

4. IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

This section provides an indication of the interested and affected parties (I&APs), stakeholders and government departments identified who should be informed and consulted with regards to the proposed extension of the Belfast Silica Mine.

4.1 Directly affected landowner/user

Four Rivers Trading 179 (Pty) Ltd.

The property from which the Belfast Silica Mine is operated is registered to Four Rivers Trading 179 (Pty) Ltd. Although the surface rights are registered to another company, the contact person (Mr. C.A. Wessels) is a Director in both companies (i.e. Belfast Silica Mine (Pty) Ltd. and Four Rivers Trading 179 (Pty) Ltd.).

The landowner is therefore aware of the current mining activity and the proposed extension application.

T Mahlangu (Portion 1 of Klipfontein 385 JS)

Mr. T. Mahlangu resides on Portion 1 of Klipfontein 385 JS, which belongs to Four Rivers Trading 179 (Pty) Ltd. Mr. Mahlangu and his family must be informed of the proposed extension application.

4.2 Directly adjacent landowners/users

The said site is located within a rural agricultural area. Table 4.1 and Figure 4.1 provide an indication of the directly adjacent landowners/users who must be informed of the proposed extension application.

Table 4.1: Directly adjacent landowners

Farm name	Portions	Landowner	Contact Person
Mineraal 384 JS	2	Emakhazeni Local Municipality	The Municipal Manager
Spitskop 383 JS	4, 8, 9, 13	Geldenhuys Familie Trust	JC Geldenhuys
Weltevreden 386 JS	14	WJ Ackhurst	W Ackhurst
	15	Mlangeni Family Trust	PJ Mlangeni
	25 - 35	Weltevreden Familie Trust	J van der Westhuizen
	36	Rapids Country Estate Home Owners Association	J van der Westhuizen
Klipfontein 385 JS	1	Four Rivers Trading 179 (Pty) Ltd.	C Wessels
	5	Geldenhuys Familie Trust	JC Geldenhuys

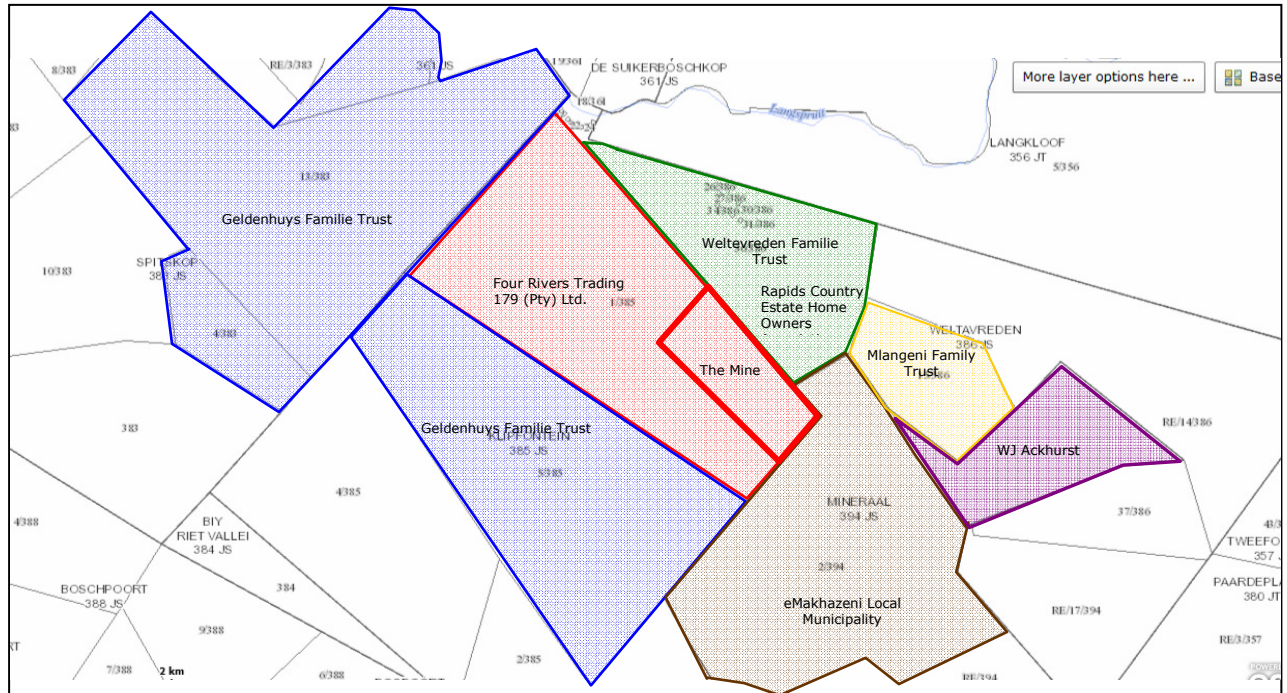


Figure 4.1: Adjacent landowners

4.3 Identified local authorities, government departments and stakeholders

The following local authorities, government departments and stakeholders must be informed of the proposed extension of the mining operation:

- ♣ Emakhazeni Local Municipality
- ♣ Nkangala District Municipality (Development and Planning)
- ♣ Department of Agriculture, Rural Development and Land Administration (DARDLA)
- ♣ Department of Agriculture, Forestry and Fisheries (DAFF)
- ♣ Department of Co-operative Governance and Traditional Affairs (COGTA)
- ♣ Department of Culture, Sports and Recreation
- ♣ Department of Economic Development, Environment and Tourism (DEDET)
- ♣ Department of Mineral Resources (DMR)
- ♣ Department of Water Affairs (DWA)
- ♣ Department of Public Works, Roads and Transport
- ♣ Mpumalanga Tourism and Parks Agency (MPA)
- ♣ Mpumalanga Provincial Heritage Authority
- ♣ South African Heritage Resources Agency (SAHRA)
- ♣ Eskom Transmission
- ♣ Eskom Distribution
- ♣ Eskom Mpumalanga Land and Rights
- ♣ Wildlife and Environment Society of South Africa (WESSA)
- ♣ Endangered Wildlife Trust (EWT)

4.4 Consultation with identified interested and affected parties

The identified interested and affected parties, authorities, government departments and stakeholders will be informed of the proposed extension of the mining operation through the public participation process to be undertaken in the EIA phase. Further details in this regard are provided in Section 7 of this report.

5. DESCRIPTION OF THE ALTERNATIVES

This section provides an indication of alternatives that will be investigated as part of the Environmental Impact Assessment (EIA) phase of the project. Further details will be provided in the Environmental Impact Assessment Report (EIAR).

5.1 Overall mining operation

Belfast Silica Mine is an existing quarrying operation which will be extended due to the presence of quartzite on the rest of the property.

The proposed extension to the mining right area would involve an area of 31.82 ha (Figure 2.2a) located on the same farm (i.e. Remaining Extent of Portion 1 of the farm Klipfontein 385 JS) as the approved mining right (Figure 2.2a). Quartzite would continue to be mined within the proposed extension area.

The applicant has therefore not considered opening another quarry on another property.

5.1.1 Mining method

The proposed extension would entail an extension of the existing quarrying operation which involves both drilling and blasting. Alternative mining methods have therefore not been considered.

5.1.2 Mine plan alternatives

The proposed extension will entail an extension of the current quarries (Quarry 1 and Quarry 2) of Belfast Silica Mine. The current mine plan will extend into the proposed extension area as indicated in Figure 2.3. Instead of mining deeper for another 30 meters, mining will move horizontally into the extension area. This would facilitate easier mining with less rehabilitation required.

Based on the current production levels, the proposed extension would increase the Life of Mine to about 40 years. The extension will also enable the mine to increase production should long term markets be negotiated which would result in more job opportunities, etc.

5.1.3 Infrastructure

Figure 2.4 provides a layout of the existing mine surface infrastructure located within the current mining right area (i.e. 19.19 ha area). Approximately 7.5 hectares of this area has been developed in terms of quarries, stockpiling and surface infrastructure.

The following surface infrastructure is present within the current mining right area (Figure 2.4):

- ❖ Crushing and screening plant;
- ❖ Loading plant (load out);
- ❖ Sand drying plant;
- ❖ Workshop area (including stores, washbay, 2200 litre aboveground diesel tank);
- ❖ Diesel tank and paraffin tank;
- ❖ Eskom transformer;
- ❖ Office;
- ❖ Change house and ablution facility;
- ❖ Explosive Magazine;
- ❖ Guard house;

- ❖ Gravel access road;
- ❖ Product stockpiles.

No new surface infrastructure other than the extended quarry areas (Figure 2.3) will be constructed as part of the extension of the mining activity. The above-mentioned surface infrastructure will continue to be utilised.

5.2 Services

5.2.1 Water

Water for domestic purposes is currently obtained from the fountain located on the adjacent property (see Section 2.7.1). If this water source was no longer available, boreholes would have to be drilled in the area in search of water.

5.2.2 Electricity

Electricity is required at the offices, workshop, crushing and screening plant, etc. Electricity is currently obtained from Eskom and is adequate (see Section 2.7.2). Alternatives could include obtaining electricity from generators or photovoltaic technology. This would depend on the availability of supply from Eskom.

5.2.3 Sewage

Sewage is disposed of by means of a septic tank (see Section 2.7.3). Alternative methods of sewage disposal (e.g. sewage package plant) are not considered viable due to the small amount of sewage produced (i.e. <25 workers) on site.

5.2.4 Waste disposal

Domestic waste is collected in black bags and disposed of at the Belfast Waste Disposal site. No solid waste disposal site will be developed on site (see Section 2.7.4). Alternatives with regards to waste recycling and disposal will be investigated by the mine.

5.2.5 Roads

The gravel access road to the mine currently extends across the property of Mr. J. van der Westhuizen, who in exchange has the use of a portion of the property belonging to Four Rivers Trading 179 (Pty) Ltd. No alternative access to the site has been investigated.

5.3 Land use

The following alternative land use options for the site will be investigated:

- Mining;
- Agriculture;
- Residential;
- A combination of the above-mentioned.

6. DISCUSSION AND CONCLUSION

6.1 Proposed extension of the existing quarrying operation

Belfast Silica Mine (Pty) Ltd. has an approved mining right for an area of 19.19 hectares on the Remaining Extent of Portion 1 of the farm Klipfontein 385 JS. The said mining right is valid for thirty (30) years.

The proposed extension to the mining right area will involve an area of 31.82 ha located on the same farm as the approved mining right. With the inclusion of the proposed extension area, the overall mining right area will then be 51.05 ha.

Quartzite will continue to be mined within the proposed extension area. Over the last 7 years, this quartzite has been proven by the consumers of this material (i.e. the smelters) to be of good quality metallurgical grade (i.e. SiO₂ content ranges from 95% to 98%).

The proposed extension will entail an extension of the current quarries (Quarry 1 and Quarry 2) which will extend into the proposed extension area. The quartzite will continue to be exploited by means of the opencast quarrying method involving both drilling and blasting. Instead of mining deeper for another 30 meters, mining will move horizontally into the extension area. This will facilitate easier mining with less rehabilitation required.

The quarry has a current production rate of approximately 15 000 tons ROM per month. Approximately 6 500 tons silica rock (used as flux) and 8 500 tons aggregate products are produced per month. Based on these production levels, the proposed extension will increase the Life of Mine to about 40 years.

The proposed extension will not only increase the Life of Mine but will facilitate more economical mine planning and easier rehabilitation of the mining area. The extension will also enable the mine to increase production should long term markets be negotiated which would result in more job opportunities, etc. Currently the company employs four (4) persons in the office and eighteen (18) persons on site (i.e. 22 persons in total).

As indicated in Section 2.6, the surface infrastructure present within the current mining right area will continue to be utilised in terms of the extension of the mining activity. In view of this, the existing services (water, sewage, waste disposal, etc.) will continue to be applicable in terms of the mining operation.

6.2 Potential environmental impacts identified

As indicated above, the existing quarry areas will be extended to within the proposed extension area. No new surface infrastructure will be required. An area of 31.82 ha will thus be impacted upon as a result of the extended quarries.

The proposed extension of the existing quarrying operation would continue to impact of the Steenkampsberg quartzite. An area of 31.82 ha would be impacted upon. The quarrying operation will continue to be conducted according to the environmental management measures indicated in the approved EMPR for the existing quarrying operation.

It should be noted that the quarrying operation could be impacted upon by geological faults that could be present within the said area. This could result in alternative mine plans being required. As indicated in Section 5 of this report, alternatives will be investigated as part of the EIA phase of this project.

The topography (steep sloped area) would continue to be impacted upon by the proposed extension of the quarrying operation. An area of 31.82 ha would be impacted upon creating a void of approximately 39 hectares in total (i.e. 7 ha + 31.82 ha). In order to reduce this impact, Belfast Silica Mine will continue to implement the environmental management measures as indicated in the approved EMPR for the existing quarrying operation.

As with the existing quarry areas, virtually no topsoil or subsoil is present within the proposed extension area resulting in the said area being classified as Wilderness. In view of this, the proposed extension area is not utilised for agricultural purposes (cultivation or grazing). An existing land use will thus not be impacted upon as a result of the proposed extension of the quarry.

No surface water environments (rivers or streams) would be directly impacted upon by the proposed extension of the existing quarrying operation (i.e. the additional 31.82 ha). However, the proposed extension would increase the void created by the existing quarries which would impact on the surface water runoff patterns towards the unnamed tributary extending through the centre of the site as well as the Langspruit.

As indicated in Section 3.8, the Belfast Silica Mine site is demarcated as an Ecological Support Area (ESA): Important subcatchments (Figure 3.12) in terms of the freshwater assessment of the Mpumalanga Biodiversity Sector Plan (2013). In order to reduce the potential impact on the nearby rivers and streams, Belfast Silica Mine will continue to implement the surface water management measures as indicated in the approved EMPR for the existing quarrying operation.

The proposed extension could impact on the identified seepage area (associated with the geological fault) that flows into the Langspruit. This seepage area is seen as a wetland area/sensitive landscape that provides a unique habitat within the overall grassland area. Wetland vegetation and a number of fern (including the Tree Fern, *Cyathea sp.*) and tree species are present within this system. *In view of this, this seepage area must be protected from any impact as a result of the proposed mining operation. The said seepage area must be demarcated and a buffer zone provided in order to protect the said system from any impact of the proposed quarrying operation. An alternative mine plan may be required in order to reduce the potential impact on this system.*

The proposed extension will impact directly on 31.82 ha of almost pristine Lydenburg Montane Grassland, which has been demarcated as an Ecological Support Area (ESA) - Local Corridor' in terms of the terrestrial assessment of the Mpumalanga Biodiversity Sector Plan (2013).

According to the PRECIS Database of the South African National Biodiversity Institute, six (6) Red Data plant species could be present within the said area. A number of protected plant species could also be present. A number of ferns were noted within the grassland area as well as the identified seepage area where the protected Tree Fern (*Cyathea sp.*) was noted. In addition, this almost pristine vegetation could also provide natural habitat for a number of animal species.

In view of the above-mentioned, a biodiversity assessment of the proposed extension area will be required in order to determine what flora (plants) and fauna (animals) could be impacted upon in terms of the proposed extension of the quarrying activity. A wetland delineation study should form part of the biodiversity assessment in order to delineate the said seepage area and provide the required buffer zone to ensure its protection. The biodiversity assessment must also provide recommendations with regards to environmental management measures to be implemented in order to reduce the potential impact of the quarrying operation. Further details with regards to this study are provided in Section 7 of this report.

According to the mine, no groundwater seepage was noted along the mining faces of both Quarry no. 1 and Quarry no.2 indicating no impact on the groundwater. However, groundwater was encountered in the floor of Quarry no. 1 when the said quarry was made deeper. In view of this potential impact on the quarrying operation, the mine decided to extend the quarries within the proposed extension area instead of mining deeper for another 30 meters. Based on the existing quarrying operation, it is thus unlikely that the proposed extension of the quarrying operation will impact on the groundwater of the site.

The extension of the quarrying operation will continue to impact on the air quality and ambient noise levels of the site and surroundings. Belfast Silica Mine will continue to implement the environmental management measures (e.g. silica dust monitoring, dust suppression, noise monitoring, etc.) as indicated in the approved EMPR for the existing quarrying operation in order to reduce this potential impact.

Eight (8) graves (belonging to the Mahlangu family) were identified in close proximity of the Mahlangu residence (Figure 3.9). No other sites of archaeological and/or cultural interest are known to exist within the boundaries of the Belfast Silica Mine property (including the proposed extension area). Approximately 7 hectares (ha) have been developed and no artefacts or remains have been unearthed by the mining activities.

According to the National Heritage Resources Act, 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) is required under the following circumstances:

- ♣ The construction of a linear development (road, wall, power line, canal, etc.) exceeding 300m in length;
- ♣ The construction of a bridge or similar structure exceeding 50m in length;
- ♣ Any development or other activity that will change the character of a site and exceed 5000m² or involve three or more existing erven or subdivisions thereof;
- ♣ Rezoning of a site exceeding 10 000m²;
- ♣ Any other category provided for in the regulations of SAHRA or a provincial heritage authority.

Since the proposed extension of the quarrying area would involve an area of 31.82ha, a Phase I Heritage Impact Assessment will be required in order to determine if any heritage resources will be impacted upon. The required HIA will be undertaken as part of the EIA phase of this project. Further details are provided in Section 7 of this report.

According to the palaeontological map supplied by the South African Heritage Resources Agency (SAHRA, 2014), the palaeontological sensitivity of the site is unknown. As a result, a minimum of a desktop study will be required by SAHRA. This study will be undertaken as part of the EIA phase of this project. Further details are provided in Section 7 of this report.

6.3 Potential impacts on identified interested and affected parties

The proposed extension will only impact on the landowner, Four Rivers Trading 179 (Pty) Ltd. and not any other landowner or user. As indicated, the landowner is aware of the proposed extension application.

Adjacent landowners and users could however, be indirectly impacted (e.g. dust, noise, blasting, etc.) as a result of the proposed extension of the quarrying operation.

To date, no consultation with identified interested and affected parties regarding the proposed extension of Belfast Silica Mine has taken place. The identified interested and affected parties, authorities, government departments and stakeholders (see Section 4 of this report) will be informed of the proposed extension of the mining operation through the public participation process to be undertaken during the EIA phase (see Section 7 of this report). Any issues of concern and/or objections will be recorded as part of this process.

According to the mine, no issues of concern/complaints/objections have been recorded in the onsite complaints register regarding the existing quarrying operations.

Belfast Silica Mine will continue to implement the environmental management measures stipulated in the approved EMPR for the existing quarrying operation in order to reduce the potential impact on interested and affected parties.

6.4 Conclusion

As indicated, the existing quarrying operation will be extended by 31.82 ha. No new surface infrastructure will be required. Belfast Silica Mine will continue to implement the environmental management measures stipulated in the approved EMPR for the existing quarrying operation in order to reduce the potential impact of the extended quarrying operation.

From this scoping exercise, it was however, evident that the following studies are required to be undertaken during the EIA phase of this project:

- ♣ Biodiversity Assessment;
- ♣ Phase I Heritage Impact Assessment;
- ♣ Desktop palaeontological study;
- ♣ Public participation.

Depending on the outcome of these studies, the mine plan will be adapted to avoid environmentally sensitive areas and additional environmental management measures implemented.

Further details with regards to the EIA phase of this project are provided in Section 7 of this report.

7. PLAN OF STUDY FOR EIA

7.1 Public participation process to be followed

7.1.1 Evaluation of the scoping report

Authorities

Six (6) copies of the scoping report (including the plan of study for environmental impact assessment (EIA)) will be submitted to the Department of Mineral Resources as requested.

A copy of the scoping report (including the plan of study for EIA) will be forwarded by the Department of Mineral Resources to the following authorities for evaluation purposes:

- Department of Water Affairs (DWA);
- Department of Economic Development, Environment and Tourism (DEDET);
- Department of Agriculture, Forestry and Fisheries (DAFF);
- Mpumalanga Tourism and Parks Agency (MTPA).

A period of 30-days will be provided for evaluation purposes by these authorities.

Comments received by the Department of Mineral Resources from these authorities will be forwarded to the applicant/environmental consultant. The Department of Mineral Resources will also indicate whether the scoping report (including the plan of study for EIA) could be approved based on the comments received.

Comments received based on the evaluation of the scoping report will be addressed during the Environmental Impact Assessment (EIA) Phase of the project.

Interested and Affected Parties

A copy of the scoping report will be made available for comment at the Emakhazeni Public Library, eMakhazeni (Belfast), for evaluation purposes. A period of 30-days will be provided for evaluation purposes by I&APs. In addition, a copy of the scoping report will be made available on the company website (www.cleanstreams.co.za).

The identified interested and affected parties (see Section 4 of this report) will be informed by means of facsimile, e-mail or telephonically of the availability of the scoping report. An advertisement will also be placed in the Middelburg Observer in order to inform I&APs of the availability of the scoping report for evaluation purposes.

A register will be kept of all comments received in terms of the evaluation of the scoping report. These comments will be forwarded to the Department of Mineral Resources for inclusion in their final decision regarding the approval of the scoping report (including the plan of study for EIA). Comments received will be addressed during the Environmental Impact Assessment Phase (EIA) of the project.

7.1.2 Consultation of identified interested and affected parties

Directly affected land user

Mr. T. Mahlangu resides on Portion 1 of Klipfontein 385 JS, which belongs to Four Rivers Trading 179 (Pty) Ltd. Mr. Mahlangu and his family must be informed of the proposed extension of the mining operation and of the availability of the scoping report (including the plan of study for EIA) for evaluation purposes.

Directly adjacent landowners/users

The following directly adjacent landowners/users need to be informed of the proposed extension of the mining operation and of the availability of the scoping report (including the plan of study for EIA) for evaluation purposes:

Farm name	Portions	Landowner	Contact Person
Mineraal 384 JS	2	Emakhazeni Local Municipality	The Municipal Manager
Spitskop 383 JS	4, 8, 9, 13	Geldenhuis Familie Trust	JC Geldenhuis
Weltevreden 386 JS	14	WJ Ackhurst	W Ackhurst
	15	Mlangeni Family Trust	JP Mlangeni
	25 - 35	Weltevreden Familie Trust	J van der Westhuizen
	36	Rapids Country Estate Home Owners Association	J van der Westhuizen
Klipfontein 385 JS	1	Four Rivers Trading 179 (Pty) Ltd.	C Wessels
	5	Geldenhuis Familie Trust	JC Geldenhuis

Other interested and affected parties to be consulted

The following local authorities, government departments and stakeholders must be informed of the proposed extension of the mining operation and of the availability of the scoping report (including the plan of study for EIA) for evaluation purposes:

- ♣ Emakhazeni Local Municipality
- ♣ Nkangala District Municipality (Development and Planning)
- ♣ Department of Agriculture, Rural Development and Land Administration (DARDLA)
- ♣ Department of Agriculture, Forestry and Fisheries (DAFF)
- ♣ Department of Co-operative Governance and Traditional Affairs (COGTA)
- ♣ Department of Culture, Sports and Recreation
- ♣ Department of Economic Development, Environment and Tourism (DEDET)
- ♣ Department of Mineral Resources (DMR)
- ♣ Department of Water Affairs (DWA)
- ♣ Department of Public Works, Roads and Transport
- ♣ Mpumalanga Tourism and Parks Agency (MTPA)
- ♣ Mpumalanga Provincial Heritage Authority
- ♣ South African Heritage Resources Agency (SAHRA)
- ♣ Eskom Transmission
- ♣ Eskom Distribution
- ♣ Eskom Mpumalanga Land and Rights
- ♣ Wildlife and Environment Society of South Africa (WESSA)
- ♣ Endangered Wildlife Trust (EWT)

7.1.3 Evaluation of the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP)

Authorities

A copy of the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) will be submitted to the Department of Mineral Resources. As requested, six (6) copies of the reports will be submitted.

A copy of the reports will be forwarded by the Department of Mineral Resources to the following authorities for evaluation purposes:

- Department of Water Affairs (DWA);
- Department of Economic Development, Environment and Tourism (DEDET);
- Department of Agriculture, Forestry and Fisheries (DAFF);
- Mpumalanga Tourism and Parks Agency (MTPA).

Interested and Affected Parties

A copy of the Environmental Impact Assessment (EIA) and the Environmental Management Programme (EMP) will be made available for comment at the Emakhazeni Public Library, Emakhazeni (Belfast), for evaluation purposes. A period of 30-days will be provided for evaluation purposes by I&APs. In addition, a copy of both reports will be made available on the company website (www.cleanstreams.co.za).

The identified interested and affected parties will be informed by means of facsimile, e-mail or telephonically of the availability of the reports. An advertisement will also be placed in the Middelburg Observer in order to inform I&APs of the availability of both reports for evaluation purposes.

A register will be kept of all comments received in terms of the evaluation of the reports. These comments will be forwarded to the Department of Mineral Resources for inclusion in their final decision regarding the approval of the project.

7.1.4 Informing Interested and Affected Parties of the Record of Decision

On receipt of the Record of Decision (positive or negative decision), all identified interested and affected parties (see Section 4 of this report) will be informed by means of facsimile, e-mail or telephonically that the Record of Decision with regards to the project has been issued.

An advertisement in this regard will also be placed in the Middelburg Observer in order to inform I&APs of the decision. In addition, a copy of the Record of Decision will be made available on the company website (www.cleanstreams.co.za).

7.2 Compilation of the Environmental Impact Assessment (EIA)

The Environmental Impact Assessment (EIA) will be compiled in terms of Section 39 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and the Directive issued by the Department of Mineral Resources. The principles of the National Environmental Management Act, 1998 (Act 107 of 1998), the National Water Act, 1998 (Act 36 of 1998) and other relevant environmental legislation will be incorporated in compiling the required documentation.

In essence, the following information will be provided in the EIA document:

- An assessment of the environment likely to be affected by the proposed activity,
- An assessment of the identified impacts of the proposed activity on the environment including cumulative impacts on the environment,
- A comparative assessment of land use and development alternatives,
- Indication of how issues raised by interested and affected parties were addressed,
- Identification of knowledge gaps,
- Inclusion of technical and supporting information.

7.2.1 Specialist studies

As indicated in Section 6, the following specialist studies will be commissioned as part of the EIA phase of the project:

- Biodiversity assessment (i.e. vegetation, animal life, wetlands)
- Phase 1 Archaeological survey;
- Desktop palaeontological study.

7.2.1.1 Biodiversity assessment

The Biodiversity assessment will consist of the following three (3) studies:

- ✦ Vegetation (plants);
- ✦ Animal life (fauna);
- ✦ Wetlands.

Vegetation (plant) study:

The proposed vegetation (plant) study would involve the following:

- Determination of the Vegetation Type/Types in accordance with existing national vegetation maps (Acocks 1988; Low & Rebelo 1998) and local vegetation studies, as well as proximity and relationship to any Centre of Endemism (van Wyk and Smith 2001). A description of the regional biodiversity context using all existing information will be provided.
- Broad-scale structural classification of the vegetation into homogenous units following the approach of Edwards (1983).
- Vegetation/habitat types will be mapped on the basis of available information (aerial photography, soil types, geology).
- Compilation of a species list (to provide an accurate indication of the floristic diversity) according to latest taxonomic treatments used by the National Herbarium (Germishuizen & Meyer 2004). Alien invasive species, according to the Conservation of Agricultural Resources Act (Act No.43 of 1983) as listed in Henderson (2001), will be highlighted.
- Determination of the occurrence, or possible occurrence, of threatened and/or sensitive plant species (as listed in Hilton-Taylor 1996 with updated threatened status according to IUCN 2000) and plant communities, on the basis of field surveys, historical distribution records obtained from the PRECIS database of the National Botanical Institute and the SARARES database of SABONET, and available literature.
- The identification of impacts as a result of the proposed mining activity.
- Recommendations on aspects such as management of threatened plant species and communities, eradication/control of alien invasive species.

Issues of concern raised through the scoping and public participation processes will also be addressed.

Animal life (fauna) study:

The proposed animal life (fauna) study would involve the following:

- Assessment of the fauna known/likely to occur in the region (based on published literature and short site visit);
- Assessment of the existing terrestrial vertebrate fauna and selected invertebrate groups;
- Assessment of the presence of 'Species of Special Concern' (SCC), including threatened and endemic taxa, and species of cultural, economic and ecological importance;
- Assessment of habitat use by the fauna, and identification and description of sites of special scientific interest;

- Provide a map of the study site identifying important faunal habitats.
- Assessment of the likely impacts that the proposed development will have on the immediate and surrounding environments;
- An indication of possible mitigation measures to be implemented.

Issues of concern raised through the scoping and public participation processes will also be addressed.

Wetland study:

The proposed wetland study would involve the following:

- Initial desktop delineation of the wetlands;
- Ground truthing;
- Soil profiling, using hydric indicators according to the DWAF (2005) wetland delineation guidelines;
- Wetland boundary verification;
- Data capture in ARC View (GIS) using scanned ortho-rectified 1: 10 000 orthophotos;
- Classification of wetlands according to HGM (see Marneweck and Batchelor, 2002) and the system developed by Kotze, Marneweck, Batchelor, Lindley and Collins (2004);
- A survey of the vegetation within the wetland area using standard vegetation survey techniques (Braun Blanquet);
- A small mammal survey;
- Determination of the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS); and
- A review of the proposed mine plan following the wetland delineation baseline assessment study;
- An assessment of the likely impacts that the proposed development will have on the immediate and downstream environments, particularly with regard to possible hydrological changes; and
- Presentation of the findings in a report.

The issues of concern raised through the scoping and public participation processes will also be addressed.

7.2.1.2 Phase 1 Heritage Impact Assessment

A Phase 1 Heritage Impact Assessment (as required in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)) will be conducted in order to determine whether any sites of archaeological and/or cultural interest are located on the said site.

The aim of the HIA will be:

- ♣ To establish whether any of the types and ranges of heritage resources as outlined in the National Heritage Resources Act (Act No 25 of 1999) occur within the project area;
- ♣ To determine the level (or degree) of significance of the heritage resources that occur within the perimeters of the project area;
- ♣ To make recommendations regarding possible mitigation or the conservation of these remains depending on their levels of significance.

Issues of concern raised through the scoping and public participation processes will also be addressed.

7.2.1.3 Desktop palaeontological study

A Desktop palaeontological study (as required in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)) will be conducted in order to determine whether the said site is important in terms of palaeontology.

7.2.2 Method of assessing issues and alternatives

7.2.2.1 Issues

Issues of concern will be identified by way of objections/concerns received, approvals granted (subject to certain conditions) and by consultation with various authorities and interested and affected parties as detailed in the preceding sections.

The identified 'environmental issues' will be defined as either:

- ♣ Definable issues e.g. air pollution
- ♣ The cause of an impact e.g. impacts as result of construction
- ♣ A generally expressed concern e.g. social disruption of communities.

The relevant and important issues will be focused on.

Issues concerning the following project phases will also be identified:

- ♣ Operational phase
- ♣ Decommissioning phase

7.2.2.2 Impacts

Potential impacts that could take place will be identified by overlaying the proposed layout plans on the environmental sensitivity map for the site.

7.2.2.3 Evaluation of impacts

The evaluation of impacts will be conducted in terms of the following criteria:

- **Nature of impact**

- **Extent of impact**

Site	Effect limited to the site and its immediate surroundings
Local	Effect limited to within 3-5 km of the site
Regional	Effect will have an impact on a regional scale

- **Duration of impact**

Short	Effect lasts for a period 0 to 5 years
Medium	Effect continues for a period between 5 and 10 years
Long	Effect will cease after the operational life of the activity either because of natural process or by human intervention
Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient

- **Intensity of impact**

Low	The impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
Medium	Where the affected environment is altered but natural, cultural and social functions and processes

	continue albeit in a modified way
High	Where natural, cultural or social functions or processes are altered to the extent that it will temporarily or permanently cease

• **Probability**

Improbable	Less than 33% chance of occurrence
Probable	Between 33 and 66% chance of occurrence
Highly probable	Greater than 66% chance of occurrence
Definite	Will occur regardless of any prevention measures

• **Significance of impact**

Low	Where the impact will have a relatively small effect on the environment and will not have an influence on the decision
Medium	Where the impact can have an influence on the environment and the decision and should be mitigated
High	Where the impact definitely has an impact on the environment and the decision regardless of any possible mitigation

• **Status**

Positive	Impact will be beneficial to the environment
Negative	Impact will not be beneficial to the environment
Neutral	Positive and negative impact

• **Confidence**

Low	It is uncertain whether the impact will occur
Medium	It is likely that the impact will occur
High	It is relatively certain that the impact will occur

It must be noted that many of the potential negative consequences can be mitigated successfully. It will however, be necessary to make a thorough assessment of all possible impacts in order to ensure that environmental considerations are taken into account, in a balanced way, as far as possible, supporting the aim of creating a healthy and pleasant environment.

7.2.2.4 Alternatives

Alternatives will be identified by way of discussion with authorities, interested and affected parties and the project applicant. Alternatives will also be identified by overlaying the proposed layout plans on the environmental sensitivity map for the site.

The 'No Project Option' will be included in the assessment. Not all alternatives will be investigated in the same degree of intensity – only the feasible ones.

The EIA report will include a description of each alternative for the project as well as the advantages and disadvantages of each.

7.3 Compilation of the Environmental Management Programme (EMP)

The Environmental Management Programme (EMP) will be compiled in terms of Section 39 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and the Directive issued by the Department of Mineral Resources. The principles of the National Environmental Management Act, 1998 (Act 107 of 1998), the National Water Act, 1998 (Act 36 of 1998) and other relevant environmental legislation will be incorporated in compiling the required documentation.

In essence, the following information will be provided in the EMP document:

- ♣ Environmental management objectives and goals,
- ♣ Mitigation measures and management of significant impacts,
- ♣ Mine Closure planning,
- ♣ Socio-economic conditions, as well as historical and cultural aspects,
- ♣ An Action Plan for implementation of the EMP,
- ♣ Environmental related emergency procedures,
- ♣ Monitoring and performance assessment,
- ♣ Financial provision, and
- ♣ Environmental awareness planning.

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APPENDIX 1: CORRESPONDENCE WITH DEPARTMENT OF MINERAL RESOURCES

- ♣ Copy of the Mining Right granted in terms of Section 23(1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) regarding the Remaining Extent of Portion 1 of the farm Klipfontein 385 JS, Belfast.
- ♣ Letter from Belfast Silica Mine (Pty) Ltd to the Department of Mineral Resources (dated: 6 May 2010).
- ♣ Letter from Belfast Silica Mine (Pty) Ltd to the Department of Mineral Resources (dated: 3 July 2013).
- ♣ Letter from the Department of Mineral Resources to Belfast Silica Mine (Pty) Ltd (dated: 26 May 2014)

APPENDIX 2: CURRICULUM VITAE

- ♣ Curriculum Vitae of A. Erasmus

APPENDIX 3: PROOF OF OWNERSHIP

- ♣ Windeed print out regarding the Remaining Extent of Portion 1 of the farm Klipfontein 385 JS

APPENDIX 4: GEOLOGICAL REPORT

- ♣ Niesing and Lingenfelder. 2003. **Geology and Silica Resource on the farm Klipfontein 385 JS.**
- ♣ Bullock, A.M.T. **Klipfontein 385 JS Belfast Silica Mine Geological Report.** Report prepared by A.M.T. Bullock. Report prepared for: Belfast Silica Mine (Pty) Ltd.