



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FINAL BASIC ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Scribante Concrete (Pty) Ltd

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FILE REFERENCE NUMBER SAMRAD: EC30/5/1/3/3/2/1/10446 EM

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1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. Objective of the basic assessment process

The objective of the basic assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage , and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

PART A
SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: ETC-Africa

Tel No.: 0724760396

Fax No. : 0867196591

e-mail address: edward@etc-africa.com

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

Edward Rice: MSc Conservation Biology (CV and degree certificate attached, Appendix A)

Duncan Pritchard: BSc Geography

(2) Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Edward Rice: 3 years experience in environmental consulting, primarily in EIAs.

Duncan Pritchard: 12 years experience in environmental consulting.

b) Location of the overall Activity.

Farm Name:	Ncolosi 393 and Farm Ngxaza 437
Application area (Ha)	4.8
Magisterial district:	OR Tambo District
Distance and direction from nearest town	42km NNW from Mthatha, Eastern Cape
21 digit Surveyor General Code for each farm portion	C10800000000039300000 Ncolosi 393 (Tsolo 393) Formerly AA No. 12 C10800000000043700000 Farm Ngxaza No. 437. Formerly AA No. 36H

c) Locality map

(show nearest town, scale not smaller than 1:250000). See attached Appendix B

d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

See attached Appendix C

(i) Listed and specified activities

Table 1. Activities to take place on site

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)
Roads	360 m ²		
Loading and truck turning area	7130 m ²		
Slipways	360 m ²		
Stockpiles	198 m ²		
Parking	26 m ²		
Toilet (temporary)	2.25 m ²		
Storage container	40 m ²		
Excavation (extraction of sand)	17764 m ²	X	GNR 983

(ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/mined and for a linear activity, a description of the route of the activity)

Scribante Concrete proposes extracting river sand from the channel and sandbars within the Inxu River, Mhlontlo Local Municipality, OR Tambo District, Eastern Cape.

It is proposed that an excavator be used during low flow conditions to extract sand from the channel and sandbars along the river bed and bank. The sand will be stock-piled on the eastern bank of the river. The excavator will access the sandbars via ramps (slipways). It will strip the top of the sandbars to the seasonal water level. The excavator will stack the sand on the river bank and a front-end loader will be used to transfer the sand to a stockpile area approximately 15m away from the river bank. Once the material is dry it will be loaded into trucks and transported by subcontractors to an existing screening facility in Mthatha. River sand will be loaded into customers' trucks at this facility. Oversized material will be transported back to the mining site, to be used for erosion control on the banks of the river and in existing gullies surrounding the site.

There is little permanent infrastructure (hard structures) involved in the proposed mining operation. The mining operation will be comprised of:

- Earth moving equipment;
- Stockpiles on the banks of the river;
- Loading and turning areas for trucks;
- Slipways;
- Storage area (a container to be used);
- Hardstand surface for waste collection and parking of earth moving machinery;
- A temporary toilet (portaloo) for staff (to be serviced by a third party);

Further details on the mining process can be found in the Mining Work Plan (Appendix D).

The listed activities triggered by the proposed operation are as follows:

- Listing Notice 1 (Government Notice R983 of 4 December 2014, as amended by Government Notice R327 of 7 April 2017):

Activity Number 21; Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including —

(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or

(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;

e) Policy and Legislative Context

Table 2. legislative context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
National Water Act: Act No 36 of 1998	Ref. No: WU8340 See acknowledgement of receipt of application for Water Use License (Appendix K)	Section 21 c and i Water Use Licence applied for.
National Environmental Management Act: Act No 107 of 1998.	EC30/5/1/3/3/2/1/10446 EM	EIA Regulations. Listed Activities trigger Basic Assessment Listing Notice 1, Activities 21
Mineral and Petroleum Resources Development Act [No. 28 of 2002]	EC30/5/1/3/2/ 10446 MP	Mining Permit Application required
Occupational Health and Safety Act: Act No 85 of 1993.		
Conservation of Agricultural Resources Act: Act No 43 of 1983.		
National Forests Act: Act No 84 of 1998.		
The Eastern Cape Biodiversity Conservation Plan (ECBCP)		
National Environmental Management: Biodiversity Act 10 of 2004.		
National Environmental Management: Waste Act: No. 59 of 2008.		
National Environmental Management: Protected areas act		
Environmental Conservation Act: Act No 73 of 1989.		
National Heritage Resources Act: Act No 25 of 1999		
Hazardous Substances Act: Act No 15 of 1973.		

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

1. Socio-economic value of the activity

The anticipated expenditure for the project (including initial capital investment, salaries and operating costs for two years) is R 2.8 mil. The expected turnover generated by or as a result of the project is R 3.5 million. The predicted number of employment opportunities created during construction phase and operational phase are 10 and 8 respectively. The total expected value of employment opportunities during two years of operation is R 687 000. Employment opportunities will be made available to individuals from the surrounding local communities.

Scribante Concrete (with the aid of The Department of Rural Development and Land Reform) is formalizing a lease agreement with the Amampondomise Asentshonalanga Traditional Council. This will ensure that three administrative areas surrounding the site (Ngolosi no 12 A/A, Maguttywa No 8 A/A, Ngxaza A/A) will receive money paid as rental for the land on a monthly basis. The Amampondomise Asentshonalanga Traditional Council Tribal Trust was created so the funds are used in a manner that benefits all the community members. The community identified infrastructure that they need in the area, namely a crèche and a community hall. The construction of these will be funded through the trust from rental money paid by Scribante Concrete.

2. Ecological value of the activity

Any mining operation of this nature is going to have adverse effects on the immediate environment. Through specialists' assessments and recommendations, effective implementation of the Environmental Management Programme, and a well-developed mine closure/rehabilitation plan, these adverse impacts can be minimised as much as possible. Done correctly the operation should result in minimal long-term effects on the environment, including the aquatic ecosystem of the Inxu River and the surrounding grassland.

Findings from the Watercourse Delineation and Impact Assessment (Appendix E) concluded that, given successful implementation of the proposed and highlighted mitigation measures (through the guidance and regulation of an ECO and relevant authorities), sand mining in this particular area will be sustainable during the two year period. The short-term impacts identified from this activity will likely be compensated for by strictly adhering to a rehabilitation plan and relevant legislation. If these are not adhered to, the activity will reduce the health and integrity of the watercourse and its surrounding terrestrial system.

Specific considerations in terms of mitigating and managing impacts have been included in Section 3 of this report under "Mitigation Measure."

There is the potential for this proposed activity to have positive environmental repercussions for the surrounding environment. The extensive gully systems in the surrounding grassland, especially those south east of the mining site, have been identified as potential rehabilitation sites. As a by-product of the sand extraction and screening processes, there will be large amounts of alluvial rocks. It is suggested that the applicant use these rocks to offset their net environmental impact. Following screening, these rocks will be returned to the site by truck. Erosion mitigation measures such as rock packing and the construction of gabions can be used to stabilise and restore the gully systems. In time these structures can slow the erosion process and trap sediment, allowing vegetation to re-establish and increasing the ecological value of the surrounding vegetation. Improving the ecological integrity of the surrounding grassland will increase the grazing value and stocking rate of the grasslands. This will increase agricultural value of the land, which is used for communal grazing by the local community. Reducing erosion in this catchment will also improve the long-term health of the Inxu River and downstream aquatic systems.

Effective implementation of erosion control measures could see improved environmental impacts long after closure of the mining operation.

3. Alternatives

Three sites were considered for the proposed sand mining operation (Fig 1). There is an illegal sand mining operation at Alternative 1 (350m downstream from the preferred site) so it was deemed unfeasible. Alternative 2 is 450m upstream from the preferred site. It exhibits good potential for the proposed activity; however, there is a gully system that is currently impassable. Attempting access to this site would likely pose serious erosion risks and subsequent degradation of the surrounding environment. The preferred site is considered most suitable as it is easily accessible via an existing gravel road to the site. There is a level section parallel to the river (the result of a borrow pit for road construction in the past) to allow vehicles to turn; therefore no earth moving to create a platform will be required. There is sufficient sedimentation of river sand in this section of the river, making it an economically viable site for the proposed activity.

The No-Go Alternative is the option of not undertaking the proposed operation. This would result in no environmental degradation. It is, however, important to note that illegal operations are becoming prolific along this river and it is likely that if the proposed activity is not authorised the neighbouring illegal operations will move onto this section of river. An authorised operation with an effective Environmental Management Programme and closure and rehabilitation plan can at least manage and mitigate environmental impacts wherever possible.

g) Motivation for the overall preferred site, activities and technology alternative.

The preferred site was chosen as it will result in fewer adverse socio-economic and environmental impacts (as explained above). In addition there is an existing access road to the site which negates the need to build another access road. This reduces the risk of further environmental degradation (habitat destruction and soil erosion) resulting from constructing another road. The technology to be used, ie mechanical removal of river sands using an excavator and loading of materials with a front-end loader, was deemed the most feasible technology for the purpose of a temporary mining operation. Minimal infrastructure will result in cheaper and more effective rehabilitation upon mine closure.

h) Full description of the process followed to reach the proposed preferred alternatives within the site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Both Alternative 2 and the Preferred site are on Farm Ncolosi 393 (on the eastern side of the river) and Farm Ngxaza No. 437 (on the western side of the river) (see Appendix F, map of alternatives considered). The river forms the boundary between these two farms. The bulk of the mining related activities (access ramps to river bed, stock piling, loading areas etc) would be on the eastern side of the river (Farm Ncolosi 393) for the Alternative 2 and preferred site. The Alternative 1 site is located on Farm Tsolo 117 (on eastern side of the river) and Farm Ngxaza No. 437 (on the western side of the river). Again

the proposed activity at this alternative site would be on the eastern banks of the river (i.e. on Farm Tsolo 117).

The technology to be used would be identical at all 3 sites (the preferred site and the two alternatives). Alternative 2 would require an additional road and structures to allow the access to cross the extensive gully system. This would likely lead to environmental degradation through increased erosion.

Alternative 1 is currently being occupied, albeit illegally. It was therefore not considered a feasible alternative.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

PUBLIC PARTICIPATION COMPLETED:

1. Two Newspaper adverts were published:
 - 1.1. Notice of Environmental Basic Assessment, Water Use License Application and Mining Permit Application was published in the Daily Dispatch on 18 January 2017
 - 1.2. Advert inviting people to the public meeting was published in the Mthatha Express on 10 November 2016.
2. A public meeting was held at St Augustines Locality on 5 December 2016.
3. Signs were placed around the site
4. Further consultation took place with the aid of the Department of Rural Development and Land Reform (DRDLR). This was in the form of 3 individual public meetings, one in each of the surrounding administrative areas on 22nd and 23 February 2017. The Headmen of each of the administrative areas arranged the venues for these meetings. The aim of the meetings was to inform as many community members as possible about the proposed mining activity.
5. The Background Information Document (BID) was uploaded to ETC-Africa's website. The BID was circulated to Interested and Affected Parties (I&AP), authorities, and stakeholders.
6. A Community Resolution regarding the proposed mining operation and lease of land from the community has been formally drafted by DRDLR and signed by the relevant elected community representatives.

PUBLIC PARTICIPATION PENDING (TO BE SUBMITTED WITH FINAL BASIC ASSESSMENT REPORT:

Upon completion of the draft Basic Assessment Report, it will be made publicly available in the surrounding areas (e.g. at the Mhlontlo Local Municipality offices in Tsolo). Notices will be placed in on notice boards in the surrounding areas to indicate that the draft report is available for public viewing and comment.

The draft Basic Assessment Report will be made available to registered I&APs, commenting authorities and stakeholders for comment.

Comments received will be responded to. These will be included in the Comments and Response Report to be submitted with the final Basic Assessment Report.

Upon receipt of a decision (RoD) from the Department of Mineral Resources, I&APs, Commenting Authorities and stakeholders will be notified of this decision and given the opportunity to appeal the decision.

iii) Summary of issues raised by I&Aps
 (Complete the table summarising comments and issues raised, and reaction to those responses)

Table 3. I&AP comments

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by	Section and
List the names of persons consulted in this column, and		Comments		the applicant	paragraph
Mark with an X where those who must be consulted were in fact consulted.		Received			reference in this report where the issues and or response were incorporated.
<u>AFFECTED PARTIES</u>					
Landowner/s	X		No comments received		
Lawful occupier/s of the land	X		No comments received		
Landowners or lawful occupiers on adjacent properties	X		No comments received		
Municipal councillor	X		No comments received		
Municipality	X		No comments received		
Organs of state (Responsible for infrastructure that may be affected Roads Department,					

Eskom, Telkom, DWA e				
			TO BE SUBMITTED WITH FINAL BASIC ASSESSMENT REPORT	
Communities	X			
Dept. Land Affairs	X			
Traditional Leaders	X			
Dept. Environmental Affairs	X			
Other Competent Authorities affected	X			
<u>OTHER AFFECTED PARTIES</u>				
			TO BE SUBMITTED WITH FINAL BASIC ASSESSMENT REPORT	
<u>INTERESTED PARTIES</u>				

iv) The Environmental attributes associated with the alternatives.(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic, and cultural character).

1. GRADIENT OF THE SITE

The gradient of the site varies as one moves perpendicular away from the river. Above the eastern bank of the river, where most of the activity will occur, there is a level section 10-20m wide (Appendix G, Fig. 1). It is understood that this was a borrow pit for materials to a build a road approximately 10 years ago. It has resulted in a flat narrow strip that runs parallel to the river with a steep decline to the river on one side (Appendix G, Fig. 2) and a steep incline away from the river on the other. These steep sections are between 50 degrees and 70 degrees across most of the site, with a few short sections with sheer 90degree slopes 1 m - 2 m in height.

The gradient of the river bed itself is very gentle, around one degree (Appendix G, Fig. 3).

2. LOCATION IN LANDSCAPE

The site is located in an inner meander of the Inxu River. The surrounding landscape is flat to undulating. The most noteworthy topographical features are the deeply incised gullies, particularly the gully which originates 2 km south-southeast of the site (Appendix G, Fig. 4).

3. SOIL AND GEOLOGICAL STABILITY OF THE SITE

Most of the soil forms identified on the site were Glenrosa soils (Orthic A-horizon underlain by Lithocutanic B-horizon) and Clovelly soil forms (Orthic A-horizon underlain by yellow-brown a-pedal B-horizon). Alluvial sands were dominant along the river (hence the proposed development). Large E-horizons were present (bleached and weakly structured soil) due to a fluctuating water table. The major geology features were Beaufort mudstone underlain by arenite. Weakly-structured, friable soils have resulted in gully erosion. Further details on the soils and geology of the site can be found in the Watercourse Delineation and Impact Assessment Report (Appendix E).

It is proposed that ramps be built to allow earth moving equipment access to the river bed. Considering the gradient and geology, stabilisation structures will be required to ensure the steep river bank does not collapse.

4. VEGETATION

4.1. Biome, vegetation type and conservation status

The following vegetation description is extracted from the Watercourse Delineation and Impact Assessment, Appendix A:

This site is found within the Indian Ocean Coastal Belt biome, and is classified as Eastern Valley Bushveld vegetation unit (SVs 6) (Mucina & Rutherford, 2006; Scott-Shaw & Escott, 2011). The desktop analysis revealed that the area is 'hardly protected' but is considered endangered due to approximately 49 % of this unit remaining intact. However, very few concerns were found from the C-plan and SEA database due to the commercial agriculture/rural nature of the site. The following information was collected from the vegetation unit CB 3:

- Distribution: KwaZulu-Natal and Eastern Cape Provinces: Deeply incised valleys of rivers including the lower reaches of the Thukela, Mvoti, Mgeni, Mlazi, Mkhomazi, Mzimkulu, Mzimkulwana, Mtamvuna, Mtentu, Msikaba, Mzimvubu (and its several tributaries), Mthatha, Mbhashe, Shixini, Qhorha and Great Kei. Very seldom extending to the coast.
- Altitude: 100–1 000 m
- Vegetation and Landscape features: Semi deciduous savanna woodlands in a mosaic with thickets, often succulent and dominated by species of Euphorbia and Aloe. Most of the river valleys run along a northwest-southeast axis which results in unequal distribution of rainfall on respective north-facing and southfacing slopes since the rain-bearing winds blow from the south. The steep north-facing slopes are sheltered from the rain and also receive greater amounts of insulation adding to xerophilous conditions on these slopes.
- Conservation Status: The vegetation type is considered least endangered with 84.6% remaining. The unit is hardly protected.

The site does not fall within a Critical Biodiversity Area (CBA) in terms of The Eastern Cape Biodiversity Conservation Plan (ECBCP). There are two CBA2 areas (i.e. near-natural landscapes) nearby; one 150m northwest of the proposed site, and one 700m southeast of the site. Both of these are classified as Mthatha Moist Grassland (Gs14), a vulnerable vegetation type (Mucina & Rutherford, 2006).

4.2. Habitats and vegetation within 500m of the site

Riparian Habitat: Banks of the Inxu River. Dominated by tree, grass and sedge species. Forest areas (mostly alien invasive black wattle, *Acacia mearnsii*) were only intermittently present on the steeper slopes of the western banks of the river, opposite side to the proposed operation. Grasslands were common on the flat areas (Appendix G, Fig. 5).

Watercourse (Inxu River): A modified yet important river system that flows through the site. Many subsistence lands and households are dependent on this system upstream and downstream of the site. It is a high sediment load system (Appendix G, Fig. 6).

Drainage Line: Non-perennial systems dominant on the eastern banks of the river. Highly eroded with very shallow soils (usually no topsoil present). Some small wetland systems have formed in these channels (Appendix G, Fig. 7).

Seepage Wetland: A moderate wetland system that has been modified by cultivated lands. This is an important cattle grazing area, particularly during times of drought and is the most intact wetland in the immediate area (Appendix G, Fig. 8).

4.3. Vegetation on the proposed site

Vegetation on the eastern side of the river, where the bulk of the activity is to take place, is degraded and secondary grassland. Livestock in the surrounding grassland includes sheep, cattle and goats. The extensive erosion is a sign that the area is overgrazed (currently and historically). Heavy and selective grazing has resulted in a dominance of unpalatable grass species. *Aristida congesta* subsp. *Barbicollis* is wide spread across the site, a species indicating overgrazing and other disturbance (erosion in this case) (van Oudtshoorn, 2004). Small patches of *Heteropogon contortus* were encountered. This species is only palatable in early summer, after which it offers little grazing value (van Oudtshoorn, 2004).

5. ANIMAL SPECIES

Other than cattle, no wildlife was encountered onsite during site visits. Small mammals such as rodents, ground squirrels, bats and a variety of insects, reptiles, birds and nesting areas are, however, expected to occur this area.

6. CULTURAL/ HISTORICAL FEATURES

Based on site visits and information from the applicant, there appears to be no historical or culturally significant features on the property. Precautions will be included in the EMP to ensure that if contractors find any artefacts on site it will be reported before any disturbance occurs.

(b) Description of the current land uses.

Land use within 500m of the site includes communal pastoral land (agriculture).

(c) Description of specific environmental features and infrastructure on the site.

The most significant features include the watercourse (Inxu River), riparian habitat, wetlands and drainage lines (presented as deeply-incised gullies).

Watercourse: The Present Ecological State (PES) and Ecological Importance & Sensitivity were assessed during the hydrological assessment (Appendix E). A results show a PES category of D: "Largely modified: A large loss of natural habitat, biota and basic ecosystem functions have occurred." The EIS of the delineated reach of the main Inxu riparian habitat, was assessed as being High: 'Very many elements sensitive to changes in water quality/hydrological regime.' This river has a high conservation status and has connectivity with the linear habitat, providing a transition between terrestrial and aquatic vegetation.

Riparian habitat: The riparian habitat is somewhat degraded. Notable disturbances directly affecting the channel and its habitat are alien vegetation encroachment and erosion enhanced by cattle movement and roads/footpaths. Grass vegetation dominates the eastern bank of the river, while woody vegetation, composed largely of black wattle (*Acacia mearnsii*) dominates the western bank.

Wetlands: Permanent and seasonal zones were identified along the banks of the river. Seasonal zones were identified towards the head of the gully system on the eastern side of the river and up the drainage line close to the river on the western bank.

Drainage lines: Due to the friable nature of the soils and degradation (mainly overgrazing) the drainage lines are heavily eroded and have formed gullies.

The only existing infrastructure on site is the access road, which is a gravel road connecting the site with the R396 to the east.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

See map attached (Appendix H) showing environmental features and road, as described above

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

See Impact Assessment (Appendix I)

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

See Impact Assessment (Appendix I)

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

1. ANTICIPATED POSITIVE IMPACTS

1.1. ENVIRONMENTAL:

Erosion control: The operation has the potential to positively impact the environment through the soil erosion control measures that are being proposed. After the extracted material has been screened the rocks will be returned to the site. These will be used to build gabions and rock pack in the extensive gully network around the site. If the erosion control measures are implemented effectively it will result in the slowing down of erosion in the gullies. With sediment being trapped, there is the potential to "reclaim" lost soil, allowing vegetation to re-establish. Over time this will lead to improved biomass, productivity, and species diversity.

1.2. SOCIO-ECONOMIC:

Improved stocking capacity: The potential to improve the state of the surrounding grassland through the erosion control measures mentioned above will have subsequent positive socio-economic impacts. By improving the condition of the grassland, it will result in a higher carrying capacity, allowing the surrounding community to stock more livestock. Whether farming is subsistent or commercial, this will result in favourable socio-economic impacts.

The anticipated expenditure for the project (including initial capital investment, salaries and operating costs for two years) is R 2.8 mil. The expected turnover generated by or as a result of the project is R 3.5 million. The predicted number of employment opportunities created during construction phase and operational phase are 10 and 8 respectively. The total expected value of employment opportunities during two years of operation is R 687 000. Employment opportunities will be made available to individuals from the surrounding local communities.

Lease of land: Scribante Concrete (with the aid of The Department of Rural Development and Land Reform) is formalizing a lease agreement with the Amampondomise Asentshonalanga Traditional Council. This will ensure that four administrative areas surrounding the site will receive money paid as rental for the land on a monthly basis. The Amampondomise Asentshonalanga Traditional Council Tribal Trust was created so the funds are used in a manner that benefits all the community members. The community identified infrastructure that they need in the area, namely a crèche and a community hall. The construction of these will be funded through the trust from rental money paid by Scribante Concrete.

2. ANTICIPATED NEGATIVE IMPACTS

2.1. ENVIRONMENTAL:

Degradation of the watercourses: It is predicted that the habitat integrity of the river system (at site and immediately downstream) will be reduced by the proposed activity. The activity will aggetate the sediment in the river, which will cause increased turbidity. This is likely to have an impact on downstream water quality and aquatic life since it reduces the amount of light penetrating the water. The sediment should settle within a relatively short distance as this is a slow flowing section of river. There are also three wetland identified

The proposed mining activity is predicted to have

Traffic and access: The proposed activity has the potential to negatively impact on traffic in the area through increased numbers of vehicles on the R396. This will however be minimal as the operation will likely only involve 3-4 truck loads per day.

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

1. MITIGATION MEASURES

Mitigation means to make something less severe – this may be by implementation of practical measures to reduce, limit and eliminate adverse impacts.

The potential environmental concerns have been considered and investigated. Appropriate mitigation measures have been proposed. Without mitigation measure, sand mining procedures can have devastating impact on the environment. It is imperative that the applicant and any contractors that may be involved are aware of the possible impacts and how these should be mitigated.

Specific management practices, and mitigation and monitoring measures, have been outlined in the Environmental Management Programme.

1.1. General Mitigation Measures:

- An Environmental Control Officer must be appointed for monitoring/reporting purposes.
- Fences must be erected around the entire mining area to prevent ingress of livestock and the public, for safety and security reasons.
- Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season
- Soil stockpiles should be located away from drainage lines and areas of temporary inundation. These are highlighted in the hydrological report (Appendix E).
- Should diesel or oil be stored on site, it will need to be stored outside of buffers identified by the hydrologist (20m buffer around drainage lines, 38m buffer around wetland) as well as the 100m river buffer (marked on the layout (Appendix C).
- All equipment, structures and storage, including parking area, temporary toilets and storage container, must be located outside the 100m buffer of the river and the drainage buffers, as per the approved site layout.
- Fuel to be stored in impermeable secondary containment e.g. in bunds or secondary containers large enough to hold at least 110% of the volume of hazardous liquid stored.
- Potentially hazardous materials must be handled and stored on site in containers with lids that must be sealed and secured, and disposed of at an appropriately permitted hazardous waste disposal site. Records of safe disposal of any hazardous waste should be kept in an on-site environmental file.
- Cement must not be mixed directly on the ground, or during rainfall events when the potential for transport to the river channel is the greatest. Cement is to only be mixed in the area demarcated for this purpose and on an impermeable surface.
- Any equipment left overnight/over weekends must be properly secured, and inaccessible to people to avoid health and safety risks and possible theft or vandalism.

- Ensure that the excavator and front-end loader are properly maintained. Equipment must be regularly serviced and inspected to make sure there are no leaks of oil, diesel, fuel, detergents or hydraulic fluids.
- Servicing and maintenance of vehicles as far as possible must occur outside of the boundaries of mining permit area. If maintenance does occur on site due to breakdown, all steps must be undertaken to avoid hydrocarbon spills/leakages.
- Oil trays must be placed under the machinery to avoid soil/groundwater contamination.
- Drip trays (where appropriate) must be emptied regularly and secured.
- Under no circumstances should oil or diesel be disposed of at the site.
- Construction personnel must be informed of the importance of disposing waste in a suitable manner.
- Collected waste must be categorised as “hazardous”, “general waste” and “construction rubble”. Separate, distinguishable containers should be provided for different waste categories. Litter and construction waste must be removed on a regular basis and disposed of at a registered land fill. General waste/litter may be transported to the Scribante Concrete site in Mthatha which is serviced with municipal waste collection. General waste generation is expected to be low.
- The state of the access road must be monitored to ensure there is no degradation through increased heavy vehicle traffic, and subsequent erosion.
- Access road should also be maintained so as to minimise dust pollution.
- All areas affected during the Construction Phase should be rehabilitated.
- The construction area must be rehabilitated with natural vegetation after construction is complete in order to improve soil binding and reduce the likelihood of bank destabilisation and soil erosion.
- A rehabilitation plan must be implemented once mining operations cease.
- Erosion mitigation, such as gabion structures must be implemented above and below the activity area.
- Bank restoration, re-vegetation and re-stabilisation must be implemented.
- The river banks (other than that authorised for the operation) must be monitored regularly for evidence of erosion. Erosion control measure must be implemented timeously if required.
- Any soil excavated, and not utilised for rehabilitation, must be removed from site or covered and no large mounds of soil should be left behind after construction.
- Truck loading and turning areas need to be constructed. Dirt roads should be avoided to reduce dust pollution. A gravel road (similar to the road currently leading to the site) is favourable as it reduces dust pollution while allowing infiltration of water, therefore minimising erosion risk.
- All vehicle movement must be restricted to designated roads, turning areas, parking areas and loading areas. No vehicles may disturb the natural vegetation.
- Fires must be prohibited on site. Any source of fire hazards must be removed. The construction and operating personnel must be educated regarding fire and fire management, and fire extinguishers must be available on site. The Contractor must ensure that the risk of fire is kept to a minimum on site.
- Construction and mining activity, which includes the movement of construction vehicles, must be restricted to normal working hours (7:00am – 17:00pm). Where possible, noise generation must be minimised.
- The contractor must, where possible, use local labour. Scribante must give priority to local applicants for security jobs.

1.2. Mitigation measures included in the Mining Work Plan

The following mitigation measures are extracted from the Mining Work Plan for the operation:

- All staff and sub-contractors will undergo the Scribante Concrete (Pty) Ltd Environmental Induction (SCON-SHE-IND-002) before commencing work.
- All visitors or short stay individuals will undergo the Scribante Concrete (Pty) Ltd Visitors Health, Safety and Environmental Induction (SCON-SHE-F-020), this induction will be signed off by the visitor and renewed monthly.
- All Trackless Mobile Machinery will be inspected at least daily for oil and lubricant leaks and spillages. Any Trackless Mobile Machinery which is leaking oil or lubricants will be taken off site until the findings are rectified.
- All Trackless Mobile Machinery will follow designated travel ways to prevent damage to the indigenous vegetation and to prevent erosion.
- Regular water quality surveys upstream and downstream of the proposed Mining area will be carried by a DMR accredited authority.
- A system of flood warning will be used on the site to prevent, employees being drowned, Trackless Mobile Machinery being inundated and water pollution due to hydrocarbons, the protocol is still being researched.

- The access point to the river bed will be maintained to prevent erosion to the river bank below the access point.
- Oversize material will be used to bolster the bank of the river to prevent wash-away and erosion.
- The single access road from the Public Highways will be maintained to prevent wash away and erosion of the veldt abutting the access road.
- It is anticipated that the sub-contractors trucks will follow a circular route whilst on site to prevent trucks having to drive in the veldt abutting the access road.
- All oil and lubrication storage areas will be bunded to 110% of the maximum capacity of the storage facility.
- Diesel emissions are controlled as part of the company's maintenance protocol and public road going vehicles emissions are tested annually as part of the road worthy testing.
- Unless there is a technical requirement, no combustion engine must be left to idle unnecessarily; engines must be switched off, the key removed and the wheels chocked when not in use.
- Respirable dust and fallout dust will be measured by a competent authority every six (6) months and the results with all calibration certificates will be available for inspection. After the first cycle of surveys have been carried out due to the wet nature of the material being mined an exemption will be applied for from the DMR.
- Vehicle and TMM diesel emissions are controlled as part of the Scribante Concrete (Pty) Ltd maintenance programme and road going vehicles are tested annually as part of the road worthy testing.
- The access road to the proposed operation will be graded and maintained to prevent ambient dust from vehicular traffic.
- Personal noise exposure and perimeter noise will be measured by a competent authority every six (6) months and the results with all calibration certificates will be copied to the client.
- No water will be required for the production process Scribante Concrete (Pty) Ltd but the Excavator will be operating in the river bed, all operations will be planned to cause as little disturbance to the riverine environment as possible.
- River water above and below the site of the Sand Mining operation will be tested for suspended solids, hydrocarbons and PH by a competent authority every (3) months and the results with all calibration certificates will be copied to the client.
- All drinking water supplied will be the commercially bought type and will be replaced as required.

2. SIGNIFICANT RECOMMENDATIONS MADE BY SPECIALISTS

2.1. Hydrological-related recommendations (from the Watercourse Assessment, Appendix E):

The following recommendations are extracted from the Watercourse Assessment Report but are not limited to hydrology-related mitigation measures:

Risk: Enhanced erosion potential and compaction

Mitigation:

- To minimize the loss and damage to vegetation and to minimize compaction during operation, the camp should be kept to a minimum and all activities must be restricted to a demarcated servitude.
- To prevent erosion and sedimentation, intensive sand mining operational activities should be undertaken during the dry season where possible when flows will be substantially reduced.
- The operation camp should be located more than 50m from all watercourses.
- All stockpiles and spoil material should be located on even surfaces, and more than 100m from watercourses so as not to cause sediment wash into the system;
- Sediment controls measures (e.g. silt traps, sedimentation ponds, etc) should be put in place should stockpiles show potential to wash away;
- The operation area should be clearly identified including access roads, stockpile or excavation areas, storage facilities and parking areas.
- Topsoil stripped from the operation footprint must not be spoiled but stockpiled and preserved for use in rehabilitation. Top-soil and sub-soil stockpiles and spoil sites to be placed on opposite sides of the access roads as this is where they will cause the least impact.
- Vehicles should be parked out of the flood line and buffer when not in use in order to prevent compaction of the soil profile.
- Topsoil should be replaced in the correct order it was extracted and erosion prevention measures be put in place on areas with a steep gradient (such as geo-textiles).
- Any excess subsoil must be removed from the site and spoiled at an agreed spoil site.

- Excess flows from open surfaces and increased slope areas need to be controlled by an erosion control measure.

Risk: Change in the linear channel flow, banks and channel bed

Mitigation:

- Sand mining activities should be prevented within 10 m of riparian banks.
- Keep access points to a minimum so as not to enhance the impacts.
- Limit the amount of driving in the river channel.
- Prevent erosion caused by the erosive power of the return flow from the jet mechanisms.
- Following completion of the operation activities and replacement of the stockpiled soil, removal of excess soil and re-vegetation of any bare areas must be undertaken.
- Compacted soil must be ripped or scarified and seeded with an appropriate vegetation species to stabilize the soil.
- If the alien species have become established during the operation period then these must be removed and indigenous species planted.
- The banks should be visually inspected every month for signs of excessive loss of riparian vegetation and bank collapse. If these symptoms are observed, mining should be avoided near the affected features.
- Mining from and within 10m of the actual banks should be avoided at all times.

Decrease in water quality

- The EMPr should include a Spill Management Plan for the operation phase that addresses measures to prevent and mitigate the spillage of hazardous materials in the operation site (oil, petrol, diesel, detergents, etc), as even small spills and leakages can have major impacts when incorporated with water. A key issue comprises detergents, which have significant impacts on amphibians and fish; detergents interfere with their membranes, causing mortality.
- Regular vehicle and machinery maintenance must be carried out to ensure that accidental spills are avoided.
- No washing of operation equipment and vehicles should be allowed from the watercourses.
- To prevent spillages, no fuel or oil should be kept onsite or within the demarcated watercourse boundaries. Absorbent materials such as “Drizit” must be readily available in the event of any accidental spills, and all contaminated material including soil must be disposed of at a registered waste disposal site.
- In locations where cement is required to be used, cement must be mixed in lined containers to prevent contamination.
- All chemicals should be appropriately stored and handled. Storerooms must be more than 100m from watercourse zones and have appropriate concrete flooring and bunding.
- Any remnant rubbish, spoil, machinery and contaminants need to be removed from the development area.
- Vehicles or machinery must not be serviced or re-fuelled within 100m of the watercourse zones.
- Appropriate ablution facilities need to be put in place more than 100m from a watercourse, with no effluent released into the soil or the river.
- Rubbish bins need to be placed on site so that no litter or food waste is left around the development.

Spread of alien invasives (applies to rehabilitation stage)

- An alien plant removal program should be instituted to eradicate alien plants within the mining footprint. Removal would have to coincide with planting of indigenous species to replace alien plants after the mining lifespan, and ensure a healthy plant cover – especially on embankments.
- Wetland vegetation must be planted where any wetland areas were located previously.
- Stockpiles and spoil sites must be clearly demarcated and be kept free of weeds and compaction.
- Bank areas need to be stabilized before re-vegetation occurs. Bare, exposed areas need to be stabilized by geo-textiles in order to give the vegetation a chance to establish.
- All growth forms of Category 1 weeds and invader plants shall actively be removed from all works areas, at all times;
- Areas for re-vegetation/alien clearing should be demarcated in order to prevent further disturbance. Furthermore, access roads for machinery should avoid any of the vegetation focus areas and areas with existing natural vegetation.
- All Category 2 and 3 weeds and invader plants shall be actively removed all prior to flowering.
- All riparian and wetland areas disturbed during the operation phase must be rehabilitated and re-vegetated according to a phased rehabilitation plan compiled by an aquatic specialist in conjunction with a vegetation specialist.
- Follow up assessments should be undertaken to prevent alien re-growth in alignment with time frames identified by a re-vegetation plan/vegetation specialist.

Risk: Air pollution affecting wetland fauna

Mitigation:

- All vehicles should be kept up to date with servicing to ensure air emissions are at legislated levels.
- There should be no fires burnt within the operation site.
- Dry and dusty areas such as access roads can be sprayed and damped to reduce the amount of dust lifted into the air by construction vehicles.

Risk: Noise and disturbance affecting wetland fauna

Mitigation:

- The wetland system should be demarcated and there should be no access for operation staff into this area during the mining activity.
- In the Environmental Awareness briefing, staff should be educated on the dynamics of wetland and riparian systems, including potential impacts on wetland fauna as a result of noise and activity.
- Noise should be kept to a minimum where possible, therefore staff should refrain from unnecessary shouting.

ix) Motivation where no alternative sites were considered.

NA

x) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

Both Alternative 2 and the Preferred site are on Farm Ncolosi 393 (on the eastern side of the river) and Farm Ngxaza No. 437 (on the western side of the river) (see Appendix F, map of alternatives considered). The river forms the boundary between these two farms. The bulk of the mining related activities (access ramps to river bed, stock piling, loading areas etc) would be on the eastern side of the river (Farm Ncolosi 393) for the Alternative 2 and preferred site. The Alternative 1 site is located on Farm Tsolo 117 (on eastern side of the river) and Farm Ngxaza No. 437 (on the western side of the river). Again the proposed activity at this alternative site would be on the eastern banks of the river (i.e. on Farm Tsolo 117).

The technology to be used would be identical at all 3 sites (the preferred site and the two alternatives).

Alternative 2 would require an additional road and structures to allow the access to cross the extensive gully system. This would likely lead to environmental degradation through increased erosion.

Alternative 2 is currently being occupied, albeit illegally. It was therefore not considered a feasible alternative.

- i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)**

Potential risks and impacts were identified during site visits, consultation with specialists and authorities as well as literature reviews on impacts associated with sand mining operations of this nature.

The potential impacts are described and assessed for significance. Significance is assessed by scoring each impact on the basis of four variables, including probability, severity, duration and spatial implications. On the understanding that a significant impact is one which, whether in isolation or in combination with other impacts, could have a material influence on the decision making process, including the specification of mitigation measures; significance in this report is scaled according to impact scores as follows:

- Low (scoring 9 or less)
- Medium (scoring between 10 and 15)
- High (Scoring 16 or more)

The four variables, with their score criteria are detailed below:

Frequency / Probability (FR)

(Frequency or likelihood of activities impacting on the environment)

- 1: Almost Never / impossible
- 2: Very seldom / highly unlikely
- 3: Infrequent / Seldom
- 4: Often / Regular
- 5: daily / Highly regular

Severity (SV)

(Degree of change to the baseline environment in terms of reversibility of impact; sensitivity of receptor, duration of impact and threat to environment and health standards)

- 1: Insignificant / not harmful
- 2: Small / potentially harmful
- 3: Significant / slightly harmful
- 4: Great / harmful
- 5: Disastrous / extremely harmful

Duration (DR)

(length of time over which activities will cause change to the environment)

- 1: One day to a month
- 2: One month to a year
- 3: One year to ten years
- 4: Life of project
- 5: Post closure

Spatial Scope (SS)

(Geographic overage)

- 1: Activity Specific
- 2: Site specific
- 3: Area
- 4: Regional
- 5: National

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	SIGNIFICANCE if mitigated
Roads	- Dust - Erosion -Visual impact	Surrounding vegetation and riparian habitat	Construction, operational and decommissioning phases	Medium	- Dust control measures (surface wetting). - Erosion control. -Remedy through rehabilitation and monitoring	Low
Loading and truck turning area	- Dust and noise disturbance - Surface water contamination - Erosion - Visual impact - Air pollution	Surrounding residents, Surface water, vegetation, riparian habitat	Construction, operational and decommissioning phases	Medium	- Dust control measures (surface wetting, gravel road design). - Erosion control - Remedy through rehabilitation and monitoring - Maintenance of vehicles to prevent oil leaks	Low

	(exhaust emissions)				- Avoiding onsite servicing of vehicles - Managing operating hour	
Slipways	- Dust and noise disturbance - Surface water contamination - Erosion - Visual impact	Surrounding residents, Surface water, vegetation, riparian habitat	Operational and potentially post decommissioning phase if not rehabilitated effectively	High	- Managing operation of equipment and operational hours, Erosion control	Medium
Stockpiles	- Dust - Visual impact - Surface water contamination	Surrounding residents and riparian habitat	Operational phase	Medium	- Managing stockpile location - Dust control measures where necessary	Low
Parking	- Visual impact	Surrounding residents	Operational phase	Low	- Ensuring correct design of parking bay	Low
Toilets (temporary)	- Visual - Surface water contamination	Surrounding residents and riparian habitat	Operational phase	Medium	- Prevent impacts through regular services of portloo and correct placement away from drainage lines and river	Low
Storage	- Visual	Surrounding residents	Operational phase	Medium	- Reduce visual impacts through correct placement and maintenance of storage container	Low
Excavation (mineral abstraction)	- Dust - Visual impact - Surface water contamination - Erosion - Air pollution	Surrounding residents, Surface water, vegetation, riparian habitat	Operational and potentially post decommissioning phase if not rehabilitated effectively	High	- Managing operation of equipment and operational hours, Erosion control	Medium

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix I**

k) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Watercourse Delineation & Impact Assessment (Appendix E)	<p><u>Risk:</u> Enhanced erosion potential and compaction</p> <p><u>Mitigation:</u></p> <ul style="list-style-type: none"> • To minimize the loss and damage to vegetation and to minimize compaction during operation, the camp should be kept to a minimum and all activities must be restricted to a demarcated servitude. • To prevent erosion and sedimentation, intensive sand mining operational activities should be undertaken during the dry season where possible when flows will be substantially reduced. • The operation camp should be located more than 50m from all watercourses. • All stockpiles and spoil material should be located on even surfaces, and more than 100m from watercourses so as not to cause sediment wash into the system; • Sediment controls measures (e.g. silt traps, sedimentation ponds, etc) should be put in place should stockpiles show potential to wash away; • The operation area should be clearly identified including access roads, stockpile or excavation areas, storage facilities and parking areas. • Topsoil stripped from the operation footprint must not be spoiled but stockpiled and preserved for use in rehabilitation. Top-soil and sub-soil stockpiles and spoil sites to be placed on opposite sides of the access roads as this is where they will cause the least impact. • Vehicles should be parked out of the flood line and buffer when not in use in order to prevent compaction of the soil profile. • Topsoil should be replaced in the correct order it was extracted and erosion prevention measures be put in place on areas with a steep gradient (such as geo-textiles). • Any excess subsoil must be removed from the site and spoiled at an 	X (All included in EIA Report)	Section viii) “The possible mitigation measures that could be applied and the level of risk” Page 21

	<p>agreed spoil site.</p> <ul style="list-style-type: none"> • Excess flows from open surfaces and increased slope areas need to be controlled by an erosion control measure. <p><u>Risk:</u> Change in the linear channel flow, banks and channel bed</p> <p><u>Mitigation:</u></p> <ul style="list-style-type: none"> • Sand mining activities should be prevented within 10 m of riparian banks. • Keep access points to a minimum so as not to enhance the impacts. • Limit the amount of driving in the river channel. • Prevent erosion caused by the erosive power of the return flow from the jet mechanisms. • Following completion of the operation activities and replacement of the stockpiled soil, removal of excess soil and re-vegetation of any bare areas must be undertaken. • Compacted soil must be ripped or scarified and seeded with an appropriate vegetation species to stabilize the soil. • If the alien species have become established during the operation period then these must be removed and indigenous species planted. • The banks should be visually inspected every month for signs of excessive loss of riparian vegetation and bank collapse. If these symptoms are observed, mining should be avoided near the affected features. • Mining from and within 10m of the actual banks should be avoided at all times. <p><u>Risk:</u> Decrease in water quality</p> <p><u>Mitigation:</u></p> <ul style="list-style-type: none"> • The EMPr should include a Spill Management Plan for the operation phase that addresses measures to prevent and mitigate the spillage of hazardous materials in the operation site (oil, petrol, diesel, detergents, etc), as even small spills and leakages can have major impacts when incorporated with water. A key issue comprises detergents, which have significant impacts on amphibians and fish; detergents interfere with their membranes, causing mortality. • Regular vehicle and machinery maintenance must be carried out to ensure that accidental spills are avoided. • No washing of operation equipment and vehicles should be allowed 		
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	<p>from the watercourses.</p> <ul style="list-style-type: none"> • To prevent spillages, no fuel or oil should be kept onsite or within the demarcated watercourse boundaries. Absorbent materials such as “Drizit” must be readily available in the event of any accidental spills, and all contaminated material including soil must be disposed of at a registered waste disposal site. • In locations where cement is required to be used, cement must be mixed in lined containers to prevent contamination. • All chemicals should be appropriately stored and handled. Storerooms must be more than 100m from watercourse zones and have appropriate concrete flooring and bunding. • Any remnant rubbish, spoil, machinery and contaminants need to be removed from the development area. • Vehicles or machinery must not be serviced or re-fuelled within 100m of the watercourse zones. • Appropriate ablution facilities need to be put in place more than 100m from a watercourse, with no effluent released into the soil or the river. • Rubbish bins need to be placed on site so that no litter or food waste is left around the development. <p><u>Risk:</u> Spread of alien invasives (applies to rehabilitation stage)</p> <p><u>Mitigation:</u></p> <ul style="list-style-type: none"> • An alien plant removal program should be instituted to eradicate alien plants within the mining footprint. Removal would have to coincide with planting of indigenous species to replace alien plants after the mining lifespan, and ensure a healthy plant cover – especially on embankments. • Wetland vegetation must be planted where any wetland areas were located previously. • Stockpiles and spoil sites must be clearly demarcated and be kept free of weeds and compaction. • Bank areas need to be stabilized before re-vegetation occurs. Bare, exposed areas need to be stabilized by geo-textiles in order to give the vegetation a chance to establish. • All growth forms of Category 1 weeds and invader plants shall actively be removed from all works areas, at all times; • Areas for re-vegetation/alien clearing should be demarcated in order to prevent further disturbance. Furthermore, access roads for 		
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	<p>machinery should avoid any of the vegetation focus areas and areas with existing natural vegetation.</p> <ul style="list-style-type: none"> • All Category 2 and 3 weeds and invader plants shall be actively removed all prior to flowering. • All riparian and wetland areas disturbed during the operation phase must be rehabilitated and re-vegetated according to a phased rehabilitation plan compiled by an aquatic specialist in conjunction with a vegetation specialist. • Follow up assessments should be undertaken to prevent alien re-growth in alignment with time frames identified by a re-vegetation plan/vegetation specialist. <p><u>Risk:</u> Air pollution affecting wetland fauna <u>Mitigation:</u></p> <ul style="list-style-type: none"> • All vehicles should be kept up to date with servicing to ensure air emissions are at legislated levels. • There should be no fires burnt within the operation site. • Dry and dusty areas such as access roads can be sprayed and damped to reduce the amount of dust lifted into the air by construction vehicles. <p><u>Risk:</u> Noise and disturbance affecting wetland fauna <u>Mitigation:</u></p> <ul style="list-style-type: none"> • The wetland system should be demarcated and there should be no access for operation staff into this area during the mining activity. • In the Environmental Awareness briefing, staff should be educated on the dynamics of wetland and riparian systems, including potential impacts on wetland fauna as a result of noise and activity. • Noise should be kept to a minimum where possible, therefore staff should refrain from unnecessary shouting. 		

Attach copies of Specialist Reports as appendices

I) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

Any mining operation of this nature is going to have adverse effects on the immediate environment. Through specialists' assessments and recommendations, effective implementation of the Environmental Management Programme, and a well-developed mine closure/rehabilitation plan, these adverse impacts can be minimised as much as possible. Done correctly the operation should result in minimal long-term effects on the environment, including the aquatic ecosystem of the Inxu River and the surrounding grassland.

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.

See Appendix C

(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

1. Positive socio-economic impacts

- Improved stocking capacity: The potential to improve the state of the surrounding grassland through the erosion control measures mentioned above will have subsequent positive socio-economic impacts. By improving the condition of the grassland, it will result in a higher carrying capacity, allowing the surrounding community to stock more livestock. Whether farming is subsistent or commercial, this will result in favourable socio-economic impacts.
- The anticipated expenditure for the project (including initial capital investment, salaries and operating costs for two years) is R 2.8 mil. The expected turnover generated by or as a result of the project is R 3.5 million. The predicted number of employment opportunities created during construction phase and operational phase are 10 and 8 respectively. The total expected value of employment opportunities during two years of operation is R 687 000. Employment opportunities will be made available to individuals from the surrounding local communities.
- Lease of land: Scribante Concrete (with the aid of The Department of Rural Development and Land Reform) is formalizing a lease agreement with the Amampondomise Asentshonalanga Traditional Council. This will ensure that four administrative areas surrounding the site will receive money paid as rental for the land on a monthly basis. The Amampondomise Asentshonalanga Traditional Council Tribal Trust was created so the funds are used in a manner that benefits all the community members. The community identified infrastructure that they need in the area, namely a crèche and a community hall. The construction of these will be funded through the trust from rental money paid by Scribante Concrete.

2. Negative socio-economic impacts

- The mining operation will result in reduced water quality for downstream water users by agitating sediment and increasing the turbidity of the water.

- The land to be leased to Scribante (approximately 5 ha) will not be available for communal grazing during the lease period.
- The mining activity may result in dust and noise disturbance for surrounding residents. This is, however, not expected to be severe as the site is more than 1km away from the nearest homestead.

3. Potentially positive ecological impacts

There is the potential for this proposed activity to have positive environmental repercussions for the surrounding environment. The extensive gully systems in the surrounding grassland, especially those south east of the mining site, have been identified as potential rehabilitation sites. As a by-product of the sand extraction and screening processes, there will be large amounts of alluvial rocks. It is suggested that the applicant use these rocks to offset their net environmental impact. Following screening, these rocks will be returned to the site by truck. Erosion mitigation measures such as rock packing and the construction of gabions can be used to stabilise and restore the gully systems. In time, these structures can slow the erosion process and trap sediment, allowing vegetation to re-establish and increasing the ecological value of the surrounding vegetation. Improving the ecological integrity of the surrounding grassland will increase the grazing value and stocking rate of the grasslands. This will increase agricultural value of the land, which is used for communal grazing by the local community. Reducing erosion in this catchment will also improve the health of the Inxu River and downstream aquatic systems. Effective implementation of erosion control measures could see improved environmental impacts long after closure of the mining operation.

4. Negative environmental impacts/risks (summary)

- Enhanced erosion potential and compaction
- Change in the linear channel flow, banks and channel bed
- Decrease in water quality in the Inxu River
- Spread of alien invasive plants
- Air pollution affecting wetland fauna and residents
- Noise and disturbance affecting wetland fauna and residents

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Key impact management objectives for the proposed mining activity include:

- Management of erosion on the banks of the river. The movement of trucks near the banks and operating of earth moving equipment on the banks and bed of the river will lead to degradation of the watercourse and riparian habitat. Managing erosion using control measures is essential for reducing the severity of these impact.
- “Environmental nuisance” management. Although the operation is some distance away from the nearest homestead, managing noise, dust and visual impacts is an important objective.
- Ensuring correct handling and storage of hazardous goods to prevent surface water and groundwater contamination.
- Strict control of the location of activities in relation to sensitive environmental features (as indicated in the layout). Any infrastructure (the toilet, storage container, and parking area) must be kept outside the 100 m buffer of the river. The gully system (south west of the mining area) is a no-go area.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

- Rehabilitation of gullies with screened material.
- Any infrastructure associated with the mining activity must be located at least 100m from the river, as indicate on the approved layout.
- Earth moving equipment parked on site must be on a hardstand surface.
- No servicing of vehicles to take place on site.
- Operation must be restricted to standard working hours (excluding weekends) to reduce possible disturbance to nearby residents.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

Short term mining at the proposed site is sustainable. Authorisation should be granted, provided there is strict adherence to recommendations by specialists, the EAP and conditions of the RoD.

ii) Conditions that must be included in the authorisation

- Rehabilitation of gullies with screened material.
- Any infrastructure must be located at least 100m from the river.
- Earth moving equipment parked on site must be on a hardstand surface.
- No servicing of vehicles to take place on site.
- Operation must be restricted to standard working hours (excluding weekends) to reduce possible disturbance to nearby residents.

q) Period for which the Environmental Authorisation is required.

Six years (2 year mining permit with the option to renew for 3 consecutive years, allowing 1 year for rehabilitation thereafter)

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

This has been confirmed.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

Ongoing management cost = R 20 000 per quarter

This is the cost of employing restoration officer/s, transportation of rocks from the screening plant to site for gully restoration, and the cost of water to be used for dust suppression. Ongoing Environmental Management

costs are incorporated into the operational costs of the mine (as reported in the Financial and Technical Competency Report of the Mining Permit Application) rather than specifically being budgeted for rehabilitation alone. For example, the transport of rocks to the site for gully restoration is done by vehicles returning to the mine from the screening facility; this is recorded as an operational cost. Salaries for persons conducting ongoing gully rehabilitating are also included in the operational cost of the mine.

Rehabilitation cost (closure) = R200 038

i) Explain how the aforesaid amount was derived.

Ongoing rehabilitation management cost is the cost of employing restoration officer/s, transportation of rocks from the screening plant to site for gully restoration, and the cost of water to be used for dust suppression.

Rehabilitation costs are calculated using forecasted contractors' rates for 2019. See table below

Inxu Sand Mine closure costs (2019)

Description		Unit	Sudden Closure Quantity	LOM Quantity	2019 Rate	Assumptions	Sudden Closure Cost	LOM Cost
1	Surface Infrastructure							
1.1	Roads						R36 516.00	R36 516.00
1.1.1	Turning and loading areas	m ²	7130.00	7130.00	R4.88	Minor gravel roads - ripped, profiled and vegetated	R34 760.89	R34 760.89
1.1.2	Slipways	m ²	360.00	360.00	R4.88	Minor gravel roads - ripped, profiled and vegetated	R1 755.11	R1 755.11
1.2	Fencing						R23 645.20	R23 645.20
1.2.1	Dismantling of security fencing	m	582.00	582.00	R40.63		R23 645.20	R23 645.20
1.3	Concrete						R3 802.73	R3 802.73
1.3.1	Parking for earth moving equipment	m ²	26.00	26.00	R146.26	Concrete slab	R3 802.73	R3 802.73
2	Rehabilitation						R95 555.88	R95 555.88
2.1.1	Profiling of disturbed areas (general) ¹	ha	2.80	2.80	13 813.35	Minimal dozing to enhance site drainage	R38 677.38	R38 677.38
2.1.2	Establishment of vegetation (general) ¹	ha	2.80	2.80	20 313.75	General - on flat areas	R56 878.50	R56 878.50
Sub Total 1							R159 519.81	R159 519.81
10 % Contingency							R15 951.98	R15 951.98
Sub Total 2 (excluding VAT)							R175 471.79	R175 471.79
14% VAT							R24 566.05	R24 566.05
Sub Total 3 (including VAT)							R200 037.84	R200 037.84

¹ Disturbed areas comprised of 198 m² stockpiles, 2.25 m² toilet site, 40 m² storage container site, and anticipated additional 27759.75 m² trampled areas

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Sufficient allowance has been made available as an operating cost for rehabilitation. Should the mining permit be granted, Scribante Concrete will make provision for the estimated closure cost by means of a Bank Guarantee or any other means available and accepted by the Competent Authority.

The Financial and Technical Competence Report has taken into account rehabilitation cost and ensured the revenue generated is sufficient to cover all anticipated environmental costs.

t) Specific Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an **Appendix** .

No specific report was generated for the purposes of the socio-economic conditions. All findings are presented hereafter:

Positive socio-economic impacts

- Improved stocking capacity: The potential to improve the state of the surrounding grassland through the erosion control measures mentioned above will have subsequent positive socio-economic impacts. By improving the condition of the grassland, it will result in a higher carrying capacity, allowing the surrounding community to stock more livestock. Whether farming is subsistent or commercial, this will result in favourable socio-economic impacts.
- The anticipated expenditure for the project (including initial capital investment, salaries and operating costs for two years) is R 2.8 mil. The expected turnover generated by or as a result of the project is R 3.5 million. The predicted number of employment opportunities created during construction phase and operational phase are 10 and 8 respectively. The total expected value of employment opportunities during two years of operation is R 687 000. Employment opportunities will be made available to individuals from the surrounding local communities.
- Lease of land: Scribante Concrete (with the aid of The Department of Rural Development and Land Reform) is formalizing a lease agreement with the Amampondomise Asentshonalanga Traditional Council. This will ensure that four administrative areas surrounding the site will receive money paid as rental for the land on a monthly basis. The Amampondomise Asentshonalanga Traditional Council Tribal Trust was created so the funds are used in a manner that benefits all the community members. The community identified infrastructure that they need in the area, namely a crèche and a community hall. The construction of these will be funded through the trust from rental money paid by Scribante Concrete.

Negative socio-economic impacts

- The mining operation will result in reduced water quality for downstream water users by agitating sediment and increasing the turbidity of the water.
- The land to be leased to Scribante (approximately 5 ha) will not be available for communal grazing during the lease period.
- The mining activity may result in dust and noise disturbance for surrounding residents. This is, however, not expected to be severe as the site is more than 1km away from the nearest homestead.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(j)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

During the EAP's site inspections, no heritage resources were encountered on the site or in the immediate surrounds. Precautions have been included in the EMPr to ensure that if contractors find any artefacts on site it will be reported to SAHRA before any disturbance occurs. Operation of the mine will be ceased immediately in the event of discovery of any heritage resource and shall not commence until advised by SAHRA authorities.

u) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4**).

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

- a) **Details of the EAP**, (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Details and expertise of the EAP are included in PART A, section 1(a).

- b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section 1)(h) herein as required).

The activity is described in full in PART A, section 1)(h).

c) **Composite Map**

(Provide a map (**Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

See map, Appendix C

d) **Description of Impact management objectives including management statements**

- i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

Closure objectives:

- Remove and / or rehabilitate all pollution and pollution sources such as waste materials and spills;
- To loosen the hardened surfaces which were used temporary site camp or access roads and re-vegetate with indigenous species.
- Establish a rehabilitated area which is not subjected to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources;
- Restore disturbed areas and re-vegetate these areas with indigenous vegetation to restore the ecological function of such areas as far as is practicable.

- ii) **Volumes and rate of water use required for the operation.**

A maximum estimate of 8000 L of water per month for drinking and dust suppression will be from a municipal source.

- iii) **Has a water use licence has been applied for?**

Yes. A Section 21 c and i Water Use License Application has been lodged (Appendix K).

iv) Impacts to be mitigated in their respective phases

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
Roads	Construction; Operational; Decommissioning	Dust, Erosion, visual impact, Damage to surrounding vegetation, Establishment of invasive alien plants	360 m ²	Surrounding vegetation; riparian habitat	Dust control measures; Erosion control; Remedy through rehabilitation and monitoring	<p>Surface wetting will be implemented as a means of dust control on roads;</p> <p>Gravel will be added to roads to improve infiltration and reduce run off, therefore reducing susceptibility to erosion</p> <p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust nuisance and visual impact.</p> <p>Roads will be rehabilitated upon decommissioning. This will include ripping compacted surfaces and revegetating.</p> <p>Speed of vehicles travelling on roads to be strictly controlled to reduce noise, dust and damage to roads.</p> <p>No other routes will be used by vehicles or</p>	<p>Maintain an erosion-free, stable road, without potholes, corrugations</p> <p>Ensure transport drivers use roads responsibly</p>	<p>Roads will be regularly graded, re-gravelled, spot re-gravelled, and reworked and compacted. Suitable material must be used for unpaved haul roads.</p> <p>Mine manager will monitor the condition of the roads to determine when dust suppression is required.</p>	<p>Roads must be correctly constructed prior to commencing any mining activity.</p> <p>Maintenance to be carried out throughout the project.</p> <p>Rehabilitation to take place during and after decommissioning.</p>

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>personnel to gain access to the site.</p> <p>Mine management must include eradication of Category 1 weeds/invaser plants in terms of National Environmental Management: Biodiversity Act (10/2004): Alien and Invasive Species Regulations, 2014</p>			
Loading and truck turning area	Construction; Operational; Decommissioning	Dust and noise disturbance, surface water contamination, erosion, visual impact, air pollution (exhaust emissions)	7130 m ²	Surrounding residents, Surface water, vegetation, riparian habitat	<p>Dust control measures (surface wetting, gravel road design); Erosion control;</p> <p>Remedy through rehabilitation and monitoring;</p> <p>Maintenance of vehicles to prevent oil leaks; Avoiding onsite servicing of vehicles; Managing operating hours</p>	<p>Measure must be implemented to preserve any top soil on site to be used for rehabilitation purposes following mining. Top soil must be stripped and stockpiled in such a way as to prevent erosion, degradation to the surrounding environment/watercourse or the influx of alien vegetation. Stockpiled top soil must be vegetated with grass immediately to stabilise and maintain the integrity of the topsoil. Maintaining ground cover on the stockpiles will also reduce the establishment of alien vegetation on these stockpiles.</p> <p>Monitoring and removal of alien vegetation must be implemented throughout the mining</p>	As above	As above	As above

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>area, including on the stockpiles.</p> <p>Gravel must be added to loading and turning areas to improve infiltration and reduce run off, therefore reducing susceptibility to erosion</p> <p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust and noise nuisance and visual impact.</p> <p>Turning and loading areas will be rehabilitated upon decommissioning. This will include ripping compacted surfaces and revegetating.</p> <p>An emergency preparedness plan (spill contingency plan) must be in place in the case of a spill of substances which can be harmful to an individual or the receiving environment.</p> <p>Any substrate contaminated by the spillage of hydrocarbons</p>			

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>or other pollutants is to be removed from the site and disposed of at a registered waste disposal site.</p> <p>All transport vehicles must be regularly serviced to reduce the likelihood of oil leaks on site and surface water contamination.</p> <p>Trucks waiting onsite should not be left idling, as this generates unnecessary emissions.</p>			
Slipways	Construction; Operational; Decommissioning	Dust and noise disturbance, surface water contamination, erosion, visual impact	360 m ²	Surrounding residents, Surface water, vegetation, riparian habitat	Erosion control, remedy through rehabilitation	<p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust & noise nuisance and visual impact.</p> <p>Earth moving equipment must use only designated slipways to access the river bed, to avoid excessive damage to the banks of the river and subsequent erosion.</p> <p>Stabilising structures will be used on the banks along the sides of the slipways to control erosion.</p>	Slipways will be maintained to reduce excessive erosion on the banks of the river either side of the slipways	<p>Gradients of slipways will not exceed 1:3.</p> <p>Stabilising structures (gabions) will be used on the sides of slipways</p>	<p>Slipways are to be correctly constructed prior to commencing with any mining activity.</p> <p>Erosion control on and around the slipways is essential throughout the operational phase.</p> <p>Upon- and post-decommissioning, the stability of the banks of the river must be ensured to prevent and further erosion.</p>

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>Areas where erosion is likely (especially the river banks near the slipways) should be monitored to allow for timely response in the event of erosion.</p> <p>Erosion should be managed or prevented throughout the operational phase of the mining activity.</p> <p>In the event of erosion, the Applicant shall be held financially responsible for the necessary rehabilitation.</p>			
Stockpiles	Operational	Dust, visual impact, surface water contamination, erosion	198 m ²	Surrounding residents, vegetation and riparian habitat	Erosion control, Control through design measures; control through storm water management; remedy by rehabilitating	<p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust & noise nuisance and visual impact.</p> <p>Stock piles must be established on level ground.</p> <p>The rate at which river sand is stockpiled should be determined by the haulage rate (rate at which sand is removed from the site) to prevent unnecessary volumes being on site at any given time. Lower</p>	<p>Minimal erosion should occur on stockpiles.</p> <p>Damage to surrounding vegetation and sedimentation of the river must be kept to a minimum.</p> <p>Stockpile area must have adequate storm water diversion.</p> <p>Stock pile angles to be kept below 1:2</p>	<p>Cut-off berms must be in place prior to commencing with mining activity.</p> <p>Stockpile area is to be monitored carefully for signs of erosion. Action to be implemented if erosion occurs.</p> <p>Sand abstraction rate must be monitored to avoid excessive build-up of stockpiled sand.</p>	<p>Immediate construction of drainage measures prior to commencing operation.</p> <p>Managing and monitoring of stock piles to take place throughout the operational phase.</p> <p>Rehabilitation of the area used for stock piling must take place during closure/rehabilitation phase</p>

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>stockpiled volumes will result in lower dust dispersion and visual impact, and will reduce the risks associated with erosion.</p> <p>Stockpiled material should not remain on site for longer than 3 days. If, for any reason, river sand will be stockpiled on site for more than 3 days, silt fences must be installed.</p> <p>Cut-off berm should be established on the upslope side of the stockpile area, to divert storm water runoff away from stockpiles.</p> <p>1:2 gradients must not be exceeded on stockpiles.</p>			
Parking	Operational	Visual impact, Surface water contamination	26 m ²	Surrounding residents, vegetation	Control through spill prevention measures and design measures; Remedy through spill response	<p>No vehicles (earth moving equipment or otherwise) to be parked within 100 m of the river (as indicated in the layout). Parking area must be established according to approved layout.</p> <p>Parking for earth-moving equipment to be comprised of a hard-stand surface to reduce likelihood of surface water contamination.</p> <p>Earth moving equipment</p>	Contamination-free site	All measured to prevent, reduce and remedy hazardous material leaks must be implemented	<p>Parking area to be prepared during construction phase, spill control and remedy measures to be in place throughout operation.</p> <p>Hard stand surface to be removed and area to be rehabilitated upon decommissioning.</p>

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>to be serviced regularly to reduce the likelihood of oil/fuel leaks.</p> <p>Drip tray must be in place under any earth moving equipment/vehicle parked on site.</p>			
Toilet (temporary)	Operational	Visual impact, surface water contamination	2.25 m ²	Surrounding residents and riparian habitat	Prevent impacts through regular services of portaloos and design measures	<p>Portable toilet must be located well outside of the 100m river buffer, as per approved layout.</p> <p>Toilet to be hired from a third party that includes regular servicing of the toilet in lease agreement (i.e. pumping effluent).</p> <p>Toilets must be placed on stable even ground.</p> <p>No unsanitary activities may take place in the river, in the vegetation or anywhere other than designated toilet.</p>	Regularly serviced toilet, a safe distance from the river	<p>Location of toilet must be per layout.</p> <p>Only a licensed company must be used, with a permit for proper handling and disposal of the waste that is collected.</p>	Toilet must be in place and ready for use before any construction commences
Storage	Operational	Visual impact, damage to surrounding vegetation, surface water contamination	40 m ²	Surrounding residents	Reduce visual impacts through correct placement and maintenance of storage container	<p>Storage container is to be located well outside the 100m river buffer, as per approved layout, and on level, stable ground</p> <p>The storage container must be securely locked at all times to prevent vandalism, theft or harm to people and/or the environment.</p> <p>When not in use, all equipment is to be kept in the storage container,</p>	All equipment is to be stored in a secure storage container. Hazardous liquid to be within secondary containment.	Acceptability of storage measures on site is to be monitored daily.	Storage container must be in place before any materials, equipment etc are brought on site.

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>to keep the site tidy and visually acceptable.</p> <p>Any hazardous liquid stored on site must be kept within the storage container AND within secondary containment (e.g. plastic trays) which is large enough to contain at least 110% of the volume of liquid stored.</p>			
Excavation (mineral extraction)	Operational and potentially post decommissioning phase if not rehabilitated effectively	Dust, noise, visual impact, surface water contamination, erosion, air pollution	17764 m ²	Surrounding residents, Surface water, vegetation, riparian habitat	Managing operation of equipment and operational hours, Erosion control	<p>Extraction of sand is to be limited to operating hours of the mine (07:00 – 17:00 during the week only). No extraction may take place during the weekend or public holidays.</p> <p>The excavator must use only the designated slipways to access the river bed.</p> <p>Operation of the excavator outside the approved mining area is prohibited, especially on the north-eastern boundary near the extensive gully erosion.</p> <p>The excavator is to be regularly serviced to reduce the likelihood to oil or fuel contamination in the river.</p> <p>No servicing of the excavator is to be done on site.</p>	A well-managed sand extraction operation which does not lead to long-term damage to the river, riparian habitat, downstream users, and surrounding residents.	Extraction activities must be carefully monitored by the mine manager to ensure that the river banks are not being compromised, and the excavation is kept within the approved mining area	As soon as the operation phase (extraction) commences. Daily monitoring of extraction is essential

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
						<p>Noise levels on the site must be managed.</p> <p>Employees working in areas with noise levels of more than 50dB need to be issued with ear protection.</p> <p>The mine manager must ensure the excavator is not in the river bed during high flow events (storms/flash floods). The mine manager must monitor the weather forecast to anticipate such high flow events and ensure that the excavator is outside the 100m river buffer at least 2 hours before peak flow.</p> <p>Any complaints or claims emanating from the lack of dust control must be attended to immediately.</p> <p>Emergency plans must be in place in case of spillages of diesel, oil, hydraulic fluids etc.</p> <p>The rate at which sand is extracted from the river must be determined by the rate at which it is loaded and transported. i.e. an unmanageable build-up of sand on site must be avoided as this poses an erosion risk.</p>			

Activity	Phase	Potential impact	Size of disturbance	Aspects affected	Mitigation type	Mitigation measure	Standard to be achieved	Compliance with standards	Time period for implementation
General	All phases	Harm to livestock or the public resulting from unauthorised access into the mining area.	4.9 ha	Livestock and surround public	Prevent impacts by preventing access to the mining area	Security fences must be erected and maintained around the entire mining area	Secure perimeter around the mine	Suitable fencing must be erected to prevent unwanted/unauthorised access, and this must be monitored and repaired should need be throughout the mining operation.	Prior to any activity taking place on site

Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting - drill site, site camp, ablation facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc</p> <p>E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)</p>	<p>(of operation in which activity will take place.</p> <p>State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).</p>	<p>(volumes, tonnages and hectares or m²)</p>	<p>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-</p> <p>..</p> <p>Upon cessation of the individual activity or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
<p>This information has been collated in the above table “ iv) Impacts to be mitigated in their respective phases”</p>					

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ());

ACTIVITY (whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.. 	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
This information has been collated in the above table “ iv) Impacts to be mitigated in their respective phases”					

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation..	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
This information has been collated in the above table “ iv) Impacts to be mitigated in their respective phases”				

i) Financial Provision
(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The main aim of closure/rehabilitation is to return the mining area to a functional state as it exists currently. Baseline vegetation includes predominately grass species, the vegetation is expected to recover relatively quickly. Seeding of indigenous grass species will take place and natural influx of pioneer grass species (of which there are many in the surrounding overgrazed communal farmland) should take place readily. Ensuring the banks of the river are stable is a key objective for long-term functionality of the watercourse, both on site and downstream. The banks of the river show signs that there was a borrow pit for construction of a road many years ago. Residents have confirmed that this is the case. The banks of the river have become naturally vegetated and stable without there being any stabilisation or rehabilitation structures in place. For this reason, it is expected that effective use of stabilisation structures following mining will yield good results.

Objectives include:

- Removal of all structures, equipment and materials from the site. This will include removal of the storage container, portable toilets, fencing and any equipment or materials stored on site. Any concrete surfaces (e.g. the parking area for the excavator) must be dug up and all resulting rubble must be removed from the site and disposed of only at a licensed facility. Any waste that may be stored on site must be disposed of at a facility licensed to receive that class of waste (i.e. hazardous waste must be disposed of at a disposal/treatment facility licensed to receive hazardous waste).
- Stabilising the banks of the river and re-establishing vegetation to prevent ongoing erosion of the river banks and sedimentation of the river downstream. Particular attention must be paid to the banks of the river on the western side of the mining area where the banks are steepest and an existing gully network exists. Where mining activity has resulted in steep edges to the river bank, these will be ripped, profiled and revegetated.
- Ripping and revegetation of any trampled, hardened surfaces to allow for infiltration of runoff.

The cost of the measures required to meet these closure objectives has been included in the closure cost calculations, in the Financial and Technical Competency Report which is submitted to the Department of Mineral Resources with the application for a Mining Permit. Scribante Concrete has provided proof that the funds required for rehabilitation are available

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The mining activity and the closure objectives have been discussed at length with the occupiers of the property and adjoining properties, namely (Ngolosi no 12 A/A, Maguttywa No 8 A/A, Ngxaza A/A), which whom there have been public meetings. All public participation has been carried out as per the NEMA EIA Regulation requirements. Proof of public notification (newspaper adverts, sign boards, circulating of the BID) is provided in Appendix J.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

See below table indicating closure objectives, rehabilitation plan, extent and prioritisation time frames for each item/area requiring rehabilitation

Activity/ area	Closure objective	Rehabilitation measures required	Extent to be rehabilitated	Monitoring required	Suggested order (item 1 to be rehabilitated first, item 7 last) & Time period for rehabilitation
Roads	Access road is to be rehabilitated to pre-mining state; soil must be free of erosion, stable, vegetated and not compacted.	<p>Any rill or gully erosion associated with access road is to be rehabilitated using rock/brush packing. Excessive erosion (gullies deeper than 50cm) must be rehabilitated with larger structures such as gabions or rock mattresses.</p> <p>Road surface is to be ripped to reduce compaction and allow for establishment of vegetation.</p> <p>Area must then be overlaid with topsoil and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs can be purchased). Watering must take place every second day for at least one month to encourage establishment.</p> <p>No vehicles may be permitted to drive on area being rehabilitated.</p>	360 m ²	<p>Weekly inspection by mine manager to ensure</p> <ul style="list-style-type: none"> - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>7</p> <p>Access road rehabilitation must only take place once all other infrastructure is removed and as soon as vehicle access is no longer required.</p>
Loading and truck turning area	Area is to be rehabilitated to pre-mining state; soil must be free of erosion, stable, vegetated and not compacted	<p>Any rill or gully erosion must be rehabilitated using rock/brush packing. Excessive erosion (gullies deeper than 50cm) must be rehabilitated with larger structures such as gabions or rock mattresses.</p> <p>Soil surface is to be ripped to reduce compaction and allow for infiltration of water and establishment of vegetation.</p> <p>Area must then be overlaid with topsoil and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs/mats can be purchased). Watering must take place every second day for at least one month to encourage establishment.</p> <p>No vehicles may be permitted to drive on area being rehabilitated.</p>	7130 m ²	<p>Weekly inspection by mine manager to ensure</p> <ul style="list-style-type: none"> - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>6</p> <p>Loading and turning area rehabilitated must only take place once all other infrastructure is removed and as soon as vehicle access is no longer required.</p>

Activity/ area	Closure objective	Rehabilitation measures required	Extent to be rehabilitated	Monitoring required	Suggested order (item 1 to be rehabilitated first, item 7 last) & Time period for rehabilitation
Slipways	Main objective is to ensure the banks of the river are stabilised and vegetated	<p>Sides of the slip ways must be levelled and shaped to an appropriate profile with maximum 1:3 gradient to reduce likelihood of erosion. Rock packing and/or geotextiles (preferably non-synthetic, such as jute geotextiles) must be used to stabilise the banks. Geotextiles must be firmly pegged into place following seeding of the banks as per above.</p> <p>Watering must take place every second day for at least one month to encourage establishment. Overwatering of steep slopes being rehabilitated (even those covered with geotextiles) must be avoided as top soil and seeds may be washed away. Rather aim to dampen the surface frequently.</p>	360 m ²	<p>Regular monitoring of the stability of the slipway side is essential. Any early signs of erosion must be reported to the ECO immediately. ECO must instruct further erosion control measures. Options include silt fences, rock packing, gabions, rock mattresses and use of additional geotextiles.</p> <p>Geotextiles must be checked to ensure they are firm against the ground. Additional pegs must be added where geotextiles are loose.</p> <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>1</p> <p>Rehabilitation of the slipways and river banks is top priority as the health of the river depends on effective rehabilitation. This should be done immediately after mining ceases.</p>
Stockpiles	Ensure no stockpiled material is left on site	<p>Only river sand (silica sand) will be stockpiled on site. The thin layer of river sand that will remain on the soil once the stockpiles have been removed will in fact aid in promoting infiltration and is a medium on which pioneer grasses will easily establish.</p> <p>All stockpiled material must be removed in a manner that does not lead to erosion of stockpiles or sedimentation of the river.</p> <p>Compaction of soil under stockpiles is likely lower than the road and truck turning areas, but ECO should assess and advise whether ripping before seeding is necessary.</p>	198 m ²	<p>Weekly inspection by mine manager to ensure</p> <ul style="list-style-type: none"> - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>2</p> <p>Stockpiles should be rehabilitated following rehabilitation of slipways (slipways are top priority). Mine manager must ensure the stockpiles are cleared and rehabilitated before the access roads are rehabilitated, as vehicle access will be required to removed raw materials.</p>

Activity/ area	Closure objective	Rehabilitation measures required	Extent to be rehabilitated	Monitoring required	Suggested order (item 1 to be rehabilitated first, item 7 last) & Time period for rehabilitation
Parking	Area is to be rehabilitated to pre-mining state; soil must be free of erosion, stable, vegetated and not compacted	<p>The parking area will be comprised of a concrete slab. The concrete will need to be removed. All rubble resulting from breaking up the concrete must also be removed and correctly disposed of (at a land fill that accepts building rubble).</p> <p>The ground under the concrete slab will likely be compacted and not suitable for plants to establish on. soil is to be ripped to reduce compaction and allow for establishment of vegetation.</p> <p>Area must then be overlaid with topsoil and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs/mats can be purchased). Watering must take place every second day for at least one month to encourage establishment.</p> <p>No vehicles may be permitted to drive on area being rehabilitated.</p>	26 m ²	<p>Weekly inspection by mine manager to ensure</p> <ul style="list-style-type: none"> - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>4</p> <p>There is minimal urgency to rehabilitate the parking area (unless an erosion risk has been identified by the ECO). It must be rehabilitated, however, before rehabilitation to access road and loading/turning area</p>
Toilet (temporary)	Removal of the structure without any surface contamination	<p>Only the contractor from which the portable toilet is hired must remove the toilet. The content of the toilet must be pumped into the tanker before the toilet is hoisted and placed on the transport vehicle. Suitable measures must be put in place to ensure none of the toilet's content spills into the environment. The mine manger must be on site to oversee the toilet being collected</p>	2.25 m ²	<p>Weekly inspection by mine manager to ensure</p> <ul style="list-style-type: none"> - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>5</p> <p>Toilets must remain on site for staff use, until just before the road/turning area is rehabilitated.</p>
Storage	<p>Storage container and all equipment stored on site to be removed.</p> <p>Area is to be rehabilitated to pre-mining state; soil must</p>	<p>Storage container and all equipment must be removed in such a way as to cause minimal damage to the surrounding environment.</p> <p>The ground under the storage container will likely be compacted and not suitable for plants to establish on. Soil is to be ripped to reduce compaction and allow for establishment of vegetation.</p> <p>Area must then be overlaid with topsoil and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs/mats can be purchased).</p>	40 m ²	<p>Weekly inspection by mine manager to ensure</p> <ul style="list-style-type: none"> - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment <p>Inspected monthly</p>	<p>3</p> <p>Storage container must be removed following slipway and stockpile rehabilitation, and prior to access road and turning area rehabilitation as vehicles access will be required for removal of the container,</p>

Activity/ area	Closure objective	Rehabilitation measures required	Extent to be rehabilitated	Monitoring required	Suggested order (item 1 to be rehabilitated first, item 7 last) & Time period for rehabilitation
	be free of erosion, stable, vegetated and not compacted	Watering must take place every second day for at least one month to encourage establishment.		during/following rehabilitation by ECO audit	
Excavation (mineral extraction)	There should be no sedimentation of the river (i.e. water in the river should be clear)	No rehabilitation measures will be implemented on the excavation area (the river bed itself). The banks of the river are the highest concern, and these will be rehabilitated during slipway rehabilitation.	17764 m ²	Daily visual assessment of the river clarity. Monthly monitoring. Inspected monthly during/following rehabilitation by ECO audit	N/A

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation measures outlined in the above table directly relate to the closure objectives. The rehabilitation measures have been formulated based on the overall objective which is to be achieved.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

Ongoing management cost = R 20 000 per quarter

This is the cost of employing restoration officer/s, transportation of rocks from the screening plant to site for gully restoration, and the cost of water to be used for dust suppression. Ongoing Environmental Management costs are incorporated into the operational costs of the mine (as reported in the Financial and Technical Competency Report of the Mining Permit Application) rather than specifically being budgeted for rehabilitation alone. For example, the transport of rocks to the site for gully restoration is done by vehicles returning to the mine from the screening facility; this is recorded as an operational cost. Salaries for persons conducting ongoing gully rehabilitating are also included in the operational cost of the mine.

Rehabilitation cost (closure) = R200 038

Rehabilitation costs are calculated using forecasted contractors' rates for 2019. See table below

Inxu Sand Mine closure costs (2019)								
	Description	Unit	Sudden Closure Quantity	LOM Quantity	2019 Rate	Assumptions	Sudden Closure Cost	LOM Cost
1	Surface Infrastructure							
1.1	Roads						R36 516.00	R36 516.00
1.1.1	Turning and loading areas	m ²	7130.00	7130.00	R4.88	Minor gravel roads - ripped, profiled and vegetated	R34 760.89	R34 760.89
1.1.2	Slipways	m ²	360.00	360.00	R4.88	Minor gravel roads - ripped, profiled and vegetated	R1 755.11	R1 755.11
1.2	Fencing						R23 645.20	R23 645.20
1.2.1	Dismantling of security fencing	m	582.00	582.00	R40.63		R23 645.20	R23 645.20
1.3	Concrete						R3 802.73	R3 802.73
1.3.1	Parking for earth moving equipment	m ²	26.00	26.00	R146.26	Concrete slab	R3 802.73	R3 802.73
2	Rehabilitation						R95 555.88	R95 555.88
2.1.1	Profiling of disturbed areas (general) ¹	ha	2.80	2.80	13 813.35	Minimal dozing to enhance site drainage	R38 677.38	R38 677.38
2.1.2	Establishment of vegetation (general) ¹	ha	2.80	2.80	20 313.75	General - on flat areas	R56 878.50	R56 878.50
						Sub Total 1	R159 519.81	R159 519.81
						10 % Contingency	R15 951.98	R15 951.98
						Sub Total 2 (excluding VAT)	R175 471.79	R175 471.79
						14% VAT	R24 566.05	R24 566.05
						Sub Total 3 (including VAT)	R200 037.84	R200 037.84

¹ Disturbed areas comprised of 198 m² stockpiles, 2.25 m² toilet site, 40 m² storage container site, and anticipated additional 27759.75 m² trampled areas

(f) Confirm that the financial provision will be provided as determined.

Sufficient allowance has been made available as an operating cost for rehabilitation. Should the mining permit be granted, Scribante Concrete will make provision for the estimated closure cost by means of a Bank Guarantee or any other means available and accepted by the Competent Authority. Proof of availability of finances has been supplied to DMR for the mining permit application, in the form of a company bank statement from Scribante Concrete.

The Financial and Technical Competence Report has taken into account rehabilitation cost and ensured the revenue generated is sufficient to cover all anticipated environmental costs.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

- g) Monitoring of Impact Management Actions
- h) Monitoring and reporting frequency
- i) Responsible persons
- j) Time period for implementing impact management actions
- k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
<ol style="list-style-type: none"> 1. Excavation 2. Stockpiling 3. Loading 4. Transporting 5. Rehabilitation 	Dust pollution/nuisance	<p><u>Dust Monitoring:</u> The dust generated by mining activities should be monitored during all source activities and addressed by management actions.</p> <p>Any complaints or claims emanating from the lack of dust control must be attended to immediately.</p> <p><u>Management Actions:</u> Dust suppression equipment such as a water car and water dispenser must be used to dampen the surface of exposed soils.</p> <p>Mine operation must be restricted to regular working hours only.</p>	<p><u>Monitoring responsibilities:</u> Mine Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Mine manager to monitor the dust levels throughout each working day.</p> <p>Audits to be conducted by an independent environmental expert.</p>	<p>Monitoring to be done daily by mine manager.</p> <p>Reporting to occur annually during operational phase and monthly during rehabilitation phase (depending on reporting frequency stipulated in the Record of Decision).</p>
<ol style="list-style-type: none"> 1. Excavation 2. Stockpiling 3. Loading 	Noise	<p><u>Noise Monitoring:</u> The noise generated by the mining activities should be monitored, and any excessive noise should be addressed.</p>	<p><u>Monitoring responsibilities:</u> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p>	<p>Monitoring to be done daily by mine manager.</p> <p>Reporting to occur annually during</p>

<ol style="list-style-type: none"> 4. Transporting 5. Rehabilitation 6. Storage 		<p>Complaints about noise levels need to be recorded and addressed immediately.</p> <p><u>Management Actions:</u> Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition.</p> <p>The access road must be kept free of ruts as this leads to loud noises when vehicles are accessing the site.</p> <p>Mine operation must be restricted to regular working hours only.</p> <p>Compliance with the appropriate legislation with respect to noise will be mandatory</p>	<p>Audits to be conducted by an independent environmental expert.</p> <p>Mine manager to monitor the noise levels throughout each working day.</p>	<p>operational phase and monthly during rehabilitation phase (depending on reporting frequency stipulated in the Record of Decision).</p>
<p>Anywhere where these activities disturb the soil surface</p> <ol style="list-style-type: none"> 1. Excavation 2. Stockpiling 3. Loading 4. Transporting 5. Rehabilitation 	<p>Invasive Alien Plant establishment</p>	<p><u>Invasive Plant Monitoring:</u> The presence of invasive alien plants should be monitored weekly and management actions enforced if need be.</p> <p><u>Management Action:</u> Removal of weeds should be manually or with an approved herbicide.</p>	<p><u>Monitoring responsibilities:</u> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Mine manager to monitor the abundance of invasive alien plants weekly.</p> <p>Audits to be conducted by an independent environmental expert.</p>	<p>Monitoring to be done weekly by mine manager.</p> <p>Reporting to occur annually during operational phase and monthly during rehabilitation phase (depending on reporting frequency stipulated in the Record of Decision).</p>
<ol style="list-style-type: none"> 1. Excavation 2. Rehabilitation 3. Loading 4. Transporting 	<p>Health and Safety Risks</p>	<p><u>Health and Safety Monitoring:</u> Monitoring must be done throughout the day to ensure workers are using appropriate PPE.</p> <p><u>Management Action:</u> The necessary warning signs should be present at the site to inform the public and workers of the mining activities.</p>	<p><u>Monitoring responsibilities:</u> The mine Manager is responsible for the wellbeing of the staff on site and monitoring to ensure all persons are safe.</p> <p>Audits to be conducted by an independent environmental expert.</p>	<p>Monitoring to be done daily by mine manager.</p> <p>Reporting to occur annually during operational phase and monthly during rehabilitation phase (depending on reporting frequency stipulated in the Record of Decision).</p>

		Further safety training to be provided if staff are not complying with health and safety regulation.		
<p>Wherever spills can occur or where waste is generated or disposed</p> <ol style="list-style-type: none"> 1. Storage 2. Excavation 3. Loading 4. Transporting 5. Rehabilitation 	Pollution/contamination to environment	<p><u>Waste Management monitoring:</u> Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site.</p> <p>Hydrocarbon spill kits to enable sufficient clean-up of contaminated areas.</p> <p>Vehicles must be regularly serviced/maintained to prevent leaks (servicing not to be done on site)</p> <p>Staff trained on waste correct management</p> <p><u>Management Actions:</u> Hydrocarbon spills need to be cleaned immediately.</p> <p>Site needs to be cleared of litter daily.</p> <p>Bins need to be emptied regularly.</p> <p>Further training to be provided for staff in waste is not being managed as per EMPr.</p>	<p><u>Monitoring responsibilities:</u> The staff and mine manager need to monitor the site daily to ensure there is no litter, measures for preventing and dealing with spills are in place, bins are being emptied etc</p> <p>Audits to be conducted by an independent environmental expert.</p>	<p>Monitoring to be done daily by mine manager.</p> <p>Reporting to occur annually during operational phase and monthly during rehabilitation phase (depending on reporting frequency stipulated in the Record of Decision).</p>
<ol style="list-style-type: none"> 1. Stockpiling 2. Excavation 3. Transporting 	Erosion	<p><u>Erosion monitoring:</u> Daily inspection of signs of erosion on the slipways, stockpiles, roads & turning area.</p> <p><u>Management Actions:</u> Erosion control measures must be implemented at the first signs of erosion. Rock packing can be done rill erosion is</p>	<p><u>Monitoring responsibilities:</u> Mine manager is responsible for monitoring erosion.</p> <p>Audits to be conducted by an independent environmental expert.</p>	<p>Monitoring to be done daily by mine manager.</p> <p>Reporting to occur annually during operational phase and monthly during rehabilitation phase (depending on reporting frequency stipulated in the Record of Decision).</p>

		<p>forming (e.g. next to roads). If erosion involves larger scale collapse of the river banks, gabions may need to be constructed</p> <p>The ECO (or similar) must be consulted as erosion control must be suitable for the specific type of erosion and location</p>		
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l) Indicate the frequency of the submission of the performance assessment/ environmental audit report.

In terms of the National Environmental Management Act (Act 107 of 1998; NEMA) and its amendment, section 24 P (3) (b), the holder of a mining permit must submit an audit report annually to the Minister responsible for mineral resources.

An annual audit will be conducted by an independent competent person (with the relevant environmental expertise) and the audit report will be submitted to DMR.

m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

Environmental awareness training (staff induction) must be carried out prior to any activity taking place on site. This must be conducted by the ECO to cover all aspects of the EMPr.

Scribante has their own induction training which adequately covers environmental and health and safety risks, as stipulated in the Mining Works Plan (Appendix D):

- All staff and sub-contractors will undergo the Scribante Concrete (Pty) Ltd Environmental Induction (SCON-SHE-IND-002) before commencing work
- All visitors or short stay individuals will undergo the Scribante Concrete (Pty) Ltd Visitors Health, Safety and Environmental Induction (SCON-SHE-F-020), this induction will be signed off by the visitor and renewed monthly.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

All risks must be dealt with as outlined in the below table and in the EMPr. It is important that staff are trained to understand all possible risks associated with the activities on site and the relevant mitigation measures for preventing those risks causing degradation to the environment. Lines of communication must be kept open between staff on site, the mine manager and the ECO. Any unforeseen risks that are observed or suspected must be discussed with the ECO and suitable mitigations must be implemented.

Area of concern	Risks	Mitigation measure
Roads	Dust, Erosion, visual impact, Damage to surrounding vegetation, Establishment of invasive alien plants	<p>Surface wetting will be implemented as a means of dust control on roads;</p> <p>Gravel will be added to roads to improve infiltration and reduce run off, therefore reducing susceptibility to erosion</p> <p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust nuisance and visual impact.</p> <p>Roads will be rehabilitated upon decommissioning. This will include ripping compacted surfaces and revegetating.</p> <p>Speed of vehicles travelling on roads to be strictly controlled to reduce noise, dust and damage to roads.</p> <p>No other routes will be used by vehicles or personnel to</p>

		<p>gain access to the site.</p> <p>Mine management must include eradication of Category 1 weeds/invaser plants in terms of National Environmental Management: Biodiversity Act (10/2004): Alien and Invasive Species Regulations, 2014</p>
<p>Loading and truck turning area</p>	<p>Dust and noise disturbance, surface water contamination, erosion, visual impact, air pollution (exhaust emissions)</p>	<p>Gravel will be added to loading and turning areas to improve infiltration and reduce run off, therefore reducing susceptibility to erosion</p> <p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust and noise nuisance and visual impact.</p> <p>Turning and loading areas will be rehabilitated upon decommissioning. This will include ripping compacted surfaces and revegetating.</p> <p>An emergency preparedness plan (spill contingency plan) must be in place in the case of a spill of substances which can be harmful to an individual or the receiving environment.</p> <p>Any substrate contaminated by the spillage of hydrocarbons or other pollutants is to be removed from the site and disposed of at a registered waste disposal site.</p> <p>All transport vehicles must be regularly serviced to reduce the likelihood of oil leaks on site and surface water contamination.</p> <p>Trucks waiting onsite should not be left idling, as this generates unnecessary emissions.</p>
<p>Slipways</p>	<p>Dust and noise disturbance, surface water contamination, erosion, visual impact</p>	<p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust & noise nuisance and visual impact.</p> <p>Earth moving equipment must use only designated slipways to access the river bed, to avoid excessive damage to the banks of the river and subsequent erosion.</p> <p>Stabilising structures will be used on the banks along the sides of the slipways to control erosion.</p> <p>Areas where erosion is likely (especially the river banks near the slipways) should be monitored to allow for timely response in the event of erosion.</p> <p>Erosion should be managed or prevented throughout the operational phase of the mining activity.</p> <p>In the event of erosion, the Applicant shall be held financially responsible for the necessary rehabilitation.</p>
<p>Stockpiles</p>	<p>Dust, visual impact, surface water contamination, erosion</p>	<p>Operation hours of the mine must be limited to standard working hours 07H00- 17H00 on weekdays (i.e. no operation after hours, on weekends and on public holidays will be permitted). This will reduce dust & noise nuisance and visual impact.</p> <p>Stock piles must be established on level ground.</p> <p>The rate at which river sand is stockpiled should be determined by the haulage rate (rate at which sand is removed from the site) to prevent unnecessary volumes being on site at any given time. Lower stockpiled volumes will result in lower dust dispersion and visual impact, and</p>

		<p>will reduce the risks associated with erosion.</p> <p>Stockpiled material should not remain on site for longer than 3 days. If, for any reason, river sand will be stockpiled on site for more than 3 days, silt fences must be installed.</p> <p>Cut-off berm should be established on the upslope side of the stockpile area, to divert storm water runoff away from stockpiles.</p> <p>1:2 gradients must not be exceeded on stockpiles.</p>
Parking	Visual impact, Surface water contamination	<p>No vehicles (earth moving equipment or otherwise) to be parked within 100 m of the river (as indicated in the layout). Parking area must be established according to approved layout.</p> <p>Parking for earth-moving equipment to be comprised of a hard-stand surface to reduce likelihood of surface water contamination.</p> <p>Earth moving equipment to be serviced regularly to reduce the likelihood of oil/fuel leaks.</p> <p>Drip tray must be in place under any earth moving equipment/vehicle parked on site.</p>
Toilet (temporary)	Visual impact, surface water contamination	<p>Portable toilet must be located well outside of the 100m river buffer, as per approved layout.</p> <p>Toilet to be hired from a third party that includes regular servicing of the toilet in lease agreement (i.e. pumping effluent).</p> <p>Toilets must be placed on stable even ground.</p> <p>No unsanitary activities may take place in the river, in the vegetation or anywhere other than designated toilet.</p>
Storage	Visual impact, damage to surrounding vegetation, surface water contamination	<p>Storage container is to be located well outside the 100m river buffer, as per approved layout, and on level, stable ground</p> <p>The storage container must be securely locked at all times to prevent vandalism, theft or harm to people and/or the environment.</p> <p>When not in use, all equipment is to be kept in the storage container, to keep the site tidy and visually acceptable.</p> <p>Any hazardous liquid stored on site must be kept within the storage container AND within secondary containment (e.g. plastic trays) which is large enough to contain at least 110% of the volume of liquid stored.</p>
Excavation (mineral extraction)	Dust, noise, visual impact, surface water contamination, erosion, air pollution	<p>Extraction of sand is to be limited to operating hours of the mine (07:00 – 17:00 during the week only). No extraction may take place during the weekend or public holidays.</p> <p>The excavator must use only the designated slipways to access the river bed.</p> <p>Operation of the excavator outside the approved mining area is prohibited, especially on the north-eastern boundary near the extensive gully erosion.</p> <p>The excavator is to be regularly serviced to reduce the likelihood to oil or fuel contamination in the river.</p> <p>No servicing of the excavator is to be done on site.</p> <p>Noise levels on the site must be managed.</p> <p>Employees working in areas with noise levels of more than</p>

		<p>50dB need to be issued with ear protection.</p> <p>The mine manager must ensure the excavator is not in the river bed during high flow events (storms/flash floods). The mine manager must monitor the weather forecast to anticipate such high flow events and ensure that the excavator is outside the 100m river buffer at least 2 hours before peak flow.</p> <p>Any complaints or claims emanating from the lack of dust control must be attended to immediately.</p> <p>Emergency plans must be in place in case of spillages of diesel, oil, hydraulic fluids etc.</p> <p>The rate at which sand is extracted from the river must be determined by the rate at which it is loaded and transported. i.e. an unmanageable build-up of sand on site must be avoided as this poses an erosion risk.</p>
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n) Specific information required by the Competent Authority
 (Among others, confirm that the financial provision will be reviewed annually).

The applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMR for review and approved as being sufficient to cover the environmental liability at the time (in the case of premature mine closure) and for closure of the mine at that time.

2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&APs ;
To be submitted with final BAR
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein.



Signature of the environmental assessment practitioner:

ETC-Africa cc

Name of company:

02 June 2017

Date:

-END-