Proposed Magdalena Colliery Discard Dump Extension

Draft Environmental Impact Assessment Report

Version - 1

14 September 2015

GCS Project Number: 12-094
Client Reference: DC25/0018/2012

Zinoju Coal (Pty) Ltd
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DOCUMENT ISSUE STATUS

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</tbody>
</table>

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Environmental and social data, as well as the environmental impact assessment provided in this report is based on information supplied by specialists in their respective fields, as well as existing information pertaining to the area in question.

It is assumed that the information provided to GCS is correct as GCS’s opinions, conclusions and recommendations are based upon this information.
PURPOSE OF THIS REPORT

Magdalena Colliery is an existing Coal Mine Operation with an approved Environmental Management Programme Report (EMPR). The mine is operated by Zinoju Coal (Pty) Ltd and proposes to extend the size of the Discard Dump at Magdalena Mine.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (as amended), Zinoju Coal is required to obtain Environmental Authorisation from the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) (formerly the Department of Agriculture and Environmental Affairs) through the undertaking of an Environmental Impact Assessment (EIA) process. In this regard, GCS Water and Environment (Pty) Ltd (GCS), has been appointed as the independent Environmental Assessment Practitioner (EAP), to conduct the EIA for the proposed extension of the Discard Dump at Magdalena Mine.

An EIA has two distinct phases: the Scoping Phase and the Impact Assessment Phase. The Scoping Phase of the process has been concluded with the compilation and submission of a Final Scoping Report to the DEDTEA for acceptance on 12 July 2013. The Scoping Report documents all activities undertaken in the Scoping Phase, the issues and impacts identified by Interested and Affected Parties (I&A-Ps) and professional experience, and the Plan of Study (PoS) for the Impact Assessment. The Final Scoping Report and PoS were accepted by the DEDTEA (10 September 2013), and the Impact Assessment Phase has commenced in accordance with the PoS.

This report therefore represents the draft version of the EIA Report that will be made available for public comment.

The purpose of the Impact Assessment Phase is to assess the direct, indirect, and cumulative environmental impacts associated with a proposed project/activity. The EIA process culminates in the submission of an EIA Report (including the Environmental Management Programme (EMPr) Addendum) to the competent authority for decision-making.

The objectives of the Impact Assessment Phase are to:

- Assess alternatives to the proposed activity in a comparative manner.
- Undertake specialist studies required.
- Assess the nature, intensity, magnitude, duration, probability and significance of all of
the potential impacts identified in the Scoping Phase.

- Identify feasible and realistic mitigation measures required to avoid and/or minimise the negative environmental impacts resulting from the activity, and combine and present all these measures in the form of a construction and operational EMP in accordance with NEMA.

- Provide the competent authority with sufficient information in order to make a decision regarding the authorisation of the activity.

The above listed objectives will be achieved by commissioning of all the specialist studies required to evaluate and assess the relevant impacts as per the PoS for EIA as well as addressing all other impacts, issues and concerns that do not require a specialist assessment.

A prescribed Public Participation Process (PPP) runs concurrently with the Scoping and Impact Assessment Phases. All comments received to date in the Scoping Phase have been documented in the Comments and Response Report (CRR) and addressed where necessary in the Draft EIA Report (this document).
YOUR COMMENT ON THE DRAFT EIA REPORT

This Draft EIA Report will be made available to all registered I&APs for public review and comment from 16 September for a period of 30 calendar days (comment period ending 16 October 2015). Registered I&APs will be notified of the availability of the document and will be sent an electronic copy on request. Copies will also be available for download from the GCS website: http://www.gcs-sa.biz/Documents. A hard copy will be placed at the libraries listed below for those I&APs without access to the internet or email:

- Dundee Library
- Dannhauser Library

An additional copy will also be available at the SHEQ Manager’s office at the Magdalena Colliery.

Any comments on the Draft EIA Report must be submitted in writing via post, facsimile or email (including any additional supporting material) before 16 October 2015 directly to:

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EXECUTIVE SUMMARY

Introduction
The Magdalena Colliery is an existing coal mine located approximately 22km north of the town of Dundee and approximately 325km east-northeast of the City of Durban, in the province of KwaZulu-Natal. The Colliery is located in the magisterial district of Amajuba and the local municipality of Dannhauser. The mine has been operational since 2003. The existing mining area is operational under a number of Mining Rights, namely 227MR (Phase 1), 213MR (Phase 2) and 198MR (Phase 3) with corresponding approved Environmental Management Programmes (EMPR’s) in accordance with the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). In addition, an Integrated Water Use License Application (IWULA) process for all exiting water uses was completed in 2007 and issued in 2011.

Project Description
Zinoju Coal (Pty) Ltd intends to expand the size of the Magdalena Colliery discard dump from 33 295.05m² (3.33ha) to 389 703.04m² (38.97ha) (expansion of 356 407.98m²/35.64ha) in order to accommodate the operational life of the company’s mining operations at the Magdalena and Aviemore collieries.

The Magdalena and Aviemore Collieries require additional discard facilities to ensure that they continue to operate effectively. Currently the Magdalena discard dump receives coarse discard from the Magdalena underground and open cast mining operation and from the Aviemore underground mining operation located approximately 13km south of the Magdalena Colliery, which is also operated by Zinoju Coal. The existing dump initiated in 2008 has a design life of 7 years and storage capacity of circa 2 million tonnes (53000 tonnes per month) and is reaching capacity and is therefore not sufficient to accommodate the life of mine requirements. Therefore, it is proposed to extend the discard dump to achieve a design life of 22 years with a maximum storage capacity of 9.5 million cubic metres.

The proposed project will involve establishment of the following:
1. New tailings storage facility (extension to existing)
2. Return water dam
3. Decant system
4. Under drainage
5. Clean and dirty water separation canals
6. Solution trench
7. Access road
Legal Requirements
In terms of the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the clearing and transformation of approximately 36ha of undeveloped land/veld for the discard dump extension is listed as Activity 15 in Government Notice No. R. 545 of the EIA Regulations (2010) promulgated in terms of Section 24(5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998). Activity 15 is stated as the “Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.” Activities listed in Government Notice No. R. 545 require environmental authorisation subject to a full Scoping and Environmental Impact Assessment. The assessing authority for this application will be the Department of Agriculture and Environmental Affairs (DAEA).

In terms of the requirements of the MPRDA, the current approved Environmental Management Programme (EMPR) for the Magdalena Colliery has been amended to reflect the proposed extended discard dump and associated infrastructure and replaces the NEMA EMP. The assessing authority for this application will be the Department of Mineral Resources (DMR).

These two application processes will be run concurrently to ensure a thorough consultation and approval process and one single public participation process will be conducted for both applications/processes.

Scoping Phase
The Environmental Scoping phase has been undertaken in accordance with the requirements of Section 24 of the NEMA, as read with GNR 543 (Regulations 26-29), 544, 545 and 546 of the NEMA and the Integrated Environmental Management (IEM) Information Series published by the Department of Environmental Affairs and Tourism (now DEA) in 2002. The competent authority for this application is the KZN Department of Economic Development, Tourism and Environmental Affairs (DEDTEA), previously known as the Department of Agriculture and Environmental Affairs (DAEA). The scoping activities of this application included:

- Authority consultations.
- EIA application of proposed project to DEDTEA.
- Public Participation Process comprising:
  - I&AP Identification and Notifications.
  - Distribution of a Background Information Document and street notices.
- On site notices.
- Notification of Key Stakeholders through letters, email and telephonic discussions.
- Public meeting held
- Compilation of a Comments and Response Report documenting public and authority comments.
- Compilation of the Draft and Final Scoping Reports
- To date limited public comment on the proposal has been provided by WESSA and local residents during the public meeting. Both Draft and Final Scoping Reports were made available for a 40-day public comment period, however, no comments on the report were returned.
- Submission of the Final Scoping Report to the DEDTEA with acceptance on 10 September 2013.

Environmental Impact Phase
The Impact Assessment Phase comprises the actual assessment of potential impacts and the compilation of a comprehensive EIA Report. In accordance with the requirements of Section 24 of the NEMA, as read with GNR 543 (Regulations 26-29), 544, 545 and 546 of the NEMA and the Integrated Environmental Management (IEM) Information Series published by the Department of Environmental Affairs and Tourism (now DEA) in 2002, the following activities were carried out in compilation of this Draft EIA include the following:

- Updating the Comments and Response Report to incorporate comments received from the Final Scoping Report.
- Specialist Studies were undertaken to assess and mitigate potential environmental impacts.
- Compilation of the Draft EIA Report, including findings of the above-mentioned studies, a detailed impact assessment and mitigation measures/recommendations.

Alternatives
For this project, deposition, site, and layout alternatives have been investigated.

Environmental Impact Assessment and the Proposed Mitigation Measures
The EIA process has to date revealed a number of potentially significant impacts associated with the proposed discard dump extension. The potential impacts identified by the EIA process are reported according to the three phases of the development namely construction, operational, and decommissioning and closure phases. The anticipated activities that may give rise to environmental and social impacts per phase are as follow:
Construction Phase
The construction activities that may impact on the environmental include the construction of the following:

- Tailings Storage Facility;
- Return water dam;
- Under drainage;
- Cut-off trenches and storm water berms;
- Clean and Dirty Water Separation Canals;
- Pollution control dam(s) (PCDs);
- Solution trench;
- Access and haul roads;
- Footprint area clearance;
- The maintenance and upgrading of the total clean water and dirty water diversion trenches; and
- Handling of plant fuel and oil spills.

Operational Phase
During the operational phase of the proposed discard dump at Magdalena Colliery the following activities may impact on the health and social aspects of the surrounding communities:

- Use of slurry ponds to collect and keep or dam all the coal slurry coming from coal mining and preparation processes;
- Use of return water to receive and temporarily store stormwater run-off from the slurry dams;
- Maintenance and inspection of slurry dams, return water dam and the effluent trench on a regular basis (deficiencies will be rectified immediately); and
- Stockpiling and transporting of coal discard material.

Decommissioning and Closure Phase
The decommissioning and closure phase consist of the following activities that may give rise to environmental impacts:

- Dismantling of infrastructure / removal of infrastructure;
- Removal of waste;
- Amelioration and vegetation of all disturbed areas;
- Maintenance of the re-vegetated dump; and
- Rehabilitation of pollution control dams.
Key specialist studies that were conducted in the EIA Phase include a preliminary ecological assessment, snail impact assessment (of 2 parts), hydrological (surface water) assessment and a geohydrological assessment. The potentially most significant impacts resulting from the construction, operation and closure of the discard dump extension are summarised as follows:

Table 0-1: Summary of Impact Assessment Significance Matrix

<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSTRUCTION PHASE ACTIVITIES: SITE PREPARATION, FOOTPRINT CLEARANCE, PIT DEVELOPMENT AND WASTE HANDLING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soils</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Loss of soil resource and agricultural potential (grazing) / loss of soil profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetation clearing for the discard dump extension construction phase will result to complete loss of vegetation</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Alien vegetation proliferation and encroachment</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Fauna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of faunal species</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Disturbance / migration of fauna resulting to loss of fauna in the area</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Loss of grazing land</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Reduction of land capability</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Surface Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface water and watercourse contamination</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Increased surface water runoff volumes and resultant increased floodpeaks and rates of erosion and sedimentation.</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Air Quality / Dust Creation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust pollution and greenhouse gas emissions</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Degeneration in local air quality as a result of dust pollution and greenhouse gas emissions.</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>Noise Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased noise levels (Nuisance Noise pollution)</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Visual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All discard dump surface activities will be visible from a certain distance from the mine</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Dust pollution and discard dump view</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Social</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degeneration in local quality of life as a result of dust pollution, noise pollution, and visual impacts.</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Health Impacts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust inhalation</td>
<td>L</td>
<td>L</td>
</tr>
</tbody>
</table>
### OPERATIONAL PHASE ACTIVITIES: COAL WASTE TRANSPORTATION AND HANDLING

<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soils</strong></td>
<td></td>
</tr>
<tr>
<td>Contamination of soils under and around Discard Dump, Erosion of soils around dump as a result of poor water control measures</td>
<td>L M</td>
</tr>
<tr>
<td><strong>Surface Water</strong></td>
<td></td>
</tr>
<tr>
<td>Deterioration of surface water quality.</td>
<td>L L</td>
</tr>
<tr>
<td>Exposure of soils and siltation of water resources and stream peak flow reduction.</td>
<td>M M</td>
</tr>
<tr>
<td>Pollution of water resources.</td>
<td>M L</td>
</tr>
<tr>
<td><strong>Groundwater</strong></td>
<td></td>
</tr>
<tr>
<td>Groundwater contamination via seepage from the discard dump</td>
<td>H M</td>
</tr>
<tr>
<td><strong>Air Quality / Dust Creation</strong></td>
<td></td>
</tr>
<tr>
<td>Degeneration in local air quality as a result of dust pollution and greenhouse gas emissions.</td>
<td>M M</td>
</tr>
<tr>
<td><strong>Noise Generation</strong></td>
<td></td>
</tr>
<tr>
<td>Operators and residents close to the mine machinery and mining operation may be affected by the noise generated.</td>
<td>M L</td>
</tr>
<tr>
<td><strong>Visual</strong></td>
<td></td>
</tr>
<tr>
<td>Disturbed aesthetics / All Discard Dump surface activities will be visible from a certain distance from the mine.</td>
<td>M M</td>
</tr>
<tr>
<td>Visual intrusion resulting from dust pollution and Discard Dump view.</td>
<td>L L</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td></td>
</tr>
<tr>
<td>Degeneration in local quality of life as a result of dust pollution, noise pollution, and visual impacts.</td>
<td>L L</td>
</tr>
<tr>
<td>Employment and community wellbeing</td>
<td>H</td>
</tr>
<tr>
<td><strong>Health Impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Dust inhalation</td>
<td>L L</td>
</tr>
<tr>
<td>Spontaneous combustion and uncontrolled fires</td>
<td>L L</td>
</tr>
</tbody>
</table>

### CLOSURE PHASE ACTIVITIES: CLEARING, REHABILITATION, RE-INSTATEMENT

<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soils</strong></td>
<td></td>
</tr>
<tr>
<td>Soil profile and agricultural potential restored</td>
<td>M</td>
</tr>
<tr>
<td><strong>Vegetation</strong></td>
<td></td>
</tr>
<tr>
<td>Seeding of all rehabilitated areas during the operational and decommissioning phase will ensure that a sustainable vegetation cover will establish in the proposed project area</td>
<td>H</td>
</tr>
<tr>
<td><strong>Fauna</strong></td>
<td></td>
</tr>
<tr>
<td>Following rehabilitation of discard dump animals will begin to migrate back into the area</td>
<td>H</td>
</tr>
<tr>
<td><strong>Agricultural Potential / Land Capability</strong></td>
<td></td>
</tr>
<tr>
<td>Grazing land restored</td>
<td>M</td>
</tr>
<tr>
<td>Land use change back mining related activities to agricultural / wilderness.</td>
<td>M</td>
</tr>
<tr>
<td><strong>Surface Water</strong></td>
<td></td>
</tr>
<tr>
<td>Runoff and drainage from the rehabilitated discard dump continue to yield polluted water.</td>
<td>M</td>
</tr>
<tr>
<td><strong>Groundwater</strong></td>
<td></td>
</tr>
<tr>
<td>Groundwater contamination via seepage from the discard dump</td>
<td>M</td>
</tr>
<tr>
<td><strong>Air Quality / Dust Creation</strong></td>
<td></td>
</tr>
<tr>
<td>dust inhalation</td>
<td>L</td>
</tr>
<tr>
<td><strong>Noise Generation</strong></td>
<td></td>
</tr>
<tr>
<td>noise pollution</td>
<td>L</td>
</tr>
</tbody>
</table>
Zinoju Coal (Pty) Ltd

Magdalena Colliery Discard Dump Extension

<table>
<thead>
<tr>
<th>Visual</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved aesthetics</td>
<td>M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Job losses resulting from closure of the mine and associated Discard Dump</td>
<td>M</td>
</tr>
<tr>
<td>Regeneration of local quality of life as a result of closure of the mine and Discard Dump</td>
<td>M</td>
</tr>
</tbody>
</table>

**Key Findings**

- Various layout alternatives were considered but the extension of the Discard Dump in a southerly direction was considered the most suitable option in order to avoid the Discard Dump being constructed over old underground workings which may lead to ground level subsistence and resultant underground water pollution;

- The Preliminary Ecological Study determined that:
  - The clearing of vegetation for the Discard Dump will have a negative effect on the biodiversity of the site but that the impacts of the proposed development on the fauna and their habitats can be mitigated and offset to acceptable levels through implementing the recommendations set out in this report;
  - Two vulnerable vegetation species were identified on site and with the presence of the confirmed sighting of the KZN endemic mollusc, *Cochlitoma simplex*, it is recommended that a biodiversity offset area be secured according to the Norms and Standards for Biodiversity Offsets: KwaZulu-Natal Province (EKZNW, February 2013). In this regard GCs and Zinoju Coal are in discussions with EKZNW.

- The Mollusc Conservation Measures Report concluded that:
  - The presence and distribution of the terrestrial herbivorous gastropod *Cochlitoma simplex* is more probably a result of the calcium-rich soils which occur on the property and not of the two vegetation types.
  - A survey be undertaken to determine the nature of and extent of the source of calcium-enrichment of the soils.

- The Soil Survey for Thukela Agate Snail Conservation concluded that:
  - There appears to be no shortage of calcium in either the soils or the vegetation on the Mooidoorn Hoek property.
  - An offset area should be set aside with the minimum aim of maintaining the presence of *Cochlitoma simplex* on the property area.
  - An offset area adjacent to the Discard Dump was identified with an area of 33.691ha which is 1.481ha i.e.4.6% larger than the area of “Continuous dense Acacia karroo thicket” which will be replaced by the extension to the discard dump.

- The Groundwater Assessment established that the existing Discard Dump is not causing any negative groundwater impacts but the groundwater monitoring
programme should be continued after the extension of the Discard Dump has taken place. A further recommended of the Groundwater Study was that the numerical model should be recalibrated after two years to determine the effectiveness of the mitigation measures implemented.

- The majority of construction, operational and decommissioning impacts identified for the proposed development were found to be of medium significance, and after mitigation measures are applied, would have a still a medium or low significance.
- The impact on vegetation was rated as high across the life cycle of the Discard Dump due to the permanent loss of vegetation as the land is cleared and the Discard Dump is extended. The impact could be reduced to a moderate rating with the application of mitigation measures as documented in the NEMA EMPr and DMR EMPR.
- Although requiring the most research and effort to derive a solution to prevent/ minimise/ offset the impact on fauna, the rating calculated was as medium.
- While the construction phase of the Discard Dump showed no groundwater impacts, the operational phase yielded a high negative impact rating with all other impacts rated as either medium or low.
- The operation of the Discard Dump (as an ancillary of the mine) yielded a high positive impact on employment and community wellbeing.
- The decommissioning phase (rehabilitation phase) recognised a number of positive impact ratings although surface and groundwater impacts remain rated as Medium negative impacts highlighting the need for post closure management and monitoring to minimise future impacts.
- Thus, no fatal flaws or unacceptable impacts are anticipated as a result of the implementation of the Magdalena Discard Dump Extension.

The impacts that have been identified for the proposed project can be mitigated to acceptable levels with the application of the mitigation measures highlighted in this report and those detailed in the NEMA EMPr and DMR EMPR.

The implementation of the discard dump extension project will allow the dump to continue operation which is a critical component of the operation of the mine. Without the dump, the mine cannot dispose of its waste coal and rock and would have to stop operation. The continued operation of the mine will bring income to the town of Dundee and surrounds, as well as the continued employment local skilled and semi-skilled workers at the Magdalena Colliery. Considering the fact that the project is the proposed extension of an existing dump, the limited environmental impacts related to its extension, available solutions to some of the more pertinent biodiversity impacts (related primarily to the snail), and
existence of the EMPR to guide and mitigate negative environmental impacts, as well as the positive socio-economic impacts related to the operation of the mine, GCS (Pty) Ltd recommends that the Magdalena Discard Dump Extension be awarded Environmental Authorisation (EA).

An amendment to the existing Integrated Water Use License will be submitted to the Department of Water and Sanitation (DWS) for inclusion of additional Section 21(c) and (i) activities. The IWULA Amendment requirements will be incorporated into the IWULA amendment application currently in progress for the extension of the discard dump.

The need for an application for a Waste Licence in terms of National Environmental Management: Waste Act (Act No. 59 of 2008) (NEMWA) must be discussed with the DMR.

It is recommended that GN704 audits must be ongoing and all activities must be monitored against the current EMPr and EMPr addendum, as well as the Environmental Management Programme (EMP) included in Appendix J of this document.

**Conclusion**

A Draft EIA Report has been compiled where the potential impacts on the environment of listed activities associated with the proposed extension of the Magdalena Discard Dump were considered, investigated and assessed in compliance with the NEMA and EIA Regulations (2010). The report contains all information that is necessary for the competent authority to consider the application and to reach a decision regarding the application and includes an assessment of each identified potential impact, including biophysical, ecological, socio-economic and cumulative impacts of the proposed development on the environment.

The environmental process undertaken thus far includes a completed and approved Scoping Phase, which included a technical investigation and public participation exercise from which key issues were identified and further investigated in the Impact Assessment Phase through the undertaking of specialist studies.

Based on the conclusion that no environmental fatal flaw was found, that all negative impacts can be mitigated to acceptable levels, and that the proposed development is anticipated to create some positive impacts on the socio-economic environments, GCS recommends that Environmental Authorisation be granted for the Extension of the Magdalena Discard Dump provided the rehabilitation measures and all other mitigation measures are implemented and the recommendations are considered.
**Way Forward**

The Draft EIA Report (this report) has been compiled after completion of all specialist studies and assessment and rating of the environmental impacts. This report will be available to all I&APs for a 40 day comment period. A Final EIA Report will be compiled following a second public participation procedure where I&APs will be informed of the availability of the Draft EIA Report for review and comment. Comments received will be addressed in the Final EIA Report which will then be submitted to the DEDTEA for a decision on the EIA application.
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The contents of an Environmental Impact Assessment Report are required to contain information as outlined in Table B as regulated under Regulation 31 of GNR 543 (EIA Regulations).

Table B: Contents of Draft EIA Report

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</tr>
<tr>
<td>A description of the environment that may be affected by the activity and the manner in which the activity may be affected by the environment</td>
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<td>A list of persons, organisations and organs of state that were registered as interested and affected parties</td>
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<td>Appendix E</td>
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</tr>
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<td>Section 3.6</td>
</tr>
<tr>
<td>A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity</td>
<td>Section 4</td>
</tr>
<tr>
<td>An indication of the methodology used in determining the significance of potential environmental impacts</td>
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<td>A description and comparative assessment of all alternatives identified during the environmental impact assessment process</td>
<td>Section 4</td>
</tr>
<tr>
<td>A summary of the findings and recommendations of any specialist report or report on a specialised process</td>
<td>Section 6</td>
</tr>
<tr>
<td>A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures</td>
<td>Section 6</td>
</tr>
<tr>
<td>An assessment of each identified potentially significant impact, including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources and the degree to which the impact can be mitigated</td>
<td>Section 6</td>
</tr>
<tr>
<td>A description of any assumptions, uncertainties and gaps in knowledge</td>
<td>Section 7.2</td>
</tr>
<tr>
<td>A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation</td>
<td>Section 7</td>
</tr>
<tr>
<td>An environmental impact statement which contains- a summary of the key findings of the environmental impact assessment, a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives, a draft environmental management programme and copies of any specialist reports</td>
<td>Section 7</td>
</tr>
</tbody>
</table>


1 INTRODUCTION AND BACKGROUND

1.1 Overview and Background

Magdalena Colliery is an existing Coal Mine Operation with an approved Environmental Management Programme Report (EMPR). The mine is operated by Zinoju Coal (Pty) Ltd (Zinoju) which is a subsidiary company of Buffalo Coal Dundee (Pty) Ltd (formerly Forbes Coal). Zinoju Coal intends to expand the size of the Magdalena Colliery Discard Dump from 33,295.05 m² (3.33ha) to 389,703.04 m² (38.97ha) (expansion of 356,407.98 m²/35.64ha) in order to accommodate the operational life of the company’s mining operations at the Magdalena and Aviemore collieries. The existing dump has a design life of 7 years and storage capacity of circa 2 million tonnes (53,000 tonnes per month) and is therefore not sufficient to accommodate the life of mine requirements.

The Magdalena Colliery is an existing coal mine that has been operational since 2003. The existing mining area is operational under a number of Mining Rights, namely 227MR (Phase 1), 213MR (Phase 2) and 198MR (Phase 3) with corresponding approved Environmental Management Programmes (EMPR’s) (see Table 1-4 in Section 1.4 below) in accordance with the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). In addition, an IWULA (Integrated Water Use License Application) process for all existing water uses was completed in 2007 and licensed in 2011.

In terms of the MRPDA, the approved EMPR (and mining right) under the MPRDA has been amended and updated to reflect the proposed changes to the existing operations and to accord with the requirements of the MPRDA. As part of this amendment, an impact assessment report identified any new potential impacts that may occur in addition to those identified in the original EIA Report and inform and guide the selection of appropriate mitigation and management measures.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the proposed extension requires environmental authorisation from the Department of Agriculture and Environmental Affairs (DAEA) subject to a full Scoping and Environmental Impact Assessment.

Zinoju Coal, who operates Magdalena Colliery, has appointed GCS (Pty) Ltd to conduct the independent EIA process for the proposed Discard Dump extension in terms of the NEMA and update the approved EMPR in terms of the MRPDA.
In order to obtain complete environmental authorisation for the proposed Discard Dump extension, two applications to two different government departments need to be compiled and submitted for approval. These are:

- Environmental Authorisation Application - Department of Economic Affairs, Tourism and Environmental Affairs (DEDTEA) (formerly the Department of Agriculture and Environmental Affairs (DAEA)).
- EMPR Amendment approval - Department of Mineral Resources (DMR).

### 1.2 Legislative Context and Requirements

This report represents the Draft EIA Report for the proposed Magdalena Colliery Discard Dump Extension which has been prepared in accordance with the EIA Regulations published in Government Notice No. R543 of 2010. These Regulations were published by the Department of Environmental Affairs (DEA) under Section 24(5) read with Section 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended) to control activities which may have a detrimental effect on the environment.

Activities listed under Government Notice No. R545 require a full Environmental Impact Assessment process. The activities detailed in Table 1-1, as listed in Government Notice No. 545 (December 2010 EIA Regulations) (as amended), have relevance to the proposed project.

#### Table 1-1: The Listed Activities Triggered by the Proposed Development as described in GN No. R. 545

<table>
<thead>
<tr>
<th>Activity No.</th>
<th>Listed activity</th>
<th>Description of the activity</th>
</tr>
</thead>
</table>
| 15           | Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; Except where such physical alteration takes place for:  
  - Linear development activities; or  
  - Agriculture or afforestation where activity 16 in this Schedule will apply. | The clearing and transformation of approximately 36ha of undeveloped land/veld for the Discard Dump extension. |
amended reflect the proposed extended Discard Dump and associated infrastructure. (Section 102)


The Magdalena Discard Dump extension is a mineral related development and coal discard is recognised as a waste under NEM:WA therefore a Waste Management Licence is required.


The following activities associated with the proposed development are considered water uses under Section 21 of the National Water Act:

- 21(b) Storing of water
- 21(c) Impeding or diverting the flow of water in a watercourse
- 21(g) Disposing of waste in a manner which may detrimentally impact on a water resource.
- 21(i) Altering the bed, banks, course or characteristics of a watercourse

To undertake these activities, a water use license is required from the Department of Water Affairs and Sanitation.


The proposed development activity is not considered a listed activity under Section 21 of the Act that requires an Atmospheric Emissions Licence.


Due to the presence of coastal forest, dune thicket and grassland onsite, it is highly likely that a number of plants onsite are protected under the NEM:BA. Under the NEM:BA, the applicant is required to apply for a permit from Ezemvelo KZN Wildlife to remove and/or relocate any protected species.

**National Forests Act, 1998 (Act No. 84 of 2008)**

Under the Act, the applicant is required to apply for a permit from the Department of Water Affairs to remove and/or relocate any protected tree species.

**KwaZulu-Natal Nature Conservation Management Amendment Act, 1999 (Act No. 5 of 1999)**

Under the Act, the applicant is required to apply for a permit from Ezemvelo KZN Wildlife to remove and/or relocate any protected plant species.

**KwaZulu-Natal Nature Conservation Ordinance 15 of 1974**

Under the Ordinance, the applicant is required to apply for a permit from Ezemvelo KZN Wildlife to remove and/or relocate any protected plant species.

**National Heritage Resources Act, 1999 (Act No. 25 of 1999)**

Under the Act, a destruction permit from Amafu will need to be acquired for the destruction of any heritage resources found onsite prior to undertaking construction activities.

**Resources Act, 1983 (Act No. 43 of 1983)**

Under the Act classification of categories of weeds & invader plants must be done as well as providing methods to implement control measures for alien and invasive plant species.

A detailed description of the applicable legislation is attached in Appendix A which aims to provide a review of relevant national and provincial legislation and regulations and policy documents, which are applicable to, or have implications for, the proposed Magdalena Colliery Discard Dump Extension.
1.3 Responsible Parties

Table 1-3: Responsible Parties

<table>
<thead>
<tr>
<th>DEDTEA ASSESSING OFFICER</th>
<th>PROPOSENT</th>
</tr>
</thead>
</table>
| Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) Environmental Management Unit | Zinoju Coal (Pty) Ltd  
Ms S Myeza  
PO Box 170  
Newcastle, 2940  
Tel: 034 315 3936  
Fax: 034 312 9986 | Zinoju Coal (Pty) Ltd  
Mrs Pearl Nkosi  
Commercial Road  
Dundee 3000  
Reg No.: 2001/011130/07  
Tel: (034) 212 1455  
Fax: (034) 212 1232 |

<table>
<thead>
<tr>
<th>RESPONSIBLE PERSON - MINE MANAGER</th>
<th>ENVIRONMENTAL ASSESSMENT PRACTITIONER</th>
</tr>
</thead>
</table>
| Mr Gideon Odendaal  
Magdalena Colliery  
P.O.Box 684  
Dundee 3000  
Tel: (034) 212 1455  
Fax: (034) 212 1232 | GCS Water and Environment (Pty) Ltd  
Mr Russell Stow  
Environmental Scientist  
P.O. Box 819  
Gillits, 3603  
Tel: 031 764 7130  
Fax: 031 764 7140  
Email: russells@gcs-sa.biz |

<table>
<thead>
<tr>
<th>MINE RIGHTS HOLDER</th>
</tr>
</thead>
</table>
| Zinoju Coal (Pty) Ltd  
Commercial Road  
Dundee 3000  
Reg No.: 2001/011130/07  
Tel: (034) 212 1455  
Fax: (034) 212 1232 |

1.4 Mining rights

The Magdalena site encompasses a number of Mining Rights (“MRs”) as granted by the Department of Mineral Resources (DMR). These are noted in Table 1-4 below.

Table 1-4: Magdalena Mining Rights

<table>
<thead>
<tr>
<th>Phase Reference / Farm Portion</th>
<th>Approval Status</th>
<th>Approval References</th>
<th>Associated Documents</th>
</tr>
</thead>
</table>
| Phase 1:  
Portions 1, 2 and of Magdalena No. 7574  
Rem. of Magdalena No. 7574 | Mining Right | 227MR / ML378/03 | Approved EMPR (dated August 2002)  
Approved Water Use Licence (07N32D/AGJ/986) |
| Phase 2:  
Portions 1, 23, 24, 25 and 26 of Alleen 1 No. 15592  
Portions 1, 2, 3, 4, 7, 8, 9, 10, 21 and 22 of Mount Johanna No. 10987  
Rem. of Mount Johanna No. 10987 | Mining Right | 213MR | Approved EMPR (dated April 2008)  
Approved Water Use Licence (07N32D/AGJ/986) |
1.5 GCS Project Team

1.5.1 Background

GCS was established in 1987 as an independent consultancy providing expertise in groundwater related fields. Since then, GCS’ professional services have evolved to include earth sciences, environmental, GIS and water resources management (hydrology, hydrogeology, water use). The various disciplines are managed as units.

GCS has always endeavoured to provide professional and cost-effective consulting services to clients. The company’s vision is to grow and develop into a consultancy and employer of choice, servicing the global market.

The Environmental Unit at GCS Durban has been involved in environmental authorisation processes and related work for the past 13 years. The unit members of the Durban team, specifically Mr Labuschagne and Mr Stow, have a wide range of environmental management skills and have been involved in the application for authorisation for a number of large scale developments and multi-discipline projects for the past 15 years. The environmental services that the unit has been involved in include the following:

- Environmental Applications in terms of the NEMA;
- Mining Right Applications in terms of the MPRDA;
- Waste Licenses in terms of the NEM:WA;
- Water Use License Applications in terms of the NWA;
- Public Participation Process in terms of the NWA and associated Guidelines;
- Integrated Water and Waste Management Plans in terms of the NWA;
- Environmental Planning;
- Environmental Due Diligence Assessments;
- Environmental Site Selection Assessments;
- Performance Assessments and Audits in terms of the MPRDA, NEMA and NWA;
- Implementation of Environmental Management Programmes; and
- Environmental Legal Reviews.
1.5.2  Our Professional Affiliations
GCS and its employees are members of relevant professional associations. The value of academic development and the professional standards that these associations represent are recognised by the company. The professional associations include, but are not limited to:
2. Environmental Assessment Practitioners Association of South Africa (EAPASA);
3. International Association for Impact Assessment - South Africa (IAIAsa); and

1.5.3  GCS Project Team
The GCS EIA project team comprises the members detailed in Table 1-5.

Table 1-5: GCS EIA Team Members

<table>
<thead>
<tr>
<th>NAME</th>
<th>ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pieter Labuschagne</td>
<td>Project Director</td>
</tr>
<tr>
<td>Russell Stow</td>
<td>Project Leader and Principal Environmental Scientist</td>
</tr>
<tr>
<td>Karin Fivaz</td>
<td>Project Environmental Scientist</td>
</tr>
<tr>
<td>Elizabeth Lees</td>
<td>Project Environmental Scientist (previous)</td>
</tr>
<tr>
<td>Ryan Edwards</td>
<td>Project Environmental Scientist (previous)</td>
</tr>
</tbody>
</table>

Detailed CVs of the current GCS project team as well as the company profile are attached under Appendix B.
2 APPROACH TO THE EIA

2.1 Purpose of the EIA

The EIA Regulations of 2010 dictates an EIA process which involves the identification and assessment of direct, indirect and cumulative environmental impacts, associated with a proposed project/activity and provides mitigation measures and recommendations to reduce, minimise, and/or negate the negative impacts and promote the positive impacts. The EIA process encompasses two phases: i.e. Scoping Phase and Impact Assessment Phase. The first phase consists of the submission of a Scoping Report and associated Plan of Study (PoS) for the Impact Assessment Phase and approval by the competent authority. This is then followed by the second phase - the ‘Impact Assessment Phase’ which culminates in the submission of an EIA Report (including an Environmental Management Programme (EMP)) to the competent authority for decision-making.

2.2 Scoping Phase

The aim of the Scoping Phase is to inform Interested and Affected Parties (I&APs) of the proposed project, identify issues and concerns, scope potential impacts, and plan investigative specialist studies to research and accurately assess potentially significant impacts. The objectives of the Scoping Phase are to:

- Identify all potential environmental (biophysical and social) issues and impacts, negative and positive, resulting from and/or associated with all phases of the proposed development (i.e. design, construction, operation and decommissioning) through consultation with key stakeholders, the public and existing baseline data.
- Clarify the reasonable and feasible project-specific alternatives to be considered through the EIA process, including the “no go” option.
- Identify and flag potentially sensitive environmental features on the site to inform the preliminary design process of the facility.
- Conduct an open, participatory, and transparent public involvement process and facilitate the inclusion of stakeholders’ concerns regarding the proposed project into the decision-making process.
- Compile a ‘roadmap’ or Plan of Study for the EIA Phase to address each of the issues and impacts as identified in the Scoping Phase.
- Define the scope of the specialist studies to be undertaken to assess the significance of the impacts during the EIA phase.
- Provide the authorities with sufficient information in order to make a decision regarding the scope of issues to be addressed in the EIA process, as well as the scope and extent
of specialist studies that will be undertaken as part of the EIA Phase of the process.

2.3 Impact Assessment Phase

The Impact Assessment Phase comprises the actual assessment of potential impacts and the compilation of a comprehensive EIA Report. The objectives of the Impact Assessment Phase are listed below:

- Assess alternatives to the proposed activity in a comparative manner.
- Undertake specialist studies required.
- Formally assess the nature, intensity, magnitude, duration, probability and significance of all of the potential impacts identified in the Scoping Phase.
- Identify feasible and realistic mitigation measures required to avoid and/or minimise the negative environmental impacts resulting from the activity and combine and present all these measures in the form of a construction and operational EMPr in accordance with NEMA.
- Provide the competent authority with sufficient information in order to make a decision regarding the authorisation of the activity.

2.4 Environmental Management Programme (EMPr - NEMA)

The EMPr associated with the NEMA EIA process outlines the mitigation measures and plans that need to be implemented and adhered to by the applicant in order to ensure that the impacts resulting from the proposed development are minimised. The EMPr will include all the mitigation requirements recommended and required for each of the potential impacts indentified and assessed in the EIA. Two programmes will be provided, one to guide the construction of the proposed development, and the other to guide the operation. Both EMPr’s will be considered draft programmes. The EMPr will be legally binding document and the applicant will be required to meet the requirements specified in the document. The EMPr will be submitted to the DAEA for approval.

2.5 Environmental Management Programme (EMPR - MPRDA)

The MPRDA EMPR will indicate how the identified impacts will be avoided, mitigated and/or managed by assessing the environmental objectives and goals. The EMPR will further outline the implementation programme for the environmental objectives and goals.

The existing and approved EMPR for the colliery will be updated and amended to include the findings of the Discard Dump extension impact assessment. The updated EMPR will be
submitted to the DMR as a consolidated EMP to include the amendment and once approved will be a single composite management tool for the Magdalena Colliery mining operation.

2.6 Public Participation

The NEMA EIA Regulations (GNR 543) specify that a Public Participation Process (PPP) must be conducted as an integral part of the EIA and in accordance with Sections 54 of the Regulations and associated guidelines.

2.6.1 Objectives of Public Participation

The procedures followed during the PPP for the proposed project must adhere to the NEMA principle whereby the participation of all I&APs in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured [NEMA, Section 2(1)(f)].

The main objectives of the PPP are to:

• Identify key stakeholders (i.e. NGOs, municipalities, government departments, traditional authorities) and I&APs (i.e. surrounding businesses, residents, landowners, interested members of the public).
• Inform I&APs about the proposed project and the Scoping and EIA Process.
• Establish lines of communication between I&APs and the project team to deal with potentially contentious issues.
• Provide ample opportunity to all parties to exchange information and express their views and raise issues and concerns.
• Obtain contributions of I&APs and ensure that all issues, concerns and queries raised are fully documented and assessed as part of the Scoping and EIA process.

2.6.2 NEMA Requirements for Public Participation

Regulation 54 of the NEMA EIA Regulations outlines the requirements for the notification and involvement of all potential I&APs. These requirements are summarized as follows:

• Fix a notice board at a conspicuous place on all alternative sites.
• Give written notice to:
  o The landowners and occupiers of the sites and those within 100 m of the alternative sites or those directly influenced by the activity under consideration.
  o The municipality which has jurisdiction in the area.
  o Ward councilors, traditional authorities and ratepayers associations.
o Any organs of state having jurisdiction in respect of any aspect of the activity.
- Place an advertisement in a local newspaper or official Gazette.
- Place an advertisement in a regional and provincial and or national newspaper if the impact extends beyond ‘local’ boundaries.
- Make information containing all relevant facts in respect of the application available to potential I&APs.
- Facilitate participation by potential I&APs in such a manner that all potential I&APs are provided with a reasonable opportunity to comment on the application.

2.7 Scoping Phase Activities

2.7.1 Competent Authority Consultation
Consultation with the competent authority being the Department of Economic Development, Tourism and Environmental Affairs (previously the Department of Agriculture and Environmental Affairs), took the form of a meeting and telephonic and email correspondence with the following officials:

- Dr Peter Kuyler - Manager: Impact Assessment, Umzinyathi District
- Mr Gerald Willis-Smith - Assistant Manager: Impact Assessment, Umzinyathi District
- Mr Poovey Moodley - Assistant Manager: Impact Assessment, Amajuba District
- Mr Lucas Mahlangu - Licensing Directorate: Department of Environmental Affairs

2.7.2 I&AP Identification and Notification
At the commencement of the Scoping and EIA Process, GCS identified key stakeholders such as municipal authorities, government departments and environmental groups/organisation that have jurisdiction over, and/or potential interest in, the activity. The key organisations and stakeholders identified as key stakeholders were:

- The Dannhauser Local Municipality;
- The Amajuba District Municipality;
- The Department of Water Affairs;
- AMAFA - KwaZulu-Natal Heritage;
- Ezemvelo KZN Wildlife (EKZNW); and
- Wildlife and Environment Society of South Africa (WESSA).
As part of the requirements for NEMA EIA Regulation 57, GCS has developed, maintained and is constantly updating an electronic I&AP register for the project. Refer to Appendix C for a copy of the latest I&APs register.

A Newspaper advert was placed in the local (Natal Courier Newspaper on the 18th of February 2013) and the regional (Independent Newspaper: Mercury and Isolezwe on the 20th of February 2013) in Zulu and English. These advertisements are presented in Appendix D. The date and venue for the local community public meeting was also included in these documents.

Notification letters and BIDs were translated into Zulu and hand delivered to all neighbouring landowners and occupiers/residents. The BIDs and delivery register are included in Appendix D. The date and venue for the local community public meeting was also included in these documents.

Site notices detailing information about the project and the Scoping and EIA Process, as well as invitation to register as I&APs, were strategically fixed at various conspicuous points around the mine and in the surrounding area. These site notices were designed to the specification of Section 54 (3) of the NEMA EIA Regulations. See Appendix D for proof of Notice Boards displays.

2.7.3 Public Meeting
A public meeting was held at the Khalima School near the mine on the 2nd March 2013 from 10h30 to 12h30. The purpose of the meeting was to present the Discard Dump expansion proposal to the local residents, to gather issues and concerns from the local residents and to respond to comments and/or concerns from the local residents where possible. The minutes of the public meeting included in Appendix D.

2.7.4 EIA Application
The EIA application to undertake the listed activities was submitted to the DAEA on 01 November 2012. GCS received the acknowledgement of the application form and authorisation to proceed on 13 November 2012. The project was allocated reference number DC25/0018/2012: KZN/EIA/0000937/2012.

2.7.5 Comments and Response Report
Copies of all comments and issues raised during the PPP have been consolidated into the Comments and Response Report (CRR) (Appendix E), which summarises each comment/issue received and provides a response. Copies of the submissions received from I&APs and key
stakeholders are included in Appendix F.

2.7.6 Draft Scoping Report
All registered I&APs were notified of the availability of the Draft Scoping Report for a 40-day public comments period on the 16th May 2013. The report was made available for review at the Magdalena Colliery Offices and GCS’ offices in Kloof. In addition, I&APs were notified that copies of the report could be made available on request or alternatively downloaded from the GCS website. Hard and electronic copies of the report were hand delivered to key governmental and non-governmental organisations on the 17th May 2013. Zulu translations of the executive summary of the DSR were hand delivered by the mine staff to the surrounding local residents.

2.7.7 Final Scoping Report
- The Final SR was made available for public comment form 8 July 2013 to 29 July 2013 (21 days), and all registered I&APs were informed of the availability of the Final SR for public review at the same venues.
- No further comments were received from Stakeholders in response to the review of the Final SR.
- The Scoping Phase of the EIA was concluded with the compilation and submission of a Scoping Report and PoS to the DEDTEA for acceptance on 12 July 2013. All I&AP and Stakeholder comments submitted in response to the review of the Final SR were submitted directly to the DEDTEA Assessing Officer.
- The Final Scoping Report and PoS were accepted by the DEDTEA on 10 September 2013. A record of correspondence with the competent authority is included in Appendix G.

2.8 Impact Assessment Phase Activities

Activities carried out in preparation of this Draft EIA Report include the following:

2.8.1 Update of Comments and Response Report
No further comments were received in response to the review of the Final SR and the CRR was finalised for the Draft EIA report, refer to Appendix E.

2.8.2 Technical and Specialist Studies
Various specialist studies have been conducted for the Discard Dump facilities at Magdalena Colliery. These studies are summarised in Table 2-1 below:
Table 2-1: Specialist Studies Conducted for the Extension of the Discard Facility at Magdalena Colliery

<table>
<thead>
<tr>
<th>Report</th>
<th>Company</th>
<th>Appendix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft Discard Dump Design Report</td>
<td>AfriCan Innovative Solutions and Projects CC</td>
<td>H1</td>
</tr>
<tr>
<td>Design Report Coal Discard Facility</td>
<td>AISP Civil Engineering and Tailings Consultants</td>
<td>H2</td>
</tr>
<tr>
<td>Coal Discard Disposal Facility Conceptual Design</td>
<td>GCS (Pty) Ltd</td>
<td>H3</td>
</tr>
<tr>
<td>Geotechnical Assessment</td>
<td>GCS (Pty) Ltd</td>
<td>H4</td>
</tr>
<tr>
<td>Hydrological Assessment of discard extension area</td>
<td>GCS (Pty) Ltd</td>
<td>H5</td>
</tr>
<tr>
<td>Groundwater Assessment of discard extension area.</td>
<td>GCS (Pty) Ltd</td>
<td>H6</td>
</tr>
<tr>
<td>Preliminary Ecological Assessment of discard extension area</td>
<td>Zunckel Ecological and Environmental Services</td>
<td>H7</td>
</tr>
<tr>
<td>Thukela Agate Snail Conservation Measures Report</td>
<td>Themtek</td>
<td>H8</td>
</tr>
<tr>
<td>Thukela Agate Snail Conservation Measures - Soil Survey Report</td>
<td>Themtek</td>
<td>H9</td>
</tr>
</tbody>
</table>

2.8.3 Compilation and Distribution of Draft EIA

- The Draft EIA Report and the EMPRr were compiled which included the findings of the above-mentioned studies, a detailed impact assessment and mitigation measures/recommendations.
- The Draft EIA Report and EMPR will be distributed to key stakeholders and government departments, and availability of the Report for I&AP review at public venues for a 30 day comment period.

2.9 Structure of this report

Chapter 1: Introduction
Provides an introduction to the proposed development, summarises the details of the applicant and the EAP and describes the applicable environmental legislation.

Chapter 2: Approach to the EIA
Details the approach to the EIA and summarises activities undertaken to date.

Chapter 3: Description of the Proposed Project
Describes the proposed project in detail. This includes the project location and the motivation for the project.

Chapter 4: Project Alternatives
A description of the assessment of alternatives of the project is provided.

Chapter 5: Description of the Local and Site Environment
Summarises the status quo of the project site and surrounding biophysical...
and socio-economic receiving environments to be considered as a baseline in the environmental impact assessment.

Chapter 6: Assessment of Environmental Impacts
Environmental impacts associated with the proposed development are identified and assessed.

Chapter 7: Environmental Impact Statement
Concludes the Draft EIA Report and gives a summary of key findings and recommendations.

Chapter 8: Way Forward
Details the way forward in the EIA process in terms of availability for public comment and any additional information requirements.

Chapter 9: References
Lists the references used in compilation of the Draft EIA Report.
3 DESCRIPTION OF THE PROPOSED PROJECT

3.1 Locality

The Discard Dump is located at the Magdalena Colliery which is approximately 25km north-northwest of the town of Dundee located on the Rem. of Farm Magdalena No. 7574 and approximately 325km east-northeast of the City of Durban, in the province of KwaZulu-Natal. The Colliery is located in the magisterial district of Amajuba and the local municipality of Dannhauser. A locality map is presented in Figure 3-1. The Discard Dump extension is proposed to be located contiguous to the existing Discard Dump and will be extended into Portion 1 of the farm Mooidoorn Hoek No. 3722 as shown in Figure 3-2. Farm Magdalena No. 7574 is owned by the Mchunu family and Portion 1 of Farm Mooidoorn Hoek No. 3722 is owned by Zinoju Coal (Table 3-1). The layout designs of the Discard Dump are presented in the 2012 AfriCan Innovative Solutions and Projects CC Discard Dump Report (Appendix H1) with a previous version having been prepared in 2008 (Appendix H2). Prior to this a conceptual design report had previously prepared been by GCS in 2006 (Appendix H3) with the associated Geotechnical Report included in Appendix H4.
Figure 3-1: Locality map
Figure 3-2: Farm Portions Associated with Discard Dump Extension
3.2 Property Descriptions and Land Ownership

Slater Coal had a 70% interest in Zinoju. Forbes and Manhattan Coal Corporation (F&MCC) bought 100% ownership of Slater Coal in February 2012. F&MCC own a 100% interest in Forbes Coal (Pty) Ltd who have a 70% ownership of Zinoju Coal (Pty) Ltd.

Table 3-1 lists the current surface right holders of the properties that are included in Phases 1, 2 and 3 of the Magdalena Colliery operations that have all been approved in terms of the MPRDA. The fields shaded blue indicate the farm portions included in Phase 1, those shaded in green Phase 2, and those shaded in yellow Phase 3. The applicant has a mining right to mine all of the properties listed in Table 1-4 and as displayed in Figure 3-2.

It is important to note that the title deeds reflect the names of the original owners. Most are now deceased and have left the properties to their beneficiaries. However, most of the properties have not been transferred into their names. The list given is what Zinoju has obtained from the people on the ground and there may be a few contentious issues amongst the beneficiaries as to whom the legal owners are. On Farm Magdalena No. 7574, none of the portions have been registered.

Table 3-1: Details of land Owners

<table>
<thead>
<tr>
<th>Farm</th>
<th>Share</th>
<th>Surface rights holder</th>
<th>Certificate/deed</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magdalena No. 7574</td>
<td>1/6</td>
<td>Phindukwenza Milisi Mchunu</td>
<td>T 16148 / 91</td>
<td>50,689</td>
</tr>
<tr>
<td></td>
<td>1/6</td>
<td>Bangani Ben Mchunu</td>
<td>T 16148 / 91</td>
<td>50,689</td>
</tr>
<tr>
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<td>1/6</td>
<td>Phiwamehlo Griffiths Mchunu</td>
<td>T 16147 / 79</td>
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<td>Themba Patric Mchunu</td>
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<td>1/3</td>
<td>Vincent Zamokwakke Mchunu</td>
<td>T 16148 / 91</td>
<td>101,378</td>
</tr>
<tr>
<td>Alleen No.1 No. 15592</td>
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<td>R Ntanzi</td>
<td>T166/1958</td>
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<td>D.T. Ntanzi</td>
<td>T6401/1956</td>
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<td>M.J.J Mazibuko</td>
<td>T6475/1961</td>
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### Zinoju Coal (Pty) Ltd

#### Magdalena Colliery Discard Dump Extension

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<td>Kemps Hoek No. 4271</td>
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<td>T 14470 / 1977</td>
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<td>Mourne No. 9148</td>
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<td>Ingonyama Trust</td>
<td>T 1860 / 1941</td>
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<th>Area (ha)</th>
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<tr>
<td>Slieve Donald No. 9229</td>
<td>Lot No. 14</td>
<td>Welcome Sithebe Piet Ngubane</td>
<td>T 1085 / 1926</td>
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<td>Lot 15 (of 13)</td>
<td>Ephraim Ngidi</td>
<td>T 834 / 1938</td>
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<td>Lot No. 16</td>
<td>John Zwane</td>
<td>T 4943 / 1925</td>
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<td>Sub 17 (of 4)</td>
<td>Alfred Jele</td>
<td>T 21071 / 1979</td>
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<td>Lot 18 (of 14)</td>
<td>Cynthia Mimi Nxumalo</td>
<td>T 4629 / 1927</td>
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<td>Muzikayifani Shezi</td>
<td>T 4630 / 1927</td>
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<td>Zwane Thabani</td>
<td>T 21350 / 1981</td>
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<td>Margaret Xaba</td>
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<td>Obed Ngwenya</td>
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<td>Gilbert Mahlaba</td>
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<td>E.T. Mtshali</td>
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<td>Nkosinathi Mtshali</td>
<td>T 339 / 1936</td>
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<td>Sipho H. Ntshepilo</td>
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<td>Ezza Hlomuka</td>
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<tr>
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<th>Area (ha)</th>
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<tr>
<td>Mount Johanna No. 10987</td>
<td>Portion 1</td>
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<td></td>
<td>Portion 3</td>
<td>Siliwane Tabete</td>
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<td>Isaac Sitole</td>
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<td>Portion 11</td>
<td>Amos Ntombeni</td>
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<td>Vezi G. Buthelezi</td>
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<td>Portion 17</td>
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<td>Portion 18</td>
<td>Paulina Z. Ngaga</td>
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</table>
3.3 Existing Mining Operation

The existing Magdalena Colliery is operated by Zinoju Coal (Pty) Ltd. The mineral deposit extracted at the Magdalena Colliery is coal from two seams. The sub outcrop of the top seam (Alfred) and the bottom seam (Gus). Mining occurs by opencast method using the sequential roll over method and underground bord and pillar method accessed by an Adit system from an old opencast high wall. The production rate of the mine is planned to increase to 152 000 Run of Mine (ROM) tons per month. The life of the mine is expected to be 17 years. The ROM from the underground operation is washed and screened at the washing plant situated within the central section of the Magdalena site. The washed product is stockpiled alongside the processing plant ready for distribution. The coal is transported from here by road to the markets with a portion of the product being taken to the Coalfields site ready for distribution by rail. All ROM from the open cast operation is however taken straight to the Coalfields plant for washing and processing.

The site’s existing Discard Dump is located to the south of the washing plants as shown in Figure 3-2. Deposition is by upstream mechanical tipping truck. The dump maintains five metre wide berms at every 5 metres vertical lift to enable access by tipper trucks. However, Zinoju is planning on creating higher terraces of 13m. Slope stability is maintained by an overall slope of 1 in 3. Pollution control measures are installed to ensure clean and dirty water separation such as cut off trenches. An under drainage system is used to collect seepage.

The existing Discard Dump takes coal discard from both the Magdalena and Aviemore collieries. Presently, the Discard Dump is nearing capacity and needs to be extended to ensure disposal capacity requirements of the life of the mine for both these operations. The existing dump was initiated in 2008, has a design life of 7 years and storage capacity of circa 2 million tonnes (53000 tonnes per month) and is therefore not sufficient to accommodate the life of mine requirements. Therefore, it is proposed to extend the Discard Dump to achieve a design life of 22 years with a maximum storage capacity of 9.5 million cubic metres. Refer to Figure 3-3 for the proposed Discard Dump extension layout.
Figure 3-3: Discard Dump Extension Layout
3.4 Proposed Discard Dump Extension

The existing Discard Dump is 3.33ha in extent and is proposed to be extended (increased in size) by approximately 36ha as shown in Figure 3-2. The details of the Discard Dump extension have been taken from the Draft Design Report prepared by AfriCan Innovative dated 19 June 2012, included in Appendix H1. The proposed project will involve establishment of the following:

1. New tailings storage facility (extension to existing);
2. Return water dam;
3. Decant system;
4. Under drainage;
5. Clean and dirty water separation canals;
6. Solution trench; and
7. Access road.

3.4.1 Tailings Storage Facility (Discard Dump Extension)

The proposed geometry was influenced by the existence of underground mine workings to the east of the Discard Dump extension stretching from the north to the south. The design criteria are as follows:

<table>
<thead>
<tr>
<th>Type of facility:</th>
<th>Coal Discard Dump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design life of mine:</td>
<td>Estimated at: 22 years</td>
</tr>
<tr>
<td>Tonnage production per year:</td>
<td>640 000t</td>
</tr>
<tr>
<td>Assumed in-situ density:</td>
<td>1.469tm⁻³</td>
</tr>
<tr>
<td>Total tonnage in life of mine:</td>
<td>14 080 000t</td>
</tr>
<tr>
<td>Total volume of residue:</td>
<td>9 584 751.5m³</td>
</tr>
</tbody>
</table>

3.4.2 Return Water Dam

The return water dam design will be designed to adhere to the National Water Act (1998) and SANS 10286: 1998 regulations, and therefore the criteria for the design of the same are as follows:

| Design return period:       | 1:100 year                  |
| Design flood:               | 146.2mm                     |
| Required volume:            | 14 500m³                    |
| Freeboard:                  | 0.8m                        |
| Depth including freeboard:  | 4m                          |

The return water dam will be designed with a clay / HDPE composite liner in line with
statutory requirements for surface and ground water pollution control.

Due to the topography of the site, two return water dams will be designed: one with a capacity of 8000m$^3$ and the other for a capacity of 7500m$^3$. Under normal operations, the volume of water in the return water dam will be kept not more than 4000m$^3$.

3.4.3 Decant System
The coal will be deposited in “dry” state and as such, no conventional decant system will be designed for this project. However, momentary rising of the water table can be expected from seepage especially after a prolonged low frequency storm. Thus, supernatant (surface) water will need to be drained off the top of the dump as soon as possible. To achieve this, an “emergency type” pump budge will be utilised. The system must be sized to decant a 24 hour 1:100 year storm in not more than 72 hours (three days).

3.4.4 Under Drainage
Previous site studies have indicated that the water table is high and that there is need for pollution control measures to ensure seepage does not come into contact with groundwater under the impoundment. The topography of the site is such that seepage flows downhill. Thus, an under-drainage system will be incorporated at the toe to capture all seepage and also help with consolidation necessary for strength gain and stability of the Discard Dump. The system will consist of perforated or slotted geo-pipes just behind the starter push-up walls connected to out-falling solid pipes discharging into the solution trench and then to the return water dam.

3.4.5 Clean and Dirty Water Separation Canals
To prevent the contamination of stormwater, cut off trenches will be excavated in phases on the upstream of the facility to divert “clean” storm water received on the upstream catchment to the stream without passing through the contaminated site. The positions of the storm diversion trenches will be clearly marked on the detailed layouts.

3.4.6 Solution Trench
The solution trench will be designed to contain flows resulting from the cumulative effects of the seepage from the under drains and Discard Dump supernatant water resulting from a 1:100 year 24 hour storm.

3.4.7 Access Road
Since the envisaged method of deposition is upstream mechanical tipping by truck, the impoundment has been designed with five metre wide berms at every ten metre vertical
lift to enable access by tipper trucks at any point around the dam in line with design specifications. Maintenance shall follow procedures stipulated in the Operations Manual to ensure access under any weather conditions and at any time.

3.4.8 Method of Deposition

The method of deposition will be by upstream mechanical tipping truck which is the current method of deposition. In addition, 5 metre wide berms will be created at every 5 metres vertical lift to enable access by tipper trucks. Slope stability will be maintained by an overall slope of 1 in 3. Pollution control measures such as cut off trenches will be installed to ensure clean and dirty water separation. In addition, an under drainage system will be used to collect seepage as process water which will initially be directed to a Return Water Dam.

3.5 Land Use and Development Context

Prior to mining of coal in this area, the middle and upper mid-slopes were used for grazing, while the more productive land in the valley was used for the cultivation of maize and other market related products. Due to the topography, and the highly sensitive nature of the soils, intense farming has not taken place on large portions of the area in question. The physical and chemical nature of the soils and erratic climate render these areas agriculturally poor.

The pre-mining land use for the area is presented in Table 3-2 and the historical land use is presented in Table 3-3 below.

Table 3-2: Pre-mining Land Use

<table>
<thead>
<tr>
<th>Land Capability</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland (lower stream areas)</td>
<td>2.76</td>
</tr>
<tr>
<td>Arable</td>
<td>31.63</td>
</tr>
<tr>
<td>Grazing to rocky semi-grassland</td>
<td>46.7</td>
</tr>
<tr>
<td>Wilderness</td>
<td>18.91</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3-3: Historical Land Use of Farm Magdalena

<table>
<thead>
<tr>
<th>Activity</th>
<th>Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-mining land use</td>
<td>Subsistence-farming (maize), grazing &amp; Mining</td>
</tr>
<tr>
<td>Hist. Agric. Production</td>
<td>Maize</td>
</tr>
</tbody>
</table>
| Evidence of misuse| Erosion gullies
|                   | Overgrazing                                  |
|                   | Un-rehabilitated mining area                 |
| Existing structures| Semi demolished buildings                    |
The mine is surrounded by moderate to low density rural settlements consisting of traditional homesteads (imizi) and more formalised houses. A handful of more traditional type homesteads are located to the west of the Discard Dump, the closest of which will occur approximately 200m from the western edge of proposed Discard Dump extension.

3.6 Need and Desirability

The Magdalena and Aviemore Collieries require additional discard facilities to ensure that they continue to operate effectively. Currently the Magdalena Discard Dump receives coarse discard from the Magdalena underground and open cast mining operation and from the Aviemore underground mining operation located approximately 6km south of the Magdalena Colliery, which is also operated by Zinoju Coal.

Both the Magdalena and Aviemore mining operations hold significant economic incentives both to the mining company and to the local inhabitants surrounding the two sites. Without the Discard Dump extension both these mining operations would be significantly disrupted, if not halted permanently, which would in turn result in a loss of these economic benefits. Therefore, the decision has been taken by Zinoju Coal to add an addendum EMPR to the existing EMPR approved by DMR to incorporate the proposed Discard Dump extension in line the necessary legislative requirements.
4 PROJECT ALTERNATIVES

4.1 Deposition alternatives

The alternative to placing discard onto a Discard Dump would be placing discard into opencast voids or mined out voids. This option is not favored as the potential risk of acid mine and the difficulty in managing any long-term pollution implications makes this option a ‘non-starter’.

4.2 Site Alternatives

No site alternatives have been considered as the Discard Dump is an already an existing facility and is suitably located to allow the extension. The only alternative would be alternatives to the layout and design of the Discard Dump, which are discussed in more detail below.

4.3 Layout Alternatives

There are a number of site constraints that has limited the consideration of differing site layouts. These site constraints include:

- The property boundary: the Discard Dump has to be located wholly within the property boundary of the mine i.e. Portion 1 of Farm Mooihoek No. 3722.
- Old underground mine workings: there exist underground workings traversing the proposed extension area ranging from as shallow as 25m below natural ground level to 50m. The MPRDA and provisions of SANS Code 10286:1998 prohibit the erection of a structure within 100m of underground workings.
- Return Water Dam: an old box cut area is used by the mine as a return water facility on the boundary of the existing Discard Dump.

Therefore, given the identified constraints, the only options for an alternative layout are to extend the Discard Dump in a southerly direction as proposed, or to increase the height of the Discard Dump. However, increasing the height of the Discard Dump is not a suitable alternative due to the safety risks. Thus, the preferred and only alternative is to extend the Discard Dump in a southerly direction as proposed.

The applicant has, however, committed to seize all opportunities to reduce the size of the Discard Dump wherever possible through the reworking of the discard materials. However,
the market for the re-use/reworking of discard materials is still in its infancy and the sustainability of the coal discard market remains uncertain. For this reason, the applicant is currently unable to make any adjustments to the parameters of the disposal site.

4.4 The ‘No Go’ Alternative

The “no go” alternative would be that the status quo remains and no extension to the existing Discard Dump occurs. Such an option would negatively affect the future viability of the Magdalena and Aviemore Collieries and thus would have significant financial implications for Zinoju Coal and significant social and financial implications for the surrounding community who depend on the mine(s) for their livelihoods.
5 DESCRIPTION OF THE LOCAL AND SITE ENVIRONMENT

5.1 Biophysical Environment

5.1.1 Climate
The closest accredited meteorological station to the Magdalena Colliery which records hourly average wind speed, wind direction and temperature data is the South African Weather Services (SAWS) station at Rietvallei, located approximately 10.5km south-west of the site. Given the proximity and the nature of the terrain, the data is considered to be suitably representative of the conditions at the Magdalena Colliery.

Mean annual temperatures in the Endumeni Municipality range from 15°C to 17°C. Three temperature zones can be discerned:

- The warmest temperatures are experience along the southern and north eastern municipal boundaries. The mean annual temperature is about 17°C.
- Areas which experience the lowest temperatures are limited to small patches within the central and western portions.
- The majority of the municipal area experiences temperatures of around 16°C.

5.1.2 Regional Climate
Magdalena Colliery is located within the summer rainfall region of South Africa, receiving more than 80% of the annual rainfall from October to March, the most of which occurs in January.

The rainfall generally occurs in the form of convectional thunderstorms and is usually accompanied by lightning, heavy rain, strong winds and sometimes hail. The rainfall events are highly localized and can vary markedly over short distances. The mean annual precipitation (MAP) for the area ranges from 630 - 1 000 mm. The gross annual A-pan evaporation for the region, measured at Carolina, is 1 831mm. Temperatures can vary between 32°C (maximum) to 3.6°C (minimum) in the summer and 21.6°C (maximum) to -7.4°C (minimum) in the winter. The annual prevailing wind direction, during the day, summer and winter months is north-westerly, while during the equinoctial period (March - May) and during night time the prevailing winds are from the east.

5.1.3 Wind
Wind related data is available for Newcastle only (1957 - 1969). The prevailing wind direction is North-westerly. The highest velocities occur during the months of August to
October when Westerly winds of up to 5.7 m/s can occur. The average wind speed is 3.7 m/s. During spring and summer, strong South-easterly winds can also develop.

5.1.4 Geology

5.1.4.1 Overview

The geology found on this site is described in the following paragraph as per findings of the Geotechnical Assessment for Proposed Magdalena Colliery Discard Facility by GCS 2006 (Appendix H4).

The site consists of a series of horizontally layered sedimentary units of the Vryheid formation located within the Ecca Group of the Karoo Supergroup. These sediments comprise successions of sandstones, shales, mudstones, coal seams. The Ecca Group overlies rocks of the Dwyka Group.

5.1.4.2 Coal Characteristics

The Magdalena Colliery is situated within the Klip River coalfield. This coalfield comprises Carboniferous and Permian sediments, which include the Vryheid formation, deposited on an undulating glaciated surface with the Dwyka tillites at the base of the sequence. Above this are predominantly Ecca sediments. No pre-Karoo rocks are exposed.

The aerial extent of the Klip River coalfield is mainly controlled by structural features. Within this area the two principal coal seams developed are the Leader Seam and the Main Seam unit, which comprise the ‘Top’, and ‘Bottom’ seams.

Course grained and gritty sandstones occur more frequently within the coal bearing strata, with overlying sediments generally being more argillaceous. Drilling proved the presence of 3 coal seams, namely: the leader seam which occurs some 13m – 18.5m above the top seam, and the bottom seam occurring some 6 - 21m below the top seam. The parting between the top and bottom seam decreases in a northerly to north westerly direction.

Both the Top and Bottom seam are not uniform, but contain one or more partings of shale or sandstone. The Top seam has a seam thickness of 1.32m to 4.38m (average seam thickness on the farm Magdalena is 2.1m). This coal is ranked as a low volatile bituminous coal. The total inter-seam partings have an average thickness of 0.19m.

The bottom seam occurs at an average of 19m below the Top seam. The parting between the Top and Bottom seam consists of medium to coarse grained sandstone. The Bottom seam height ranges from 0.7m to 2.04m (average 1.00m on the farm Magdalena No. 7574).
5.1.4.3 **Coal Floor Contours and Cross Sections**

On Magdalena, the coal reserves are truncated by dolerite sills to the north and southeast. These sills have acted as resistant ‘caps’ in the process of erosion, forming topographical highs with moderate to steep sloping sides to the valleys. Dolerite dykes within the area tend to follow pre-existing fault planes. These faults planes give rise to the vertical displacement of the coal seam.

In this region, the sediments of the Vryheid Formation are generally considered medium to poor potential fractured rock, with negligible primary porosity and low transmissivity. Groundwater storage and movement is primarily confined to fractures, joints and bedding planes within the rock mass and aquifer recharge is largely dependent on rainfall.

The contact zones between the sediments and dolerite intrusions and/or faults are often highly indurated and these discrete highly fractured zones often enhance groundwater storage and permeability and usually offer preferential flow-paths for groundwater migration. Boreholes sited strategically to target these discrete fracture zones may offer exploitable quantities of groundwater.

5.1.5 **Topography**

The site falls on the eastern aspect of Mount Johanna, just below the crest of the ridge from 1286 to 1341m above mean seal level (msl), rising 55m across 395m giving a 14% average slope across the site. The slope follows a typical profile, being steeper towards the top and becoming less steep towards the toe. A number of non-perennial water courses drain from this ridgeline within the property, giving the site some topographical variation.

5.1.6 **Surface Water Resources**

The information in this section is extracted from the Hydrological Assessment compiled in respect of the proposed Extension of the Discard Dump (refer to Appendix H5).

The proposed development falls within Water Management Area 7, the Thukela River catchment, and more specifically the Buffalo River sub-Catchment and Quaternary Catchment V32D which is 596km² and has a mean annual precipitation of 743.9 mm and an evaporation rate of 1845.2 mm. The catchment’s mean annual surface runoff is 49.7 mm which implies a significant amount of infiltration and ground water recharge.

The main hydrological feature on site is the Bloubankspruit non-perennial stream, which flows from west to east across the catchment and drains to the Buffel River. Natural water
feature on site is a spring. Artificial water features include one storage dam used to temporarily hold water from the slurry pond and four earth dams within the catchment.

5.1.7 Groundwater resources
The information in this section is extracted from the Groundwater Assessment compiled in respect of the proposed Extension of the Discard Dump (refer to Appendix H6).

There is a monitoring program present at the Magdalena mine, which include several monitoring boreholes and surface water points down gradient of the proposed expansion area of the Discard Dump. Results from the water monitoring indicate that groundwater levels have seasonal fluctuations with a general increase over time. A general decrease was noted in most boreholes during the 2012 period due to a drought; however, water levels appear to be returning to normal at the time of compilation of the groundwater assessment.

Groundwater quality data indicates no significant negative impacts down gradient of the Discard Dump. This shows that any seepage from the current Discard Dump is contained and has not migrated down gradient of the dump. However there is indication of the groundwater contamination caused by most likely the slurry pond.

It was found that that groundwater movement in the Ecca sediments (which is present on this site) is slow to moderate, compounded by the relatively planar topography. Therefore any pollutants generated by the mining activities (SO\textsubscript{4} content usually) will therefore migrate slowly. The Discard Dump at Magdalena mine will contain some coal but will mostly consist of waste rock material. Thus the Discard Dump is not expected to contribute significantly to acid mine drainage.

5.2 Ecological Environment

A Preliminary Ecological Assessment, by Karen Zunckel, was undertaken on the site for the proposed extension for the Discard Dump and the following information was obtained from the study (Appendix H7).

5.2.1 Flora
The proposed development project area falls within the Grassland Biome in the Sub-Escarpment Grassland Bioregion and is bisected roughly in half in a northeast southwest plane by two vulnerable vegetation types; Income Sandy Grassland and Glencoe Moist Grassland (KZN Veg Type 9 or national veg type Gs 4) as illustrated in Figure 5-1.
The above mentioned vegetation types form the broad vegetative communities but at a finer scale, the ecological assessment differentiated only minor distinctive vegetation communities based on different growth forms and species composition (Figure 5-2). Such small scale variations in community structure are, inter alia, due to changes in soil characteristics (such as soil type, fertility and water content), differences in relief as well as historical land use.

Figure 5-1: Vegetation Types in relation to the MCDD project area (EKZNW, 2009b)
Figure 5-2: Google Earth imagery of the property indicating the four different vegetation communities
The following habitat conditions were found on site:

**Cleared flat veld**
This is a strip of relatively flat land adjacent to the barbed wire fence surrounding the existing works that has been cleared of trees, presumably as a fire break. The grass species which dominates is *Cynodon dactylon*. This species is providing a thick cover resulting in minimal erosion taking place.

**Steep and rocky encroached grassland**
The northern most portions of the site and an area towards the south are dominated by large boulders and sheets of shale where soils are shallow and basal cover is low (20-30%, including the boulders). There are signs of micro erosion taking place with very little organic matter present. The vegetation shows signs of encroachment with species, i.e. *Acacia karroo*, dominating together with *Diospyros lycioides*, *A. robusta* and *Tarenna junodii* in the tree layer. The grass composition is dominated by mainly increasers, i.e. *Cynodon dactylon*, *Eragrostis curvula*, *Eragrostis racemosa*, *Paspalum dilatatum*, *Sporobolus africanus*, *Aristida congesta* and *Melinis repens*. Very few weeds are present, the only exception being *Verbena aristigera*, and signs of overgrazing are apparent.

**Older more established trees**
Trees of greater stature dominate the central portions of the site. A greater diversity of trees to that of the previous habitat community include, *Searsia lucida*, *Searsia pentheri*, *Searsia rehmanniana* and *Gymnosporia buxifolia*. Slopes are slightly less steep and exposed rocks and boulders are less with the ground surface better covered than the ‘Steep and rocky encroached grassland’. There are not as many watercourses draining this section of the property. However, there are signs of micro erosion taking place. Grass composition approximates the previous habitat community, being dominated by many of the same increasers. However a few desirable species, i.e. *Diheteropogon amplectens* and *Themeda triandra*, were present, although in short supply due to heavy overgrazing by goats, cattle and sheep.

**Eroded gullies**
The eroded gully areas show signs of macro erosion with very poor plant density and many bare patches of soil. The grass composition is almost exclusively increasers and the tree layer was dominated by short *Acacia karroo* shrubs.

A preliminary site walk-over found there are no threatened or protected species on the proposed site but 2 species of endemic herbs *Felicia erigeroides* (*Astereceae*) and
Ledebouria ovatifolia (Hyacinthaceae) were found and are Harvestable Natural Resources.

5.2.1 Ezemvelo KZN Wildlife C-Plan

In terms of strategic conservation planning, the extension site is currently classified as ‘Biodiversity Priority Area 3’ within the 2010 Ezemvelo KZN Wildlife Conservation Plan. This indicates that the site may be of moderate conservation importance. Noteworthy, or threatened, faunal populations that may occur onsite, as identified in the C-Plan, include the millipede Doratogonus minor and the mollusc Cochlitoma simplex.

5.2.2 Fauna

There are a total of three South African Red Data faunal species of special concern that are known to occur or have the potential to occur within the Discard Dump extension area; namely Cochlitoma simplex (Thukela Agate Snail), Doratogonus minor (Minor Black Millipede) and Durbania amakosa subs. natalensis (Amakosa Rocksitter). The presence of the terrestrial herbivorous gastropod Cochlitoma simplex was confirmed on site.

The identification of this species initiated the commissioning of a mollusc specialist assessment and the assessment was completed by Dr Ed Granger (Themtek, January 2014 see Appendix H8). The following was extracted from his report.

“In the report prepared by Karen Zunckel 2013 (Appendix H7) an offset area was proposed for the gastropod Cochlitoma simplex based on two indigenous vegetation types that were mapped and described by Mucina & Rutherford (2006). Consequently it was found through further investigation that the mollusca appear to be found on soils which contained significant quantities of small concretions of calcium carbonate. Therefore it is hypothesised that the distribution, and probably also the high density of snails evidenced by the large number of shells seen on Mooidoorn Hoek No. 3722, is determined by the
distribution of calcium-rich soils which occur on the property and not by the two vegetation types of Mucina & Rutherford."

Concerns raised in this study are:

- If an offset area is created on Ptn.1 of the Farm Mooidoorn Hoek No. 3722 the only area in which it could be accommodated is downslope of where it is proposed to establish the extension to the Discard Dump.
- The nature and extent of the source of the calcium carbonate concretions is unknown and the extension of the Discard Dump may compromise the contribution of the calcium to the surrounding soils.

These concerns prompted a soil survey to be completed by Themtek October 2014 (Appendix H9).

Through this investigation it was establish that on Mooidoorn Hoek there does not appear to be a shortage of calcium in either the soils or the vegetation, and therefore the snail appears to prefer extensive areas of well-established thicket, dominated by Sweet Thorn (*Acacia karroo*), with a canopy that is more-or-less closed during summer. The source of the calcium was found to be most likely the dolerite dyke, which has intruded the various sedimentary strata that occur on Mooidoorn Hoek, is the parent material from which the soils on the steep east-facing slope are derived is the source of the calcareous nodules which occur so abundantly on the surface of the soils in this area.

Based on the data presented in the survey, and the conclusions which have been drawn from this, and the observations made during the visit, Dr Granger recommended that an offset area of 33.691ha which is 1.481ha i.e.4.6% larger than the area of “Continuous dense Acacia karroo thicket” which will be replaced by the extension to the discard dump, be set aside as an offset area with the minimum aim of maintaining the presence of *Cochlitoma simplex* on the property (See Figure 7 in Appendix H9).

### 5.3 Socio-Economic Environment

#### 5.3.1 Socio-Economic Characteristics

Dannhauser is one of three local municipalities within the Amajuba District Municipality and covers an area of approximately 1516 square kilometres. It is the smallest municipality within the District Municipality consisting of 10 wards of which 98% are located in rural areas and only 2% located in urban areas (*T&IKZ*, 2009 and Dannhauser Municipality, 2009). This town is located midway between Durban and Johannesburg, about eight
kilometres off the national road between the two cities (KZNcogta, 2009). It is surrounded by some of the largest coal-producing mines in KwaZulu-Natal of which Magdalena Colliery is one.

The town of Dannhauser is situated 15 Kilometres south-west of Magdalena. Numerous rivers flow through the municipal area, the most important being the Ngagane and uMzinyathi Rivers (KZNcogta, 2009). The area between Dannhauser and Magdalena is densely populated, unemployment is rife and poverty is visible throughout the region.

**Population Density**

According to the estimates of T&IKZN (2009), the population of the Amajuba District is 486 846 with an estimated 104 065 people living in the Dannhauser area. Population densities are highest in the Traditional Authority Areas in the north-eastern portion of the municipal area and in the town of Dannhauser itself (T&IKZN, 2009). The population is made up of 90% indigenous African people and 10% European-African (white) and other heritages, with males making up 54% and females 46% of the population. There is an annual estimated growth rate of 2.4%.

As most of the municipality is rural, it is characterized by high levels of poverty, unemployment and a lack of business development opportunities (Dannhauser Municipality, 2010).

Approximately 74% of the total population is below the age of 34. Children (0-4 years of age), that is, below the pre-school enrolment age constitute 13% of the population; while those who are at school constitute 28.1% of the population, 4% of the total population are over 65 years old. This however indicates a high dependency ratio within the municipal area which in turn has a negative impact on the overall socio-economic development of the area as it impedes the ability of individuals to save and invest (Dannhauser Municipality, 2010).

Dannhauser functions as a small rural service centre i.e. providing commercial service facilities and agricultural services and is not a large employment generator. As a result the residents of the municipal area rely on the larger urban centres of Dundee and Newcastle for employment opportunities and higher order goods and services (KZNcogta, 2011).

**Major economic activities and sources of employment**

The major economic sectors within Dannhauser use to be agriculture and mining. However, mining is undergoing a movement away from large scale operations to smaller operations and there has been a decline of the coal-mining sector. Farming remains a major source of
formal employment (KZNcogta, 2011).

Notably, the closure of mines that occurred few years ago had a major negative influence on economic activity and growth in the area and this has, in turn, adversely affected industries and retailers downstream that benefited from the past mine population. At present, small scale agricultural, informal mining and trade (produce and general supplies) dominate the major economic activities within the immediate area. Two thirds of the Dannhauser Municipality residents are mostly dependent on Social Services Grants. This intervention provided by Social Development is the greatest relief to the residents who had no access to any other source of income (Dannhauser Municipality, 2010).

The area is characterized by very high levels of unemployment (78.6%) and this is attributed to the general economic situation in the area, as well as the fact that the area is largely rural. Closure of coal mines and the related industries within the greater area has attributed to the increase in unemployment. Also, the retrenchments of migrants in the cities where they were employed and have now returned to Dannhauser have a huge influence on the low economic levels in this municipal area (Dannhauser Municipality, 2010).

The municipality gets its income from grants provided by the Provincial Government and a small fraction of its population and businesses that pay municipal rates. Mining, tourism and agriculture sectors offer growth opportunities for many; but this is hampered by lack of skilled people and proper infrastructure in the industrial area.

**Housing**

Housing delivery seems to be problematic for the municipality of Dannhauser as this was reflected in the Housing Plan compiled by the municipal’s department of housing. The plan indicated that much attention must be given to the housing needs of the people of Dannhauser as it appears that a huge percentage of them are without adequate housing. The municipality of the area has placed housing needs at the top of the priority list and has established various measures to implement the housing plan of the area. The mine will however also assist in facilitating the implementation of the housing plan and with relocations where needed.

**Social infrastructure**

Social infrastructure in the form of shops and informal businesses occur within a 5km radius of Magdalena colliery area. All other informal infrastructure occurs in the towns of Dundee and Newcastle.
Provision of water
The provision of water within the municipal area has not improved since 2001. The municipality has a backlog of 65% of households with no water connections. It is estimated that an amount of R 195 million was required to minimize the backlog in the District by 2009 (in line with government targets). In terms of this a large amount of this funding is required to deal with the backlog in Dannhauser. In addition, it is noted that 2 schools within Dannhauser area also have a backlog with regard the water provision.

5.3.2 Agricultural Potential and Land Capability
According to the soils database from the Environmental Protection Atlas of South Africa (ENPAT), the soils of the majority of the proposed discard footprint comprise miscellaneous rocky soils derived from dolerite, sandstone and shale, with a small portion comprising prismacutanic and/or pedocutanic diagnostic horizons with one or more of: vertic, melanic, red structured diagnostic horizons. It is speculated that the soils are relatively shallow and highly erodible.

In terms of land use, the land underneath the proposed Discard Dump extension footprint comprises degraded veld that has undergone extensive bush encroachment. At present, limited cattle grazing occurs on the site and erosion gillies are prominent. Grazing was the prominent land use during pre-mining times.

5.3.3 Cultural and Heritage Resources
There are no sites of archaeological or cultural interest on the Magdalena Colliery. At the public meeting, some local residents raised indicated that graves may be present onsite. Local residents and community leaders will be consulted to identify such graces if present.

5.3.4 Visual
The existing Magdalena Colliery area occurs on the north-eastern side of a local topographical highpoint. The mine and all potential dust generation may therefore be visible from dwellings occurring in the vicinity of the property, especially those on the plateau to the west of the site and those dwellings on the flat low lying areas to the east. The coal Discard Dump along with the mine processing plant is visible from the Secondary Provincial Road, P272.

5.3.5 Noise
Local noise levels are minimal and no significant noise pollution is generated by the Magdalena Colliery area. The study area does not occur along any major route or within the vicinity of industrial activity. Monthly noise monitoring is currently being conducted.
5.3.6 Air Quality

The air quality in the surrounding areas is relatively good with the main local pollutant sources of the area being the mine and smoke from cooking fires in the mornings and evenings. During the cold winter nights, the local people burn coal from the mine; this results in smog forming over the area. No major industrial activities, which may further impact on air quality, occur within a 5km radius of the Magdalena Colliery or the proposed open cast extension.

The air quality at the site is moderate depending on the time of year and the strength of the prevailing winds. The potential sources of dust pollution within and in the vicinity of the mine are the exposed, bare surfaces onsite, predominately the dirt roads, and haulage and earthmoving activities. Monthly dust monitoring is currently being conducted.
6 ASSESSMENT OF ENVIRONMENTAL IMPACTS

6.1 Introduction

This chapter describes and evaluates the effects of the proposed extension project of the Magdalena Colliery and the associated activities on the natural and social environments. These activities were identified through consultation with operational mine management and by the specialists who contributed to this report. Activities associated with the project will be addressed and their associated impacts assessed.

6.2 Impact Assessment Methodology

To ensure uniformity, the assessment of potential impacts is addressed in a standard manner so that a wide range of impacts are comparable. For this reason a clearly defined rating methodology has been used to assess the impacts identified in each specialist study.

The significance (quantification) of potential environmental impacts have been determined using a ranking scale, based on the following (terminology has been taken from the Guideline Documentation on EIA Regulations, by the Department of Environmental Affairs and Tourism, April 1998):

<table>
<thead>
<tr>
<th>Status of Impact</th>
<th>Magnitude:=M</th>
<th>Duration:=D</th>
</tr>
</thead>
<tbody>
<tr>
<td>+: Positive</td>
<td>10: Very high/don’t know</td>
<td>5: Permanent</td>
</tr>
<tr>
<td>N: Neutral</td>
<td>8: High</td>
<td>4: Long-term (ceases with the operational life)</td>
</tr>
<tr>
<td>-: Negative</td>
<td>6: Moderate</td>
<td>3: Medium-term (5-15 years)</td>
</tr>
<tr>
<td></td>
<td>4: Low</td>
<td>2: Short-term (0-5 years)</td>
</tr>
<tr>
<td></td>
<td>2: Minor</td>
<td>1: Immediate</td>
</tr>
<tr>
<td></td>
<td>0: Not applicable/none/negligible</td>
<td>0: Not applicable/none/negligible</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale:=S</th>
<th>Probability:=P</th>
</tr>
</thead>
<tbody>
<tr>
<td>5: International</td>
<td>5: Definite/don’t know</td>
</tr>
<tr>
<td>4: National</td>
<td>4: Highly probable</td>
</tr>
<tr>
<td>3: Regional</td>
<td>3: Medium probability</td>
</tr>
<tr>
<td>2: Local</td>
<td>2: Low probability</td>
</tr>
<tr>
<td>1: Site only</td>
<td>1: Improbable</td>
</tr>
<tr>
<td>0: Not applicable/none/negligible</td>
<td>0: Not applicable/none/negligible</td>
</tr>
</tbody>
</table>
The environmental significance of each potential impact is assessed using the following formula:

\[
\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}
\]

The maximum value is 100 significance points (SP). Potential environmental impacts were rated on the following basis:

<table>
<thead>
<tr>
<th>Significance</th>
<th>Environmental Significance Points</th>
<th>Colour Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (positive)</td>
<td>&gt;61</td>
<td>H</td>
</tr>
<tr>
<td>Medium (positive)</td>
<td>31 to 60</td>
<td>M</td>
</tr>
<tr>
<td>Low (positive)</td>
<td>&lt;30</td>
<td>L</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>N</td>
</tr>
<tr>
<td>Low (negative)</td>
<td>&gt;-30</td>
<td>L</td>
</tr>
<tr>
<td>Medium (negative)</td>
<td>-31 to -60</td>
<td>M</td>
</tr>
<tr>
<td>High (negative)</td>
<td>&gt;-61</td>
<td>H</td>
</tr>
</tbody>
</table>

The following process was followed:

1. Identify risks – Possible impacts on the environment
2. Quantitative assessment of risks – Significance of the possible impacts
3. Prepare risk ranking – Risk to the environment
4. Identify management measures – Mitigation measures

### 6.3 Construction Phase Activities

The following environmental aspects associated with the construction phase (i.e. site preparation) of the proposed Magdalena Discard Dump extension have been considered. It is noted that only those impacts associated directly with the extension of the Discard Dump have been assessed:

The construction activities that may impact on the environmental include the construction of the following:

- Tailings Storage Facility.
- Return water dam.
• Under drainage.
• Cut-off trenches and storm water berms.
• Clean and Dirty Water Separation Canals.
• Pollution control dam(s).
• Solution trench.
• Access and haul roads.

6.4 Description of Potential Impacts

The impact assessment is summarised in Table 6-1 and is described in more detail in this section.

6.4.1 Loss of soil resource

The construction activities of the Discard Dump will result in the disruption of the soil profile, particularly the clearance of land, earthworks and the movement of vehicles and people over unpaved areas. The top-and subsoil will be removed from the proposed area for the Discard Dump and the formation of the topsoil stockpiles will result in the topsoil being leached over time. The significance of the loss of soil resource is calculated to be Medium without mitigation and remains Medium with mitigation.

Mitigation measures to minimise and/or reduce the loss of soil resources are detailed in the EMP and the existing EMPR and EMPR Addendum.

6.4.2 Loss of agricultural potential / land capacity

The amount of available land for agricultural practice will be reduced by the extension of the Discard Dump. Additionally, the loss of agricultural potential/land capacity is linked to the loss of soil resources, as soil resource availability for agricultural purposes decreases. The construction of a permanent structure in a particular area also prohibits other potential land uses.

Land use will change from natural veld and grazing land to mining related activities. However, upon cessation of mining operations at Magdalena and Aviemore Collieries, the Discard Dump extension area will be rehabilitated. All topsoil and subsoil will be stockpiled separately and care will be taken to ensure that vegetation established during progressive rehabilitation is not damaged. The land capability will then revert from mining to grazing and thus increase agricultural potential and land capacity. The potential impacts on Loss of Agricultural Potential and Land Capacity are expected to be Medium and will decrease to Low in the long term after mitigation measures are implemented.
Mitigation measures to minimise and/or reduce the loss of agricultural potential / land capacity are detailed in the EMP and the existing EMPR and EMPR Addendum.

6.4.3 **Impacts to floral biodiversity**

A Preliminary Ecological Study was undertaken by Zunckel Ecological and Environmental Services (2012) and is included in this document as **Appendix H7**.

The study identified that the proposed development project area falls within the Grassland Biome in the Sub-Escarpment Grassland Bioregion and is bisected roughly in half in a northeast southwest plane by two vulnerable vegetation types; Income Sandy Grassland and Glencoe Moist Grassland (KZN Veg Type 9 or national veg type Gs 4). The above mentioned vegetation types form the broad vegetative communities but at a finer scale, the ecological assessment differentiated only minor distinctive vegetation communities based on different growth forms and species composition.

In terms of strategic conservation planning, the extension site is currently classified as ‘Biodiversity Priority Area 3’ within the 2010 Ezemvelo KZN Wildlife Conservation Plan. This indicates that the site may be of moderate conservation importance. Noteworthy, or threatened, faunal populations that may occur onsite, as identified in the C-Plan, include the millipede *Doratogonus minor* and the mollusc *Cochlitoma simplex*.

There are a total of three South African Red Data faunal species of special concern that are known to occur or have the potential to occur within the Discard Dump extension area; namely *Cochlitoma simplex* (Thukela Agate Snail), *Doratogonus minor* (Minor Black Millipede) and *Durbania amakosa* subs. *natalensis* (Amakosa Rocksitter). The presence of the terrestrial herbivorous gastropod *Cochlitoma simplex* was confirmed on site while neither the millipede nor the rocksitter were observed.

The study concluded that although field observations show that the site has been impacted by grazing and browsing by livestock, lowering the biodiversity value of the proposed area to moderate, the clearing of vegetation for the Discard Dump will have a negative effect on the biodiversity of the site. This will be a permanent impact and the significance rating is calculated as **High** but can be reduced to a **Medium** through mitigation measures.

The specialist also recommended that a biodiversity offset area be secured according to the Norms and Standards for Biodiversity Offsets: KwaZulu-Natal Province (EKZNW, February 2013). GCS is currently in discussion with Ezemvelo KZN Wildlife in this regard.
The specialists also recommended that the project be planned and implemented according to the latest best practice guidelines available for sustainable mining noting the need not to repeat common previous mistakes in terms of loss of biodiversity as a result of mining activities.

It is the opinion of the ecologists, that the impacts of the proposed development on the fauna and their habitats can be mitigated and offset to acceptable levels through implementing the recommendations described and further detailed in this report.

6.4.4 Loss of faunal biodiversity / disturbance of faunal species

6.4.4.1 Preliminary Ecological Study

The Preliminary Ecological Study (Appendix H7) revealed that the terrestrial herbivorous gastropod Cochlitoma simplex is present on site. This mollusk is a SA Red Data faunal species of special concern and has been found to be present within the Magdalena Colliery Discard Dump extension area and surrounds.

6.4.4.2 Mollusc Conservation Measures Report

The identification of this species initiated the commissioning of a mollusc specialist assessment and the assessment was completed by Dr Ed Granger (Themtek, January 2014 see Appendix H8) who has hypothesised that that the distribution, and probably also the high density of snails evidenced by the large number of shells seen on Mooidoorn Hoek No. 3722, is determined by the distribution of calcium-rich soils which occur on the property and not by the two vegetation types of Mucina & Rutherford. This area where such high levels of calcium occur, supports “Continuous dense Acacia karroo thicket” which probably contributes significantly to maintaining a suitable local climate during late spring and the end of summer when the snails are active and breed. In the light of this assumption, because similar thicket habitat, which appears to occur on the same geological formation, was seen on other properties between Dundee and Magdalena Mine, it seems likely that other populations of C. simplex occur elsewhere in the vicinity of Ptn.1 of the Farm Mooidoorn Hoek No. 3722.
In light of the study, Dr Granger proposed that a survey be undertaken to determine the nature of and extent of the source of calcium-enrichment of the soils on the midslope and footslope of Ptn.1 of the Farm Mooidoorn Hoek No. 3722. The objective of the survey was to establish the extent of the calcium-rich surface soils on Mooidoorn Hoek below (i.e. east of) the proposed eastern boundary of the proposed extension to the discard dump where the snail might be present. This information was required as input to identifying the boundaries of an offset area on Mooidoorn Hoek.

6.4.4.3 Reconnaissance soil survey undertaken to determine possible measures to conserve the Thukela agate snail

The soil survey established that on Mooidoorn Hoek there appears not to be a shortage of calcium in either the soils or the vegetation, and therefore the snail appears to prefer extensive areas of well-established thicket, dominated by Sweet Thorn (*Acacia karroo*), with a canopy that is more-or-less closed during summer. The source of the calcium was found to be most likely the dolerite dyke, which has intruded the various sedimentary strata that occur on Mooidoorn Hoek, is the parent material from which the soils on the steep east-facing slope are derived is the source of the calcareous nodules which occur so abundantly on the surface of the soils in this area.

The total extent of Mooidoorn Hoek is 113.118ha of which approximately 32.210ha (28.5%) on the steep east-facing slopes of the property is occupied by Continuous dense *Acacia karroo* thicket (shown as a stippled pink line in Figure 7 in Appendix 9). The footprint of the proposed extension (including perimeter paddocks) to the discard dump on Mooidoorn Hoek is 24.926ha. Therefore, when the proposed extension is completed, only ca.7.284ha or ca.22.6% of the present block of “Continuous dense *Acacia karroo* thicket” will remain.
Figure 7 of Appendix H9 - Soil Survey for Thukela Agate Snail Conservation
Based on the data presented in the survey, and the conclusions which have been drawn from this, and the observations made during the visit, Dr Granger recommended that the area shown by the stippled pink line in Figure 7 in his report be set aside as an offset area with the minimum aim of maintaining the presence of Cochlitoma simplex on the property. The extent of the proposed offset area is 33.691ha which is 1.481ha i.e. 4.6% larger than the area of “Continuous dense Acacia karroo thicket” which will be replaced by the extension to the discard dump.

It should be noted that a ‘corridor’ at least 50m wide is proposed between the eastern boundary of the paddock wall shown in Figure 7 of the report and the north-western and western boundary of the underground workings shown in the same figure. This ‘corridor’ is proposed to reduce the risk of collapse of the underground workings if the discard dump was created above them. As such, 15.828ha or ca.47% of the proposed offset area is underlain by underground workings and that no form of building is permitted on any land underlain by underground workings.

The criteria to determine the proposed offset area included:

i. No other areas of “Continuous dense Acacia karroo thicket” of similar size to the offset area occur on the property.

ii. The proposed offset area is adjacent to the area in which the highest density of snails which are known to be present.

iii. The proposed offset area includes 11.211ha of “Continuous dense Acacia karroo thicket” in which C. simplex is known to occur. This is equivalent to ca.33.3% of the proposed offset area.

iv. Very high to moderately high densities of calcium carbonate nodules occur on the surface of the soils throughout the area.

v. The north-western and western boundaries of the proposed offset area and the eastern boundary of the area mapped as “Continuous dense Acacia karroo thicket” share a continuous boundary of ca.770m.

vi. The vegetation at, and in the immediate vicinities of sample sites 11, 12 and 13, either closely resembles that which was mapped as “Continuous dense Acacia karroo thicket” or in which the C. simplex was found to be present i.e. at sample site 12.

vii. Trying to establish a sufficiently large area of “Continuous dense Acacia karroo thicket” east of the eastern boundary of the proposed offset area would take longer to achieve than the time in which the extension to the discard dump must be completed.

viii. There is good road access to and through the proposed offset area.

ix. Fences which exclude domestic livestock already exist along the south-western and
south-eastern boundaries of the proposed offset area.
x. Being at the western end of Mooihoek the area is as far distant as possible from human settlements to the east which might seek to continue harvesting A. karroo which is taking place in and around the dam which exists just to the west of sample sites 11 and 12.
xii. Fencing the perimeter of offset area would reduce the risk of unauthorised entry on to the extended discard dump.

The owners of the mine are prepared to consider setting aside an area on Mooihoek with the aim of trying to at least maintain the presence of the snail on the property and are prepared to have this area registered as a conservation servitude in the title deeds of the property.

Considering the results of the studies undertaken, the potential loss of habitat caused by land clearing, and the potential loss of this snail species on this section of the site, a *Medium* environmental impact significance rating is calculated even with application of mitigation measures.

The disturbance to fauna form the construction of the extension is calculated as *Medium* but with appropriate mitigation measures and possible offsets, the impact significance of the disturbance can be reduced to a *LOW* significance.

In order to mitigate the potential impact on the snails, a number of mitigation measures can be implemented in line with the recommendations of the specialist reports including the allocation of an offset area on the property as delineated in Figure 7 of the Mollusc Conservation Measures Report.

Other recommendations include:

6.4.4.1 **Fencing**
- In addition to fencing the entire perimeter, a gate should be provided to allow access of domestic livestock should this be deemed necessary.

6.4.4.2 **Proposed extension to the discard dump: peripheral paddocks**
- Contaminated water collecting in the Pollution Control Dams (PCD or ‘Paddocks as they are referred to in the specialist report) must not escape or discharge downhill across the adjacent lower-lying slopes nor should it be allowed to seep into the soil profiles on these slopes. In the event of exceptionally heavy rain, provision should be made in the design to ensure that the PCDs to not overflow and enter the
proposed offset area.

- Apart from the strong likelihood that acidified water in the PCDs will kill any snails that come into contact with it, such water will also dissolve calcium carbonate on the soil surface and in the soil profile. This could not only have disastrous consequences for the snail’s major source of calcium but also adversely affect the survival and recruitment of Acacia karroo in the offset area.
- It is recommended that the creation of the proposed extension of the discard dump be undertaken on a phased basis over 20 years.

6.4.4.3 Relocation of snails

- So long as this rate of expansion remains, it is recommended that the snails be removed in annual increments in areas which are determined by the boundaries of the proposed area which is to be added the following year. As such, the boundaries of the next phase of the proposed extension must be marked on the ground and that in the immediately following wet season, “at night or during the day when the weather is heavily overcast”, the demarcated area must be searched by a group of trained people (possibly older school children) and all snails found immediately relocated to a portion of the proposed offset site which has been previously identified as already being occupied by C. simplex.
- Because it may prove difficult to determine when adult snails may have laid their eggs or young are about but cannot be easily found, it will be necessary to undertake capture forays on more than one occasion within every summer/wet season.

6.4.4.4 Relocation of soil

- At the commencement of the dry season the proposed offset area should be searched to identify areas where the density of calcium carbonate nodules on the soil surface is comparatively low. An area of more or less the same extent as the area which is to be occupied by the next extension to the discard dump should then be selected. Thereafter, the topsoil along with surface plant debris on the area which is to become buried should be removed to a depth of ca.150mm and this material transported to the pre-selected site in the offset area and spread across the surface. ‘Scraping’ the topsoil and associated plant material off the site which is to become buried and spreading it across the selected site in the offset area should be a seamless exercise.
- It is not recommended that removed topsoil be placed in places within the offset area where the tree canopy is tall and dense and there is an abundance of nodules on the surface.
• Spreading removed soil brings with it the risk of it becoming invaded with weeds which might cause an area to become unsuitable for the snails.

6.4.4.5  Felled trees and aloes

• A number of de-branched trunks of the taller trees that are felled, together with any tall aloes that will also be buried beneath the extending discard dump must be laid out in places in the offset area where such snail habitats are absent or scarce. The presence of such refuge habitats within the area of “Continuous dense Acacia karroo thicket” should be noted to determine the size of tree trunks to be used.

• It is important that artificially placed tree trunks and aloes are monitored for the presence of snails.

6.4.4.6  Baseline assessment and monitoring

• It is essential that, before they are implemented for the first time, a baseline assessment of snail density must be undertaken and that monitoring of the outcomes be undertaken frequently during the first few years and that the data from each monitoring event is analysed so that the new information can be used to adjust both the strategies outlined above and the frequency of monitoring.

• Between 10 and 15 plots, more or less equidistant permanent monitoring plots, each 10m X 10m, should be set out across the area of “Continuous dense Acacia karroo thicket” which will be replaced by the extension to the discard dump and in the offset area. A further 10 to 15 plots should be established to sample the differences in habitat (tree canopy and calcium carbonate density) and density of shells that can be found with reasonable ease, constitute the initial sampling intensity. The data collected must be analysed promptly in order to determine whether the number of plots are sufficient or whether additional plots need to be established and sampled. All plots established during this baseline assessment - with the exception of those that are lost each year as the dump is extended - should be reassessed annually or the first five years. Thereafter every two years for five years and finally two years before extension to the dump is complete.

• In addition to counting the number of snails present in the plots it will also be necessary to monitor some habitat parameters such as density of calcium carbonate nodules, density of tree canopy, height of trees etc.

• In the case of areas within the proposed offset area where soil has been spread after it has been removed from places which become occupied by the expanding discard dump, it is essential that if monitoring plots do not already exist in such areas that additional plots become established on these re-distributed soils.

• It is recommend that the baseline assessment and subsequent monitoring be
undertaken, or at least supervised, by a competent malacologist resident in South Africa.

6.4.4.7 Additional off-site safe guards

- It is strongly recommended that recent aerial photographs be searched to determine whether habitat similar to the area of “Continuous dense Acacia karroo thicket” delineated in Figure 7 occurs on any adjacent properties and if any do exist, that they be searched to establish whether the snail is also present there.
- If suitable habitat is found but snails are not present consideration should be given to relocating some rescued animals to one or more such sites.
- However, if this is contemplated, it should be borne in mind that the restrictions which introducing a rare species on to a property might not appeal to the landowner.
- Consideration should also be given to determining whether C. simplex is present in the Dr. Alden Lloyd Nature Conservation Area and the feasibility of relocating some of the snails from Mooidoorn Hoek to this conservation area.
- Whatever offsite strategies may be put in place to try and safeguard the presence of C. simplex in the vicinity of Mooidoorn Hoek they must form part of the monitoring programme outlined above.

6.4.5 Impacts on surface water resources

A hydrological assessment was undertaken for the proposed project and is available in Appendix H5 of this document. Construction activities have the potential to contaminate nearby surface water resources and may cause the following activities:

- Leachate or contaminated discharge from the Discard Dump, accidental or negligent spills/leaks of fuel or oil and siltation of water transfer structures (e.g. berms).
- The disturbance of the current Discard Dump might cause instability resulting in more seepage to surface water resources.
- Poor maintenance of construction vehicles may result in oil and or fuel leaks.
- Footprint clearing will expose soil leading to the siltation of surface water resources. Prior to construction; clean and dirty separation infrastructure need to be in place to manage runoff velocity preventing erosion gullies.

The potential impacts from seepage of the Discard Dump and the potential fuel/oil spillages are considered to be of Medium significance but can be reduced to Low with the implementation of management and mitigation measures presented in the EMPr and EMPR Addendum. The significance rating for the impact of siltation is Medium and can be
reduced to **Low** through implementing mitigation measures.

### 6.4.5.1 Impacts on groundwater resources
A Groundwater Assessment was undertaken for the proposed project and is included in **Appendix H6** of this document. There are no particular impacts to groundwater resources during the construction phase.

### 6.4.5.2 Air quality / dust creation
During the construction phase of the proposed Discard Dump extension project, dust will be generated by construction vehicles moving in the proposed project area. Upon vegetation clearing, wind blowing over exposed soils will also result generate dust. In addition, vehicular emissions will be generated from earth moving machinery and increased traffic will generate more dust on gravel roads. The vehicles moving over the area are expected to generate dust which will likely affect nearby residents or passing traffic/pedestrians within 200m of all the gravel roads. The potential impacts of dust pollution are considered to be of **Medium Significance in a fairly localised area**. The impacts on the local air quality is also considered to be **Medium**. The implementation of mitigation measures will significantly reduce the potential impacts on air quality caused by dust creation and gas emissions to a **Low** rating.

### 6.4.5.3 Noise
Vehicle movement on onsite during construction of the Discard Dump will elevate the noise levels in the vicinity of the project site and the surrounding areas from base noise levels and could be considered a nuisance to both surrounding communities and local fauna. This impact is expected to be ongoing throughout mining life of both Magdalena and Aviemore Collieries and will cease upon closure of both of the mining sites.

It should be noted that the noise generated by mine machinery, trucks and activities on the existing Discard Dump does not have a significant impact on the environment. The addition of the Discard Dump area will not increase the significance of the current background noise levels. Since the noise caused by mining operations and the existing Discard Dump already forms part of the existing ambient noise climate, the proposed Discard Dump extension will not present a new unknown source of noise. The impacts related to noise is considered to be **Low**.

### 6.4.5.4 Visual intrusion
During the construction phase of the Discard Dump extension project, dust and machinery may be visible within a 2km radius of the open cast extension area, resulting in a visual
The removal of vegetation and topsoil, as well as the creation of stockpiles will affect the visual character of the site for receptors within the viewshed of the site which covers a much larger area. However, due to the visual intrusion of the existing mining activities at Magdalena, the extension of the existing discard dump will not change the current visual impacts significantly. The impact is expected to have medium-term duration (life of mine), following which closure and rehabilitation will reshape topography and the site will be re-vegetated. The significance of the visual impact is considered to be Medium with and without appropriate mitigation measures.

6.4.5.5 Impacts to local social aspects and quality of life

The impacts to local social aspects and quality are separated into impacts associated with dust pollution, noise, and visual impacts:

**Dust pollution**
The Discard Dump extension project may result in a slight increase in dust pollution above current levels which may be affecting surrounding homesteads, primarily as a nuisance factor. The mine will take precautionary and management measure to suppress dust pollution and therefore the dust levels of pollution produced are not expected to exceed the prescribed limits of the SANS 1929 (2011): Ambient air quality - Limits for common pollutants. Thus, health and wellbeing of the surrounding communities is not likely to be affected by the slight increase in dust levels above current levels.

Even though there are no anticipated significant increases in the dust levels as a result of the proposed Discard Dump, should complaints be received from the local residents, advance management measures will be implemented and, if required, steps to relocate affected residents will be considered.

**Noise pollution**
A number of homesteads are located in fairly close proximity to the proposed dump extension. These homesteads are not likely to experience increased noise levels associated with construction activities at the Discard Dump extension as the dump is currently continuously in operation. Even though there are no anticipated significant increases in the noise levels, should complaints be received from the local residents, noise management measure should be implemented with immediate effect.

**Visual impacts**
Visual impacts related to the construction of the extension on surrounding communities are not expected to differ significantly from present conditions in the area and have been
assessed in the operational phase discussed in Section 6.4.5.4 of this report.

**Dust inhalation**

The Discard Dump extension will result in a slight increase in the local dust levels, which translates into increased dust inhalation, especially for those homesteads in the close proximity to the site. However, the anticipated increase in dust level is not expected to be above the acceptable limits by the SANS 1929:2011: Ambient air quality - Limits for common pollutants. Measures to minimise dust generation onsite will be included in the construction and operational EMP’s for the Discard Dump and will be audited regularly. The significance of the health impact is considered to be Low and can be reduced with appropriate mitigation measures.

**Community Livelihoods**

The site is being heavily impacted on by adjacent communities’ livelihood strategies which appear to be largely subsistence-based at present and related to the consumption of grazing and fodder available on site through agreement with the mine to have access to the mine property. The extension of the Discard Dump over a portion of the land currently grazed areas will make them inaccessible to the community and alternative grazing lands will have to be found through negotiation with the mine.

Considering the extent of the extension comparative to the surrounding community land occupation, the loss of this area of grazing land is not expected to significantly impact on the communities.

All of the impacts related to the local social impacts and quality of life are considered to be of Low significance.
### Table 6-1: Potential Impacts Arising during the Construction Phase of the Magdalena Discard Dump Extension

<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>SOILS</td>
<td>Loss of soil resource and agricultural potential (grazing) / loss of soil profile.</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Clearing of vegetation and disruption of soil profile.</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>AGRICULTURAL POTENTIAL AND LAND CAPABILITY</td>
<td>Loss of grazing land</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Construction activities.</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Alien vegetation proliferation and encroachment.</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>VEGETATION</td>
<td>Vegetation clearing for the Discard Dump extension construction phase will result to complete loss of vegetation.</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>The secondary vegetation occurring within the extension footprint will be cleared and destroyed for construction activities.</td>
<td>10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>FAUNA</td>
<td>Loss of endemic snail species (Thukela Agate Snail).</td>
<td>10</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Disturbance during land clearing of the construction phase.</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SURFACE WATER</td>
<td>Surface water contamination. The current Discard Dump could be disturbed and cause instability resulting in more seepage to surface water resources.</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Construction activities.</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Sedimentation of water resources and associated soil erosion.</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Construction activities.</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note: D = Direct, S = Secondary, P = Potential, M = Major, L = Lesser.*
<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUND WATER</td>
<td>Construction activities.</td>
<td>0 0 0 0 0</td>
<td>N/A</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>AIR QUALITY / DUST CREATION</td>
<td>Construction activities.</td>
<td>6 4 2 5 60</td>
<td>M</td>
<td>4 4 2 3 30</td>
</tr>
<tr>
<td>Degeneration in local air quality as a result of dust pollution and greenhouse gas emissions.</td>
<td>Construction activities.</td>
<td>6 4 2 5 60</td>
<td>M</td>
<td>4 4 2 3 30</td>
</tr>
<tr>
<td>NOISE POLLUTION</td>
<td>Construction activities.</td>
<td>6 2 2 3 30</td>
<td>L</td>
<td>6 2 2 1 10</td>
</tr>
<tr>
<td>Increased noise levels coming from construction activities.</td>
<td>Construction vehicles and machinery.</td>
<td>6 2 2 3 30</td>
<td>L</td>
<td>6 2 2 1 10</td>
</tr>
<tr>
<td>VISUAL INTRUSION</td>
<td>Construction activities.</td>
<td>4 4 2 4 40</td>
<td>M</td>
<td>4 4 2 4 40</td>
</tr>
<tr>
<td>Dust pollution and Discard Dump view.</td>
<td>Construction activities.</td>
<td>6 4 2 4 48</td>
<td>M</td>
<td>4 4 2 4 40</td>
</tr>
<tr>
<td>SOCIAL</td>
<td>Noise and dust during construction phase.</td>
<td>4 4 2 2 20</td>
<td>L</td>
<td>4 4 2 2 20</td>
</tr>
<tr>
<td>HEALTH IMPACTS</td>
<td>Dust generated by construction activities</td>
<td>4 4 2 2 20</td>
<td>L</td>
<td>4 4 2 2 20</td>
</tr>
</tbody>
</table>
6.5  Operational Phase Impacts

The Operational Phase will involve the delivery and placing of course discard onto the dump. The discard will be compacted to reduce permeability and increase stability and covered with inert soil.

6.5.1  Operational phase activities

The following are the major potential environmental impacts that occur from these activities:

- Contamination of soils.
- Soil erosion from poor surface runoff control.
- Noise and dust pollution.
- Pollution risk from seepage from the Discard Dump and PCDs.

The environmental impacts associated with the operational phase of the proposed Magdalena Discard Dump Extension are outlined in Table 6-2.

6.5.2  Description of potential impacts

6.5.2.1  Soils

Operational activities will result in coal discard material contaminating the soil underneath and around the Discard Dump area. This will render the soil unusable and unfit for plant growth. Gully erosion may potentially occur when soil is exposed during maintenance activities of which stormwater runoff will be a main contributor to erosion. The significance of the impacts on soil is considered to be Medium during the operational phase with and without mitigation.

6.5.2.2  Vegetation and Fauna

The operational phase activities of placing discard on the dump will have no further impacts on natural vegetation and fauna than those identified in the construction phase.

6.5.2.3  Surface water

According to the findings of the Hydrological assessment (Appendix H5), operational activities of the proposed Discard Dump extension will result to the following impacts:

- The Discard Dump extension will reduce the Bloubankspruit and Catchment A areas and runoff volumes. This will cause potential deterioration of water quality but the proposed development is not anticipated to have a large potential stream peak flow reduction impact on the runoff of the immediate and general areas.
• Runoff from the Discard Dump may contain elevated chemical concentrations, which will impact negatively on the environment if released. Water contained within the settling dam will show elevated chemical concentrations, which will impact negatively on the environment if released.

• All operational activities will result to soil surface exposure to pollution thereby causing siltation of water resources after a rainfall season.

The impacts on surface water are considered to have a Medium to Low significance given the implementation of best practice surface water management which can reduce the significance of potential impacts.

6.5.2.4 Groundwater
According to the findings of the Groundwater Assessment (Appendix H6) seepage from discard extension may enter the ground water table, resulting in pollution of the aquifer. Sulphate plumes could be created which would expand over time and migrate past the dimensions of the Discard Dump.

According to the study results, interaction between the various surface operations, including the Discard Dump and slurry pond, will create a large sulphate plume to the north west of the site. The risk calculated for the Discard Dump expansion, without any mitigation measures, will be High. This is a factor of the duration and extent of the impact, especially considering the large area that the Discard Dump will occupy. However, this risk can be reduced to Medium with the appropriate mitigation measures, which will include recalibration of the numerical model after two years to determine the effectiveness of the mitigation measures implemented. It is important that this be consistently monitored and updated so that any significant changes in water quality can be dealt with efficiently. Refer to impacts table, Table 6-2 for a list of the recommended mitigations measures.

6.5.2.5 Air quality/ dust creation
During the operational phase of the proposed Discard Dump extension project, wind blowing over exposed areas (roads, coal stockpiles and Discard Dump) may result in air pollution due to dust. Dust will also be generated by transportation of coal waste to the discard area. Wind blowing over exposed soils and unprotected stockpiles will also result to dust generation. In addition, vehicular emissions will be generated from earth moving machinery, mining and transport vehicles. The vehicles moving over the area are expected to generate dust which will likely affect nearby residents or passing traffic/pedestrians within 200m of all the gravel roads.
Currently most dust pollution created at Magdalena results from material handling points and haulage roads on the mine and at the plant as well as from coal stockpiles. It should be noted that even though the Discard Dump also contributes a certain percentage in dust pollution at Magdalena, very small and insignificant amounts accumulate from the stockpiled coal discard material. As such, the cumulative impact is expected to be moderately-low. However, in order to control dust and its impact, dust levels are currently being monitored at Magdalena to determine point sources and allow for measures to be installed to reduce the dust levels at these sites. Compliance levels are currently met.

Measures to minimise dust generation onsite and to minimise the risk of spontaneous combustion of the Discard Dump are included in the EMP and EMPR and EMPR Addendum for the Discard Dump extension and will be audited biennially.

The potential impacts of dust pollution and local air quality are considered to be Medium with and without mitigation.

6.5.2.6 Noise Generation
Operators and residents close to the proposed Discard Dump area may be affected by noise generated by transportation trucks. Only the residents that are in close proximity to the proposed extension area will experience noise impacts. The impacts related to noise are considered to be Medium during the operational phase.

6.5.2.7 Visual Intrusion
All operational activities (dust, transportation trucks, coal waste stockpiles) of the proposed Discard Dump will be visible from a certain distance from the mine. The dump will pose a visual impact to those rural residents that look onto the dump site and road users that regularly use the main road. The impact is expected to have medium-term duration (life of mine) and will be reduced upon rehabilitation and closure of the mine. The impacts related to visual intrusion are considered to be Medium to Low during the operational phase.

6.5.2.8 Heritage / Archaeological Sites
Operational activities of the proposed Discard Dump extension will not result to any impacts on heritage sites as no areas of cultural significance were identified in the project area.
6.5.2.9 Social
The impacts to local social aspects during the operational phase are separated into impacts associated with dust pollution, employment, socio-economic structure and safety impacts.

Dust pollution
During the operational phase of the proposed project, nuisance dust pollution may result in uncomfortable conditions for the surrounding residents thereby affecting their social well-being. The impact of the extension of the Discard Dump on the quality of life was rated as being of Low significance with or without mitigation.

Regional Socio-Economic Structure
Even though there are no anticipated employment opportunities associated with the proposed Magdalena Discard Dump extension project, there is likely going to be positive impacts on the local and regional economic structure indirectly through the continued operation of the mine and continued employment of local communities members as well as the continuation of the local economic development projects (Social and Labour Plan). The impact of the extension of the Discard Dump on the social prosperity was rated as being of High positive significance.

Safety
Queries about safety were raised at the Scoping Phase public meeting where local community members raised concerns about children having access to the site. While Zinoju Coal took note of the concern, they responded to indicate that the mine property is fenced and has security access. As such, children and/or people should not have unauthorised entry to the mine. The mine has safety and security measures in place to protect individuals but they cannot control accidents resulting from unauthorised entry to the property.
### Table 6-2: Potential Impacts Arising during the Operation of the Discard Dump Facility

<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>SOILS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contamination of soils under and around Discard Dump. Erosion of soils around dump as a result of poor water control measures.</td>
<td>Dumping of discard on the dump area.</td>
<td>6</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURFACE WATER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deterioration of surface water quality.</td>
<td>Discard Dump contaminated run-off.</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Exposure of soils and siltation of water resources and stream peak flow reduction.</td>
<td>All operational activities - exposure of soil surface and ineffective rehabilitation.</td>
<td>8</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Pollution of water resources.</td>
<td>All operational activities- discard deposition - risk of failure.</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>GROUND WATER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundwater contamination via seepage from the Discard Dump.</td>
<td>Discard Dump Expansion and associated activities.</td>
<td>10</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

1. Maintain good ground cover in the areas susceptible to gully erosion.
2. Ensure gullies are immediately filled in and compacted.
3. Maintain stormwater management measures to route water correctly.
4. Consider run-off from Discard Dump as dirty water.
5. Maintain all water control infrastructure. Clean water run-off must be diverted around areas of disturbance.
6. Design pollution control structures to contain the 1:50 year flood event.
7. Ensure Stormwater Management Plan is implemented.
8. Ensure discard dump design is adhered to.
10. Ensure clean and dirty water separation.
11. Ensure containment of dirty water from the site in an appropriate containment facility (as per design and SWMP).
12. Ensure storms water management infrastructure, ensure effective rehabilitation.
13. Where practicable, sediments must be captured and retained on-site.
14. Ensure rehabilitation plan is adhered to.
15. Ensure implementation and application of the EMPR and EMPR Addendum.
16. Ensure all exposed surfaces are vegetated as quickly as possible.
17. Ensure regular inspections and maintenance of the extended Discard Dump.
18. Undertake regular GN 704 Audits, and updates of the Water Balance for the mine.
19. Ensure Stormwater Management Plan is implemented.
20. Ensure discard dump design is adhered to.
22. Ensure clean and dirty water separation.
23. Ensure containment of dirty water from the site in an appropriate containment facility (as per design and SWMP).
24. Compact Discard Dump in layers so that a 1% recharge is achieved (Normal recharge is 3 to 5%).
25. Slope the dump to achieve maximum runoff and prevent ponding.
26. Construct toe drains if groundwater levels increase to +5m from surface.
27. Plant 5 rows of Eucalyptus trees to intercept any seepage from the dump.
28. A full phytoremediation program will be considered as part of the groundwater management system.
29. Storm water management.
30. Optimise water re-use.
31. Line returns water dams.
32. On-going discard rehabilitation and looking at ways to re-use discard material.
33. Once the dump has been established, new samples must be taken for geochemistry analysis by acid base accounting to verify existing data.
34. The numerical model should be recalibrated after two years to determine the effectiveness of mitigation measures implemented. This must be consistent monitored and updated so that any significant changes in water quality can be dealt with efficiently.

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### POTENTIAL ENVIRONMENTAL IMPACT

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>AIR QUALITY / DUST CREATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Segregation in local air quality as a result of dust pollution and greenhouse gas emissions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The extension of the Discard Dump will increase the area of land susceptible to the generation of dust pollution as well as increase the risk of spontaneous combustion and greenhouse gas emissions.</td>
<td>1. Minimise dust generation. 2. Apply dust suppression methods. 3. Extend dust monitoring network to include the proposed Discard Dump area and ensure continuous air quality monitoring to ensure minimised impacts.</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>NOISE POLLUTION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operators and residents close to the mine machinery and mining operation may be affected by the noise generated.</td>
<td>1. Limit construction activities to the day time; 2. Ensure that all equipment is regularly serviced.</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>VISUAL INTRUSION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disturbed aesthetics / All Discard Dump surface activities will be visible from a certain distance from the mine.</td>
<td>1. Design infrastructure to take cognisance of the environment where possible. 2. Ensure immediate rehabilitation of worked areas as they are completed. 3. Ensure complete and comprehensive rehabilitation of the dump upon closure.</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Visual intrusion resulting from dust pollution and Discard Dump view.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension of the Discard Dump increases the surface area and creates more exposed areas to generate dust</td>
<td>1. Design infrastructure to take cognisance of the environment where possible. 2. Ensure immediate rehabilitation of worked areas as they are completed. 3. Ensure complete and comprehensive rehabilitation of the dump upon closure.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>SOCIAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degeneration in local quality of life as a result of dust pollution, noise pollution, and visual impacts.</td>
<td>1. Reduce dust impacts through dust monitoring and prevention where possible. 2. Reduce dust impacts through dust suppression. 3. Engage with local communities to ensure that subsistence farming and cattle grazing activities are not disrupted during the operational phase.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Employment and community wellbeing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued operation of the Magdalena mine as a result of the extension of the Discard Dump.</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>HEALTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust inhalation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The discard dump extension will result in a slight increase in the local dust levels, which translates into increased dust inhalation, especially for those homesteads in the close proximity to the site.</td>
<td>Reduce dust impacts through dust suppression.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Spontaneous combustion and uncontrolled fires</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the dump is not adequately compacted, spontaneous combustion of the dump materials may occur which represents a safety and health risk to those working onsite and living in close proximity to the dump.</td>
<td>Ensure that the discard dump is compacted adequately and also monitor it to sport potential spontaneous combustion so it can be stopped at the very beginning before its spreads to a larger area.</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
6.6 Decommissioning and Closure Phase Impacts

The majority of impacts associated with the decommissioning and closure of the Discard Dump are positive. These include:

- Improved aesthetics.
- Migration of fauna back into the area.
- Restoration of soils.
- Increasing soil capability for vegetation establishment.
- Controlled indigenous flora re-institution and rehabilitation.
- Agricultural potential restored.

Table 6-3 below details the impacts identified for the decommissioning and closure phase.

6.6.1 Description of potential impacts

6.6.1.1 Soils
Ongoing rehabilitation during the decommissioning phase of the project will result in sub- and top-soil stockpiles being utilised to cover coal discard and the placement of a 150mm topsoil layer will ensure that vegetation establishment will be effective. It is expected that the restoration of soils will have a positive impact of Medium significance.

6.6.1.2 Agricultural potential and land capability
Due to the placement of appropriate layer of topsoil over the rehabilitated areas, previous land capability will be restored (grazing). This impact will have a Medium rated positive significance.

6.6.1.3 Vegetation
During the decommissioning phase, rehabilitation of the affected area will ensure that a sustainable vegetation cover will establish in the proposed project area. This is considered as a positive impact of High significance.

However without proper management, rehabilitation and monitoring, it is likely that the disturbed surfaces associated with the establishment, operation and closure of the Discard Dump will become preferential sites for the colonisation of exotic and alien invasive plant species. This impact is rated with a significance of negative Medium.
6.6.1.4 Fauna
Following cessation of mining activities in the area, and after the affected areas have been rehabilitated, it is anticipated that animals will begin to move back into the area. This is considered as a positive impact of High significance.

6.6.1.5 Surface water
According to the Hydrological Assessment (Appendix H5) findings, during the decommissioning and subsequent closure phase, surface water quality in the Bloubankspruit Streams may be impacted upon. This could occur as a result of removal of infrastructure and rehabilitation activities, resulting in pollution of water resources, polluted runoff from Discard Dump and coal waste stockpiles and from siltation of watercourses. The significance of impacts on surface water is considered to be Medium and can be reduced with appropriate mitigation measures to Low.

6.6.1.6 Groundwater
Seepage from the Discard Dump might result in acid mine drainage and long term sulphate plume development is anticipated if such seepage occurs. The engineered discard dump design is considerate of this as the main potential impact and will incorporate measures and infrastructure to minimise such potential. The significance of impacts on groundwater after closure is considered to be Medium.

6.6.1.7 Air quality / dust creation
The Discard Dump extension project will not create additional excessive dust during decommissioning due to the progressive rehabilitated which would have taken place over its life cycle i.e. rehabilitation will take place on one section while another is being excavated. By the time the Discard Dump has reached full capacity it should be almost completely rehabilitated. Contractors will be responsible for undertaking regular air quality surveys to monitor impacts during this phase. For instance, if excessive dust generation is created (i.e. during the dry season), work will be halted until dust has abated and water suppression has taken place. Following cessation of all activities, and seeding of the rehabilitated areas, dust generation will be reduced to almost 0. No residual impacts on air quality are expected. The reduction in dust creation and improvement in air quality post-closure is considered to be Low positive impact.

6.6.1.8 Noise generation
Although transportation of coal along the various roads will cease post-closure, noise will still be generated by earth moving equipment operating on site during final rehabilitation. This will, however be minor in comparison to operational noise levels. Once closure is
complete, noise levels will drop back to 0 or natural background levels. The significance of impacts on noise nuisance impacts post-closure is considered to be of positive Low significance.

6.6.1.9 Visual Intrusion

Upon cessation of mining activities, rehabilitation of the affected areas, visual aesthetics of the area will be improved in comparison with operational and decommissioning phase impacts. No negative residual impacts are therefore expected on visual aspects and this impact has a significance rating of Medium (positive).
### Table 6-3: Impacts Anticipated During the Closure and Rehabilitation of the Discard Dump

<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td><strong>DECOMMISSION PHASE ACTIVITIES: REHABILITATION OF DISTURBED AREA AND CLOSURE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SOILS</strong></td>
<td>Soil profile and agricultural potential restored.</td>
<td>Rehabilitation and closure activities.</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>AGRICULTURAL POTENTIAL AND LAND CAPABILITY</strong></td>
<td>Restoration of soils from stockpiles to pits, increasing soil capability for vegetation establishment.</td>
<td>Rehabilitation and closure activities.</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td><strong>VEGETATION</strong></td>
<td>Seeding of all rehabilitated areas during the operational and decommissioning phase will ensure that a sustainable vegetation cover will establish in the proposed project area.</td>
<td>Discard Dump extension and associated activities.</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Alien vegetation proliferation and encroachment</td>
<td>Without proper management, rehabilitation and monitoring, it is likely that the disturbed surfaces associated with the establishment, operation and closure of the Discard Dump will become preferential sites for the colonisation of exotic and alien invasive plant species.</td>
<td></td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td><strong>FAUNA</strong></td>
<td>Following rehabilitation of Discard Dump, animals will begin to migrate back into the area.</td>
<td>Rehabilitation and closure activities.</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td><strong>SURFACE WATER</strong></td>
<td>Runoff and drainage from the rehabilitated Discard Dump may continue to yield polluted water.</td>
<td>Runoff from the rehabilitated Discard Dump.</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td><strong>GROUND WATER</strong></td>
<td>Groundwater contamination via seepage from the Discard Dump.</td>
<td>Seepage from the rehabilitated Discard Dump.</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td><strong>AIR QUALITY / DUST CREATION</strong></td>
<td>Dust inhalation.</td>
<td>Rehabilitation and closure activities.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>NOISE POLLUTION</strong></td>
<td>Noise disturbance to local residents.</td>
<td>Rehabilitation and closure activities.</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td><strong>VISUAL INTRUSION</strong></td>
<td>Improved aesthetics</td>
<td>Rehabilitation of the Discard Dump.</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

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6.7 Cumulative impacts

This section of the environmental impact assessment report presents the results of the investigation of whether the proposed Magdalena discard dump extension will contribute towards any cumulative impacts.

6.7.1 Fauna and Flora

The clearing of land will result in the destruction of hectares of disturbed natural vegetation and the displacement of fauna which will only recover once the relevant sections of the Discard Dump have been rehabilitated. In the broader scale of the whole Magdalena mine area, the cumulative impact of vegetation loss and fauna disturbance is substantially larger when looking at the area of land cleared to build the mine and associated infrastructure. When considered on a local level beyond the boundaries of the mine, the secondary impact of clearing of land and associated loss of biodiversity where homesteads have been established around the mine boundary, is even larger. As such the cumulative impact could be considered *Highly* significant.

However, the mine has an EMPR which is being implemented which considers rehabilitation post construction of any and all mining operations including the Discard Dump. As such, the Discard Dump and mine property will be rehabilitated in its entirety when the mine closes with the aim of ultimately reducing the total impact of the mine property to as close to 0 as possible and returning the site to as close to its original state as possible. Unfortunately though, rehabilitation of the adjacent community’s land is not controlled by the mine and therefore is not expected to ever be rehabilitated to the degree the Discard Dump and mine area.

6.7.2 Water resources

Over the past decades, mining activities at Magdalena Colliery have presented detrimental effects on the surface water environment in the catchment. The presence of several mining activities within one catchment may have also had severe effects on surface water environment at a local scale increasing the cumulative impact. Similarly with groundwater contamination where activities at the mine have resulted in varying levels of pollution at the different operations of the mine. As such, the cumulative negative environmental impact could be considered *High* in the context of the larger catchment area.

Zinoju Coal has made significant efforts to improve water management around the Magdalena site through continuous improvement in technology, procedures, practices and environmental awareness and ongoing implementation of the EMPR with the objective of reducing the impact of the mining operation on the catchment’s water resources.
monitoring plays a key role in this system whereby areas on high contamination can be identified and corrective action taken where possible. The cumulative impact on local and catchment resources can be managed and reduced with greater improvements into the future.
7 ENVIRONMENTAL IMPACT STATEMENT

7.1 Objectives of the EIA

The objectives of the EIA have been met where:

- Alternatives for the proposed project were reviewed and assessed.
- Specialist studies were completed to inform the impact assessment.
- All the identified potential impacts were assessed by considering the nature, intensity, magnitude, duration, probability and significance of each impact.
- Mitigation measures to avoid and/or minimise the negative environmental impacts were identified and provided in the form of an Addendum EMPR to the existing Mine EMPR.
- Sufficient information is provided in this report to assist the competent authority to make a decision regarding the authorisation of the activity.

7.2 Summary of the adequacy of the information, implications for decision making of gaps uncertainties and assumptions

All information provided by Zinoju Coal and the specialties studies is correct and valid at the time it was provided. The information provided in this report pertains to the impacts of the proposed development of the Discard Dump at Magdalena Mine only.

Information gaps identified include:

- Bloubankspruit water quality monitoring;
- A updated mine water balance;
- An updated Stormwater Management Plan of the Magdalena Mine; and
- Biodiversity offset plan.

7.3 Risk

Potential risks to the proposed development were minimised through the undertaking of informative specialist studies, evaluation of alternatives, compliance with engineering design standards, and detailed analysis of potential impacts. However risk aspects still remain:

- Inadequate implementation of the specific designed of the Discard Dump which will lead to safety risk.
- Requirement to obtain a number of additional licences in addition to environmental authorisation e.g. Amended Water Use Licence, Tree Removal Permit, EMPR.
Addendum.

- Acceptance of a biodiversity offset approach with EKZNW and associated requirements thereof.

### 7.4 Summary of key findings

- Various layout alternatives were considered and it determined that the Discard Dump should extend in a Southerly direction in order to avoid the Discard Dump being constructed over old underground workings which may lead to ground level subsidence and underground water pollution.

- The specialist studies commissioned for the project identified the following key aspects of the site:
  - Monthly monitoring of the technical data and hazard management system should be carried out.
  - When preparation of the site for deposition of the discard takes place it is recommended that the surface topsoil layer be removed and stockpiled in such a way that it is preserved for future rehabilitation purposes. Similarly, the underlying soils that are excavated should also be stockpiled and preserved for rehabilitation purposes.
  - It was established that the current Discard Dump is not causing any negative groundwater impacts but the groundwater monitoring programme should be continued after the extension of the Discard Dump has taken place. It is also further recommended that the numerical model is recalibrated after two years to determine the effectiveness of the mitigation measures implemented.
  - With the confirmed sighting of the KZN endemic mollusc, *Cochlitoma simplex*, it is recommended that a biodiversity offset area be secured according to the Norms and Standards for Biodiversity Offsets: KwaZulu-Natal Province (EKZNW, February 2013).

- Majority of construction, operational and decommissioning impacts identified for the proposed development were found to be of medium significance and after mitigation measures are applied would have a still a medium or low significance.

- The impact on vegetation was rated as high across the life cycle of the Discard Dump. This is due to the permanent loss of vegetation on the proposed site of the Discard Dump.

- The significance of potential impacts on groundwater was rated to be of medium significance during the operation phase with the application of the correct infrastructure, mitigation measures, and procedures.

- The significance of impacts decreased with the decommissioning phase (rehabilitation phase) from medium to low as expected.
7.5 Recommendations

The impacts that have been identified for the proposed project can be mitigated to acceptable levels. Thus, no fatal flaws or unacceptable impacts would occur through the implementation of the Magdalena Discard Dump Extension.

The implementation of the discard dump extension project will ensure local economic growth in the Dundee area and also ensure continuation of job opportunities for local skilled and semi-skilled workers at the Magdalena Colliery, and will incorporate the transfer of technical skills. For these reasons, GCS (Pty) Ltd recommends that the Magdalena Discard Dump Extension be awarded Environmental Authorisation (EA).

An amendment to the existing Water Use Licence must be submitted to the Department of Water Affairs (DWA) for approval in terms of watercourse and wetland crossings (Section 21 (c) and (i)). The IWULA Amendment requirements will be incorporated into the IWULA amendment application currently in progress.

An application for a Waste Licence in terms of National Environmental Management: Waste Act (Act No. 59 of 2008) (NEMWA) also has to be completed. This process will be discussed with the relevant authorities at the appropriate time.

It is recommended that GN704 audits must be ongoing and all activities must be monitored against the current EMPR and EMPR addendum, as well as the Environmental Management Programme (EMPr) included in Appendix J of this document. Further, it is also recommended that the implementation of mitigation measures contained in this document and in the EMPr be included as a condition of the EA.

7.6 Environmental Management Programme (EMPR)

In terms of the MRPDA, the mine has various EMPRs for various mining facilities and operations in place. An EMPR specific to the extension has been compiled and will be added as an addendum to the approved EMPR for Magdalena and not an amendment thereof. The MPRDA EMPR will indicate how the identified impacts will be avoided, mitigated and/or managed by assessing the environmental objectives and goals.
7.7 Conclusion

A Draft EIA Report has been compiled where the potential impacts on the environment of listed activities associated with the proposed development of the Avoca South Industrial and Business Estate were considered, investigated and assessed in compliance with the NEMA and EIA Regulations. The report contains all information that is necessary for the competent authority to consider the application and to reach a decision regarding the application and includes an assessment of each identified potential impact, including biophysical, ecological, socio-economic and cumulative impacts of the proposed development on the environment.

The EIA process undertaken thus far includes a completed and approved Scoping Phase, which included a technical investigation and public participation exercise from which key issues were identified and further investigated in the Impact Assessment Phase through the undertaking of specialist studies.

Based on the conclusion that no environmental fatal flaw was found, that all negative impacts can be mitigated to acceptable levels, and that the proposed development is anticipated to create some positive impacts on the socio-economic environments, GCS recommends that Environmental Authorisation be granted for the Extension of the Magdalena Discard Dump provided the rehabilitation measures and all other mitigation measures are implemented and the recommendations are considered.
8 WAY FORWARD

The Final Scoping Report was submitted to DEDTEA and accepted by the Department. All comments received from I&APs on the Final SR have been incorporated in the Draft EIA Report and included in the Comments and Response Report.

The Draft EIA Report (this report) has been compiled after completion of all specialist studies and assessment and rating of the environmental impacts. This report will be available to all I&APs for a 30 day comment period. A Final EIA Report will be compiled following a second public participation procedure where I&APs will be informed of the identified impacts and mitigation measure of the proposed development.

Comments received will be addressed in the Final EIA Report which will be submitted to the DEDTEA for a decision on the EIA application for Environmental Authorisation to implement the proposed extension of the Discard Dump at Magdalena Mine.
REFERENCES


Themtek (2014). A Report on Possible Measures to Conserve the Thukela Agate Snail [Cochlitoma Simplex (Smith, 1878)] on Portion 1 of the Farm Mooidoorn Hoek No. 3722, Magdalena Colliery, Dundee, Kwazulu-Natal.

Themtek (2014). Results of A Reconnaissence Soil Survey Undertaken to Determine Possible Measures to Conserve the Thukela Agate Snail [Cochlitoma Simplex (Smith, 1878)] on Portion 1 of the Farm Mooidoorn Hoek No. 3722, Magdalena Colliery, Dundee, Kwazulu-Natal.