

winter, the winds decrease considerably and blow more frequently from the north. Berg winds are a feature of the entire Benguela region and may occur throughout the year, but are more frequent in winter. The wind is hot and dry and usually blows from the east or north-east. The evaporation rates are higher than expected for a coastal area as a result of the wind regime. The occurrence of coastal fog drastically reduces evaporation.

The gross annual evaporation rate is on average of 2 500 mm. Thus, with an annual average rainfall of 111 mm, the net evaporation may be calculated to be 2 389 mm, which denotes extremely dry conditions. Extreme weather conditions are rare and, in general, the coastline climate is fairly consistent. Winds occasionally reach gale force velocity and berg wind conditions can persist for a week or longer, causing higher than usual temperatures. Drought conditions are rare and rainfall is usually higher than average once in every 10 years, causing ephemeral rivers to flow.

Biological Environment

The study area lies within the relatively uniform cool Namaqua marine biogeographic region, which extends from Cape Point to Lüderitz in Namibia. The major force driving the ecology of this region is coastal upwelling, predominantly occurring in the spring/summer period when the south-easterly is the prevailing wind. The upwelling process supplies inorganic nutrients to the euphotic zone supporting high biological productivity (see previous section). This coast is, however, characterized by low marine species richness and low endemism.

The biota of nearshore marine habitats on the West Coast is relatively robust, being naturally adapted to an extremely dynamic environment where biophysical disturbances are commonplace. The benthic communities within this region are largely ubiquitous, particular only to substrate type (i.e. hard vs. soft bottom), exposure to wave action, or water depth. Habitats specific to the study area include sandy intertidal and subtidal substrates, Intertidal rocky shores and subtidal reefs, and the water body.

The biological communities consist of many hundreds of species, often displaying considerable temporal and spatial variability - even at small scales. No rare or endangered species have been recorded. Therefore, the discussion below describes 'typical' biological communities, focussing on dominant, commercially important and conspicuous species only.

Sandy Substrate Habitats and Biota

Sandy substrates comprise approximately 14.25 km of the concession coast. The benthic biota of soft bottom substrates constitutes invertebrates that live on, or burrow within, the sediments, and are generally divided into megafauna (>10 cm), macro fauna (animals >1 mm) and meiofauna (<1 mm).

Although the coastline of the study area is highly dominated by rocky shores, there are some isolated pocket beaches between the rocky outcrops. Sandy beaches are one of the most dynamic coastal environments. The composition of their faunal communities is largely dependent on the interaction of wave energy, beach slope and sand particle size, which is termed beach morphodynamics. Three morphodynamic beach types are described: dissipative, reflective and intermediate beaches (McLachlan *et al.* 1993):

Dissipative beaches are generally relatively wide and flat with fine sands and high wave energy. Waves start to break far from the shore in a series of spilling breakers that 'dissipate' their energy along a broad surf zone. This generates slow swashes with long periods, resulting in less turbulent conditions on the gently sloping beach face. These beaches usually harbour the richest intertidal faunal communities.

Reflective beaches have low wave energy, and are coarse grained (>500 µm sand) with narrow and steep intertidal beach faces. The relative absence of a surf zone causes the waves to break directly on the shore causing a high turnover of sand. The result is depauperate faunal communities.

Intermediate beach conditions exist between these extremes and have a very variable species composition (McLachlan *et al.* 1993, Jaramillo *et al.* 1995, Soares 2003). This variability is mainly attributable to the amount and quality of food available.

Beaches with a high input of e.g. kelp wrack have a rich and diverse drift-line fauna, which is sparse or absent on beaches lacking a drift-line (Branch & Griffiths 1988). As a result of the combination of typical beach characteristics, and the special adaptations of beach fauna to these, beaches act as filters and energy recyclers in the nearshore environment (Brown & McLachlan 1990). Due to the exposed nature of the coastline in the study area, most beaches are of the intermediate to reflective type.

The macrofaunal communities of sandy beaches are generally ubiquitous throughout the southern African West Coast region, being particular only to substratum type, wave exposure and/or depth zone.

The supralittoral zone is situated above the High Water Spring (HWS) tide level, and receives water input only from large waves at spring high tides or through sea spray. This zone is characterised by a mixture of air-breathing terrestrial and semi-terrestrial fauna, often associated with and feeding on kelp deposited near or on the drift line. Terrestrial species include a diverse array of beetles and arachnids and some oligochaetes, while semi-terrestrial fauna include the oniscid isopod *Tylos granulatus*, and amphipods of the genus *Talorchestia*.

The intertidal or mid-littoral zone has a vertical range of about 2 m. This mid-shore region is characterised by the cirrolanid isopods *Pontogeloides latipes*, *Eurydice (longicornis=) kensleyi*, and *Excirolana natalensis*, the polychaetes *Scolelepis squamata*, *Orbinia angrapequensis*, *Nephtys hombergii* and *Lumbrineris tetraura*, and amphipods of the families Haustoridae and Phoxocephalidae. In some areas, juvenile and adult sand mussels *Donax serra* may also be present in considerable numbers.

Rocky Substrate Habitats and Biota

Rocky and mixed sand and rock substrates comprise approximately 59.1 km of the concession coastline. The following general description of the intertidal and subtidal habitats for the West Coast is based on Field *et al.* (1980), Branch & Branch (1981), Branch & Griffiths (1988) and Field & Griffiths (1991). It is supplemented by the descriptions of Steffani (2001), Blamey (2003), Pulfrich *et al.* (2003a), and Steffani & Branch (2003a, b, 2005), from the Groen River coastline just south of the project area. The biological communities of rocky intertidal and subtidal reefs are generally ubiquitous throughout the southern African West Coast region, being particular only to wave exposure, turbulence and/or depth zone.

Intertidal Rocky Shores

Several studies on the west coast of southern Africa have documented the important effects of wave action on the intertidal rocky-shore community. Specifically, wave action enhances filter-feeders by increasing the concentration and turnover of particulate food, leading to an elevation of overall biomass despite low species diversity (McQuaid & Branch 1985, Bustamante & Branch 1995a, 1996a, Bustamante *et al.* 1997). Conversely, sheltered shores are diverse with a relatively low biomass, and only in relatively sheltered embayments does drift kelp accumulate and provide a vital support for very high densities of kelp trapping limpets, such as *Cymbula granatina* that occur exclusively there (Bustamante *et al.* 1995b). In the subtidal, these

differences diminish as wave exposure is moderated with depth.

West Coast rocky intertidal shores can be divided into five zones on the basis of their characteristic biological communities: The Littorina, Upper Balanoid, Lower Balanoid, Cochlear/Argenvillei and the Infratidal Zones. These biological zones correspond roughly to zones based on tidal heights. Tolerance to the physical stresses associated with life on the intertidal, as well as biological interactions such as herbivory, competition and predation interact to produce these five zones.

Supralittoral fringe or Littorina zone - The uppermost part of the shore is the supralittoral fringe, which is the part of the shore that is most exposed to air, perhaps having more in common with the terrestrial environment. The supralittoral is characterised by low species diversity, with the tiny periwinkle *Afrolittorina knysnaensis*, and the red algae *Porphyra capensis* constituting the most common macroscopic life.

Upper Mid-littoral or Upper Balanoid zone - The upper mid-littoral is characterised by the limpet *Scutellastra granulata*, which is present on all shores. The gastropods *Oxysteles variegata*, *Nucella dubia*, and *Helcion pectunculus* are variably present, as are low densities of the barnacles *Tetraclita serrata*, *Octomeris angulosa* and *Chthamalus dentatus*. Flora is best represented by the green algae *Ulva* spp.

Lower Mid-littoral or Lower Balanoid zone - Toward the lower shore, biological communities are determined by exposure to wave action. On sheltered and moderately exposed shores, a diversity of algae abounds with a variable representation of: green algae – *Ulva* spp, *Codium* spp.; brown algae – *Splachnidium rugosum*; and red algae – *Aeodes orbitosa*, *Mazzaella (=Iridaea) capensis*, *Gigartina polycarpa (=radula)*, *Sarcothalia (=Gigartina) stiriata*, and with increasing wave exposure *Plocamium rigidum* and *P. cornutum*, and *Champia lumbricalis*.

The gastropods *Cymbula granatina* and *Burnupena* spp. are also common, as is the reef-building polychaete *Gunnarea capensis*, and the small cushion starfish *Patiriella exigua*. On more exposed shores, almost all of the primary space can be occupied by the dominant alien invasive mussel *Mytilus galloprovincialis*. First recorded in 1979 (although it is likely to have arrived in the late 1960's), it is now the most abundant and widespread invasive marine species spreading along the entire West Coast and parts of the South Coast (Robinson *et al.* 2005). *M. galloprovincialis* has partially displaced the local mussels *Choromytilus meridionalis* and *Aulacomya ater* (Hockey & Van Erkom Schurink 1992), and competes with

several indigenous limpet species (Griffiths *et al.* 1992, Steffani & Branch 2003a, b).

Recently, another alien invasive has been recorded, the acorn barnacle *Balanus glandula*, which is native to the west coast of North America where it is the most common intertidal barnacle. The presence of *B. glandula* in South Africa was only noticed a few years ago as it had always been confused with the native barnacle *Cthamalus dentatus* (Simon-Blecher *et al.* 2008). There is, however, evidence that it has been in South Africa since at least 1992 (Laird & Griffith 2008). At the time of its discovery, the barnacle was recorded from 400 km of coastline from Elands Bay to Misty Cliffs near Cape Point (Laird & Griffith 2008). As it has been reported on rocky shores south of Lüderitz in Namibia (Pulfrich 2013), it is likely that it occurs in the study area. When present, the barnacle is typically abundant at the mid zones of semi-exposed shores.

Sublittoral fringe or Argenvillei zone - Along the sublittoral fringe, the large kelp-trapping limpet *Scutellastra argenvillei* dominates, forming dense, almost monospecific stands achieving densities of up to 200/m² (Bustamante *et al.* 1995). Similarly, *C. granatina* is the dominant grazer on more sheltered shores, also reaching extremely high densities (Bustamante *et al.* 1995). On more exposed shores *M. galloprovincialis* dominates. There is evidence that the arrival of the alien *M. palloprovincialis* has led to strong competitive interaction with *S. argenvillei* (Steffani & Branch 2003a, b, 2005).

The abundance of the mussel changes with wave exposure and at wave-exposed locations, the mussel can cover almost the entire primary substratum, whereas in semi-exposed situations it is scarce. As the cover of *M. galloprovincialis* increases, the abundance and size of *S. argenvillei* on rock declines and it becomes confined to patches within a matrix of mussel bed. As a result, exposed sites, once dominated by dense populations of the limpet, are now largely covered by the alien mussel. Semi-exposed shores do, however, offer a refuge preventing global extinction of the limpet. In addition to the mussel and limpets, there is variable representation of the flora and fauna described for the lower mid-littoral above, as well as the anemone *Aulactinia reynaudi*, numerous whelk species and the sea urchin *Parechinus angulosus*. Some of these species extend into the subtidal below.

Very recently, the invasion of west coast rocky shores by another mytilid, the small *Semimytilus algosus*, was noted (de Greef *et al.* 2013). It is hypothesized that this species has established itself fairly recently, probably only in the last ten years. Its current range extends from the Groen

River mouth in the north to Bloubergstrand in the south. Where present, it occupies the lower intertidal zone, where they completely dominate primary rock space, while *M. galloprovincialis* dominates higher up the shore. Many shores on the West Coast have therefore now been effectively partitioned by the three introduced species, with *B. glandula* colonizing the upper intertidal, *M. galloprovincialis* dominating the mid-shore, and *S. algosus* smothering the low-shore (de Greef *et al.* 2013).

Rocky Subtidal Habitat and Kelp Beds

Biological communities of the rocky sublittoral can be broadly grouped into an inshore zone from the sublittoral fringe to a depth of about 10 m dominated by flora, and an offshore zone below 10 m depth dominated by fauna. This shift in communities is not knife-edge, and rather represents a continuum of species distributions, merely with changing abundances.

From the sublittoral fringe to a depth of between 5 and 10 m, the benthos is largely dominated by algae, in particular two species of kelp. The canopy-forming kelp *Ecklonia maxima* extends seawards to a depth of about 10 m. The smaller *Laminaria pallida* forms a sub-canopy to a height of about 2 m underneath *Ecklonia*, but continues its seaward extent to about 30 m depth, although further north up the west coast increasing turbidity limits growth to shallower waters (10-20 m) (Velimirov *et al.* 1977, Jarman & Carter 1981, Branch 2008). *Ecklonia maxima* is the dominant species in the south forming extensive beds from west of Cape Agulhas to north of Cape Columbine, but decreasing in abundance northwards. *Laminaria* becomes the dominant kelp north of Cape Columbine and therefore in the project area, extending from Danger Point east of Cape Agulhas to Rocky Point in northern Namibia (Stegenga *et al.* 1997, Rand 2006).

Kelp beds absorb and dissipate much of the typically high wave energy reaching the shore, thereby providing important partially-sheltered habitats for a high diversity of marine flora and fauna, resulting in diverse and typical kelp-forest communities being established. Through a combination of shelter and provision of food, kelp beds support recruitment and complex trophic food webs of numerous species, including commercially important rock lobster stocks (Branch 2008).

Growing beneath the kelp canopy, and epiphytically on the kelps themselves, are a diversity of understory algae, which provide both food and shelter for predators, grazers and filter-feeders associated with the kelp bed ecosystem. Representative under-storey algae include *Botryocarpa prolifera*, *Neuroglossum binderianum*, *Botryoglossum platycarpum*, *Hymenena venosa* and

Rhodymenia (= *Epymenia*) *obtusa*, various coralline algae, as well as subtidal extensions of some algae occurring primarily in the intertidal zones (Bolton 1986). Epiphytic species include *Polysiphonia virgata*, *Gelidium vittatum* (= *Suhria vittata*) and *Carpoblepharis flaccida*. In particular, encrusting coralline algae are important in the under-storey flora as they are known as settlement attractors for a diversity of invertebrate species. The presence of coralline crusts is thought to be a key factor in supporting a rich shallow-water community by providing substrate, refuge and food to a wide variety of infaunal and epifaunal invertebrates (Chenelot *et al.* 2008).

The sublittoral invertebrate fauna is dominated by suspension and filter-feeders, such as the mussels *Aulacomya ater* and *Choromytilus meridionalis*, and the Cape reef worm *Gunnarea capensis*, and a variety of sponges and sea cucumbers. Grazers are less common, with most herbivory being restricted to grazing of juvenile algae or debris-feeding on detached macrophytes. The dominant herbivore is the sea urchin *Parechinus angulosus*, with lesser grazing pressure from limpets, the isopod *Paridotea reticulata* and the amphipod *Ampithoe humeralis*. The abalone *Haliotis midae*, an important commercial species present in kelp beds is naturally absent north of Cape Columbine.

Key predators in the sub-littoral include the commercially important West Coast rock lobster *Jasus lalandii* and the octopus *Octopus vulgaris*. The rock lobster acts as a keystone species as it influences community structure via predation on a wide range of benthic organisms (Mayfield *et al.* 2000). Relatively abundant rock lobsters can lead to a reduction in density, or even elimination, of black mussel *Choromytilus meridionalis*, the preferred prey of the species, and alter the size structure of populations of ribbed mussels *Aulacomya ater*, reducing the proportion of selected size-classes (Griffiths & Seiderer 1980). Their role as predator can therefore reshape benthic communities, resulting in large reductions in taxa such as black mussels, urchins, whelks and barnacles, and in the dominance of algae (Barkai & Branch 1988, Mayfield 1998).

Of lesser importance as predators, although numerically significant, are various starfish, feather and brittle stars, and gastropods, including the whelks *Nucella* spp. and *Burnupena* spp. Fish species commonly found in kelp beds off the West Coast include hottentot *Pachymetopon blochii*, two-tone finger fin *Chirodactylus brachydactylus*, red fingers *Cheilodactylus fasciatus*, galjoen *Dichistius capensis*, rock suckers *Chorisochismus dentex* and the catshark *Haploblepharus pictus* (Branch *et al.* 2010).

There is substantial spatial and temporal variability in the density and biomass of kelp beds, as storms can remove large numbers of plants and recruitment appears to be stochastic and unpredictable (Levitt *et al.* 2002, Rothman *et al.* 2006). Some kelp beds are dense, whilst others are less so due to differences in seabed topography, and the presence or absence of sand and grazers. Due to their importance as recruitment, nursery, and feeding grounds for numerous species, including the commercially important rock lobster *J. lalandii*, kelp beds are considered a medium sensitivity habitat.

The Water Body

The study area is located in the central Benguela ecosystem and, as there are few barriers to water exchange, pelagic communities are typical of those of the region. The pelagic communities are typically divided into plankton, fish and marine mammals (seals, dolphins and whales).

Seabird

Large numbers of pelagic seabirds exploit the pelagic fish stocks of the Benguela system. Of the 49 species of seabirds that occur in the Benguela region, 14 are defined as resident, 10 are visitors from the northern hemisphere and 25 are migrants from the southern Ocean. The area between Cape Point and the Orange River supports 38% and 33% of the overall population of pelagic seabirds in winter and summer, respectively. A number of 14 species of seabirds breed in Southern Africa; Cape Gannet, African Penguin, four species of Cormorant, White Pelican, three Gull and four Tern species. The breeding areas are distributed around the coast with islands being especially important. The number of successful breeding birds at the particular breeding sites varies with food abundance.

Birds endemic to the region and likely to occur most frequently in the study area include Cape Gannets, Kelp Gulls, African Penguins, African Black Oystercatcher and Hartlaub's Gull. Of these, the Black Oystercatcher and Bank Cormorant are rare. The breeding success of African Black Oystercatcher is particularly susceptible to disturbance from off-road vehicles as they nest and breed on beaches between the Eastern Cape and southern Namibia. Caspian and Damara terns are likewise rare and breed in the study area, especially in the wetland and saltpan areas associated with the Oliphant's River estuary.

Most of the breeding seabird species forage at sea with most birds being found relatively close inshore (10 - 30 km), although African Penguins and Cape Gannets are known to forage up to 60 km and 140 km offshore, respectively.

Marine Mammals

The marine mammal fauna of the West Coast comprises between 28 and 31 species of cetaceans (whales and dolphins) and four species of seals. The Cape fur seal *Arctocephalus pusillus* is the only species of seal resident along the west coast of Africa, occurring at numerous breeding and non-breeding sites on the mainland and on nearshore islands and reefs. Vagrant records from four other species of seal more usually associated with the sub Antarctic environment have also been recorded: southern Elephant seal (*Mirounga leoninas*), sub Antarctic fur seal (*Arctocephalus tropicalis*), Crab eater (*Lobodon carcinophagus*) and Leopard seals (*Hydrurga leptonyx*). There are three Cape fur seal breeding colonies within the broader study area: at Kleinzee (incorporating Robeiland), and at Bucchu Twins near Alexander Bay. The colony at Kleinzee has the highest seal population and produces the highest seal pup numbers on the South African Coast (Wickens 1994). The colony at Bucchu Twins, formerly a non-breeding colony, has also attained breeding status (M. Meyer, SFRI, pers. comm.). Non-breeding colonies occur at Strandfontein Point (~5 km north of the Groen River mouth) and on Bird Island at Lamberts Bay. All have important conservation value since they are largely undisturbed at present.

Dusky dolphin (*Lagenorhynchus obscurus*) and Heaviside's dolphin (*Cephalorhynchus heavisidii*) are resident year round throughout the Benguela ecosystem coastal waters, although a hiatus in sightings (or low density area) is reported between ~27° S and 30° S, associated with the Lüderitz upwelling cell. In water <500 m deep, Dusky Dolphins are likely to be the most frequently encountered small cetacean. The species is very boat-friendly and will often approach boats to bow ride. This species is resident year round throughout the Benguela ecosystem in waters from the coast to at least 500 m deep, but may occur as far offshore as 2 000 m deep. Although no information is available on the size of the population, they are regularly encountered in near-shore waters between Cape Town and Lamberts Bay, but further north they are usually found further from shore in slightly deeper water. Abundance estimates are being calculated but currently suggest a relatively large population of several thousand, at least. Group sizes up to 800 have been reported in southern African waters.

Heaviside's Dolphins are relatively abundant in the Benguela ecosystem. Individuals show high site fidelity to small home ranges, 50-80 km along shore (Elwen *et al.* 2006) and may thus be more vulnerable to threats within their home range. This species occupies waters from the coast to at least 200 m depth, (Elwen *et al.* 2006; Best 2007). They may show a diurnal onshore-offshore

movement pattern (Elwen *et al.* 2010b), but this varies throughout the species range. Their small group sizes and inconspicuous behaviour when offshore make monitoring their presence very difficult. However, their echolocation clicks can be detected using PAM technology at ranges up to ~500 m and the characteristic high frequency, narrow-band nature of the clicks (Morisaka *et al.* 2011) makes them easily distinguished from other species in the area. Heaviside's dolphins are resident year round.

Whale species that may be sighted in the area include Southern Right Whale (*Balaena glacialis*), Humpback Whale (*Megaptera novaeangliae*), and Killer Whale (*Orcinus orca*), along with Antarctic Minke (*Balaenoptera acutorostrata*) and Bryde's (*B. brydei*) whales. Whales occurring in the nearshore region in the study area will largely be transitory.

All whales and dolphins are given protection under the South African Law. The Marine Living Resources Act, 1998 (No. 18 of 1998) states that no whales or dolphins may be harassed, killed or fished. No vessel or aircraft may, without a permit or exemption, approach closer than 300 m to any whale and a vessel should move to a minimum distance of 300 m from any whales if a whale surfaces closer than 300 m from a vessel or aircraft.

Areas of Conservation Importance on the Coastline

Using biodiversity data mapped for the 2004 and 2011 National Biodiversity Assessments, a systematic biodiversity plan has been developed for the West Coast with the objective of identifying coastal and offshore priority focus areas for Marine Protected Area (MPA) expansion. The biodiversity data was used to identify nine focus areas for protection on the West Coast between Cape Agulhas and the South African – Namibian border.

Of principal importance in the study area is the proposed Namaqua MPA, which stretches between the Groen and Spoeg Rivers and adjacent to the Namaqua National Park. This area meets habitat targets for 14 habitat types including 'Critically Endangered' habitat types such as Namaqua Inshore Reef, Namaqua Inshore Hard Grounds and Namaqua Sandy Inshore. Although there is no direct overlap of the study area with any of the proposed focus areas, the proposed Namaqua MPA inshore protected area lies in close proximity to the southern boundary of Concession 7a.

EIA/EMP UPDATE PROCESS

WCR has an existing EMP and existing converted mining rights over Namaqualand Mines, converted on July 2012.

WCR wants to continue with mining on the areas covered by this right, with immediate target being the Koingnaas and Michell's Bay areas by 2015 for the areas that will not trigger new listed activities.

The current EMP has, as such, been reviewed to determine activities which would be deemed to have the existing environmental authorization, as described under the EMP. The continuation of mining activities that are planned in Namaqualand Mines will be undertaken under this existing environmental authorization.

The comprehensive application, including the listed activities, which are not covered in the EMP would then require a separate environmental authorization application. The application will include listed activities according to the following Acts:

- Minerals and Petroleum Development Act, Act No. 28 of 2002 (MPRDA),
- National Environmental Management Act, 1998 (Act No.107 of 1998);
- National Water Act, 1998 (Act No. 36 of 1998);
- National Environmental Management: Integrated Coastal Management Act (24 of 2008);
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008);

Therefore, an environmental impact assessment process would need to be undertaken while the authorised activities are implemented on-site during mining. The aforementioned listed activities are included as Appendix 2.

This communication is intended to provide an opportunity to IAPs to input into the EIA/ EMP update process. The EIA/EMP update process will be undertaken in phases. The EIA/EMP process is currently at the engagement phase of stakeholders and IAPs, which will entail engaging the identified stakeholders and IAPs, sending them a background information document (BID) and obtaining their comments, concerns and suggestions.

It is necessary to establish a framework of cooperation between four key participants/role players who will contribute in the EIA success and these role players are:

- The applicant, who has to submit an application for environmental authorisation and appoint an independent environmental practitioner to conduct the EIA. The applicant has to also provide a description of their project so that the impacts of such a development can be adequately assessed. The applicant then makes commitments on how they will manage the identified impacts and provide human and

financial resources for implementation of such commitments;

- Independent environmental practitioner, who has to co-ordinate the engagement of stakeholders and gather issues relating to the development and then collate those into reports, commission specialists to investigate issues further and determine impacts. Then make recommendation on the mitigation measures. The applicant then provides commitments and the reports which contain these undertakings are submitted to the regulatory authority. These commitments then become the conditions of approval;
- IAPs, who have a right and a responsibility to present their issues, concerns and suggestions concerning the development; and
- The regulatory authorities, who guide the EIA process through legislative framework and then assess the submitted documentation and make a final decision whether to authorise the development or not.

As part of the notification process, kindly note that an advert, which explains the details of the proposed project and EIA/ EMP update process to be undertaken will be placed in the local newspaper.

Adverts will be published in both English and Afrikaans. We are currently in the initial stages of public participation process, wherein the stakeholders and IAPs are being informed about the EIA/EMP update to allow them an opportunity to raise any concerns they might have. A pre-consultation meeting was held with DMR on 10 March 2015. The EIA /EMP update process timeframes are outlined in Appendix 3.

POTENTIAL ENVIRONMENTAL IMPACTS

The potential environmental impacts associated with the proposed mining operation are no different from the other impacts associated with the existing shallow marine mining operations. The potential impacts associated with the beach and nearshore operations will include:

- Mortality of benthic organisms;
- Compromised water quality and sediment inundation of areas adjacent to those being mined by discharge and placing of overburden on sea walls;
- Disturbance of intertidal and subtidal marine areas;
- Displacement of sand overburden, gravels and rocks displaced into adjacent areas;

- Changes to the nature of intertidal zone and creation of boulder beaches;
- Physical modification of the environment by removal and/ or re-distribution of boulders and sediments in the intertidal and subtidal areas which may directly and indirectly disturb ecological processes and/or important biological resources;
- Cumulative impact on the coastal zone;
- Cofferdams constructed with sand bags may destroy all intertidal and subtidal biota by smothering. Nevertheless, after mining activities have ceased the sea tends to breach dams within a few months as a result of heavy wave action, and depending on the siting and occurrence of storms, return to the pre-mined state over a period of months to several years;
- An increase in turbidity resulting from pumping of gravel is inevitable. Negative impacts can be expected to the ecosystem when raised turbidity is generated over large areas;
- An increase in turbidity caused by the pumping of bottom sediments may have adverse effects on light penetration resulting in limiting of primary phytoplankton production and the depth to which kelp normally grows.

In addition, the impacts associated with the land operations will include:

- Impacts on air quality such as dust storms;
- Impacts on water quality i.e. increased water turbidity;
- Impacts on the natural landscape such as visual pollution of mine residue dumps and mine structures; presence of waste and litter;
- Impact on soil capability and quality, e.g. loss of seedbed ecosystems; degraded agricultural potential;
- Shallow marine ecosystems such as damage to shallow marine ecosystems and habitats by ongoing shallow marine mining operations;
- Impact on terrestrial ecosystems like disturbance to terrestrial ecosystems and loss of habitat;
- Impacts on protected and/or sensitive sites such as lichen fields;
- Impact on freshwater resources such as volume and quality of fresh water and seasonal shortages of potable water;
- Impact on land use and availability i.e. restricted access;
- Impact on health and safety such as occupational health and safety;

- Impact on local business opportunities such as jobs given to people outside the local community;
- Impacts on the local economy such as a bleak future once mining activities slow down;
- Impacts on regional transport infrastructure e.g. increased traffic on poorly maintained roads and road safety;
- Impacts on natural vegetation such as hotspot of floral biodiversity and unique adaptation of plants to semi-desert terrain;
- Positive impacts on community well-being i.e. prosperity of the community, employment and general significant economic stimulation of the local economy through job creation;
- Impacts on industry such as over-dependence on mining industry and need to promote alternative industries (e.g. kelp harvesting, mariculture, tourism).

Cumulative Impacts

Cumulative impacts can be separated into three main categories:

- Impacts arising as a consequence of the “knock-on” effects of an activity (e.g. disturbance of seals, seabirds and terrestrial animals, effects on ecotourism);
- Impacts resulting from multiple effects of the same activity (e.g. repetitive mining of the same bay); and
- Impacts arising from an activity on a spatial and temporal scale (e.g. increase in number of mining vessels).

Cumulative impacts arising due to increase in vessel-based mining on a spatial and temporal scale have been assessed through a coordinated monitoring of biological and physical impacts by all mining companies operational along the coast. According to studies done by Pisces Environmental Services (Pty) Ltd. (2008), it was found that:

Natural recovery does occur, even at the depths of the deepest marine diamond mining activities. Recovery rates are most rapid in the beach, intertidal and shallow-subtidal areas referred to as being of ‘most concern’, with recovery of these areas occurring in less than two years after cessation of mining. There are therefore direct correlations between recovery rate and degree of re-mining, with recovery being rapid in the nearshore areas which are subject to re-mining, and slower (10-15 years) in deep-water areas, which are not subject to re-mining;

The primary, direct impacts of all marine mining activities relate to excavation, removal, disturbance or re-deposition of sediments, with all other impacts (other than some terrestrial impacts such as access track creation) resulting from these sediment excavation process. However, natural sediment-transport processes in the central Benguela are substantial and continual, and the mining-related sediment impacts are comparatively small in relation to these natural processes, particularly in shallow waters.

YOUR INVOLVEMENT IS REQUESTED

Interested and affected parties (IAPs) are invited to participate in the EIA/EMP process. To ensure that you are registered as an IAP, or to lodge any issue, concern, or get clarity on the proposed project, please contact the Environmental Assessment Practitioner (EAP) indicated on the reply slip (refer to Appendix 4). Attached is a reply slip, which you can fill-in and send back using the details provided on it.

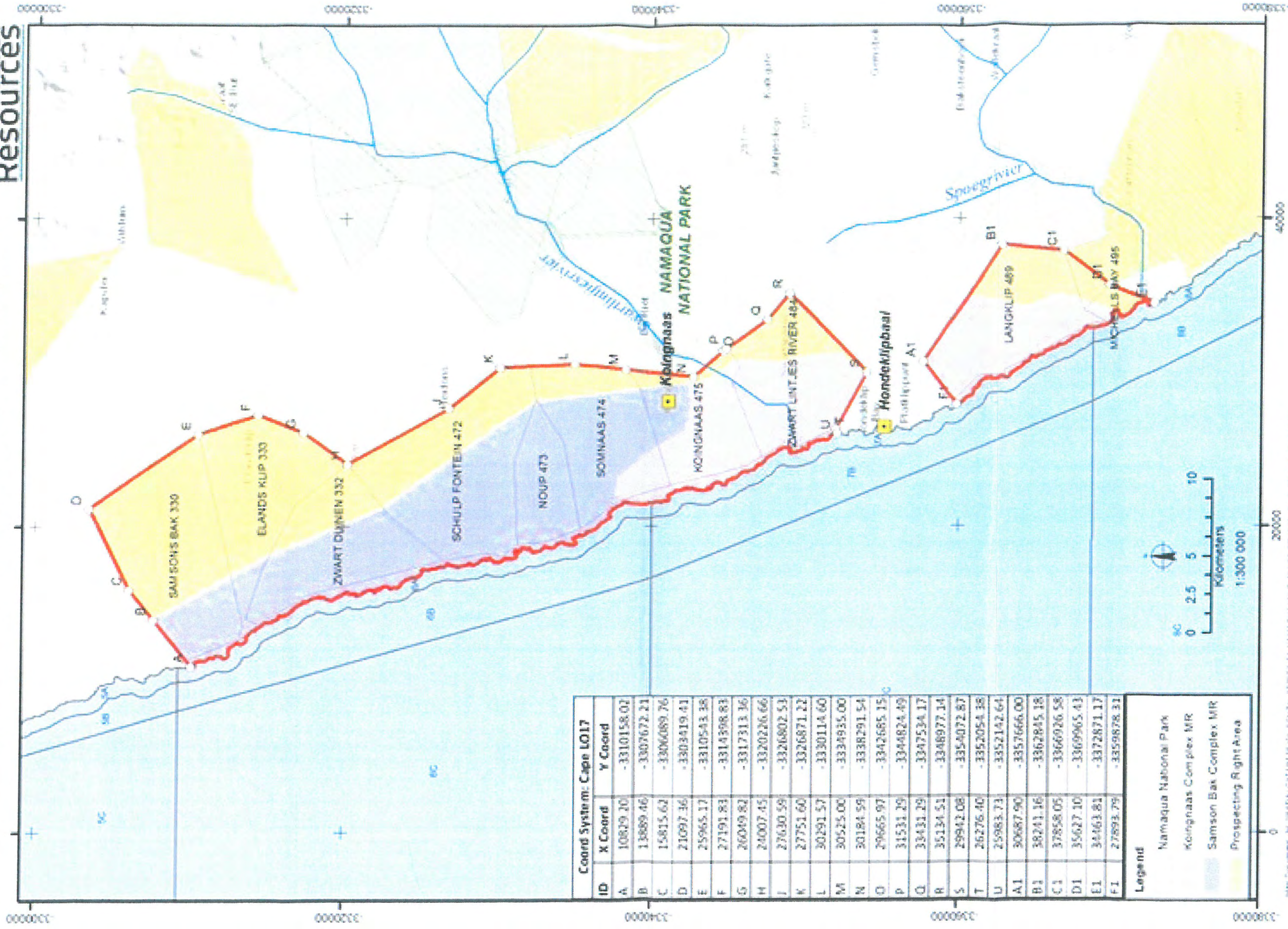
MITIGATION OF POTENTIAL ENVIRONMENTAL IMPACTS

Any concerns and issues raised by IAPs will be assessed during the impact assessment phase of the EIA/EMP update process. The environmental impacts identified from those issues, will be addressed in the EMP. Management measures to ensure that the impacts are minimised or avoided, will be developed, compiled and submitted to DMR. DMR will then evaluate and review the EMP, in consultation with other relevant government departments, and issue a decision.

Figure 1: Map showing the extent of the mining area

West Coast Resources

Figure 1: Map showing extent of the mining area



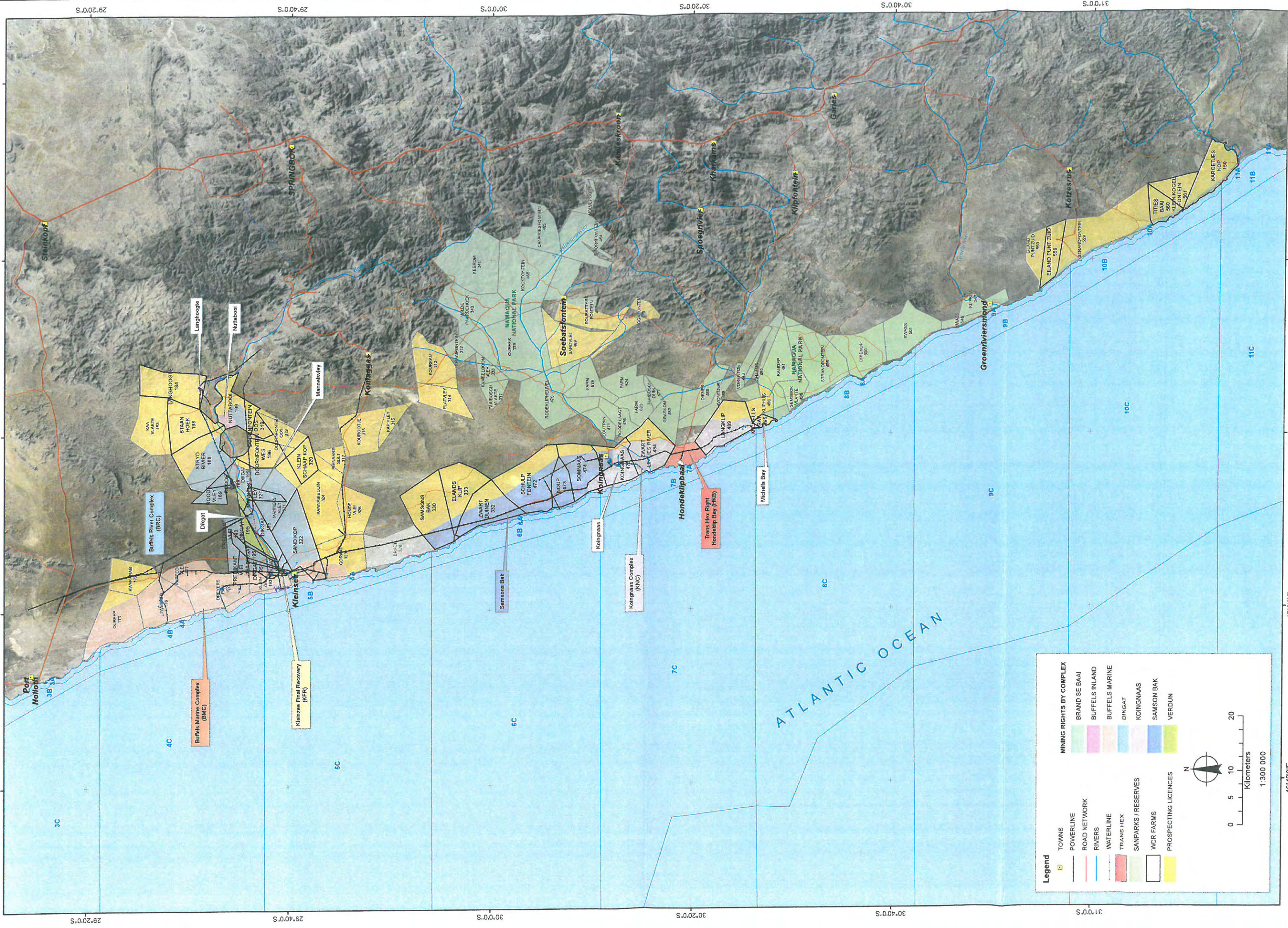
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C	-3306089.76
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H	-3320226.66
I	-3326802.51
K	-3326871.22
L	-3330114.60
M	-3334935.00
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O	-3342685.15
P	-3344824.49
Q	-3347534.17
R	-3348977.14
S	-3354072.87
T	-3352054.38
U	-3352142.64
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B1	-3362845.18
C1	-3366926.58
D1	-3369965.43
E1	-3372871.17
F1	-3359878.31

Legend	
[Light Blue Box]	Namaqua National Park
[Yellow Box]	Koingnaas Complex MR
[Light Purple Box]	Samson's Bak Complex MR
[Yellow Box]	Prospecting Right Area

Map Courtesy: M. SPANGLER/AMBA/ENR, 2007; AFRIKA-04, NAMAQUANA, DIVERS PROJECT, 09, PLAN 0001 20-00014

Figure 2: Locality Map

WESTCOAST RESOURCES - LOCALITY MAP



Legend

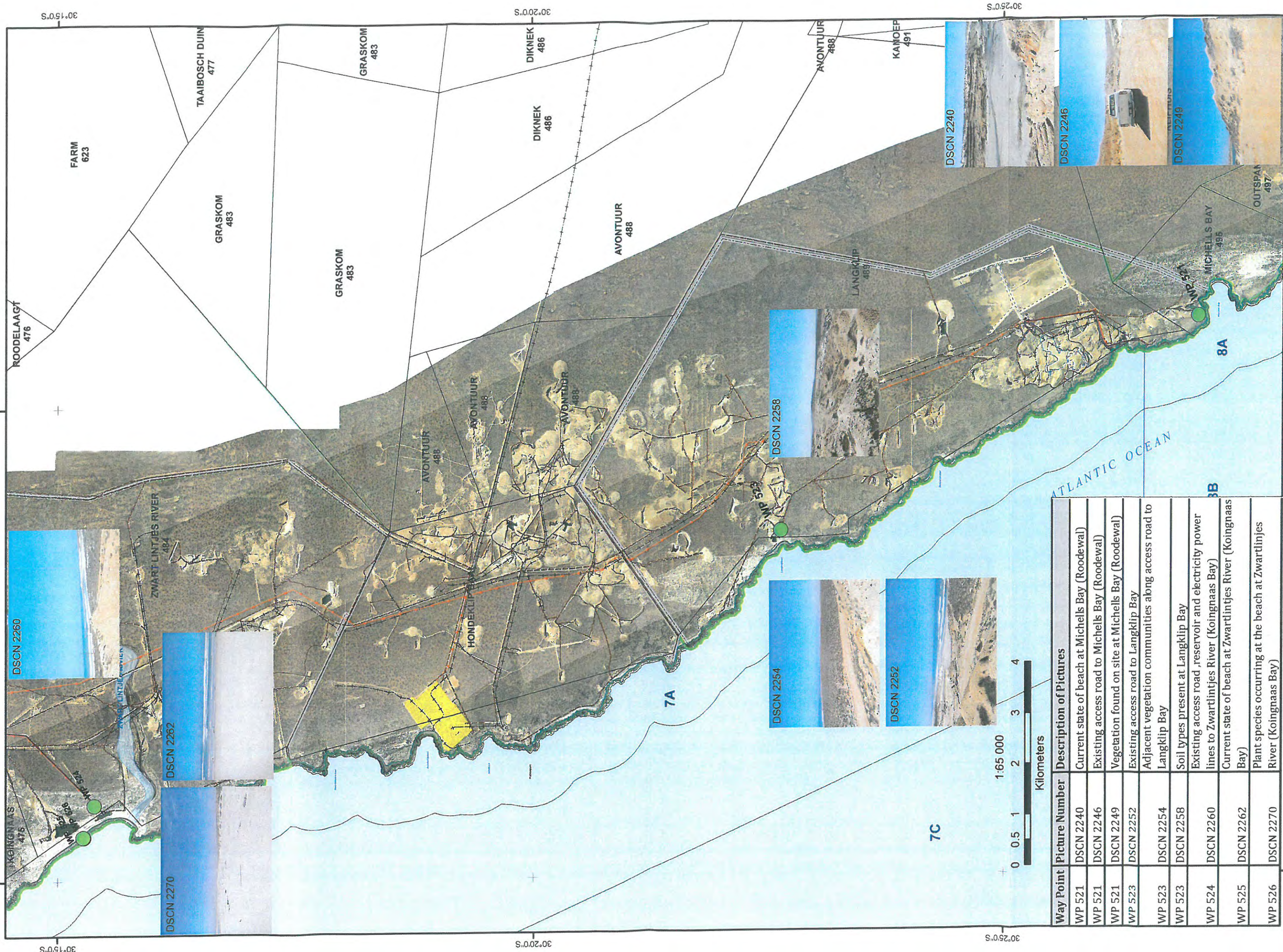
	TOWNS		MINING RIGHTS BY COMPLEX
	POWERLINE		BRAND SE BAAI
	ROAD NETWORK		BUFFELS INLAND
	RIVERS		BUFFELS MARINE
	WATERLINE		DIKGAT
	TRANS HEX		KOINGMAAS
	SANPARKS / RESERVES		SAMSON BAK
	WCR FARMS		VERDUN
	PROSPECTING LICENCES		

0 5 10 20
Kilometers
1:300 000

N

Figure 3: Map illustration of study area (including photographs)

WESTCOAST RESOURCES - KOINGNAAS WAY POINTS



Way Point	Picture Number	Description of Pictures
WP 521	DSCN 2240	Current state of beach at Michells Bay (Roodewal)
WP 521	DSCN 2246	Existing access road to Michells Bay (Roodewal)
WP 521	DSCN 2249	Vegetation found on site at Michells Bay (Roodewal)
WP 523	DSCN 2252	Existing access road to Langklip Bay
WP 523	DSCN 2254	Adjacent vegetation communities along access road to Langklip Bay
WP 523	DSCN 2258	Soil types present at Langklip Bay
WP 524	DSCN 2260	Existing access road ,reservoir and electricity power lines to Zwartlintjes River (Koingnaas Bay)
WP 525	DSCN 2262	Current state of beach at Zwartlintjes River (Koingnaas Bay)
WP 526	DSCN 2270	Plant species occurring at the beach at Zwartlintjes River (Koingnaas Bay)

Figure 4.1: Geological Map of study area

Figure 4.1: Geological map of study area

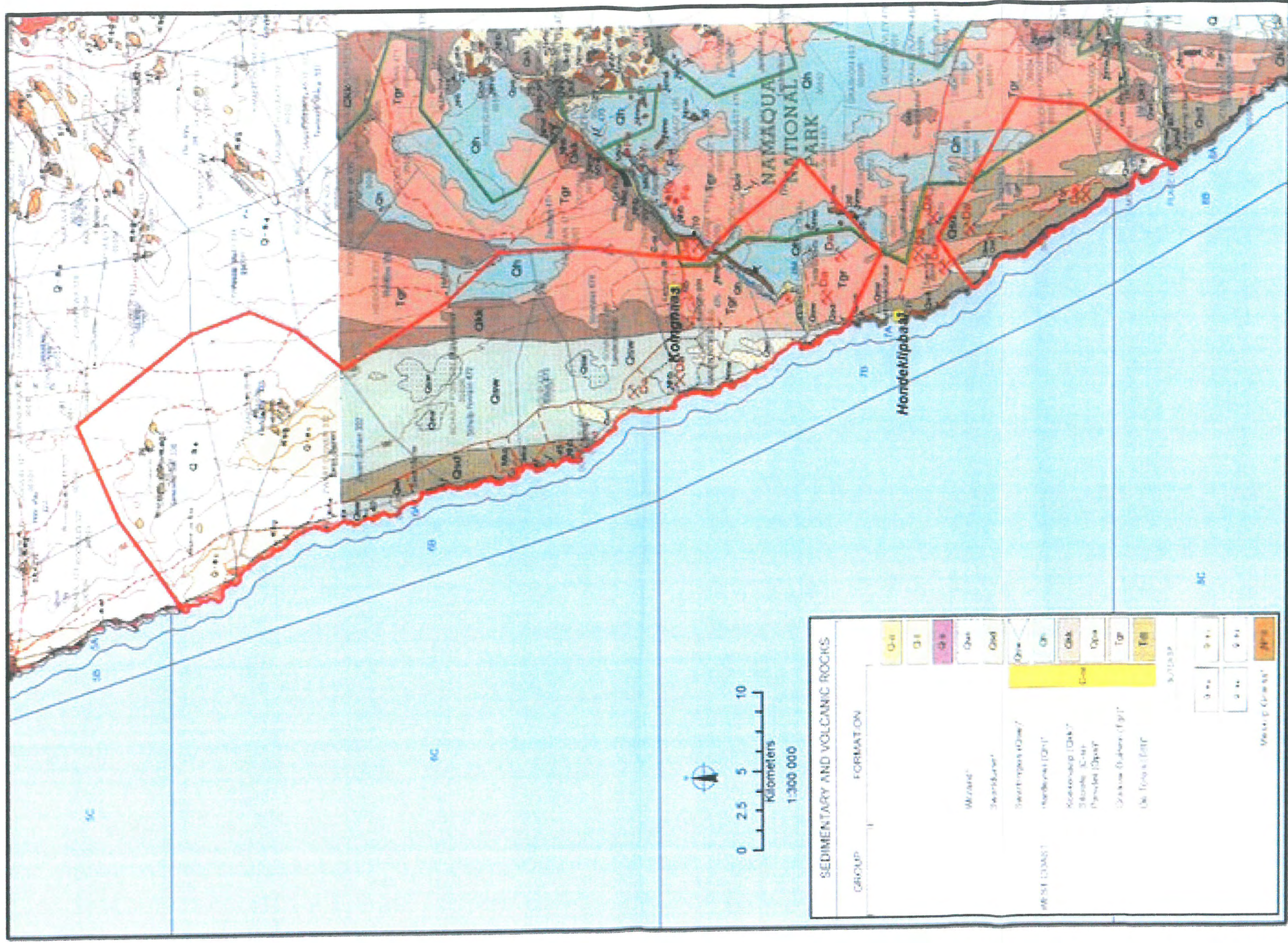
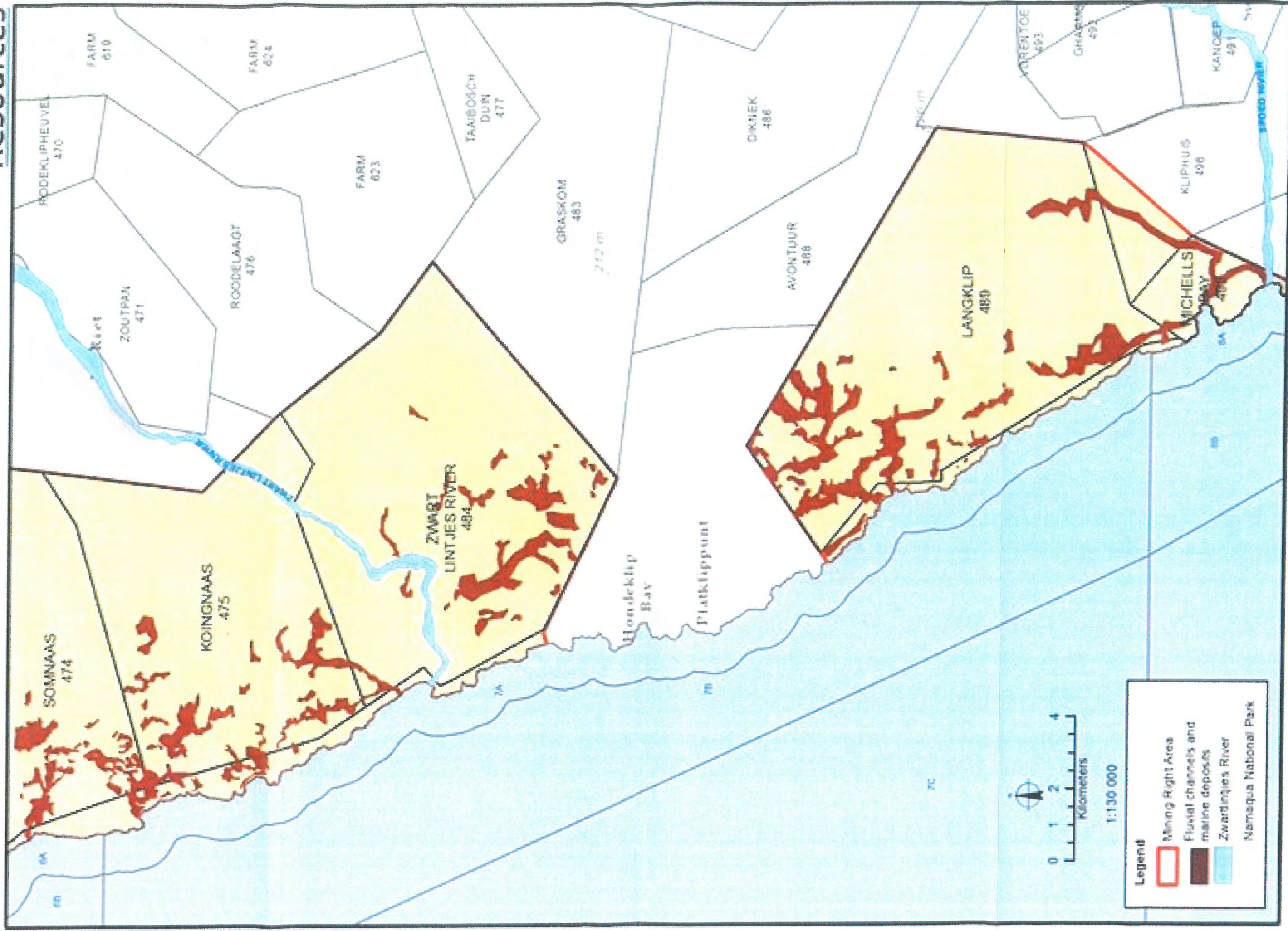


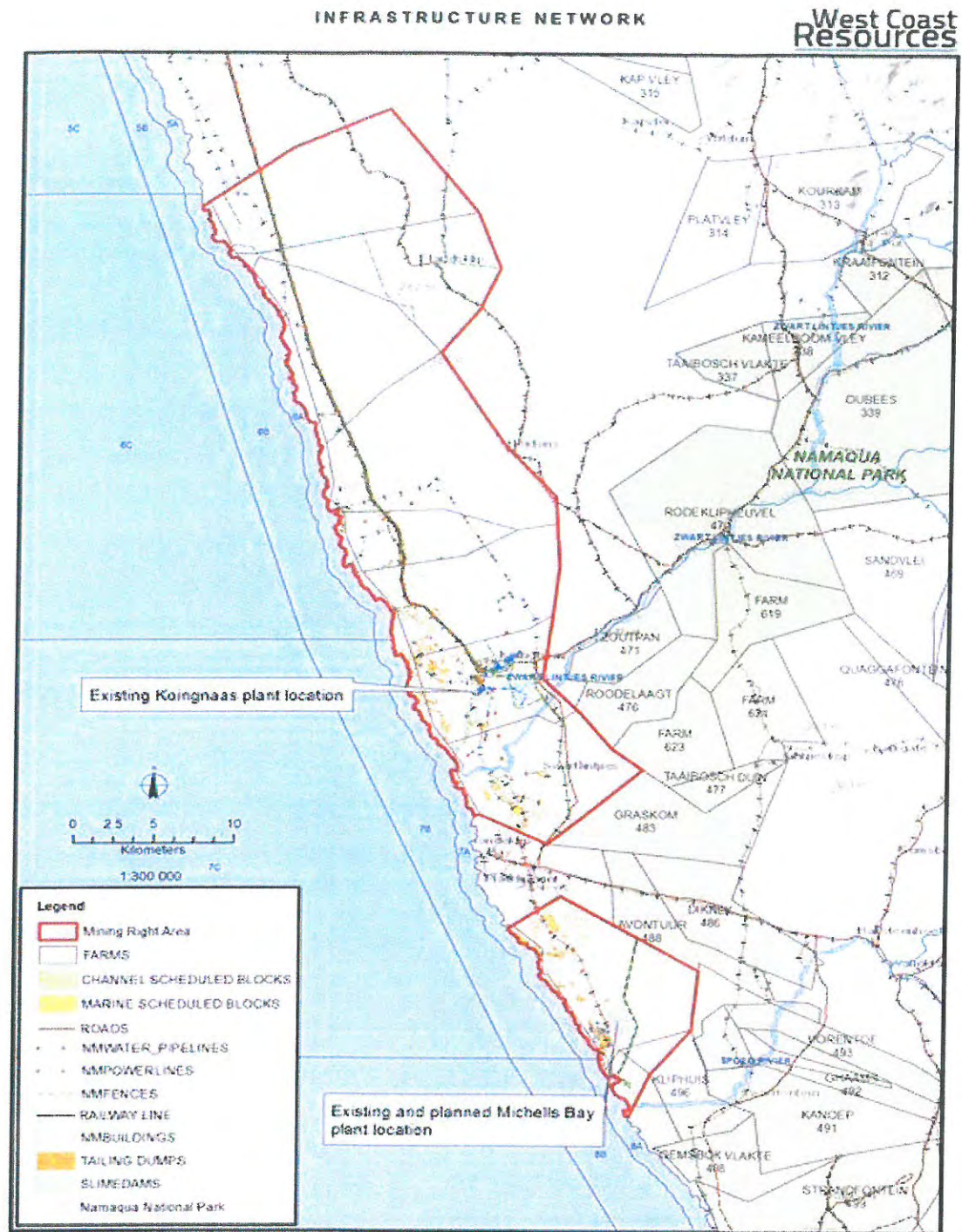
Figure 4.2: Geological map of study area

Figure 4.2: Geological map of study area

West Coast Resources

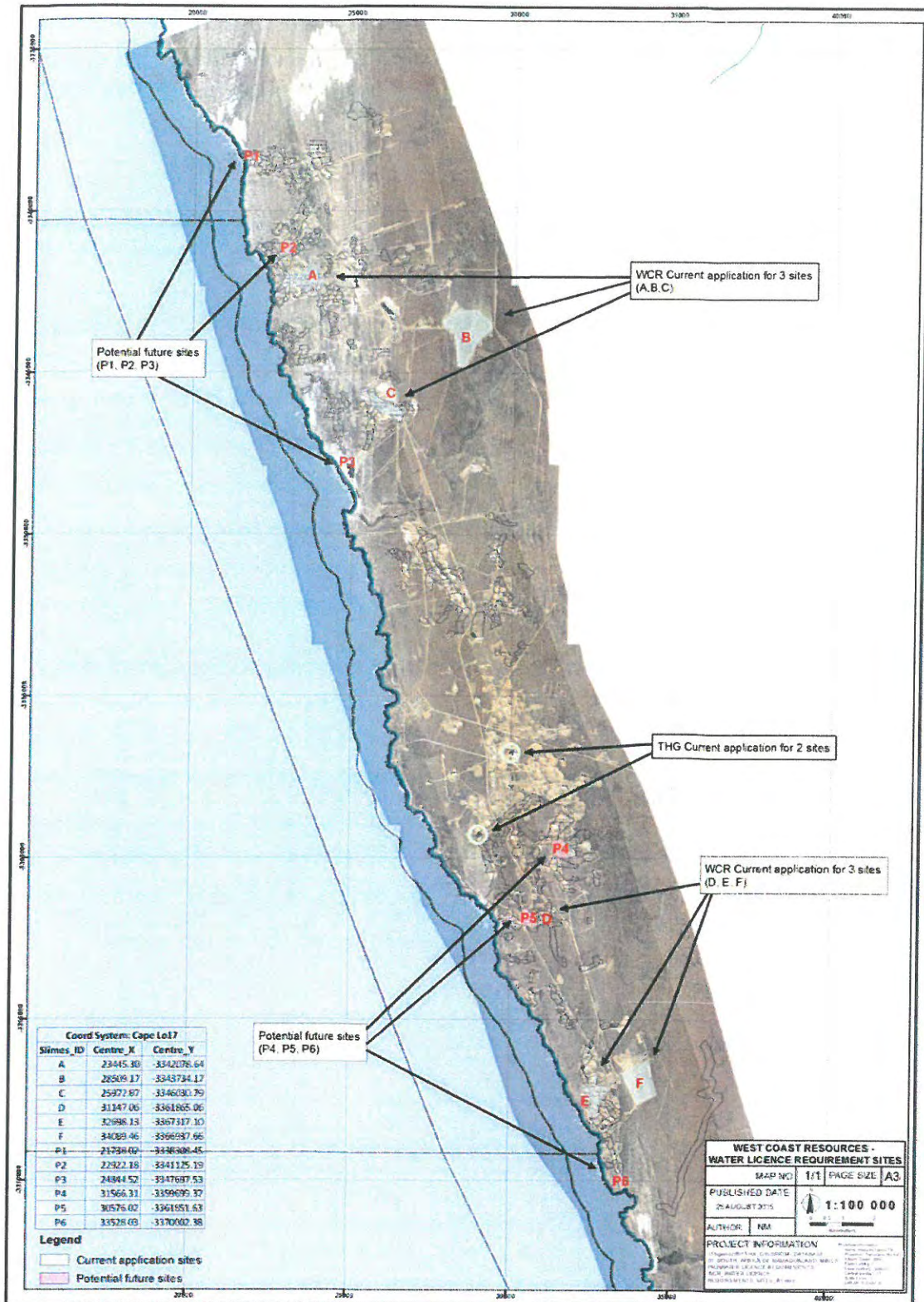


Annexure 1: Figure 1- Infrastructure Network



Map prepared by SRM, ORANGE RIVER SOUTH AFRICA, NAMAQUALAND, NINE PRINTS, 4/11, NEW HAVEN, 2010

Annexure 1: Figure 2- Existing and proposed slimes dams locations



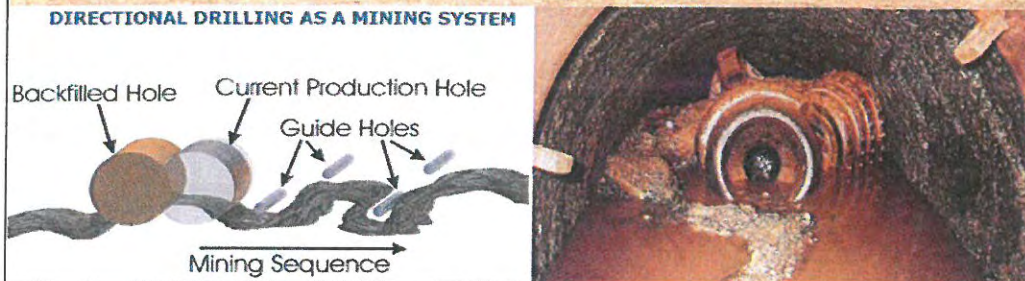
Annexure 1: Figure 3- Diagram illustrating the hydraulic mining method (top) and discharge of slurry to sea for beach accretion and seawall mining (middle and bottom).



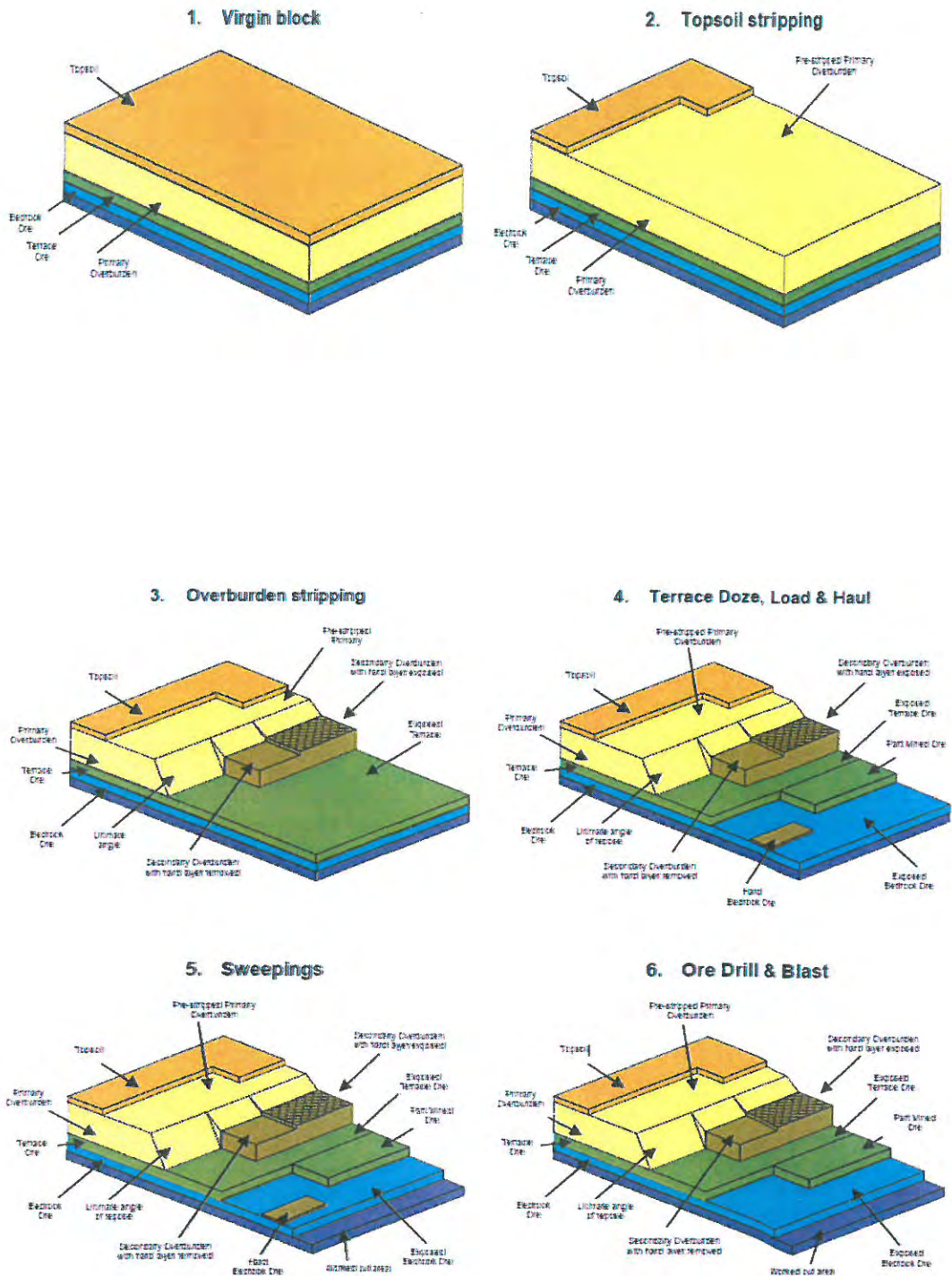
Annexure 1: Figure 4 - Navigational drilling: insets showing reaming of pilot hole (bottom right) and ore extraction method (bottom left)



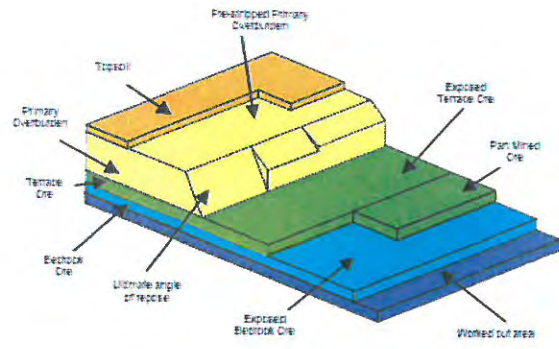
DIRECTIONAL DRILLING AS A MINING SYSTEM



Annexure 1: Figure 5 - Diagram illustrating open cast mining method employed



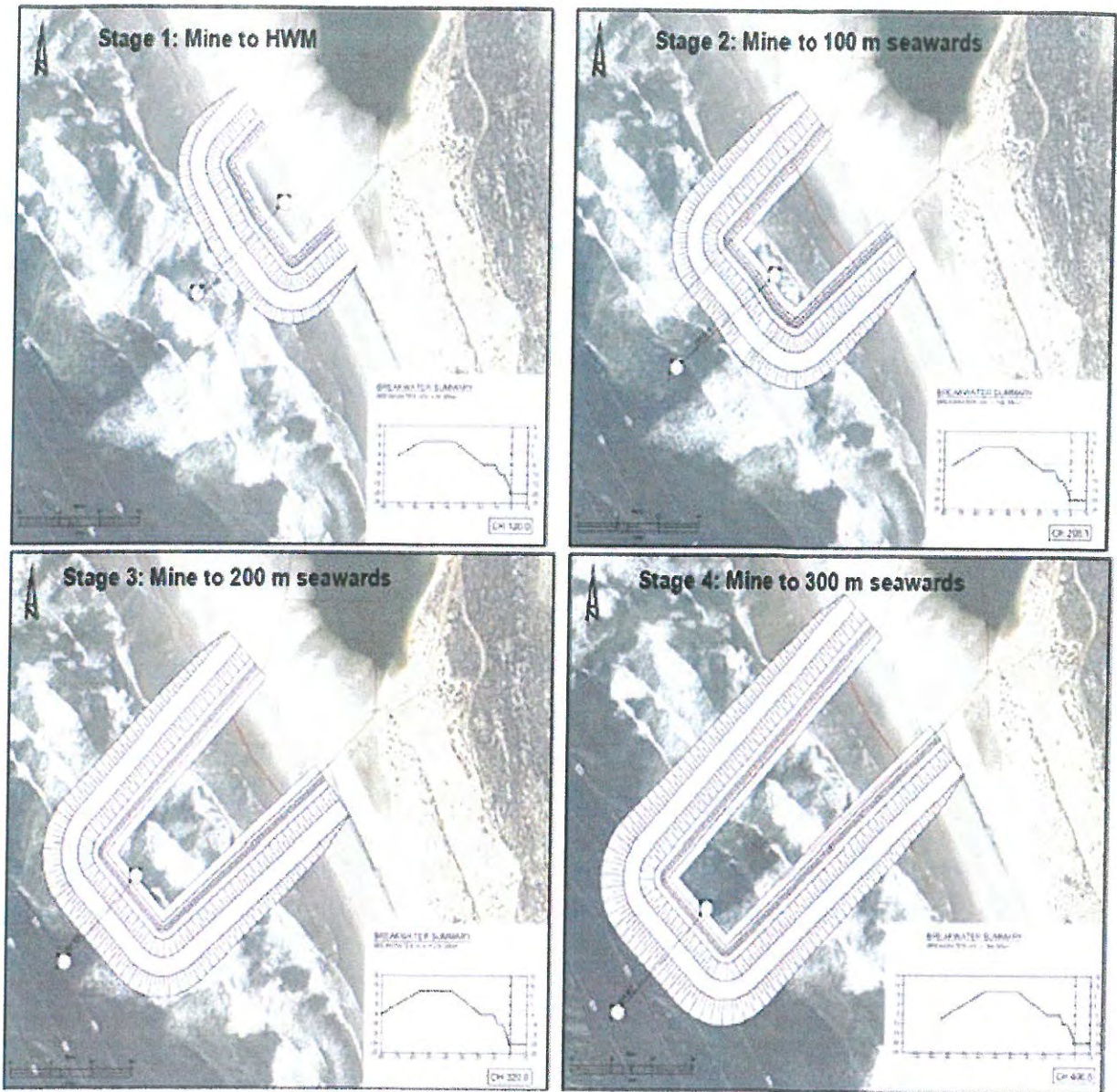
7. Overburden Drill & Blast



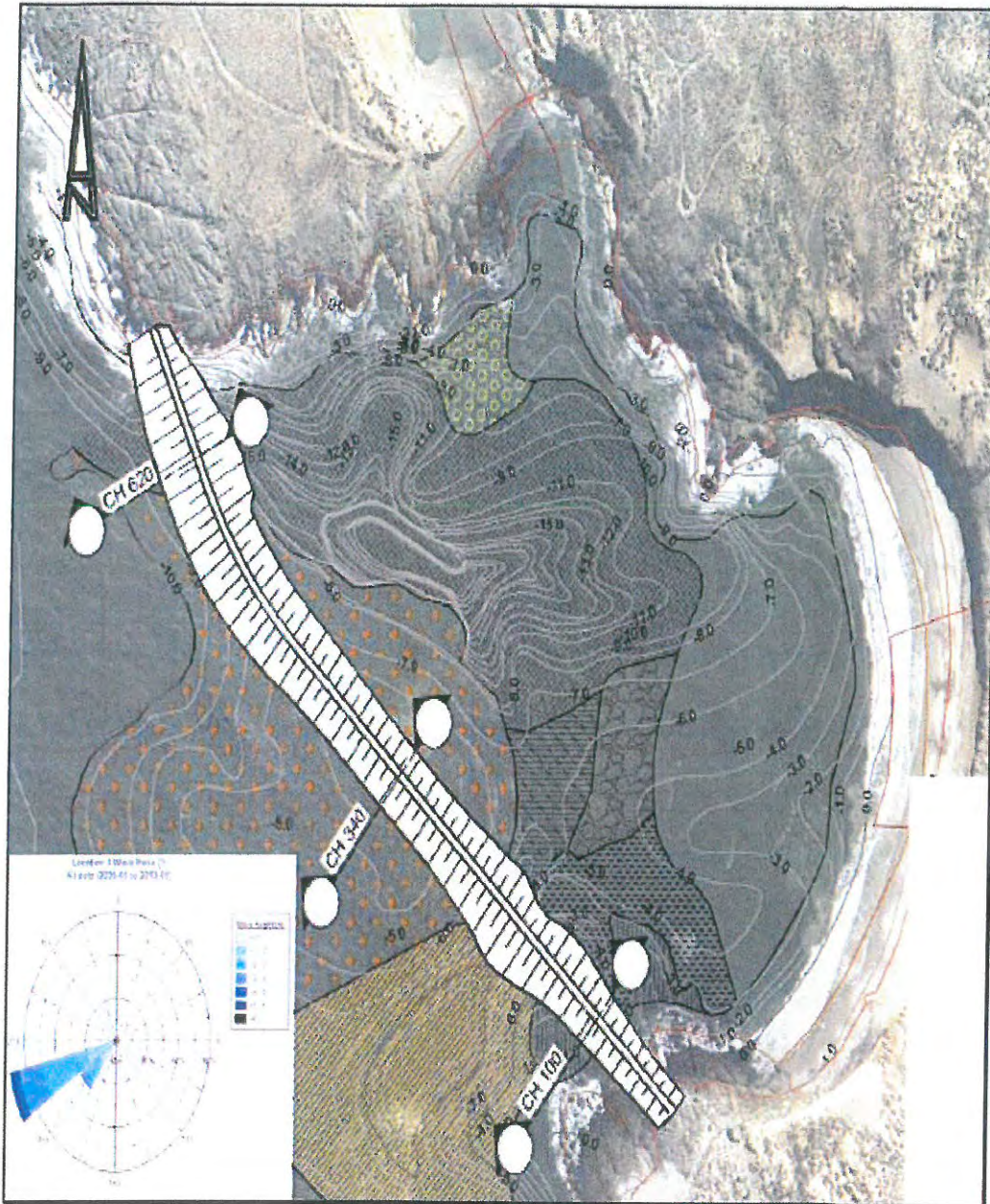
Annexure 1:Table 1- Resource Statement for the Koingnaas Mining Area

Resource Areas	Resource Classification	Ore (Mt)	Carats (Mct)	Grade (cpht)	Stone Size (ct/stone)
<u>Land mining & Onshore channels</u>					
KN Plant Area	Indicated	7,3	0,74	10,18	0,22
MB Plant Area	Indicated	4,3	0,41	9,39	0,21
KN Plant Area	Inferred	4,6	0,59	12,81	0,22
MB Plant Area	Inferred	3,3	0,43	12,94	0,22
KN TMR	Inferred	11,4	0,43	3,76	0,22
Samson's Bak area	Indicated	2,1	0,19	9,14	0,17
Samson's Bak area	Inferred	38,0	1,19	3,12	0,20
Total land	Inferred	57,3	2,64	4,61	0,22
<u>Surf-zone, Beach & Offshore channels</u>					
Surf-zone	Inferred	0,31	0,13	41,65	0,22
Beach & offshore channel	Deposit	4,66	0,82	17,66	0,20
Total	Indicated	13,7	1,34	9,78	0,20
Total	Inferred	57,6	2,8	4,81	0,21
Total	Deposit	4,66	0,82	17,66	0,20

Annexure 1: Figure 6.1 -Illustration of phased rock berm/coffer dam construction and extension along offshore channels



Annexure 1: Figure 6.2 - Proposed rock berm for mining at Rooiwal Bay



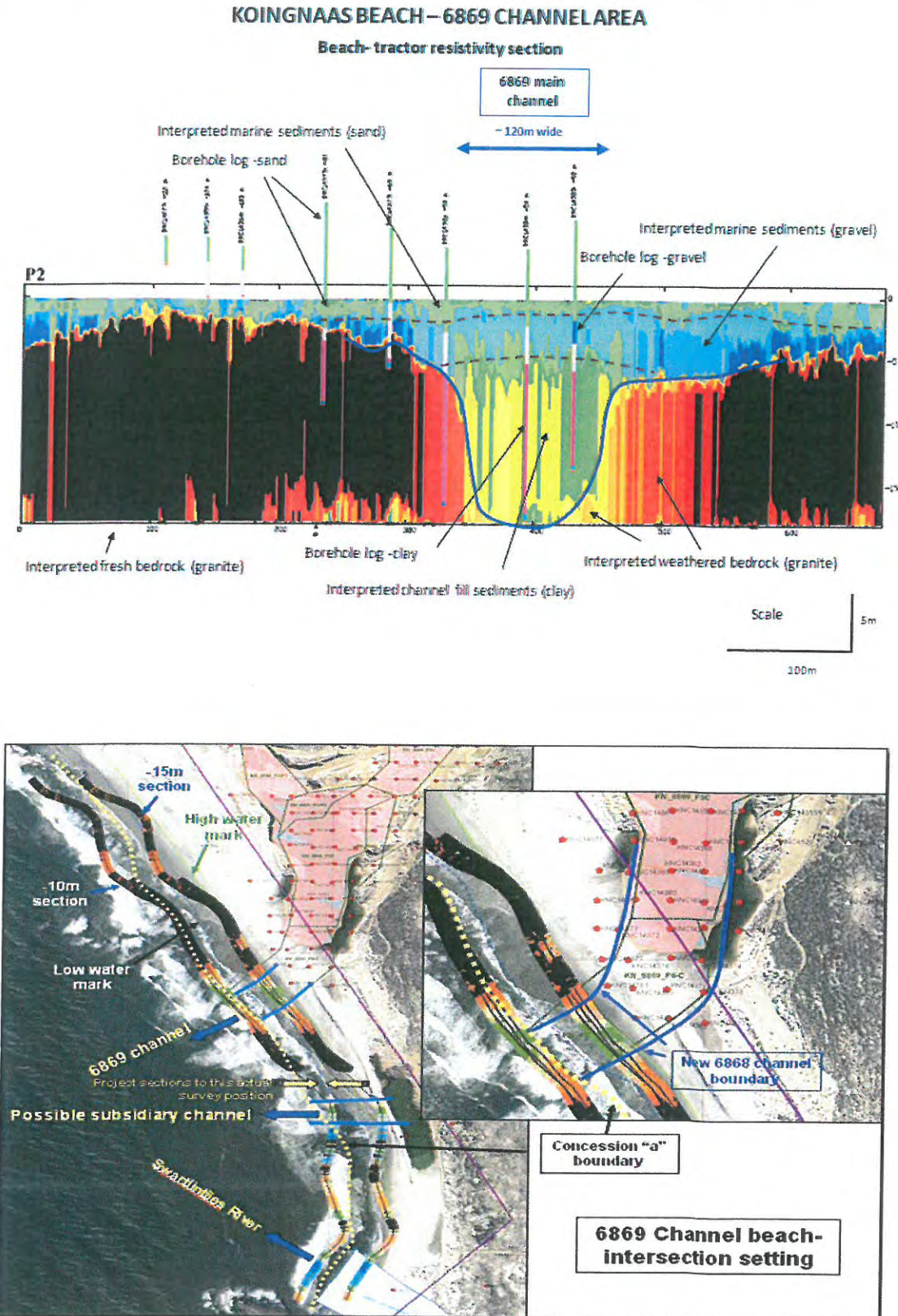
Annexure 2: Figure 1 - New SONIC drill rig in operation at Koingnaas



Annexure 2: Figure 2 - New WCR 10tph mobile DMS Prospecting Plant in transit (top) and in operation (bottom)



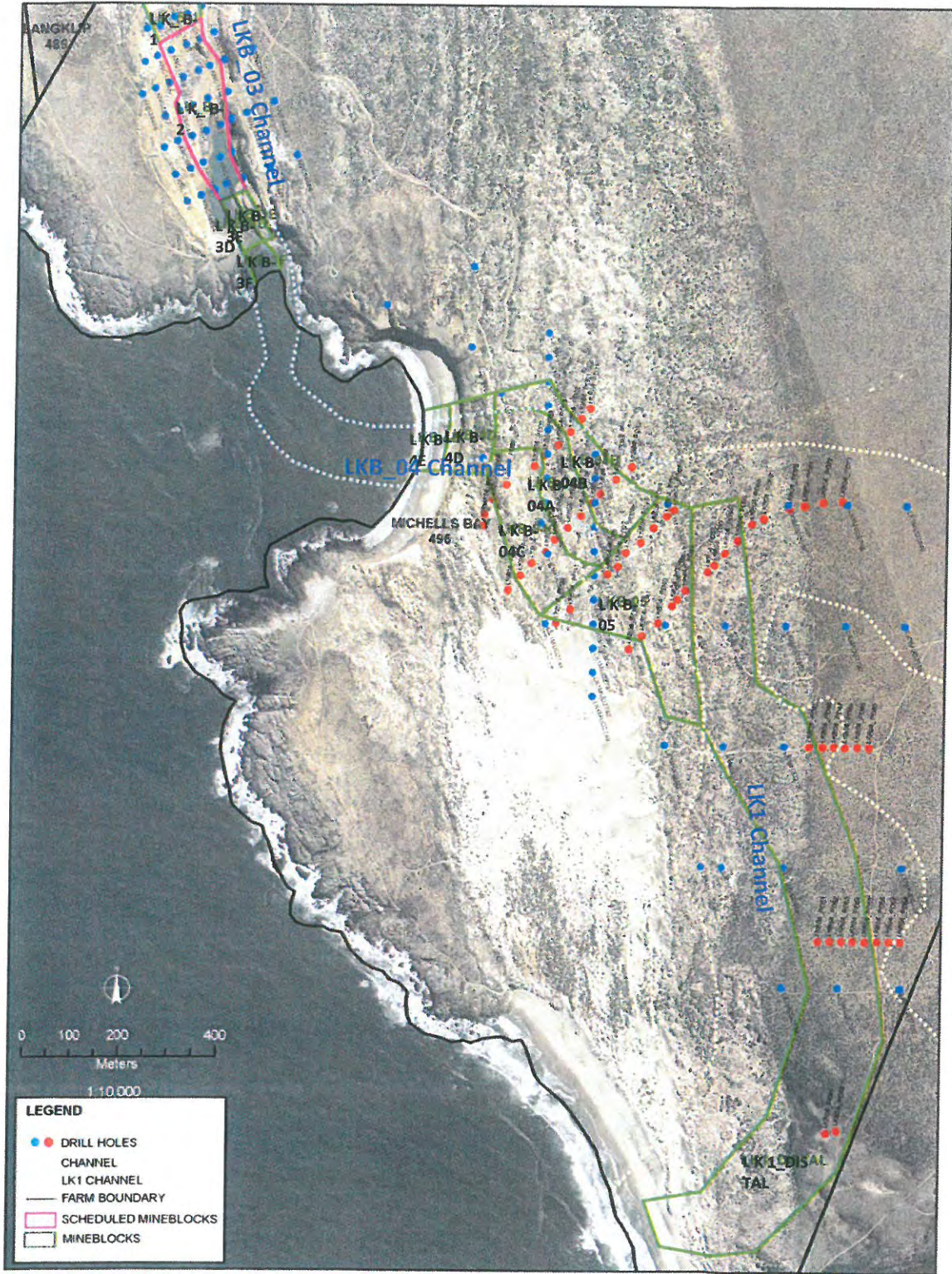
Annexure 3: Figure 1 - Result of a beach resistivity survey at the KN 6869 channel on Koingnaas showing channel depth definition (top) and channel boundary extensions (bottom)



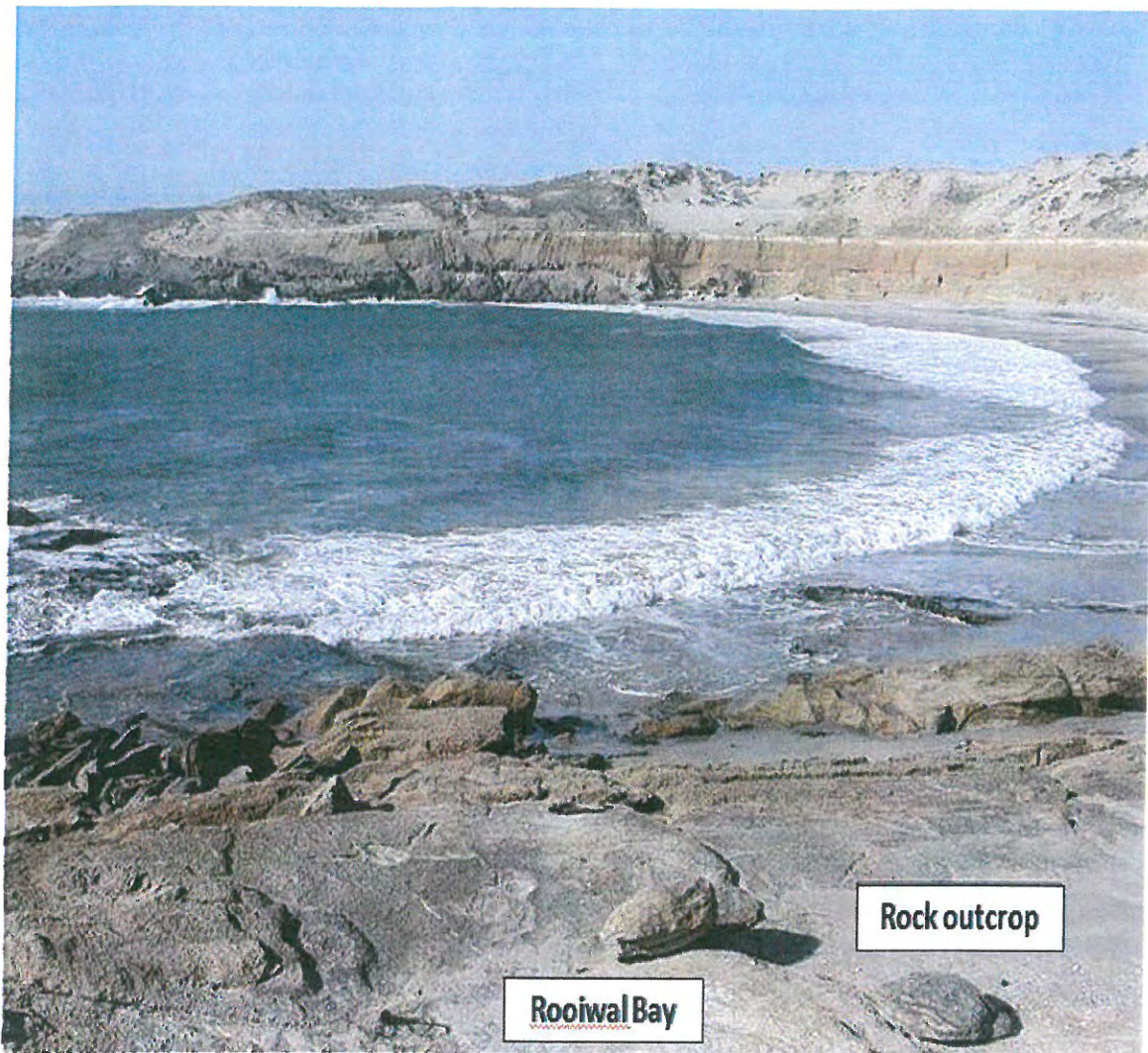
Annexure 3: Figure 2 - The LKB channel deposit showing channel outlines, one possible scenario for linking the LKB_03 and LKB_04 channels, drill coverage and mine blocks

LKB CHANNEL SHOWING GEOPHYSICAL DEFINITION,
DRILL HOLES AND MINE BLOCKS

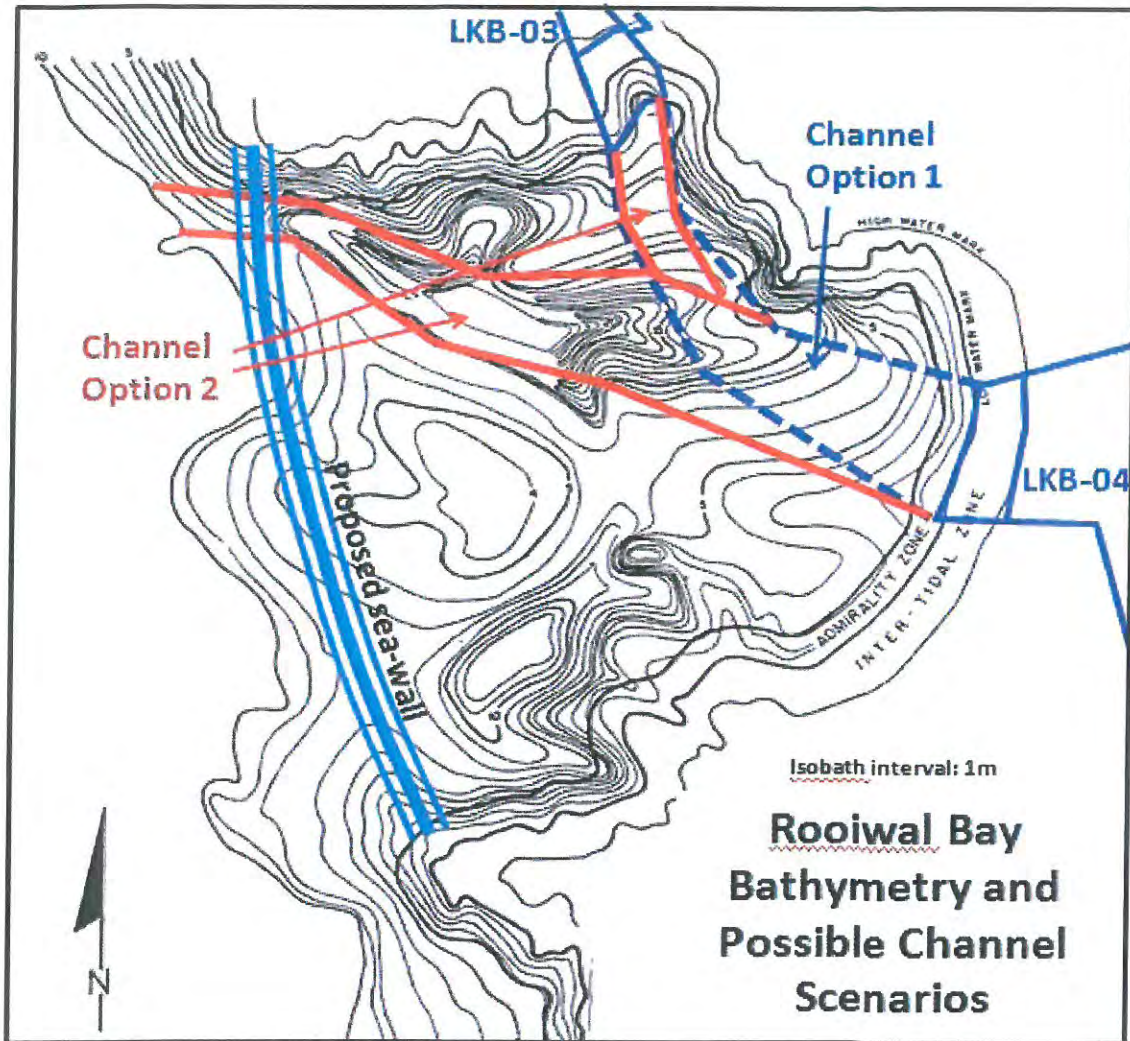
West Coast
Resources



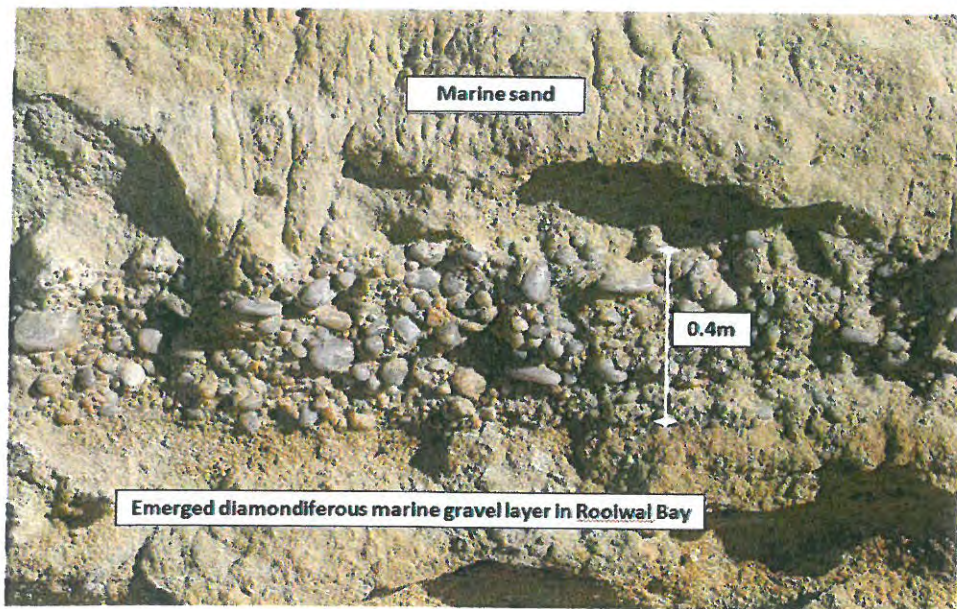
Annexure 3: Figure 3 - View north across Rooiwal Bay showing LKB-03 channel sediments on the far right side



Annexure 3: Figure 4 - Two possible scenarios for LKB-03 and LKB-04 channel configuration through Rooiwal Bay and proposed possible sea-wall location ('resource' estimate based on Option 1)



Annexure 3: Figure 5- Diamondiferous marine gravel layer in Rooiwal Bay



Appendix 2: Triggered listed activities

1. National Environmental Management Act, 1998 (Act No. 107 of 1998) listed activities

Table 1.1: Listed activities in terms of National Environmental Management Act, 1998 (Act No.107 of 1998)

Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1), 04 December 2014	17 (i), (iii), (iv), (d),(e), (f)	<p>Development;</p> <p>(i) in the sea;</p> <p>(ii) in an estuary;</p> <p>(iii) within the littoral active zone;</p> <p>(iv) in front of a development setback; or</p> <p>(v) if no development setback exists, within a distance of 100 metres water mark of the sea or an estuary, whichever is the greater;</p> <p>in respect of-</p> <p>(a) fixed or floating jetties and slipways;</p> <p>(b) tidal pools;</p> <p>(c) embankment;</p> <p>(d) rock revetments or stabilising structures including stabilising walls;</p> <p>(e) buildings of 50m² or more; or (f) infrastructure with a development footprint of 50 square metres or more but excluding</p> <p>(aa) the development of infrastructure and structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development is related to the development of a port or harbour, in which case Activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) the development of temporary infrastructure or structures where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared; or</p> <p>(dd) where such development occurs within an urban area.</p>

Appendix 2: Triggered Listed Activities

Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	19 (i) (ii)	<p>The infilling or depositing of any material of more than 5m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5m³ from-</p> <ul style="list-style-type: none"> (i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater, but excluding where such infilling, depositing, dredging, excavation, removal or moving- <ul style="list-style-type: none"> (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of Activity 21 in this Notice, in which case that activity applies.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	24	<p>The development of:(i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <ul style="list-style-type: none"> (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; <p>but excluding-</p> <ul style="list-style-type: none"> (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.

Appendix 2: Triggerred Listed Activities

Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	14	The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	9	The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.

Appendix 2: Triggered Listed Activities

Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014		The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	45	The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure- (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion- (aa) relates to transportation of water or storm water within a road reserve; or (bb) will occur within an urban area.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1),04 December 2014	46	The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure- (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion- (aa) relates to transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes within a road reserve; or (bb) will occur within an urban area.

Appendix 2: Triggered Listed Activities

National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1), 04 December 2014	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management Plan.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R983 (Listing Notice 1), 04 December 2014	26	Residential, retail, recreational, tourism, commercial or institutional developments of 1000 square metres or more, on land previously used for mining or heavy industrial purposes; excluding - (i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or (iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.

Appendix 2: Triggered Listed Activities

Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R985 (Listing Notice 3), 04 December 2014	4 a (ii) (ee)	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres in (a) Free State, Limpopo, Mpumalanga and Northern Cape provinces:</p> <ul style="list-style-type: none"> i. In an estuary; ii. Outside urban areas, in: <ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or (iii) In urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation

Appendix 2: Triggered Listed Activities

			purpose; or (cc) Seawards of the development setback line or within urban protected areas.	
Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations	
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R985 (Listing Notice 3), 04 December 2014	12 (d) (ii) (iii)		<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan :</p> <p>(d) in Northern Cape</p> <p>(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA 'or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(ii) within critical biodiversity areas identified in bioregional plans</p> <p>(iii) within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas or;</p> <p>(iv) on land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>

Appendix 2: Triggered Listed Activities

Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R984 (Listing Notice 2),04 December 2014	14 (ii) (iii)	<p>The development and related operation of-</p> <ul style="list-style-type: none"> (i) an island; (ii) anchored platform; or (iii) any other structure or infrastructure on, below or along the sea bed; excluding - <ul style="list-style-type: none"> (a) development of facilities, infrastructure or structures for aquaculture purposes; or (b) the development of temporary structures or infrastructure where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.

Appendix 2: Triggered Listed Activities

National Environmental Management Act, 1998 (Act No. 107 of 1998)	R984 (Listing Notice 2),04 December 2014	17	Any activity including the operation of that activity which requires a mining right as contemplated in Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Act	Number and date of relevant notice as per EIA Regulations	Activity No.	Listed activity as described in the Regulations
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R984 (Listing Notice 2),04 December 2014	21	Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.

Appendix 2: Triggered Listed Activities

National Environmental Management Act, 1998 (Act No. 107 of 1998)	R984 (Listing Notice 2),04 December 2014	23	The reclamation of an island or parts of the sea.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	R984 (Listing Notice 2),04 December 2014	26 (i) (iii) (iv) (v) (d)	Development-- (i) in the sea; (ii) in an estuary; (iii) within the littoral active zone; (iv) in front of a development setback; or (v) if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater; in respect of - (a) facilities associated with the arrival and departure of vessels and the handling of cargo; (b) piers; (c) inter- and sub-tidal structures for entrapment of sand; (d) breakwater structures; (e) coastal marinas; (f) coastal harbours or ports; (g) tunnels; or (h) underwater channels; but excluding the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

2. National Water Act, 1998 (Act No. 36 of 1998)

Table 2.1: Listings of activities in terms of National Water Act, 1998 (Act No. 36 of 1998) for the project. These activities will require a water use licence.

Act	Number of Section	Listing No.	Listed activity as described in this Section
National Water Act, 1998 (Act No. 36 of 1998)	Section 21	g	Disposing of waste in a manner which may detrimentally impact on a water resource

Appendix 2: Triggered Listed Activities

National Water Act, 1998 (Act No. 36 of 1998)	Section 21	h	Discharging waste or water containing waste into a water resource through a canal, pipe or sewer, sea outfall or other conduit
National Water Act, 1998 (Act No. 36 of 1998)	Section 21	j	Removing and/ or discharging of underground water if it is necessary for the efficient continuation of a activity or for the safety of people
National Water Act, 1998 (Act No. 36 of 1998)	Section 21	c	Impeding or diverting the flow of water in a water course
National Water Act, 1998 (Act No. 36 of 1998)	Section 21	i	Altering the bed, banks, course or characteristics of a water course

3. National Environmental Management: Integrated Coastal Management Act (24 of 2008)

Table 3.1: Listed activities in terms of National Environmental Management: Integrated Coastal Management Act (24 of 2008)

- Design capacity of existing slimes dam and safety risk status, however the ones at Mitchell's Bay appear to be adequate.
- Registration certificates for dams with a safety risk. All dams containing more than 50 000 m³ of water and have a vertical height of 5 m should be registered in terms of Chapter 12 of the National Water Act.
- Any dams for impounding wastewater, tailings or slurry must have minimum freeboard of 0.8 m above the full-supply level. Plans, specifications and designs must be Approved by a professional engineer and submitted to Department of Water and Sanitation (DWS). Water storage dam – Freeboard with respect to water storage dams can be Design, construct and maintain all water systems in such a manner as to guarantee the serviceability of such conveyances for flows up to and including those arising as a Result of the maximum flood with an average period of recurrence of once in 50 years.
- Defined as the distance between the full supply level (spillway crest level) and the lowest point on the dam wall crest.

Table 3.1: Listed activities in terms of National Environmental Management: Integrated Coastal Management Act (24 of 2008)