BACKGROUND INFORMATION DOCUMENT:

Environmental Impact Assessment for Proposed Extension of Tormin Mine, West Coast, South Africa

January 2017 SRK Project Number: 507228

1 INTRODUCTION

Mineral Sand Resources (Pty) Ltd (MSR) owns and operates the Tormin Mineral Sands Mine (Tormin Mine) on the West Coast of South Africa, near Lutzville. The mine holds two Mining Rights (MR162 and MR163), covering an area of 120 ha, and an approved Environmental Management Programme (EMPr) to mine Valuable Heavy Minerals (VHM) below the high-water mark adjacent to farm Geelwal Karoo 262 (Figure 3). The mine has been in operation since 2013.

MSR intends to extend mining operations into the following areas (the "project") (Figure 3 and Figure 4):

- Ten beaches adjacent to Remainder of Graauw Duinen 152, and Portions of farm Klipvley Karoo Kop 153, along a stretch of coastline north of Tormin Mine, totalling 28.7 ha; and
- A 90 ha area on the farm Geelwal Karoo 262 comprising a 75 ha inland mining area and a 15 ha infrastructure expansion area.

In terms of Section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA), MSR must therefore apply to the Department of Mineral Resources (DMR) for an amendment of their existing Mining Rights and EMPr. An EMPr can be amended or varied with the written consent of the Minister of Mineral Resources.

The project will trigger activities listed in terms of the Environmental Impact Assessment (EIA) Regulations, 2014, promulgated in terms of the National Environmental Management Act 107 of 1998 (NEMA); as such, Environmental Authorisation (EA) in terms of NEMA will be required and an EIA process must be conducted. MSR appointed SRK Consulting (South Africa) (Pty) Ltd (SRK) to undertake the EIA process required in terms of NEMA and the EIA Regulations, 2014.

Although not a requirement of the EIA Regulations, 2014, MSR is undertaking "pre-application" stakeholder engagement to consult with the public and authorities early on. Pre-application stakeholder engagement includes the distribution of this **Background Information Document** (**BID**).

This **BID** aims to:

- Provide a brief motivation and description of the project;
- Briefly describe the environmental baseline;
- Describe what the EIA process entails; and
- Provide information on how you can participate.

See page 7 for details on how you can participate in the EIA process.

2 PROJECT DESCRIPTION AND MOTIVATION

MSR currently uses hydraulic excavators to mine VHM beach deposits to an average depth of 6 m, along a ~75 m wide and ~12 km long stretch of beach adjacent to farm Geelwal Karoo 262 (Figure 3). Sand (ore) is excavated and loaded into dump trucks. The dump trucks haul the ore to a processing plant, including a wet concentrator, on the headland (the processing plant). The VHM are extracted at the processing plant and the silica (beach sand) is returned to the beach as a slurry by pipeline.

MSR proposes to extend mining operations to ensure the ongoing operation of Tormin Mine. The proposed project consists of the following key components:

- **Mine VHM deposits on ten beaches** along a stretch of coastline north of Tormin Mine, totalling 28.7 ha (Figure 1 and Figure 4A):
  - Mining will be undertaken using current methods and other ancillary equipment to position and load the ore into dump trucks. The trucks will haul the ore to the Run-of-Mine (ROM) stockpile at the processing plant, either via a mobile primary beach concentrator at the beach or directly;
  - Beach mining will be conducted along the beach between the tidal level of the sea at the time of mining and the high-water mark. Mining will progress along each beach depending on tidal

movements and mine schedule grade requirements;

- Where the VHM deposit is shallow or poorly developed, mining will take place during low tide. Where thick VHM deposits are found near the low water mark, a sand berm, wave breaker (ditch), or similar will be constructed on the seaward side of the deposit, providing temporary safety protection from the incoming tide whilst ensuring the mining process is efficient and minimising the need to return to the same area following tide retreat. Once the deposit has been mined, wave action will quickly return the beach to its former condition (and partly replenish VHM deposits). In some instances, a bulldozer will reshape the beach to the original profile; and
- The Trans Hex Group (THG) has the right to mine the beaches for diamondiferous gravel below the VHM deposit. MSR will continue to coordinate mining activities with THG to ensure efficient mining of the VHM deposit and the diamondiferous gravel;

Figure 1: Beach in the proposed extension area

- **Upgrade existing gravel roads** along the coast (to the north of Tormin Mine) to serve as safer haul roads for dump trucks. This includes public road OP09764 and informal beach access roads used by THG and, previously, by Namakwa Diamond Company (Figure 2 and Figure 4):
  - Roads will be widened to ~12.25 m;
  - Approximately 160 truck trips per day are planned between the beaches and the processing plant (peak of 18 truck trips per hour); and
  - Dust suppression measures will be implemented as required;
- **Mine an inland strandline** within a ~160 m wide and ~5 km long area inland of the existing mine and processing plant (Figure 4):
  - Strip mining will be undertaken progressively with topsoil removed and stored on disturbed land (direct placement where possible), followed by the removal of mineralised sand and gravel ore to a depth up to 30 m (average of 10 m);
  - The ore will be loaded into dump trucks and transported to the ROM stockpiles at the processing plant;
  - Tailings will be returned to the mine void to construct containment cells which will be filled with fine tailings from processing for drying out and preparation for final backfilling; and
  - Rehabilitation will be undertaken sequentially and as soon as possible once mining activities have progressed to the next working face of the strandline;
- **Construct a process water dam** (40 m x 40 m x 7 m) between the existing process water storage dams and the inland strandline to store processed water. A dewatering (decant) dam will be constructed adjacent to the process water dam to store water decanted for reuse;
- **Construct a Mineral Separation Plant (MSP)** adjacent to the existing processing plant to produce high grade and/or finished ilmenite, garnet, zircon and rutile products for export;
- **Install a Reverse Osmosis (RO) Plant** with capacity to provide ~24 m^3/hour of fresh (potable) water for processing and domestic purposes. Seawater will be abstracted at the existing seawater intake point and pumped to the existing process water dams and a new process water dam at the MSP; and
- Install a **powerline** (33 kv) from the Sere wind energy facility to the processing plant.

Figure 2: Existing gravel roads will require upgrading

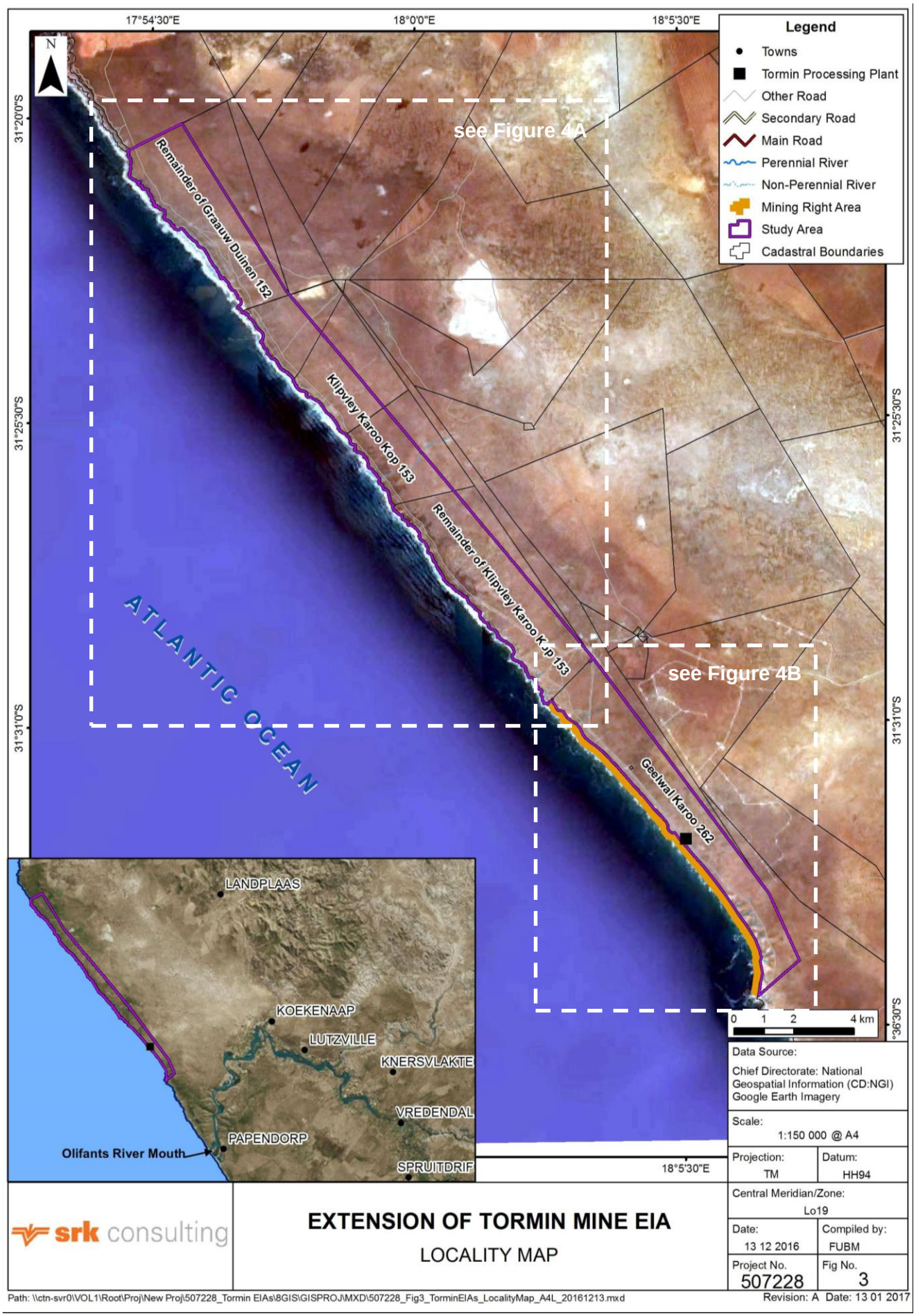

Figure 3: Locality map

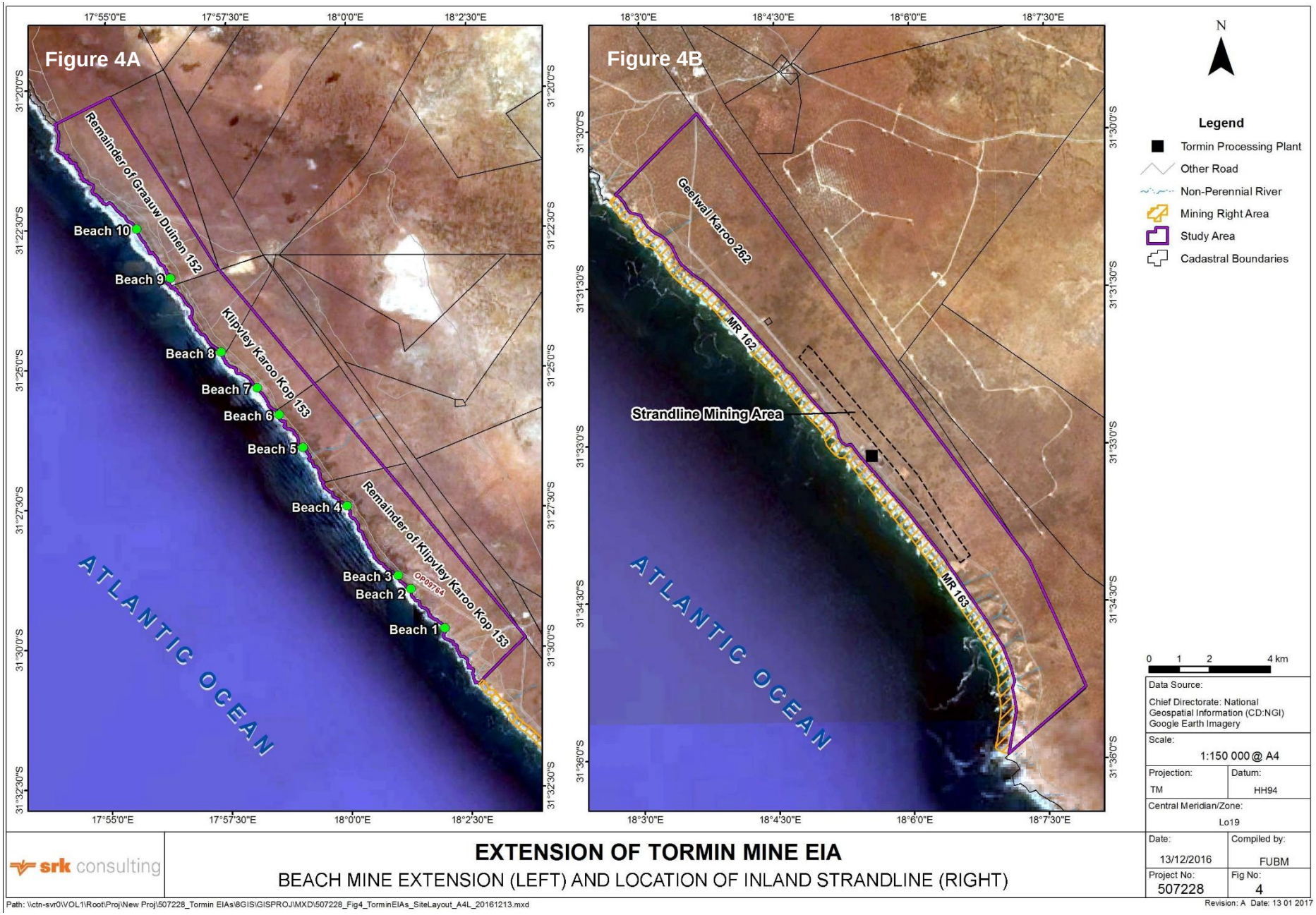

Figure 4: Beach mine extension (left) and location of inland strandline (right)

3 THE ENVIRONMENTAL BASELINE

Tormin Mine is located on farm Geelwal Karoo 262 on the West Coast of South Africa, north of the Olifants River Estuary and approximately 25 km west of Lutzville. Eskom's Sere wind energy facility is located on the ridgeline inland of Tormin Mine.

Access to the Mine is from Koekenaap via Robeiland and De Punt, or from Koekenaap via Kommandokraal and Skaapvlei. The Mine maintained gravel road extending the length of farm Geelwal Karoo 262 provides access to the Mine. The public (gravel) road OP09764 provides access to the coastline north of Tormin Mine. This road is used by farmers and visitors to the coastline. The coastline is used by campers and other recreational users.

The coastline of Geelwal Karoo 262 consists of wide beaches separated by rugged rocky promontories. Steep dunes and rocky cliffs (between 30 and 50 m above mean sea level) are a feature of the area. The coastal platform is almost flat before rising to a ridgeline along the western boundary of farm Geelwal Karoo 262.

The coastline to the north of Tormin Mine is characterised by a rocky shoreline with isolated beaches in small bays. The character of the coastline changes further north, as longer beaches and primary dune systems become more prominent. The vertical change from the high-water mark to the inland zone is less abrupt; the topography rises gently to a ridgeline ~ 5 km inland.

Areas along the West Coast have been disturbed from historical and current mining and/or prospecting activities, as well as by people accessing the coastline on a network of informal beach access roads.

The predominant vegetation type of the region is Namaqualand Strandveld (Figure 5). Plant diversity of this vegetation type is relatively low but has a rich component of annual and perennial flora. Namaqualand Seashore vegetation occurs along the coast on slightly sloping beaches and coastal rocky formations (Figure 6). The vegetation of the area consists of low coastal shrub up to 1 m high, typical of much of the West Coast.

Figure 5: Namaqualand Strandveld vegetation on the coastal platform

Figure 6: Namaqualand Seashore vegetation along the coast

The extent of Critical Biodiversity Areas and Ecological Support Areas along the coast, as identified by the South African National Biodiversity Institute based largely on secondary information, indicates that the area may have high biological value and could be important for the movement and migration of plants and animals.

The beaches are used by shoreline birds for foraging, rest or breeding as well as by mammals such as the Cape Clawless Otter and Black-Backed Jackal. The dunes and rocky formations / cliffs are important reptile habitats and several relatively rare species - restricted to the West Coast - occur within this habitat. The coastal plain is an important habitat for a wide range of faunal species.

The study area lies in the Olifants-Doorn Water Management Area. With the exception of the Olifants River, ~19 km south-east of Tormin Mine and beyond the study area, all of the rivers and wetlands in the area are minor ephemeral systems. Wetlands in the area comprise mainly pans or "depressions".

The bulk of archaeological sites (mainly Later Stone Age middens) lie within 500 m of the coast. Inland of the coast, archaeological sites are quite scarce, limited to scatters in deflation hollows. Evidence of historic occupation is prolific in areas of rocky outcrops with shelters or overhangs or any place with potential for providing a water source.

4 ALTERNATIVES

It is a requirement of NEMA that feasible and reasonable alternatives are considered, including the 'No Go' option. A number of alternatives were considered by MSR during the Pre-Feasibility phase of the project:

Technology alternatives for **transporting ore** to the processing plant:

- Conveyors;
- Pump an ore slurry; or
- Use dump trucks.

MSR do not consider conveyors and pipelines to be feasible as these alternatives will require significant capital outlay and the infrastructure will significantly increase the disturbance footprint and risk of environmental contamination.

Technology alternatives enabling **beach mining**:

- Use dredging techniques and machinery;
- Use remote-operated / underwater enabled machinery or an amphibious excavator; or
- Geofabric "socks" as an alternative to sand berms and wave breakers.

The high energy environment during most high tides does not allow the use of machinery. Mining will therefore focus on the use of mobile excavators during low tides.

MSR considered three alternatives for additional **electricity supply**:

- Connect to the Sere wind energy facility;
- Install additional generator sets (gensets); or
- Install photovoltaic panels to generate electricity on-site.

A connection to the Sere wind energy facility is MSR's preferred alternative.

MSR considered three alternatives for additional **fresh water supply**:

- Continue to truck in water from Lutzville;
- Apply for an allocation from the Lower Olifants River canal; or
- Seawater desalination (RO Plant).

MSR considers seawater desalination as the only viable option, as trucking of water is considered no longer feasible and the canal has insufficient unallocated water available for Tormin Mine.

5 THE EIA PROCESS

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation (EA) issued by the competent authority, in this case, the Department of Mineral Resources (DMR). The EIA Regulations, 2014 (Government Notice (GN) R982, which came into effect on 8 December 2014), promulgated in terms of NEMA, govern the process, methodologies and requirements for the undertaking of EIAs in support of EA applications. The EIA Regulations are accompanied by Listing Notices (LN) 1-3 that list activities that require EA.

The EIA Regulations, 2014, lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a Basic Assessment (BA) process or a Scoping and Environmental Impact Reporting (S&EIR - also referred to as an EIA) process is required to obtain EA. LN 1 and LN3 list activities that require a BA process, while LN 2 lists activities that require S&EIR.

SRK has determined that the proposed project triggers activities listed in terms of LN 1, LN 2 and LN 3 of the EIA Regulations, 2014, requiring an EIA; these are provided in Table 1.

Table 1: Listed activities triggered by the project

No	Description *(abbreviated)*
Listing Notice 1 (requiring BA)	
9	Development of infrastructure exceeding 1 000 m in length for bulk transportation of water
10	Development of infrastructure exceeding 1 000 m in length for bulk transportation of effluent, process water or slimes
16	Development of a desalination plant producing more than 100 m^3 of treated water per day
17	Development within 100 m inland of the high-water mark of the sea
19	Depositing or excavating of material from the seashore or the littoral active zone
56	Widening of a road by more than 6 m or lengthened by more than 1 km
Listing Notice 2 (requiring S&EIR)	
6	Any activity requiring a licence or permit for release of emissions or pollution
15	Clearance of more than 20 ha of indigenous vegetation
21	Primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing
28	Commencing of an activity which requires an atmospheric emission licence
Listing Notice 3 (requiring BA)	
4	Development of a road wider than 4 m with a reserve less than 13.5 m in areas containing indigenous vegetation
12	Clearance of more than 300 m^2 of indigenous vegetation in sensitive areas
18	Widening of a road by more than 4 m in areas containing indigenous vegetation

Before commencing with the project, the proponent (MSR) is thus required to appoint an independent Environmental Assessment Practitioner (EAP) to undertake a S&EIR process and to obtain authorisation in terms of NEMA from the competent authority (DMR).

In addition to EA, various other key authorisations, permits or licences may be required before the project may proceed (see Table 2).

Table 2: Key authorisations, permits and licences

Application	Authority
Waste Manage-ment Licence	DMR
Heritage Application	Heritage Western Cape
Water Use Authorisation	Department of Water and Sanitation
Atmospheric Emission Licence	National Department of Environmental Affairs: Air Quality Management Services
Coastal Waters Discharge Permit	National Department of Environmental Affairs: Oceans and Coasts

The EIA Regulations, 2014, define the detailed approach to the S&EIR process, which consists of two phases: the Scoping Phase and the Impact Assessment Phase (see Figure 7). The aims of the S&EIR process are to:

- Notify stakeholders of the proposed development (and S&EIR process);
- Provide stakeholders with the opportunity to participate effectively in the process and identify relevant issues and concerns;
- Ensure that stakeholders' issues and concerns are addressed in the assessment and are accurately recorded and reflected in the Scoping and EIA Reports;
- Assess the potential positive and negative environmental impacts associated with the proposed activity; and
- Make recommendations as to how the potential negative impacts can be effectively mitigated and the benefits enhanced.

The following specialist studies will be undertaken to inform the S&EIR:

- Land Capability Impact Assessment;
- Air Quality Impact Assessment;
- Groundwater Impact Assessment;
- Marine Impact Assessment;
- Freshwater Ecology Impact Assessment;
- Terrestrial Ecology Impact Assessment;
- Heritage Impact Assessment;
- Visual Impact Assessment; and
- Traffic Impact Assessment.

Consultation with the public and authorities forms a critical part of the S&EIR process, and is intended to provide all stakeholders with opportunities to raise issues and concerns that should be addressed in the S&EIR process and to comment on the documentation submitted to DMR.

SRK plans to conduct a thorough consultation process that makes provision for public comments and open days.

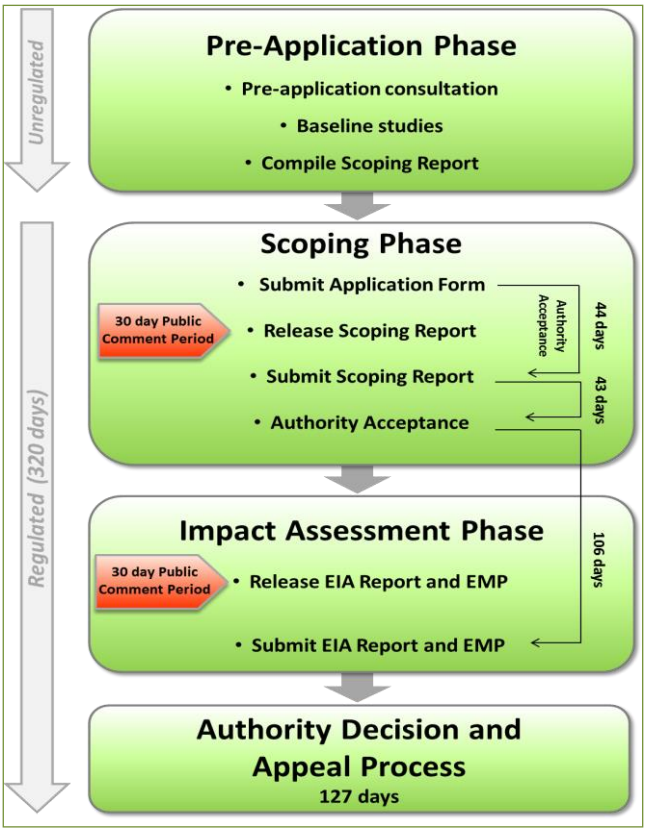

Figure 7: Simplified S&EIR process diagram

HOW YOU CAN PARTICIPATE IN THE EIA PROCESS

We value your input into the S&EIR process. If you or your organisation would like to be involved in the S&EIR process, **please submit your contact details for registration as a stakeholder** on our database. Only registered stakeholders will continue to be informed about the S&EIR process and receive the relevant documents and notifications of opportunities to comment.

REGISTER OR PROVIDE YOUR COMMENT

Register or send written comment to:

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Please refer to the above reference numbers in your submissions. If registering as a stakeholder, please provide your name, contact details (preferred method of notification, e.g. email), and indication of any direct business, financial, personal or other interest in the application.