

6 EIA PROCESS AND METHODOLOGY

6.1 Introduction

The Environmental Impact Assessment (EIA) and Waste Licence Application process for the proposed extension of the Hendrina Wet Ash Disposal Facilities is comprised of three main phases, namely the Application phase, Scoping phase and Impact Assessment phase (which will include the Waste License Report and the Conceptual Designs). This report documents the tasks which have been undertaken as part of the Impact Assessment phase of the EIA. These tasks include the public participation process and the documentation of the issues which have been identified as a result of these activities.

6.2 Scoping Phase

6.2.1 Introduction

The Scoping Phase of an EIA serves to define the scope of the detailed assessment of the potential impacts of a proposed project. The Environmental Scoping Phase was undertaken in accordance with the requirements of sections 24 and 24D of the National Environmental Management Act (NEMA) (Act 107 of 1998), as read with Government Notices R 543 (Regulations 26-30), 544, 545 and 546 of the NEMA

Lidwala undertook the Scoping Phase of the project between **March and August 2011**. The public review of the Draft Scoping Report ran for a period of **51 calendar days** from **2 June 2011 to 22 July 2011**. The responses and comments from I&APs on the draft Scoping Report were captured in the Final Environmental Scoping Report. The final Environmental Scoping Report was submitted to DEA for review and decision-making on **30 August 2011**.

An Authorities' site visit and meeting was held on **14 September 2011** to present and discuss the Final report with the relevant authorities and to take the authorities on site to see the preferred alternative. The minutes of this meeting are included in **Appendix D**. The Final Environmental Scoping Report was accepted in writing on **26 September 2011**. The letter of acceptance is included in **Appendix A**.

6.2.2 Public Participation

A comprehensive Public Participation Process (PPP) was implemented as part of the Scoping Phase. The Project and environmental assessment process was widely announced with an invitation to the general public to register as I&APs and to actively participate in the PPP. The main activities undertaken as part of the PPP in the Scoping Phase were as follows:

- Print media advertisements in English, Afrikaans, Zulu and Pedi that were placed in the Beeld, Sowetan, Middleberg Observer and Eskasi News newspapers to announce the EIA Process;
- Key Stakeholders were contacted telephonically and informed of the Project and the EIA process;
- A Background Information Document (BID) and comment sheet were produced in English, Afrikaans, Zulu and Pedi detailing the proposed Project and explaining the EIA process. The BID was emailed and posted to I&APs and uploaded on the website;
- Copies of the BID were made available to I&APs as and when requested. Public documents were also made available in public libraries and other local public venues, including:
 - Pullenshope Municipal Library
 - Hendrina Municipal Library
 - Hendrina Power Station: Reception
 - Middleburg Municipal Library
 - Middleburg Chamber of Commerce
 - Steve Tshwete Local Municipal offices in Middleburg and Hendrina
 - Lidwala and Eskom Website
- General project notices were erected at the following locations:
 - Hendrina Power Station: Reception
 - Pullenshope Library
 - Hendrina Municipal Library
 - Alternative Sites
 - Pullenshope Post Office
- The official site notices were erected as per the NEMA EIA Regulations at four of the five alternative sites. Due to the fact that no access was available to Alternative C no site notice was erected at this location.
- Public open day and meeting was held at the Cynithia Murphy Hall in Pullenshope on **19 July 2011**.

A 51-day commenting period (**2 June 2011 to 22 July 2011**) was allowed for I&APs to comment on the Draft Scoping Report (DSR). All comments received were captured and responded to in the Comment and Response Report.

6.2.3 Potential Environmental Impacts Identified during Scoping

Environmental impacts identified during the scoping phase, which were considered to require further assessment, are listed below:

Table 6.1. List of environmental and socio-economic issues identified during Scoping

Environmental Issues Identified	
Geology	<ul style="list-style-type: none"> • Impacts related to the construction-related earthworks as well as the pollution of geological features in case of spillage/leakage of hydrocarbon and other hazardous

<p>material from storage facilities have been identified as having a medium significance.</p> <ul style="list-style-type: none"> • Mitigation measures are required to be identified.
<p>Topography</p> <ul style="list-style-type: none"> • Change to drainage patterns due to construction-related earthworks and additional stormwater drainage patterns. • Mitigation measures are required to be identified.
<p>Soil</p> <ul style="list-style-type: none"> • Pollution of soil due to handling, use and storage of hazardous substances during construction and operation. • The loss of available top soil, through clearing or erosion. • Mitigation measures are required to be identified.
<p>Land Capability</p> <ul style="list-style-type: none"> • Key variables that determine the land capability of the study area such as soil fertility reduced and disturbed due to the potential activities related to the wet ash disposal facility. • The loss of viable agricultural land. • Mitigation measures are required to be identified.
<p>Avifauna</p> <p>The greatest predicted impact of the wet ash disposal facility on avifauna is the destruction of habitat and disturbance of birds during construction. During the construction phase, habitat destruction and alteration inevitably takes place. Habitat destruction is anticipated to be the most significant impact in this study area. However, this can be minimized and mitigated should the smallest alternative be chosen. Similarly, the above mentioned construction and maintenance activities impact on bird through disturbance, particularly during bird breeding activities. Disturbance of birds is anticipated to be of lower significance than habitat destruction. Leachate from fly wet ash disposal facilities can contain heavy metals (Theism and Marley, 1979) which could result in contamination of surrounding water sources, used by water birds in the study area. Correct placing of the new dam, away from wetlands, dams and water bodies, will help to mitigate this impact.</p> <p>In addition to the expansion of the wet ash disposal facilities the project will also include the expansion of the relevant infrastructure associated with the ashing system, such as pipelines, storm water trenches, seepage water collection systems, pump stations, seepage dams etc, and may also involve the relocation of certain infrastructure (e.g. power lines) depending on which alternative is chosen. The impacts of such associated infrastructure on avifauna are predicted to be minimal, so long as the infrastructure is within the proposed wet ash disposal facility footprint.</p>
<p>Biodiversity</p> <p>Ten impacts were identified that are of relevance to any development in a natural environment. Impacts were placed in three categories, namely:</p> <ul style="list-style-type: none"> • Direct impacts: <ul style="list-style-type: none"> ○ Destruction of threatened and protected flora species;

- Direct impacts on threatened fauna species;
- Destruction of sensitive/ pristine habitat types;
- Direct impacts on common fauna species;
- Indirect Impacts:
 - Floristic species changes subsequent to development;
 - Faunal interactions with structures, servitudes and personnel;
 - Impacts on surrounding habitat/ species;
- Cumulative Impacts:
 - Impacts on SA's conservation obligations & targets (VEGMAP vegetation types);
 - Increase in local and regional fragmentation/ isolation of habitat; and
 - Increase in environmental degradation.

Other, more subtle impacts on biological components, such as changes in local, regional and global climate, effects of noise pollution on fauna species, increase in acid rain and ground water deterioration are impacts that cannot be quantified to an acceptable level of certainty and is mostly subjective in nature as either little literature is available on the topic or contradictory information exist

Surface Water

- Contamination of surface water from seepage and run off.
- Loss of aquatic biodiversity.
- Loss of runoff into the catchment.
- The detailed aquatic ecological impact assessment will quantify the significance of possible impacts associated with the preferred site

Groundwater

- Contamination of ground water due to hydrocarbon spillage and seepage into groundwater reserves, affecting groundwater quality.
- Mitigation measures are required to be identified.
- Further construction of infrastructure and compaction of the area will further contribute to reduced water infiltration rates to replenish groundwater aquifers. Mitigation measures are required to be identified.

Noise

Change in ambient noise levels during both construction and operation

Air Quality

- Increase in dust generating activities during construction and operation including exceedances of PM10 concentrations and exceedances of dustfall rates.
- Mitigation measures may be required to be identified if required.

Socio-Economic Issue Identified

- Visual impacts of preferred site
- Disturbance of cultural or historical sites
- Economic benefits through employment
- Continued generation of Electricity over the long term at Hendrina Power Station
- Health risks from elevated PM10 concentrations and dust fall rates

- Loss of groundwater resource to local users (in terms of potential groundwater contamination)
- Inflow of temporary workers.
- Mitigation measures are required to be identified

Potential Impacts associated with relocating the linear infrastructure at Alternative E

- Visual impact of the new power line routes and proposed tower structures;
- Loss of land capability if relocated over agricultural land and the loss of available top soil;
- Loss of aquatic habitat and contamination of surface water ecosystems due to sedimentation;
- Loss of biodiversity and habitats;
- Potential groundwater contamination due to chemical spillage during construction;
- Collisions and electrocutions of birds;
- Disruption of land use and loss of economic potential; and
- Increase in health risk to neighbouring residents due to EMF

These potential impacts were further investigated during the EIA phase of the project by means of the following processes and methodology.

6.3 Impact Assessment Phase

6.3.1 Introduction

The purpose of the Impact Assessment Phase of an EIA is as follows¹:

- Ensure that the process is open and transparent and involves the Authorities, proponent and stakeholders (see **Chapter 6**);
- Address issues that have been raised during the preceding Scoping Phase (**Chapter 8** and **9**);
- Assess alternatives to the proposed activity in a comparative manner (see **Chapter 9**);
- Assess all identified impacts and determine the significance of each impact (see **Chapter 9**); and
- Formulate mitigation measures (see **EMP – Appendix E**).

Numerous acceptable approaches and methodologies exist by which the above purpose can be achieved. The legislation in South Africa, including the guideline documents published in support thereof, does not provide a specific methodology for the assessment of impacts.

¹ DEAT (2005) *Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005, Integrated Environmental Management Guideline Series*, Department of Environmental Affairs and Tourism (DEAT), Pretoria

Rather, an assessment framework is provided within which environmental assessment practitioners are expected to structure a project-specific assessment methodology. This assessment framework recognises that there are different methodologies available for assessing the impact of a development but that the specific methodology selected must provide for the following²:

- A clear process for impact identification, prediction and evaluation;
- Specification of impact identification techniques;
- Criteria for evaluating the significance of impacts;
- Design of mitigation measures to address impacts;
- Defining types of impacts (direct, indirect or cumulative); and
- Specification of uncertainties.

6.3.2 Specialist Studies

Table 6.2 provides a list of the Specialists that are involved in this study and their areas of expertise.

Table 6.2: List of Specialist Studies

Specialist Study	Organisation Responsible for the Study
Impacts on groundwater	Metago Water GeoSciences Consulting
Impacts on surface water and aquatic fauna & flora	Ecotone Freshwater Consultants
Impacts on terrestrial fauna & flora	Bathusi Environmental
Impacts on soils & agricultural potential	Agricultural Research Council
Impacts on heritage resources	Johnny van Schalkwyk
Impacts on air quality	Airshed Planning Professionals
Impacts due to noise	Francois Malherbe Acoustic Consultants
Impacts on the social environment	Lidwala Consulting Engineers (SA)
Impacts on avifauna	Endangered Wildlife Trust
Visual impact assessment	MetroGIS
Conceptual Design	Lidwala Consulting Engineers (SA) and Alan Robinson
Geotechnical Studies	Alan Robinson
GIS	Lidwala Consulting Engineers (SA)
Land Survey	Global Geomatics

6.3.3 Public Participation Process

The main objectives of the PPP in the Impact Assessment Phase are to:

- Inform Interested and Affected Parties (IAPs) about the proposed project and the EIA process;
- Establish lines of communication between IAPs and the project team;

² DEAT (2005) *Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005, Integrated Environmental Management Guideline Series*, Department of Environmental Affairs and Tourism (DEAT), Pretoria

- Provide an opportunity to all parties to exchange information and express their views and concerns;
- Obtain contributions of IAPs and ensure that all issues, concerns and queries raised are fully documented; and
- Identify all the significant issues that need to be addressed in the EIA, if warranted.

PPP during the impact assessment phase revolves around the review and findings of the EIA, which are altogether presented in this Draft Environmental Impact Report (EIR). All I&APs have been notified of the progress to date and availability of the Draft EIR, via mail, email and advertisements in local newspapers (**Appendix F**) as detailed in **Table 6.3** below.

Table 6.3: Date on which the adverts were published for the review of the Draft EIR

Newspaper	Publication Date	Language
Middleberg Observer	21 February 2013	English, Afrikaans, Zulu and Pedi

The I&AP register was used to capture all I&AP details and interactions which were updated as and when information was distributed to or received from I&APs. This ongoing and up-to-date record of communication is an important record-keeping requirement of the EIA legislation and was undertaken for the duration of the Impact Assessment. The full I&AP register is included in **Appendix G**. A comments and response report, documenting all comments and concerns raised by I&APs throughout the process has also been included in **Appendix H**.

A legislated period of **60** consecutive days has been allowed for public comment. Reports have been made available in the following way:

- Distribution for comment at central public places, which were used during the scoping phase. Provision has been made for the placement of the reports at four venues, namely:
 - Pullenshope Municipal Library
 - Hendrina Municipal Library
 - Hendrina Power Station: Reception
 - Gerard Sekoto Municipal Library
- The document has been made available to download from the Lidwala (www.lidwala.com) and Eskom (www.eskom.co.za/eia) websites; and
- Copies of the report on CD will be made available on request.

A public meeting is to be held during this phase (as shown in **Table 6.4**). The open day will be facilitated by key members of the PPP project team. The purpose of the public open day will be to present the findings of the impact assessment where I&APs are given the opportunity to debate and discuss key issues and concerns.

Table 6.4: Public Meeting

Province	Area	Venue	Date
Mpumalanga	Pullenshope	Cynthia Murphy Hall Corner of Maculata and Oak Streets Pullenshope	Tuesday 12 March 2013 Meeting Starts at 18:00 (Registration from 17:30)

All registered Interested and Affected Parties (I&APs) have been notified, in writing, of the availability of the draft Environmental Impact Report in the week of **21 February 2013 (Appendix I)**. In addition site notices (**Appendix F**) advertising the public review period and public meeting have been erected at the following locations:

- Pullens Hope Municipal Library
- Hendrina Municipal Library
- Hendrina Power Station: Reception
- Gerard Sekoto Municipal Library
- Middleburg Chamber of Commerce
- Steve Tshwete Local Municipal offices in Middleburg and Hendrina
- Pullens Hope Post Office

A **60** day period will be provided for public review and comments. Comments received during the review period will be included in the Final EIA Report.

The final EIR will incorporate public comments received on the Draft EIR and will be made available for public review with hard copies distributed to the authorities.

All I&APs will receive a letter at the end of the process notifying them of the authority's decision, thanking them for their contributions, and explaining the appeals procedure.

To date, tasks that have been completed include the:

- Continued identification of stakeholders or I&APs;
- Notifications and advertisements;
- EIA Newsletter;
- Notification of the availability of the Draft EIR for public comment; and
- Distribution of the invitation to the public meeting.

Tasks that are still to be completed during this phase include:

- Hold Public meeting;
- Review of the Draft EIR by the public and relevant authorities;
- Capturing of responses and comments raised by I&APs on the Draft EIR;
- Submission of the Final EIR to the authorities for decision-making with simultaneous release for final public input (envisaged 14 calendar days); and
- Ongoing consultation and engagement.

6.3.4 Consultation with Authorities

The relevant authorities required to review the proposed Project and provide an Environmental Authorisation were consulted from the outset of this study, and have been engaged throughout the project process. The competent authority for this project is DEA. The DWA and MDEDET are noted as key commenting authorities.

Background information regarding the proposed Project was provided to the other relevant authorities, together with a registration and comment form formally requesting their input into the EIA process. The authorities include *inter alia*:

- Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET);
- Department of Water Affairs;
- Nkangala District Municipality;
- Steve Tshwete Local Municipality; and
- South African Heritage Resources Agency (SAHRA) – head office.

6.3.5 Impact Assessment Methodology

In accordance with Regulation 31 of Government Notice R.543, promulgated in terms of section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998), Lidwala were required to assess the significance of potential impacts in terms of the following criteria:

- Cumulative impacts;
- Nature of the impact;
- Extent and duration of the impact;
- 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.

Issues were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The physical **extent**, wherein it is indicated whether:
 - * 1 - the impact will be limited to the site;
 - * 2 - the impact will be limited to the local area;
 - * 3 - the impact will be limited to the region;
 - * 4 - the impact will be national; or
 - * 5 - the impact will be international;
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
 - * 1 - of a very short duration (0–1 years);

- * 2 - of a short duration (2-5 years);
- * 3 - medium-term (5-15 years);
- * 4 - long term (> 15 years); or
- * 5 - permanent;
- The **magnitude of impact on ecological processes**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 - small and will have no effect on the environment;
 - * 2 - minor and will not result in an impact on processes;
 - * 4 - low and will cause a slight impact on processes;
 - * 6 - moderate and will result in processes continuing but in a modified way;
 - * 8 - high (processes are altered to the extent that they temporarily cease); or
 - * 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:
 - * 1 - very improbable (probably will not happen);
 - * 2 - improbable (some possibility, but low likelihood);
 - * 3 - probable (distinct possibility);
 - * 4 - highly probable (most likely); or
 - * 5 - definite (impact will occur regardless of any prevention measures);
- the **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- the **status**, which is described as either positive, negative or neutral;
- 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.

The **significance** is determined by combining the criteria in the following formula:

$S = (E+D+M)*P$; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30 - 60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

6.3.6 Draft Environmental Management Plan

A Draft Environmental Management Plan (EMP) has been compiled and is attached as **Appendix E**.

This EMP serves as a guideline document for the construction and operation of the proposed infrastructure to ensure safe work procedures and prevent unnecessary environmental impacts. The EMP contains guidelines, operating procedures and rehabilitation/pollution control requirements which will be binding after approval of the EMP. It is essential that the EMP be carefully studied, understood, implemented and adhered to at all times. Expansion or adaptation of this management plan may be required in specific circumstances. The document describes mitigation measures for possible impacts associated with the proposed infrastructure.

6.4 Conclusion

This chapter discussed the various tasks that have been undertaken as part of the EIA phase of the process. The main components include the Public Participation Process and assessment of identified impacts and alternatives that have been undertaken as part of the EIA.

The Draft EIR has been made available for public comment. The availability of this report was announced to all registered I&APs via site notices, personalised letters and telephonic notification of key stakeholders. The Draft EIR has been distributed to suitable public venues with comment sheets which will be collected at the end of the **60** day comment period. Comments on the Draft EIR will be captured and responded to in the updated Issues and Response Report. Thereafter, the Draft EIR will be finalised into a Final EIR which will be submitted to DEA for their review. All registered I&APs will be informed by personalised letter of the availability of the Final EIR, and of the Environmental Authorisation and associated conditions of environmental authorisation by personalised letters.