



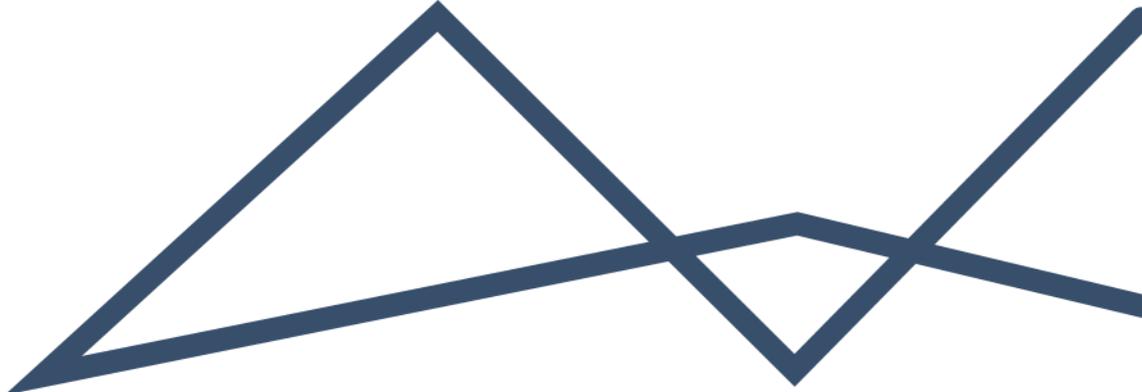
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# ENVIRONMENTAL MANAGEMENT PROGRAMME

KUSASA REFINING (PTY)





**DOCUMENT DETAILS**

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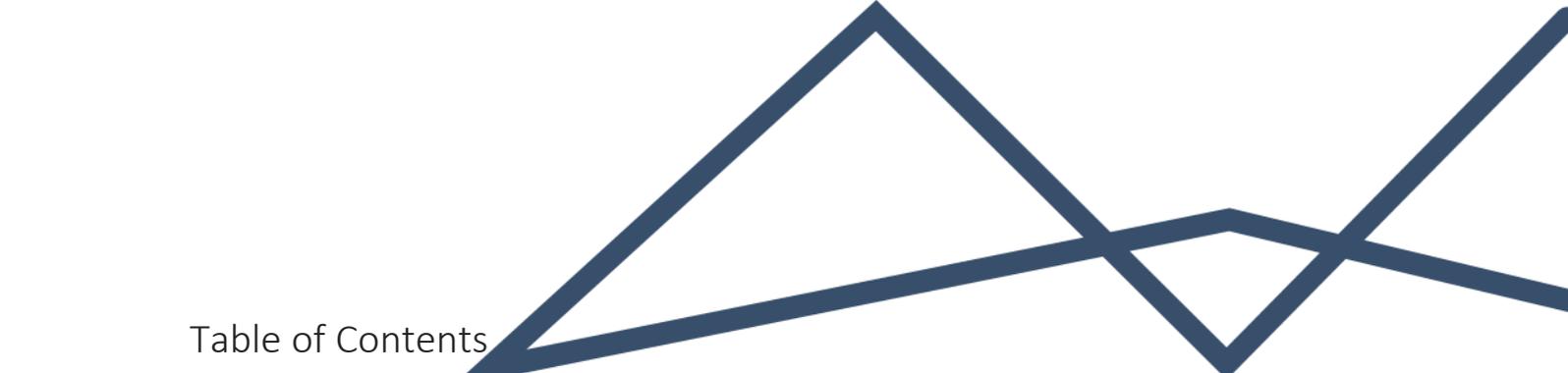
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| REVISION DATE: | REV #             | DESCRIPTION   |
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| 2026/03/12     | REVISION 1        | EMPr submitted with application for EA to include new PGM Line-GAUT REF#: 002/25-26/E0277 |

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# 1 INTRODUCTION

Kusasa Refining operates a precious metals refining facility in Wadeville, Ekurhuleni, Gauteng. Kusasa is in possession of the following licences:

- Waste Management Licence: 12/9/11/L200210120254/3/V.
- Air Emissions Licence: 14/1/1/7/8/188/kusasa/Wadeville/ALB
- **PENDING** Environmental Authorisation: GAUT REF#: 002/25-26/E0277

This EMPr has been compiled as a guideline for the mitigation and management measures to be implemented to avoid, reduce and minimise potential environmental impacts arising out of the construction phase of the project. Table 1 is provided for ease of reference to indicate where the required information is presented in the EMPr.

Table 1: GNR982 EMPr Content Checklist.

| GNR982 Appendix 4 Requirements |   | Relevant Section of this Report |
|--------------------------------|---|---------------------------------|
| 1.                             | An EMPr must comply with section 24N of the Act and include-  | Section 4, Appendix A           |
| (a)                            | details of-   |                                 |
| (i)                            | the EAP who prepared the EMPr; and  |                                 |
| (ii)                           | the expertise of that EAP to prepare an EMPr, including a curriculum vitae;   |                                 |
| (b)                            | a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;  | Section 6                       |
| (c)                            | a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;                                     | Section 6<br>Figure 2           |
| (d)                            | a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- | Section 17                      |
| (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;   |                                 |
| (e)                            | a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);  | Section 17                      |
| (f)                            | a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in  | Section 17                      |



| GNR982 Appendix 4 Requirements   | Relevant Section of this Report |
|--|---------------------------------|
| paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -<br>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;<br>(ii) comply with any prescribed environmental management standards or practices;<br>(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and<br>(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable; |                                 |
| (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);  | Section 17                      |
| (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);   | Section 17                      |
| (i) an indication of the persons who will be responsible for the implementation of the impact management actions;  | Section 17                      |
| (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;   | Section 17                      |
| (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);  | Section 17                      |
| (l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;  | Section 17                      |
| (m) an environmental awareness plan describing the manner in which-<br>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and<br>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and  | Section 13                      |
| (n) any specific information that may be required by the competent authority.  |                                 |

## 2 SCOPE OF THIS DOCUMENT

The purpose of the EMPr is to give effect to precautionary measures, which are to be put in place for controlling the activities that take place during the construction and operational phase of the project. The EMPr also provides guidance to assist in ensuring compliance with relevant national legislative and regulatory requirements.

It should be borne in mind, however, that the EMPr is a working document that should be updated on a regular basis, as and when necessary. Formal risk identification forms an integral part of EMPr management and assists with prioritizing and focusing the control of risks. The EMPr thus supports this on-going proactive mitigation and the duty of care to the environment. The EMPr shall therefore allow for risk minimization, rather than just



ensuring legal compliance. The purpose of this EMPr is thus also to 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. Any revisions or amendments to the EMPr must be undertaken according to the provisions of Chapter 5 of the National Environmental Management (Act 107 of 1998-NEMA), Environmental Impact Assessment (EIA) regulations (GNR982).

### 3 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 Waste Management Licence application process (under the provisions of the 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 takes into account 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.

### 4 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

EIMS has been appointed by the Applicant to fulfil the role of Environmental Assessment Practitioner (EAP) and to compile this EMPr. EIMS is compliant with the definition of an EAP as defined in Regulation 13 (GNR982). This includes, inter alia, the requirement that EIMS is:

- 1) Objective and Independent;
- 2) Has expertise in conducting EIAs;



- 3) Comply with the NEMA, the Regulations and all other applicable legislation;
- 4) Takes into account all relevant factors relating to the application; and
- 5) Provides full disclosure to the applicant and the relevant environmental authority.

EIMS is a private and independent environmental management consulting firm with in excess of 30 years' experience in conducting EIAs. The EAP's responsible for preparing this EIA Report are Monica Niehof (Senior Consultant) and Mr Liam Whitlow (Principal EAP). Brief details of Monica and Liam's expertise and experience are presented below:

Liam Whitlow is a registered Professional Natural Scientist who holds a Bachelor of Science Honours degree and has more than 9 years' experience in the environmental field. His key focus is on environmental impact assessments, environmental permitting, public participation, environmental management plans and programmes, strategic environmental advice, rehabilitation advice and monitoring, environmental compliance advice and monitoring as well as providing technical input for projects in the environmental management field. He has been involved as an EAP in several infrastructure projects and other EIAs across the country

Monica Niehof is a Senior Consultant at EIMS with ~8 years of experience and has extensive experience in industrial projects, sustainable energy technologies, urban/spatial planning and Geographic Information Systems (GIS). He holds an MSc degree from the University of Pretoria. He has completed numerous projects, in a Senior Consultant and Project Manager role, covering a diverse array of Environmental Impacts Assessments (EIA), Environmental Management Plans (EMP), Environmental Management Frameworks (EMFs), compilation of Integrated Water and Waste Management Plans and Environmental Due Diligences (EDD) in South Africa as well as Tanzania, Uganda, Namibia, Mozambique and Lesotho.

## 5 APPLICANT DETAILS

Details of the applicant are provided in Table 2.

Table 2: Holder/ Applicant Contact Details.

| Item                   | Details                         |
|------------------------|---------------------------------|
| <b>Applicant:</b>      | Kusasa Refining (Pty) Ltd       |
| <b>Contact name:</b>   | Raneeka Rampersadh.             |
| <b>Tel no:</b>         | 010 001 6284                    |
| <b>E-mail address:</b> | compliance@kusasarefining.co.za |
| <b>Postal address:</b> | P.O. Box 14079, Wadeville, 1422 |

## 6 DESCRIPTION OF THE ACTIVITY

The Kusasa Refining facility was originally owned, operated and licenced by EcoPackaging. EcoPackaging obtained an AEL and WML for the operations in 2017 and 2018 respectively. These licences were transferred to Kusasa. Please see below a condensed description of the activities authorised:

### 6.1 PYROLYSIS AND REFINING FACILITY (ORIGINAL ECOPACKAGING OPERATIONS)

The EcoPackaging project is a hazardous-waste beneficiation facility designed to divert certain defined wastes (including e-waste and discarded X-ray film) from landfill and recover high-value metals, while also producing an energy-rich synthesis gas (syngas) as part of the treatment process. During day-to-day operations the plant



will process materials using an integrated sequence of pyrolysis/ashing, chemical sponging, electro-winning and melting. All incoming materials waste will be sourced from registered suppliers, delivered pre-prepared, and stored inside an enclosed, bunded warehouse to manage hazardous storage risks and avoid triggering additional storage-related listed activities.

In Phase 1, waste is thermally decomposed in an oxygen-limited retort pyrolysis system (heated to ~700°C; initial start-up via LPG, thereafter largely sustained by syngas) to generate syngas, ash, and molten metals. Syngas is used to fuel the pyrolysis furnace and a crucible furnace for smelting/refining, with excess gas cleaned (cyclones/filters) and flared via thermal oxidation; ash is recirculated to maximise gas yield, then calcined/vitrified before discharge for refining. The cooled ash/molten fraction is treated with acids to form a metal-bearing “sponge”, with acid fumes extracted to a wet scrubber, and the resulting solution processed through electro-winning to recover metals; spent acid is stored in bunded tanks and removed by licensed contractors for off-site treatment/disposal. The recovered sponge is then blended with fluxes and melted/refined/granulated in a gas-fired crucible furnace (using syngas). Phase 2 (to be implemented later) will route cleaned excess syngas to a small on-site generator ( $\leq 100\text{--}150$  kWh) to produce electricity primarily for internal use, with remaining gas still treated and flared, and with scrubbed tars/condensates returned to the pyrolyser to avoid generating additional waste streams.

## 6.2 NEW PGM LINE

The current Kusasa Refining facility and proposed new PGM line is described as follows:

The current Kusasa operation refines metallic precious-metal bars mainly containing gold (Au) and silver (Ag) using an aqua regia refining and selective precipitation approach. Incoming crude bars are received with documentation, weighed, classified and sampled, with assays performed using existing fire assay and ICP routines to confirm metal contents before batches are aggregated for processing. The established line includes melting/granulation, acid dissolution/parting, solid–liquid separation (filters), silver recovery and purification (to powder, melting to bars, then electrowinning to ~99.99% silver crystals), gold precipitation and melting to bullion, and then effluent neutralisation, filter-press dewatering and storage for off-site management by accredited waste contractors. Air emissions are managed through the existing baghouse, interior pre-scrubbers and the main wet scrubber, and the facility’s existing hazardous-chemical handling, waste management practices and sensor systems remain in place.

The new component is the PGM processing line, added so Kusasa can refine and sell PGMs (Pt, Pd, Rh, Ir, Ru) as purified products rather than only agglomerating/reselling them “as encountered.” While it still uses the same overarching chemistry platform (aqua regia + selective precipitation), the PGM line introduces additional/upgrade equipment (notably a high-temperature induction melter, a titanium reactor tank for nitric parting/extra aqua regia capacity, additional mixer tanks and filtration units, and extra emissions pre-treatment such as a dedicated PGM pre-scrubber and cyclone/dust separation) to handle higher melting points and expanded separation stages. Operationally, what is new is the extended downstream treatment of solutions/solids to recover PGMs: after parting and filtration, the process now includes palladium precipitation (using an organic complexing agent) followed by roasting and melting, and then sequential platinum, rhodium, iridium and ruthenium recoveries via conditioning/precipitation, filtration, roasting (including oxidation steps for Ir/Ru solids) and product finishing (melting to bullion where applicable, or storing sampled powder products). The remaining barren solution is then cemented for trace metals and routed to the existing effluent treatment circuit.

This EMP aims to provide impact management outcomes and actions related to the existing and proposed new PGM line, while retaining the controls prescribed for the original authorised ‘EcoPackaging’ operations.

Please refer to the Basic Assessment Report compiled and submitted in support of the application for EA for further details.



## 7 SENSITIVITY MAP

Due to the fact that the facility is located in an existing heavy industrial area, no impacts on fauna or flora are expected. The main impacts associated with the activity are the potential impacts on surface and ground water resources and impacts on air quality. As such the sensitivity map Figure 1 has identified sensitive receptors in the areas that would be most affected by potential pollution. The construction and operation of the facility must be managed to avoid impacting on these receptors.

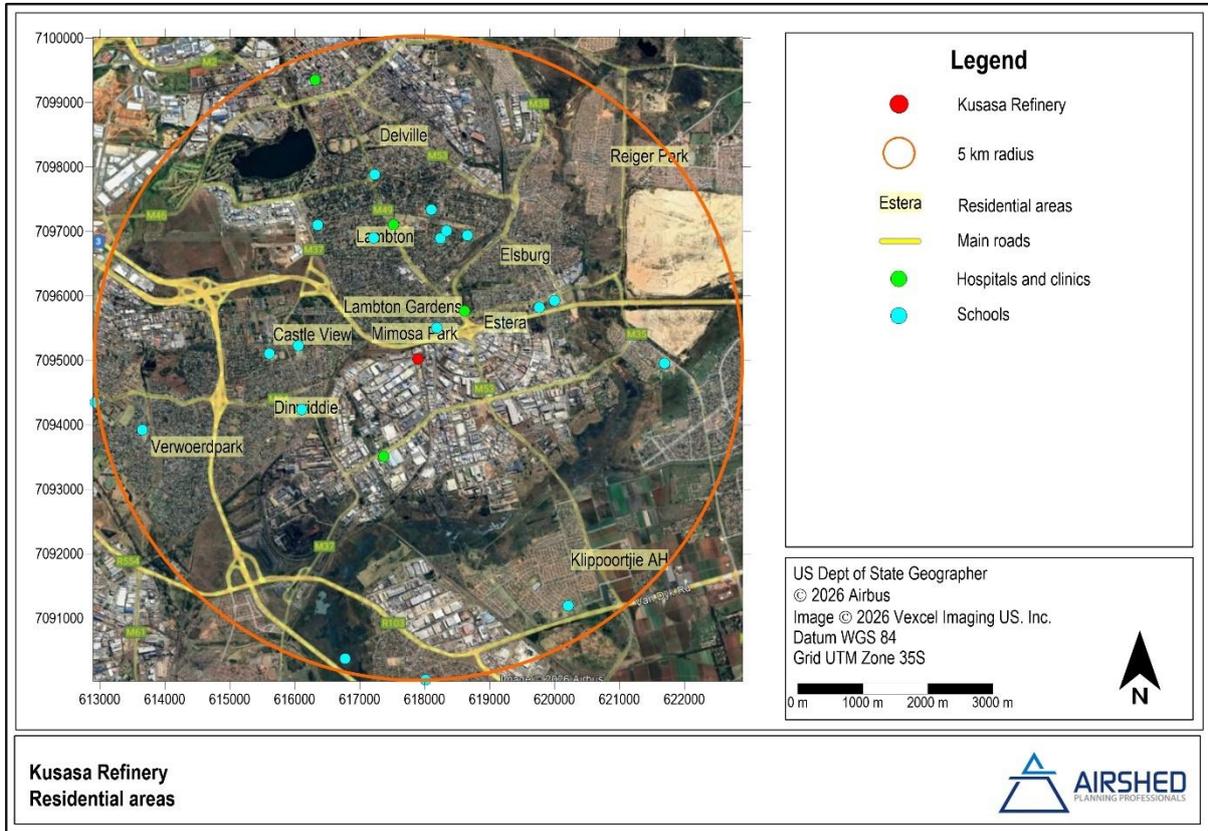


Figure 1: Sensitivity Analysis Map for Air Quality Impacts due to the Proposed Project Operations.

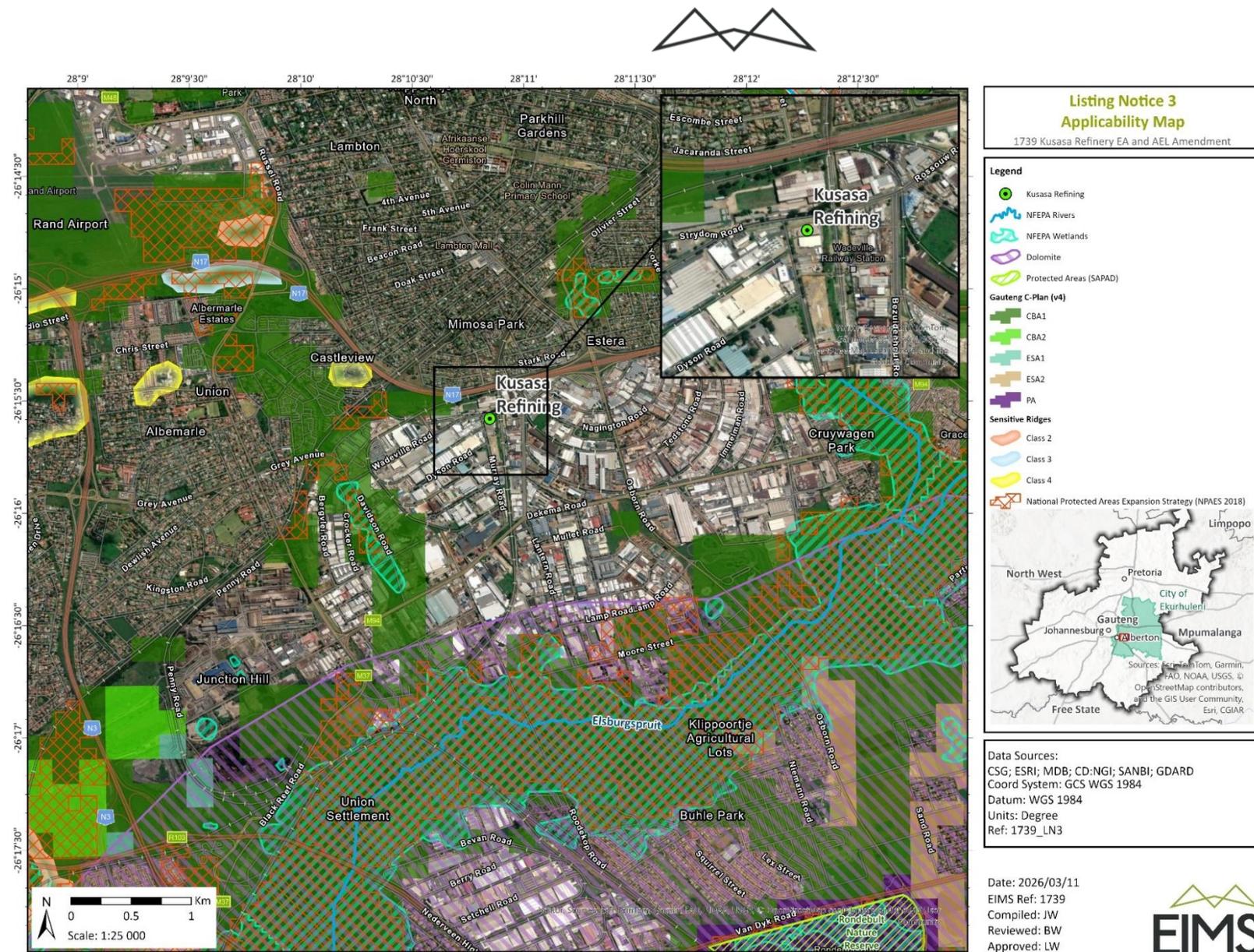


Figure 2: Listing Notice 3 Sensitivity Map



## 8 LEGISLATIVE OVERVIEW

This section has attempted to identify relevant laws and regulations that are applicable to the proposed project. The purpose of this is to provide the applicant with an overarching understanding of how the different sections of legislations define and integrate the different spheres of the environment. Understanding these will ensure long term and continued alignment with their principals. The applicant should ensure that legislation applicable to the development is kept up to date.

Table 3: Authorisation, permits and licences relevant to the proposed project.

| Act  | Regulation / GN#            | Status   | Authorisation   |
|--|-----------------------------|--|---|
| <b>National Environmental Management Act, 1998 as amended 2004</b> | GNR 982 and GNR983          | Undertaking of Environmental Impact Assessment Application process in order to comply with this requirement.                             | In 2026 Kusasa applied for an amendment to their existing AEL to include a PGM Refining Lice. As such they triggered Listing Notice 1 Activity 34.<br><br>This is pending authorisation: GAUT REF#: 002/25-26/E0277<br><br>This EMPr has been supplemented to include the relevant management and mitigation measures associated with this application. |
| <b>National Environmental Management Waste Act, 2013</b>           | GNR 921, (B2, B4)           | A pyrolysis plant that will process 4 Tons per day of hazardous waste (e-waste (PC Boards only) and used x-rays)                         | Approved 12/9/11/L200210120254/3/V.   |
|  | GNR 921, (B3)               | A chemical refinery plant that will refine 4 Tons per day of ASH recovered from (e-waste (PC Boards only) and used x-rays)               | Approved 12/9/11/L200210120254/3/V.   |
|  | GNR 921, (B4)               | The plant will use thermal and chemical treatment of 4 Tons of hazardous waste per day.  | Approved 12/9/11/L200210120254/3/V.   |
| <b>National Environmental Management Air Quality Act, 2004</b>     | Category 4, Sub-category 17 | As a facility that will recover metal from scrap material, the proposed project will require an AEL to operate (Section 21 of NEM: AQA). | Air Emissions Licence: 14/1/1/7/8/188/kusasa/Wadeville/ALB- Listed Activity 4.17  |

It remains the Applicants responsibility to ensure compliance with all relevant legislation. Additionally, should there be changes in legislation and/or regulations, then action must be taken to incorporate such changes and



to pass these requirements on to the contractors. The remainder of this section provides a brief overview and description of the legislative context within which the project is located.

## **8.1 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:

### **8.1.1 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). 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 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.

### **8.1.2 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.

### **8.1.3 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.

### **8.1.4 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.

### **8.1.5 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 DWS (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.

### 8.1.6 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.

### 8.1.7 POLLUTER PAYS 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.”

## 8.2 SPECIFIC ENVIRONMENTAL REQUIREMENTS

Table 4 provides a broad overview of the general environmental legislation, and provides an overview of enviro-legal provisions that may be applicable to this project. Detailed Mitigation measures and requirements have included in the EIA.

Table 4: General Environmental Legislation.



| Title of legislation, policy or guideline   | Description  |
|---|--|
| <b>National Environmental Management Act (Act No. 107 of 1998 - NEMA)</b>                   | <p>The NEMA, aims to protect the environment, and stipulates that development must be socially, environmentally and economically sustainable, and that disturbances and pollution of the environment must be avoided, minimised and remedied. The Act also provides for the equitable access to environmental resources, to meet basic human needs. Decisions on the environment must be taken in an open and transparent manner, and resources must be held in trust for the public and protected as such. NEMA also makes provision for the cost of remedying pollution, and all such costs shall be paid by the polluter.</p>   |
| <b>National Water Act (Act No. 36 of 1998 - NWA)</b>  | <p>NWA provides the law relating to the water resources of South Africa. The purpose of the NWA is to manage and control the means by which all water resources are protected, used, developed, conserved and controlled.</p>  |
| <b>The National Environmental Management: Air Quality Act (Act No. 39 of 2004 - NEMAQA)</b> | <p>NEMAQA is the main legislative tool for the management of air pollution and related activities. The objective of the Act is to protect the environment by providing reasonable measures for- the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development; and generally to give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people.</p>     |
| <b>National Environmental Management: Waste Act (Act No. 59 of 2008 – NEMWA)</b>            | <p>The purpose of the NEMWA is to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development. In addition, sustainable development requires that the generation of waste is avoided, or where it cannot be avoided, that it is reduced, re-used, recycled or recovered and only as a last resort treated and safely disposed of.</p>  |
| <b>National Environmental Management: Biodiversity Act (Act No. 10 of 2004 - NEMBA)</b>     | <p>NEMBA “provides for: the management and conservation of South Africa’s biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters conducted therewith”.</p> <p>NEMBA also deals with, amongst others, declared weeds and invaders in South Africa and categorises these species according to level of control required.</p> |
| <b>National Heritage Resources Act (Act No. 25 of 1999 - NHRA)</b>                          | <p>NHRA provides for the protection of heritage resources of South Africa, which are of cultural significance or other special value by introducing an integrated and interactive system for the management of national heritage resources.</p>  |



| Title of legislation, policy or guideline                             | Description   |
|---|---|
| <b>Hazardous Substances Act (Act No. 15 of 1973)</b>                  | Deals with the proper handling and disposal of hazardous substances and required licenses.  |
| <b>National Veld and Forest Fire Act, (Act 101 of 1998)</b>           | Deals with the prevention of fires through mandatory firebreaks and other prevention measures.  |
| <b>Occupational Health and Safety Act (Act No. 85 of 1993 - OHSA)</b> | Deals with the health and safety of all workers and includes employer obligation toward the safety of workers.  |
| <b>Environment Conservation Act, 1989 (Act No. 73 of 1989 - ECA)</b>  | ECA was, prior to the promulgation of the NEMA, the backbone of environmental legislation in South Africa. To date the majority of the ECA has been repealed by various other Acts, however Section 25 of the ECA and the Noise Regulations (GN R. 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.<br><br>South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with the ECA noise regulations |

## 9 DUTY OF CARE RESPONSIBILITIES

Section 28 of the NEMA makes provision for duty of care, and remediation of environmental damage. The binding principals 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, 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.

(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.

## 10 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; this includes commencing with a listed activity without an WML or the non-compliance with conditions of any EA and associated EMPr;
- 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.

## 11 ROLES AND RESPONSIBILITIES

The applicant will be 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.

### 11.1 THE PROJECT APPLICANT/PROPONENT

The applicant is the principal party (Proponent) of the project. For the purposes of this proposal it is understood that the Applicant role is fulfilled by Kusasa Refining (Pty) Ltd. The legal accountability for correct implementation of the relevant requirements of the WML 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 construction 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 WML and EMPr;
- Ensure that the various contractors and applicable sub-contractors appoint a suitably qualified, competent Environmental Officer (EO) that will be responsible for among others, ensuring compliance with the EMPr and EA throughout the construction of the relevant project components;
- Appoint a suitably qualified, competent Independent Environmental Control Officer (ECO) who will undertake periodic audits on the various contractors works and/or aspects 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/ WML 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.

## 11.2 THE ENVIRONMENTAL CONTROL OFFICER

The ECO is appointed by the Applicant and should preferably 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 (at least 2 weeks) 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 regular 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 programs (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules.

It is important to note that where opportunity for interpretation occurs within the conditions of this EMPr, the interpretation of the ECO will take preference.

## 11.3 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 (if required by the ECO) that will be responsible for among others, ensuring daily compliance with the EMPr, WML 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.

## 11.4 ENVIRONMENTAL OFFICER / WASTE OFFICER /AIR QUALITY OFFICER

The Applicant shall appoint an Environmental Officer (EO), who is responsible for the on-site implementation of the EMPr. The Applicant must ensure that the EO is suitably qualified and competent to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the ECO and the public. The EO ensures that all staff and contractors working under the Applicant abide by the requirements of the EMPr. The appointment of additional EO's and/or sub-contractors EO's is at the ECO's discretion. The costs related to the implementation of the EMPr will be the responsibility of the Applicant.

The EO roles will include:

- Preparing activity based Environmental Method Statements where applicable and where required by the ECO;
- Review the relevant safe work procedures/risk assessments/induction training/DSTI's (daily safe task instruction) during the construction phase and include information relating to the relevant environmental risks and appropriate mitigation measures;
- Support the ECO in monitoring by maintaining a permanent presence on site;
- 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 regular basis;



- Complete a daily diary with the purpose of recording environmental issues and corrective measures on a daily basis;
- Report any complaints to the ECO to be captured in the Consultation 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.

## 11.5 THE AUTHORITIES

The authorities that should be involved include the DEA. 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.

## 12 ENVIRONMENTAL MANAGEMENT SYSTEM

The purpose of this EMPr is to ensure that the environment is properly considered during the design, construction, operations, and decommissioning, 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.

### 12.1 DOCUMENT CONTROL

A formal document control system should be established. The document control system must provide for the following requirements;

- Documents are approved for adequacy prior to use;
- Review and update documents as necessary and re-approve documents;
- Ensure that changes and the current version status of documents are identified;
- Ensure that relevant versions of applicable documents are available at points of use;
- Ensure that documents remain legible and readily identifiable;
- Ensure that documents of external origin necessary for the EMPr are identified and their distribution controlled; and
- Prevent unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

The responsibility for establishing a suitable document control system rests with the Project Manager.



## 12.2 RECORD KEEPING

It is essential that an official procedure for control of records be developed to ensure records required to demonstrate conformity to environmental standards are maintained. The Applicant, or the Project manager (if assigned) is therefore required to develop and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records as part of the EMPr. Records must be legible, identifiable and traceable.

## 12.3 AUDITING AND REPORTING PROCEDURES

Reporting procedures must be developed at the start of the project, for conveying information from the compliance monitoring activities and to ensure that management is able to take rapid corrective action should certain thresholds be exceeded. Different reporting procedures may include:

- Inspections;
- Accidents and emergencies;
- Measuring performance indicators and interpreting and acting on the indicators;
- Records of monitoring activities to test the effectiveness of mitigation measures and impact controls, as well as for compliance auditing purposes; and
- Training programmes and evidence of appropriate levels/amount of skills/capacities created.

All monitoring and auditing must be accompanied by applicable records and evidence (e.g. delivery slips, photographic records, etc.). All reports must be retained and made available for inspection by the ECO, the Applicant and /or the Relevant Competent Authorities. All reports shall be signed by the relevant parties to ensure accountability. The Applicant must use the audit report findings to continually ensure that environmental protection measures are working effectively on site through a system of self-checking. The EMPr should be viewed as a dynamic document aimed at continual environmental performance improvement.

The following auditing and reporting shall be required throughout the construction phase:

- **Daily Environmental Diary:** These reports must be prepared by the contractors' EO and must aim to monitor and report on day to day activities so as to ensure compliance with, the relevant authorisations, licences and permits, the approved EMPr, and environmental method statements. These reports must be compiled on a daily basis during high activity periods but can be scaled down as the project requires;
- **Monthly Compliance Reports (EO):** These reports must be prepared by the contractors' EO and must aim to provide a concise monthly performance report, including copies of relevant documents (e.g. waste manifests, incident registers, consultation registers, etc.);
- **Audit Reports:** The ECO must compile Monthly audits report during the construction phase, and Annual compliance reports (audits) during the operational phase. All audits are to be submitted to the Applicant for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified. Depending on the outcome of the permitting processes it may be a requirement to submit these to the relevant authorities.

## 12.4 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;
- Monitoring of selected environmental quality variables;
- Audits of the site and relevant documentation as well as specific activities; and
- Reporting on a monthly basis.



An environmental non-conformance and incident register must be prepared and maintained by the ECO throughout the construction phase in order to track and monitor environmental concerns, incidents, and non-conformances. The register must include details of date, location, description of the NC or Incident, applicable environmental commitment/standard, corrective action taken, adequacy of corrective action, date rectified, etc.

Non-compliance with the EMP or any other environmental legislation, specifications or standards shall be recorded by the ECO in the non-conformance register. This register shall be maintained by the ECO and will be sent to the Applicant and Contractor on a regular basis (monthly), and the Applicant shall ensure that the responsible party takes the necessary corrective actions. Non-conformances may only be closed out in the register by the ECO upon confirmation that adequate corrective action has been taken and/or documented proof provided. The register should be utilised to measure overall environmental performance.

## 12.5 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 ECO's non-conformance and incident register. Minor incidents shall be recorded by the contractor, and by the Applicant (continued into operational phase) in their own incident register. Definitions and examples of environmental incidents are provided in Table 5.

Table 5: Description of Incidents and Non-conformances for the Purpose of the Project.

| Type                                 | Description   |
|--------------------------------------|---|
| <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>  | <p>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.</p> <p>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 ECO shall make the final decision as to whether a particular incident should be classified as a Major incident.</p> <p>An example of a Major environmental incident would be a significant spillage (e.g. 500 litres) of fuel into a watercourse.</p> |
| <b>Medium Environmental Incident</b> | <p>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.</p> <p>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 ECO shall make the final decision as to whether a particular incident should be classified as a Medium incident.</p> <p>An example of a Medium environmental incident would be a large spill of fuel (e.g. &gt;50 litres) onto land.</p>   |



| Type                                | Description   |
|-------------------------------------|---|
| <b>Minor Environmental Incident</b> | <p>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.</p> <p>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.</p> <p>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 than fifty (50) litres.</p> |

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to EO, and the ECO, and shall be recorded in the contractors' respective incident registers;
- The ECO 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 ECO 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 ECO 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.

## 13 REVIEW AND REVISION OF THE EMPr

It is important to note that this EMPr is made legally binding on the Applicant through the WML 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 as a result 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 ECO should be responsible for ensuring that the registration and updating of all relevant EMPr documentation is carried out. It shall be the responsibility of the Applicant, in consultation



with the ECO, 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 ECO 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 effected with written approval from the competent authority and in accordance with the relevant legal processes.

## 14 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 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 training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition of the environment;
- The importance of compliance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- Compliance with mitigation measures proposed for sensitive areas;
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences (legal and/or other) of departure from specified operating procedures including fines (where applicable);
- The mitigation measures required to be implemented when carrying out their work activities; and
- All operational risks must be identified and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/or degradation of the environment.

In the case of permanent staff required during the operational phase of the project, the Applicant / contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor / Applicant shall keep a record of adequate environmental induction training.

The specific requirements for environmental training during the construction phase include:



- Environmental Induction Training: All general workers must receive induction training which shall be presented by the Contractors HSE Manager Representatives. The induction training must include an environmental management component which will be prepared by the EO and presented where possible by the EO. The training material must include general environmental awareness and an overview of the approved EMPr and applicable authorisations, licences and permits. The Induction Training Material must be reviewed and approved by the ECO;
- Regular Environmental Toolbox Talks: Environmental toolbox talks will be prepared by the EO to cover a range of environmental topics and must be presented to relevant staff during applicable times during construction process (e.g. at the start of a day or activity). The aim of these toolbox talks will be to inform site employees of general environmental requirements pertaining to specific activities, as well as specific EMPr and EA requirements and obligations. The ECO shall review environmental toolbox talks on a periodic basis to ensure the material is relevant and appropriate;
- Informal training of all staff on site is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day to day activities. Such training must be given or otherwise facilitated by the EO; and
- The EO must review all applicable safe work procedures/risk assessments/DSTI's (daily safe task instruction) from the safety department and include the relevant environmental risks and appropriate mitigation measures where necessary. Since the above procedures are specific to the applicable activity being undertaken, the inclusion of environmental measures aims to ensure each activity is undertaken in an environmentally responsible manner.

## 15 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 were 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:

- Threat consequence if and when the 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 shall be required to develop and implement an 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;
- Contamination of a water resource;
- 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 (Table 6).

Table 6: Emergency Response Entity Details.

| Emergency response entity          | Details   |
|------------------------------------|---|
| <b>Interwaste</b>                  | Brammer St, Industries East, Germiston, 1401<br>Phone: 011 323 7300 |
| <b>RescueRod</b>                   | 6 Ingwe Rd, Edenvale, 1609<br>Phone: 011 452 3232                   |
| <b>Fire Department (Germiston)</b> | Osborne street, Germiston<br>Phone: 011 824 2636; 011 375 5911      |

## 15.1 SPILL RESPONSE PROCEDURE

The Applicant 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 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 12.5 shall also apply.

The Applicant must also, (as per Section 30 of the NEMA) notify the Director-General (DWA, DEA and DMR), 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

## 15.2 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 that the environmentally sensitive areas are adequately demarcated throughout the construction phase;
- Ensure topsoil, subsoil and rock dumps 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 plan.

## 16 WASTE MANAGEMENT PLAN

The following section is provided to assist the Applicant in general waste management. The information and measures stipulated herein, should be read and implemented with the general EMP conditions.

### 16.1 DEFINITIONS

**Disposal** means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

**General waste** means waste that does not pose an immediate hazard or threat to health or to the environment, and includes—

- a) domestic waste;
- b) building and demolition waste;
- c) business waste; and
- d) inert waste;

**Hazardous waste** means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

**Health care general waste** means the non-hazardous portion of the waste generated at the health care facility. This is any waste that comprises uncontaminated plastics, paper, cardboard or food residues.

**Health care risk waste** means the hazardous portion of the waste generated at the health care facility. This is any waste that poses a hazard to human health or the environment.

**Recycle** means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.



**Re-use** means to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles.

**Storage** means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

**Temporary storage** means a once off storage of waste for a period not exceeding 90 days.

**Treatment** means any method, technique or process that is designed to:

- a) change the physical, biological or chemical character or composition of a waste; or
- b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
- c) destroy or reduce the toxicity of a waste, in order to minimise the impact of the waste on the environment prior to further use or disposal

**Waste** means:

- a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
- b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,

but any waste or portion of waste, referred to in paragraphs (a) and (b) above, ceases to be a waste-

- i. once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
- ii. where approval is not required, once a waste is, or has been re-used, recycled or recovered;
- iii. where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or
- iv. where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

**Waste disposal facility** means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise.

**Waste transfer facility** means a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility.

## 16.2 INTRODUCTION

This Waste Management Plan (WMP) has been developed for implementation by Applicant, for the construction and operation of its ashing/pyrolysis and chemical refinery plant. It addresses the aspect of compliance with respect to the relevant waste management activities and waste streams. This plan covers the relevant waste streams for day to day operations within the facility.

At all times, the Applicant will aim to achieve the objectives of the waste hierarchy as depicted in Figure 3 below. Throughout each waste stream identified within this plan, the potential to reduce the volume of waste disposed of to landfill is highlighted where applicable (e.g.: reducing paper usage, recycling of waste, etc.). Furthermore, training and awareness with all employees must be undertaken to educate all role-players on the importance of waste management. Records of training, supplier permits, disposal site permits and waste volumes produced/recycled must be maintained and should be updated on a regular basis within the applicant's waste reporting database. The applicant must maintain monthly statistics on the waste reporting database.



Figure 3: Waste Management Hierarchy.

### 16.3 PURPOSE

This plan aims to provide the minimum management requirements of waste streams that can pose a significant risk to the environment.

### 16.4 ROLES AND RESPONSIBILITIES

The Applicant is responsible for the continual development and monitoring of the implementation of this plan. The applicant shall designate suitably qualified EO's / Waste Management Officers (WMO's) whose duties shall include implementation of this plan. The EO's shall have a relevant tertiary qualification in environmental management and shall receive adequate training in waste management practices.

Key roles and responsibilities for the relevant parties which have activities/processes that generate certain types of waste are detailed as follows:

- **Waste Generators:** The Pyrolysis process will treat hazardous x-rays and e-waste from suppliers. All generators/suppliers of waste take responsibility for safe disposal of their waste via the correct and licenced waste stream. No employee (including contractors and their sub-contractors) shall be deemed to be exempt from complying with this WMP where applicable. The spent acids created as a waste product from the refining process must also be safely disposed of.
- Contractors:
  - Act on behalf of the applicant to fulfil a specific function as and when necessary;
  - Responsible for compliance with this WMP where relevant; and
  - Responsible for the appointment of designated EO's/WMO's to ensure compliance with this WMP.
- Environmental Officers / Waste Officers:
  - Identify waste materials and classify them where necessary;
  - Maintain waste inventories (including the waste management database) where necessary;
  - Identify any possible deviations from the requirements contained in this WMP and bring these deviations to the attention of the responsible manager or project manager;
  - Training of employees on the correct waste management practices in line with this WMP and reporting on the number of people trained within the monthly waste reporting database;



- Evaluate and coordinate the storage and handling of various waste streams;
- Manage the rectification of any deficiencies identified in the waste management practices; and
- Compile and maintain necessary documentation (checklists, reports, inventories, etc.) and provide feedback to higher management throughout organisational structure (where relevant).

## 16.5 MONITORING

All operational aspects shall be subject to regular audits against this WMP. The audit procedure and reporting templates and channels shall be in accordance with accepted practices.

## 16.6 SPENT ACID MANAGEMENT

The only resulting waste product of the ashing/pyrolysis and chemical leaching processes is spent acid. Acid spillage can have extreme impacts on the ecology of streams, affecting the beneficial use of waterways downstream of waste processing and other operations. Acid conditions can:

- mobilise (bring into solution) metals to levels injurious to aquatic ecosystems, riparian communities and possibly human health (e.g. zinc, cadmium, aluminium, copper);
- limit the downstream beneficial uses of the receiving water (e.g. stock, recreation, fishing, aquaculture, irrigation);
- alter important life supporting balances in water chemistry (e.g. bicarbonate buffering system);
- lead to the development of chemical precipitates (e.g. ferric hydroxide, aluminium hydroxide etc.) that can smother aquatic habitat and reduce light penetration;
- negatively impact groundwater quality;
- lead to the installation of expensive control, treatment and rehabilitation programs;
- create long term environmental liabilities; and
- limit the reuse of water and exacerbate the corrosion of site infrastructure and equipment.

Experience has shown that acid spillage, if not properly managed has the potential to be a long-term liability for not only the facility operator/s but also the regulators and the surrounding community.

Domestic waste would be disposed by the municipal management system. In terms of the hazardous waste component, the following material will be disposed of at a suitably licensed disposal facility (proposed to be Holfontein):

- The spent acid spent acid created from the **ashing** process would be classified as H:H liquid waste; and
- Oily rags, created during maintenance;

### 16.6.1 TRAINING

Training must be provided to all employees working with waste and to all contract workers that might be exposed to the waste. The training programme must include:

- Precautionary measures that need to be taken;
- Procedures that employees should apply in their particular work type;
- Spill procedures and accident response;
- Relevant protective clothing; and



- Risks of the hazardous substances, employees are likely to be exposed to, to their health.

Attendance registers must be kept and signed by each employee. Records to be kept and made available to relevant authorities if required.

### 16.6.2 EMERGENCY RESPONSE PLAN

In terms of the WMP, the Applicant must identify potential emergencies specific to Waste related spills and other potential emergencies related to waste, since the EIA had identified that potential pollution the ground and surface water were potentially significant impact from Waste spillages. The Application must thus develop procedures for preventing and responding to them.

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. Waste specific emergency plans and procedures must developed and as a minimum include the following:

- Hazard identification;
- Prevention measures;
- Response planning; and
- Remedial actions.

### 16.6.3 STORAGE, HANDLING & TREATMENT

The following points apply to the storage, handling and treatment of wastes:

- All chemicals and acids must be stored in suitable above ground storage tanks. The tank must be made of a non-reactive material and banded to contain spills;
- The waste storage facility must be free from odour or emissions at levels likely to cause annoyance;
- Spent acid would be stored in acid tanks, granulated e-waste and shredded x-ray film waste is stored in one-ton container bags in the demarcated areas in the warehouse, oily rags from maintenance would be in suitable red marked container for disposal at Holfontein, while domestic waste would be stored in wheelie bins;
- The waste treatment and storage facility must be operated within its design capacity and the waste containers must not be overfilled;
- The spent acid storage tanks must be inspected daily to verify that the tanks are leak resistant;
- The hazardous waste storage container, associated piping and equipment must be of sufficient structural strength to withstand normal handling and installed on a stable foundation;
- The spent acid storage tank must be a closed system and pressure resistant;
- An automatic overflow prevention device must be fitted onto the tanks to prevent overflow and spillage;
- Any coupling to the tanks must be maintained in good condition and must only be used when filling or decant of this waste to tankers for transport to Holfontein for liquid disposal; and
- No spillage may enter any storm drains.

### 16.6.4 MANAGEMENT MEASURES

The following management measures must be followed in order of presentation as far as possible in order to effect the waste hierarchy principles and achieve sound waste management practices:



- The spent ash containment system must be regularly inspected (daily) for defects, leaks or overflows to ensure that the system is operating effectively and thereby minimising the risk to the environment.
- Regular (monthly) samples of the spent ash must be taken and analysed by an accredited laboratory to ensure that the composition and potential risk that the spent acid poses are fully understood. Thereafter the spent acid must be classified in terms of the Waste Classification and Management Regulations (2013). The physical, chemical and biological parameters to be assessed shall be discussed and agreed to with the laboratory depending on the ultimate disposal methods.
- The applicant must verify, through routine inspections and external audits, that their waste feedstock contains no Cathode Ray Tube (CRT) monitors, televisions or items of e-waste containing Mercury (Hg) or any other harmful components forming part of the waste feedstock.
- The storage of spent acid in large quantities may trigger the requirement for further licensing in terms of the NEMWA and as such, the option of regular disposal shall be considered carefully from a technical as well as financial point of view;
- Depending on the requirements for onsite storage of spent acid, careful consideration must be made with respect to the location of storage (health and safety) and the containment vessel/s. All storage vessels shall be watertight and chemically resistant to ensure that no seepage from the vessels occurs;
- Collection and transportation of spent acid (for disposal) must be undertaken by a suitably licensed service provider and all service provider's permits/licenses must be kept on file for record purposes; and
- Only dispose of spent acid at a suitably licensed disposal facility (dependent on the chemical, physical and biological results thereof) and all disposal records must be kept on file as proof of safe disposal.

The applicable legal requirements relating to the handling, storage, recycling and disposal of this waste stream is presented in the process flow chart below.

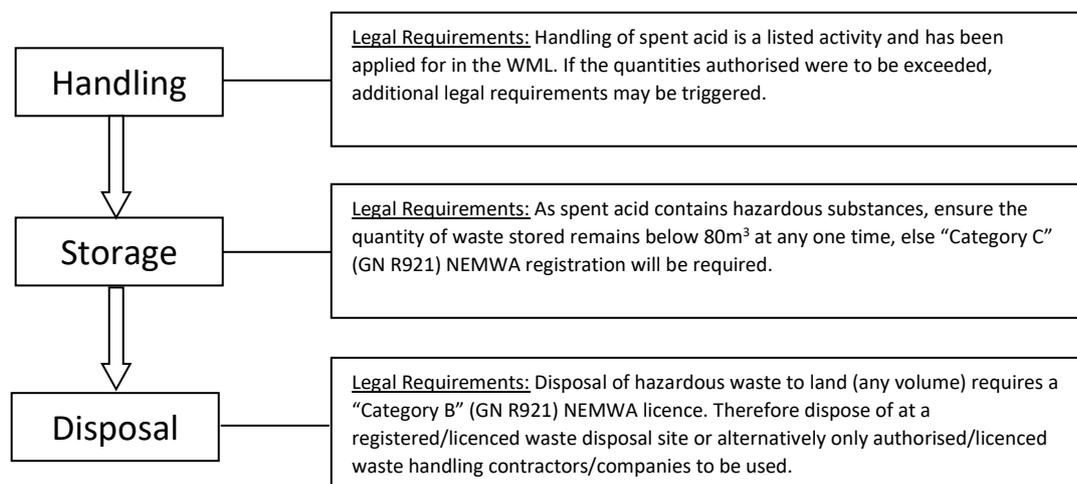


Figure 4: Legal Requirements Process Flow Chart for Spent Acid Waste.

## 16.7 ACCESS CONTROL

The following measures must be implemented to limit access to potentially hazardous wastes:

- A security guard must be posted at the gate to ensure authorised access only. Weather proof, durable and legible signs in at least 3 official languages must be displayed at the entrance to the facility. The signs must indicate the risks involved in entering the site, hours of operation, the name, address, telephone number and the person responsible for the operation of the facility; and



- Operation of the hazardous waste processing facility must be limited to employees who have been trained with respect to the operation of the hazardous waste processing facility and emergency response procedures.

## 16.8 GENERAL HOUSEKEEPING

- Never obstruct access to exits and emergency equipment such as fire extinguishers and safety showers. Comply with local fire codes for emergency exits, electrical panels, and minimum aisle width;
- Store coats, bags, and other personal items in the proper area, not on the bench tops or in the aisles;
- Do not use floors, stairways, and hallways as storage areas. Items stored in these areas can become hazards in the event of an emergency;
- Keep drawers and cabinets closed when not in use, to avoid accidents;
- Properly label in permanent marker and store all chemicals appropriately by compatibility;
- Label transfer vessels with the full chemical name, manufacturer's name, hazard class, and any other special warnings;
- Store chemical containers in order and neatly. Face labels outward for easy viewing. Containers themselves should be clean and free of dust. Containers and labels that have begun to degrade should be replaced, repackaged, or disposed of in the proper location. Do not store materials or chemicals on the floor because these may present trip and spill hazards;
- Keep chemical containers closed when not in use;
- Secure all compressed gas cylinders to walls or benches;
- Secure all water, gas, air, and electrical connections in a safe manner;
- Return all equipment and laboratory chemicals to their designated storage location at the end of the day;
- To reduce the chance of accidentally knocking containers to the floor, keep bottles, beakers, flasks, and the like at least 5cm from the edge of bench tops;
- Keep work areas clean (including floors) and uncluttered. Wipe up all liquid and ice on the floor promptly;
- To avoid flooding, do not block the sink drains. Place rubber matting in the bottom of the sinks to prevent breakage of glassware and to avoid injuries;
- Do not pile up dirty glassware in the laboratory. Wash glassware carefully. Remember that dirty water can mask glassware fragments. Handle and store laboratory glassware with care. Discard cracked or chipped glassware promptly;
- Dispose of all waste chemicals properly and in accordance with organizational policies;
- Dispose of broken glass and in a specially labelled container for broken glass. Treat broken glassware contaminated with a hazardous substance as a hazardous substance;



## 17 EMPR MANAGEMENT AND MITIGATION

| TECHNICAL OR MANAGEMENT OPTIONS |  |   |   |                                  |                                 |   |   |
|---------------------------------|--|---|---|----------------------------------|---------------------------------|---|---|
| Item No.                        | Technical or Management Option   | Phase                                       | Timeframes  | Responsible Party                | Monitoring Party<br>(Frequency) | Target  | Performance Indicators<br>(Monitoring Tool)                           |
| 17.1 LEGAL COMPLIANCE           |  |   |   |                                  |                                 |   |   |
| <b>A</b>                        | The Applicant shall identify and comply with all relevant national, provincial and local legislation, including associated regulations and bylaws and shall establish and maintain procedures to keep track of, document and ensure compliance with environmental legislative changes. | Planning<br>Construction<br>Decommissioning | Prior to construction and ongoing throughout construction | Applicant                        | ECO (monthly)                   | Ensure compliance with relevant legislation.  | Up to date legal register.<br>(Legal register)<br>(ECO Monthly Audit) |
| <b>B</b>                        | 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<br>Construction<br>Decommissioning | Prior to construction and ongoing throughout construction | Applicant<br>ECO                 | ECO (monthly)                   | Ensure compliance with relevant legislation / Confirmation that requirements in terms of updated legislation are passed onto the contractors. | (Contractors contractual agreements)<br>(ECO Monthly Audit)           |
| <b>C</b>                        | The applicant must appoint an external Independent Environmental Auditor to undertake an annual environmental compliance audit. The audit must comply  | All phases                                  | Ongoing-annually  | Applicant<br>Independent Auditor | Annual Compliance Audit         | Independent compliance verification   | Annual Compliance Audit   |



| TECHNICAL OR MANAGEMENT OPTIONS |  |  |                                   |                   |  |  |  |
|---------------------------------|--|--|-----------------------------------|-------------------|--|--|--|
| Item No.                        | Technical or Management Option   | Phase  | Timeframes                        | Responsible Party | Monitoring Party<br>(Frequency)            | Target   | Performance Indicators<br>(Monitoring Tool)  |
|                                 | with the requirements of Regulation 34 of the NEMA EIA Regulations (GNR982)  |  |                                   |                   |  |  |  |
| 17.2 APPOINTMENT OF ECO         |  |  |                                   |                   |  |  |  |
| <b>A</b>                        | The Applicant shall appoint a suitably qualified ECO. The ECO must preferably have a tertiary qualification in Environmental Management or appropriate environmental science field. The ECO should have appropriate qualification and experience in the implementation of environmental management specifications. For the purposes of implementing the conditions contained in this EMPr. The Applicant shall provide the ECO with the necessary support to ensure that the environmental aspects relating to the development is adhered to. The appointment of the ECO shall remain in force until all obligations of this EMPr have been met (e.g. including rehabilitation phase). | Planning<br>Construction<br>Operation<br>Decommissioning | Prior to construction and ongoing | Applicant         | Applicant (once off prior to construction) | Appoint ECO to ensure monitoring of successful implementation of the EMPr. | Confirmation that ECO has been appointed and is suitably qualified to perform the duties contained in this EMPr.<br><br>(ECO appointment and CV) |
| <b>B</b>                        | The Applicant is responsible for the maintenance, update and review of the EMPr. The ECO shall include any   | Planning<br>Construction                                 | As required                       | Applicant<br>ECO  | ECO (Monthly)                              | Ensure EMPr is reviewed and updated where                                  | Audit results and recommendations  |



| TECHNICAL OR MANAGEMENT OPTIONS        |   |                                       |                                   |                          |   |   |  |
|--|---|---------------------------------------|-----------------------------------|--------------------------|---|---|--|
| Item No.                               | Technical or Management Option  | Phase                                 | Timeframes                        | Responsible Party        | Monitoring Party<br>(Frequency)                             | Target  | Performance Indicators<br>(Monitoring Tool)  |
|  | 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.  | Operation<br>Decommissioning          |                                   |                          | Applicant (as and when necessary)                           | necessary to ensure adequate mitigation for all impacts associated with the project.                        | (ECO Monthly Audit)  |
| <b>17.3 APPOINTMENT OF CONTRACTORS</b> |   |                                       |                                   |                          |   |   |  |
| <b>A</b>                               | The EMPr must be made binding on the applicant service providers (where applicable) and contractors and should be included in tender documentation and contracts. The costs related to the implementation of the EMPr must be provided for in the contract. | Planning<br>Construction<br>Operation | Prior to construction and Ongoing | Applicant<br>Contractors | ECO (Once-off at the start of individual contractor's work) | Ensure that the contractor is in possession of the EMPr and that they understand their obligations thereto. | Confirmation that contractor has received EMPr, and that EMPr has been made contractually binding.<br><br>(Contractual agreements) (ECO Monthly Audit) |
| <b>B</b>                               | All contractors and sub-contractors must have a copy of this EMPr on site and should be briefed by the EO with regards to the use and implementation of the EMPr.   | Planning<br>Construction              | Prior to construction and Ongoing | Contractor               | ECO (Monthly)<br>Applicant (once off per contractor)        | Ensure all contractors are aware of EMPr requirements.  | Confirmation that contractors have received training relating to EMPr implementation.<br><br>(Training records)<br>(ECO Monthly Audit)                 |



| TECHNICAL OR MANAGEMENT OPTIONS |   |              |                                   |                         |                              |  |  |
|---------------------------------|---|--------------|-----------------------------------|-------------------------|------------------------------|--|--|
| Item No.                        | Technical or Management Option  | Phase        | Timeframes                        | Responsible Party       | Monitoring Party (Frequency) | Target   | Performance Indicators (Monitoring Tool)   |
| <b>C</b>                        | The Contractor or applicant shall appoint a dedicated EO who is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the ECO and the public. The EO shall be appointed prior to the onset of construction works. | Planning     | Prior to construction and Ongoing | Contractor              | ECO (Once-off)               | Ensure a suitably qualified EO is present on site to oversee day to day activities and ensure successful implementation of EMPr during construction. | Confirmation that EO has been appointed and is suitably qualified to perform the necessary duties contained in this EMPr.<br>(ECO Monthly Audit) |
| <b>D</b>                        | The Contractor shall ensure that all sub-contractors working under them abide by the requirements of the EMPr through the inclusion of the EMPr and applicable environmental requirements in contractual agreements for all sub-contractors.  | Construction | Ongoing                           | Contractor              | EO (Weekly)<br>ECO (Monthly) | Ensure that the contractor implements all the mitigation measures as described in the EMPr.  | Signed declaration of understanding by contractors<br>(EO weekly checklist)<br>(ECO Monthly Report)  |
| <b>17.4 SERVICE DETECTION</b>   |   |              |                                   |                         |                              |  |  |
| <b>A</b>                        | In the event that construction activities take place near to existing services, thorough service detection should be undertaken and services exposed (where necessary) in the area to be disturbed to ensure there is no damage or disruption to  | Construction | Prior to construction and ongoing | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly) | Ensure no damage or disruption to existing services.   | Results of service detection<br>Incident register indicating disruption to services  |



| TECHNICAL OR MANAGEMENT OPTIONS |  |              |            |                         |                                 |  |  |
|---------------------------------|--|--------------|------------|-------------------------|---------------------------------|--|--|
| Item No.                        | Technical or Management Option   | Phase        | Timeframes | Responsible Party       | Monitoring Party<br>(Frequency) | Target                                   | Performance Indicators<br>(Monitoring Tool)  |
|                                 | services. Where appropriate, suitable buffer zones should be fenced off or demarcated around such areas to prevent any damage as a result of construction activities.  |              |            |                         |                                 |  | (EO weekly checklist)<br>(ECO Monthly Report)<br>(Incident Register)<br>(Consultation register)  |
| <b>B</b>                        | In all cases, where services must be temporarily disrupted, 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 in the event that repair will require a significant amount of time. | Construction | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)    | Minimum disruption to existing services. | Affected parties / verification that relevant parties have been timeously notified prior to, or immediately after accidental disruption of services.<br><br>(Proof of notification and response thereon from affected party) |



## TECHNICAL OR MANAGEMENT OPTIONS

| Item No.           | Technical or Management Option   | Phase                             | Timeframes | Responsible Party                         | Monitoring Party<br>(Frequency) | Target   | Performance Indicators<br>(Monitoring Tool) |
|--------------------|--|-----------------------------------|------------|---|---------------------------------|--|---|
| <b>17.5 SAFETY</b> |  |                                   |            |   |                                 |  |   |
| <b>A</b>           | <p>The Applicant through the Project Manager, where applicable, shall ensure:</p> <ul style="list-style-type: none"> <li>• That reasonable measures are taken to ensure the safety of all site staff;</li> <li>• Provide appropriate Personal Protective Equipment (PPE) where required;</li> <li>• Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993) and associated regulations;</li> <li>• That all vehicles using public roads 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;</li> <li>• That all accidents and incidents are recorded and reported to the Project Manager and EO/ECO; and</li> <li>• The Applicant and Contractor must ensure that he/she has the contact</li> </ul> | <p>Construction<br/>Operation</p> | Ongoing    | <p>Project<br/>Manager<br/>Contractor</p> | Safety Department               | Ensure compliance with legal provisions of OHSA. | <p>(safety reports)<br/>(safety audits)</p> |



| TECHNICAL OR MANAGEMENT OPTIONS                        |   |                       |  |                   |                                 |  |  |
|--|---|-----------------------|--|-------------------|---------------------------------|--|--|
| Item No.   | Technical or Management Option  | Phase                 | Timeframes   | Responsible Party | Monitoring Party<br>(Frequency) | Target   | Performance Indicators<br>(Monitoring Tool)  |
|  | details of the nearest emergency rooms (hospitals) to the site, of both private and public hospitals.   |                       |  |                   |                                 |  |  |
| 17.6 EMERGENCY RESPONSE / DISASTER MANAGEMENT PLANNING |   |                       |  |                   |                                 |  |  |
| A  | <ul style="list-style-type: none"> <li>Develop, implement, and maintain an Emergency Preparedness and Response Plan (EPRP) for implementation during the operational phase. This should be revised periodically as the various phases of the construction work takes place.</li> <li>Identify suitable individuals that can be trained and used as first aid officers on site (levels 1 to 3). Training of these individuals should ideally take place during the planning phase of the project.</li> <li>Consult with ambulance services and/or hospitals so that they are aware of the project and would be able to provide emergency and/or medical services if needed.</li> </ul> | Planning<br>Operation | Prior to construction.<br>Implementation ongoing during construction phase | Applicant         | ECO (Once-off)                  | Ensure emergency preparedness and response systems in place. | Verification that EPRP is in place.<br>(ECO Audit)<br>(EPRP)<br>(Incident Reports) |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |  |                   |                                  |   |   |
|---------------------------------|--|-----------|--|-------------------|----------------------------------|---|---|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes                                       | Responsible Party | Monitoring Party<br>(Frequency)  | Target  | Performance Indicators<br>(Monitoring Tool)   |
| <b>B</b>                        | <ul style="list-style-type: none"> <li>Provide compliant flammable liquid storage for ethanol, with ignition control and separation from oxidisers (e.g., peroxides).</li> <li>Implement bonding/earthing and safe transfer procedures for ethanol to minimise ignition sources.</li> <li>Update EPRP to include ethanol-specific scenarios (vapour release, ignition, firewater containment and disposal).</li> <li>Introduce VOC minimisation SOP: minimise open handling, keep containers closed, use enclosed dosing where feasible, application of required PPE.</li> </ul> | Operation | Pre-commencement of PGM Line<br><br>Ongoing      | Applicant         | EO (Weekly)<br><br>ECO (Monthly) | Ensure emergency preparedness and response systems in place.<br><br>VOC minimization<br>SOP | Verification that EPRP and SOP is in place.<br><br>ECO Audit<br>EPRP<br>Incident Reports          |
| <b>C</b>                        | <ul style="list-style-type: none"> <li>Develop a firewater containment plan (valving/isolation, temporary bunding, sump isolation/collection) to prevent contaminated firefighting water from leaving site.</li> <li>Update emergency risk assessments, scenarios and drills to account for new chemicals and increased</li> </ul>   | Operation | Prior to commencement of PGM Line<br><br>Ongoing | Applicant         | EO (Weekly)<br><br>ECO (Monthly) | Effective emergency planning  | Updated Risk Assessments<br><br>Firewater containment plan<br><br>Proof of authority notification |



| TECHNICAL OR MANAGEMENT OPTIONS |   |                                  |  |                                 |                                      |   |  |
|---------------------------------|---|----------------------------------|--|---------------------------------|--------------------------------------|---|--|
| Item No.                        | Technical or Management Option  | Phase                            | Timeframes                               | Responsible Party               | Monitoring Party (Frequency)         | Target  | Performance Indicators (Monitoring Tool)   |
|                                 | <p>volumes; maintain training records and drill reports.</p> <ul style="list-style-type: none"> <li>Update site emergency maps to include new PGM areas, associated chemical stores and shut-off points; ensure compatibility with municipal fire response requirements where applicable.</li> <li>Notify the relevant emergency services of the amended operations-e.g. local fire department.</li> </ul>                |                                  |  |                                 |                                      |   |  |
| <b>17.7 FIRE PREVENTION</b>     |   |                                  |  |                                 |                                      |   |  |
| <b>A</b>                        | <ul style="list-style-type: none"> <li>The Applicant, Contractor and ECO shall assess the risk of fires and where required the relevant party shall ensure that fire breaks are created prior to the onset of construction. Relevant firefighting equipment is to be provided in relevant locations as per the Safety Specifications on site.</li> <li>A fire response plan must be prepared by the applicant.</li> </ul> | <p>Planning<br/>Construction</p> | <p>Prior to construction and Ongoing</p> | <p>Applicant<br/>Contractor</p> | <p>EO (Weekly)<br/>ECO (Monthly)</p> | <p>Protect site and adjacent properties from runaway fires.</p> | <p>Verification that appropriate fire prevention measures and response plans are in place where required.</p> <p>(EO weekly checklist)<br/>(ECO Monthly Audit)</p> |



| TECHNICAL OR MANAGEMENT OPTIONS |                                |       |            |                   |                              |        |  |
|---------------------------------|--------------------------------|-------|------------|-------------------|------------------------------|--------|--|
| Item No.                        | Technical or Management Option | Phase | Timeframes | Responsible Party | Monitoring Party (Frequency) | Target | Performance Indicators (Monitoring Tool) |

### 17.8 SOCIO-ECONOMIC CONSIDERATIONS

|          |  |                                       |                                      |                               |                               |  |   |
|----------|--|---------------------------------------|--------------------------------------|-------------------------------|-------------------------------|--|---|
| <b>A</b> | The Project manager must ensure that a system is established and maintained for the recording of public and community comments and concerns. The comments and concerns must be addressed as far as reasonable possible.  | Planning<br>Construction<br>Operation | Prior to construction<br><br>Ongoing | Applicant/<br>Project manager | ECO (Monthly)                 | Ensure that socio-economic considerations are considered and implemented where necessary | Preparation and maintenance of a consultation register.<br><br>(ECO Monthly Audit)<br>(Consultation register) |
| <b>B</b> | <ul style="list-style-type: none"> <li>Transparent information should be supplied to the community from the outset of the project.</li> <li>Employment opportunities should first be offered to the local community if the skills are available within the community.</li> </ul> | Planning<br>Construction<br>Operation | Ongoing                              | Applicant<br>Contractor       | EO (Monthly)<br>ECO (Monthly) | Ensure that socio-economic considerations are considered and implemented where necessary | Preparation and maintenance of a consultation register.<br><br>(ECO Monthly Audit)<br>(Consultation register) |



| TECHNICAL OR MANAGEMENT OPTIONS |   |           |            |                   |                                 |  |  |
|---------------------------------|---|-----------|------------|-------------------|---------------------------------|--|--|
| Item No.                        | Technical or Management Option  | Phase     | Timeframes | Responsible Party | Monitoring Party<br>(Frequency) | Target   | Performance Indicators<br>(Monitoring Tool)  |
| 17.9 GROUND AND SURFACE WATER   |   |           |            |                   |                                 |  |  |
| A                               | <ul style="list-style-type: none"> <li>• All granulated e-waste and shredded x-ray film will be stored in a warehouse with concrete flooring to prevent the formation of leachate that may impact surface and ground water;</li> <li>• General waste would be collected in “wheelly bins”, with lids, for removal by the municipality to a suitably licenced disposal facility;               <ul style="list-style-type: none"> <li>○ The spent acid containers will be bunded (secondary containment system) to ensure recovery of potential spills. The bund must be capable of storing at least 110% of the storage capacity of one of the tanks. The two acid storage tanks will not be connected to each other;</li> <li>○ A stormwater management plan must</li> </ul> </li> </ul> | Operation | All phases | Applicant         | ECO<br>(Monthly)                | Ensure that water quality is not negatively impacted upon. | Monitoring reports and results indicated same if not better quality and quantity of water.<br><br>(EO weekly checklist)<br>(ECO Monthly Audit) |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |            |                   |                                     |   |   |
|---------------------------------|--|-----------|------------|-------------------|-------------------------------------|---|---|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes | Responsible Party | Monitoring Party<br>(Frequency)     | Target  | Performance Indicators<br>(Monitoring Tool)   |
|                                 | be compiled to ensure dirty and clean water are separated, prior to discharge. Dirty water may not be discharged into the natural environment or municipal sewerage system, without the relevant licences and permits;   |           |            |                   |                                     |   |   |
| <b>B</b>                        | Kusasa must develop an SOP that ensures daily inspections of any bunded areas that are not located under roof. Any spills must be contained in the bund area and disposed of as waste and not discharged. On site pH testing must be done of all water collected within bunded areas prior to discharge. | Operation | All phases | Applicant         | ECO<br>(Monthly)                    | Ensure that water quality is not negatively impacted upon.<br><br>Discharge water with pH 5,5-7,5 | Monitoring/<br>inspection reports and results.<br><br>(EO weekly checklist)<br>(ECO Monthly Audit)                  |
| <b>C</b>                        | Applicable preventative measures must be implemented to prevent contamination of natural water resources.  | Operation | All phases | Applicant         | EO (Weekly)<br><br>ECO<br>(Monthly) | Prevent pollution and contamination of natural water resources.                                   | Visual confirmation of compliance with EMP conditions.<br><br>Water monitoring results<br><br>(EO weekly checklist) |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |            |                   |                                 |   |  |
|---------------------------------|--|-----------|------------|-------------------|---------------------------------|---|--|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes | Responsible Party | Monitoring Party<br>(Frequency) | Target  | Performance Indicators<br>(Monitoring Tool)  |
|                                 |  |           |            |                   |                                 |   | (ECO Monthly Audit)  |
| D                               | <p>Dewatering of water collected in the storage bunds and warehouse must be undertaken in a manner that ensures that:</p> <ul style="list-style-type: none"> <li>• Polluted water is not discharged directly into the environment.</li> <li>• Sediment laden water is not discharged in a manner which may result in increased sedimentation of natural water resources.</li> </ul>  | Operation | All phases | Applicant         | EO (Weekly)<br>ECO (Monthly)    | Prevent pollution and contamination of natural water resources. | <p>Visual confirmation of compliance with EMPr conditions.</p> <p>(EO weekly checklist)</p> <p>(ECO Monthly Audit)</p> |
| E                               | <ul style="list-style-type: none"> <li>• Implement a chemical compatibility/segregation matrix for new reagents (peroxides, ethanol, ammonium salts) and integrate into storage layout, signage and training.</li> <li>• Review bund materials and chemical resistance for new chemicals; include bund-water sampling (where necessary) and controlled dewatering procedure (no discharge of contaminated bund water to the environment).</li> </ul> | Operation | Ongoing    | Applicant         | EO Weekly checklists            | Effective chemical management                                   | <p>(EO weekly checklist)</p> <p>ECO Audits</p>   |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |   |                   |                                 |  |   |
|---------------------------------|--|-----------|---|-------------------|---------------------------------|--|---|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes                              | Responsible Party | Monitoring Party<br>(Frequency) | Target   | Performance Indicators<br>(Monitoring Tool) |
|                                 | <ul style="list-style-type: none"> <li>Strengthen transfer controls: including supervised transfers, use drip trays, quick-connect couplings (if possible), line integrity checks, isolation valves (if possible); include checks in EO weekly checklists.</li> <li>Add specific controls for oxidisers (sodium peroxide/hydrogen peroxide): dedicated storage, spill kits suitable for oxidisers, and exclusion of combustible absorbents where inappropriate.</li> </ul> |           |   |                   |                                 |  |   |
| F                               | <ul style="list-style-type: none"> <li>Confirm effluent/neutralisation capacity for PGM campaign peaks (neutralisation tank capacity, filter press throughput, storage capacity/freeboard) and document contingency procedures for peak volumes.</li> <li>Define scrubber liquor management route (storage, sampling, classification, contractor disposal) and integrate into the waste register and monitoring plan.</li> </ul>   | Operation | Pre-commencement of PGM Line<br>Ongoing | Applicant         | EO Weekly checklists            | Effective chemical management<br>Prevent uncontrolled liquid effluent releases | (EO weekly checklist)<br>ECO Audits         |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |            |                         |                              |  |   |
|---------------------------------|--|-----------|------------|-------------------------|------------------------------|--|---|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes | Responsible Party       | Monitoring Party (Frequency) | Target   | Performance Indicators (Monitoring Tool)                                |
|                                 | <ul style="list-style-type: none"> <li>Add commissioning effluent characterisation programme: pH, conductivity, chloride/nitrate proxies, ammonia (if relevant), and metals suite aligned with new PGM circuit reagents and feedstock; set trigger levels and corrective actions.</li> <li>Update stormwater plan drawings to include new chemical storage/transfer areas and any new dirty-water capture points; implement bund-water sampling prior to any dewatering.</li> <li>Waste streams must be classified and assessed in accordance with the requirements of the NEMWA. Disposal to suitable licenced facilities.</li> </ul> |           |            |                         |                              |  |   |
| <b>17.10 AIR QUALITY</b>        |  |           |            |                         |                              |  |   |
| <b>A</b>                        | <ul style="list-style-type: none"> <li>The proposed stack height will be approximately 8 and 9 metres respectively;</li> </ul>   | Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly) | Ensure that emission levels are controlled within acceptable limits. | Confirmation that emissions are within limits based on monitoring plan. |



**TECHNICAL OR MANAGEMENT OPTIONS**

| Item No. | Technical or Management Option   | Phase | Timeframes | Responsible Party | Monitoring Party<br>(Frequency) | Target                               | Performance Indicators<br>(Monitoring Tool)   |
|----------|--|-------|------------|-------------------|---------------------------------|--------------------------------------|---|
|          | <ul style="list-style-type: none"> <li>The emissions from the chemical sponging process will be directed to a scrubber before being emitted to the atmosphere;</li> <li>The emissions from this electro-winning process will be directed to the same scrubber that the sponging process is utilising;</li> <li>The scrubbing liquid will consist of Water, Caustic Soda (NaOH), and Sodium Hydrosulphite (Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub>). The amount of NaOH and Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> will need to be determined during operation to achieve a 96% to 98% scrubbing efficiency;</li> <li>The scrubber will be serviced every 12 months, in order to ensure effective operation. The sponge formed during the process is separated from the liquid via a specially designed filter press;</li> </ul> |       |            |                   |                                 | No complaints relating to emissions. | (EO weekly checklist)<br>(ECO Monthly Audit)<br>(Consultation register)<br>Scrubber servicing records.<br>Air quality monitoring reports. |



| TECHNICAL OR MANAGEMENT OPTIONS |   |              |                    |                         |                                 |                                  |  |
|---------------------------------|---|--------------|--------------------|-------------------------|---------------------------------|----------------------------------|--|
| Item No.                        | Technical or Management Option  | Phase        | Timeframes         | Responsible Party       | Monitoring Party<br>(Frequency) | Target                           | Performance Indicators<br>(Monitoring Tool)  |
|                                 | <ul style="list-style-type: none"> <li>Air Quality Monitoring shall be undertaken as specified in the AEL licence conditions;</li> </ul>  |              |                    |                         |                                 |                                  |  |
| <b>B</b>                        | <ul style="list-style-type: none"> <li>In the event that asbestos is disturbed on site, it must be classified by an AIA to determine the hazard rating and management measures. The contractor will notify the Occupational Hygiene Section of the National Institute for Occupational Health (NIOH) and make the necessary arrangement for an inspection and responsible disposal.</li> <li>Asbestos handling, the removal of fibres and any mechanism to suppress the emission of fibres must comply with the Policy on the Handling and Disposal of Asbestos and Asbestos Containing Waste in terms of Section 20 of the Environment Conservation Act, 1989 (Act 73 Of 1989) and the Asbestos</li> </ul> | Construction | Construction phase | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)    | Prevent the release of asbestos. | Visual confirmation of compliance with EMPr conditions.<br><br>Proof of communication with NIOH.<br><br>(EO weekly checklist)<br>(ECO Monthly Audit) |



| TECHNICAL OR MANAGEMENT OPTIONS |   |           |            |                   |                                 |   |  |
|---------------------------------|---|-----------|------------|-------------------|---------------------------------|---|--|
| Item No.                        | Technical or Management Option  | Phase     | Timeframes | Responsible Party | Monitoring Party<br>(Frequency) | Target  | Performance Indicators<br>(Monitoring Tool)    |
|                                 | Regulations (R773 of 10 April 1987) promulgated under the OHSA.   |           |            |                   |                                 |   |  |
| C                               | <ul style="list-style-type: none"> <li>Monitor and report monthly kWh consumption as part of operational environmental reporting.</li> <li>Set energy intensity KPIs with quarterly review and corrective actions via the non-conformance system.</li> <li>Develop and implement energy efficiency SOPs: examples include minimise furnace hold time, optimise batch scheduling, maintain chiller setpoints, and avoid overcooling; include preventative maintenance focused on energy performance.</li> <li>Evaluate feasible low-carbon supply measures (PV/wheeling/renewable procurement) and implement where practicable; record decisions and progress in management review minutes.</li> </ul> | Operation | Ongoing    | Applicant         | Annual                          | Reduced reliance on carbon intensive energy sources | Reduced energy and carbon intensity over time. |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |   |                   |                                  |                                  |  |
|---------------------------------|--|-----------|---|-------------------|----------------------------------|----------------------------------|--|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes                                  | Responsible Party | Monitoring Party<br>(Frequency)  | Target                           | Performance Indicators<br>(Monitoring Tool)      |
| D                               | <ul style="list-style-type: none"> <li>Add dust capture equipment (and any baghouse interface points) to the EMPr maintenance schedule including inspection frequency, dust removal procedures, integrity checks and record keeping.</li> <li>Ensure all furnace off-gas and hot-process vents are captured and routed through the abatement systems; avoid temporary venting/bypass.</li> <li>Develop and implement dust handling SOP: including use of sealed containers, wet methods/HEPA vacuum only, controlled transfer to storage, and classification/manifesting of dust as per waste requirements, application of specified PPE.</li> <li>Provide task-specific training on fine dust handling and housekeeping frequency.</li> </ul> | Operation | Pre-commencement of PGM line<br><br>Ongoing | Applicant         | EO (Weekly)<br><br>ECO (Monthly) | Controlled particulate emissions | (EO weekly checklist)<br><br>(ECO Monthly Audit) |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |   |                   |                                  |                      |  |
|---------------------------------|--|-----------|---|-------------------|----------------------------------|----------------------|--|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes                                  | Responsible Party | Monitoring Party<br>(Frequency)  | Target               | Performance Indicators<br>(Monitoring Tool)      |
| E                               | <ul style="list-style-type: none"> <li>Confirm, and document, abatement capacity for increased acid loadings: verify scrubber design basis (gas flow, acid loading, liquid-to-gas ratio, reagent dosing capacity) against the new monthly acid volumes and PGM operating schedule.</li> <li>Add a formal scrubber performance verification programme to demonstrate the scrubber remains effective at the increased higher load.</li> <li>Develop chemical handling Standard Operating Procedures (SOPs) for high-volume HCl/HNO<sub>3</sub>. These should include controls such as transfer in bunded areas, quick-connect couplings, drip trays, transfer supervision and must be linked to the EMP<sub>r</sub> spill prevention/response system.</li> <li>Obtain AEL amendment to reflect revised process.</li> </ul> | Operation | Pre-commencement of PGM line<br><br>Ongoing | Applicant         | EO (Weekly)<br><br>ECO (Monthly) | Controlled emissions | (EO weekly checklist)<br><br>(ECO Monthly Audit) |



| TECHNICAL OR MANAGEMENT OPTIONS |  |                           |            |                         |                              |   |  |
|---------------------------------|--|---------------------------|------------|-------------------------|------------------------------|---|--|
| Item No.                        | Technical or Management Option   | Phase                     | Timeframes | Responsible Party       | Monitoring Party (Frequency) | Target  | Performance Indicators (Monitoring Tool)   |
|                                 | <ul style="list-style-type: none"> <li>Add targeted monitoring for emissions of concern during the initial PGM implementation to verify predictions and confirm compliance with AEL conditions.</li> </ul>   |                           |            |                         |                              |   |  |
| 17.11 NOISE                     |  |                           |            |                         |                              |   |  |
| A                               | <ul style="list-style-type: none"> <li>All plant and construction equipment to be kept in good repair to ensure that point source noise emissions are reduced.</li> <li>Adjacent property owners should also be consulted if any night time construction activities are to take place.</li> <li>Strive for compliance with the relevant South African National Standards (e.g. SANS 10103) and other noise control legislation. Monitoring should be carried out. The ECO has the discretion to instruct that monitoring be undertaken.</li> </ul> | Construction<br>Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly) | Ensure that noise levels are controlled within acceptable limits.<br><br>No complaints relating to noise. | Confirmation that noise levels are within acceptable limits and relevant notifications undertaken (e.g.: blasting).<br>(EO weekly checklist)<br>(ECO Monthly Audit)<br>(Consultation register) |



| TECHNICAL OR MANAGEMENT OPTIONS                           |   |              |            |                         |   |   |   |
|---|---|--------------|------------|-------------------------|---|---|---|
| Item No.  | Technical or Management Option  | Phase        | Timeframes | Responsible Party       | Monitoring Party<br>(Frequency)                           | Target  | Performance Indicators<br>(Monitoring Tool)                       |
| <b>B</b>  | <ul style="list-style-type: none"> <li>Specify low-noise equipment where feasible; install acoustic enclosures/silencers on dominant sources (e.g., chiller/fans) if boundary noise risk is identified through monitoring.</li> <li>Restrict particularly noisy maintenance activities to daytime hours where practicable and document deviations.</li> </ul> | Operation    | Ongoing    | Applicant               | EO (Weekly)<br>ECO (Monthly)                              | Ensure that noise levels are controlled within acceptable limits.<br><br>No complaints relating to noise. | EO weekly checklist<br>ECO Monthly Audit                          |
| <b>17.12 SITE ACCESS, SECURITY AND TRAFFIC MANAGEMENT</b> |   |              |            |                         |   |   |   |
| <b>A</b>  | No person will be allowed to keep or use alcohol, recreational drugs, traditional or modern weapons, or otherwise dangerous objects on-site, or to enter the site while under the influence of alcohol or drugs.  | Construction | Ongoing    | Applicant<br>Contractor | Safety Department (Daily)<br>EO (Weekly)<br>ECO (Monthly) | Ensure safety and security is maintained on site.   | No incidents (Site induction material)<br>(Consultation register) |
| <b>B</b>  | Staff, employees and construction workers will not be allowed to keep (or have in their possession at any point in  | Construction | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)                              | Avoid public nuisance, introducing foreign species/diseases to  | (EO weekly checklist)<br>(ECO Monthly Audit)                      |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |            |                      |   |  |   |
|---------------------------------|--|-----------|------------|----------------------|---|--|---|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes | Responsible Party    | Monitoring Party (Frequency)  | Target   | Performance Indicators (Monitoring Tool)  |
|                                 | time) any animals, including livestock, poultry, wildlife or pets on site.   |           |            |                      |   | area and unsanitary conditions.  |   |
| <b>C</b>                        | All employees and visitors to the site must undergo a site induction which shall include basic environmental awareness and site specific environmental requirements and relevant protocols / procedures. This induction should be presented or otherwise facilitated by the Applicant whenever possible. Records of site inductions shall be kept on file at the site.                           | Operation | Ongoing    | Applicant Contractor | Safety Department (As and when necessary)<br>EO (Weekly)<br>ECO (Monthly) | Ensure visitors are aware of site environmental sensitivities, and procedures.                 | Verification that awareness training is undertaken.<br>(Induction training registers)<br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| <b>D</b>                        | A security guard must be posted at the gate to ensure authorised access only. Weather proof, durable and legible signs in at least 3 official languages must be displayed at the entrance to the facility. The signs must indicate the risks involved in entering the site, hours of operation, the name, address, telephone number and the person responsible for the operation of the facility | Operation | Ongoing    | Applicant Contractor | EO (Weekly)<br>ECO (Monthly)  | Avoid public nuisance, introducing foreign species/diseases to area and unsanitary conditions. | (EO weekly checklist)<br>(ECO Monthly Audit)  |



| TECHNICAL OR MANAGEMENT OPTIONS |   |              |            |                         |  |   |   |
|---------------------------------|---|--------------|------------|-------------------------|--|---|---|
| Item No.                        | Technical or Management Option  | Phase        | Timeframes | Responsible Party       | Monitoring Party<br>(Frequency)                                  | Target  | Performance Indicators<br>(Monitoring Tool)   |
| E                               | Heavy delivery vehicles must be clearly marked for visibility purposes. Travel at night should be avoided as far as is reasonably possible. Heavy vehicles may not exceed relevant speed limits.  | Operation    | Ongoing    | Applicant<br>Contractor | Safety Department<br>(weekly)<br>EO (Weekly)<br>ECO<br>(Monthly) | Limit the potential for road accidents.   | No fines issued.<br>Vehicle accidents.<br>Safety Department<br>(Weekly checklists)<br>(EO weekly checklist)<br>(ECO Monthly Audit)          |
| F                               | Vehicles shall be maintained in good working condition to prevent disruption of traffic in adjacent road networks and internal roads.   | Operation    | Ongoing    | Applicant<br>Contractor | Safety Department<br>(weekly)<br>EO (Weekly)<br>ECO<br>(Monthly) | Visual observation of plant and vehicles for compliance with EMPr requirements. | Incident registers<br>Non-conformance registers<br>Safety Department<br>(Weekly checklists)<br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| G                               | <ul style="list-style-type: none"> <li>Ensure that all construction personnel wear suitable clothing to enable them to be visible and distinguishable within the community. Additionally all construction workers are to wear identifiable tags.</li> </ul> | Construction | Ongoing    | Applicant<br>Contractor | Safety Department<br>(weekly)<br>ECO<br>(Monthly)                | Adequate awareness  | Safety incident reports / registers<br>(ECO Monthly Audit)<br>(Consultation register)   |



| TECHNICAL OR MANAGEMENT OPTIONS   |  |           |            |                         |                                 |   |  |
|-----------------------------------|--|-----------|------------|-------------------------|---------------------------------|---|--|
| Item No.                          | Technical or Management Option   | Phase     | Timeframes | Responsible Party       | Monitoring Party<br>(Frequency) | Target  | Performance Indicators<br>(Monitoring Tool)  |
| <b>Waste Feedstock Management</b> |  |           |            |                         |                                 |   |  |
| <b>A</b>                          | <ul style="list-style-type: none"> <li>All granulated e-waste and shredded x-ray film would be stored in a warehouse with concrete flooring to prevent the formation of leachate that may impact surface and ground water;</li> <li>The applicant must verify, through routine inspections and external audits, that their waste feedstock contains no Cathode Ray Tube (CRT) monitors, televisions or items of e-waste containing Mercury (Hg) or any other harmful components form part of the waste feedstock.</li> </ul> | Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)    | Adequate provision for spill prevention and containment | Visual observation that storage facilities comply with EMPr requirements and relevant norms and standards.<br><br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| <b>B</b>                          | <ul style="list-style-type: none"> <li>Restocking of waste feedstock may only take place within a dedicated area inside the site (that is subject to appropriate spill prevention and containment measures).</li> </ul>  | Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)    | Pollution prevention during refuelling                  | Visual observations that use of spill prevention measures are adequate.<br><br>(EO weekly checklist)   |



| TECHNICAL OR MANAGEMENT OPTIONS |   |           |            |                         |                              |   |  |
|---------------------------------|---|-----------|------------|-------------------------|------------------------------|---|--|
| Item No.                        | Technical or Management Option  | Phase     | Timeframes | Responsible Party       | Monitoring Party (Frequency) | Target  | Performance Indicators (Monitoring Tool)   |
|                                 | <ul style="list-style-type: none"> <li>Any accidental spillages shall be contained and cleaned up promptly.</li> </ul>  |           |            |                         |                              |   | (ECO Monthly Audit)  |
| <b>C</b>                        | <ul style="list-style-type: none"> <li>All waste storage containers must be adequate in number and accessibility to effectively manage the waste treated on site.</li> <li>Chemical storage containers shall be watertight, wind-proof and shall also be conspicuous.</li> <li>Waste feedstock must also be protected from rain, which may cause pollutants to leach out. Particular caution is to be exercised with regards to handling of hazardous waste, to ensure that it does not spill or leak from the waste storage containers.</li> </ul> | Operation | Ongoing    | Applicant<br>Contractor | EO (Daily)<br>ECO (Monthly)  | Ensure waste is adequately controlled in a responsible manner | Visual observation that waste management complies with EMPr requirements and relevant norms and standards.<br><br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| <b>D</b>                        | <ul style="list-style-type: none"> <li>If skips are utilised for waste storage, these shall be provided with tarpaulins/lids to prevent the ingress of water and waste</li> </ul>   | Operation | Ongoing    | Applicant<br>Contractor | EO (Daily)<br>ECO (Monthly)  | Prevent contamination of                                      | Visual observation that waste management complies with EMPr  |



| TECHNICAL OR MANAGEMENT OPTIONS |  |  |            |                         |  |   |  |
|---------------------------------|--|--|------------|-------------------------|--|---|--|
| Item No.                        | Technical or Management Option   | Phase                                    | Timeframes | Responsible Party       | Monitoring Party (Frequency)   | Target  | Performance Indicators (Monitoring Tool)   |
|                                 | being blown by the wind and shall be placed on a concrete hard stand to prevent the potential for soil and/or water pollution as a result of spillages.  |  |            |                         |  | environment from waste storage  | requirements and relevant norms and standards.<br>(EO weekly checklist)<br>(ECO Monthly Audit)   |
| E                               | <ul style="list-style-type: none"> <li>The storage volumes of waste on site shall not exceed the applicable thresholds contained within the NEMWA List of Waste Management Activities and the Authorised Waste Management Licence.</li> <li>In the case that a storage capacity exceeding this amount is required or planned for, the necessary waste permits must be obtained in accordance with the NEMWA beforehand.</li> </ul> | Planning<br>Operation<br>Decommissioning | Ongoing    | Applicant<br>Contractor | EO (As and when necessary)<br>ECO (As and when necessary)<br>Applicant (As and when necessary) | Appropriate waste disposal frequency to reduce potential for permitting requirement | Visual observation that waste management complies with EMPr requirements and relevant norms and standards.<br>EO (As and when necessary)<br>ECO (As and when necessary)<br>Applicant (As and when necessary) |
| F                               | <ul style="list-style-type: none"> <li>A waste management system must be developed to track and monitor solid and liquid waste storage, waste separation, and frequent removal of waste for</li> </ul>   | Operation                                | Ongoing    | Applicant<br>Contractor | EO (Daily)<br>ECO (Monthly)  | Ensure waste is adequately controlled in a responsible manner                       | Audits that ensure waste management complies with EMPr requirements and  |



| TECHNICAL OR MANAGEMENT OPTIONS             |  |              |            |                         |                                 |   |  |
|---|--|--------------|------------|-------------------------|---------------------------------|---|--|
| Item No.                                    | Technical or Management Option   | Phase        | Timeframes | Responsible Party       | Monitoring Party<br>(Frequency) | Target  | Performance Indicators<br>(Monitoring Tool)  |
|   | <p>permanent disposal at an appropriately licensed waste disposal facility.</p> <ul style="list-style-type: none"> <li>No waste material (including excess or unwanted feedstock material or other chemicals) are to be disposed of, or discarded on site.</li> <li>Under no circumstances may there be any burial of waste on the site.</li> </ul>  |              |            |                         |                                 |   | <p>relevant norms and standards.</p> <p>(Waste register)</p> <p>(Waste disposal records)</p> <p>(Safe disposal certificates)</p> <p>(EO weekly checklist)</p> <p>(ECO Monthly Audit)</p> |
| <b>17.13 HAZARDOUS SUBSTANCE MANAGEMENT</b> |  |              |            |                         |                                 |   |  |
| <b>A</b>                                    | <ul style="list-style-type: none"> <li>All hazardous substances (e.g. fuel, acids, spent acids) must be handled, stored and in a safe and responsible manner (in accordance with relevant MSDS) so as to prevent pollution of the environment or harm to people or animals.</li> <li>Appropriate measures must be implemented to prevent spillage and appropriate steps must be</li> </ul> | Construction | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)    | Appropriate hazardous storage to reduce potential for pollution of environment. | <p>Visual observation that hazardous substance storage complies with EMPr requirements and relevant norms and standards.</p> <p>(EO weekly checklist)</p> <p>(ECO Monthly Audit)</p>     |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |            |                         |                              |   |  |
|---------------------------------|--|-----------|------------|-------------------------|------------------------------|---|--|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes | Responsible Party       | Monitoring Party (Frequency) | Target  | Performance Indicators (Monitoring Tool)   |
|                                 | <p>taken to prevent pollution in the event of a spill.</p> <ul style="list-style-type: none"> <li>If, asbestos is disturbed on site (including exposing old ceilings, water pipes etc) must be classified to determine the hazard rating and management measures. The contractor will notify the Occupational Hygiene Section of the National Institute for Occupational Health (NIOH) and make the necessary arrangement for an inspection and disposal.</li> </ul> |           |            |                         |                              |   |  |
| B                               | <ul style="list-style-type: none"> <li>Hazardous substances shall be confined to specific roofed warehouse areas and in such a way that does not pose any danger of pollution even during times of high rainfall.</li> <li>Hazardous chemical storage areas shall be bunded (impermeable) with adequate containment (at least 110% the</li> </ul>  | Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly) | Adequate provision for spill prevention and containment | <p>Visual observation that storage facilities comply with EMPr requirements and relevant norms and standards.</p> <p>(EO weekly checklist)<br/>(ECO Monthly Audit)</p> |



| TECHNICAL OR MANAGEMENT OPTIONS |   |           |            |                         |  |   |   |
|---------------------------------|---|-----------|------------|-------------------------|--|---|---|
| Item No.                        | Technical or Management Option  | Phase     | Timeframes | Responsible Party       | Monitoring Party (Frequency)                               | Target  | Performance Indicators (Monitoring Tool)  |
|                                 | <p>largest volume stored) for potential spills or leaks.</p> <ul style="list-style-type: none"> <li>Waste from spillages shall be removed and recycled or disposed of responsibly.</li> <li>The spent acid containers will be banded (secondary containment system) to ensure recovery of potential spills. The bund must be capable of storing at least 110% of the storage capacity of one of the tanks. (the three acid storage tanks will not be connected to each other);</li> </ul> |           |            |                         |  |   |   |
| C                               | Any containers in which hazardous substances (e.g. acids and solvents) are stored shall be clearly marked as to the contents therein (in accordance with OHSA regulations). Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practice must be adhered to.   | Operation | Ongoing    | Applicant<br>Contractor | Safety Department (weekly)<br>EO (Weekly)<br>ECO (Monthly) | Clear identification of hazardous substances to ensure correct fire prevention and spill response measures can be applied in the event of a spillage. | Visual observation that storage containers are adequately marked.<br>(EO weekly checklist)<br>(ECO Monthly Audit) |



| TECHNICAL OR MANAGEMENT OPTIONS |  |           |            |                         |  |   |  |
|---------------------------------|--|-----------|------------|-------------------------|--|---|--|
| Item No.                        | Technical or Management Option   | Phase     | Timeframes | Responsible Party       | Monitoring Party<br>(Frequency)                                  | Target  | Performance Indicators<br>(Monitoring Tool)  |
| <b>D</b>                        | All relevant national, regional and local legislation and relevant norms and standards with regard to the transport, use and disposal of hazardous materials shall be strictly complied with.  | Operation | Ongoing    | Applicant<br>Contractor | Safety Department<br>(weekly)<br>EO (Weekly)<br>ECO<br>(Monthly) | Compliance with relevant legislation, regulations, norms and standards.                                       | Legal register<br>(EO weekly checklist)<br>(ECO Monthly Audit)   |
| <b>E</b>                        | Any waste material or excess chemicals should be removed from the site and should preferably be recycled (e.g. spent acid, oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled shall be disposed of at a suitably licensed waste facility. | Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO<br>(Monthly)                                  | Responsible management of hazardous substances to prevent pollution of the environment.<br>Waste minimisation | Visual observation that wastes are managed appropriately.<br>(EO weekly checklist)<br>(ECO Monthly Audit)                        |
| <b>F</b>                        | Hazardous waste may only be disposed of at a licensed hazardous waste disposal facility. Proof of disposal must be retained (e.g. waste slips, waste manifests, and safe disposal certificates). The 'cradle-to-grave' principle must be complied with.                                    | Operation | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO<br>(Monthly)                                  | Appropriate disposal of hazardous waste   | Waste register and manifests to ensure cradle-to-grave principle has been complied with.<br><br>(Waste register/Waste manifests) |



| TECHNICAL OR MANAGEMENT OPTIONS |   |              |            |                      |  |   |   |
|---------------------------------|---|--------------|------------|----------------------|--|---|---|
| Item No.                        | Technical or Management Option  | Phase        | Timeframes | Responsible Party    | Monitoring Party (Frequency)                               | Target  | Performance Indicators (Monitoring Tool)  |
|                                 |   |              |            |                      |  |   | (Safe disposal certificates)<br>(EO weekly checklist)<br>(ECO Monthly Audit)  |
| <b>G</b>                        | Personnel utilising hazardous substances on site shall be properly trained concerning the proper use, handling and disposal of hazardous substances. If required, advice shall be obtained from the manufacturer with regard to the safe handling and storage of hazardous materials. | Construction | Ongoing    | Applicant Contractor | Safety Department (weekly)<br>EO (Weekly)<br>ECO (Monthly) | Adequate training to ensure proper use, handling and disposal of hazardous substances                           | Visual observation that hazardous substance management complies with EMPr requirements.<br><br>(Environmental training records)<br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| <b>H</b>                        | <ul style="list-style-type: none"> <li>The Applicant shall develop and maintain a hazardous substance register for all hazardous materials that shall be kept on site during all phases of the project.</li> <li>The register shall be provided to the ECO upon request.</li> </ul>   | Construction | Ongoing    | Applicant Contractor | Safety Department (weekly)<br>EO (Weekly)<br>ECO (Monthly) | Documentation available on site relating to correct use, handling, storage and disposal of hazardous substances | Audits to confirm that MSDS records are adequate and hazardous substances register is up to date.   |



| TECHNICAL OR MANAGEMENT OPTIONS |   |           |  |                   |                                 |   |   |
|---------------------------------|---|-----------|--|-------------------|---------------------------------|---|---|
| Item No.                        | Technical or Management Option  | Phase     | Timeframes   | Responsible Party | Monitoring Party<br>(Frequency) | Target  | Performance Indicators<br>(Monitoring Tool)   |
|                                 | <ul style="list-style-type: none"> <li>Material Safety Data Sheets (MSDS) must be available on site at the point of use and readily accessible for all hazardous substances stored.</li> </ul>  |           |  |                   |                                 |   | (Hazardous substance register and MSDS)<br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| I                               | <ul style="list-style-type: none"> <li>Add new waste streams to the waste register (e.g. baghouse dust, PGM precipitate residues, spent filter media/cloths, centrifuge residues, off-spec salts/sponges); define storage and disposal route for each.</li> <li>Update waste classification programme to include new wastes (in line with the NEMWA requirements) and confirm acceptance criteria with disposal/treatment facilities and contractors.</li> <li>Provide secure, sealed and labelled storage in bunded/impervious areas; prevent dust liberation and stormwater contact; include</li> </ul> | Operation | Prior to operation start.<br>Ongoing during operations | Applicant         | EO (Weekly)<br>ECO (Monthly)    | Updated Register<br>Clear waste segregation.<br>Waste manifests | Compliance Audits   |



| TECHNICAL OR MANAGEMENT OPTIONS |   |           |            |                   |                                 |   |   |
|---------------------------------|---|-----------|------------|-------------------|---------------------------------|---|---|
| Item No.                        | Technical or Management Option  | Phase     | Timeframes | Responsible Party | Monitoring Party<br>(Frequency) | Target                                      | Performance Indicators<br>(Monitoring Tool)               |
|                                 | compatibility segregation for reactive residues. <ul style="list-style-type: none"> <li>Update contractor verification procedure: retain acceptance letters/permits for new waste types and ensure manifests reflect correct UN/transport classes where applicable.</li> </ul>  |           |            |                   |                                 |   |   |
| J                               | <ul style="list-style-type: none"> <li>Confirm transporter licensing for hazardous chemicals and wastes; verify permits annually and retain on file; ensure SDS and emergency information accompanies loads.</li> <li>Schedule deliveries/collections to avoid peak traffic and reduce accident risk; formalise logistics SOP and include response procedures for transporters.</li> <li>Obtain acceptance confirmation from treatment/disposal facilities for new PGM-related wastes (dusts, residues) prior to shipping; update manifests accordingly.</li> </ul> | Operation | Ongoing    | Applicant         | EO (Weekly)<br>ECO (Monthly)    | Safe transportation of hazardous materials. | Safe disposal/treatment certificates<br>Compliance Audits |



**TECHNICAL OR MANAGEMENT OPTIONS**

| Item No.                              | Technical or Management Option   | Phase                             | Timeframes | Responsible Party               | Monitoring Party<br>(Frequency)     | Target   | Performance Indicators<br>(Monitoring Tool)   |
|---------------------------------------|--|-----------------------------------|------------|---------------------------------|-------------------------------------|--|---|
| <b>17.14 GENERAL WASTE MANAGEMENT</b> |  |                                   |            |                                 |                                     |  |   |
| <b>A</b>                              | <p>Waste generated on site (such as domestic and inert waste) shall be separated into reusable, recyclable and non-recyclable waste, and shall be further separated as follows:</p> <ul style="list-style-type: none"> <li>• Hazardous waste, consisting of substances that may be harmful to the receiving environment, and therefore require precautionary measures when handled. Examples include (but not limited to) oil, paint, diesel.</li> <li>• General waste, consisting of non-hazardous substances and substances that cannot be recycled. Examples include (but not limited to) construction rubble, excess construction materials that cannot be reused.</li> <li>• Recyclable waste, (where volumes are sufficient to make recycling feasible) shall</li> </ul> | <p>Construction<br/>Operation</p> | Ongoing    | <p>Applicant<br/>Contractor</p> | <p>EO (Daily)<br/>ECO (Monthly)</p> | <p>Ensure proper categorisation of waste to ensure correct handling and disposal</p> | <p>Visual observation that waste categorisation and separation complies with EMPr requirements.<br/>(EO weekly checklist)<br/>(ECO Monthly Audit)</p> |



| TECHNICAL OR MANAGEMENT OPTIONS              |  |  |            |                         |                                    |   |  |
|--|--|--|------------|-------------------------|------------------------------------|---|--|
| Item No.                                     | Technical or Management Option   | Phase  | Timeframes | Responsible Party       | Monitoring Party (Frequency)       | Target  | Performance Indicators (Monitoring Tool)   |
|  | preferably be stored in separate bins.   |  |            |                         |                                    |   |  |
| <b>B</b>                                     | <ul style="list-style-type: none"> <li>Refuse which cannot be reused or recycled must be disposed of at a suitable waste disposal facility.</li> <li>Refuse may not be burned or buried on, or near the adjacent properties (nor on any other properties that are not specifically registered for such activity).</li> </ul> | Construction<br>Operation                                | Ongoing    | Applicant<br>Contractor | EO (Weekly)<br>ECO (Monthly)       | Ensure responsible waste disposal and compliance with legal requirement.                        | Visual observation and/or documented proof that waste is disposed of at the approved facility.<br>(Waste register)<br>(Waste disposal records)<br>(Safe disposal certificates)<br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| <b>17.15 SEWAGE, EFFLUENT AND SANITATION</b> |  |  |            |                         |                                    |   |  |
| <b>A</b>                                     | <ul style="list-style-type: none"> <li>There must be adequate provision for safe, hygienic and effective sanitation at the site and these shall conform to all relevant health and safety standards and codes.</li> </ul>  | Planning<br>Construction<br>Operation<br>Decommissioning | Ongoing    | Applicant<br>Contractor | Safety Department<br>ECO (Monthly) | Safe, hygienic and effective sanitation that complies with legal provisions of OHSA regulations | Visual observation that EMPr and legal requirements relating to sewage and sanitation are met.   |



| TECHNICAL OR MANAGEMENT OPTIONS |   |                          |                                 |                   |  |   |  |
|---------------------------------|---|--------------------------|---------------------------------|-------------------|--|---|--|
| Item No.                        | Technical or Management Option  | Phase                    | Timeframes                      | Responsible Party | Monitoring Party (Frequency)                   | Target  | Performance Indicators (Monitoring Tool)   |
|                                 | <ul style="list-style-type: none"> <li>Under no circumstances will pit latrines, french drain systems or soak away systems be allowed.</li> </ul>             |                          |                                 |                   |  |   | (Safety audit reports)<br>(ECO Monthly Audit)  |
| <b>B</b>                        | No industrial effluent may be disposed of into a municipal sewer or into the environmental without prior authorisation from the relevant competent authority. | Planning<br>Construction | Ongoing                         | Contractor        | Safety Department EO (Weekly)<br>ECO (Monthly) | Responsible disposal of sewage  | Visual observation that there are no spillages from cleaning of chemical toilets, septic tanks, etc.<br>(Safety audit reports)<br>(Disposal records)<br>(EO weekly checklist)<br>(ECO Monthly Audit) |
| <b>17.16 DECOMMISSIONING</b>    |   |                          |                                 |                   |  |   |  |
| <b>A</b>                        | Should the project reach decommissioning stage, the relevant permits / licences and/or authorisations must be applied for.                                    | Decommissioning          | Upon completion of development. | Applicant         | Applicant (As and when necessary)              | Ensure that the decommissioning activity is undertaken in a legally responsible manner. | Visual observation that decommissioning complies with EMPr and legal requirements.   |



| TECHNICAL OR MANAGEMENT OPTIONS |  |                 |  |                   |  |   |   |
|---------------------------------|--|-----------------|--|-------------------|--|---|---|
| Item No.                        | Technical or Management Option   | Phase           | Timeframes   | Responsible Party | Monitoring Party<br>(Frequency)                                      | Target  | Performance Indicators<br>(Monitoring Tool)   |
|                                 |  |                 |  |                   |  |   | Applicant (permits / licences / authorisations in hand)   |
| <b>B</b>                        | <p>Prior to decommissioning the entire project or aspects of the project, a suitably qualified specialist must prepare a decommissioning plan that addresses the following aspects as a minimum:</p> <ul style="list-style-type: none"> <li>• Waste management;</li> <li>• Effluent management;</li> <li>• Pollution prevention;</li> <li>• Camp/staff and machinery management; and</li> <li>• Rehabilitation.</li> </ul> | Decommissioning | Upon completion of development or aspects thereof. | Applicant         | Applicant (As and when necessary)<br><br>ECO (As and when necessary) | Ensure that decommissioning plan is prepared and approved (if necessary). | <p>Visual observation that decommissioning complies with EMPr and legal requirements.</p> <p>(decommissioning plan/s)</p> <p>Applicant (permits / licences / authorisations in hand)</p> <p>ECO (Reports)</p> |



## 18 STORM WATER MANAGEMENT

The following section provides an overview of the storm water management measures that must be implemented on site to separate clean and dirty stormwater.

### 18.1 EXISTING STORM WATER

Some internal storm water infrastructure exists on the site. One part of the internal system is connected to the municipal system. This Municipal system starts at the northern corner of the erf and runs in a south easterly direction along the road. No extraneous storm water is expected from the upstream properties.

### 18.2 MANAGEMENT PRINCIPALS

The objective is to keep the clean water clean and to retain and treat the dirty water. For the purpose of this plan, dirty water is defined as storm water, contaminated with feedstock or spent acid waste. The water from the roofs, discharging directly into a closed piped system will be considered as clean. The following aspects must be incorporated into the storm water management plan:

- Adequate storm water management measures must be implemented on site, to prevent accidental spent acid spillage impacting on surface and ground water.
- Waste should be stored in suitable containers with lids to prevent water inflow. This bins should be stored within a designated location on a concrete floor.
- The spent acid will be stored in non-reactive tanks positioned in a specifically designed area, which will include a bunded area. Storm water may not be contaminated by spent acid.

### 18.3 CLEAN WATER MITIGATION

The following measures are relevant for clean water separation:

- Care must be taken to ensure that the manholes under the roofed areas are kept covered to ensure that dirty water do not enter this system.
- It is proposed to construct additional heavy duty grid inlets redirecting the dirty water away from the roofed areas.
- Certain grid inlets will have to be re-opened/re-constructed.
- It is also proposed to re-shape the railway reserve, west of the site to drain away from the buildings.
- It is also recommended that a grid inlet be constructed along to drain the clean water into the municipal system, near the bunded spent acid and chemical storage area.

### 18.4 DIRTY WATER MITIGATION

It must be noted that there is no municipal requirement for controlling the quantity of the run-off. Attenuation is therefore not required. There are also no targets set for improving the quality of the storm water leaving the site. Suspended solids and Total Phosphorus targets are therefore not applicable. The purpose of the storm water management plan is to ensure that no polluted dirty storm water leaves the site. The plan proposes that a treatment train approach be followed (Figure 5).

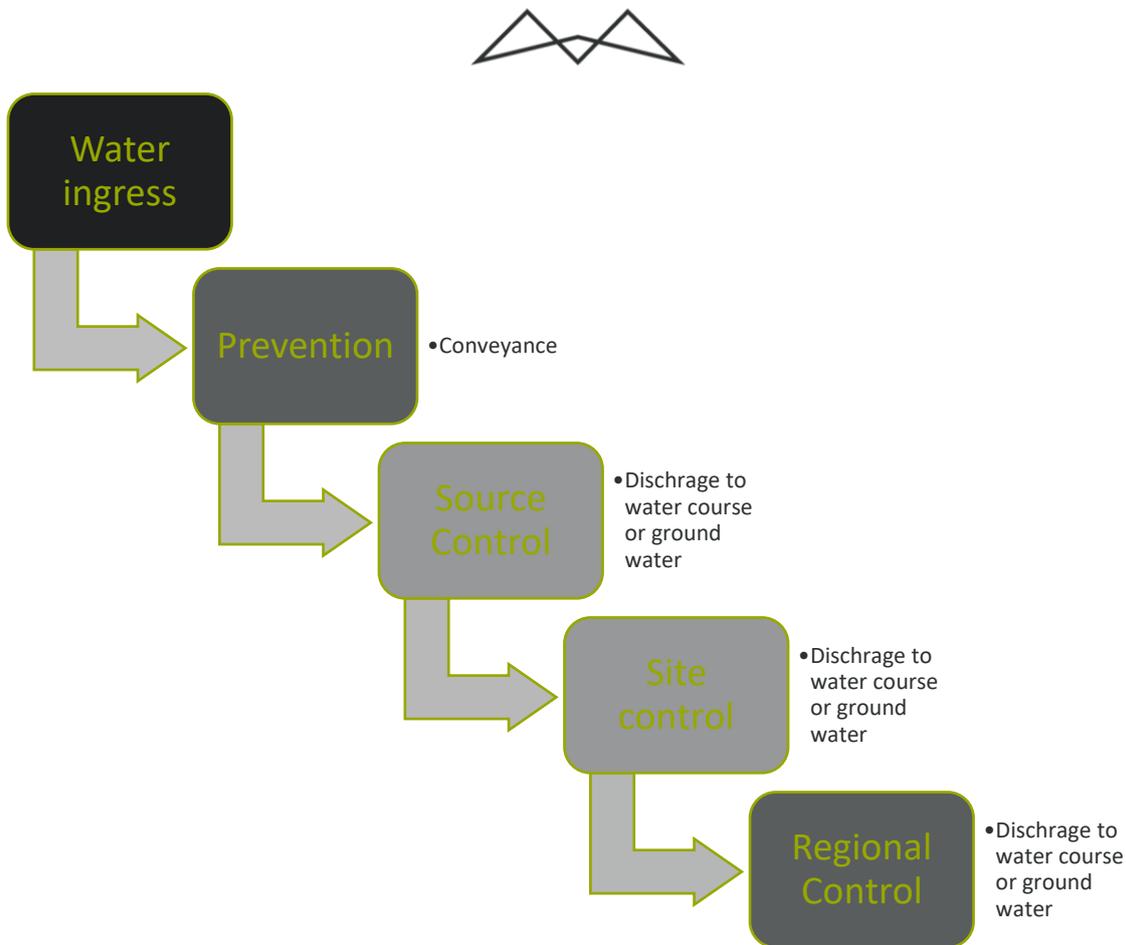


Figure 5: Treatment Train Process (Frost.A, 2007).

#### 18.4.1 SOURCE CONTROL

At prevention level the control should be at the source. In order to limit waste and chemicals entering the system, it is recommended that:

1. All areas, including under the roofs, be swept at least twice a day.
2. All the concrete hard stands surrounding the buildings will be treated as dirty water. These areas are also fed with stormwater from roofed areas. To prevent waste going into clean area or exiting the site, heavy duty grid inlets will be installed to trap most of the larger pieces of waste. These grid inlets must be cleared from any debris at regular intervals.

#### 18.4.2 SITE CONTROL

Alternatives should be investigated to mitigate the impact of spent acid and chemicals impacting on water courses and ground water. Dirty stormwater must be treated to acceptable limits prior to discharge into watercourses or the environment and will require the applicant to obtain a Water Use License. Alternative treatment and disposal measures must be investigated, since discharge into the environment is not the preferred options. Dirt water should be treated and disposed of in line with relevant legislation requirements.

#### 18.4.3 REGIONAL CONTROL

Due to the nature of the township, no regional control is required from the applicant. It is deemed to be the responsibility of the local municipality to cater for regional control.