areas.	Construction Operation	During the construction phase.	EO & Design Engineer	EO daily, ECO Monthly	To prevent the leakage of hazardous materials into the environmentally sensitive areas and thus avoid pollution of those areas.	Spill registers, visual site observations.
G	Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.	Construction	During the construction phase.	EO & Contractor	EO weekly and ECO monthly.	To prevent any soil erosion onsite.	Adequate Soil erosion control on site, visual site observations.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
H	A chemical spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.	Construction Operational	For the duration of the project life cycle.	EO & Contractor	EO daily and ECO monthly	To prevent pollution of the environment by hydrocarbon spills and minimise the need for spill clean-ups which might be costly.	Spill incident procedure submitted to the ECO, daily and monthly environmental checklists, visual observations of the site.
I	All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or moved to a suitable contained area	Construction Operational	Throughout the project life cycle.	EO & Contractor	EO daily, ECO monthly	To prevent the pollution of the environment by spillages.	Spill registers, EO weekly checklists and ECO monthly checklists.
J	Washing of equipment shall be restricted to urgent maintenance requirements only. All washing shall be undertaken in a designated bunded area which must be equipped with suitable wastewater collection measures. The use of detergents for washing shall be controlled, subsidising	Construction Operational	Throughout the project life cycle	EO & Design Engineer	EO daily and ECO monthly	To prevent the pollution of environmental sensitive areas by the use of cleaning detergents from wash water.	The presence of a designated maintenance area, EO daily checklists, ECO monthly checklists and visual site observations.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	detergents with a low phosphate and nitrate concentration.						
K	A carefully considered and updated stormwater management plan must be implemented.	Operational	During the operational phase	EO & Contractor	As and when required	To reduce environmental pollution by cleaning chemicals and manage surface water.	Visual site observation, EO checklists and surface water/drainage management plan submitted to the ECO
L	Cement and concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces to the satisfaction of the EO and ECO.	Construction	During the construction phase	Project manager, EO	EO daily and ECO monthly	To prevent the pollution of the environment by the concrete spills.	EO weekly checklists and ECO Monthly checklists. Visual site observations of where concrete mixing occurs.
M	A fire management plan needs to be complied with and implemented to restrict the impact fire might have on the surrounding areas.	Construction Operational	Throughout the project life cycle	EO & Contractor	EO daily and ECO monthly	To reduce the risk of environmental hazards which can result from fires and reduce impact on vegetation onsite.	Fire management developed and submitted to the ECO.
N	Where possible rocks removed in the construction phase should be used in areas where erosion control needs to be performed	Construction	During the construction phase.	EO & Contractor	Whenever required	To reduce and control erosion onsite	Visual observation of rocks used to control erosion.
O	Where possible replace Kikuyu in lawns with indigenous grasses such as <i>Cynodon dactylon</i> (Couch Grass), <i>Dactyloctenium austral</i> (Durban Grass) and St. Augustine grass ( <i>Stenotaphrum secundatum</i> ). <i>Dactyloctenium austral</i> especially does well as a lawn grass in Gauteng and maintenance is straightforward.	Construction Operation	Throughout the project life cycle.	EO & Contractor	Ongoing	To promote the growth of indigenous vegetation throughout the project site.	Visual observation of indigenous grasses used in lawn maintenance.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
<b>14.8.2 FAUNA</b>							
A	The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments. Signs must be put up to enforce this.	Construction Operational	Throughout the project life cycle.	Project manager, EO	EO daily, ECO monthly	To reduce the disturbance of construction activities on surrounding areas	Signs in place to enforce this mitigation measure.
B	Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to avifauna species and nocturnal mammals.	Construction Operational	Throughout the project life cycle	Applicant, Project manager and EO	Ongoing	To avoid noise which may chase away bird species from the project area.	Minimum noise during the evenings, construction and operational minimised to acceptable working hours, complaints registers maintained onsite.
C	No trapping, killing, or poisoning of any animals (i.e. birds) is to be allowed. No unnecessary cutting down of trees or shrubs is to be permitted. EO must assess trees to be cut down / removed for birds nesting. Nests identified to be relocated to an appropriate area	Construction Operation	Throughout the project life cycle	EO	Ongoing	To prevent killing of birds nesting on site.	Zero bird killings on site.
D	Facility lighting during construction & operation should be kept to a minimum and should make use of the latest technology to ensure that light disturbance is minimised. This will also reduce the attraction of insects (and in turn insectivorous birds) to the facility	Construction Operational	Throughout the project life cycle.	Project manager, EO & Design Engineer	EO daily and ECO monthly.	To reduce the attraction of insects (and in turn insectivorous birds) to the facility.	Visual site observations of the facility lighting.
E	All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to	Construction Operational	Throughout the project life cycle	Health and Safety Officer	EO daily, ECO monthly	To minimise killing of animals on site as a result of construction activities.	Environmental Awareness Training Registers, ECO monthly checklist.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	comply with speed limits, to respect all forms of wildlife.						
F	All areas to be developed must be walked through by the EO before the activity commences to ensure no nests or fauna species are found in the area. Should any sensitive species or their nest be found in the area, a suitably qualified specialist must be consulted to advise on the correct actions to be taken.	Construction Operational	At the start of the project.	EO	Once at the start of the project	To prevent the killings of faunal species which may occur within the project area and ensure safe relocation of any sensitive animals which may be onsite when construction commences.	Site walk throughs to search for animals prior to the occurrence of activities onsite. Safe rescuing of animal species found onsite.
G	Ensure that cables and connections are insulated successfully to reduce electrocution risk.	Planning Construction Operational	Throughout the project life cycle	EO & Contractor, Engineer	ECO monthly	To prevent the killing of fauna which may be located on site by electric shocks.	ECO monthly checklists.
<b>14.8.3 ALIEN SPECIES</b>							
A	The footprint area of the construction should be kept to a minimum. The footprint area must be demarcated to avoid unnecessary disturbances to adjacent areas.	Construction	During the construction phase.	Project manager, EO & Contractor	EO daily ECO monthly	To prevent the encroachment of the site vegetated areas by alien species.	Visual observations of no alien vegetation onsite, ECO and EO checklists.
B	Occurrence / presence of alien species must be managed as and when necessary. ECO should regularly check and ensure control / removal of alien invasive species is being undertaken.	Construction Post Construction	Throughout the project life cycle	Project manager, EO & Contractor	ECO Monthly	To ensure that alien vegetation is successfully managed even post construction	Visual observations of no alien vegetation onsite.
C	No alien invasive vegetation shall be used for any rehabilitation or landscaping purposes	Construction Rehabilitation	Throughout the project life cycle.	Project manager, EO & Contractor	ECO monthly	To prevent the encroachment of the site vegetated areas by alien species.	Visual observations of no alien vegetation onsite, ECO and EO checklists.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
<b>14.8.4 GENERAL</b>							
A	Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces.  No non environmentally friendly suppressants may be used as this could result in pollution of water sources.	Construction  Operational	Throughout the project life cycle.	Project manager, EO & Contractor	EO daily  ECO monthly	To suppress dust on site and avoid nuisance to neighbours and other residents by dust from the site.	Visual observations of dust suppression measures onsite.
C	An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, re-use, and recycling of materials. Containers for recycling of at least glass, paper, metals, and plastics shall be provided at the construction camp. Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof.	Planning  Construction  Operational	During the operational phase.	EO & Health and Safety Officer	EO monthly	To prevent the attraction of pesticides to the site by mismanaged general waste.	Visual observation of effective waste management onsite, closable waste bins, regular waste disposal certificates.
C	A minimum of one toilet must be provided per 15 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Construction	During construction phase	EO & Health and Safety Officer	EO daily  ECO monthly	To prevent the spillage of effluent into the environment and therefore prevent the pollution into the environment.	Visual observations of clean and well maintained toilets onsite, EO weekly checklists and ECO monthly checklists.
D	The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility	Construction	During the construction phase	EO & Health and Safety Officer	EO daily  ECO monthly	To ensure safe handling and disposal of waste onsite.	Visual observations of marked and separate waste bins onsite, safe disposal slips for waste.
E	Under no circumstances may domestic waste be burned on site	Construction  Operational	Once at the start of the project	EO, Contractor & Health	EO daily  ECO monthly	To ensure safe handling and disposal of waste onsite	Approved waste management method statement, no burning of waste onsite.





Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
				and Safety Officer			
F	Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. The maximum domestic waste storage period will be 10 days.	Life of operation	Throughout the project life cycle.	EO, Contractor & Health and Safety Officer	EO daily ECO monthly	To ensure safe handling and disposal of waste onsite	Visual observations of covered waste bins that are frequently emptied.
<b>14.8.5 ENVIRONMENTAL AWARENESS TRAINING</b>							
A	All personnel and contractors to undergo Environmental Awareness and Occupational Health and Safety (OHS) Training. A signed register of attendance must be kept for proof. Contractors and employees must all undergo the induction and be made aware of the potential risks and Emergency Response Procedure.	Construction	During the construction phase.	EO, Contractor	ECO monthly	To ensure that all construction personnel are aware of environmental sensitivities onsite and other important environmental topics like waste management.	Environmental Awareness Training registers, EO and ECO checklists.
<b>14.8.6 EROSION</b>							
A	Speed limits must be put in place to reduce erosion.  Reducing the dust generated by the listed activities above, especially the earthmoving machinery, through wetting the soil surface and putting up signs to enforce speed limit as well as speed bumps built to force slow speeds.  Signs must be put up to enforce this.	Construction Operational	Throughout the project life cycle	Project manager, EO	EO daily, ECO weekly	To reduce erosion and dust generation caused by activities onsite	Speed limit signs, visual observations of dust suppression through wetting, complaints registers, EO weekly and ECO monthly checklists.
E	A stormwater management plan must be updated and implemented.	Planning Construction	Throughout the project life cycle	Project manager,	ECO monthly	To ensure that stormwater is managed appropriately onsite	Visual observations of stormwater management measures implemented onsite, approved



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
		Operational		Environmental Officer		and reduce the risk of flooding.	stormwater management plan and ECO checklists.
<b>14.9 HERITAGE</b>							
<b>14.9.1 IMPACT ON THE GENERAL PROJECT AREA</b>							
A	Implement a chance to finds procedures in case where possible heritage finds are uncovered.	Construction	Ongoing for the duration of construction	Applicant EO Heritage Specialist	EO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	EO Monthly Checklist/Report
<b>14.9.2 IMPACT ON POSSIBLE CULTURAL AND FOSSIL HERITAGE</b>							
A	A suitably qualified ECO must be appointed and must be able to identify possible archaeological, cultural, palaeontological and historic features during the construction phase.  The ECO must train the Contractor to recognise any heritage features. Should there be a sign of such objects, construction must halt in that area immediately and a suitably qualified heritage specialist must be called to investigate through the ECO.	Construction	Ongoing for the duration of construction	Applicant EO ECO	EO (monthly / as or when required)  ECO monthly	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	Training and Induction Reports  EO Monthly Checklist/Report
B	Should graves be discovered/uncovered the site should be demarcated with a 30-meter no-go-buffer-zone and the grave should be avoided.	Construction	Ongoing for the duration of construction	Applicant EO Heritage Specialist	EO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under	EO Monthly Checklist/Report



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	<p>If human remains are discovered a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.</p> <p>If during the test excavations it is determined that the feature is not a grave, the site will then have no heritage significance and require no further mitigation.</p>					Section 36 and 38 of NHRA	
C	<p>Should any palaeontological material be exposed during clearing, digging, excavating, drilling or blasting (unlikely), SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.</p> <p>All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken</p>	Construction	Ongoing for the duration of construction	Applicant EO Palaeontologist	EO (monthly / as or when required) ECO monthly	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	Monthly Checklist/Report



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
<b>14.10 CLOSURE AND DECOMMISSIONING</b>							
<b>14.10.1 REHABILITATION AND DECOMMISSIONING PLAN</b>							
A	Decommissioning and Dismantling must be guided by guidelines and relevant legislations such as Decommissioning and Dismantling of High-Risk Plant Guideline, OHS Act, Safety Standards for Decommissioning Hazardous Plant, etc. All building waste must be temporary stored in such a way as to prevent pollution of the environment and disposed at a registered hazardous facility. Oil containing equipment must be temporary stored on a bunded facility and disposed at a registered hazardous facility. Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment. The Contractor must also be equipped to contain and clean up any pollution causing spills.	Decommissioning	After the completion of all phases.	Project Manager EO	EO weekly	The site should resemble a pre-construction state.	Construction material, operational facilities and waste offsite. Photographic evidence and waste disposal registers.
B	All areas disturbed by operational activities must be subject to landscaping and rehabilitation adequate to allow for the proposed end-user.	Decommissioning	After the completion of all phases.	Applicant Project Manager	EO weekly	The site should resemble a pre-construction state.	Evidence of rehabilitation. No waste on-site and represent a pre-construction state.



Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
C	All exotic flora and weeds to be eradicated in an environmentally friendly manner	Decommissioning Rehabilitation	After the completion of all phases.	Project Manager EO	EO weekly	The site should resemble a pre-construction state.	No presence of weeds on site.