ECOLOGICAL BASELINE ASSESSMENT

FOR

PROPOSED BENTONITE AND ZEOLITE PROSPECTING RIGHT APPLICATION

ON

ERVEN 2224 AND RE/1015 HEIDELBERG, WESTERN CAPE

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1. INTRODUCTION AND BACKGROUND

Eco Impact Legal Consulting (Pty) Ltd (Eco Impact) has been appointed by the Imerys Refractory Mineral SA to assess the biodiversity and freshwater ecosystems impacts of the proposed prospecting activities on erven 2224 and RE/1015 near Heidelnerg in the Western Cape.

Imerys Refractory Minerals South Africa (Pty) Ltd t/a Cape Bentonite Mine is an existing Bentonite and Zeolite mining company operating on various farms in close proximity to the towns of Heidelberg and Riversdale that fall within the Hessequa Local Municipality and Eden District Municipality in the Western Cape Province.

Cape Bentonite Mines proposes to apply for a prospecting right to prospect for bentonite and zeolite on the erven 2224 and RE/1015 near the town of Heidelberg in the Western Cape.

The ***proposed prospecting activities*** will entail the following phases:

- ***Phase 1 – Field Mapping and Surveying***

A qualified geologist will survey/explore the transformed cultivated areas on the proposed prospecting property by foot and map potential visible bentonite and zeolite outcrops. If such visible outcrops are found on the transformed cultivated areas of property the geologist will map these areas for potential sampling during phase 3.

- ***Phase 2 – Literature Review***

A qualified geologist will research known geological literature of the property and surrounds to assist in determining approximate location of viable bentonite and zeolite deposits on the transformed cultivated areas of the property.

After the completion of phases 1 and 2 the geologist will produce potential bentonite and zeolite deposits maps for the property which will serve as guidelines for the next phase which will entail drilling and sampling.

- ***Phase 3 –Drilling and Sampling***

Direct push sampler drilling and sampling **–** using the maps as produced by the geologist during phases 1 and 2 the geologist will determine which orebodies must be investigated further by direct push sampler drilling. This is conducted by the mining company itself and involves the use of a direct push sampler drill rig.The drill rig will push a stainless steel tube of 50-60cm long into the ground, once full it will bring it up and the sample will be taken out. This process will be carried out until bentonite is found or reaching the depth of around 6m. The hole will then immediately be rehabilitated by backfilling and a month later the site is revisited to detrmine if any the holes re-opened due to decompaction. The sampler holes will have the following maximum temporary footprints – Diameter 60mm; depth 6m = 3.6m^3 overburden material produced by drilling to be backfilled immediately after sample has been taken. Samples would be collected according to the geology. Approximately 1000 sampler holes are proposed for the property, but final proposed direct sampler holes's amount will be determined during the completion of phases 1 and 2 therefore proposed direct sampler holes amount might increase or decrease.

Boreholes and sampling - following the results of the samples collected during the direct push sampler drilling, a qualified drilling contractor will be appointed by the mining company and under the guidance and supervision of the qualified geologist conduct the following drilling activities on the areas as identified by the geologist. Drilling involves using a rotary percussion drilling rig bringing samples to the surface in the form of chips. The drilled boreholes will have the following maximum temporary footprints - diameter 0.2m by 0.2m; depth 30m = 12 m^3 maximum overburden material produced per borehole to be replaced immediately after sample has been taken. <1kg of sample material is collected by the geologist from each borehole for testing. The drilling samples collected are sent to the

laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body. Approximately 60 drilling sections/lines with 3 boreholes each are proposed for the property = approximately 180 boreholes in total for the property, but final proposed boreholes amount will be determined during the completion of phases 1 and 2 and direct push sampler drilling results and the number of proposed drilling boreholes therefore might increase or decrease.

Rehabilitation – immediately (same day) following samples taken during drilling as described above the excavated material will be replaced and existing agricultural land contour structures will be reinstated. The disturbed prospecting areas will be monitored for signs of erosion for at least six months after sampling and erosion rectification and prevention measures will be implemented as and if required. Alien invasive and weed vegetation monitoring and removal will be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.

- ***Phase 4 – Sample Analysis***

<1kg of sample material is collected by the geologist from each borehole for testing. The samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body**.**

- ***Phase 5 – Maps, Reserve and Resource Modelling***

Maps will be produced showing the location, depth and extent of physical prospecting work, together with, sampling points and the lithology, mineral content and mineral distribution identified, relative to the prospecting area. Following the results of sample analysis conducted the geological reserve modelling is done by using SURPAC and AUTOCAD geological software to determine the grades and quantities of available bentonite and zeolite resources and produce the feasibility reports for the property as investigated/surveyed.

Sensitive environmental features that were identified on the property include indigenous vegetation remnants which exists throughout the property and consists of Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas (“CBA”) as according to the Fine Scale Planning (“FSP”) for Hessequa, as well as scattered Milkwood trees (*Sideroxylyn inerme*) within the cultivated lands. Refer to Map 4.

Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas (“CBA”) and Ecological Support Areas (“ESA’) and National Wetland Freshwater Ecosystems Priority Areas (“NFEPA”). Refer to Map 5.

Prospecting will however not be done on any area demarcated as terrestrial or aquatic CBA or ESA nor on any NFEPAs or indigenous vegetation areas. Individual Milkwood trees within cultivated lands will be demarcated and not be impacted upon.

Significant direct impacts potentially associated with the prospecting excavation phase are direct loss of indigenous terrestrial and aquatic vegetation and disturbance of soil which may lead to partial disruption of ecological processes due to fragmentation of habitat and erosion. The extent in this case would be local. Indirect impacts would occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien vegetation to partial disruption of ecological processes due to the effects of the alien species encroachment and/or erosion. The extent of the potential indirect impacts in this case would

be local.

Where no existing gravel roads exists as buffer areas an buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. The proposed buffer areas may only be used as roads and for stormwater/erosion management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.

The ecological baseline assessment concluded that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property as indicated on Map 4 of this report and the specialist recommendations as listed in this report are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site.

IMPORTANT NOTE: Proposed prospecting activities as referred to throughout the report include all activities associated with the proposed prospecting activities such as any trenching and drilling excavations, site establishment, demarcations, , any vehicular movements, use of access and internal road infrastructure, topsoil and overburden storage, implementation of rehabilitation measures etc.

2. METHODOLOGY, ASSUMPTIONS AND LIMITATIONS OF THE STUDY

Input into this report was informed by a combination of desktop assessments of existing biodiversity and freshwater ecosystem information for the study area and catchment, as well as by a more detailed assessment of the freshwater features at the site.

The site was visited in June 2018. During the field visit, the characterisation and integrity assessments of the ecological features were undertaken. Mapping of the features was undertaken using Google Maps with GPS tracker. The features were mapped while doing the field survey. The SANBI Biodiversity GIS website was also consulted to identify any constraints in terms of fine-scale biodiversity conservation mapping as well as possible freshwater features mapped in the Freshwater Ecosystem Priority Areas maps. This information/data was used to inform the resource protection related recommendations.

The basic terms of reference (TOR) for this study were the Cape Nature recommended TOR for biodiversity specialists, and are as follows:

- Produce a baseline analysis of the botanical attributes of the study area as a whole.
- This report should clearly indicate any constraints that would need to be taken into account in considering the development proposals further.
- The baseline report must include a map of the identified sensitive areas as well as indications of important constraints on the property. It must also:
- Describe the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering viability etc.

In terms of biodiversity pattern, identify or describe:

Community and ecosystem level

- The main vegetation type, its aerial extent and interaction with neighbouring types, soil or topography;
- The types of plant communities that occur in the vicinity of the site
- Threatened or vulnerable ecosystems (*cf. SA vegetation map/National Spatial Biodiversity Assessment, etc.*)

Species level

- Red Data Book species of conservation concern (RDBSCC) - (provide location)
- The viability of and estimated population size of the RDBSCC that are present (include degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High = 70-100% confident, Medium 40-70% confident, Low 0-40% confident)
- The likelihood of other RDBSCC species occurring within the vicinity (include degree of confidence)

Other pattern issues

Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity.

- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying
- The condition of the site in terms of current or previous land uses

In terms of biodiversity process, identify or describe:

- The key ecological "drivers" of ecosystems on the site and in the vicinity, such as fire.
- Any mapped spatial component of an ecological process that may occur at the site or in the vicinity i.e. watercourses, biome boundaries, migration routes etc.
- Any possible changes in key processes e.g. increase fire frequency or drainage/artificial recharge of aquatic systems.

- Describe what is the significance of the potential impact of the proposed project – with and without mitigation – on biodiversity pattern and process at the site, landscape, and regional scales.

- Recommend actions that should be taken to prevent or mitigate impacts. Indicated how these should be scheduled to ensure long-term protection, management and restoration of affected ecosystems and biodiversity.

- Indicate limitations and assumptions, particularly in relation to seasonality.

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of freshwater ecosystems. The following techniques and methodologies were utilized to undertake this study as/if required:

- The ecological importance and sensitivity assessment as associated with aquatic systems was conducted according to the guidelines as developed by DWAF (1999).
- Recommendations are made with respect to the adoption of buffer zones within the development site, based on the wetlands functioning and site characteristics.

The level of aquatic assessment undertaken was considered to be adequate for this study.

3. BROAD ECOLOGICA CHARACTERISTICS OF THE SITE AND SURROUNDS

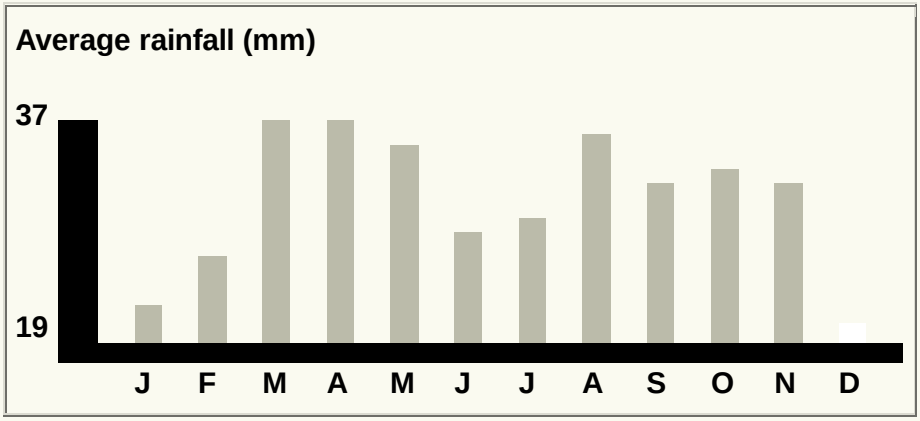
3.1. TOPOGRAPHY

The farm is characterised by its undulating landscape with associated steep slopes, drainage lines and gorges which limits the extent of cultivation to moderate slopes and flat lying areas.

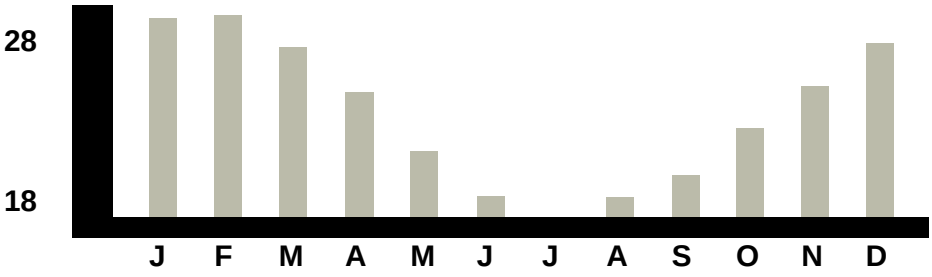
3.2. CLIMATE

Heidelberg (WC) normally receives about 366mm of rain per year, with rainfall occurring throughout the year. The chart below (lower left) shows the average rainfall values for Heidelberg (WC) per month. It receives the lowest rainfall (19mm) in December and the highest (37mm) in March. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Heidelberg (wc) range

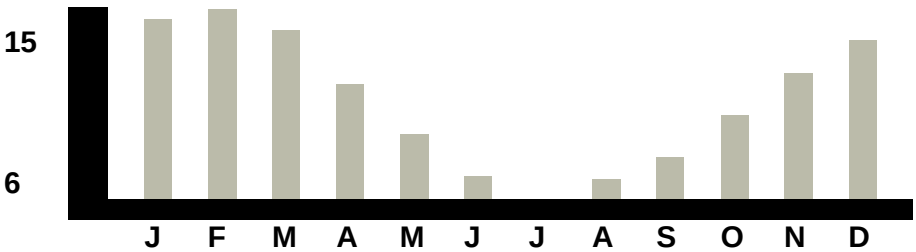
from 18°C in July to 27.5°C in February. The region is the coldest during July when the mercury drops to 5.8°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.



Average midday temperature (°C)



Average night-time temperature (°C)



3.3 GEOLOGY

On a regional level the site geology is derived from the Bokkeveld group as part of Worcester Normal Fault of the Cape Fold Belt Area.

On a local level the site geology consists mainly of volcanic sedimentary deposit in the early Cretaceous layers composed of continental layers from Alluvial to Siltstones and Lacustine.

3.4 VEGETATION AT A NATIONAL AND REGIONAL CONTEXT

The study area is part of the Fynbos biome, located within what is now known as the Core Region of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is one of only six Floristic Regions in the world, and is the only one largely confined to a single country (the Succulent Karoo component extends into southern Namibia). It is also by far the smallest floristic region, occupying only 0.2% of the world's land surface, and

supporting about 11500 plant species, over half of all the plant species in South Africa (on 12% of the land area). At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Many of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. Data from the nationwide plant Red Listing project indicate that 67% of the threatened plant species in the country occur only in the southwestern Cape, and these total over 1800 species (Raimondo *et al* 2009)! It should thus be clear that the southwestern Cape is a major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species.

The study area lies within the East Coast Renosterveld bioregion (Mucina & Rutherford 2006). This bioregion has a moderately distinct flora, and high numbers of plant Species of Conservation Concern, with the main pressures being extensive habitat loss, due mainly to agriculture, followed by alien invasive vegetation, quarrying and urbanisation, and habitat modification due to lack of appropriate fire regimes. Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas ("CBA") as according to the Western Cape Biodiversity Plan ("WCDP") 2017, is the indigenous vegetation type remaining within the area.

The study area falls within the planning domain of the Hessequa Municipality Fine Scale Conservation Plan (Pence 2008) and the WCDP (2017). These conservation plans have identified Critical Biodiversity Areas (CBAs) which aims to guide sustainable development by providing a synthesis of biodiversity information to decision makers. It serves as the common reference for all multi-sectoral planning procedures, advising which areas can be lost to development, and which areas of critical biodiversity value and their support zones should be protected against any impacts. The CBAs and ESAs as mapped for the relevant property is shown in Maps 4 and 5. The primary reason for selection of these areas as terrestrial and/or aquatic CBAs and/or ESAs is that it helps meet the national conservation target for threatened vegetation types, and ancillary reasons are that it offers opportunities for continuation of ecological connectivity especially related to the hydrological connectivity of the drainage lines.

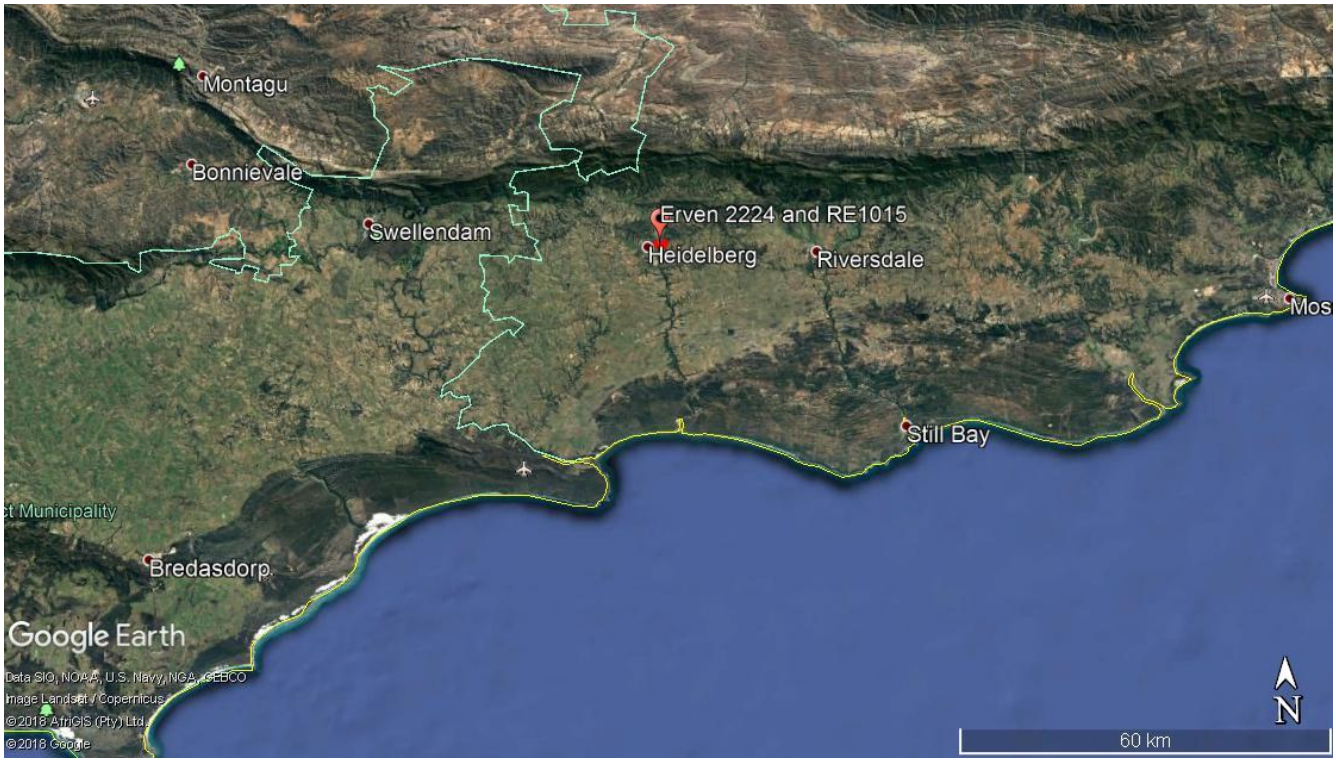
3.5 FRESHWATER ECOLOGICAL FEATURES

Several non-perennial secondary drainage lines is located throughout the property due to the undulating nature of the topography which eventually feeds into manmade dams and eventually the Duiwenhoks River.

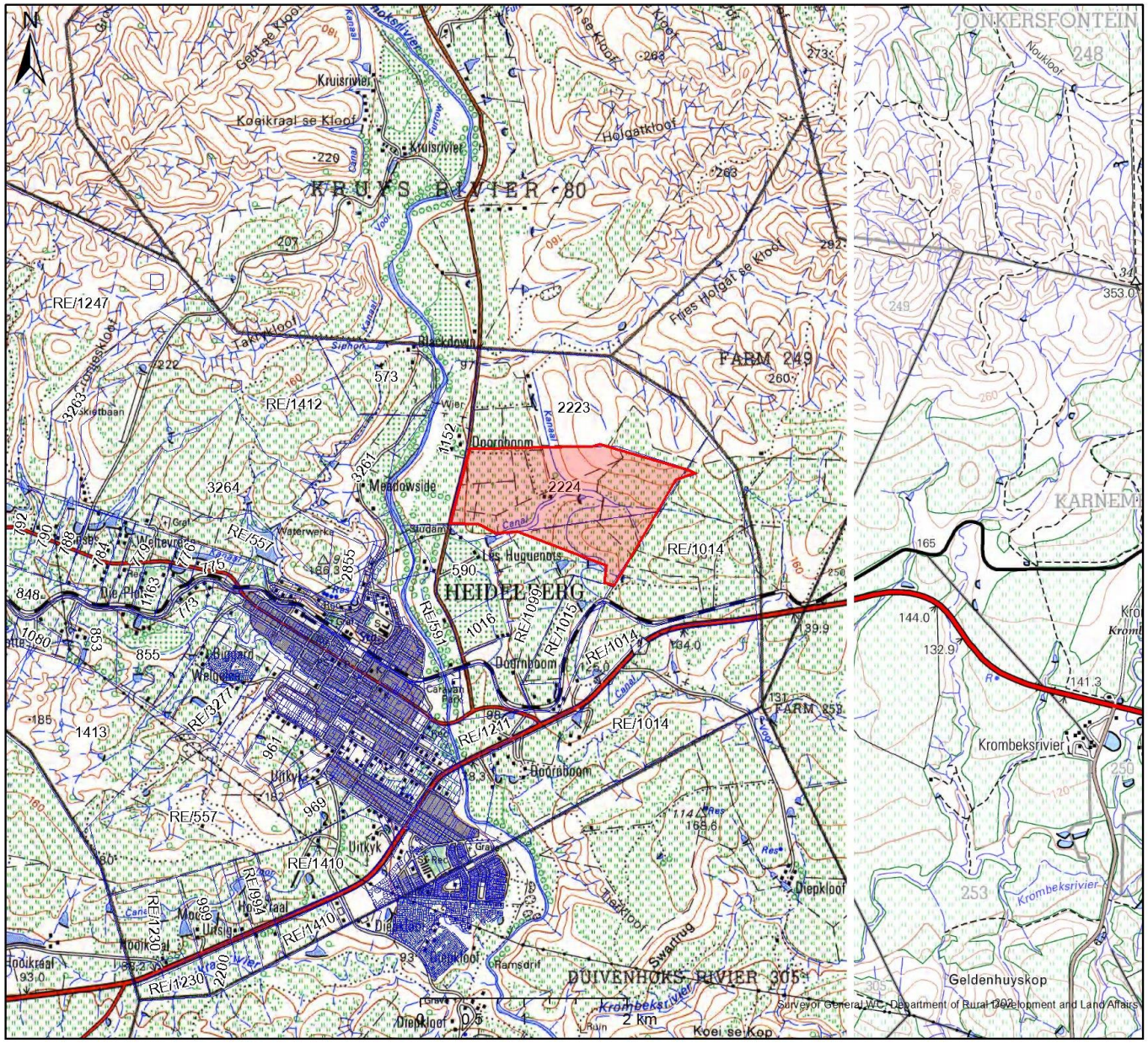
Most of the drainage lines with their associated wetland characteristics are in a moderate to good condition as they are located within the "klowe" too steep to plough and surrounded by indigenous vegetation remnants which also remains because the areas are too steep to plough for cultivation.

3.6 MAPS

Map 1: Locality of Heidelberg and Riversdale in the Western Cape.



Map 2: Locality of the Erven 2224 and RE1015 near Heidelberg in the Western Cape.
GPS co-ordinate for "middle" of surveyed site - 34° 04' 37.06"S
20° 58' 25.57"E



Erven 2224 and RE/1015

Legend

☐ Erf

Scale: 1:50 000

Date created: August 1, 2018

Western Cape Government
Agriculture

Surveyor General WC, Department of Rural Development and Land Affairs

Map 3: The 1 in 50 000 topographical map for the study area – Erven 2224 and RE1015

Erven 2224 and RE1015 Prospecting Right

Legend

Erf

Rivers (Strahler Stream Order)

- 5
- 4
- 3
- 2
- 1

Rivers

- Dry Water Course
- Non-Perennial
- Perennial
- Rapids
- Waterfall

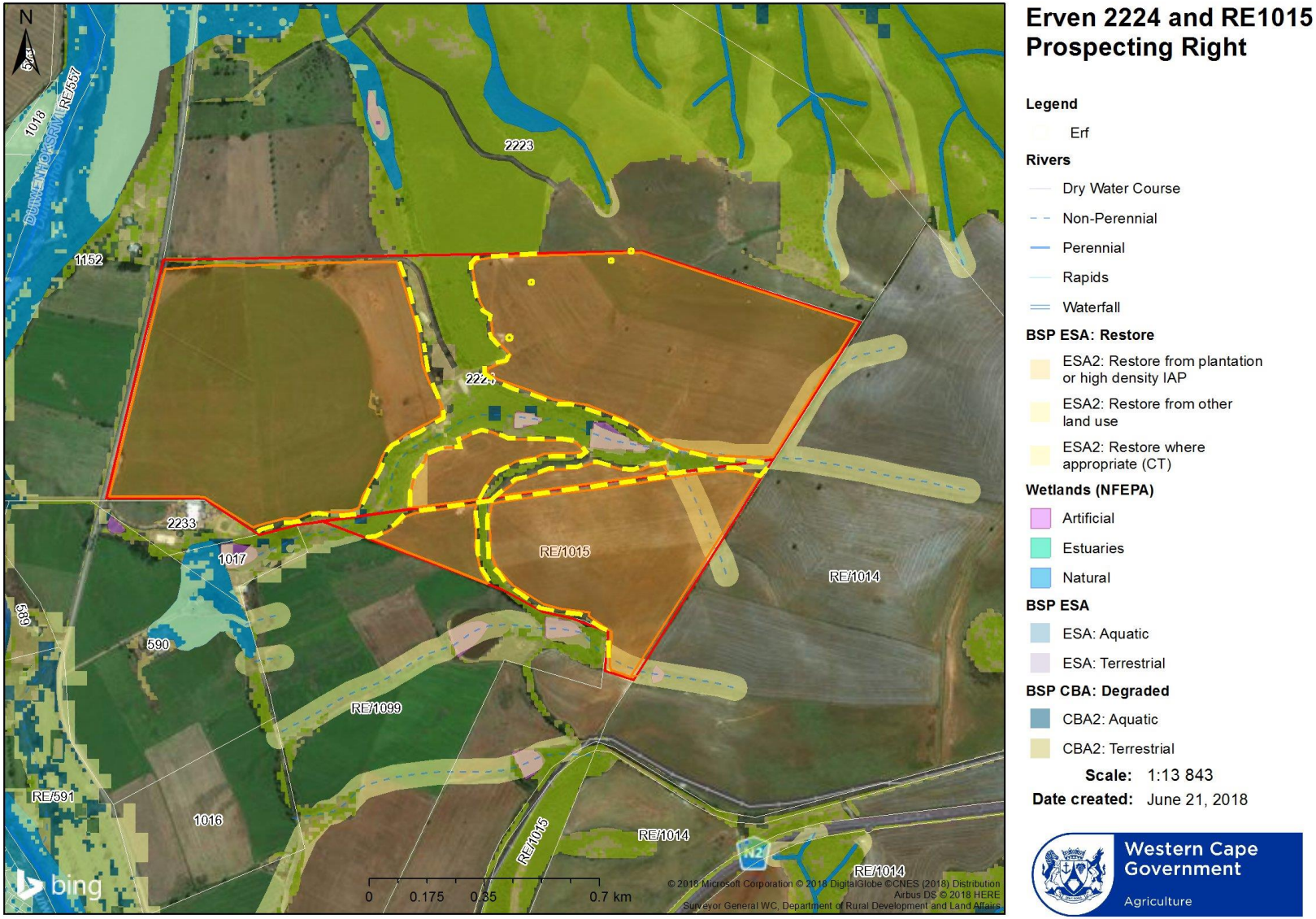
Wetlands (NFEPA)

- Artificial
- Estuaries
- Natural

Scale: 1:13 843
Date created: June 21, 2018

Western Cape Government
Agriculture

Map 4: Proposed prospecting activities areas of ±126ha as surveyed (outlined in orange and yellow dash). Artificial/man-made and Natural National Freshwater Ecosystem Priority Areas ("NFEPA") on the site and surrounds.



Erven 2224 and RE1015 Prospecting Right

Legend

Erf

Rivers

- Dry Water Course
- Non-Perennial
- Perennial
- Rapids
- Waterfall

BSP ESA: Restore

- ESA2: Restore from plantation or high density IAP
- ESA2: Restore from other land use
- ESA2: Restore where appropriate (CT)

Wetlands (NFEPA)

- Artificial
- Estuaries
- Natural

BSP ESA

- ESA: Aquatic
- ESA: Terrestrial

BSP CBA: Degraded

- CBA2: Aquatic
- CBA2: Terrestrial

Scale: 1:13 843

Date created: June 21, 2018

Western Cape Government
Agriculture

Map 5: Biodiversity GIS ("BGIS") land use map indicating mapped terrestrial and aquatic Critical Biodiversity Areas ("CBA"), Ecological Support Areas ("ESA") and associated buffer areas as according to WCDP (2017) in relation to the proposed prospecting activities areas on transformed cultivated agricultural land (as outlined in orange and yellow dash). The yellow circles indicate locations of four scattered Milkwood trees not to be impacted upon.

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4. OBSERVATIONS AND FINDINGS RELATIVE TO THE TERMS OF REFERENCE

4.1 THE MAIN VEGETATION TYPE/S AND PLANT COMMUNITIES THAT OCCUR ON AND OR/IN THE VICINITY OF THE SITE

Critically Endangered - Eastern Ruens Shale Renosterveld as according to the Western Cape Biodiversity Plan ("WCDP") 2017, is the indigenous vegetation type within the immediate area.

Observations and Findings:
All proposed prospecting activities areas as delineated in orange and yellow dash lines on Maps 4 and 5 have been completely transformed due to agricultural cultivation except for four scattered individual Milkwood trees remaining within the cultivated agricultural lands.

The remaining Eastern Ruens Shale Renosterveld remnants are located in-between the transformed cultivated areas, along the drainage line areas associated with steep slopes which could not be ploughed for cultivation.

From the site survey conducted and most recent google earth map images it is evident that the proposed prospecting activities areas have been ploughed and cultivated within the last year 2017-2018. Except for four scattered individual Milkwood trees remaining within the cultivated agricultural lands, which must not be impacted upon, no natural, near natural or rehabilitating indigenous vegetation remnants are located on the proposed prospecting activities areas.

4.2 FUANA AND AVIFAUNA COMMUNITIES THAT OCCUR ON AND OR/IN THE VICINITY OF THE SITE

Fish

Observations and Findings:
Neither fish species nor their associated habitats are present on the proposed prospecting activities areas.

Invertebrates

Observations and Findings:
It is expected that the area has a rich and diverse invertebrate life especially within the remaining indigenous vegetation areas. The proposed prospecting activities, if restricted to recommended areas, will not have significant detrimental impact on invertebrate species within the sensitive indigenous vegetation and drainage line areas as identified on the property.

Birds (Avifauna)

Approximately 164 species are known to occur in the bigger area (Hockey et al 2006).

Observations and Findings:
No bird species of conservation concern ("SCC") or their associated habitats were observed on the proposed prospecting activities areas at the time of the survey.

If recommendations as provided in this report are adhered to it is not expected that the proposed prospecting activities will have a significant detrimental impact on any bird SCC or their habitat due to extensive undeveloped areas that will remain as is adjacent to proposed mining areas.

Mammals

As reported in Smithers (1983) small buck e.g. common duiker, steenbok and grysbok, bushbuck, rodents such as mole rats, field mice and hares, as well as carnivores such as genets, mongoose and caracal are likely to inhabit the area.

Some 70 mammal species are known to occur in the bigger area (Smithers 1983).

Observations and Findings:
No mammal SCC or their associated habitats were observed on the proposed prospecting areas at the time of the survey.

If recommendations as provided in this report are adhered to it is not expected that the proposed activities will have a significant detrimental impact on any mammal SCC concern or their habitat due to extensive undeveloped areas that will remain as is adjacent to proposed mining areas.

Amphibians and Reptiles (Herpetofauna)

With respect to amphibians, Minter et al (2004) state that "habitat loss or modification as a result of agriculture and other forms of human activity remains the most important single threat to the survival of amphibian populations. The scale of these changes and their relative permanence are the major cause. At greatest risk are species that have limited distributions."

As reported in Alexander et al (2007) 26 reptile species are likely to inhabit the area.

Observations and Findings:
No amphibian or reptile SCC or their associated habitats were observed on the proposed prospecting areas at the time of the survey.

If recommendations as provided in this report are adhered to it is not expected that the proposed prospecting activities will have a significant detrimental impact on any amphibian or reptile SCC concern or their habitats due to extensive undeveloped areas that will remain as is adjacent to proposed mining areas.

Before and during clearing activities, search and rescue of tortoises must be conducted on site. All tortoises collected must be released on the adjacent areas that will not be impacted upon.

4.3 IN TERMS OF BIODIVERSITY PATTERN, IDENTIFY OR DESCRIBE, AT SPECIES LEVEL - THE VIABILITY OF, AND ESTIMATED POPULATION SIZE OF THE TOPS AND RDB SPECIES OF CONSERVATION CONCERN THAT ARE PRESENT

Red Data Listed or species listed under TOPS regulation (Vegetation)

The original natural vegetation types on the greater property and surrounds have been mapped as Eastern Ruens Shale Renosterveld (*Critically Endangered*).

Observations and Findings:
(High 100% confident):
It is expected that several vegetation SCC are located within the remaining natural to near natural areas on the property however all proposed mining activities areas as delineated in orange and yellow dash lines on Maps 4 and 5 have been transformed due to agricultural cultivation and the only remaining indigenous vegetation SCC present within these areas are four scattered Milkwood trees which is an protected tree species and which may not be impacted upon by the proposed activities.

Red Data Listed or species listed under TOPS regulation (Reptiles and Amphibians)

Observation and Findings:

(High 100% confident):
As the proposed prospecting activities areas are to be located on annually cultivated agricultural land no SCC amphibian or reptile species are known and expected to occur within these areas and no rare or localized species were recorded at the time of the survey.

Red Data Listed or species listed under TOPS regulation (Mammals)

The following table lists the Red Data mammal species (including their status) which are predicted, or confirmed to occur in the general area and possibly within the study area (Friedman & Daly, 2004):

RED DATA MAMMAL SPECIES				
	COMMON NAME	**SCIENTIFIC NAME**	**RED DATA CATEGORY**	**PREDICTED OCCURENCE**
1	Lesueur's Wing-gland Bat	Cistugo lesueuri	Near threatened	Unlikely
2	Long-tailed Serotine Bat	*Eptesicus hottentotus*	Least Concern	Unlikely
3	Schreibers' Long-fingered Bat	*Miniopterus schreibersii*	Near Threatened	Possible
4	Temminck's Hairy Bat	*Myotis tricolor*	Near Threatened	Possible
5	Cape Serotine Bat	*Neoromicia capensis*	Least Concern	Possible
6	Egyptian Split Faced Bat	*Nycteris thebaica*	Near threatened	Possible
7	Cape horseshoe bat	*Rhinolophus capensis*	Near threatened	Possible
8	Geoffroy's horseshoe bat	*Rhinolophus clivosus*	Near threatened	Possible
9	Egyptian Fruit Bat	*Rousettus aegyptiacus*	Least Concern	Possible
10	Egyptian Free-tailed Bat	*Tadarida aegyptiaca*	Least Concern	Possible
11	Rock Hyrax	*Procavia capensis*	Least Concern	Unlikely
12	Cape Clawless Otter	*Aonyx capensis*	Least Concern	Unlikely
13	Water Mongoose	*Atilax paludinosus*	Least Concern	Possible
14	Black-backed Jackal	*Canis mesomelas*	Least Concern	Unlikely
15	Caracal	*Caracal caracal*	Least Concern	Likely
16	Yellow Mongoose	*Cynictis penicillata*	Least Concern	Possible
17	African Wild Cat	*Felis silvestris*	Least Concern	Unlikely
18	Small Grey Mongoose	*Galerella pulverulenta*	Least Concern	Possible
19	Small-spotted Genet	*Genetta genetta*	Least Concern	Unlikely
20	Large-spotted Genet	*Genetta tigrina*	Least Concern	Unlikely
21	Large Grey Mongoose	*Herpestes ichneumon*	Least Concern	Possible
22	Striped Polecat	*Ictonyx striatus*	Least	Unlikely

			Concern	
23	Honey badger	*Mellivora capensis*	Near threatened	Unlikely
24	Bat-eared Fox	*Otocyon megalotis*	Least Concern	Likely
25	Leopard	*Panthera pardus*	Least Concern	Unlikely
26	African Weasel	*Poecilogale albinucha*	Data deficient	Unlikely
27	Aardwolf	*Proteles cristatus*	Least Concern	Unlikely
28	Cape Fox	*Vulpes chama*	Least Concern	Unlikely
29	Red Hartebeest	*Alcelaphus buselaphus*	Least Concern	Unlikely
30	Springbok	*Antidorcas marsupialis*	Least Concern	Unlikely
31	Klipspringer	*Oreotragus oreotragus*	Least Concern	Unlikely
32	Grey Rhebok	*Palea capreolus*	Least Concern	Unlikely
33	Steenbok	*Raphicerus campestris*	Least Concern	Likely
34	Cape Grysbok	*Raphicerus melanotis*	Least Concern	Unlikely
35	Common Duiker	*Sylvicapra grimmia*	Least Concern	Possible
36	Eland	*Taurotragus oryx*	Least Concern	Unlikely
37	Bushbuck	*Tragelaphus scriptus*	Least Concern	Possibe
38	Fynbos golden mole	*Amblysomus corriae*	Near threatened	Possible
39	Cape golden mole	*Chrysochloris asiatica*	Data deficient	Possible
40	Reddish-grey Musk Shrew	*Crocidura cyanea*	Data Deficient	Unlikely
41	Greater Musk Shrew	*Crocidura flavescens*	Data Deficient	Unlikely
42	Forest shrew	*Myosorex varius*	Data deficient	Unlikely
43	Lesser Dwarf Shrew	*Suncus varilla*	Data Deficient	Unlikely
44	Cape Hare	*Lepus capensis*	Least Concern	Likely
45	Scrub Hare	*Lepus saxatilis*	Least Concern	Possible
46	Chacma Baboon	*Papio ursinus*	Least Concern	Unlikely
47	Cape Spiny Mouse	*Acomys subspinosus*	Least Threatened	Possible
48	Namaqua Rock Mouse	*Aethomys namaquensis*	Least Threatened	Unlikely
49	Cape Dune Mole Rat	*Bathyergus suillus*	Least Concern	Possible
50	Common Mole Rat	*Cryptomys hottentotus*	Least Concern	Possible
51	Grey Climbing Mouse	*Dendromus melanotis*	Least Concern	Possible
52	Brant's Climbing	*Dendromus*	Least	Unlikely

	Mouse	*mesomelas*	Concern	
53	Short-tailed Gerbil	*Desmodillus auricularis*	Least Concern	Possible
54	Cape Mole Rat	*Georychus capensis*	Least Concern	Unlikely
55	Hairy Footed Gerbil	*Gerbillurus paeba*	Least Concern	Possible
56	Spectacled Dormouse	*Graphiurus ocularis*	Least Concern	Possible
57	Porcupine	*Hystrix africaeaustralis*	Least Concern	Likely
58	Pygmy Mouse	*Mus minutoides*	Least Concern	Unlikely
59	Verreaux's Mouse	*Myomyscus verreauxi*	Least Concern	Unlikely
60	White-Tailed Rat	*Mystromys albicaudatus*	Endangered	Unlikely
61	Vlei Rat	*Otomys irroratus*	Least Concern	Unlikely
62	Laminate Vlei Rat	*Otomys laminatus*	Least Concern	Unlikely
63	Saunders Vlei Rat	*Otomys saundersiae*	Least Concern	Unlikely
64	Karoo Bush Rat	*Otomys unisulcatus*	Least Concern	Unlikely
65	Striped Mouse	*Rhabdomys pumilio*	Least Concern	Likely
66	Pouched Mouse	*Saccostomus campestris*	Least Concern	Unlikely
67	Kreb's Fat Mouse	*Steatomys krebsii*	Least Concern	Possible
68	Cape Gerbil	*Tatera afra*	Least Concern	Possible
69	Cape Rock Elephant-shrew	*Elephantulus edwardii*	Least Concern	Unlikely
70	Aardvark	*Orycteropus afer*	Least Concern	Unlikely

Observations and Findings:
(High 90% confident):
No SCC mammal species as listed were observed during the survey of the proposed prospecting activities areas at the time of the survey and if they are present on the property they are expected to only occasionally visit the proposed prospecting activities areas.

Red Data Listed or species listed under TOPS regulation (Avifauna)

The only avifauna species of special significance likely to occur within the vicinity of the site are:

- Giant Eagle Owl *Bubo lacteus* (vulnerable and vagrant species)
- Stanley's Bustard *Neotis denhami* (Vulnerable)
- Blue Crane *Anthropoides paradiscus* (Vulnerable)
- Chestnut Banded Plover *Charadrius pallidus* (Near Threatened)
- Cape Vulture *Gyps coprotheres* (vulnerable)
- African Marsh Harrier *Circus ranivorus* (Vulnerable)
- Black Harrier *Circus maurus* (Near Threatened)
- Martial Eagle *Polemaetus bellicosus* (Vulnerable)
- Lesser Kestrel *Falco naumanni* (Vulnerable)

- Lanner Falcon *Falco biarmicus* (Near Threatened)
- Peregrine falcon *Falco peregrinus* (Near Threatened)

(Barnes 2000)

Observations and Findings:
(High 90% confident):
None of the above species were observed on or near site the proposed prospecting areas during the survey and are more likely to only occasionally visit the proposed prospecting areas and do not breed there.

4.4 ANY SIGNIFICANT LANDSCAPE FEATURES OR RARE OR IMPORTANT VEGETATION/FAUNAL ASSOCIATIONS SUCH AS SEASONAL WETLANDS, ALLUVIUM, SEEPS, QUARTZ PATCHES OR SALT MARSHES IN THE VICINITY:

Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Aquatic Critical Biodiversity and Ecological Support Areas ("ESA"), associated buffer areas and National Freshwater Ecosystems Priority Areas ("NFEPA"). And scattered Milkwood trees within the cultivated agricultural lands. Refer to Maps 4-5.

The proposed mining activities will however not have any significant detrimental impacts on these sensitive environmental and landscape features as it is recommended that all mining activities are restricted to the completely transformed cultivated agricultural areas in-between and adjacent to these features as identified and delineated in this report.

4.5 THE EXTENT OF ALIEN PLANT COVER ON THE SITE AND SURROUNDS:

The only significant woody invasive alien vegetation in the study area is *Acacia mearnsii* (black wattle), which occurs mostly along the drainage lines, where it is locally common. Numerous alien herbs and grasses also occur, mainly on the cultivated agricultural lands.

4.6 THE CONDITION OF THE SITE IN TERMS OF CURRENT OR PREVIOUS LAND USES:

From the site survey conducted and most recent google earth map images it is evident that all of the proposed prospecting activities areas as indicated on Maps 4-5 have been ploughed and cultivated within the last year 2017-2018. Except for four scattered individual Milkwood trees remaining within the cultivated agricultural lands, which must not be impacted upon, no natural, near natural or rehabilitating indigenous vegetation remnants are located on the proposed prospecting activities areas.

4.7 THE KEY ECOLOGICAL "DRIVERS" AND/OR ENVIRONMENTAL GRADIENTS OF ECOSYSTEMS ON THE SITE AND IN THE VICINITY

Key ecological drivers identified on the property are the non-perennial drainage lines, man-made and natural dams with associated wetland characteristics, as well as the existing indigenous vegetation remnants for which fire is a key ecological driver.

Key environmental gradients present on the site are associated with the variable slopes and elevation of the site which leads to a transition from terrestrial indigenous and aquatic indigenous vegetation associated with non-perennial drainage lines and dams along the ravines of the site.

4.8 ANY POSSIBLE CHANGES IN KEY PROCESSES E.G. INCREASED FIRE FREQUENCY OR DRAINAGE/ARTIFICIAL RECHARGE OF AQUATIC SYSTEMS

With the implementation of appropriate storm water management and erosion preventions

measures, no significant changes in key processes are foreseen to occur on site or adjacent to the site due to the proposed prospecting activities.

4.9 THE CONDITION AND FUNCTIONING OF RIVERS AND WETLANDS (IF PRESENT) IN TERMS OF POSSIBLE CHANGES TO THE CHANNEL, FLOW REGIME AND NATURALLY-OCCURRING RIPARIAN VEGETATION

With the implementation of appropriate demarcation, storm water management and erosion preventions measures, the condition and functioning of the adjacent drainage lines and man-made dams will not be impacted upon due to the proposed prospecting activities.

4.10 WOULD THE CONSERVATION OF THE SITE LEAD TO GREATER VIABILITY OF THE ADJACENT ECOSYSTEM BY SECURING ANY OF THE FUNCTIONAL FACTORS LISTED?

Conservation of the drainage lines associated with remaining indigenous vegetation areas are important in terms of securing ecological functioning of the site and surrounds, however prospecting activities are not proposed on any of the significant environmental and landscape features as identified on the property and will therefore not have an detrimental impact on the functional environmental factors of the site and surrounds.

4.11 DOES THE SITE OR NEIGHBOURING PROPERTIES POTENTIALLY CONTRIBUTE TO MEETING REGIONAL CONSERVATION TARGETS FOR BOTH BIODIVERSITY PATTERN AND ECOLOGICAL PROCESSES?

Yes, conservation of indigenous vegetation remnants on the property will potentially contribute to meeting regional conservation targets, but none of these remnants are present on or will be impacted by the prospecting activities as proposed on transformed cultivated agricultural land.

4.12 IS THIS A POTENTIAL CANDIDATE SITE FOR CONSERVATION STEWARDSHIP?

The viable indigenous vegetation remnants remaining on the property is a potential candidate for conservation stewardship if the landowner should wish to pursue such a matter, but the prospecting areas as proposed on transformed cultivated agricultural land are not.

5. IMPACT ASSESSMENT WITH ASSOCIATED MITIGATION AND REHABILITATION MEASURES TO BE IMPLEMENTED

Ecological impacts may be both direct and indirect, with the former occurring mostly at the prospecting excavation stage and the latter mostly at the rehabilitation stage. All potential environmental impacts identified are however expected to be of a short term and temporary nature.

Significant direct impacts potentially associated with the prospecting excavation phase are direct loss of indigenous terrestrial and aquatic vegetation and disturbance of soil which may lead to partial disruption of ecological processes due to fragmentation of habitat and erosion. The extent in this case would be local. Indirect impacts would occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien vegetation to partial disruption of ecological processes due to the effects of the alien species encroachment and/or erosion. The extent of the potential indirect impacts in this case would be local.

For purposes of this assessment “prospecting” is assumed to mean all prospecting related activities, and the No-Go/Development alternative is assumed to be a continuation of the status quo, which in this case means mainly cultivation and heavy livestock grazing. It is assumed that the post prospecting landuse in the study area will be cultivation and/or livestock grazing.

The No-Go/Development alternative will result in the site remaining as is which will therefore have no further ecological impact and current status quo will persist.

(See Appendix B attached for Impact Assessment Methodology used)

Prospecting Excavation/Trenching/Drilling Phase:

Nature of potential impact:
Impact of proposed prospecting activities on terrestrial indigenous vegetation and associated mapped terrestrial CBAs and ESAs

Discussion:
Indigenous vegetation remnants are present throughout the surrounding areas and adjacent to the prospecting activities areas as proposed on transformed cultivated agricultural land. Four scattered protected species Milkwood trees are also present within the cultivated agricultural lands.

To prevent any potential direct or indirect detrimental impacts on these remnants mitigation measures as listed must be implemented throughout the proposed prospecting activities.

Cumulative impacts:
Erosion, loss of conservation worthy species and natural vegetation habitat during prospecting activities.

Mitigation:

- The individual *Sideroxylon inerme* trees ("Milkwood trees") that were recorded within the cultivated areas must be demarcated within a 5m buffer radius by the ECO before any prospecting activities occurs within a 50m range of the trees and must remain demarcated throughout the applicable prospecting operational and rehabilitation phases. Demarcation can be removed when implementation of the applicable rehabilitation measures have been completed.
- Clearly demarcate the 8m wide buffer areas proposed as measured from the edge of all remaining indigenous vegetation areas and undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Demarcation method to be approved by an Environmental Control Officer (ECO).
- No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.
- No natural vegetation areas edges may be cleared or impacted upon by the proposed prospecting activities.
- The proposed buffer areas to be located within existing cultivated land may only be used as roads and for stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed prospecting trenches and boreholes immediately (same day) with onsite excavated material after samples have been collected.
- Monitor excavated prospecting areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures as and if required.

Criteria	Without Mitigation	With Mitigation
Extent	2	1
Duration	3	1
Magnitude	6	2
Probability	4	2
Significance	44 – Medium	8 - Low
Status	Medium Negative	Low Negative Significance

	Significance without Mitigation	with Mitigation
Reversibility	100% Reversible	100% Reversible
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

Nature of potential impact:
Impact of proposed prospecting activities on drainage lines and dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic CBAs and ESAs

Discussion:
Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines and dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Aquatic Critical Biodiversity and Ecological Support Areas ("ESA"), associated buffer areas and National Freshwater Ecosystems Priority Areas ("NFEPA"). Refer to Maps 4 and 5.

The proposed prospecting activities will however not have any significant detrimental impacts on these sensitive environmental and landscape features as it is recommended that prospecting activities are restricted to the completely transformed cultivated agricultural areas in-between and adjacent to these features as identified and delineated in this report

To prevent potential edge effects a buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. The proposed buffer areas may only be used as roads and for stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.

Cumulative impacts:
Disturbance and transformation of drainage lines or wetland areas during prospecting activities.

Mitigation:
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas at least 8m from the edge of the any drainage lines, indigenous vegetation and man-made dams with associated wetland characteristics and aquatic vegetation.
- No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.
- No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed prospecting activities.
- Storm water and erosion control measures to be implemented as per an EMP must be conducted and monitored to prevent siltation or erosion of sensitive environmental and landscape features as identified on site.
- Backfill proposed prospecting trenches and boreholes immediately (same day) with onsite excavated material after samples have been collected.
- Monitor excavated prospecting areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures as and if required.
- No prospecting activities may occur within 100m from any drainage line or wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency

Criteria		
	Without Mitigation	**With Mitigation**

Extent	2	1
Duration	3	1
Magnitude	6	2
Probability	4	2
Significance	44 – Medium	8 - Low
Status	Medium Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100% Reversible	100% Reversible
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

Nature of potential impact:
Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes

Discussion:
Due to the undulating terrain on which the prospecting activities are proposed storm water runoff may cause erosion of the disturbed sites.

Cumulative impacts:
Erosion of the disturbed sites and surrounding environments.

Mitigation:

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed prospecting boreholes immediately (same day) with onsite excavated material after samples have been collected.
- Monitor excavated prospecting areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures as and if required.

Criteria		
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	3	1
Magnitude	6	2
Probability	4	2
Significance	44 – Medium	8 - Low
Status	Medium Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100% Reversible	100% Reversible
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

Prospecting Rehabilitation Phase:

Nature of potential impact:
Introduction of alien and weed plant species during rehabilitation

Discussion:
Indirect impacts occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien and weed vegetation, to partial disruption of ecological processes due to the effects of the alien and weed species. The extent of the indirect impact in this case will be local.

Cumulative impacts:
Disturbance of the site due to proposed prospecting activities may lead to introduction of alien and weed vegetation encroachment during rehabilitation, which may in turn lead to infestation of surrounding remaining natural areas and drainage lines resulting in disruption and destruction of ecological processes.

Mitigation:

- Only use topsoil and excavated material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas.
- Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.

Criteria	**Without Mitigation**	**With Mitigation**
Extent	3	1
Duration	5	1
Magnitude	6	2
Probability	4	2
Significance	56 - Medium	8 - Low
Status	Medium Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100% Reversible	100% Reversible
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

Nature of potential impact:
Potential erosion of the site and surrounds during rehabilitation phase

Discussion:
Disturbance of the land during prospecting activities could lead to soil erosion which can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should heavy rains fall on disturbed and rehabilitated areas.

Cumulative impacts:
Exposing and disturbing soil may lead to erosion of site and surrounds if not mitigated.

Mitigation:

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on

the prospecting activity areas and surrounds.

- Backfill proposed prospecting trenches and boreholes immediately (same day) with onsite excavated material after samples have been collected.
- Monitor excavated prospecting areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures as and if required.

Criteria		
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	3	1
Magnitude	6	2
Probability	4	2
Significance	44 – Medium	8 - Low
Status	Medium Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100% Reversible	100% Reversible
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

6. CONCLUDING REMARKS AND SUMMARY OF IMPACT MITIGATION AND REHABILITATION MEASURES PROPOSED BEFORE, DURING AND AFTER MINING ACTIVITIES

If strict adherence is kept to the recommendations as set out in this report and incorporated into the Environmental Management Programme, the proposed development will not have a significant impact on any listed flora, fauna or avifauna species of conservations concern, their habitats or any sensitive environment and landscape features as identified on the property.

- All proposed prospecting activities to be located on completely transformed and cultivated agricultural areas as identified on Maps 4 and 5 of this report.
  GPS co-ordinates of four scattered Milkwood trees within cultivated agricultural lands:
  1. 34º 04’ 31.34”S
     20º 58’ 31.68”E
  2. 34º 04’ 25.71”S
     20º 58’ 35.05”E
  3. 34º 04’ 23.85”S
     20º 58’ 42.98”E
  4. 34º 04’ 22.9” S
     20º 58’ 45.50”E

- Clearly demarcate the individual *Sideroxylon inerme* trees (“Milkwood trees”) within a 5m radius buffer area, before any prospecting activities occurs within a 50m range of the trees. Demarcation method to be approved by Environmental Control Officer as required according to the EMP.

- Clearly demarcate all proposed prospecting activities areas and buffer areas as proposed. To prevent potential edge effects a buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the mining activities phase. The proposed buffer areas may only be used as roads and for stormwater management and no other activities associated

with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO).

- No disturbance should be allowed within the remaining indigenous vegetation, drainage lines and wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.

- No natural vegetation, drainage lines or wetland areas edges may be cleared or impacted upon by the proposed prospecting activities.

- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.

- Backfill proposed prospecting trenches and boreholes immediately (same day) with onsite excavated material after samples have been collected.

- Only use topsoil and excavated material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas.

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.

- Monitor excavated prospecting areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures as and if required.

- Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.

- In consultation with the Department of Water and Sanitation and the Breede Gourits Catchment Management Agency determine the need for water use authorisation for proposed prospecting activities within 100m from a drainage line or wetland.

- The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions, including recommendations as provided in this report and only proceed under supervision of a competent and diligent Environmental Control Officer during Phase 3 – Trenching, Drilling and Sampling of the proposed prospecting activities.

Eco Impact is of the opinion, and based on the survey and desk study done, that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property as indicated on Maps 4 and 5 of this report and the specialist recommendations as listed in this report are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site.

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APPENDIX A: ABBREVIATED CURRICULUM VITAE AND DECLARATION OF INDEPENDENCE OF FRESHWATER SPECIALIST

BACKGROUND AND QUALIFICATIONS OF SPECIALIST CONSULTANT

Full Name: Nicolaas Hanekom
Year of Birth: 1967
Nationality: South African
Profession: Environmental Scientist and Environmental Assessment Practitioner
Years in Profession: Since 1989

This Freshwater Impact Assessment was conducted by Nicolaas Hanekom who has 26 years' experience working as an ecologist in the field of nature conservation. He has extensive field experience, knowledge of freshwater ecology, knows the region in which he is working and exercises sound and unbiased scientific and professional judgment. He has received training on the basics of freshwater ecosystems impact assessment during his career in nature conservation. He is a qualified Environmental Assessment Practitioner who holds a M. Tech, Nature Conservation from the Cape Peninsula University of Technology and a registered Professional Natural Scientist (Ecologist) with the South African Council for Natural Scientific Professions ("SACNASP").

Summary of Experience:

- Assistance Reserve Manage at Gariep Dam Nature Reserve (1993-1998)
- Reserve Manager, Conservation Services Manager for Western Cape Nature Conservation Board (1998-2001)
- Part time external Lecturer at Cape Peninsula University of Technology (2003-2005)
- Director: Environmental Management at Cape Lowlands Environmental Services (2006-2010)
- Environmental Impact Assessment Practitioner at Eco Impact (Pty) Ltd (2010 to date)
- Safety Health & Environmental System consulting

Mr Hanekom meets the legal requirements to act as a specialist on this project in terms of Regulation 13 of the Environmental Impact Assessment Regulations, 2014 that took effect on 8 December 2014, which regulates the general requirements for Environmental Assessment Practitioners ("EAP"s) and specialists. The regulation states that:

An EAP and a specialist, appointed in terms of regulation 12(1) or 12(2), must –

(1)(a) be independent;
(b) have expertise in conducting environmental impact assessments or undertaking specialist work as required, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity;
(c) ensure compliance with these Regulations;
(d) perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application;
(e) take into account, to the extent possible, the matters referred to in regulation 18 when preparing the application and any report, plan or document relating to the application; and
(f) disclose to the proponent or applicant, registered interested and affected parties and the competent authority all material information in the possession of the EAP and, where applicable, the specialist, that reasonably has or may have the potential of influencing-
(i) any decision to be taken with respect to the application by the competent authority in terms of these Regulations; or
(ii) the objectivity of any report, plan or document to be prepared by the EAP or specialist, in terms of these Regulations for submission to the competent authority; unless access to that information is protected by law, in which case it must be indicated that such protected information exists and is only provided to the competent authority.

(2) In the event where the EAP or specialist does not comply with sub regulation (1) (a), the proponent or applicant must, prior to conducting public participation as contemplated in chapter 5 of these Regulations, appoint another EAP or specialist to externally review all work undertaken by the EAP or specialist, at the applicant's cost.

THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Nicolaas Willem Hanekom, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of NEMA, the Environmental Impact Assessment Regulations, 2014.

Signature of the specialist

Eco Impact Legal Consulting (Pty) Ltd
Name of company

20 June 2018
Date

APPENDIX B: Impact Assessment Methodology

Below is the assessment methodology utilized in determining the significance of the potential mining impacts on the biophysical environment, and where applicable the possible alternatives. The methodology is broadly consistent with that described in the Department of Environmental Affairs' Guideline Document on the EIA Regulations (1998) and as provided by the Shangoni Management Services.

For each potential impact, the significance is determined by specified factors as in Table 1. Significance is described prior to mitigation as well as with the most effective mitigation measure(s) in place.

The mitigation described in the document represents the full range of plausible and pragmatic measures that must be implemented.

Despite the attempts at providing a completely objective and impartial assessment of the environmental implications of proposed activities, the specialist can never completely escape the subjectivity inherent in attempting to define significance.

Recognising this, potential subjectivity in the current process is addressed as follows:

- Be clear about the difficulty of being completely objective in the determination of significance;
- Develop an explicit methodology for assigning significance to impacts and outlining this methodology in detail. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing toward determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the report with a clear summary of how the assessor derived the assigned significance; and
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.

Although these measures may not totally eliminate subjectivity, they do provide an explicit context within which to review the assessment of impacts.

Table 1: Assessment criteria for the evaluation of impacts

Criteria	Description		
Nature	a description of what causes the effect, what will be affected, and how it will be affected.		
	Type	**Score**	**Description**
Extent (E)	None (No)	1	Footprint
	Site (S)	2	On site or within 100 m of the site
	Local (L)	3	Within a 20 km radius of the centre of the site
	Regional (R)	4	Beyond a 20 km radius of the site
	National (Na)	5	Crossing provincial boundaries or on a national / land wide scale
Duration (D)	Short term (S)	1	0 – 1 years
	Short to medium (S-M)	2	2 – 5 years
	Medium term (M)	3	5 – 15 years
	Long term (L)	4	> 15 years
	Permanent(P)	5	Will not cease
Magnitude (M)	Small (S)	0	will have no effect on the environment
	Minor (Mi)	2	will not result in an impact on processes
	Low (L)	4	will cause a slight impact on processes
	Moderate (Mo)	6	processes continuing but in a modified way
	High (H)	8	processes are altered to the extent that they temporarily cease
	Very high (VH)	10	results in complete destruction of patterns and permanent cessation of processes.
Probability (P) the likelihood of the impact actually occurring. Probability	Very improbable (VP)	1	probably will not happen
	Improbable (I)	2	some possibility, but low likelihood
	Probable (P)	3	distinct possibility

Criteria	Description		
is estimated on a scale, and a score assigned	Highly probable (HP)	4	most likely
	Definite (D)	5	impact will occur regardless of any prevention measures
Significance (S)	Determined through a synthesis of the characteristics described above: **S = (E+D+M) x P** Significance can be assessed as low, medium or high		
Low: < 30 points:	The impact would not have a direct influence on the decision to develop in the area		
Medium: 30 – 60 points:	The impact could influence the decision to develop in the area unless it is effectively mitigated		
High: < 60 points:	The impact must have an influence on the decision process to develop in the area		
No significance	When no impact will occur or the impact will not affect the environment		
Status	Positive (+)		Negative (-)
The degree to which the impact can be reversed	Completely reversible (R)	90-100%	The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.
	Partly reversible (PR)	6-89%	The impact can be partly reversed providing that mitigation measures as stipulated in the EMP are implemented and rehabilitation measures are undertaken
	Irreversible (IR)	0-5%	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place
The degree to which the impact may cause irreplaceable loss of resources	Resource will not be lost (R)	1	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the EMP are implemented
	Resource may be partly destroyed (PR)	2	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the EMP are implemented
	Resource cannot be replaced (IR)	3	The resource cannot be replaced no matter which management or mitigation measures are implemented.
The degree to which the impact can be mitigated	Completely mitigatible (CM)	1	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the EMP are implemented
	Partly mitigatible (PM)	2	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the EMP are implemented. Implementation of these measures will provide a measure of mitigatibility
	Un-mitigatible (UM)	3	The impact cannot be mitigated no matter which management or mitigation measures are implemented.

APPENDIX C: Relevant Environmental Legislation Considered

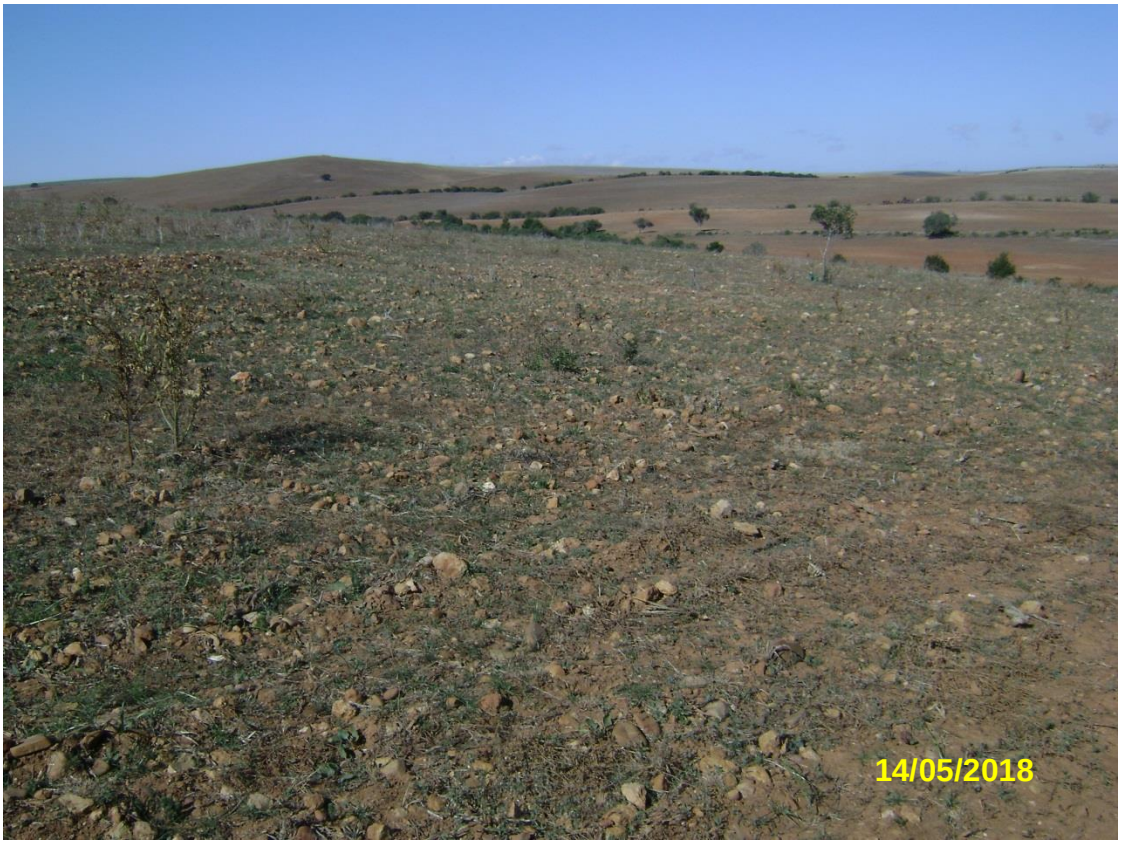
Agricultural Pests Act 36 of 1983
Atmospheric Pollution Prevention Act 45 of 1965 (regulations only)
Conservation of Agricultural Resources Act 43 of 1983
Constitution of the Republic of South Africa 1996
Environment Conservation Act 73 of 1989
Fencing Act 31 of 1963
Fertilizers Farm Feeds Agricultural Remedies and Stock Remedies Act 36 of 1947
Mineral and Petroleum Resources Development Act 28 of 2002
National Environmental Management Act 107 of 1998
National Environmental Management: Air Quality Act 39 of 2004
National Environmental Management: Biodiversity Act 10 of 2004
National Environmental Management: Protected Areas Act 57 of 2003
National Environmental Management: Waste Act 59 of 2008
National Forests Act 84 of 1998
National Veld and Forrest Fire Act 101 of 1998
National Water Act 36 of 1998

Hessequa local municipality air pollution control by-law
Hessequa local municipality fences and fencing by-law
Hessequa local municipality storm water management by-laws
Hessequa local municipality solid waste disposal by-law
Hessequa local municipality by-law relating to water supply, sanitation services and industrial effluent
Hessequa local municipality by-law relating to roads and streets
Hessequa local municipality by-law relating to the prevention of public nuisances and nuisances arising from the keeping of animals

Eden district municipality air quality management by-law
Eden district municipality municipal health by-laws

APPENDIX D: Site photos of proposed prospecting activities area on cultivated agricultural land on Erven 2224 and RE1015

Site Photo 1: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.



Site Photo 2: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.

Site Photo 3: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.

Site Photo 4: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.

Site Photo 5: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.

Site Photo 6: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.

Site Photo 7: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.

Site Photo 8: Erven 2224 and RE/1015 **-** Prospecting activities area as proposed on transformed cultivated land.