

9.1

INTRODUCTION

The aim of the EIA for the Project is to provide information to inform decision-making that will contribute to sustainable development. The Final EIR will be submitted to the GDARD to provide information and an independent assessment, thus enabling the GDARD to make an informed decision regarding whether or not to grant an environmental authorisation for the Project. If granted, this report will also assist the GDARD to define the conditions under which the Project should go ahead. The development of the Project is likely to result in negative environmental impacts; however, it is also considered that there are positive socio-economic benefits associated with the Project. In particular, the Project will meet the development objectives of the R59 corridor.

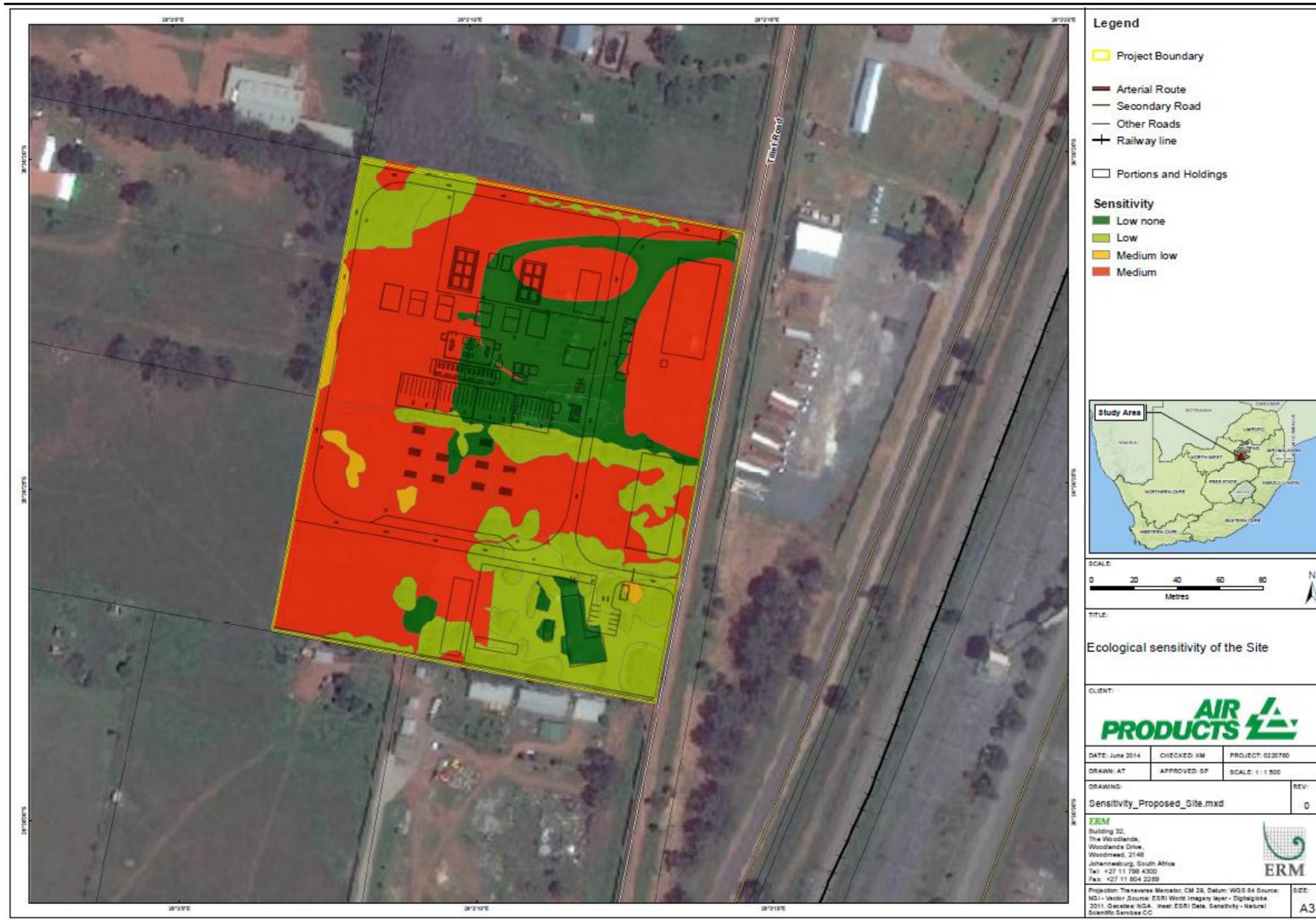
Through the EIA process, which included stakeholder and specialist input, ERM has identified and assessed a number of potential impacts relating to the Project. This section provides an overview of the EIA findings and provides key mitigation measures, should the Project be developed.

The site layout has been designed based on the sensitivity constraints of the Project site (*Figure 9.1*). Areas of low to no sensitivity will be used for majority of the Project infrastructure for Phase 1 of the Project. In addition, the existing farmhouse and outbuilding on the Project site will be used as offices and change facilities respectively. Areas of medium sensitivity will also be impacted in the northern portion of the site, through the development of Phase 1 and 2 of the Project. The south western portion of the Project site however will be conserved of this remaining natural grassland.

The final site layout may require some minor alterations as a consequence of more detailed geotechnical studies. Any revisions of the design will, however, be within the Project infrastructure footprint as illustrated below and any amendments will be submitted to GDARD before construction, with an indication of the extent of change and associated changes in significance ratings of impacts, if applicable.

The potential impacts associated with the Project are summarised below and should be considered both in the context of the Project motivation.

Figure 9.1 Site Layout and Sensitivity



9.2.1

Construction Phase Impacts

The initial stage of construction will involve site clearing and grubbing, which will be restricted to the area required for the construction of the Project. Site clearing will begin with the destruction and removal of two building structures, located on the northern portion of the site. Clearing and grading will also involve removal of vegetation and debris, particularly litter. Site preparation also involves the mobilisation of equipment, materials and heavy vehicle traffic on the Project site.

These activities are likely to cause the following negative impacts on the biophysical environment:

- disturbance and loss of soil resources;
- increased potential for soil erosion;
- increase in PM₁₀ emissions;
- increase in noise emissions;
- loss of grassland and floral habitat;
- spread of alien invasive species;
- loss of faunal habitat;
- sensory disturbance to fauna; and
- loss of faunal species.

Prior to mitigation, the impact assessment identified one negative impact of major significance, namely the increase in PM₁₀ emissions as a result of travelling vehicles and site clearing activities. The post-mitigation or residual significance is considered to be moderate as with the strict adherence to mitigation measures.

The loss of grassland and flora and faunal habitat as well as spread of alien invasive plant species has a moderate significance, prior to mitigation. These impacts have been reduced to minor significance with the implementation of the specified mitigation measures, particularly the conservation of the patch of grassland in the south western portion of the Project site and the translocation of CI species to this same area.

Noise emissions and the potential loss of faunal species due to spills have been assessed to have a minor significance, prior to mitigation. The disturbance and loss of soil resources, soil erosion and sensory disturbance to fauna have been assessed to have negligible significance prior to and after implementing mitigation measures. The significance ratings for these impacts have been reduced, primarily due to the limited duration of the construction activities and the low sensitivity of these receptors.

Construction activities are also likely to result in positive and negative impacts on the socio-economic environment, these include:

- creation of employment opportunities;
- training and skills development;
- procurement of goods and services;
- potential impact on heritage, archaeological and paleontological resources; and
- increase in traffic volumes;

The positive impacts of employment, training and skills development and local procurement of goods and services have a minor significance prior to and after the implementation of enhancement measures. The primary reason for the significance rating is the limited extent of these benefits. The Project will result in the employment of approximately 10 people from the local community with the Project Contractor sourcing the majority of materials for the Project from the region and not locally.

The potential impact on heritage, archaeological and paleontological resources and increase in traffic, all have a negligible significance prior to and after mitigation measures have been implemented. This is due to no resources of heritage or archaeological/paleontological having been identified on the Project site. Furthermore, the M61 Road and Kalksteen Roads have an average of 91percent spare capacity per lane, therefore the Project construction traffic on these existing roads were considered negligible.

The Project construction activities may also result in negative unplanned or accidental events, these include:

- accidental spills to soil and groundwater resources from materials and wastes; and
- vehicle accidents.

Potential contamination of groundwater and soil resources as a result of spills or leaks from the use of construction materials or generation of construction wastes has a moderate significance prior to mitigation. The likelihood of this impact occurring is high due to unforeseen accidental incidents. With the implementation of the proposed mitigation, this impact is considered to have a minor significance. Vehicle accidents are also an unforeseen incident that is considered to have a minor significance prior to mitigation and post-mitigation. Due to the extent of the Project site and construction activities, it is not likely that there would be a high number of construction vehicles travelling to and from the site which would increase the likelihood of a vehicle accident.

To summarise, the construction phase of the Project will have a major impact on the air quality, due to the current exceedance of the PM₁₀ regulatory limit, specified in the NAAQS. All other biophysical and socio-economic impacts resulting from the construction of the Project are minor-negligible if the mitigation measures as proposed in the Construction EMP_r (*Annex F*) are adhered to. *Table 9.1* provides a summary of the potential impacts of the Project construction phase.

Table 9.1 *Impact Summary: Construction Phase*

Affected Resource/Receptor	Potential Impact	Pre-Mitigation Significance	Post-Mitigation Significance
Soil Resources	Disturbance and loss of soil resources	Negligible	Negligible
	Increased potential for soil erosion	Negligible	Negligible
Air Quality	Potential PM ₁₀ emissions	Major	Moderate
Ambient Noise	Potential increase in noise emissions	Minor	Minor
Flora	Loss of grassland and floral habitat	Moderate-Minor	Minor
	Potential impact of alien invasive species on remaining grassland	Moderate	Minor
Fauna	Loss of faunal habitat (Cumulative)	Moderate-Minor	Minor
	Potential sensory disturbance to fauna	Negligible	Negligible
	Potential loss of faunal species due to spills	Minor-Negligible	Negligible
Local Economy	Creation of employment opportunities	Minor (Positive)	Minor (Positive)
	Training and skills development	Minor (Positive)	Minor (Positive)
	Procurement of goods and services	Minor (Positive)	Minor (Positive)
Heritage/ Archaeology/ Palaeontology	Potential Impact on Heritage, Archaeological and Paleontological Resources	Negligible	Negligible
Traffic	Potential increase in traffic volumes	Negligible	Negligible
	Vehicle accidents	Minor	Minor
Soil and Groundwater	Accidental spills/leaks from materials	Moderate	Minor
	Accidental spills/leaks from wastes	Moderate	Minor

9.2.2 *Operational Phase Impacts*

The Project’s operational activities include the manufacturing, storage and distribution of acetylene gas, which also involves the management of the lime by-product with limited maintenance activities. These activities are likely to result in the following negative impacts to the bio-physical environment:

- increase in PM₁₀ emissions;
- increase in NO₂ emissions;

- increase in SO₂ emissions;
- potential acetone emissions;
- potential PH₃ emissions;
- increase in VOC emissions;
- increase in noise emissions;
- spread of alien invasive species;
- sensory disturbance to fauna; and
- loss of faunal species.

With the Project site located within the Vaal Airshed Priority Area, the impact to air quality was an important consideration in the impact assessment. Emissions of PM₁₀, NO₂, SO₂, acetone, PH₃ and VOC were assessed to be of negligible significance prior to mitigation and post-mitigation. This was due to these emissions being within their respective regulatory limits.

The noise emissions were assessed to be of moderate significance prior to mitigation, however with the effective implementation of mitigation this can be reduced to a minor significance rating.

The spread of alien invasive plant species has a moderate significance, prior to mitigation. This impact has been reduced to minor significance with the implementation of the specified mitigation measures, particularly the on-going monitoring and removal of any emerging seedlings.

The potential sensory disturbance to fauna and loss of faunal species both a minor-negligible significance rating prior to mitigation which has been reduced to negligible with the implementation of mitigation such as downward facing security lights and covering the two water catchment pits to detract fauna from the Project site.

The socio-economic impacts are the same as for the construction phase, these include:

- creation of employment opportunities;
- training and skills development;
- procurement of goods and services;
- potential impact on heritage, archaeological and paleontological resources; and
- increase in traffic volumes;

The positive impacts of employment, training and skills development and local procurement of goods and services have a minor significance prior to and after the implementation of enhancement measures. The primary reason for the significance rating is the limited extent of these benefits. The Project will result in the employment of between five to ten people from the local community with the Project Contractor sourcing the majority of materials for the Project from the region and not locally. The limited number of opportunities is due to the closing down of the existing acetylene plants at Air

Products Kempton Park and Pinetown facilities. Air Products therefore wish to retain their staff.

The potential impact on heritage, archaeological and paleontological resources and increase in traffic, both have a negligible significance prior to and after mitigation measures have been implemented. This is due to no resources of heritage or archaeological/paleontological having been identified on the Project site. Furthermore, the M61 Road and Kalksteen Roads have an average of 91percent spare capacity per lane, therefore the Project operation traffic on these existing roads were considered negligible.

The Project operation may also result in negative unplanned or accidental events, these include:

- risk of fire/explosion;
- accidental spills to soil and groundwater resources from materials and wastes; and
- vehicle accidents.

Potential contamination of groundwater and soil resources as a result of spills or leaks from the use of process raw materials or operational wastes has a moderate significance prior to mitigation. The likelihood of this impact occurring is high due to unforeseen accidental incidents (ie improper handling/storage/use). With the implementation of the proposed mitigation, this impact is considered to have a minor significance. Vehicle accidents are also an unforeseen incident that is considered to have a minor significance prior to mitigation and post-mitigation. This impact is not likely as there would only be two trucks used for distribution of the acetylene gas. These drivers would be suitably qualified and experienced to undertake this activity.

The greatest risk of the Project operation was identified to be the potential rupture of both acetylene generators (ie during Phase 2 of the Project). This failure or loss of containment may result in an explosion and fire. This impact was rated as moderate prior to and post-mitigation due the effect of such an incident resulting in minor damage to masonry structures and window approximately 82m from the site boundaries. Furthermore, the nearest human sensitive receptors would be the surrounding neighbours, which include some residences, located between 150 to 200m from the southern, western and northern boundaries of the Project site. The likelihood of this risk occurring is *unlikely* if Air Products strictly adhere to their Standard Operating Procedures on vessel and tank inspections).

Acetone pool fires were also identified as a potential risk during the operational phase. This impact however was considered to be minor prior to and post-mitigation due to the effect being restricted within the boundaries of the Project site.

To summarise, the operational phase of the Project will have no major impacts on the bio-physical or socio-economic environment. The impact from a

rupture of the acetylene generator however is considered to be of moderate significance prior to and post-mitigation due to the extent of the impact, beyond the Project boundaries. All impacts resulting from the operation of the Project are minor-negligible if the mitigation measures as proposed in the Operation EMPr (*Annex F*) are adhered to. *Table 9.2* provides a summary of the potential impacts of the Project construction phase.

Table 9.2 *Impact Summary: Operation Phase*

Affected Resource/Receptor	Potential Impact	Pre-Mitigation Significance	Post-Mitigation Significance
Air Quality	Potential PM ₁₀ emissions	Negligible	Negligible
	Potential NO ₂ emissions (Cumulative)	Negligible	Negligible
	Potential SO ₂ emissions	Negligible	Negligible
	Potential Acetone emissions	Negligible	Negligible
	Potential Phosphine (PH ₃) emissions	Negligible	Negligible
	Potential VOC emissions (Cumulative)	Negligible	Negligible
Ambient Noise	Potential increase in noise emissions	Moderate	Minor
Flora	Potential impact of alien invasive species on remaining grassland	Moderate	Minor
Fauna	Potential sensory disturbance to fauna	Negligible	Negligible
	Potential loss of faunal species due to spills	Minor-Negligible	Negligible
Local Economy	Creation of employment opportunities	Minor (Positive)	Minor (Positive)
	Training and skills development	Minor (Positive)	Minor (Positive)
	Procurement of goods and services	Minor (Positive)	Minor (Positive)
Heritage/ Archaeology/ Palaeontology	Potential Impact on Heritage, Archaeological and Paleontological Resources	Negligible	Negligible
Traffic	Potential increase in traffic volumes	Negligible	Negligible
	Vehicle accidents	Minor	Minor
Fire/Explosion	Acetylene generator rupture/failure	Moderate	Moderate

Affected Resource/Receptor	Potential Impact	Pre-Mitigation Significance	Post-Mitigation Significance
	Risk from acetone pool fires	Minor	Minor
Soil and Groundwater	Accidental spills/leaks from materials	Moderate	Minor
	Accidental spills/leaks from wastes	Moderate	Minor

9.2.3 *Decommissioning Phase Impacts*

The Project has a design lifespan of 40 to 50 years. However, with regular maintenance it is anticipated that the useful life of the power plant could extend well beyond the design lifespan. There is currently no agreement in place which defines what will happen to the facility at the end of its useful lifecycle, but it is anticipated that the Project site will be decommissioned with the intention for reuse or redevelopment, or returned to its original state.

The bio-physical and socio-economic impacts as identified for the construction phase are similar to those that are likely to occur during the decommissioning phase of the Project.

The key impact that is likely to occur as a result of the decommissioning phase is the generation of waste from the dismantling and removal of all Project infrastructure. Measures for the management of waste have been listed in the decommissioning EMPr (*Annex F*).

9.3 *KEY MITIGATION*

It is considered critical that the following key mitigations be undertaken prior to construction to ensure the environmental and socio-economic viability of the Project:

- conduct a detailed dolomite stability investigation which shall include a gravity survey, percussion drilling as well as discussions with the Council for Geoscience;
- obtain and adhere to the Project Air Emissions Licence;
- obtain a permit from the GDARD to translocate the Conservation Important species (*Declining Boophane disticha*) to the south western section portion of the property, where no development is to take place;
- ensure that the Project is compliant with the requirements of the MHI Regulations; the MHI Risk Assessment must be submitted to the Local Provincial Director of the Department of Labour, the Chief Inspector of the Department of Labour and the local authorities.
- develop a Stormwater Management Plan;

- obtain building plan approval from the Midvaal Local Municipality for the establishment of the Project facility and adhere to building restrictions and or recommendations of buffers;
- establish a grievance procedure to allow community members to raise concerns and issues relating to the Project; and
- develop a Site Emergency Plan and determine the qualified and suitably experience local emergency services to support the Project.

The implementation of the mitigation measures identified above and those detailed in *Annex F*, including monitoring, will provide a basis for ensuring that the potential positive and negative impacts associated with the establishment of the development are enhanced and mitigated to a level which is deemed adequate for the Project to proceed.