

**ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME**

GECKO FERT PHOSPHATE MINE

NAME OF APPLICANT: Gecko Fert (PTY) LTD

REFERENCE NUMBER: WC 30/5/1/2/2/10019MR

UNDERTAKING (in terms of regulation 51)

I, **...Abraham Burger.....**, the undersigned and duly authorized by Gecko Fert (Pty) Ltd, have studied and understand the contents of this document and duly undertake to adhere to the conditions as set out therein, unless specifically or otherwise agreed to in writing. Furthermore, I undertake to adhere to the provisions of the Act (Mineral & Petroleum Resources Development Act 28 of 2002) and regulations thereto.

Signed at.....**PAARL**..... on this **...13th...** day of **.....December.....** 2012

.....
Applicant

I,, the undersigned and duly authorized thereto by the Department of Mineral Resources, have studied and approved the contents of this document.

Signed at..... on this day of 201...

.....
Director: Mineral Development

NAME OF APPLICANT: **GECKO FERT (PTY) LTD**

REFERENCE NUMBER: **WC 30/5/1/2/2/10019MR**

**ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME**

**SUBMITTED FOR AN APPLICATION FOR MINING RIGHT
in terms of SECTION 39 & REGULATIONS 50 & 51
of the MINERAL AND PETROLEUM RESOURCES
DEVELOPMENT ACT, 2002, (ACT NO 28 OF 2002)**

December 2012
Report Number: 2570/EMP/R2

STANDARD DIRECTIVE

All applicants for mining rights are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an environmental Impact Assessment, and an Environmental Management Programme strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 30 days of notification by the Regional Manager of the acceptance of such application.

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Works Cited

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- Mucina, L., & Rutherford, M. (2006). *The Vegetation of South Africa, Lesotho and Swaziland*. SANBI.

Applicant Details:

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Table 1: Applicant contact details

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Town/City:	Cape Town
Province:	Western Cape

Table 2: DMR contact details

Locality Plan of proposed project:

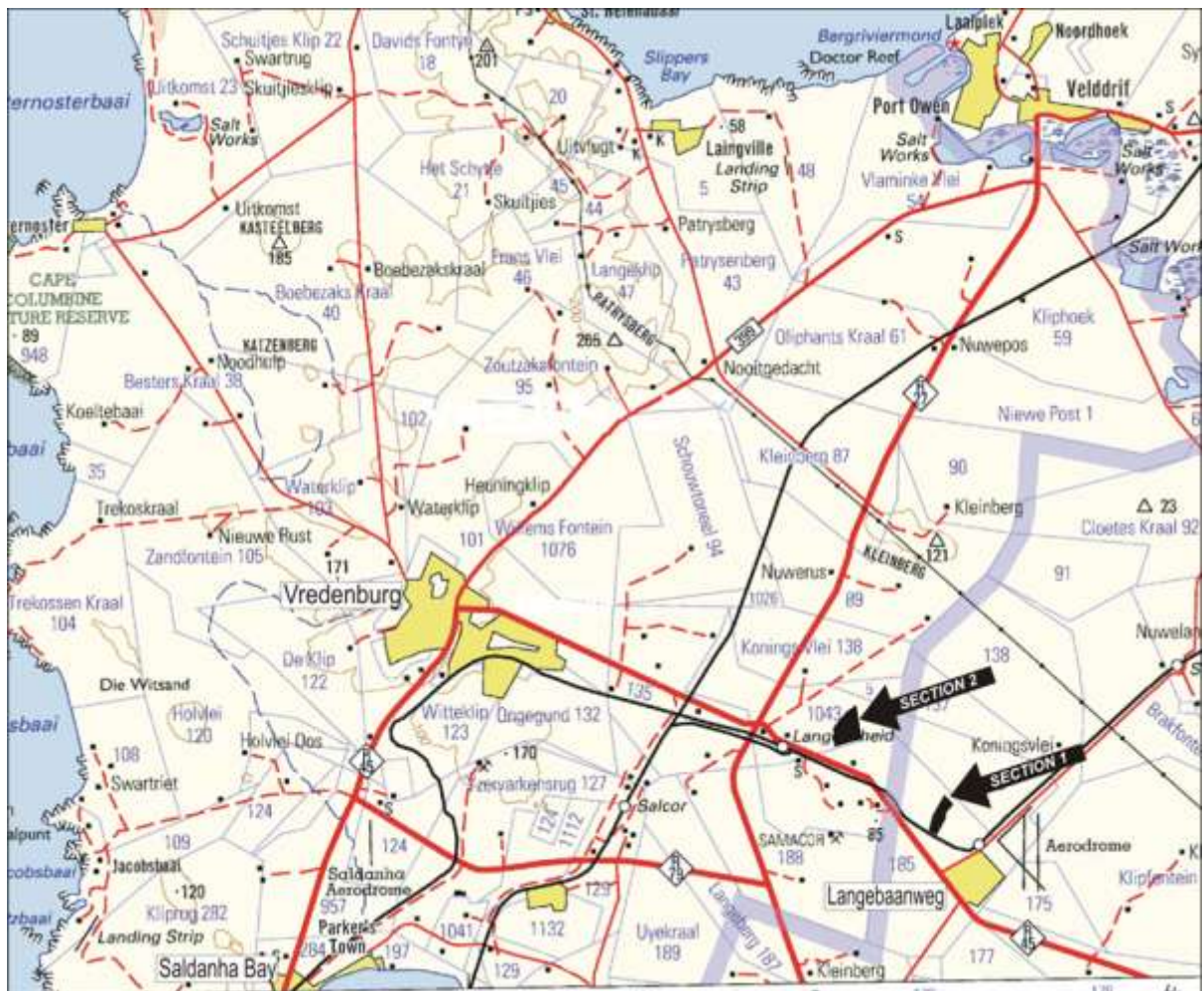


Figure 1: Locality Plan

SECTION 1: ENVIRONMENTAL IMPACT ASSESSMENT

1 Description of the baseline environment

1.1 Concise description of the environment on site relative to the environment in the surrounding area.

Some background to this application is important as it relates to potential impact of this operation.

In 2009, application was made by the applicant to prospect 3 farms (including the 2 farms which are subject of this application). Such prospecting consisted of trial pits dug in 2 phases by excavator at over 136 holes¹ across the 3 farms. The results of such prospecting were used as motivation for the lodging of a mining permit application over 1.5ha area on farm Langeberg 185/7.

At the time of lodging of the Mining Permit, there was still some uncertainty as to the mining and processing method as well as a guaranteed market for the product, although pre –permit indications were favourable.

Mining at that 1.5ha site has now run its course and in that time the applicants have developed a suitable mining method, built up a relationship with the contractor who conducts the actual mining and processing of the material as well as established a sustainable market for the material.

The important point to remember is that mining has been in place for 2 years with little if any impact on environmental aspects (as will be discussed fully in this text).

1.1.1 Surrounding Land Use

The following activities / land uses are included as background baseline information and these could conceivably be affected by the proposed mining (although as defined later, such impact is highly unlikely to occur and would in any event be insignificant given the small scale of the operation in both the spatial and temporal sense) –

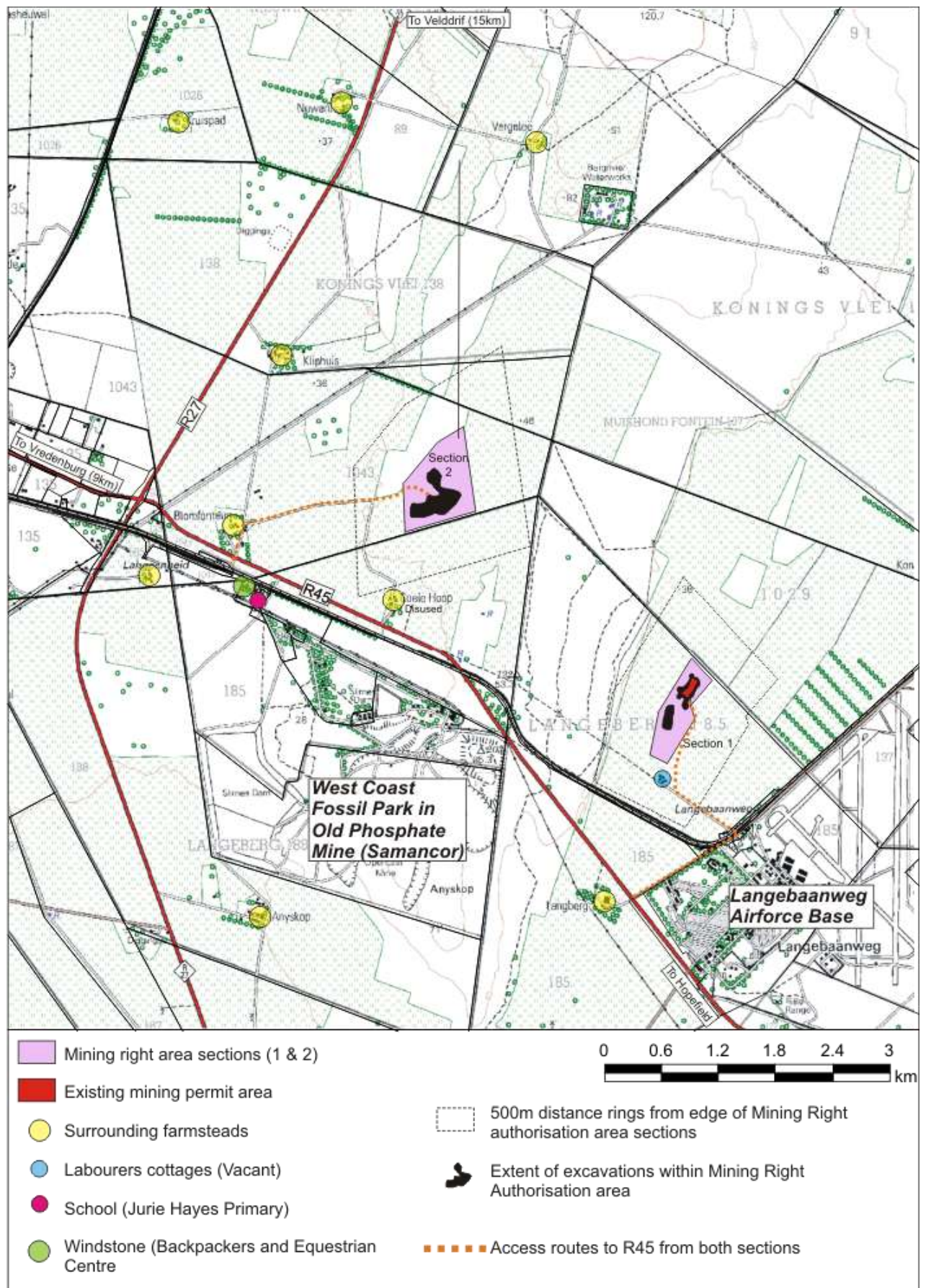
Note that all distances quoted are from the closest Mining Right authorisation boundary – actual excavation is within this boundary at different distances (as shown in figure 2):

- The sites are located on fallow land and the area is largely agricultural / rural in nature.
- The Langebaanweg Airforce base is located some 2km south of Section 1.
- The West Coast Fossil Park (in the old Phosphate Mine) is located 2.2km west of Section 1 and 1.9km south of Section 2. Important to note that

¹ These holes have been completely rehabilitated and are not visible as the sites of prospecting anymore.

mining at this site will in no way resemble mining which took place at that “Old Phosphate Mine”. Mining in that excavation targeted the deep clays which were then washed and further processed. This resulted in generation of slimes/fine tailings and overburden. Mining in this case does not target the clays but instead targets the gravel like phoscrete layer above the clays. No washing is required and no overburden is present.

- The rail line is located just over 1km south of each section.
- The Jurie Hayes Primary School is located 1.65km SW of Section 2.
- Windstone Backpacker and Equestrian Centre is located immediately west of the primary school.
- The closest residence to Section 2 is the landowner’s residence approximately 1.2km to the W. Other farmsteads to note are as follows, with the first two being of particular note given comment received on Scoping report from the Trust’s representative:
 - The Kliphuis Farmstead 1.8km NW of Section 2 (Olivier Bester Family Trust)
 - Nuwerus Farmstead 3.4km NNW of Section 2) (Olivier Bester Family Trust)
 - Vergelee Farmstead 2.8km NNE of Section 2
- The “Bergrivier Waterworks” site is located 2.9km NNE of Section 2
- A few (± 10) residences at the old rail station opposite Langebaanweg. These houses are rented and all occupiers will be approached for their comment.
- “Green Village” is located 2km south of Section 2 across the R45 (TR21/2) road and the rail line
- Die Kop granite aggregate quarry is located 4.8km north
- Vredenburg is 19km west



1.1.2 Topography

The sites are located at an altitude of about 40m above mean sea level (amsl) in a generally very flat landscape. There are some semi-permanent but localised vegetated dunes surrounding the mining area. The largest of these is the north-south naturally vegetated dune which forms the high lying area (altitude up to 50m amsl) between the 2 mining sections. The formation of any pedocrete requires flat topography and these dunes are probably post pedocrete dunes. The dunes will in any event not be disturbed.

The existing mining (taken place in the mining permit area) has lowered the topography over an area of 1.5ha by between 1.0 and 1.5m. The side slopes of this pit should normally have been sloped to 1:3 with all sharp edges rounded to mimic natural contours. However, the holders have not conducted such slope rehabilitation given that the current pit slopes would form the advancing face of the mine proposed at Section 1 in terms of this plan.

The photo below shows the current topography to be very flat. It also shows the current mining in the foreground.

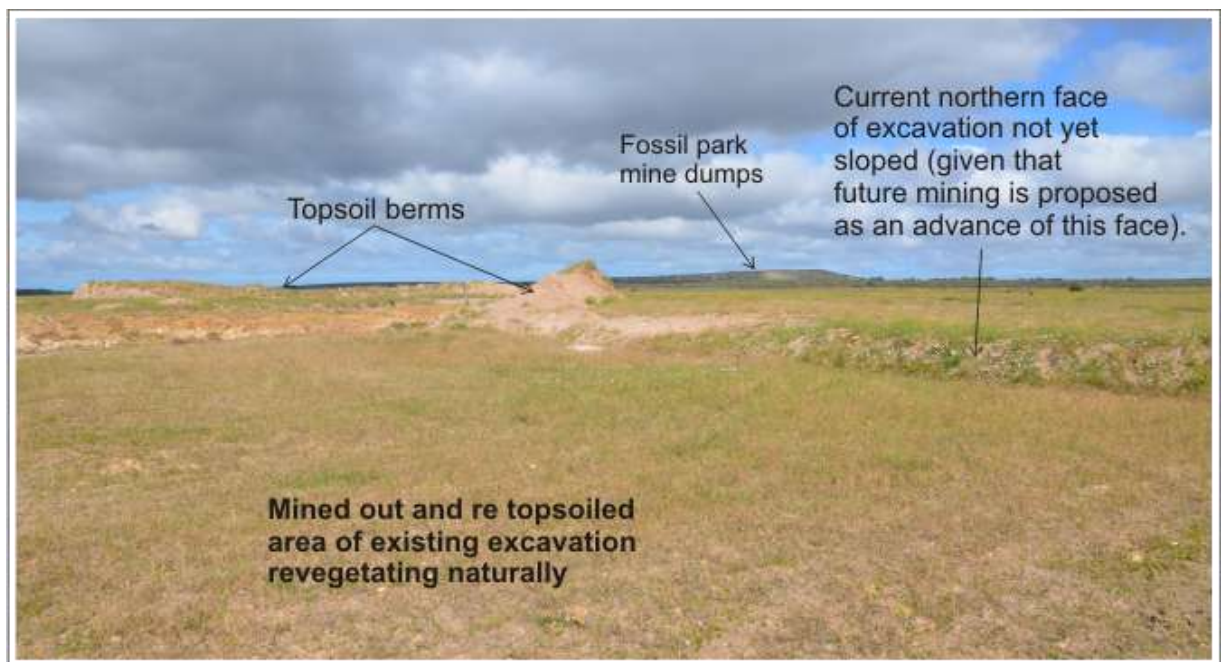


Photo 1: General topography as per background. Current rehabilitated portion of the existing mine in foreground.

1.1.3 Visual Impact

None. The current site is not visible from any surrounding residence or public road. The temporary topsoil dumps may be visible to some of the cultivated lands to the north.

1.1.4 Soil

Possibly the most important aspect of the proposed attenuation measures is the proper handling of topsoil. Without effective topsoil management, the disturbed areas will not effectively revegetate, visual impact (if any) will remain and the agricultural capability of the land will not return and all impacts would thus be multiplied.

Soil form is typical Mispah type with pedocrete formation within the mining area. Below the pedocrete, clay is generally located. During prospecting operation, topsoil depth was recorded and the result is contained in Figures 3 and 4 per section below.

The general soil profile is shown in photo below with the upper pedocrete /gravel referred to locally as Kaalphos and the clay layer beneath that referred to as the Langfos.

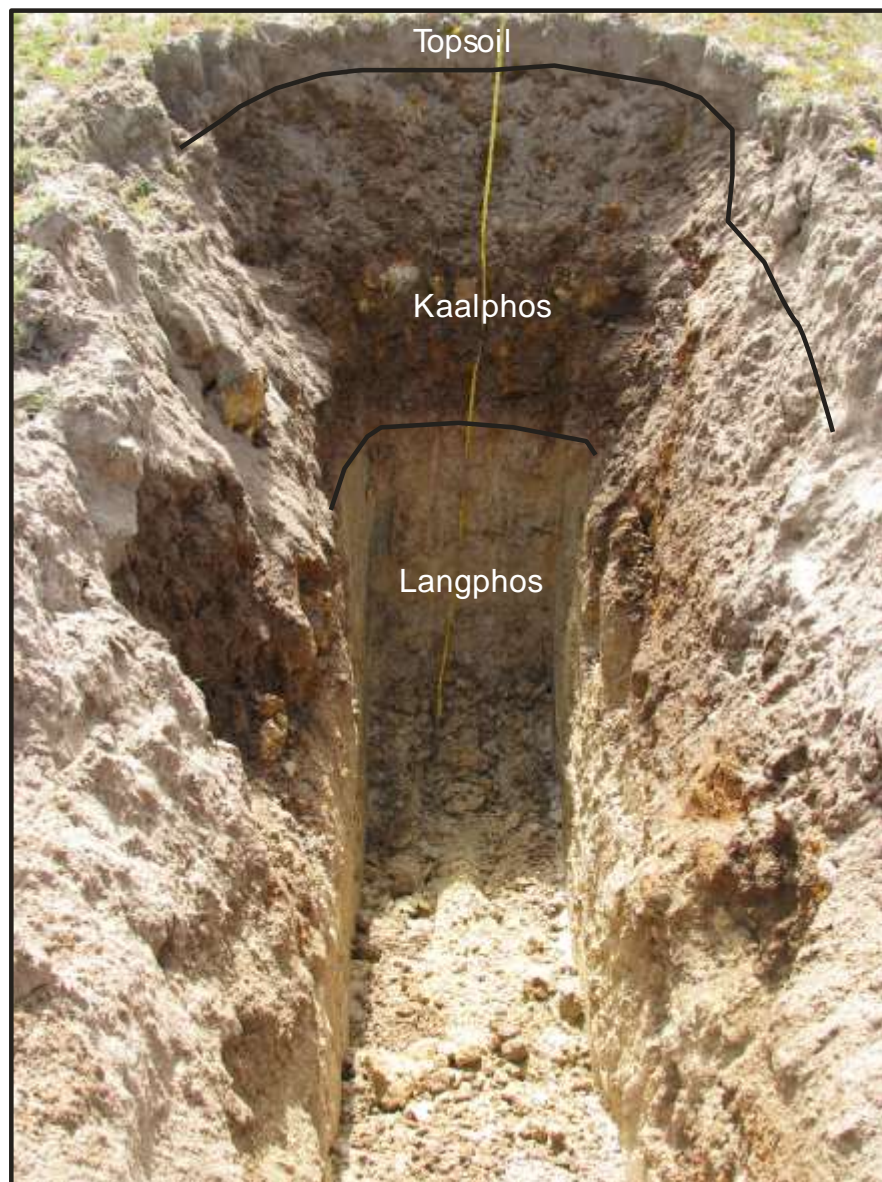


Photo 2: Typical soil profile

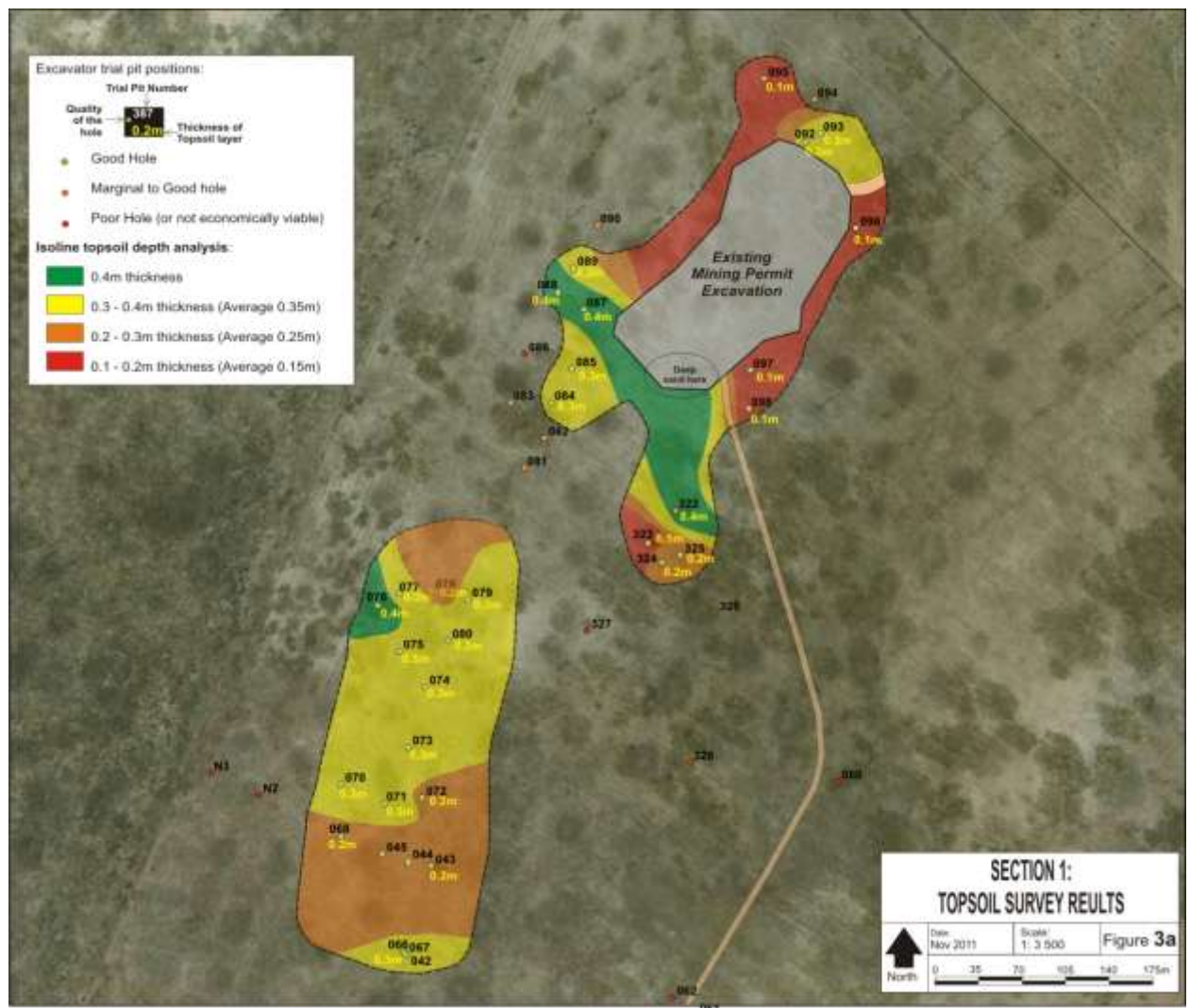


Figure 3: Topsoil Survey results - Section 1

And for Section 2:

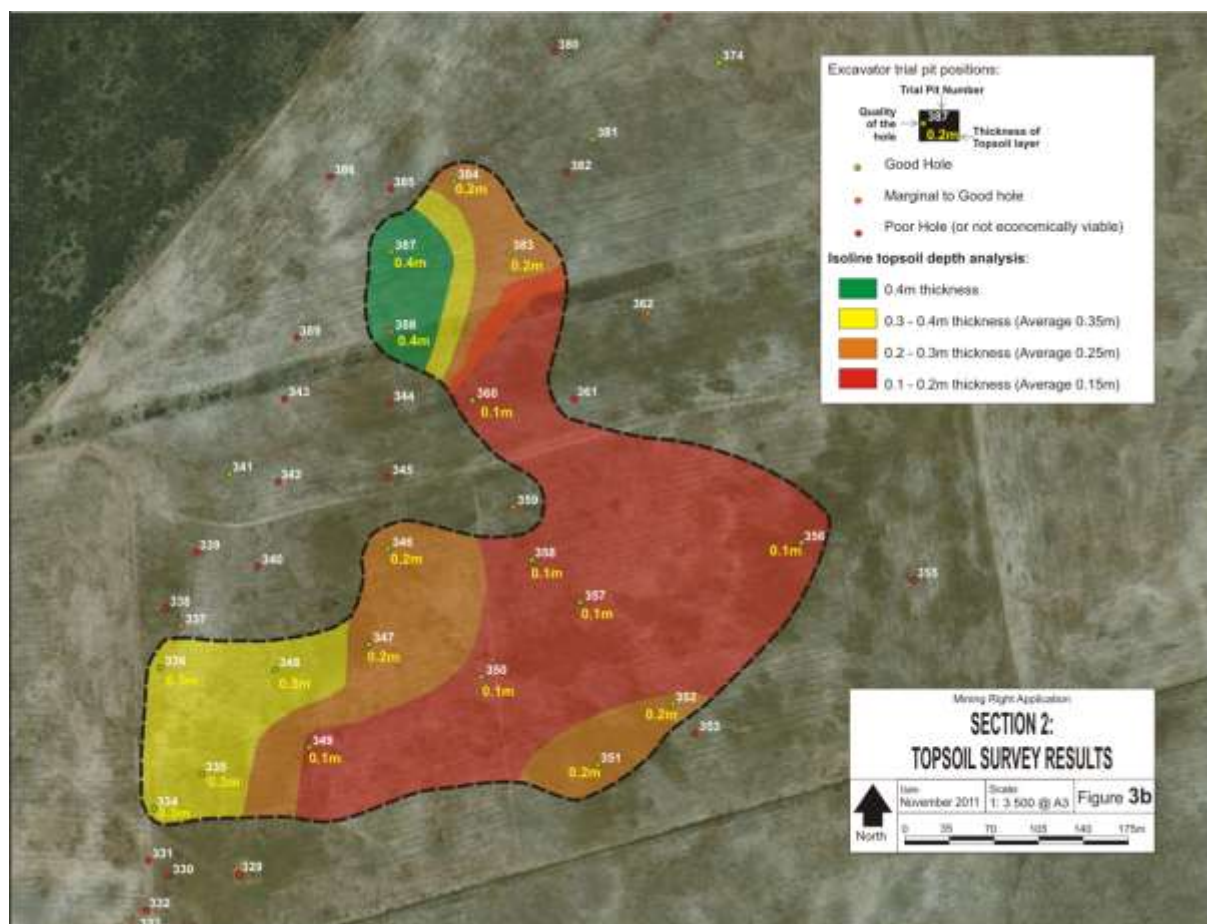


Figure 4: Topsoil survey results - Section 2.

1.1.5 Land Capability

The land capability of the entire mining right area has been classified as grazing land, although it must be noted that the landowner wishes to include the mined out and rehabilitated areas as extension to his existing² game farm (i.e. wilderness rating).

	Section 1 Excavation		Section 2 Excavation	
Land capability	Area			%
Wilderness area	0ha	0%	0ha	0%
Arable Land	8.2ha	100%	12.5ha	100%
Grazing	0ha	0%	0ha	0%
Wetland Area	0ha	0%	0ha	0%
Total	8.2ha	100%	12.5ha	100%

The wheat yield for these veld portions is in the order of 1.5tons /ha (Pers Comm: Mr J Bester, Landowner), however, the landowner only plants pasture species for sheep

² At the time of initiation of this project through prospecting, the landowner had commenced with game fencing of the dune area (Pers. Comm: Mr J Bester). The landowner has not completed the game fencing yet. A neighbouring landowner (Mr A Vermeulen of the Olivier Bester Family Trust) for some reason disputes the claim by the landowner that any game fencing has commenced.

grazing (every 2-3 years) and does not sell wheat off these portions of land. The aim of the rehabilitation programme is to restore the veld to its wilderness rating.

1.1.6 Natural Vegetation

This entire paragraph 1.1.6 is a direct copy of the specialist assessment of the botanical status and value of the site (such study being conducted by Fynbos Ecoscapes's S Privett – Refer Annexure B:

“The latest SA vegetation map (Mucina & Rutherford 2006) categorises the original vegetation at section 1 as Saldanha Flats strandveld and section 2 as Hopefield sand fynbos. Saldanha Flats strandveld grows naturally on coastal flats from St Helena Bay and the southern banks of the Berg River to Saldanha and Langebaan in the south. It grows predominantly on shallow calcareous sand over fossiliferous Pleistocene limestone. It is an endangered vegetation type with only some 11% statutorily conserved in the West Coast National Park and more than half of its original extent having been converted through cultivation, road building and urban development.

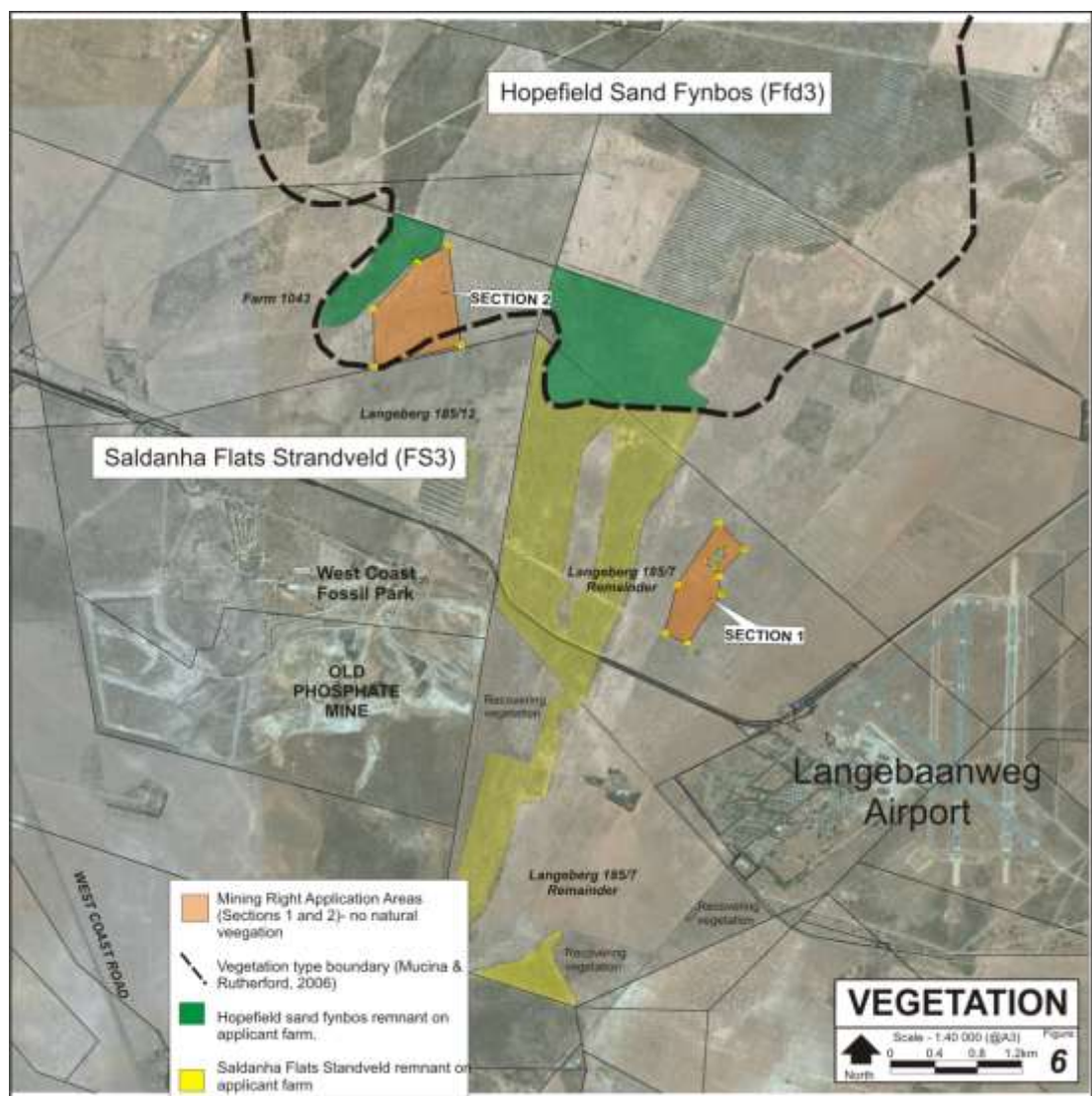


Figure 5: Vegetation³

³ Specialist study Figure 2

Vegetation map showing the section 1 and section 2 mining rights area (orange polygons) and intact Hopefield sand fynbos (green) and Saldanha Flats strandveld (yellow).

Hopefield sand fynbos occurs from Aurora to Ronderg with an outlier in the strandveld at Kleinberg north of Langebaanweg. It grows on deep, acidic, tertiary sands and is a vulnerable vegetation type (Anonymous 2009). There is only a very small portion statutorily conserved in the West Coast National Park and some 40% of its original extent has already been transformed through cultivation and for grazing lands.

The section 1 Mining Right application area is virtually devoid of natural vegetation (see plate 1 below). It is fallow land, which is cultivated with pasture species from time to time and permanently used as pasture. Indigenous species recorded at this site include the annuals *Bulbine annua*, *Oncosiphon suffruticosum* (stinkruid), *Dorotheanthus bellidiformis*, *Mesembrythemum guerichianum*, the perennials *Conicosia pugioniformis*, an unidentifiable *Aspalathus* sp. and the grass *Cynodon dactylon* (kweek).



Plate 1. Section 1, showing past mining activities and degraded vegetation characterised by exotic grasses with only very few, weedy indigenous species present.

Section 2 has even less indigenous plants and is completely dominated by exotic grasses and annuals. The only indigenous species recorded in this field were *Mesembryanthemum guerichianum* and *Manulea tomentosa*.



Plate 2. Section 2 is characterised by ploughed lands with exotic grasses and no visible indigenous species”.

Section 2 borders on an area of degraded Hopefield sand fynbos to the north. Mining must be restricted to the existing ploughed lands and at least a thirty meter buffer should be delineated between the northern edge of the mining area and the patch of degraded Hopefield sand fynbos on the property.

Species of conservation concern

No species of conservation concern were recorded at either section 1 or section 2. Due to deep ploughing in the past there is unlikely to be any indigenous geophytes on these sites.

Conservation value and vulnerability

Both section 1 and section 2 falls within farm lands and have negligible biodiversity value. The conservation value of the vegetation in the study area is Low in local (Saldanha) and regional (West Coast) terms, as it has been completely transformed by agriculture.

Critical Biodiversity Areas

The proposed quarry extension areas fall outside of defined Critical Biodiversity Areas for the region (see figure [6] below). The mining of these sites will not result in fragmentation or impact on natural ecological processes.

Figure [6 below]. The location of the proposed mining areas (dark stars) in relation to protected areas and Critical Biodiversity Areas. Dark green are protected areas, light green are CBA's and light brown are no natural vegetation.

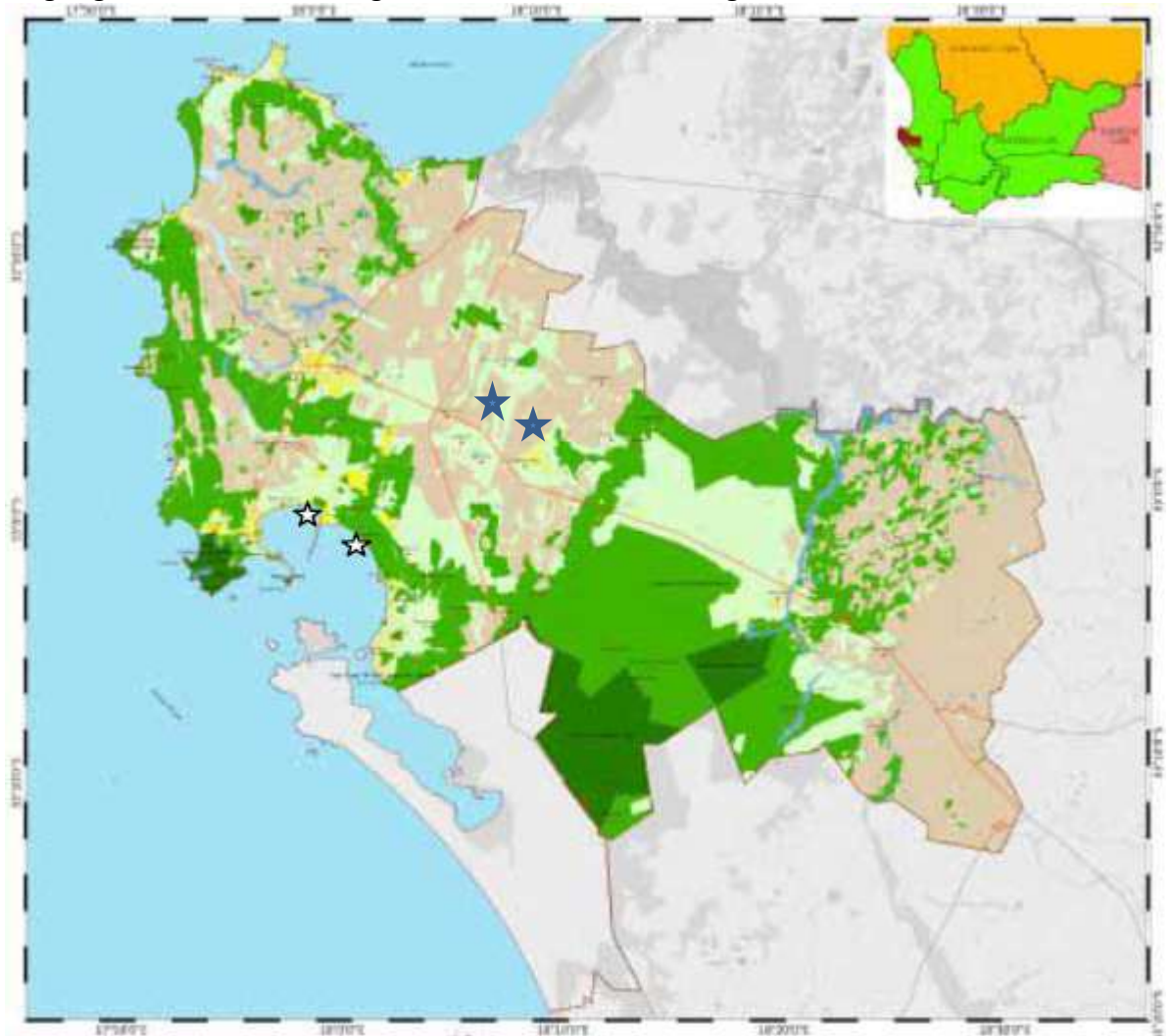


Figure 6: Vegetation: CBA Context

1.1.7 Animal Life

Vast expanses of low shrubland veld type vegetation provide a habitat suitable for species typical of the area. These include small buck, rodents (meerkat, mice, shrews etc.), reptiles (snakes and tortoises) birds and insects. The large scale of the habitat type (especially to the south) when compared to the extent of the proposed activities negate any significance of any impact in this regard.

1.1.8 Surface Water

The site is located in quaternary drainage basin G10M. There are absolutely no surface water resources in the mining area and surface water will not be impacted in terms of quantity or quality. No water is utilised in the mining process.

1.1.9 Ground Water

No water is utilised in the mining process. During the application for Mining Permit, the groundwater regime was identified as one of the potential impacts given the water which was located during prospecting. A specialist study was undertaken by John Weaver and is included as Annexure E. Such study concluded as follows:

“There is a seasonal (winter) water table developed in the upper loose sands. This is of minor significance to the planned mining activities, and will cause some wetness at the edges of mining.

The upper aquifer has an unconfined water table, which may be intersected by the mining activities. The mining activities will have minor to nil impact on this aquifer. The aquifer is localized and is areally variable in both quality and yield potential. If the water table is shallower than the planned maximum depth of open cast mining, then the open pit may be flooded by groundwater inflows. A groundwater dewatering system may need to be installed in order to mine under dry conditions.

The lower aquifer is an important groundwater resource that is currently being exploited as a regional water-supply source at the Langebaan Road Aquifer Wellfield about 6 kilometres east of the mining permit area. This aquifer will not be affected by any mining activities as it is sealed off with an impermeable 10 m thick clay layer, the Elandsfontyn Clay Member. There is no hydraulic connectivity through this clay layer.

Phosphate nodules are found throughout both the upper aquifer and the lower aquifer of Langebaan Road. Groundwater is in equilibrium with this phosphate. Levels of natural dissolved phosphate are <0.2 mg/L. Mining of phosphate at the Gecko Fert site will not result in phosphate pollution of the groundwater of either the upper aquifer nor of the lower aquifer”.

1.1.10 Air Quality (Dust)

Attention is drawn to paragraph 4.8.4 of the extract from SANS regarding recognition that certain enterprises need to operate within “band 3” by virtue of “the practical operation of the enterprise...” provided that the best available control technology is applied for the duration”.

“DUST FALL STANDARDS SANS 1929:2004

4.8 Dust Deposition

4.8.1 General

The four-band scale to be used in the evaluation of dust deposition is given in 4.8.2 and target, alert and action levels indicated in 4.8.3. Permissible margins of tolerance are outlined in 4.8.4 and exceptions noted in 4.8.5

4.8.2 Evaluation Criteria for Dust Deposition

Dust deposition rates shall be expressed in units of $\text{mg m}^2 \text{ day}^{-1}$ over a 30-day averaging period. Dust deposition shall be evaluated against a four-band scale as presented in Table 9.

Table 9 – Four-band scale evaluation criteria for dust deposition

Band number	Band description label	DUSTFALL RATE (D) ($\text{mg/m}^2/\text{day}^1$ 30-day average)	Comment
1	Residential	$D < 600$	Permissible for residential and light commercial.
2	Industrial	$600 < D < 1\,200$	Permissible for heavy commercial and industrial.
3	Action	$1\,200 < D < 2\,400$	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	$2\,400 < D$	Immediate action and remediation required following the first exceedance. Incident report to be submitted to relevant authority.

4.8.3 Target, Action and Alert Thresholds are given in Table 10

Table 10 – Target, action and alert thresholds for dust deposition

Level	DUSTFALL RATE (D) ($\text{mg/m}^2/\text{day}^1$ 30-day average)	Averaging period	Permitted frequency of exceedances
Target	300	Annual	
Action residential	500	30 days	Three within any year, no two sequential months
Action industrial	1 200	30 days	Three within any year, no two sequential months.
Alert threshold	2 400	30 days	None. First exceedance requires remediation and compulsory report to authorities.

4.8.4 Margin of Tolerance

An enterprise may submit a request to the authorities to operate within Band 3 (ACTION Band), as specified in Table 9, for a limited period, providing that this is essential in terms of the practical operation of the enterprise (for example the final removal of a tailings deposit) and provided that the best available control technology is applied for the duration.

No margin of tolerance will be granted for operations that result in dustfall rates which fall within Band 4 (ALERT Band) as specified in Table 9.

4.8.5 Exceptions

Dustfalls that exceed the specified rates but that can be shown to be the result of some extreme weather or geological event shall be discounted for the purpose of enforcement and control. Such event might typically result in excessive dustfall rates across an entire metropolitan region, and not be localised to a particular operation. Natural seasonal variations, such as dry windy period during the Highveld spring will not be considered extreme events for this definition”

At present, the ambient dust levels are related to rural activities and are generally quite low. Dust sources at present are:

- Occasional ploughing when preparing fields for cultivation
- Dust / pollen during harvesting
- Dust generated off unsurfaced roads
- Dust generated by current mining. The 1.5ha mining permit has been in operation for over a year and dust generation levels have been very low (Pers. Comm: Contractor through visual assessment and monitoring- “definitely does not impact on any surrounding land-user or landowner”).

Note however that during the Public Open Day, the attendees (2) described a scenario where summer winds would result in significant topsoil loss if such topsoil was placed/ replaced immediately prior to summer. They did note that ambient

dust levels during these strong winds are very high. This aspect has been built into the mining method.

1.1.11 Noise

Current noise generating activities in the area are related to:

- Traffic (not much) on unsurfaced roads in the area
- General minimal farm related noise
- Noise generated through mining at the existing mining permit area.

1.1.12 Socio economic profile of the area

Refer Annexure H for Socio-economic profile of the area.

1.2 Concise description of each of the existing environmental aspects both on the site applied for and in the surrounding area which may require protection or remediation.

The overriding aspects of the environment which may require protection or remediation are:

1. Impact on Palaeontology
2. Handling of topsoil

Palaeontology: Full specialist Palaeontological Assessment has been conducted by J. Pether. The study concludes that there may be artefacts of Palaeontological significance.

Topsoil handling: The proper handling & reuse of topsoil is essential to the rehabilitation of the site. Should mining progress to clay layer with no replacement of topsoil, then the revegetation of the site will be severely compromised, the land capability would be significantly impacted and the closure objectives described later in this text will not be met.

1.3 Concise description of the specific land uses, cultural and heritage aspects and infrastructure on the site and neighbouring properties / farms in respect of which the potential exists for the socio-economic conditions of other parties to be affected by the proposed mining operation.

None. The only parties whose Socio-economic conditions may be affected are the landowner (who has an agreement in place with the applicant) and the contractor company conducting the mining and its employees. These are positive impacts.

1.4 Annotated map showing the spatial locality and aerial extent of all environmental, cultural/heritage, infrastructure and land use features identified on site and on the neighbouring properties and farms.

Refer the following maps contained herein:

Figure 1: Locality Plan	2
Figure 2: Surrounding land use and access /delivery routes	5

Figure 3: Topsoil Survey results - Section 1	8
Figure 4: Topsoil survey results - Section 2.....	9
Figure 5: Vegetation.....	10
Figure 6: Vegetation: CBA Context.....	13
Figure 7: Prospecting results and Reserve Calculation: Section 1	23
Figure 8: Prospecting results and reserve calculation: Section 2	24
Figure 9: Mine Layout Plan - Section 1	25
Figure 10: Mine Layout Plan - Section 2	26
Figure 11: Surrounding and adjacent landowners.....	51
Figure 12: Langebaanweg Windrose.....	74
Figure 13: Dust vectors	75
Figure 14: Section 1 Entrance detail	76
Figure 15: Wind / dust considerations at entrance to Section 1	104

In addition, Annexures contain more detailed maps in respect of relevant aspect.

1.5 Confirmation that supporting documents in the form of specialist studies are attached as appendices.

The following annexures are attached:

Annexure B:	Botanical Specialist Assessment compiled by S Privett of Fynbos Ecoscapes
Annexure C:	Latest Palaeontological Impact Assessment by John Pether
Annexure D:	Archaeological Impact Assessment by Jonathan Kaplan
Annexure E:	Specialist groundwater Assessment by John Weaver

2 The proposed mining operation.

2.1 The mineral to be mined.

Phosphate Ore: Note that only the phoscrete (gravel like layer known as kaalpos (as shown in photo 2)) is the target of this mining operation. The clay (langpos) will not be mined.

2.2 The mining method to be employed and provide a concise description of the intended magnitude thereof in terms of volumes, depth and aerial extent.

The application for mining right over 2 non-contiguous portions of land to develop a shallow surface mine to remove pedocrete-type Phosphate rock. No blasting is required and no processing takes place on site.

No planning of this nature can occur without upfront knowledge of planned post mining land use. In this case, the landowner has currently in the process of fencing off an area of his farm for game farming. In the future he wishes to expand that game area and eventually include both mined out sections in the game farm. So although the aim of rehabilitation is to return the veld with pasture type vegetation, the landowner does require that natural vegetation will eventually take place. As a result, topsoil preservation and handling is of utmost importance to ensure this aim can be met.

Geology and rock formation generally determines the mining method. In this case the phosphate ore manifests as a pedocrete (i.e. phoscrete and is similar in formation to a ferricrete, calcrete, etc.). The material is either in massive form or as gravel or in sandy matrix and is never deeper than 2.5m in depth. Phosphate containing clay (locally known as langpos) is typically in place below the phoscrete. The proposal is to mine as a continuous strip mining method with integrated rehabilitation programme as described below:

1. Vegetation removal

Fortunately the sites are both located in wheatlands / pasture area. In fact Section 1 was cultivated in 2011 whilst Section 2 is fallow and was utilized as pasture in 2010. As a result, the vegetation will merely be removed along with topsoil⁴. This will ensure that a viable seedbank remains in the removed topsoil and also stabilises the replaced topsoil to prevent windblown loss of topsoil should it occur.

2. Topsoil removal:

All material above the phoscrete will be utilized as topsoil. The depth varies from 5cm in extreme shallow cases to depths of almost 1m. Topsoil depth map is as contained in para 1.1.4.

⁴ The specialist botanist specifies that there is no requirement for plant rescue or transplanting given that no natural vegetation remains

All topsoil is to be removed and the ideal would be for the topsoil to be utilized immediately in the rehabilitation of the previously mined area. Two aspects however, complicate this ideal:

- 1) Given the above scenario, it will result in only the first block's topsoil requiring long term stockpiling. Such topsoil would be used in the rehabilitation of the final block.
- 2) The public participation process's Public Open Day attendees also noted that the summer winds were exceptionally strong and that there would be significant topsoil loss to wind⁵ if the topsoil was removed, stockpiled or replaced during this period. For this reason it is essential that topsoil removal, stockpiling or replacement be timed to take place immediately after the summer season.

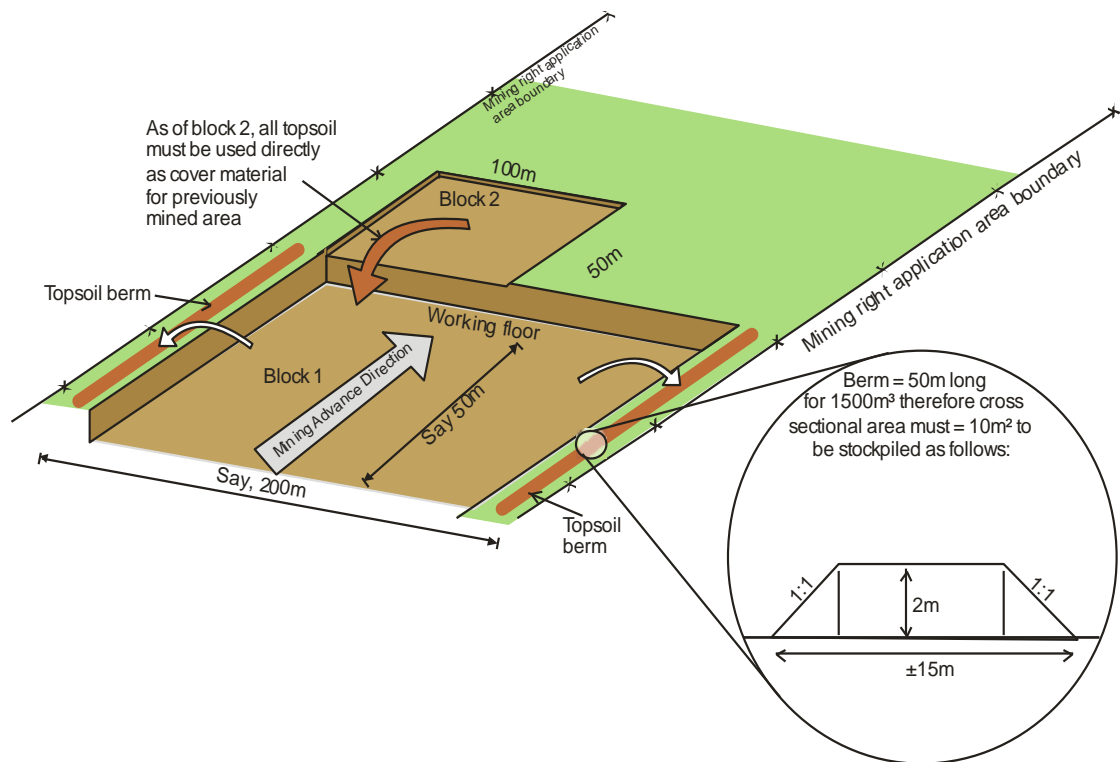
It is worth noting that the topsoil removal and replacement which took place during the mining permit excavation development did not suffer any loss to wind. This may be due to the vegetation content of the topsoil or that topsoil was coincidentally removed at the right time of the year. The rehabilitation which has been completed (Refer photo 1) did indeed take place in the early autumn months.

The botanist calls for the protection of topsoil during storage using hessian or shade cloth (see footnote below). This will only be necessary if the topsoil is removed after winter (and therefore subject to strong summer wind loss).

Topsoil heaps/berms are to be limited to 2m in height. The aim of such height restriction is more to preserve any viable seedbank than to reduce any visual / topographical impact. Topsoil can be stockpiled on either side of the excavation as shown in the diagram below.

Assuming the removal of topsoil to 300mm topsoil and that mining will be conducted in 200m x 50m blocks or blocks of 1ha, then topsoil handling will entail the removal of ($10\,000\text{m}^2 \times 0.3\text{m} =$) $3\,000\text{m}^3$ or $1\,500\text{m}^3$ per side of excavation (as shown in the diagram below):

⁵ This reiterated by the specialist botanist who states: "Strong winds that characterise this area are potentially a problem when it comes to topsoil management. It will be important that topsoil be adequately protected using hessian, shade net (or other suitable material) covering during storage. The timing of spreading and stabilising the topsoil with fast growing crops (in autumn) will be important to ensure rapid establishment of seedlings and resultant stabilisation".



3. Phoscrete Removal:

Mining of the phoscrete can then take place to a depth determined by the underlying clay layer. The typical profile of the material is as indicated in the photo overleaf. The pedocrete is referred to by its local name “Kaalphos” in the photo.

Note that mining is to take place as a strip mining operation in blocks with a working floor of no more than 1ha exposed and unrehabilitated at any one time. The principle of strip mining requires that rehabilitation be conducted after mining has been completed in that area (as described in points 4-7 below)

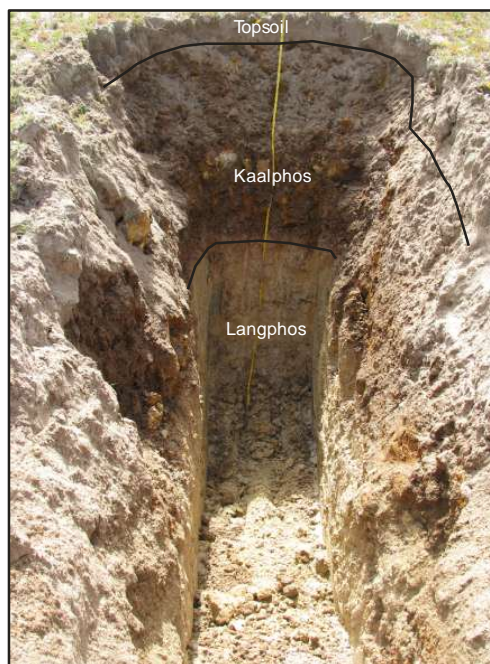
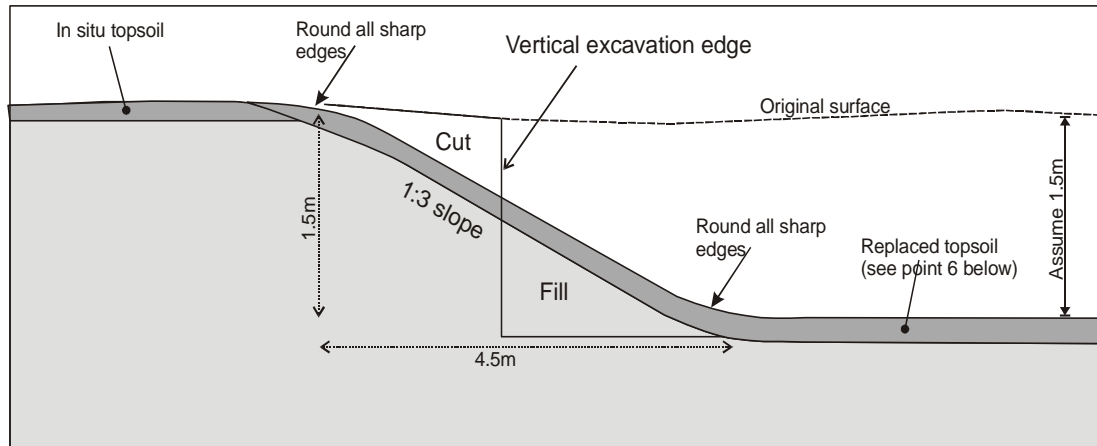


Photo 2 (repeat): Soil profile

4. Excavation shaping

After phoscrete removal has been completed and the floor no longer serves as the working area, then that portion of the mine must be rehabilitated. The first step in such rehabilitation is the shaping of the excavation edges. This entails the dozing of the edges of the excavation to 1:3 slopes and the subsequent rounding of the sharp edges to mimic natural contours (as shown in the diagram below).



The timing of these rehabilitation activities is also important and should be timed so that topsoiling can take place in early to middle autumn.

5. Topsoil replacement

After the excavation has been shaped, then all topsoil must be replaced to original depth down the 1:3 slopes and across the floor of the excavation. Any road that is required to access the workings must be retained for post mining rehabilitation. No topsoil is to be replaced after winter or during the summer months.

6. Revegetation

Notwithstanding the proposed eventual land use, the landowner and applicant have agreed that the mined out area must at the very least have all topsoil replaced and must be returned as pasture.

The landowner will encourage return of natural vegetation when the mining area is incorporated into his existing game farm. The applicant is obliged to seed the area with a pasture mix recommended by the landowner with such seeding taking place mid-autumn at the latest.

7. Monitoring and Aftercare

Monitoring and aftercare will consist solely of alien vegetation control and the ensuring that no erosion of the side slopes (highly unlikely) takes place. Revegetation must continue as per point 6 above until closure is granted. It must be noted that the only risk that remains after mining is that of alien vegetation infestation.

Road upgrading:

Any roads which are required will only be through the use of existing roads. No roads may be developed to wider than 4m should any upgrading be required (unlikely to be required).

Reserves and Mining Footprint:

The calculated reserves are as shown below. Note that the reserves were calculated as follows:

1. Trial pits (118 excavator-dug holes) were dug in the 2 target sections during the second round of prospecting.
2. Each of these holes were logged for target deposit thickness and percentage material (if in sandy matrix), amongst others.
3. At the office, these holes were mapped and aggregated by thickness variations (of 0.5m, 0.75m, 1.5m, 1.75m and 2.0m in the case of Section 1 and 0.5m, 0.75m, 1.112m and 1.37m in the case of Section 2).
4. Each of the polygons developed by those aggregate depths was then measured for area and multiplied by average depth to yield the results as follows:
5. Note that the material weighs 2tons per m³.

Section 1

Thickness	Total Area	Volume (Tight)	Tons
0.50m	3 949m ²	1 975m ³	3 949t
0.75m	28 863m ²	21 647m ³	43 295t
1.50m	28 410m ²	42 615m ³	85 230t
1.75m	19 061m ²	33 357m ³	66 714t
2.00m	1 621m ²	3 242m ³	6 484t
Total			205 671t

Section 2

Thickness	Total Area	Volume (Tight)	Tons
0.50m	12 042m ²	6 021m ³	12 042t
0.75m	44 919m ²	33 689m ³	67 379t
1.12m	51 024m ²	57 147m ³	114 294t
1.37m	16 943m ²	23 212m ³	46 424t
Total			240 138t
Grand Total			445 809t

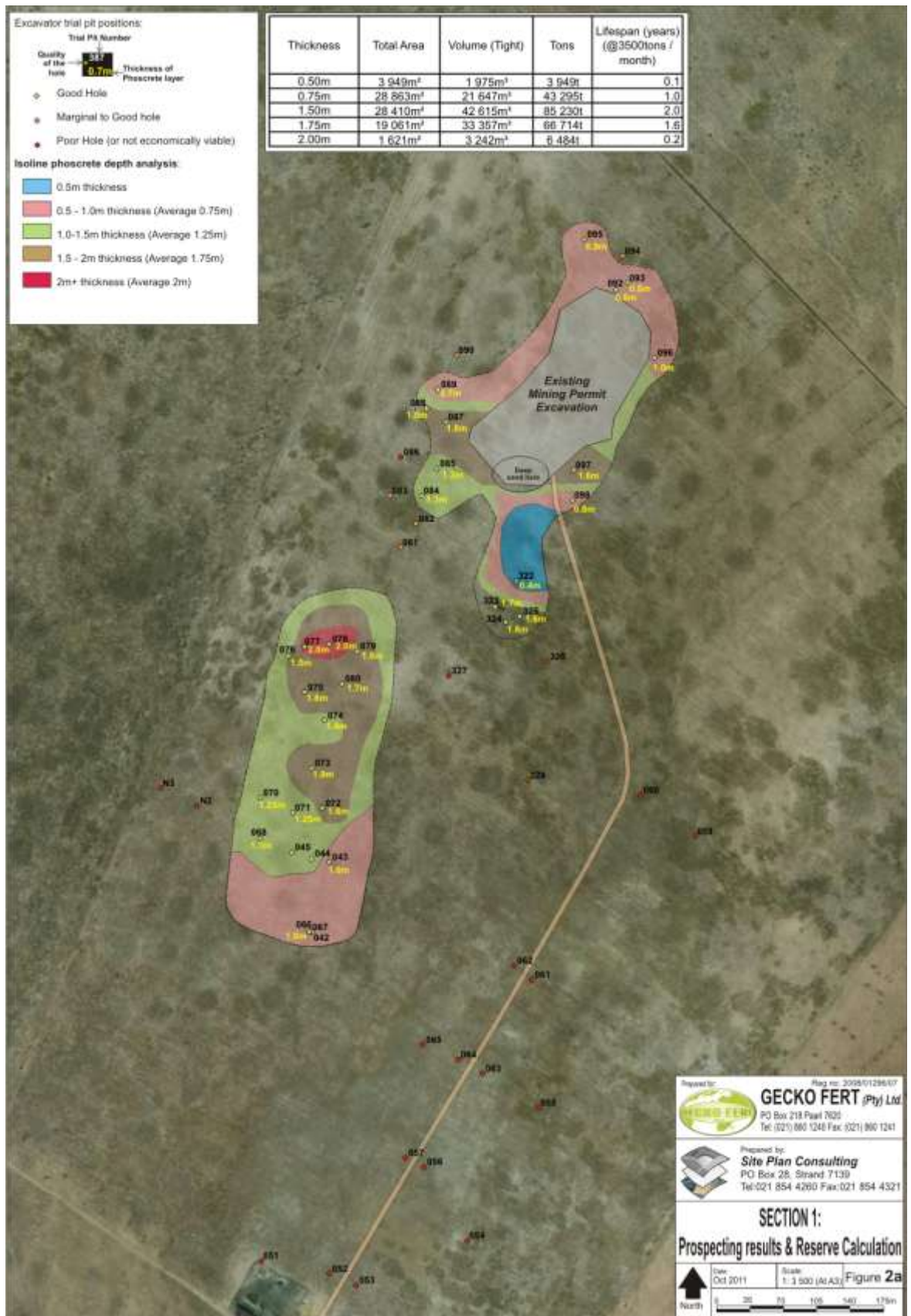


Figure 7: Prospecting results and Reserve Calculation: Section 1

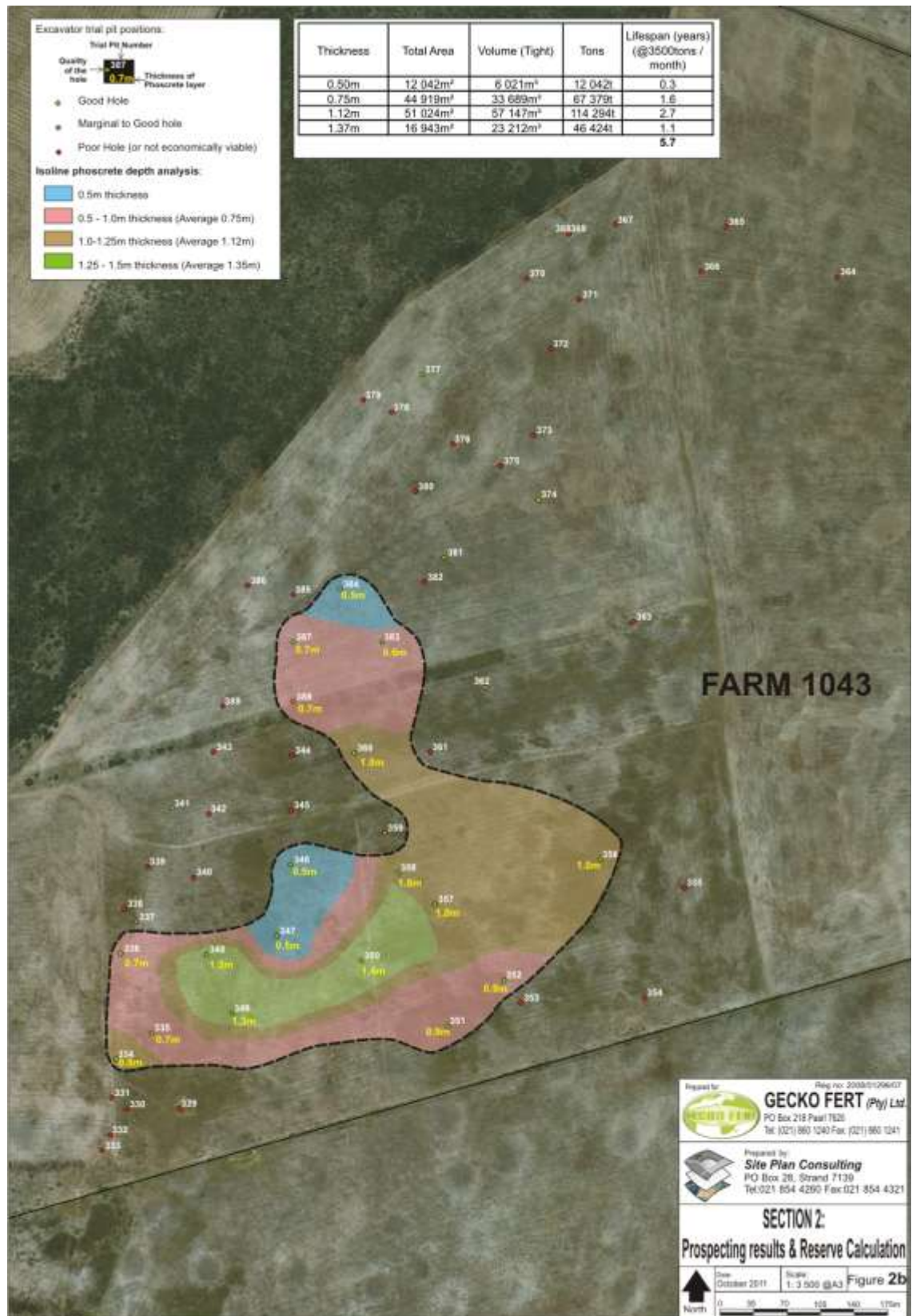


Figure 8: Prospecting results and reserve calculation: Section 2

Figures 9 and 10 overleaf indicates the mining area in 2 sections as well as extent of expected final excavations:

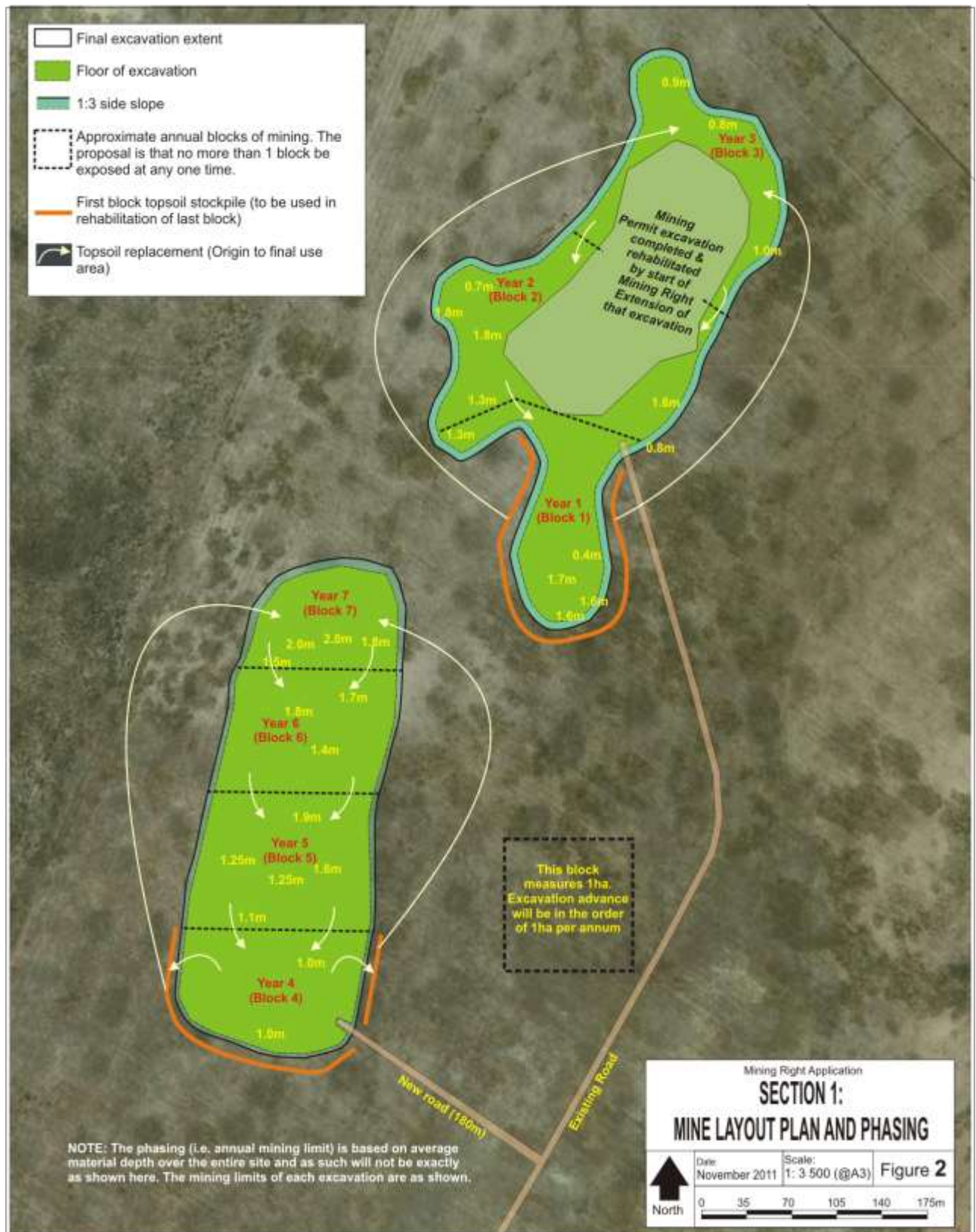


Figure 9: Mine Layout Plan - Section 1

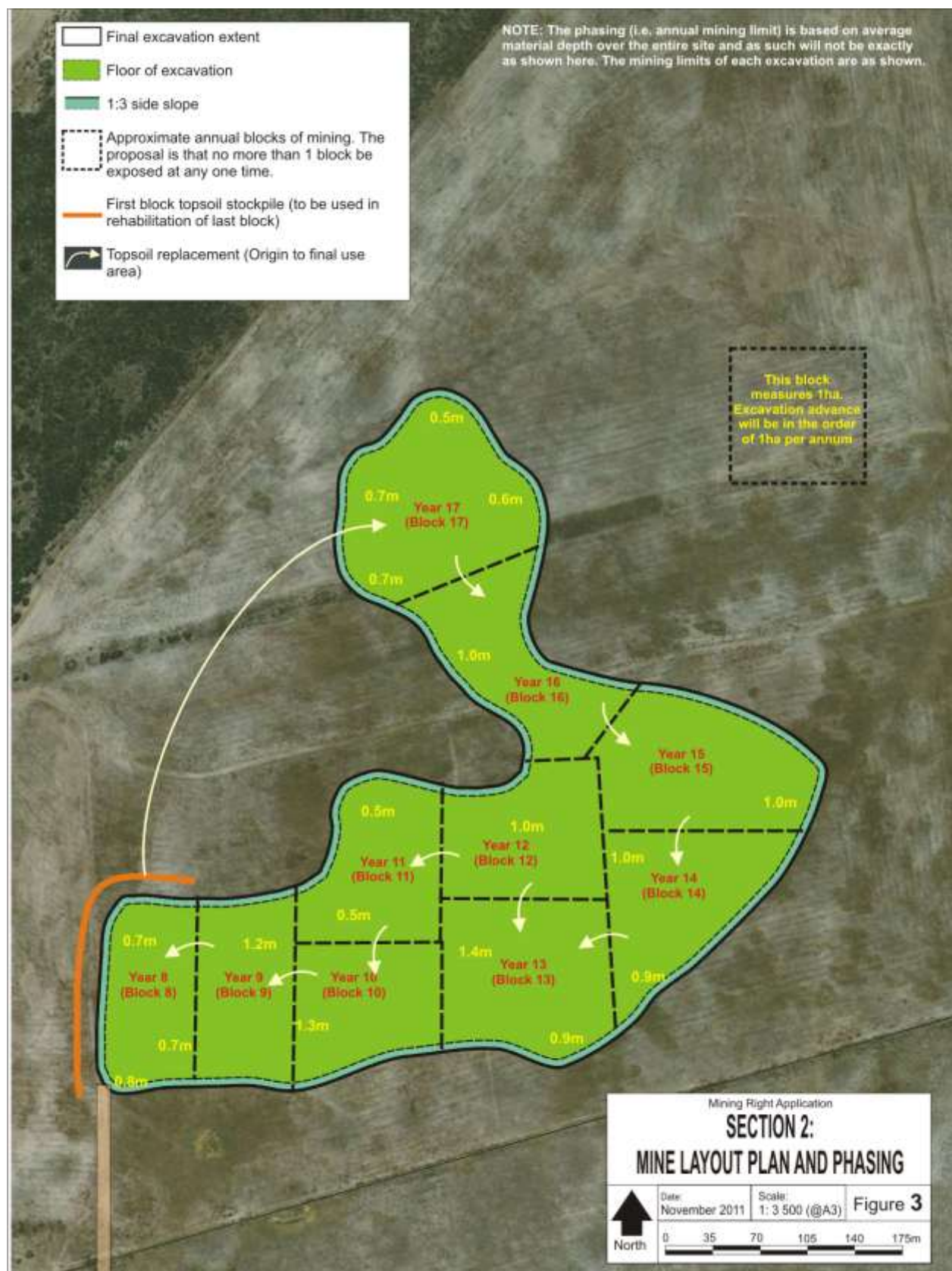


Figure 10: Mine Layout Plan - Section 2

2.3 List of the main mining actions, activities, or processes.

This mine already exists (as the Mining Permit excavation in Section 1) and there is strictly speaking no requirement for establishment phase, however there are some activities that will be considered establishment phase activities. The complete mining process is described in full in para 2.2 and listed (from the establishment phase through to the decommissioning and after care phase) in table form below.

Activity
1. POST-APPROVAL ACTIVITIES
1.1. Section 1: Demarcate mining right area by means of posts
1.2. Section 1: Demarcate maximum excavation area
2. ESTABLISHMENT ACTIVITIES
2.1. Provide chemical toilets for staff ⁶
2.2. Conduct Environmental Induction training to contractor staff
2.3. Section 1: No roads required – all roads in place
2.4. Section 2: Only existing farm roads will be used (May require upgrading) – no roads wider than 4m
3. OPERATIONAL PHASE ACTIVITIES – Sections 1 and 2
3.1. Complete rehabilitation of floor of Mining Permit area (Section 1)
3.2. Topsoil removal (along with vegetation) to perimeter stockpile ahead of face advance in Block 1 of each section. Subsequent blocks' topsoil removal as per para 2.2. point 2. No topsoil removal in or just prior to summer.
3.3. Removal of phoscrete by excavator to temporary stockpile in pit or directly onto awaiting delivery vehicle.
3.4. Use of access/delivery road to the site to transport material to processing plant off-site
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES
4.1. Levelling of floor (if required) – only early autumn.
4.2. Shaping of final pit edges (1:3 slopes and no sharp edges).
4.3. Topsoiling of shaped areas (directly from current mining block or from stockpile (only in early-mid autumn)).
4.4. Seed topsoiled area with pasture mix –latest mid-autumn
4.5. Conduct EPA (bi-annually)
4.6. Enforce no-go area access.
4.7. Decontaminate any oil / fuel leaks.
4.8. Continue alien vegetation removal programme.
5. DECOMMISSIONING PHASE ACTIVITIES
<i>Complete rehabilitation of the excavation through:</i>
5.1. Finalise sloping of final pit edges to 1:3
5.2. Topsoil (ex first block topsoil stockpile) shaped area
5.3. Re-vegetate such area using pasture mix seed
6. AFTERCARE PERIOD
6.1. Remove alien vegetation, if present
6.2. Conduct supplementary seeding if necessary
6.3. Conduct final performance assessment
6.4. Lodge closure Application
6.5. DMR Grant Closure Application

Table 3: List of activities

⁶ Chemical toilet chosen over toilet to septic tank given the fairly long distances covered during mining right period. The chemical toilet is fully mobile.

2.4 Plan showing the location and aerial extent of the aforesaid main mining actions, activities, or processes as required to calculate the financial provision in accordance with the Department's published guideline. (Reg. 51(b) (v)).

Refer Figures 9 & 10.

2.5 Listed activities (in terms of the NEMA ETA regulations) which will be occurring within the proposed project.

The following activities represent listed activities which could in theory be applicable to the mine and were listed in the scoping report. Progress / alterations to this are as contained in "comment" column where applicable. The following activities represent listed activities which could in theory be applicable to the mine:

In terms of Listing Notice 1 (i.e. No.R. 544):

Listing #	Description	Comment
23	Transformation of vacant land to... industrial use, outside urban area where total area to be transformed is bigger than 1ha but less than 20ha	Whether an excavation can be considered an industrial use is debatable. In any event, the total area to be disturbed by excavations in Section 1 and Section 2 is less than 20ha (at 19.4ha) over 2 non-contiguous excavations on 2 different non-adjacent farms.
56	Phased activities which result in trigger being exceeded	

In terms of Listing Notice 2 (i.e. No.R. 545):

Listing #	Description	Comment
20	Any activity which requires a mining right	Does not apply. DMR is competent authority.

In terms of Listing Notice 3 (i.e. No. R. 546) for Western Cape:

Listing #	Description	Comment
12	The clearance of an area of 300m ² or more of vegetation where 75% or more of the cover constitutes indigenous vegetation... in a CBA identified in bioregional plan	No
13	The clearance of an area of 1ha or more of vegetation where 75% or more of the cover constitutes indigenous vegetation... in a sensitive area as identified in an EM framework as contemplated in Chapter 5 of the (NEM)Act and adopted by the competent authority	No
26	Phased activities	No

2.6 Indication of the phases (construction, operational, decommissioning) and estimated time frames in relation to the implementation of these actions, activities or processes and infrastructure.

A simplified time frame diagram is as shown in the table below:

	Years																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Establishment Phase: Section 1	■																		
Operational Phase: Section 1	■	■	■	■	■	■	■	■											
Decommissioning rehabilitation: Section 1									■										
Establishment Phase: Section 2								■											
Operational Phase: Section 2									■	■	■	■	■	■	■	■			
Decommissioning rehabilitation phase: Section 2																	■		
Aftercare Phase																	■	■	
Closure Application																			■

Table 4: Simplified time schedule of activities

2.7 Confirmation if any other relevant information is attached as appendices.

None.

3 The potential impacts

3.1 List of the potential impacts, on environmental aspects separately in respect of each of the aforesaid main mining actions, activities, processes, and activities listed in the NEMA ETA regulations.

The following table lists each of the activities which may generate impacts. The shaded blocks represent a ***potential*** impact which could ***conceivably*** occur, but this is before any attenuation and is not ranked.

Activity	Geology	Topography	Topsoil	Vegetation	Land Capability	Ground Water	Surface Water	Animal Life	Noise	Air Quality (Dust)	Visual	Social/ Economic	Palaeontol./Cultural	Hydrocarbon Impact	Traffic /Access
1. POST-APPROVAL ACTIVITIES															
1.1. Section 1: Demarcate mining right area by means of posts					+										
1.2. Section 1: Demarcate maximum excavation area					+										
2. ESTABLISHMENT ACTIVITIES															
2.1. Provide chemical toilets for staff ⁷						-									
2.2. Conduct Environmental Induction training to contractor staff															
2.3. Section 1: No roads required – all roads in place but entrance will be paved and upgraded – refer para 20.7															
2.4. Section 2: Only existing farm roads will be used (May require upgrading) – no roads > 4m wide			-	-	-				-	-				-	
3. OPERATIONAL PHASE ACTIVITIES – Sections 1 and 2															
3.1. Complete rehabilitation of floor of Mining Permit area (Section 1)		+	+	+	+			+	-	-				-	
3.2. Topsoil removal (along with vegetation) to perimeter stockpile ahead of face advance in Block 1 of each section. Subsequent blocks' topsoil removal as per para 2.2. point 2.			-	-	-			-	-	-	-		-	-	
3.3. Removal of phoscrete by excavator to temporary stockpile in pit or directly onto awaiting delivery vehicle.	-	-			-	-		-	-	-			-	-	
3.4. Use of access/delivery road to the site to transport material to processing plant off-site								-	-	-				-	-
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES															
4.1. Levelling of floor (if required).		+							-	-				-	
4.2. Shaping of final pit edges (1:3 slopes and no sharp edges).		+							-	-				-	
4.3. Topsoiling of shaped areas (directly from current mining block – see point 3.2 in this table).			+						-	-				-	
4.4. Seed topsoiled area with pasture mix.				+	+			+							
4.5. Conduct EPA (bi-annually)															

⁷ Chemical toilet chosen over toilet to septic tank given the fairly long distances covered during mining right period. The chemical toilet is fully mobile.

Activity	Geology	Topography	Topsoil	Vegetation	Land Capability	Ground Water	Surface Water	Animal Life	Noise	Air Quality (Dust)	Visual	Social/ Economic	Palaeontol./Cultural	Hydrocarbon Impact	Traffic /Access
4.6. Enforce no-go area access.				+	+										
4.7. Decontaminate any oil / fuel leaks.														+	
4.8. Continue alien vegetation removal programme.				+	+										
5. DECOMMISSIONING PHASE ACTIVITIES															
<i>Complete rehabilitation of the excavation through:</i>															
5.1. Finalise sloping of final pit edges to 1:3		+							-	-				-	
5.2. Topsoil (ex first block topsoil stockpile) shaped area			+						-	-				-	
5.3. Re-vegetate such area using pasture mix seed				+	+			-							
6. AFTERCARE PERIOD															
6.1. Remove alien vegetation, if present				+	+										
6.2. Conduct supplementary seeding if necessary				+	+										
6.3. Conduct final performance assessment															
6.4. Lodge closure Application															
6.5. DMR Grant Closure Application															

Table 5: List of potential impacts

3.2 List of all potential cumulative environmental impacts.

The assessment of cumulative impacts on a site specific basis is often a complex operation. The aim of this impact analysis is ultimately to determine at which point the combined impacts from several operations (similar or dissimilar) in the area will affect the environment or part thereof to such a negative degree that the project should not be allowed to proceed.

Types of cumulative impacts:

1. **Additive impact:** Impacts of the same nature from different operations (e.g. Excessive groundwater abstraction from several operations in the same area result in a severe drawdown effect)
2. **Interactive impact:** where a cumulative impact is the result of a combination of different impacts to cause a new kind of impact. This kind of impact can be:
 - Countervailing – the net adverse effect is less than the sum of the individual impacts (e.g. pumping clear water into a polluted water resource).

- Synergistic – when the impacts work together to develop a sum of different impacts results in an impact which is greater than the individual impacts.

The only current identified land use is that of pasture and occasional grain cultivation. At this stage there are no identified land uses (present or future) which may have potential environmental linkages to the land concerned except for the use of the land for Conservation as proposed by the landowner.

It must be noted that mining has already begun adjacent to Section 1 as a Mining Permit application. As a result the (site specific and cumulative) impacts of the operation are known or have been measured over the last 2 years.

So, it is known that there are no cumulative impacts as a result of this operation which would prevent the operation from proceeding.

In terms of on-site cumulative impact, the following is relevant:

Hydrocarbon Impact – All trucking and mobile plant operations together contribute to the potential accumulative hydrocarbon impact, which must be treated holistically. Refer fuel and lubricant management specifications in Section 2 - EMP.

Noise and dust Impacts – All activities generating noise and dust cumulatively have the potential to impact on the surrounding land use of adjacent (although it has been shown to be not the case).

3.3 State specifically whether or not there is a risk of acid mine drainage or potential groundwater contamination associated with the mineral to be mined. (If such a risk is associated with the mineral to be mined provide a summary of the findings and recommendations of a specialist geo-hydrological report in that regard).

No such potential exists.

4 The alternative land use or developments that may be affected.

4.1 Concise description of the alternative land use of the area in which the mine is proposed to operate.

The mine already exists (as a 1.5ha Mining Permit excavation). The only reasonable alternative land uses identified are as follows:

Farming: The proposed extension to the excavation has some arable agricultural potential. The only feasible agricultural use for the land is for pasture development or grain cultivation (or as proposed by the landowner for game farming). Mining will contribute significantly more to job opportunities and economic upliftment in the area, especially when considering the small footprint required. The long term use of the land for agriculture is not precluded by the proposed mining activities

Conservation: The long term use of the land as conservation is not precluded by the proposed mining activities.

4.2 List and description of all the main features and infrastructure related to the alternative land uses or developments.

Farming: No infrastructure in the expansion area of the excavation.

Conservation: No infrastructure on the mine site, although the landowner has initiated game farming on the areas of natural vegetation on his farm through erection of a game fence.

4.3 Plan showing the location and aerial extent of the aforesaid main features of the alternative land use and infrastructure related to alternative land developments identified during scoping.

Refer figure 2: Surrounding Land Use.

5 The potential impacts of the alternative land use or development

5.1 List of the potential impacts of each of the aforesaid main features and infrastructure related to the alternative land use or development and related listed activities.

Farming: Note that all natural vegetation in the proposed mining area has been replaced with grain / pasture species.

Conservation: No impact will occur on the existing partially fenced game section on the landowner's farm as a result of the proposed mining. The landowner has expressed a wish to incorporate the mined out areas into an extension of the game farm.

5.2 Description of all potential cumulative impacts of the main features and infrastructure related to the identified alternative land uses or developments.

Refer Para 3.2.

6 Identification of potential social and cultural impacts.

6.1 List of potential impacts of the proposed mining operation on the socio-economic conditions of other parties' land use activities.

The proposed operation will have absolutely no impact on the surrounding landowners' socio-economic condition or any other parties land use activities with the exception of the landowner whom will be compensated in terms of agreement set up between the parties.

6.2 Description of the cultural and heritage aspects that will potentially be affected, and describe the potential impact on such cultural / heritage aspect.

6.2.1 Existing Situation

Archaeology:

The study conducted by Mr. J Kaplan was commissioned during the Prospecting phase of this operation. He was tasked to also comment on expected long term impact of mining. Be that as it may his findings are summarized as follows:

- "A few Later Stone Age, Middle Stone Age and Early Stone Age tools were documented during the study but these are spread very thinly and unevenly over the surrounding landscape. The archeological remains occur in severely disturbed context and have been rated as having low local significance.
- Some fragmented fossil bone was found in an old limestone quarry opposite the Transnet Iron Ore Railway Line west of the R27 (West Coast Road)⁸
- The remains of an abandoned farm workers cemetery were also documented in one of the proposed target areas⁹. Sadly, this 'site' has been severely damaged by ploughing activities, but the integrity of the site (as a place of memory) remains intact. At least 35 graves (or their remains) were counted, most of them comprising piles of Koffieklip. All burials sites and graves are protected under the National Heritage Resources Act (No of 1999) and may not be damaged or disturbed without a permit issued by the South African Heritage Resources Agency (SAHRA)".

Palaeontology:

"A Palaeontological Impact Assessment (PIA) was prepared for the prospecting application (Pether, 2009a) that outlined the potential palaeontological heritage resources in the subsurface of the prospecting area. This was followed up with a document setting out procedures for mitigation, for inclusion in the EMP for the prospecting (Pether, 2009b). Palaeontological monitoring was carried out on the 16th September 2009, when the prospecting trenches were inspected for possible fossil

⁸ This old limestone quarry was part of the prospecting area but is not at all part of the Mining Right area

⁹ Remember that this was a target are identified during prospecting and is not relevant to the reduced Mining Right area

content. A Palaeontological Mitigation Report was subsequently compiled (Pether, 2009c)". – J Pether – Annexure C

Specialist report has been compiled and is included in Annexure C. The details of such study are extensive and will not be copied here, except to say that Palaeontological artefacts will most likely be uncovered during mining of the pedocrete layer.

6.2.2 Potential Impact

Archaeology:

The following is quoted from the AIA conducted by Mr J Kaplan. Please note that even though the study was conducted prior to prospecting, the findings are still valid for the mining right application especially in light of the fact that the site has been "transformed and modified as a result of farming activities" :

"The Phase 1 Archaeological Impact Assessment has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to the proposed prospecting for grade exploitable phosphate. It is estimated that more than 95% of the proposed site has already been transformed and modified as a result of farming activities.

The probability of locating important pre-colonial archaeological heritage remains during implementation of the project is likely to be **low**.

Unmarked pre-colonial human burials may possibly be uncovered or exposed during earthmoving operations.

Potentially important vertebrate fossils (bones) may be uncovered or exposed should test excavations penetrate or intersect any limestone or associated fossil bearing sediments.

Prospecting in the 'target area' (Block F) alongside the railway line will definitely impact on the abandoned farm labourers cemetery¹⁰".

Palaeontology:

"Mining will result in a negative direct impact on the fossil content of the affected subsurface. Fossils and significant observations will be lost in the absence of management actions to mitigate such loss. This loss of the opportunity to recover fossils and their contexts when exposed at a particular site is irreversible.

Conversely, mine pits and construction excavations furnish the "windows" into the coastal plain depository that would not otherwise exist and thereby provide access to the hidden fossils. The impact is positive for palaeontology, provided that efforts are made to watch out for and rescue the fossils. There remains a medium to high risk of valuable fossils being lost in spite of management actions to mitigate such loss. These aspects are summarised in Table below.

¹⁰ The cemetery was avoided during invasive prospecting and proposed mining is located more than 800m from that site

PALAEONTOLOGICAL IMPACT TABLE - MINING

Locale	Quarries	
	Without mitigation	With mitigation
Extent	Local/regional	Local/regional
Magnitude	High	Medium
Duration	Long	Long
SIGNIFICANCE	HIGH (-)	MED-HI (- & +)
Probability	Definite	Definite
Confidence	Certain	Certain
Reversibility	Irreversible	Irreversible
Status	Negative	Positive
Irreplaceable loss of resources?	Yes	Partly
Can impacts be mitigated?	Partly	
Mitigation:	Monitoring and inspection of excavations.	

The impact mitigation measures are contained in para 20.6 and Annexure C: Chapter 4 and 5 (in Annexure C).

6.3 Quantification of the impact on the socio-economic conditions of directly affected persons.

PERSPECTIVES ON SOCIO-ECONOMIC/ECONOMIC IMPACT

The socio-economic impact of the phosphate mine is assessed within the following perspectives:

(a) Regional Context

- The site is located within the western Saldanha Bay Local municipality which includes:
 - i. Regional service centres of Saldanha Bay and Vredenburg
 - ii. Tourism centre, fishing centres and coastal holiday towns of Paternoster, Langebaan and St Helena Bay. The town of Velddrif lies just outside the Municipal area but has definite socio-economic linkages to the Saldanha Municipality
 - iii. The main economic bases of the Municipality include Industry (Saldanha Steel Project, Deep Water Port), Farming: Mostly wheat and grain (but not every year) and fishing is still an important industry.
- The mine's target market has proved to the agricultural community on a national scale. Given the national sales of the product, the socio economic impact should be assessed on a broader scale than just the locality in which the mine is located, however given the small scale of the operation and the relatively slow rate of advance / sales the socio-economic impact is more local of nature.

- Regionally speaking, the site itself is located just outside Saldanha and has clear and good access to transport infrastructure.

Saldanha Bay is recognised a potential regional economic driver in the Western Cape. It is part of a potential West Coast Strategic Development Initiative (with studies ongoing as to the potential of the establishment of an Industrial Development Zone (as a corridor between Saldanha Bay and Vredenburg)). Furthermore Saldanha Bay lies at the northern extremity of the 2030 Metropolitan Functional Region (MFR) of the City of Cape Town. The potential importance of the Port of Saldanha as a complement to the Port of Cape Town in the handling of general cargo is also acknowledged in the Metropolitan Integrated Transport Plan (MITP) of the City (Ackron).

(b) Surrounding Land Use Context

The surrounding land use consists of (Refer Figure 2):

- The overwhelming majority of surrounding land use consists of wheat / grain/pasture cultivation to the north. The site is located on the eastern edge of the cultivated lands before the Hopefield sands (just other side of the Langebaanweg Airforce Base make cultivation uneconomical).
- The site is well located in terms of access (with immediate access onto the good surfaced roads).
- The closest community is the Langebaanweg community (1.6km SE).
- The West Coast Fossil park is an important tourist facility and is located about 2km south of Section 2. The sites are not visible and will in no way be impacted by the proposed mining ... remember that mining has been taking place for the last 2 years with no adverse impact on the Fossil Park.

(c) Socio-Economic Upliftment

The applicant company is bound by prescriptions of the Social and Labour Plan to contribute to the community's skills development and must also implement a Local Economic Development project which meets the satisfaction of the DMR and local authority. Negotiations are still underway in this regard, but the project that appears to meet everyone's satisfaction is contribution with others to the development of housing near Vredenburg.

The social and labour plan also prescribes skills development for staff and community members. This is however limited given the small scale of the proposed activities.

The mining company does not employ any personnel to undertake the mining and processing. Such work is conducted under contract. The point is that the proposed authorisation of this site will not result in any additional job opportunities but will provide continued employment for existing contractor personnel.

POTENTIAL IMPACTEES

(a) Vredenburg Community

(i) **Community Skills Development:**

The applicant has committed to the provision of (a limited number) of bursaries (at FET college), Learnerships, School support etc. for member of the community (i.e. above and beyond their responsibility to contractor staff)

(ii) **Positive socio-economic programmes**

As detailed in the Social and Labour Plan as has been tabled to the DMR, the applicant has committed itself to the proposed housing provision project near Vredenburg.

(b) **Agricultural Economy**

No surrounding landowner's agricultural income will be materially affected. The site is cultivated as pasture and sometimes grain. There is no reason why such cultivation could not continue after mining (Refer Photo 1 which shows rehabilitating mined out area).

(c) **Tourism Industry**

No tourist will be aware of the mining operations as the site is not / will not be visible from any surrounding public road or residence (with the exception of distant views to someone who clammers up the old mine dump adjacent to the West Coast Fossil Park).

POTENTIAL ECONOMIC AND SECONDARY SOCIO-ECONOMIC IMPACT ON EXISTING COMMERCIAL OPERATIONS

There are no other phosphate producing mines in the area and the site will not impact on any other mining commodity.

7 Assessment and evaluation of potential impacts.

7.1 List of each potential impact identified in paragraphs 3 and 6 above.

The following table merely lists the proposed activities and a list of aspects of the environment which **may conceivably** be impacted upon by such activity. The table does not (and is not meant to) quantify the nature of impact (except to state whether such impact is beneficial (positive)).

1. POST-APPROVAL ACTIVITIES	
1.1.	Section 1: Demarcate mining right area by means of posts
1.1.1.	Land Capability
1.2.	Section 1: Demarcate maximum excavation area
1.2.1.	Land Capability
2. ESTABLISHMENT ACTIVITIES	
2.1.	Provide chemical toilets for staff ¹¹
2.1.1.	Groundwater
2.2.	Conduct Environmental Induction training to contractor staff
2.2.1.	EMS (Positive)
2.3.	Section 1: No roads required – all roads in place but access area to Section 1 to be upgraded – refer para 20.7.
2.4.	Section 2: Only existing farm roads will be used (May require upgrading) – no roads wider than 4m
2.4.1.	Topsoil
2.4.2.	Vegetation
2.4.3.	Land Capability
2.4.4.	Noise
2.4.5.	Air quality
2.4.6.	Hydrocarbon
3. OPERATIONAL PHASE ACTIVITIES – Sections 1 and 2	
3.1.	Complete rehabilitation of floor of Mining Permit area (Section 1) ¹²
3.1.1.	Topography (Positive)
3.1.2.	Topsoil (Positive)
3.1.3.	Vegetation (Positive)
3.1.4.	Land Capability (Positive)
3.1.5.	Animal Life (Positive)
3.1.6.	Noise
3.1.7.	Air quality
3.1.8.	Hydrocarbon
3.2.	Topsoil removal (along with vegetation) to perimeter stockpile ahead of face advance in Block 1 of each section. Subsequent blocks' topsoil removal as per para 2.2. point 2. Not prior to or during summer.
3.2.1.	Topsoil

¹¹ Chemical toilet chosen over toilet to septic tank given the fairly long distances covered during mining right period. The chemical toilet is fully mobile.

¹² Not strictly part of this application, however the portions of the floor and all side walls have been retained for mining of the Mining right are Section 1 (should such mining right be granted)

3.2.2. Vegetation
3.2.3. Land Capability
3.2.4. Animal Life
3.2.5. Noise
3.2.6. Air quality
3.2.7. Visual
3.2.8. Palaeontology
3.2.9. Hydrocarbon
3.3. Removal of phoscrete by excavator to temporary stockpile in pit or directly onto awaiting delivery vehicle.
3.3.1. Geology
3.3.2. Topography
3.3.3. Land Capability
3.3.4. Groundwater
3.3.5. Animal Life
3.3.6. Noise
3.3.7. Air quality
3.3.8. Palaeontology
3.3.9. Hydrocarbon
3.4. Use of access/delivery road to the site to transport material to processing plant off-site
3.4.1. Animal Life
3.4.2. Noise
3.4.3. Air quality
3.4.4. Hydrocarbon
3.4.5. Traffic / Access
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES
4.1. Levelling of floor (if required) – early autumn.
4.1.1. Topography (Positive)
4.1.2. Noise
4.1.3. Air quality
4.1.4. Hydrocarbon
4.2. Shaping of final pit edges (1:3 slopes and no sharp edges –early autumn).
4.2.1. Topography (Positive)
4.2.2. Noise
4.2.3. Air quality
4.2.4. Hydrocarbon
4.3. Topsoiling of shaped areas – refer para 2.2.point 2 – in early to mid autumn
4.3.1. Topsoil (Positive)
4.3.2. Noise
4.3.3. Air quality
4.3.4. Hydrocarbon
4.4. Seed topsoiled area with pasture mix.
4.4.1. Vegetation (Positive)
4.4.2. Land Capability (Positive)
4.4.3. Animal Life (Positive)
4.5. Conduct EPA (bi-annually)
4.5.1. EMS (Positive)
4.6. Enforce no-go area access.

4.6.1. Vegetation (Positive)
4.6.2. Land Capability (Positive)
4.7. Decontaminate any oil / fuel leaks.
4.7.1. Hydrocarbon (Positive)
4.8. Continue alien vegetation removal programme.
4.8.1. Vegetation (Positive)
4.8.2. Land Capability (Positive)
5. DECOMMISSIONING PHASE ACTIVITIES
<i>Complete rehabilitation of the excavation through:</i>
5.1. Finalise sloping of final pit edges to 1:3
5.1.1. Topography (Positive)
5.1.2. Noise
5.1.3. Air quality
5.1.4. Hydrocarbon
5.2. Topsoil (ex first block topsoil stockpile) shaped area
5.2.1. Topsoil (Positive)
5.2.2. Noise
5.2.3. Air quality
5.2.4. Hydrocarbon
5.3. Re-vegetate such area using pasture mix seed
5.3.1. Vegetation (Positive)
5.3.2. Land Capability (Positive)
5.3.3. Animal Life (Positive)
6. AFTERCARE PERIOD
6.1. Remove alien vegetation, if present
6.1.1. Vegetation (Positive)
6.1.2. Land Capability (Positive)
6.2. Conduct supplementary seeding if necessary
6.2.1. Vegetation (Positive)
6.2.2. Land Capability (Positive)

7.2 Concomitant impact rating for each potential impact listed in paragraph 7.1 above

This section describes the impact of the proposed mining programme. The impacts are rated according to nature, extent, duration, probability of occurring and significance.

a) The significance level is based on the following criteria:

Significance		Criteria
Negative	Significant (S)	<ul style="list-style-type: none"> Recommended level always exceeded with associated widespread community action Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever Complete loss of land capability Destruction of rare or endangered specimens May affect the viability of the project

Significance		Criteria
	Moderate (M)	<ul style="list-style-type: none"> Moderate measurable deterioration and discomfort Recommended level occasionally violated – still widespread complaints Partial loss of land capability Complete change in species variety or prevalence May be managed Is insignificant if managed according to EMP provisions
	Minor/ (I) Insignificant	<ul style="list-style-type: none"> Minor deterioration. Change not measurable Recommended level will rarely if ever be violated Sporadic community complaints Minor deterioration in land capability Minor changes in species variety or prevalence
	Negligible	<ul style="list-style-type: none"> An impact will occur but it is barely discernible and not worthy of further investigation
Positive	Minor	<ul style="list-style-type: none"> Improvements in local socio-economics
	Significant	<ul style="list-style-type: none"> Major improvements in local socio-economics with some regional benefits

The duration is classified as	The probability is ranked as
<ul style="list-style-type: none"> Permanent (post-closure) Life of Mine (LOM) Temporary 	<ul style="list-style-type: none"> Definite/Certain Possible Unlikely

b) The resultant table of impacts is as follows:

Nature of impact	Extent	Duration	Probability	Significance
1. POST-APPROVAL ACTIVITIES				
1.1. Section 1: Demarcate mining right area by means of posts				
1.1.1. Land Capability	Mining right area measures 78.63ha in 2 sections	Life of mine	Definite	Positive. Insignificant.
1.2. Section 1: Demarcate maximum excavation area				
1.2.1. Land Capability	The excavation areas measure 19.4ha in 3 non-contiguous sections	Life of mine	Definite	Positive. Insignificant.
2. ESTABLISHMENT ACTIVITIES				
2.1. Provide chemical toilets for staff ¹³				
2.1.1. Groundwater	Local (at point of leak)	Until detection / rectification	Unlikely	Insignificant
2.2. Conduct Environmental Induction training to contractor staff				
2.2.1. EMS (Positive)	All staff members	Life of mine	Definite	Positive.
2.3. Section 1: No roads required – all roads in place (Upgrade access precinct to Section 1) – refer para 20.7				
2.4. Section 2: Only existing farm roads will be used (May require upgrading) – no roads wider than 4m				
2.4.1. Topsoil	Through widening of existing road (only in the case of Section 2)	Life of mine	Unlikely	Insignificant
2.4.2. Vegetation	Through widening of existing road (only in the case of Section 2)	Life of mine	Unlikely	Insignificant
2.4.3. Land Capability	Any widening of road will lead to that strip being unavailable as pasture	Life of mine	Unlikely	Insignificant
2.4.4. Noise	Earthmoving equipment during development	On execution < 1 week	Unlikely	Insignificant

¹³ Chemical toilet chosen over toilet to septic tank given the fairly long distances covered during mining right period. The chemical toilet is fully mobile.

Nature of impact	Extent	Duration	Probability	Significance
2.4.5. Air quality	Earthmoving equipment during development	On execution < 1 week	Unlikely	Insignificant
2.4.6. Hydrocarbon	Potential for oil / fuel leaks	On execution < 1 week	Unlikely	Insignificant
3. OPERATIONAL PHASE ACTIVITIES – Sections 1 and 2				
3.1. Compete rehabilitation of floor of Mining Permit area (Section 1)¹⁴				
3.1.1. Topography	1.5ha previously mined area less that already rehabilitated	Permanent	Definite	Insignificant (Positive)
3.1.2. Topsoil	1.5ha previously mined area less that already rehabilitated	Permanent	Definite	Insignificant (Positive)
3.1.3. Vegetation	1.5ha previously mined area less that already rehabilitated	Permanent	Definite	Insignificant (Positive)
3.1.4. Land Capability	1.5ha previously mined area less that already rehabilitated. Note however that the area will not be available for grazing as it will be surrounded by excavation extension	Permanent	Definite	Insignificant (Positive)
3.1.5. Animal Life	1.5ha previously mined area less that already rehabilitated	Permanent	Definite	Insignificant (Positive)
3.1.6. Noise	Earthmoving equipment during development	On execution	Definite	Insignificant
3.1.7. Air quality	Earthmoving equipment during development	On execution	Definite	Insignificant
3.1.8. Hydrocarbon	Potential for oil / fuel leaks	On execution	Unlikely	Insignificant
3.2. Topsoil removal (along with vegetation) to perimeter stockpile ahead of face advance in Block 1 of each section. Subsequent blocks' topsoil removal as per para 2.2. point 2. Topsoil removal not immediately prior to or during summer windy period.				
3.2.1. Topsoil	Max 1ha at a time.	Life of mine in case of 1 st block per section. Maximum for remainder is less than 1 year (given replacement only in mid-autumn)	Definite	Insignificant
3.2.2. Vegetation	Max 1ha at a time to total of just under 20ha (as 3 excavations in 2 sections)	Life of mine in case of 1 st block per section. Max 1 year.	Definite	Insignificant
3.2.3. Land Capability	78.63 ha in 2 sections strictly speaking not available to the farmer. ¹⁵	Life of mine	Unlikely	Insignificant
3.2.4. Animal Life	Animal life (as it is) will be chased from advance areas (i.e. 19.4ha over 17years)	Life of mine but only on execution	Most Likely	Insignificant
3.2.5. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
3.2.6. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.

¹⁴ Not strictly part of this application, however the portions of the floor and all side walls have been retained for mining of the Mining right are Section 1 (should such mining right be granted)

¹⁵ In theory, the area will not be available as pasture however, the practice over the last 2 years has shown that livestock graze next to the excavations with no issues to date.

Nature of impact	Extent	Duration	Probability	Significance
3.2.7. Visual	The topsoil dumps on surface may be visible from the cultivated fields of surrounding landowners	Life of Mine	Possible	Insignificant
3.2.8. Palaeontology	There may be fossiliferous topsoil. Unlikely given previous ploughing etc.	Permanent	Highly unlikely	Moderate
3.2.9. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
3.3. Removal of phoscrete by excavator to temporary stockpile in pit or directly onto awaiting delivery vehicle.				
3.3.1. Geology	±225 000m ³ tight phoscrete will be removed	Permanent	Definite	Insignificant
3.3.2. Topography	Topography will be lowered by up to 2m (average 1.5m)	Permanent	Definite	Insignificant
3.3.3. Land Capability	Assume up to 19.4ha not available as grazing area / pasture/grain cultivation	Life of mine	Definite	Insignificant
3.3.4. Groundwater	Upper aquifer may be exposed at times (under wet conditions)	Until topsoil replacement but only under wet conditions	Probable	Insignificant
3.3.5. Animal Life	19.4ha over 17 year life of mine. Disturbance to burrowing animals	On execution	Less likely than during topsoil removal	Insignificant
3.3.6. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
3.3.7. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.
3.3.8. Palaeontology	19.4ha over 17 year lifespan of mine	Permanent	Most Likely	Moderate to high (Refer Annexure C)
3.3.9. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
3.4. Use of access/delivery road to the site to transport material to processing plant off-site				
3.4.1. Animal Life	Possibility of road kill	Life of mine when driving on access routes	Possible	Insignificant
3.4.2. Noise	Noise from delivery vehicles. Residences of old Langebaanweg station houses	On execution	Possible	Insignificant / moderate
3.4.3. Air quality	Potential for dust generation when passing or near to residences at Old Langebaanweg Station	On execution under (un)favourable wind conditions	Probable	Insignificant
3.4.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
3.4.5. Traffic / Access	At sales of 31 000tons per annum using 18 ton trucks that equates to average 7 trucks per day leaving the site (in 242 day working year)	Life of mine. 8 years past Old Langebaanweg Station residences	Definite	Insignificant
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES				

Nature of impact	Extent	Duration	Probability	Significance
4.1. Levelling of floor (if required) – best conducted during early autumn (although not subject to strong winds).				
4.1.1. Topography (Positive)	All mined out areas	Permanent	Definite	Insignificant
4.1.2. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
4.1.3. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.
4.1.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
4.2. Shaping of final pit edges (1:3 slopes and no sharp edges) – best during early autumn				
4.2.1. Topography (Positive)	All final pit slopes	Permanent	Definite	Insignificant
4.2.2. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
4.2.3. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.
4.2.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
4.3. Topsoiling of shaped areas (see point 3.2 in this table) – early to mid-autumn only.				
4.3.1. Topsoil	All mined out areas. No more than 1ha at a time to be without topsoil	Life of mine	Definite	Insignificant (Positive)
4.3.2. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
4.3.3. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.
4.3.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
4.4. Seed topsoiled area with pasture mix – mid autumn.				
4.4.1. Vegetation (Positive)	All topsoiled areas.	Permanent	Definite (although natural revegetation does work)	Insignificant
4.4.2. Land Capability (Positive)	All seeded areas will r return to pre-mining land capability	Permanent	Definite	Insignificant
4.4.3. Animal Life (Positive)	Animal Life will return to vegetated areas	Permanent	Definite	Insignificant
4.5. Conduct EPA (bi-annually)				
4.5.1. EMS (Positive)	Entire site. Confirm EMP prescriptions are complied with.	Once every 2 years	Definite	Moderate
4.6. Enforce no-go area access.				

Nature of impact	Extent	Duration	Probability	Significance
4.6.1. Vegetation (Positive)	All areas outside of proposed excavation areas	Life of Mine	Definite	Insignificant
4.6.2. Land Capability (Positive)	All areas outside of proposed excavation areas	Life of Mine	Definite	Insignificant
4.7. Decontaminate any oil / fuel leaks.				
4.7.1. Hydrocarbon (Positive)	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
4.8. Continue alien vegetation removal programme.				
4.8.1. Vegetation (Positive)	Mining right area, especially disturbed areas	Life of mine and aftercare	Definite	Insignificant
4.8.2. Land Capability (Positive)	Mining right area, especially disturbed areas	Life of mine and aftercare	Definite	Insignificant
5. DECOMMISSIONING PHASE ACTIVITIES				
<i>Complete rehabilitation of the excavation through:</i>				
5.1. Finalise sloping of final pit edges to 1:3				
5.1.1. Topography (Positive)	All final pit slopes	Permanent	Definite	Insignificant
5.1.2. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
5.1.3. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.
5.1.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
5.2. Topsoil (ex first block topsoil stockpile) shaped area - early to mid-autumn				
5.2.1. Topsoil (Positive)	Final mining block	Permanent	Definite	Insignificant
5.2.2. Noise	Noise from earthmoving equipment. Impact localised.	On execution	Definite	Insignificant. None on surrounding landowners.
5.2.3. Air quality	Dust from earthmoving equipment. Impact localised	On execution	Definite	Insignificant. None on surrounding landowners.
5.2.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	From event until clean up	Possible	Insignificant
5.3. Re-vegetate such area using pasture mix seed – latest mid -autmun				
5.3.1. Vegetation (Positive)	All topsoiled areas.	Permanent	Definite (although natural revegetation does work)	Insignificant
5.3.2. Land Capability (Positive)	All seeded areas will return to pre-mining land capability	Permanent	Definite	Insignificant
5.3.3. Animal Life (Positive)	Animal Life will return to vegetated areas	Permanent	Definite	Insignificant
6. AFTERCARE PERIOD				
6.1. Remove alien vegetation, if present				
6.1.1. Vegetation (Positive)	Mining right area, especially disturbed areas	Life of mine and aftercare	Definite	Insignificant

Nature of impact	Extent	Duration	Probability	Significance
6.1.2. Land Capability (Positive)	Mining right area, especially disturbed areas	Life of mine and aftercare	Definite	Insignificant
6.2. Conduct supplementary seeding if necessary				
6.2.1. Vegetation (Positive)	Excavation area	Life of mine and aftercare	Definite	Insignificant
6.2.2. Land Capability (Positive)	Excavation area	Life of mine and aftercare	Definite	Insignificant

Table 6: Classification of potential impacts

7.3 Indication of the phases (construction, operational, decommissioning) and estimated time frames in relation to the potential impacts rated.

Impacts occur in a range from on occurrence of event to permanent as described in the table above. Life of Mine impact refers to up to 19 years (including Mining, decommissioning and aftercare period) as per chart below.

	Years																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Establishment Phase: Section 1	■																		
Operational Phase: Section 1	■	■	■	■	■	■	■	■											
Decommissioning rehabilitation: Section 1									■										
Establishment Phase: Section 2								■											
Operational Phase: Section 2									■	■	■	■	■	■	■	■			
Decommissioning rehabilitation phase: Section 2																	■		
Aftercare Phase																	■	■	
Closure Application																			■

Table 7: Simplified schedule of activities (repeat)

8 Identification of the alternative land uses which will be impacted upon.

The only reasonable alternative land uses identified are as follows:

Farming: Both sections are currently used for dryland cultivation of pasture. The sites can on occasion also be used for single-grain cultivation but returns are poor compared to other areas.

The impact of mining on this is insignificant (given small scale of the operation) and temporary (as the site will be available for pre-mining land use after mining).

Mining will contribute significantly more to job opportunities and economic upliftment in the area, especially when considering the small footprint required for the mining and the fact that the surface will be available for original use post mining.

Conservation: The long term use of the land as conservation is not precluded by the proposed extension to the excavation. The site will however be temporarily (life of mine) be unavailable as *wilderness* area.

9 Listed results of a specialist comparative land use assessment.

Not applicable.

10 List of all the significant impacts as identified in the assessment conducted in terms of Regulation 50 (c)

This regulation requires the applicant to determine the appropriate mitigation measures for each significant impact of the proposed mining operation. This is not intended to be a duplication of Reg 51(b) which requires a description of the mitigation measures in detail. It is only intended to determine the appropriate type of mitigatory measure to be applied in the EMP.

Mitigation measures are aimed at eliminating, offsetting, or reducing adverse environmental impacts and could have a range of objectives, such as:

- **Avoidance:** Avoiding projects or activities that could result in adverse impacts; avoiding certain types of resources or areas considered to be environmentally sensitive. This approach is most effective when applied in the earliest stages of project planning.
- **Prevention:** Measures aimed at preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having harmful environmental and social impacts.
- **Preservation:** Preventing any future actions that might adversely affect an environmental resource. This is typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
- **Minimisation:** Limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, or redesigning elements of a project.

- **Rehabilitation:** Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation.
- **Restoration:** Restoring affected resources to an earlier (and possibly more stable and productive) state, typically a 'pristine' condition.
- **Compensation:** Creation, enhancement, or protection of the same type of resource at another suitable and acceptable location, compensating for lost resources. It should be noted that compensation may be a suitable mitigation measure for certain impacts of certain projects, but is often not a sustainable measure to implement. (CSIR, 2005)

When assessing the criteria which describe the levels of impact in the table in para 7.2, it is clear that potentially the highest impact is that on Palaeontology. However, the specialist does state that the impact can in fact be positive with the implementation of a well organised monitoring system.

Be that as it may, the largest impacts will be generated by the following activities. The table also lists the mitigation strategy to be employed (from the definition above):

Activity / Impact	Mitigation class
Potential impact on palaeontology	Monitoring / Minimisation
Impact of topsoil removal	Rehabilitation
Impact on topography as a result of the excavation advance	Rehabilitation

11 Identification of interested and affected parties.

11.1 List of names of landowners and other affected parties in respect of the land uses that have been identified on the property and adjacent and non-adjacent properties that may be affected by the mining operation:

REFER Annexure A6 for full list of all parties consulted during this process.

The Landowners to the application are as follows:

Farm	Landowner	Title Deed
Farm 1043	BLOMFONTEIN TRUST	T92418/1998
Langeberg 185/7	JOACHIM PAULUS BESTER	T52817/1986

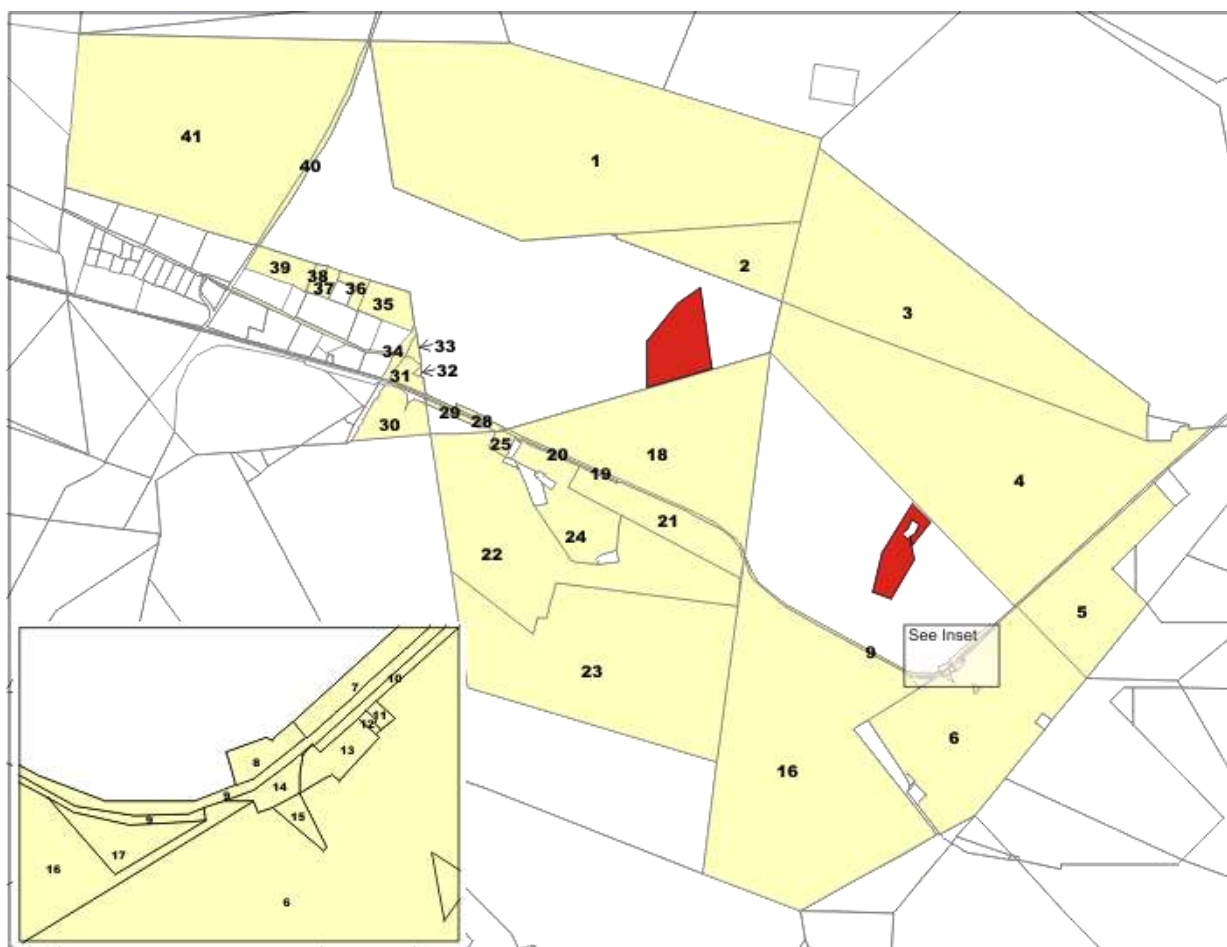
In both cases the contact details of the landowner / landowner representative is:

Mr "Jokie" Bester

Tel: 083 290 7667

Landline: 022 766 1056

The following map shows the locality of the surrounding landowners which were all consulted as will be shown later in the text:



ID	Farm (Ptn / Farm)	Owner	ID	Farm (Ptn / Farm)	Owner
1	2/138	Olivier Bester Familiy Trust	21	15/185	West Coast Fossil Park Trust
2	5/137	Olivier Bester Familiy Trust	22	29/185	West Coast Fossil Park Trust
3	4/137	Nicolaas Lambert Loubser	23	1/188	West Coast Fossil Park Trust
4	RE/1029	Jacobus Stephanus Loubser	24	45/185	Terra Nominees (Pty) Ltd
5	RE/6/137	Republic of South Africa	25	38/185	Brenda Winder
6	19/185	Republic of South Africa	26	9/137	Transnet Ltd
7	40/185	Olivier Bester Familiy Trust	27	3/137	Transnet Ltd
8	54/185	Olivier Bester Familiy Trust	28	1/137	Transnet Ltd
9	9/185	Transnet Ltd	29	8/137	Transnet Ltd
10	41/185	Olivier Bester Family Trust	30	27/135	Gerard and Estelle Lambrechts
11	33/185	Annamarie De Kock Van Eeden	31	50/135	Cornelius Leonardus Hoogland
12	39/185	Gideon Jacobus Van Eeden	32	8/135	Nederduits Ger Sendings Kerk - Vredenburg
13	55/185	Olivier Bester Family Trust	33	26/135	Lucas Neil Steyn
14	24/185	Transnet Ltd	34	3/135	Waterwyk (Pty) Ltd
15	26/185	Transnet Ltd	35	22/135	Neville Graham Eriksen
16	7/185	Joachim Paulus Bester	36	RE/21/135	Tranquila Vida Property Investments (Pty) Ltd
17	30/185	Republic of South Africa	37	Erf 15338	
18	12/185	De Kock Familiy Trust	38	48/135	Gregory Peter Fouche
19	8/185	Transnet Ltd	39	20/135	Andrew Martin Coetzee
20	22/185	Transnet Ltd	40	43/135	Transnet Ltd
			41	2/135	Local Authority

Figure 11: Surrounding and adjacent landowners

Refer Annexure A2 for letter of no objection from the landowner.

All adjacent landowners were sent either Email or Registered mail (Refer Annexure A for copy of letters and mail slips) after discussion/introduction per telephone. This correspondence was sent with a copy of the Background Information Document (BID)¹⁶ which served as discussion document.

List of landowners consulted and method of consultation as per table below. Full contact details in Annexure A6:

Organisation & Position	Name	How Alerted	Refer Annexure
Olivier Bester Trust	Alwyn Vermeulen	Registered Mail	A3
Surrounding landowner	Jacobus Loubser & NL Loubser	Registered Mail	A3
De Kock Family Trust	Martin De Kock	E-Mail	A3
Surrounding landowner	Andrew Martin Coetzee	E-Mail	A3
Surrounding landowner	Greg Peter Fouche	Registered Mail	A3
Surrounding landowner	Neville Graham Eriksen	Registered Mail	A3
Surrounding landowner	Lucas Neil Steyn	E-Mail	A3
Surrounding landowner	Brenda Winder	E-Mail	A3
Surrounding landowner	Gideon & Annemarie Van Eeden	Registered Mail	A3
Terra Nominees (Pty) Ltd	Dineo Peta	Registered Mail	A3
Nederduits Gereformeerde Sendelingskerk	To whom it may concern	E-Mail	A3
Nederduits Gereformeerde Sendelingskerk	To whom it may concern	E-Mail	A3
Transnet	Norman Papenfus / Hlonipho Zondi	E-Mail	A3
Tranquila Vida Eiendoms CC	Rudi Aspeung	E-Mail	A3
West Coast Fossil Park	Pippa Haarhof	E-Mail	A3
Air Force Base	Col D Smith	E-Mail	A3

11.2 List of the relevant Local Government, Provincial Government Departments, Land Claims Commissioner and Tribal Authorities consulted

The following table lists the applicable parties that were consulted in this regard:

Organisation & Position	Name	How Alerted	Refer Annexure
Ward Councillors			
Ward Councillor Ward 1	Mr M S Biko	Registered Mail	A4
Ward Councillor Ward 2	Mr J Skei	Registered Mail	A4
Ward Councillor Ward 3	Mr RJ Don	E-Mail	A4
Ward Councillor Ward 4	Mr S T Vries	Registered Mail	A4
Ward Councillor Ward 5	Mr F Pronk	E-Mail	A4
Ward Councillor Ward 6	Mr A Kruger	E-Mail	A4
Ward Councillor Ward 7	Mr F Schippers	E-Mail	A4
Ward Councillor Ward 8	Mr NS Louw	E-Mail	A4
Ward Councillor Ward 9	Mr S J Masina	Registered Mail	A4
Ward Councillor Ward 10	Ms E SJ Steyn	E-Mail	A4

¹⁶ A full copy of the BID was attached to the Scoping report as an Annexure. No copy is attached to this document but should any person wish to see such document, it can be made available to them.

Organisation & Position	Name	How Alerted	Refer Annexure
Ward Councillor Ward 12	Mr T Benjamin	Registered Mail	A4
Ward Councillor Ward 13	Ms S L van Tura	E-Mail	A4
Government			
Local Authority: Municipal Manager	Louis Scheepers	E-Mail	A4
Local Authority: Env. Section	Manager: Civil Services	E-Mail	A4

Table 8: List of Local Government and tribal authorities consulted

It must be noted that the Department of Mineral Resources liaises directly with the other Government Departments (such as Water Affairs, Agriculture, Environment, Health, etc.)

11.3 List of relevant Government Agencies and institutions responsible for various aspects of the environment and infrastructure.

The following table lists the applicable parties that were consulted in this regard:

Government, NGO's & Civic Organisations			
West Coast Biosphere Reserve	Val Priestly	E-Mail	A5
WESSA	Philippa Huntley	E-Mail	A5
Saldanha Bay Forum	Christo van Wyk	E-Mail	A5
Saldanha Bay Forum	Jimmy Walsh	E-Mail	A5
Agri: Western Cape	For Vredenburg Farmers Association	E-Mail	A5

Table 9: List of NGOs consulted

11.4 List of relevant local communities that were consulted:

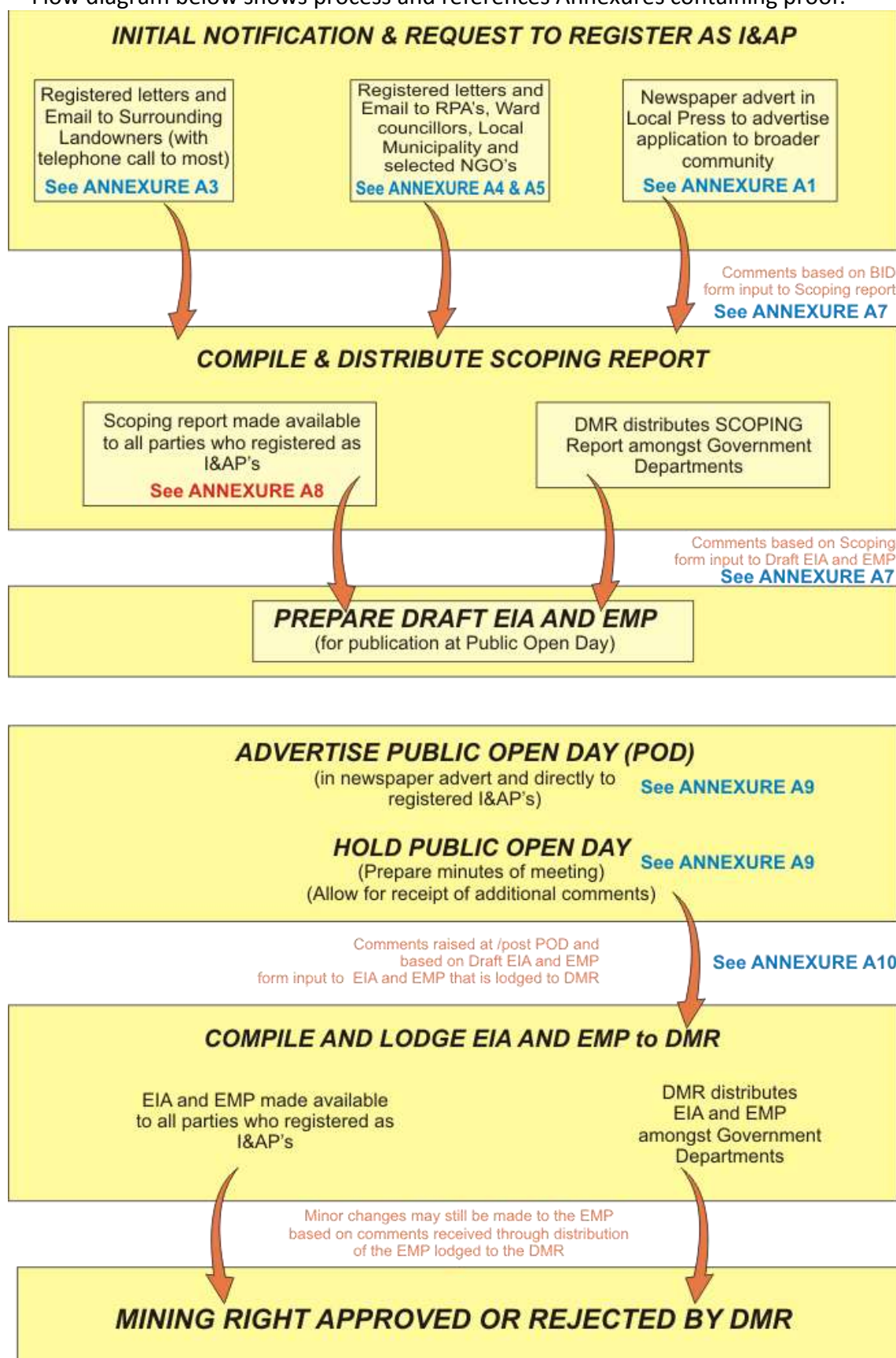
In addition to sending notification to all ward councillors listed in para 11.2 above, the relevant Ratepayers Associations were notified and the application was also advertised in the Local press (i.e. Weslander : 27 July 2012) – see Annexure B1 for copy of newspaper advert. Such advert served as notification of application and also served as call to register as Interested and Affected Party.

Organisation & Position	Name	How Alerted	Refer Annexure
Ratepayers Assoc: Vredenburg	Mr Morgan Smith	E-Mail	A5
Ratepayers Assoc: Langebaan	Jaco Kotze	E-Mail	A5

The public were provided with a second notification in the same publication (on 19 October 2012 when they were invited to attend the Public Open Day (held on 6 November 2012)).

12 The details of the engagement process.

Flow diagram below shows process and references Annexures containing proof.



12.1 Confirm which authorities have been consulted with regard to any economic development plans or proclaimed nature reserves in the area

Yes. The Local Authority has been approached as well as the West Coast Biosphere.

Note also that the Department of Mineral Resources is responsible for ensuring that the Government Departments at National level are made aware of the application and Cape Nature have been consulted through this process.

12.2 Confirm that the nature and scope of the mining project and the typical impacts of such mine have been explained to I&AP's including landowners, SAHRA and communities concerned.

All identified I&AP's have been sent written information in the form of the Background Information Document (full copy of which was contained in Annexure to the Scoping Report). Should any party wish to have a copy of the published BID, please contact craig@siteplan.co.za.

In addition, a draft copy of this EMP was distributed after the Public Open Day. Should anyone wish to have a copy of such draft EMP, please contact craig@siteplan.co.za.

12.3 Confirm which specialists, knowledgeable institutions and knowledgeable persons have been consulted and indicate in what regard

The following specialists were tasked for their inputs:

- Palaeontological Impact Assessment – John Pether – See Annexure C. Note that J Pether has been the Specialist Palaeontologist since the Prospecting application and has compiled 3 reports (viz. a pre-prospecting desktop action plan, a post –prospecting analysis and now the mining related Palaeontological Impact Assessment which is included as Annexure C).
- Archaeological Impact Assessment was written after prospecting to serve the prospecting right application. It remains relevant for the Mining Right application and does not need updating – Refer Annexure D.
- Groundwater Impact Assessment was written after prospecting to serve the Prospecting Right and Mining Permit application. It remains relevant for the Mining Right application and does not need updating – Refer Annexure E.
- Updated Botanical Assessment -Fynbos Ecoscapes – See Annexure B

The EMP and Palaeontological Impact Assessment have been lodged at the offices of Heritage Western Cape and to date we await their response.

13 Details regarding the manner in which the issues raised were addressed.

13.1 Confirm whether or not the description of the environment has been compiled with the participation of the landowner, I&AP's and Communities concerned.

Yes. A description of the existing Environment was contained in both the Background Information Document (BID), the Scoping report and the Draft EMP¹⁷. Furthermore the readers of the BID were specifically asked the following questions – refer question 1, 3 and 5:

1. Do you agree with the provided description of the status of existing biophysical environment (as described earlier in the BID)?
2. Do you agree with the potential impacts on biophysical environment identified as a result of the proposed mining (as described earlier in the BID)?
3. Do you agree with the provided description of the status of existing heritage /cultural environment (as described earlier in the BID)?
4. Do you agree with the potential impacts on heritage / cultural aspects identified as a result of the proposed mining (as described earlier in the BID)?
5. Do you agree with the provided description of the status of existing socio economic environment (as described earlier in the BID)?
6. Do you agree with the potential impacts on socio-economic aspects identified as a result of the proposed mining (as described earlier in the BID)?
7. Do you know of any land developments which may be impacted upon by the proposed project?
8. Do you know of any other parties which should specifically be consulted in respect of this project?

13.2 Confirm whether the potential impacts have been compiled with the participation of landowner and I&AP's

Yes. A description of the expected impacts on the Environment was contained in the Background Information Document (BID), the Scoping report and the Draft EMP. Furthermore the readers of the BID were specifically asked the questions contained in para 13.1 (refer questions 2, 4 and 6).

13.3 Confirm whether or not the list of potential impacts related to Social and Cultural impacts have been compiled with parties directly affected

Yes. A description of the expected impacts on the Social and Cultural Environment was contained in the Background Information Document (BID), the Scoping report and the Draft EMP. Furthermore the readers of the BID were specifically asked the questions contained in para 13.1 (refer questions 4 and 6).

¹⁷ All of these documents have been available on the Site Plan website since their publication and such availability was widely advertised. Hard copies and emails of the documents have also been made available to the registered I&AP's and other parties who preferred such format.

13.4 Provide list of issues raised by I&AP's and indicate whether they have been accommodated in this document

The following responses have been received:

CAPE NATURE: letter dated 22 August 2012 – response to Scoping report

Response / Comment from CapeNature	Response from applicant & accommodation in EMP
The site has been transformed with no natural vegetation remaining. In addition it does not form part of terrestrial CBA therefore CapeNature has no objection from biodiversity perspective.	Noted
Groundwater remains a concern even though specialist says that upper aquifer will not be polluted and lower aquifer will not be impacted upon, CapeNature recommend that boreholes near to site should be monitored on a quarterly basis for water quality	CapeNature's concern is noted. There are no pollutants in the mining method proposed. Be that as it may, the applicant will monitor the water quality in the nearest borehole on quarterly basis for first 3 years. Refer para 18.3 for prescription in EMP.
The mining site must be clearly demarcated and all remaining natural vegetation areas must be indicated as no-go areas	Agree. The Mining right area and excavation area will be denoted by colour coded posts and the contractor staff will undergo induction training to ensure that all staff are aware not to enter natural vegetation (which vegetation is in any event quite a distance from most of the mining). Refer para 20.1 for specification.
Rehabilitated areas must be monitored post rehabilitation to ensure revegetation and also for alien vegetation management	Yes. Refer para 20.3 and para 23 for specification.

Department of Environment Affairs and Development Planning (DEA&DP): letter dated 30 August 2012 – response to Scoping report:

Response / Comment from CapeNature	Response from applicant & accommodation in EMP
The letter commences with a list of activities which may be triggered by the proposed operation based on DEA&DP perusal of the Scoping Report:	
GN No. R544: Activity 22: The construction of a road outside urban areas where reserve is wider than 13.5m or where no reserve exists, the road is wider than 8m...	Does not apply... no roads will be constructed. Only existing tracks will be utilised and none will be wider than 4m. Refer Para 3.2 (after point 7) for prescription in EMP.
GN No. R544: Activity 47: The widening of a road by more than 6m or the lengthening of a road by more than 1km where reserve is wider than 13.5m or where no reserve exists the road is wider than 8m...	Does not apply... Only existing tracks will be utilised and none will be wider than 4m (and will certainly not be widened by 6m). Refer Para 3.2 (after point 7) for prescription in EMP

Response / Comment from CapeNature	Response from applicant & accommodation in EMP
GN No. R545: Activity 15: Physical alteration of undeveloped vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20ha or more.	Whether an excavation can be considered an industrial use is debatable. In any event, the total area to be disturbed by excavations in Section 1 and Section 2 is less than 20ha (at 19.4ha) over 2 non-contiguous excavations on 2 different non-adjacent farms ¹⁸ .
GN No 546: Activity 4: The construction of a road wider than 4m with a reserve less than 13.5m in areas outside urban areas	No roads will be constructed as only existing roads will be used. There may be some requirement to upgrade the roads (although unlikely) and absolutely no road will be wider than 4m in any event. Refer specification in Para 3.2 (after point 7)
GN No 546: Activity 10: Storage of dangerous good/s where such containers have a combined capacity between 30 and 80m ³	Does not apply. No diesel will be stored on site. Diesel will be brought in trailer mounted bowser as required.
Botanical Assessment is out of date, was compiled at the wrong time of the year and did not make reference to CAPE fine Scale Mapping.	We concur and have tasked another specialist botanist to undertake further study of the site. Please note that the site is located outside of CBA or ecological support area. Refer Annexure B for Specialist Botanist report in full. The recommendations of the botanist have been incorporated into the text as required.
The remainder of the letter was a notice to the DMR	

Letter from representative (Mr Alwyn Vermeulen) of Olivier Bester Family Trust dated 21 August 2012 – response to BID

The following table lists the comments raised by the Trustees, with a response to each comment in the third column. This comment was based on the BID document. A copy of the Scoping report was delivered to Mr Vermeulen (and kindly by Mr Vermeulen to each of the co-parties listed in the letter as objectors). No comment has been received in response to the Scoping report (although it was noted in the covering letter that in the absence of comment, then their comments raised in the 21 August 2012 letter would stand until the EMP was distributed).

Ref	Comment	Response
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¹⁸ Even though it is less than 20ha such measurement would need accurate survey in the field given the “closeness” of the area to 20ha. GN No 544: Activity 23 is for areas between 1ha and 20ha, so should this excavation be construed as an “industrial use” then in theory that activity would trigger the need for basic assessment.

Ref	Comment	Response
1a	The SE wind blows ferociously during late spring and summer. This is the dry season and time to harvest. The wind blows in the direction of the affected party's property – the farms Kliphuis and Nuwerus.	The first point in response to this statement is made by comparing figure 11 (the windrose for Langebaanweg airport) with the location of the farms mentioned in the respondent's letter as shown in figure 12 (both figures after this table). The windrose shows quite clearly that the wind seldom if ever blows truly from the SE. The wind actually blows from the South and SW in summer and directly N in the winter months. It is conceded that these winds are strong ¹⁹ but they will in no way impact on the farmsteads of Kliphuis and Nuwerus.
1a	Mining will directly affect the respondent's employees' quality of life. The distance between Section 2 and the labourers cottages and farm managers house is approximately 2km.	As figure 2 shows, the distance to the cottages and the managers house is about 1.7km from the mining right area edge and about 2km from the excavation BUT this distance and the direction of the houses from the excavation precludes any dust impact (refer figure 1 and compare to figure 2)
1a	The respondent cultivates land bordering the farmyard. Grain is sown for grazing and selling. The added dust will have a negative effect on the quality of the grain.	<i>Inert</i> dust has indeed been shown to have a negative impact on plant growth. This is seen alongside gravel roads where the strip adjacent to the road in some cases can show stunted growth. But three factors in this case preclude any impact in this regard: The distance from the excavation area to the respondent's crops is too far for this to become an issue. The dust (in this case if it ever were hypothetically to have an impact) would most likely in any event contain phosphates which would be a benefit to the crops/soil in question Finally, dust generation levels will not be high. Refer insert after 1c below.
1b	Dust will have an impact on the quality of the wool on the sheep (i.e. affects the grading and price)	Dust generation levels will not be high. The applicants have been mining within 150m of a neighbouring property for the last 2 years with no complaints received in respect of dust.
1c	Two of the trustees have a registered bee-keeping business. Beehives are scattered all over the properties of the Trust. Added dust will have a negative effect on the business.	Dust generation levels will not be high. The applicants have been mining within 150m of a neighbouring property for the last 2 years with no complaints received in respect of dust.

¹⁹ And the topsoil removal and replacement programme has been modified to reflect this concern.

Ref	Comment	Response
	<p>The issue of dust as a result of mining is / will mitigated and/or monitored by the following:</p> <ol style="list-style-type: none"> 1. Dust generation will be minimal given that the mine plan allows for only 1ha to be denuded at a time given the proposed strip mining operation as described in the Background Information Document and subsequent Scoping report and Draft EMP 2. The ambient dust levels must also be considered. The local farmers generate enormous volumes of dust during their ploughing, sowing and harvesting cycles. The dust generated during one ploughing cycle over the surface areas of the farms will most likely exceed the dust generated by the proposed mining over its lifespan. 3. Perhaps the most significant argument against the impact of dust is that the mine has been operating under mining permit for the last 2 years through the dry times and no complaint was received at all for any aspect of the operation. 4. The applicant will install DustWatch monitors at 3 stations of the respondent's choice during mining. The DustWatch system enables the recording not only of dust levels but also records where the dust came from (which wind vector) and from what source (can differentiate topsoil, subsoil etc.) 5. Note also that the applicant has consulted with Transnet (Dries Mouton – 083 293 7544) in respect of the upgrade of the access point to Section 1. In addition 100m beyond the rail crossing will be paved to eliminate dust and in the interim, a water cart will be available for when trucks are running. 	
1d	The proposed sites are located in productive farmlands. It came to the respondents attention that the Director General: DMR had said that no application to mine land under agricultural production would be approved... threat of food security. SA became a net importer of food in 2007.	There are several mines and quarries located on productive farmlands. Most of the area south of Malmesbury along MR174 has been mined of its sand. The topsoil is first removed and then replaced after mining allowing for continued use of the land for cultivation. In any event the impact of the loss of 21ha ²⁰ (even were such loss to occur) when seen against the benefits of this quarry and the vast expanses of productive wheatlands in the region is negligible ²¹ .
2a	The respondent is opposed to the mining as there will be a permanent change in topography if excavation should proceed.	There will be a change in topography. The landscape will be lowered by between 1 and 1.5m over 21ha. This change in topography will have absolutely no impact on the respondent.

²⁰ Note that the 21ha includes disturbance by existing mining. Proposed mining measures approximately 19.5ha.

²¹ This report has been submitted to the Department of Agriculture BY the DMR and Agri-Western Cape has been notified as an I&AP's.

Ref	Comment	Response
2a	Twenty-one ha is a huge portion of cultivable land and the respondent is of the opinion that the sites will be visible from the neighbouring farms, the public road between Vredenburg and Langebaanweg as well as the subordinate road known as the "Waterwesepad" when the mined product is stockpiled.	<p>21ha does not represent a "huge" portion of land. 21ha represents 1.05% of the farms in question.</p> <p>In respect of visual impact of the "stockpiles", the following is applicable:</p> <ul style="list-style-type: none"> • There is no processing on site. • Any mined product stockpiles will be very temporary of nature (less than 1 month, if that). • Such stockpiles will be in the floor of the quarry (further lowering their effective height) • This impact is so minimal as to be negligible. • These stockpiles will not be visible from any surrounding public road or residence (although they may be visible from the cultivated farmlands adjacent to the mine property).
2b	Soil conservation has been an issue as long ago as the 1960's. The founder of the Olivier Bester Family Trust (Mr AO Bester) was serving on the Soil Conservation Committee in order to preserve the topsoil in the area. See annexures A, B and C (of Alwyn Vermeulen letter).	<p>No topsoil will be destroyed. It is not in the applicant's interest to remove the topsoil with the product in any event.</p> <p>Topsoil will be temporarily disturbed when removed ahead of mining to be replaced immediately on a mined out and shaped area behind the advancing face (except of course in the case of the first block).</p>
2c	Para 5.6.2 confirms the sentiments of the respondent (as represented by the Trustees) except that the impact will not be insignificant and temporary.	<p>Para 5.6.2 of the BID described the importance of topsoil management. The impact is described a rating of insignificant because the impacts meets the quoted criteria as described in para 5.1 of the BID as follows:</p> <ul style="list-style-type: none"> • Minor deterioration. Change not measurable • Recommended level will rarely if ever be violated • Sporadic community complaints • Minor deterioration in land capability • Minor changes in species variety or prevalence
2d.a	The owner of farm 1043 (locally known as Blomfontein) is the Blomfontein Trust (IT 4969/1997). Mr JP Bester (Jokie), a director of Gecko Fert (Pty) Ltd (the applicant), is a tenant. He is not the landowner as indicated on p3, 11, 12, 15, 16, 17 and 18 of the BID. He is the owner of farm 185/7.	Strictly speaking, Mr JP Bester is a tenant BUT he is the designated representative of the Blomfontein Family Trust. The Blomfontein Family Trust has the following trustees: Mr JP Bester, his mother and his sister. The Beneficiaries of the Trust are: Mr JP Bester, his descendants, his mother and father.
2d.a	Par 5.6.3 (p15 of the BID) states that it "is imperative that the applicant abide by the prescriptions of the integrated mine and rehabilitation plan as described in para 4.1"	We concur

Ref	Comment	Response
2d.ai	The Estate of the late Mr AO Bester has instituted civil action against Mr JP Bester (of Langeberg, tenant of Blomfontein) arising from loans granted and payable. (in the High Court of SA, Western Cape High Court, Cape Town – case no: 11720/2012, Jan Myburgh Fourie N.O v Joachim Paulus Bester).	We do not understand the relevance of this statement.
2d.ai	Mr JP Bester has only recently (± June/July 2012) started to erect game fences and does not have an existing game farm (para 5.7.1 – p15) and or private nature reserve (para 5.8.1 p17, and para 5.8.2 p18). This constitutes a misrepresentation.	This is incorrect. Mr JP Bester has been erecting game fences (albeit slowly) since 2009. His intent is clear.
2d.ai	Mr Kobus Swart, another director of Gecko Fert (Pty) Ltd (the applicant), was previously involved with 3 other fertilizer businesses. None of these businesses survived and Mr Swart's estate was to the best of our knowledge twice sequestered.	We do not understand the relevance of this statement. Mr Swart's perseverance should be championed. The company has in the last 2 years built up a client list of several companies (which we will provide to the DMR upon request).
2d.ai	Pelican Organic Fertilizer CC was liquidated by the High Court Cape Town – case 5425/2009. Mr Swart has sold fertilizer (5:1:5) to Mr JJG Burger of Citrusdal, which after analysis, was found to be of inferior quality. The previous business failed due to misrepresentations made by Mr Swart.	We do not understand the relevance of this statement.
2d.ai	NJ Burger Grondverskuiwings in Vredendal has instituted civil action against Gecko Fert (Pty) Ltd, Jacobus Johannes Swart (Kobus), Joachim Paulus Bester (Jokie) and Abraham Burger (Braam) in the High Court of SA, Western Cape High Court, Cape Town – case 12983/2009, as the defendants have hired crushing machines, but failed to pay the bill.	We do not understand the relevance of this statement.
2d.iii	Abovementioned gives the respondent an uneasy feeling about the sustainability of this application and the proposed mining activities and shows that the directors of Gecko Fert (Pty) Ltd do not honour commitments.	The respondents "uneasy feeling" is regrettable. These applicants have been mining the site successfully for the last 2 years. The applicants initially specifically went the mining permit (as opposed to straight into Mining Right) route to ensure that the business was a sustainable venture and in that time they have developed a business clientele (list of current clients available to the DMR upon request).

Ref	Comment	Response
2d.iii	The BID gives no indication how and by whom the operating hours and rehabilitation of mined land would be policed.	<p>The operating hours of a mine are regulated in the EMP and are self-policed. However, if any member of the public shows that after hours work is taking place, then they would report such transgression to the DMR who would take steps against the mining company.</p> <p>In terms of policing the rehabilitation of the mined out area that aspect is policed by means of independently conducted Environmental Performance Assessments and constant monitoring by staff members on site. The Environmental Management System is described in full in the upcoming EMP.</p>
<p>It is worth noting at this point that the respondent makes valid points about the BID giving no indication of various measures and implementation of mitigation measures. The point of the BID document (as Background Information Document) is to make the reader aware of the proposed operation and list preliminary impacts. The document does not prescribe the full Environmental Management System (EMS). That is the job of the Environmental Management Plan (EMP).</p> <p>So while we agree that the BID does not indicate issues which are pertinent to the respondent, it must be noted that it was not in the intent of the BID. The respondent was given further opportunity to comment at the Public Open Day and on the EMP.</p>		
2d.bi	The respondent believes that the applicant neither has the ability nor the motivation to ensure that the mined land would be rehabilitated.	It is not about the applicant's motivation to do this. The law (MPRDA) requires that an upfront financial guarantee be provided (in the form of cash or bank guarantee). The quantum of such fund is calculated by independent party (in accordance with guidelines presented by the DMR).
2d.bii	The respondent agrees with the description of natural vegetation as set out in para 5.8.1. It is the respondent's intention to preserve the natural Strandveld and Fynbos and objects to the proposed mining as the sites are close to the respondent's veld.	No. The sites are not in natural vegetation nor are they close to any of the respondent's natural vegetation. The closest natural vegetation belonging to the respondent is more than 500m away.
2d.biii	The BID gives no indication how and by whom the general principles set out in para 5.8.3 will be applied and policed.	The principles listed in para 5.8.3 will be converted into mitigation measures in the EMP. These measures are legally binding and must be applied by the applicant. The success of implementation is measured in the regular legally prescribed Environmental Performance Assessments to be conducted by independent party.

Ref	Comment	Response
2d.biv	The respondent believes that animals on/near the mining sites will be permanently chased away and the pests, like the “Nagmuise” (gerbil) will therefore settle in adjacent farmland (the respondent’s property). “Nagmuise” have been a problem for many years and it was found to be very difficult to control if neighbouring landowners do not apply responsible pest control methods.	No. The rate of advance is so slow and the activities so minor as to not generate massive migration of the gerbils to surrounding farms.
2d.bv	The BID gives no indication who will conduct the animal rescue programme and where the rescued animals (especially gerbils) will be settled.	The rescue programme is specifically for slower moving animals and is unlikely to include the gerbil in any event. The target of the programme would be tortoises, snakes, etc. and these would be chased or moved by the operators to an area just off the proposed topsoil clearing area.
2d.bvi	The respondent has a borehole not far from section 2. The open cast mine may negatively affect the flow and availability of groundwater. It is the respondent’s submission that phosphate pollution of the groundwater is a possibility and seen in the light of a study by the University of South Florida, radioactive elements of phosphate rock can get into water supplies (the drinking troughs of the respondent’s cattle), be released to the air or accumulate in animals.	During the earlier mining permit application, groundwater was acknowledged as a possible impact and specialist study was conducted by John Weaver. The entire study is included in the scoping report which has recently been published for comment by registered Interested and Affected Parties. The study did identify the boreholes on the respondent’s farm and address the other issues which have been raised by the respondent. The respondent has been requested to read the Specialist study and comment on such document. There is absolutely no risk of radioactive contamination as a result of phosphate mining ²² . The footnote is a direct copy of the source of the respondent’s comment which is taken completely out of context. There is no uranium / radium or radon coupling with this phosphate ore. The study quoted was a for a specific / unique deep phosphate mine in USA near the Peace River in Florida (known as the USF Mosaic Phosphate Mine)
2d.bvii	Please take note that the respondent keeps many sheep, cattle and springbok on the neighbouring farms. There are also many “duiker” and “steenbok” and their presence enhances the attractiveness and rural character of the farms.	Noted. The animals will in no way be affected by the proposed mining.

²² “Another consequence is that radioactive materials such as uranium/ radium/ radon is often coupled with phosphates and the mining process tends to leave a higher concentration of these radioactive materials on mined lands. Having said that, a study by the Florida Institute of Phosphate Research completed in 1986 indicated that foods grown on these lands did not pose a risk to human health. One impact it can have, however, is an increase in Radon gas emissions within any structures built upon the mined out area making it suspect for human habitation afterwards.”
<http://jasher1.myweb.usf.edu/blog/enviro.html>.

Ref	Comment	Response
2d.bviii	The BID gives no indication how mining into the clay layer will be avoided.	<p>It is not in the miners' interest to get clay contamination in their product. The clay is wet and "sticky" of nature and clogs up the screens and mills at the off-site plant. Removing the phosphate ore from the clay requires significant processing (as was the case in the adjacent SAMANCOR mine).</p> <p>As shown in the soil profile photos in the BID document, the clay is clearly discernible for the product to be mined and will not be mined.</p>
2d.bvix	<p>The occupants of the houses near the old railway station at Langebaanweg have complained of noise and dust pollution.</p> <p>Dust is generated by the trucks of the applicant passing between the houses on the gravel road.</p> <p>The applicant's vehicles have also damaged the surface of the road and the mined product (of the current 1.5ha mining site) regularly drops from the trucks on the road surface.</p> <p>It came to the respondent's attention that mining activities have increased in the last few months and the possibility exists that mining at Section 1 (as in the BID) is already operational.</p>	<p>The applicants have received no such complaint. Note that the applicants have been mining the site for the last 2 years and have advertised the fact by means of signboard with contact details at the gate to the property adjacent to the houses near the old railway station.</p> <p>This has been identified by the consultant as a possible impact and the applicant will commit to ensuring no dust is generated along the affected length of road.</p> <p>The contractor uses licenced vehicles on a public road. As for the material falling out of the truck, the contractor is certainly responsible to ensure that this does not happen and measures must be put in place to prevent this in the future.</p> <p>Yes. The mine has been operational for the last 2 years.</p>
2d.bx	The BID gives no indication of who will install and monitor the Dust Watch system	That will be responsibility of the applicant


Ref	Comment	Response
2d.bxi	The noise generated by earthmoving equipment will definitely be a disturbance to the respondent and it's tenants and employees.	<p>No. The distances from the activity generating centres will preclude any impact in this regard. Also, the only time equipment operates on surface is when topsoil is being removed otherwise all earthmoving equipment is below natural ground level with the advancing face acting as topographical barrier.</p> <p>It is further noted that the respondents tenants and employees are located 1700m from the Section 2 mining right area and just 450m from the West Coast road. It is highly unlikely that the noise of the earthmoving equipment will be heard above the traffic generated noise along that West Coast Road.</p>
2d.bxii	The BID gives no indication who will police the speed of the delivery vehicles and ensure that silencers are operational on earthmoving equipment and trucks.	That would be job of the contractor and it must be written into the agreement between the parties.
2d.bxiii	The respondent agrees with the potential impact on the biophysical environment and is of the opinion that the applicant will ignore the proposed attenuation measures as set out in para 5.4.2, 5.5.3, 5.6.3, 5.7.3, 5.8.3, 5.9.3, 5.11.3, 5.12.3, 5.12.3 and 5.13.3.	<p>The attenuation measures become legally binding prescriptions of the EMP. The applicant would ignore these at great risk given that the implementation of these measures are policed through a programme of monitoring and Environmental Performance Assessments. The DMR have the right to withdraw the mining right at any time should the applicants not fulfil the requirements.</p> <p>In addition it is a legal requirement that the applicant provide financial guarantee for the rehabilitation of the land (at contractor rates) prior to mining right being issued.</p>
3	The West Coast Fossil Park was established due to the importance of the archaeological site. Langebaanweg is the most important and richest pre-Pleistocene site in Southern Africa and any threat should be averted. It is acknowledged that the site was only discovered due to the previous mining activities of Samancor. One has to keep in mind that the extent of the discovery is of enormous value and that the deposits are more widespread than just the current heritage site.	This has been acknowledged and the applicant's responsibility in this matter is made clear by the 2 specialists studies conducted in this regard. The first study was conducted prior to prospecting whilst the second was conducted in the prospecting pits to determine the impact that mining may have on the Palaeontological situation.

Ref	Comment	Response
4	The respondent is of the opinion that a decision to grant a Mining Right would set in motion a chain of events which will lead to the commencement of full scale mining in the area again. These activities will be difficult to control and threaten still unknown archaeological treasures. As indicated by (unknown) palaeontologists in their report (p23 of BID), the trenches showed proof of preserved specimens and that this needs more investigation before mining activities can commence.	Specialist studies have been conducted throughout the process in this regard and such study has been by J Pether (as Specialist Palaeontologist) – Refer Annexure C.
4b	Although the respondent agrees with the status of the existing heritage environment, it believes that the potential impact might be more extensive.	The respondent must be more specific than providing such broad sweeping statements.
5a	The statistics provided in the BID is outdated. There has been an influx of unemployed people in the Vredenburg Magisterial district the past 10 years. Informal settlements have been established, have expanded rapidly, natural resources (especially water) have been put under pressure and crime has increased enormously.	That may be the case. If so, then it is precisely the reason why more job creating enterprises are required (as it has been shown that employment reduces these social ills). The impact of the mine is not only in the creation of direct employment opportunities but also through indirect job opportunities, and the implementation of the community benefitting measures required in terms of the Social and Labour Plan.
5b	Agriculture is most important in providing jobs.	The statistics (in 2001) show that Agriculture employed 10% of the employed population. The same statistics showed 48% to be not applicable (i.e. not working). Given those statistics, any employment generating activity should be seen as important. No agricultural jobs will be lost through the proposed activities over 19.4ha of marginal veld.
6a	The respondent is of the opinion that poaching, stock theft, stock loss and a threat to the security of the respondent's employees and tenants are sure consequences if mining should proceed. It has been experienced by the respondent that criminals cut border fences, locks and chains and trespass at any time of day or night to commit offences. Many incidences have occurred since the area became known to outsiders. Newly appointed employees of the applicant will travel on farm roads and it will be very difficult to distinguish between bona fide employees and those with a criminal intent.	Noted. This is an issue which could be addressed by the applicant through provision of a uniform or name tag. Such requirement would also be written into the agreement with the landowner. Be that as it may, the applicant does not ever need to cross the respondent's farms and any person stating that they were from the mine on the respondents property would be trespassing.

Ref	Comment	Response
6b	<p>As already indicated above (2) the road at Langebaanweg has deteriorated tremendously over the last few months. Sections [Portions] 54 and 55 of section [portion] 7 Langeberg 185 is the property of the respondent and the applicant has not yet applied for permission to travel from the public road via the property of the respondent to the current mining site. Due to the deterioration of the gravel road and the added dust and noise caused by the applicant's vehicles, the respondent is considering the possibility of withdrawing the right of way that Mr JP Bester has for agricultural purpose.</p>	<p>The applicant does have a servitude over 185/54. Refer figure 13. Legal proof of this is in the Title Deed of farm 185/54.</p> <p>Note that the applicant does not need to cross any portion of 185 / 55.</p>
6c	<p>The respondent will undoubtedly suffer severe losses if mining proceeds. If mining proceeds it will be followed by 17 years of mining to the benefit of a few and permanent loss of sustainable and productive agricultural land and jobs.</p> <p>It has been demonstrated that mining will create fewer employment opportunities than those that will be lost.</p> <p>Where will the current farm labourers of Mr JP Bester be accommodated? A mining business coupled with a "game farm" do not need as many labourers as a busy composite farm.</p>	<p>How will the respondent suffer such losses. Please specify.</p> <p>The lands will not be lost to agriculture. The topsoil will be returned and the lands pervious agricultural potential will return.</p> <p>Where has this been demonstrated? Mining is a more labour intensive operation over 21ha than could ever be achieved by agriculture. No agricultural jobs will be lost through the proposed mining. Only mining jobs will be created (and not at the expense of any agricultural jobs).</p> <p>No jobs will be lost on Mr Bester's farm. The farm employees will continue to be housed and employed as per the status quo – no change.</p>
6c (cont.)	<p>The current discontent among the labourers of Mr JP Bester will explode if more mineworkers are employed, paid more and treated differently from those who have been living on farm 1043 for years.</p> <p>The respondent already employs 2 workers living on farm 1043.</p> <p>Mining will definitely have a negative impact on the respondent's farming and therefore also on respondent's profit and its ability to employ more labourers</p>	<p>This will need to be handled sensitively and sensibly by Mr J Bester who is both the landowner and a shareholder in the proposed mining. Bear in mind that mining has taken place here for the last 2 years and if mining right is granted, then mining will continue using the same model (and exactly the same employees).</p> <p>Irrelevant</p> <p>Mining will not have an impact on the respondents farming. The respondent has been requested to provide specific reasons why the respondent's farming activities will be negatively impacted.</p>

Ref	Comment	Response
6d	Drug and alcohol abuse is common where people are idle. The shift from mixed farming (employing several labourers) to game farming and mining might result in the increase of abuse of dependence producing substances. The rural settlement near Vredenburg is 12 km away from farm 1043 and farm Kliphuis (respondent's property). The distance is often travelled by stock thieves on foot and knowledge of a mining site may convince them to explore the area. The trenches may also provide hideaways for thieves.	No ... no jobs will be lost through the disturbance of 21ha by mining. Remember that mining does not occur over 21ha instantly, but in fact advances at a rate of 1ha per year. The staff required to run the mine have already been employed for the last 2 years. In addition, it is the landowner's intent with or without mining to proceed with the game farm. So all arguments regarding the game farm by the respondent must be discounted.
6e	The respondent has concerns about security guards being housed on the sites. The BID does not give any indication whether these personnel will be required to be registered at the relevant authority of the Security Sector or not. "Unofficial", unregistered security staff may have criminal records and put the property and lives of respondent's employees at risk.	The security guards will be registered at the relevant authority of the Security Sector.
6f	Although everyone knows that theft, malicious damage to property and trespass are criminal offences, most low paid, uneducated people do not consider arrest and possible incarceration as a deterrent.	So noted.
6g	The BID gives no indication who will police the closure of gates, maintain the water supplies or monitor the weekly meetings.	Noted. Remember that the contractors have already been mining the site for the last 2 years. Closure of gates to be the responsibility of the contractor. It will be written into the contract that the contractor will bear this responsibility (including any losses as a result of negligence). Similarly for maintenance of water supplies.
6h	It is the respondent's submission that although there might be potential socio economic upliftment, the applicant has no intention to show any social responsibility or to develop skills in any way. Which local BEE companies will supply the goods and services to the applicant? The current BEE director of Gecko Fert (Pty) Ltd is a farm labourer of Mr JP Bester. He has according to my knowledge only passed standard 4.	The Social and Labour Plan forms part of the application for mining right. It contains details of the applicant's skills development for staff members and community members as well as corporate social investment through implementation of a LED programme identified in the IDP. The applicants have as part of the application also committed to the procurement progression plan as well as utilisation of local SMME's to provide goods and services. The BEE director has been taken under the wing of Mr Bester after being identified and fast tracked as a competent and suitable individual. The applicants would like it recorded that they find the respondents reference to his education levels distasteful and irrelevant.

Ref	Comment	Response
7	No	This is in response to the question: Do you know of any <u>land developments which may be impacted</u> upon by the proposed project?
8a	Parties who should be consulted: Standard Bank (Vredenburg Branch) The bondholder over farm Langeberg 185/7 PO Box 2, VREDENBURG, 7380	Not relevant to Mining Right but may become applicable during LUPO application
8b	Mr Philbert and Mrs Henriette Melck Nature conservationists phmelck@gmail.com	Done. The scoping report has been sent to these parties for their comment.
8c	Mrs Fiona Kotze Beekeeper langriet@neu.co.za	Done. The scoping report has been sent to this party for their comment but has been returned with incorrect Email address. We will continue to source this person for comment.
8d	Mr Keith Harrison Bird watching club Tel. 022 713 3026	Done. The scoping report has been sent to this party for their comment.
8e	Mr Jimmy Walsh Chairperson of the West Coast National Biosphere Reserve	Done.
8f	Mr Dave Mitchell Chairperson of the West Coast Fossil Park Trust	The West Coast Fossil Park has been provided all information through Ms P Haarhof as contact person.
8g	Dr Dave Roberts Snr Research Scientist at the Council of Geosciences	No. Not relevant
8h	Mr Andries Jacobus Bester Founder of the Blomfontein Trust Tel. 022 784 0003	The designated representative of the Family trust has been informed
8i	Mr H Steenkamp Nooitgedacht Farm PO Box 88, VREDENBURG, 7380	In what context? The application was advertised in the local press so that any nonadjacent farmers could respond if they so wished.
8j	Mr Loubser Koningsvlei Farm PO Box 48, LANGEBAANWEG, 7375	Done
8k	Mr D Klassmen Vergelee Farm PO Box 2656, BELLVILLE, 7535	In what context? The application was advertised in the local press so that any nonadjacent farmers could respond if they so wished.
8l	West Coast District Municipality PO Box 242, MOORREESBURG, 7310	Done through local Municipality
8m	Vredenburg Municipality Private Bag X12, VREDENBURG, 7380	Done
9	See annexures F, G, H, I, J and K of Olivier Bester Family Trust letter	

Ref	Comment	Response
9F	<p><u>Mev. Trautman (Huis Nr 1)</u> The road to the railway line is being damaged as well as the railway line.</p>	<p>Acknowledged. The applicant must provide suitable surfacing of section of the road (Refer Para 20.7) and protection for the rail line – Refer photo below which shows absolutely no damage to the rail crossing at the houses as a result of mining. The applicant has however contacted the relevant authorities at Transnet for their comment and assistance in strengthening of the crossing should it be required – Refer 20.7</p>
		
9G	<p><u>Pretorius (Langebaanweg 2) - translated</u> The road to the rail line is getting into bad condition and is not maintained.</p> <ul style="list-style-type: none"> – The trucks generate dust – Wildlife are scared (Verwildering van natuurlewe) – Asthmatic reaction / health risk 	<p>Acknowledged. The applicant must provide suitable dust reduction measures to the applicable section of the road. Dust off that section of road will most likely be handled through wetting by water cart on the short term and then surfacing of the section in the medium term. Refer para 20.7</p>
9H	<p><u>W.H. Groenewald (3 Langebaanweg) - translated</u></p> <ul style="list-style-type: none"> – The trucks generate dust – Rail crossing not suitable for heavy vehicles. – Concern about the number of vehicles in the future – (illegible but I think it says that alternative access must be sought) 	<p>Acknowledged. The applicant must provide suitable dust reduction measures to the applicable section of the road. Dust off that section of road will most likely be handled through wetting by water cart on the short term and then surfacing of the section in the medium term. Refer para 20.7</p> <p>Refer photo above which shows absolutely no damage to the rail crossing at the houses as a result of mining. The applicant has however contacted the relevant authorities at Transnet for their comment and assistance in strengthening of the crossing should it be required – Refer 20.7</p> <p>The only feasible alternative access route is to the north of the houses. But that requires a new road through the farm and a new access point. At the moment, trucks move very slowly past the houses because of the cattle gate and rail line. An alternative access point would result in trucks accelerating past all the rail station houses with associated noise impact.</p>

Ref	Comment	Response
9I	<p><u>Alta Janse van Rensburg (House no.4)</u> The effect on our health. I am suffering from Bronchospasm and the dust will be a very high risk for me.</p> <p>The fact that there will be a lot of movement of people and trucks which will increase crime rate in a very peaceful area. The railway crossings will also be affected by the trucks.</p>	<p>Acknowledged. Dust off that section of road will most likely be handled through wetting by water cart in the short term and then surfacing of the section in the medium term. Refer para 20.7.</p> <p>No. There will be no more activity than has taken place over the last 2 years.</p>
9J	<p><u>PJ Laura (Huis No. 5) – translated</u></p> <ul style="list-style-type: none"> - Allergic to dust - Damage to rail crossing 	<p>Acknowledged. The applicant must provide suitable dust reduction measures to the applicable section of the road. Dust off that section of road will most likely be handled through wetting by water cart on the short term and then surfacing of the section in the medium term. Refer para 20.7</p> <p>Refer photo above which shows absolutely no damage to the rail crossing at the houses as a result of mining. The applicant has however contacted the relevant authorities at Transnet for their comment and assistance in strengthening of the crossing should it be required – Refer 20.7</p>
9K	<p><u>William Percy Mills (9 Langebaanweg)</u></p> <ul style="list-style-type: none"> – Heavy trucks on the roads. – Noise factor. – Health and safety hazard – dust. 	<p>The contractor uses licenced vehicles on a public road . Noise: Only working hours operation. Dust: Acknowledged. The applicant must provide suitable dust reduction measures to the applicable section of the road. Dust off that section of road will most likely be handled through wetting by water cart on the short term and then surfacing of the section in the medium term. Refer para 20.7</p>

Fax from representative (Mr Alwyn Vermeulen) of Olivier Bester Family Trust dated 4 December 2012

Mr Vermeulen reiterated his objection to the application but added nothing new to the points raised in his earlier letter²³. In addition he requested copies of the updated Botanical Assessment and the Palaeontological Impact Assessment. These will be forwarded to him as part of this “Final” EMP.

Email from Mr Martin de Kock (Neighbour) dated 26 October 2012 – response to Invitation to Public Open Day

Mr de Kock represents the owners of farm Goeiehoop (Langeberg 185/12). Note that such owners also include Mr J Bester (being owner of the farms upon which the rights are being applied for).

²³ Note that Site Plan did respond to his earlier objection (as per the table above) but Mr Vermeulen has ignored that response and merely states that his objection still stands – Mr Vermeulen did attend the Open Day.

His only request is that no material be transported across his farm. Initially it was the intention for material from Section 2 to be trucked across that farm. Such intention has now been discarded and the material will be trucked off site on a route on the farm upon which mining takes place past Mr J Bester's farmstead. Mr Bester is aware of this and has no issues with such arrangement – Refer Figure 2 for proposed access/delivery route alignment.

Email from Mr FJ Schippers (Executive Mayor) dated 30 November 2012

The response form Site Plan to Mr Shipper's concerns contains the details of his Email contained in full in Annexure A7:

1. You required that Department of Agriculture be contacted for input. In respect of this, part of the Department of Mineral Resource's mandate by law is to provide Department of Agriculture with the Scoping Report and Environmental Management Programme... so you can rest assured that they have been consulted. In addition, documentation has been forwarded to Agri-Western Cape (for them to forward to Vredenburg Farmers' Association) – For some reason, Agri Western Cape will not supply contact details to the Farmers Association representative for us to contact them directly.
2. Regarding road access – The access routes will be contained in the final EMP. Only existing routes will be used as well as existing access points. We will contact the District Roads Engineer for comments specifically in terms of access points – remember that the mine has been in operation under valid Mining Permit for the last 2 years and no incident in respect of road safety or traffic has been experienced.
3. Your concern in respect of where workers will come from and whether they will reside on site: No worker will reside on site. The business model to be employed is the same one that has been in practice for the last 2 years where contractor staff are trucked in as required. Staff on site consists solely of a front end loader operator and driver or two.
4. You require that a proper committed and monitored rehabilitation programme be considered. This is a valid concern and I am sure that once you have read Chapters 15-25 of the EMP (of which I will personally ensure that you get a hard copy) you will be satisfied in this regard
5. LUPO applications: These will be lodged in due course – hopefully in late January 2013

Public Open Day Report Back

The Public Open Day was widely advertised through letters to all identified I&AP's (i.e. not just those who registered as I&AP's) as well as being advertised in the press (Refer Annexure A9).

Despite that, the Public Open Day (POD) was very poorly attended with just Mr A Vermeulen (of the Olivier Bester Family Trust) and one of his farm managers attending the POD.

The following issues were raised by these 2 parties:

1. The BID, the Scoping Report and the Draft EMP did not take cognisance of the extreme winds which blow in summer. The attendees were concerned that the strong winds would result in topsoil loss and excess dust on the crops and sheep - a

valid concern. They recommended that timing of topsoil removal and replacement be considered in the scheduling of the mine (if it were to go ahead given their objection to the proposed mine). Resolution of these issues have been included in this version of the EMP which prescribes that topsoil removal and replacement be conducted in early to middle autumn so that the winter rains can sustain revegetation.

It is perhaps worth noting that the current mining which has taken place in terms of the approved Mining Permit topsoil removal took place with vegetation content. Such vegetation served to bind the topsoil and no topsoil loss took place. The rehabilitated section was fortunately conducted just before the winter months and has revegetated so well as to match surrounding landscape.

In short, the EMP has prescribed the timing of topsoil removal and replacement and we do not believe that this will be an issue given past experience on site.

2. The Scoping report and Draft EMP referred to an average of 7 trucks per day leaving the site, however the attendees of the POD stated that they counted 20 trucks on one day. The fact is that this situation could easily arise given that loading and delivery of product to the off-site plant will take place as required to build viable stockpile for continuous feed of the crusher at the plant site. So although the average is trucks per day, there will be some days with significantly more (and most days with none).
3. They wished to know the procedure for raising complaints and wanted the contact details of the DMR for them to lodge complaints. The process that is recommended is that the complainant first contacts the applicant and if such course of action does not satisfy the complainant, then contact the DMR. Refer table 2 in introduction to this report for contact details of each of these parties.

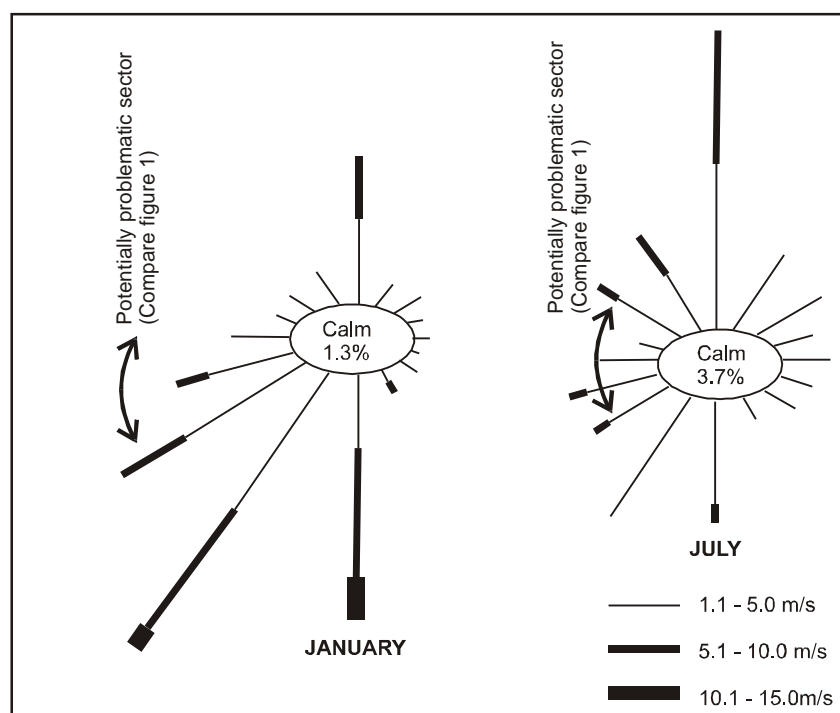


Figure 12: Langebaanweg Windrose



Figure 14: Section 1 Entrance detail

14 The appropriate mitigatory measures for each significant impact of the proposed mining operation.

None. No significant impacts identified to date.

Note however that the Palaeontological Impact Assessment does state that such impact would be significant without mitigatory measures. Such mitigation measures are outlined described in full in Para 20.6

15 Arrangements for monitoring and management of environmental impacts.

How will the site be monitored and what actions will be undertaken to ensure that management of environmental impacts takes place?

The Environmental Management System (EMS) will consist of the following elements:

1. Environmental education and awareness programme to all levels of staff at the mine (Refer Para 25 and Annexure G)
2. Monitoring programme in which all levels of staff are involved (as described in more detail in table form in para 18.3)
3. Conducting of Environmental Performance Assessments by independent party (as described in more detail after this list)
4. An independent monitoring committee could be set up (if there is sufficient interest) which would meet on site on an annual basis to discuss issues relating to environmental management. The members of such committee would comprise representatives of the mining company, environmental section of the local municipality, Fossil Park and any surrounding landowners or representatives thereof. The applicant is bound to attempt to set up this committee but experience has shown that in the cases of such low impact that such committees seldom materialise.

The aim of *monitoring* and *performance assessments* (i.e. points 2 and 3 above) is to ensure that the provisions of the EMP programme and any other DMR conditions are carried out during the entire life of the mine. The proposal here is to get all mine personnel involved in the monitoring and assessments, thereby providing opportunity for increased environmental awareness at all levels. This may be frustrated by possible changes in contractor staff from contract period to contract period.

Apart from the regulated 2-year interval (Reg. 55(2)(b)), performance assessments must also be conducted at the following milestones:

- At the end of the construction phase
- At the end of decommissioning rehabilitation

The performance assessments may be conducted by site management (Reg 55(1)(a)), however if he/she does not feel comfortable conducting the assessment then independent input can be used (Reg. 55(4)). The DMR may, if they feel the performance assessment has not been adequately conducted require that an independent party conduct the assessment (Reg. 55(6)(c) and 55(7)). The results of the performance assessment must be submitted as part of the reporting requirements of the operation (Reg. 55(1)(c)).

The performance assessment report must be written in accordance with the guidelines from the DMR (Reg. 55(3)) and the regulations do provide the basic content of the performance assessments as follows: (Reg. 55(3)(a)-(g)):

- Information regarding the period applicable to the performance assessment
- The scope of the assessment
- The procedure used for the assessment

- The interpreted information gained from the monitoring the approved EMP programme
- The evaluation criteria used during the assessment
- The results of the assessment
- Recommendations on how and when non-compliance and deficiencies will be rectified

Environmental monitoring serves to support the environmental performance assessments as well as serving to increase environmental awareness within an overall Environmental Management System. This is achieved by allowing the employees to conduct continuous monitoring at their stations and reporting (by way of a simple form) to the site manager, say, 1/week. The site manager will once/month conduct a check of the responses received (by actually conducting the monitoring him/herself).

On site monitoring will thus consist of the following elements and programme:

- Continuous monitoring by operators and management when on site as per programme in para 18.3
- Possible establishment of a monitoring committee consisting of at the very least the land owner, adjacent owner/s, representative from the DMR and an applicant representative.
- Such monitoring committee must conduct an environmental audit annually.
- The minutes of these meetings must be forwarded to the DMR.
- The applicant also commits to conducting an Environmental Performance Assessment every two years (in accordance with the MPRDA)

16 Technical and supporting information.

Annexure B: Specialist Botanical Assessment by Fynbos Ecoscapes

Annexure C: Latest Specialist Palaeontological Impact Assessment by John Pether

Annexure D: Specialist Archaeological Impact Assessment by Jonathan Kaplan

Annexure E: Specialist Groundwater Impact Assessment by John Weaver

SECTION 2: ENVIRONMENTAL MANAGEMENT PROGRAMME

17 Description of environmental objectives and specific goals for mine closure.

17.1 Environmental aspects that describe the pre-mining environment to serve as guide for setting closure objectives.

Vegetation:

No natural vegetation remains and the site is not located within CBA or Ecological Support area.

Land Capability

The current land use / capability is pasture and occasional grain cultivation. The minimum aim of the decommissioning rehabilitation must be return the land for use as either of these pre-mining land uses.

Landowner Socio-economic condition/ Landowner requirements:

However, the landowner has expressed a desire to include these excavations as part of his private game farming practice. The landowner has initiated game fence construction at the current extent of the game farm (to the west of Section 1). The closure objective is to maximise the ability for the restoration of the post mining area to serve as a wilderness area. In other words, the applicants will only be responsible for returning the land as pasture, and the landowner will be responsible to return the site to natural vegetation for inclusion in the game farm.

17.2 Measures required to contain or remedy any causes of pollution or degradation or the migration of pollutants, both for closure of the mine and post-closure.

The only possible cause of post mining *pollution* is hydrocarbon pollution (from earthmoving equipment utilized in decommissioning rehabilitation)- unlikely

In addition, the potential exists for degradation of the veld through alien vegetation infestation in the mining right area - possible

The following measures are required to be put into place to prevent these occurrences:

Hydrocarbon pollution: Refer Para 20.5 for full Hydrocarbon management plan

Alien Vegetation Control: The applicant is required to fully control all alien species within the mining right area for life of mine as well as during the minimum 2 – year aftercare period, after-which such alien control will be the responsibility of the landowner.

18 Description of environmental objectives and specific goals for the management of identified environmental impacts emanating from the proposed mining operation. (As informed by the information provided in the EIA in terms of Regulation 50 (h)).

18.1 List of identified impacts which will require monitoring programmes.

Nature of impact	Extent	Will impact require monitoring programme
1. POST-APPROVAL ACTIVITIES		
1.1. Section 1: Demarcate mining right area by means of posts		
1.1.1. Land Capability	Mining right area measures 78.63ha in 2 sections	Yes
1.2. Section 1: Demarcate maximum excavation area		
1.2.1. Land Capability	The excavation areas measure 19.4ha in 3 non-contiguous sections	Yes
2. ESTABLISHMENT ACTIVITIES		
2.1. Provide chemical toilets for staff ²⁴		
2.1.1. Groundwater	Local (at point of leak)	Yes
2.2. Conduct Environmental Induction training to contractor staff		
2.2.1. EMS (Positive)	All staff members	No
2.3. Section 1: No roads required – all roads in place		
2.4. Section 2: Only existing farm roads will be used (May require upgrading) – no roads wider than 4m		
2.4.1. Topsoil	Through widening of existing road (only in the case of Section 2)	Yes
2.4.2. Vegetation	Through widening of existing road (only in the case of Section 2)	Yes
2.4.3. Land Capability	Any widening of road will lead to that strip being unavailable as pasture	No
2.4.4. Noise	Earthmoving equipment during development	No
2.4.5. Air quality	Earthmoving equipment during development	Yes
2.4.6. Hydrocarbon	Potential for oil / fuel leaks	Yes
3. OPERATIONAL PHASE ACTIVITIES – Sections 1 and 2		
3.1. Compete rehabilitation of floor of Mining Permit area (Section 1) ²⁵		
3.1.1. Topography	1.5ha previously mined area less that already rehabilitated	Yes
3.1.2. Topsoil	1.5ha previously mined area less that already rehabilitated	Yes
3.1.3. Vegetation	1.5ha previously mined area less that already rehabilitated	Yes
3.1.4. Land Capability	1.5ha previously mined area less that already rehabilitated. Note however that the area will not be available for grazing as it will be surrounded by excavation extension	No
3.1.5. Animal Life	1.5ha previously mined area less that already rehabilitated	No
3.1.6. Noise	Earthmoving equipment during development	No

²⁴ Chemical toilet chosen over toilet to septic tank given the fairly long distances covered during mining right period. The chemical toilet is fully mobile.

²⁵ Not strictly part of this application, however the portions of the floor and all side walls have been retained for mining of the Mining right are Section 1 (should such mining right be granted)

Nature of impact	Extent	Will impact require monitoring programme
3.1.7. Air quality	Earthmoving equipment during development	Yes
3.1.8. Hydrocarbon	Potential for oil / fuel leaks	Yes
3.2. Topsoil removal (along with vegetation) to perimeter stockpile ahead of face advance in Block 1 of each section. Subsequent topsoil removal to take place directly to mined out areas. Topsoil removal to be programmed to take place only after windy season.		
3.2.1. Topsoil	Max 1ha at a time.	Yes
3.2.2. Vegetation	Max 1ha at a time to total of just under 20ha (as 3 excavations in 2 sections)	Yes
3.2.3. Land Capability	78.63 ha in 2 sections strictly speaking not available to the farmer. ²⁶	No
3.2.4. Animal Life	Animal life (as it is) will be chased from advance areas (i.e. 19.4ha over 17years)	Yes
3.2.5. Noise	Noise from earthmoving equipment. Impact localised.	No
3.2.6. Air quality	Dust from earthmoving equipment. Impact localised	Yes
3.2.7. Visual	The topsoil dumps on surface may be visible from the cultivated fields of surrounding landowners	No
3.2.8. Palaeontology	There may be fossiliferous topsoil. Unlikely given previous ploughing etc.	Yes
3.2.9. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
3.3. Removal of phoscrete by excavator to temporary stockpile in pit or directly onto awaiting delivery vehicle.		
3.3.1. Geology	±225 000m ³ tight phoscrete will be removed	No
3.3.2. Topography	Topography will be lowered by up to 2m (average 1.5m)	Yes
3.3.3. Land Capability	Assume up to 19.4ha not available as grazing area / pasture/grain cultivation	No
3.3.4. Groundwater	Upper aquifer may be exposed at times (under wet conditions)	Yes
3.3.5. Animal Life	19.4ha over 17 year life of mine. Disturbance to burrowing animals	Yes
3.3.6. Noise	Noise from earthmoving equipment. Impact localised.	No
3.3.7. Air quality	Dust from earthmoving equipment. Impact localised	Yes
3.3.8. Palaeontology	19.4ha over 17 years	Yes
3.3.9. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
3.4. Use of access/delivery road to the site to transport material to processing plant off-site		
3.4.1. Animal Life	Possibility of road kill	Yes
3.4.2. Noise	Noise from delivery vehicles. Residences of old Langebaanweg station houses	Yes
3.4.3. Air quality	Potential for dust generation when passing or near to residences at Old Langebaanweg Station	Yes
3.4.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
3.4.5. Traffic / Access	At sales of 31 000tons per annum using 18 ton trucks that equates to average 7 trucks per day leaving the site (in 242 day working year). Note that 7 represents the average and it could be that up to 20 trucks leave the site in a day and then none for a few days.	No
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES		
4.1. Levelling of floor (if required).		
4.1.1. Topography (Positive)	All mined out areas	Yes

²⁶ In theory, the area will not be available as pasture however, the practice over the last 2 years has shown that livestock graze next to the excavations with no issues to date.

Nature of impact	Extent	Will impact require monitoring programme
4.1.2. Noise	Noise from earthmoving equipment. Impact localised.	No
4.1.3. Air quality	Dust from earthmoving equipment. Impact localised	Yes
4.1.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
4.2. Shaping of final pit edges (1:3 slopes and no sharp edges).		
4.2.1. Topography (Positive)	All final pit slopes	Yes
4.2.2. Noise	Noise from earthmoving equipment. Impact localised.	No
4.2.3. Air quality	Dust from earthmoving equipment. Impact localised	Yes
4.2.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
4.3. Topsoiling of shaped areas (directly from current mining block – see point 3.2 in this table).		
4.3.1. Topsoil	All mined out areas. No more than 1ha at a time to be without topsoil	Yes
4.3.2. Noise	Noise from earthmoving equipment. Impact localised.	No
4.3.3. Air quality	Dust from earthmoving equipment. Impact localised	Yes
4.3.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
4.4. Seed topsoiled area with pasture mix.		
4.4.1. Vegetation (Positive)	All topsoiled areas.	Yes
4.4.2. Land Capability (Positive)	All seeded areas will return to pre-mining land capability	Yes
4.4.3. Animal Life (Positive)	Animal Life will return to vegetated areas	No
4.5. Conduct EPA (bi-annually)		
4.5.1. EMS (Positive)	Entire site. Confirm EMP prescriptions are complied to.	NA
4.6. Enforce no-go area access.		
4.6.1. Vegetation (Positive)	All areas outside of proposed excavation areas	Yes
4.6.2. Land Capability (Positive)	All areas outside of proposed excavation areas	Yes
4.7. Decontaminate any oil / fuel leaks.		
4.7.1. Hydrocarbon (Positive)	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
4.8. Continue alien vegetation removal programme.		
4.8.1. Vegetation (Positive)	Mining right area, especially disturbed areas	Yes
4.8.2. Land Capability (Positive)	Mining right area, especially disturbed areas	Yes
5. DECOMMISSIONING PHASE ACTIVITIES		
<i>Complete rehabilitation of the excavation through:</i>		
5.1. Finalise sloping of final pit edges to 1:3		
5.1.1. Topography (Positive)	All final pit slopes	Yes
5.1.2. Noise	Noise from earthmoving equipment. Impact localised.	No
5.1.3. Air quality	Dust from earthmoving equipment. Impact localised	Yes
5.1.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
5.2. Topsoil (ex first block topsoil stockpile) shaped area - before winter (not during windy season)		
5.2.1. Topsoil (Positive)	Final mining block	Yes
5.2.2. Noise	Noise from earthmoving equipment. Impact localised.	No
5.2.3. Air quality	Dust from earthmoving equipment. Impact localised	Yes
5.2.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Yes
5.3. Re-vegetate such area using pasture mix seed		
5.3.1. Vegetation (Positive)	All topsoiled areas.	Yes
5.3.2. Land Capability (Positive)	All seeded areas will return to pre-mining land capability	Yes
5.3.3. Animal Life (Positive)	Animal Life will return to vegetated areas	No

Nature of impact	Extent	Will impact require monitoring programme
AFTERCARE PERIOD		
5.4. Remove alien vegetation, if present		
5.4.1. Vegetation (Positive)	Mining right area, especially disturbed areas	Yes
5.4.2. Land Capability (Positive)	Mining right area, especially disturbed areas	Yes
5.5. Conduct supplementary seeding if necessary		
5.5.1. Vegetation (Positive)	Excavation area	Yes
5.5.2. Land Capability (Positive)	Excavation area	Yes

Table 10: List of impacts requiring monitoring

18.2 List of the source activities that are the cause of the impacts which require to be managed.

See table above in para 18.1.

18.3 Management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually or periodically as the case may be in order to control any action, activity or process which causes pollution or environmental degradation.

<i>Aspect to be monitored</i>	<i>Where</i>	<i>When</i>	<i>By Whom</i>	<i>Action to be taken if there are shortcomings</i>
Demarcation: Are posts demarcating mining area in place	On Mining Right corners and also within view of each other	At Performance Assessment	EPA compiler	Replace or add posts as required
Demarcation: Are posts demarcating mining area in place	On Excavation max extent corners and also within view of each other	At Performance Assessment	EPA compiler	Replace or add posts as required
Noise: Only if complaint received – most likely to occur at rail crossing if applicable	At source of complaint. Measure noise – Note: does not refer to noise survey of staff (OHS)	As required	Specialist Noise Measurement Consultants	Environmental consultants to investigate and recommend additional measures
Dust: Only if complaint received: Most likely source of complaint at rail crossing houses	At source of complaint. Install DustWatch or similar – Note: does not refer to gravimetric dust survey of staff (OHS)	If complaint is received then dust to be permanently monitored using DustWatch or similar. Additional dust monitors must also be placed as required to measure ambient dust levels.	DustWatch Consultants	ECO or consultants to investigate and recommend additional measures
Topsoil removal; Method and timing	At place of removal	Topsoil removal not to take place in months of October to February	Mine Manager	Cover topsoil with shade cloth or hessian.
Topsoil replacement: Method / timing	At place of replacement	Topsoil replacement not to take place in months of October to February	Mine Manager	Plough straw into topsoil
Oil / fuel leaks	Vehicles to be checked regularly. Diesel bowser parking area	To be monitored constantly (especially during refuelling)	Contractor	Clean up using effective and env friendly products

Aspect to be monitored	Where	When	By Whom	Action to be taken if there are shortcomings
Topography: Rehabilitated	Ensure all floors levelled and no and hoc dumps on floors Ensure all slopes rehabilitated to maximum gradient of 1:2	<ul style="list-style-type: none"> • Prior to rehabilitation of any floor section • During mining of final edge slope • At completion of shaping of each section 	Quarry manager	Level floor. Backfill slopes exceeding 1:3. Backfill to be avoided as it will cost.
Groundwater	CapeNature require that nearest borehole's water quality be analysed on quarterly basis. The nearest deep borehole is located on Rem of Farm 1029 (Loubsher) – see groundwater impact assessment (Annexure E).	On a quarterly basis for first 3 years	Applicant to Lab	If there is deterioration of water quality then consult specialist groundwater consultant
Success of operational revegetation	Any areas which may have been rehabilitated during the operational phase	Once annually by Quarry Manager. If shortcoming then manager must contact expert	By Specialist botanist	Specialist botanist or landowner recommends supplementary pasture seeds
Alien vegetation	Entire mining right area.	Formally once every 6 months.	Quarry manager but also by staff members trained during induction environmental training	Conduct alien vegetation clearing.
Environmental education and awareness	All quarry staff	At commencement of every contract period	Mine Manager or environmental consultants	Retrain
Domestic waste management	Entire quarry right area	Continuously	All staff members	Pick up and place in bins or keep in vehicle
Traffic speeds on delivery road	On delivery road	Continuously	All staff members	Report contractor to management
Emergency action plan readiness	All quarry staff	At induction (or as required)	Quarry Manger	Retrain
Palaeontology (fossils)	At time of material removal but especially at processing facility	At occurrence.	Operators at site and at plant site	Stockpile sample and contact West Coast Fossil Park and HWC. Move operations to nearby area if possible

Table 11: Proposed monitoring

18.4 The roles and responsibilities for the execution of the monitoring and management programmes.

See table above in para 18.3

19 Description of environmental objectives and specific goals for the socio-economic conditions as identified in the social and labour plan.

19.1 Description of environmental objectives and specific goals for historical and cultural aspects.

The aim of the applicant is to:

- Ensure that all staff (including contractor staff) are aware of potential fossiliferous nature of material and to instruct them on what to look for and what actions to take when (if) uncovering any fossils.
- Furthermore, abide by all prescriptions of the laws relating to heritage and cultural issues through the life of the mine.
- Minimize any impact in respect of historical and cultural issues

19.2 Environmental objectives and goals in respect of historical and cultural aspects identified in specialist studies conducted: Outline of the implementation programme

Refer Annexure C for full details but the objective of the programme is through a monitoring system to rescue as many fossils as possible. The implementation programme consist of the following steps (see para 20.6 for detail):

- **Access.** Ready access to the site by specialists/mitigators and associated personnel should be permitted by the mining company.
- **Training.** Gecko Fert staff should be adequately trained in the detection and in certain instances, collection of fossil material.
- **Communication.** The mitigators should be timeously informed of important fossil discoveries.
- **Motivation.** Successful mitigation will largely hinge on the voluntary cooperation of Gecko Fert staff. The mitigators should motivate personnel via lectures, feedback on the significance of fossil finds and their publicization.
- **Documentation.** Gecko Fert should assist in the onsite documentation of fossil finds. This could involve provision of mine plans, work area and temporary storage facilities, materials and labour.
- **Costs.** The underlying philosophy is that the need to create an artificial fossil archive is precipitated by the destruction of the natural *in situ* archive. The mining company should therefore be liable for the costs incurred in the creation of the new archive

Para 20.6 AND Annexure C (Part 4 and 5 as well as Fossil Find Procedure) contains full detail of actions required to be implemented in the case of a fossil find.

20 The appropriate technical and management options chosen for each environmental impact, socio-economic condition and

historical and cultural aspect in each phase of the mining operation, as follows;

Nature of impact	Extent	Technical / Management option chosen	Refer para for more detail
1. POST-APPROVAL ACTIVITIES			
1.1. Section 1: Demarcate mining right area by means of posts			
1.1.1. Land Capability	Mining right area measures 78.63ha in 2 sections	This is in itself a management option chosen to ensure that facilities are placed in accordance with the recommendations of this EMP	Refer Para 20.1
1.2. Section 1: Demarcate maximum excavation area			
1.2.1. Land Capability	The excavation areas measure 19.4ha in 3 non-contiguous sections	This is in itself a management option chosen to ensure that facilities are placed in accordance with the recommendations of this EMP	Refer Para 20.1
2. ESTABLISHMENT ACTIVITIES			
2.1. Provide chemical toilets for staff²⁷			
2.2. Conduct Environmental Induction training to contractor staff			
2.2.1. EMS (Positive)	All staff members	Training Intervention	Refer Annexure G and Para 25
2.3. Section 1: No roads required – all roads in place – Upgrade of access point precinct- refer para 20.7			
2.4. Section 2: Only existing farm roads will be used (May require upgrading) – no roads wider than 4m			
2.4.1. Topsoil	Through widening of existing road (only in the case of Section 2)	Topsoil management methodology	Refer para 20.2
2.4.2. Vegetation	Through widening of existing road (only in the case of Section 2)	Vegetation removal procedure	Refer Para 20.3
2.4.3. Land Capability	Any widening of road will lead to that strip being unavailable as pasture	NA	None
2.4.4. Noise	Earthmoving equipment during development	Ensure silencers in working order (if applicable)	None
2.4.5. Air quality	Earthmoving equipment during development	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
2.4.6. Hydrocarbon	Potential for oil / fuel leaks	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
3. OPERATIONAL PHASE ACTIVITIES – Sections 1 and 2			
3.1. Complete rehabilitation of floor of Mining Permit area (Section 1)²⁸			
3.1.1. Topography	1.5ha previously mined area less that already rehabilitated	Excavation shaping methodology	Refer para 20.4
3.1.2. Topsoil	1.5ha previously mined area less that already rehabilitated	Topsoil management methodology	Refer para 20.2
3.1.3. Vegetation	1.5ha previously mined area less that already rehabilitated	Revegetation method & alien vegetation control	Refer para 20.3
3.1.4. Land Capability	1.5ha previously mined area less that already rehabilitated. Note however that the area will not be available for grazing as it will be surrounded by excavation extension	Revegetation method & alien vegetation control	Refer para 20.3
3.1.5. Animal Life	1.5ha previously mined area less that already rehabilitated	Revegetation method & alien vegetation control	Refer para 20.3

²⁷ Chemical toilet chosen over toilet to septic tank given the fairly long distances covered during mining right period. The chemical toilet is fully mobile.

²⁸ Not strictly part of this application, however the portions of the floor and all side walls have been retained for mining of the Mining right are Section 1 (should such mining right be granted)

Nature of impact	Extent	Technical / Management option chosen	Refer para for more detail
3.1.6. Noise	Earthmoving equipment during development	NA	None
3.1.7. Air quality	Earthmoving equipment during development	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
3.1.8. Hydrocarbon	Potential for oil / fuel leaks	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
3.2. Topsoil removal (along with vegetation) to perimeter stockpile ahead of face advance in Block 1 of each section. Subsequent topsoil removal to take place directly too mined out areas.			
3.2.1. Topsoil	Max 1ha at a time.	Topsoil management methodology	Refer para 20.2
3.2.2. Vegetation	Max 1ha at a time to total of just under 20ha (as 3 excavations in 2 sections)	Revegetation method & alien vegetation control	Refer para 20.3
3.2.3. Land Capability	78.63 ha in 2 sections strictly speaking not available to the farmer. ²⁹	Revegetation method & alien vegetation control	Refer para 20.3
3.2.4. Animal Life	Animal life (as it is) will be chased from advance areas (i.e. 19.4ha over 17years)	Revegetation method & alien vegetation control	Refer para 20.3
3.2.5. Noise	Noise from earthmoving equipment. Impact localised.	NA	None
3.2.6. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
3.2.7. Visual	The topsoil dumps on surface may be visible from the cultivated fields of surrounding landowners	None required	NA
3.2.8. Palaeontology	There may be fossiliferous topsoil. Unlikely given previous ploughing etc.	Palaeontology Find Procedure	Refer para 20.6
3.2.9. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
3.3. Removal of phoscrete by excavator to temporary stockpile in pit or directly onto awaiting delivery vehicle.			
3.3.1. Geology	±225 000m ³ tight phoscrete will be removed	None. Mining.	NA
3.3.2. Topography	Topography will be lowered by up to 2m (average 1.5m)	Excavation shaping methodology	Refer para 20.4
3.3.3. Land Capability	Assume up to 19.4ha not available as grazing area / pasture/grain cultivation	Revegetation method & alien vegetation control	Refer para 20.3
3.3.4. Groundwater	Upper aquifer may be exposed at times (under wet conditions)	CapeNature require that nearest borehole's water quality be analysed on quarterly basis	NA
3.3.5. Animal Life	19.4ha over 17 year life of mine. Disturbance to burrowing animals	None possible	NA
3.3.6. Noise	Noise from earthmoving equipment. Impact localised.	NA	None
3.3.7. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
3.3.8. Palaeontology	19.4ha over 17 years	Palaeontology Find Procedure	Refer para 20.6
3.3.9. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5

²⁹ In theory, the area will not be available as pasture however, the practice over the last 2 years has shown that livestock graze next to the excavations with no issues to date.

Nature of impact	Extent	Technical / Management option chosen	Refer para for more detail
3.4. Use of access/delivery road to the site to transport material to processing plant off-site			
3.4.1. Animal Life	Possibility of road kill	Limit speeds on farm roads	
3.4.2. Noise	Noise from delivery vehicles. Residences of old Langebaanweg station houses	Noise attenuation measures	Refer para 20.7
3.4.3. Air quality	Potential for dust generation when passing or near to residences at Old Langebaanweg Station	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
3.4.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
3.4.5. Traffic / Access	At sales of 31 000tons per annum using 18 ton trucks that equates to average 7 trucks per day leaving the site (in 242 day working year)	NA	None
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES			
4.1. Levelling of floor (if required).			
4.1.1. Topography (Positive)	All mined out areas	Excavation shaping methodology	Refer para 20.4
4.1.2. Noise	Noise from earthmoving equipment. Impact localised.	NA	None
4.1.3. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
4.1.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
4.2. Shaping of final pit edges (1:3 slopes and no sharp edges).			
4.2.1. Topography (Positive)	All final pit slopes	Excavation shaping methodology	Refer para 20.4
4.2.2. Noise	Noise from earthmoving equipment. Impact localised.	NA	None
4.2.3. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
4.2.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
4.3. Topsoiling of shaped areas (directly from current mining block – see point 3.2 in this table).			
4.3.1. Topsoil	All mined out areas. No more than 1ha at a time to be without topsoil	Topsoil management methodology	Refer para 20.2
4.3.2. Noise	Noise from earthmoving equipment. Impact localised.		
4.3.3. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
4.3.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
4.4. Seed topsoiled area with pasture mix.			
4.4.1. Vegetation (Positive)	All topsoiled areas.	Revegetation method & alien vegetation control	Refer para 20.3
4.4.2. Land Capability (Positive)	All seeded areas will r return to pre-mining land capability	Revegetation method & alien vegetation control	Refer para 20.3
4.4.3. Animal Life (Positive)	Animal Life will return to vegetated areas	Revegetation method & alien vegetation control	Refer para 20.3
4.5. Conduct EPA (bi-annually)			
4.5.1. EMS (Positive)	Entire site. Confirm EMP prescriptions are complied to.	NA	None

Nature of impact	Extent	Technical / Management option chosen	Refer para for more detail
4.6. Enforce no-go area access.			
4.6.1. Vegetation (Positive)	All areas outside of proposed excavation areas	Training Intervention	Refer Annexure G and Para 20.1 and 25
4.6.2. Land Capability (Positive)	All areas outside of proposed excavation areas	Training Intervention	Refer Annexure G and Para 20.1 and 25
4.7. Decontaminate any oil / fuel leaks.			
4.7.1. Hydrocarbon (Positive)	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
4.8. Continue alien vegetation removal programme.			
4.8.1. Vegetation (Positive)	Mining right area, especially disturbed areas	Revegetation method & alien vegetation control	Refer para 20.3
4.8.2. Land Capability (Positive)	Mining right area, especially disturbed areas	Revegetation method & alien vegetation control	Refer para 20.3
5. DECOMMISSIONING PHASE ACTIVITIES			
<i>Complete rehabilitation of the excavation through:</i>			
5.1. Finalise sloping of final pit edges to 1:3			
5.1.1. Topography (Positive)	All final pit slopes	Excavation shaping methodology	Refer para 20.4
5.1.2. Noise	Noise from earthmoving equipment. Impact localised.	NA	None
5.1.3. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
5.1.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
5.2. Topsoil (ex first block topsoil stockpile) shaped area			
5.2.1. Topsoil (Positive)	Final mining block	Topsoil management methodology	Refer para 20.2
5.2.2. Noise	Noise from earthmoving equipment. Impact localised.	NA	None
5.2.3. Air quality	Dust from earthmoving equipment. Impact localised	Monitoring, Dust suppression options	Refer para 18.3 & para 20.7
5.2.4. Hydrocarbon	Potential for oil / fuel leaks from mechanical equipment. Impact localised.	Hydrocarbon Management & Waste Management Protocol	Refer para 20.5
5.3. Re-vegetate such area using pasture mix seed			
5.3.1. Vegetation (Positive)	All topsoiled areas.	Revegetation method & alien vegetation control	Refer para 20.3
5.3.2. Land Capability (Positive)	All seeded areas will return to pre-mining land capability	Revegetation method & alien vegetation control	Refer para 20.3
5.3.3. Animal Life (Positive)	Animal Life will return to vegetated areas	Revegetation method & alien vegetation control	Refer para 20.3
6. AFTERCARE PERIOD			
6.1. Remove alien vegetation, if present			
6.1.1. Vegetation (Positive)	Mining right area, especially disturbed areas	Revegetation method & alien vegetation control	Refer para 20.3
6.1.2. Land Capability (Positive)	Mining right area, especially disturbed areas	Revegetation method & alien vegetation control	Refer para 20.3
6.2. Conduct supplementary seeding if necessary			
6.2.1. Vegetation (Positive)	Excavation area	Revegetation method & alien vegetation control	Refer para 20.3

Nature of impact	Extent	Technical / Management option chosen	Refer para for more detail
6.2.2. Land Capability (Positive)	Excavation area	Revegetation method & alien vegetation control	Refer para 20.3

Table 12: Appropriate technical and management options chosen to reduce / eliminate impact

20.1 Demarcation and No Go Areas

The applicant is required to demarcate no go areas as follows:

- The mining right area must be demarcated by means of posts in each of the corner positions of the mining right area. In addition posts must be placed so that two side by side posts are always visible from any position for a person to easily determine whether they are inside of the mining right area
- A second set of posts (colour coded) must be placed to demarcate the final extent of excavation. Contractors must be informed of this maximum extent (as well as the requirement for 1:3 final face).

The no go areas must form part of the Environmental Induction Training – see Annexure E (which forms part of the Environmental Awareness programme (Refer Para 25))

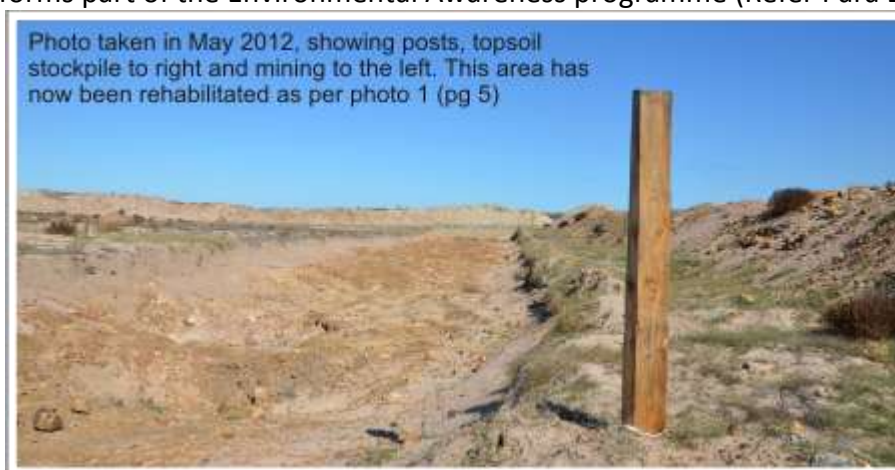


Photo 3: Demarcation by means of posts

20.2 Topsoil handling

The management of topsoil is of utmost importance. Without topsoil management, the disturbed area is subject to several other potential long terms impacts such as lack of revegetation, dust generated off denuded areas and potential visual scarring.

Topsoil management must consist of the following elements:

- All topsoil (however thin) must be removed prior to any development taking place.
- All topsoil must then be removed along with remaining vegetation.
- All topsoil removed from the first mining block shall be stored in perimeter topsoil preservation berms being maximum 2-3m in height in order to preserve as much of its soil characteristics as possible (as per photo above). Topsoil berms must be allowed to revegetate (and as such the side slopes must be kept to 1:2 slopes) so that they do not suffer the effects of wind erosion or generate dust
- Topsoil that is removed in subsequent blocks per section must be used immediately (or within one month) in the rehabilitation of previously mined out and shaped mining block

In addition no topsoil should be brought in from other areas for rehabilitation.

The timing of topsoil removal and replacement is important as well as it relates to potential loss through strong winds which are associated with summer. SO, topsoil may only be removed or replaced during the months of May, June, July and August.

Should topsoil be removed to stockpile in any other period it will require that cover be provided through hessian or shadelcloth. Should topsoil be replaced outside of the stipulated period it will most likely require stabilisation through ploughing in or straw.

20.3 Vegetation Management

20.3.1 Revegetation of denuded areas

The following is copied directly from the specialist botanist report (included in full as Annexure B).

- The primary component of any rehabilitation program is the correct management of topsoil. Strong winds that characterise this area are potentially a problem when it comes to topsoil management. It will be important that topsoil be adequately protected using hessian, shade net (or other suitable material) covering during storage. The timing of spreading and stabilising the topsoil with fast growing crops (in autumn) will be important to ensure rapid establishment of seedlings and resultant stabilisation.
- Ideally top soil should not be stored for more than a year and a phased approach to the mining, whereby topsoil is removed and used immediately or within a year to cover previously mined slopes is preferred.
- As this area is already farmed and characterised by agricultural species there is no need for search and rescue, seed collection or sowing of indigenous species. Once areas of mines are closed off and topsoil returned, then agricultural seed mix should be applied in autumn to return the sites to their pre-mining state.

20.3.2 Alien Vegetation Management

The following description on the eradication of specifically Rooikrantz has been largely extracted/quoted from the Cape Nature Conservation Handbook, Plant Invaders: Beautiful but Dangerous, edited by Stirton (1978) and the book: Alien weeds and invasive plants by Leslie Henderson (2001).

“Mechanical eradication is an effective method of control for Rooikrans. Rooikrans rarely coppices after effective cutting, but care must be taken to cut the stem as close to the ground as possible, thereby ensuring that no buds will resprout.

Young plants can be pulled by hand, as they have shallow roots and intermediate sized saplings should be cut off below the root/stem junction. Spraying the regrowth of seedlings with herbicide is not recommended, due to possible impact on the indigenous vegetation.

It is suggested that mature trees simply be cut off as close to the ground as possible and left to rot, standing on site, or the wood can be removed for use. Alternatively, the lighter wood, branches and leafy material can be put through a chip-mulch machine to produce a coarse mulch for rehabilitation work. Care must be taken to do this when the seeds are still unripe or after they have been dropped, as one does not want to distribute additional viable seed in the mulch.

As with all alien vegetation control, follow-up action 3 months after the initial control is possibly more important than the initial control. This is because once a mature tree is removed, much of the long-lived seed reserve in the soil under the parent tree germinates, which means that if no follow-up takes place, one mature tree can be replaced with hundreds of small trees and the situation gets worse. Also, when blocks are burnt after clearing the Rooikrans seed reserve in the soil will be stimulated to germinate, resulting in mass new growth. This is why the follow-up control is as necessary as the initial control.

Where felled Rooikrans is burned, the area must be monitored for the germination of Rooikrans seedlings and those of other alien plant species. Small numbers of seedlings can be pulled up by hand, but large populations could be sprayed with a herbicide. Best results for eradicating Rooikrans seedlings (< 30cm tall) have been obtained by spraying them with *GARLON* during the active growth season (August-March). The seedlings must be sprayed with a mix of 200 ml *GARLON* on 20 litres of water. Where mature, but not too old (< 2m tall) single Rooikrans trees occur, they can also be sprayed with a mix of 100 ml *GARLON* on 5 litres of *DIESEL*. Drift of this herbicide can be prevented by putting a funnel-shaped hood (stiff plastic) around the spray nozzle. It saves herbicide and prevents indigenous plants from being killed.

Young plants can be pulled by hand and intermediate sized saplings should be cut off below the root/stem junction, or be pulled out of the ground with a tree puller”.

20.4 Excavation rehabilitation method: Shaping

In this case, the rehabilitation of the pit side slopes is relatively straightforward. The aim of such rehabilitation is to:

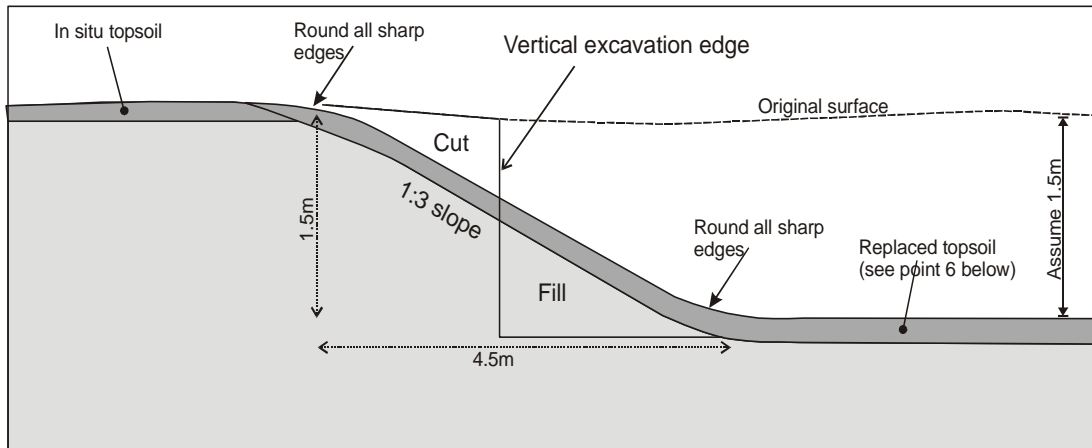
1. Ensure safety to humans and animals
2. Ensure that final rehabilitation of the site blends into surrounding natural vegetation and topography as much as possible.

To meet the aims noted above, the following is required:

Shaping:

The maximum gradient is to be 1:3. All sharp edges are to be rounded to mimic natural contours.

It is critical that the contractor be made aware of these requirements, because the holder will ultimately be responsible for ensuring such 1:3 slope is in place.



Revegetation:

Revegetate in accordance with provisions of para 20.3.

20.5 Hydrocarbon and Waste Management Protocol

Hydrocarbon and Industrial / Domestic management requires specifications on the following aspects:

- Domestic and industrial waste handling and disposal
- Storage of fuel and lubricants
- Transport of fuel to site
- Transfer of fuel from storage facility to vehicle / refuelling in the veld
- Emergency repair in the veld

There is no workshop on site, neither is there any requirement for a permanent bunded fuel tank. The contractors who do work on the site be informed to implement the following prescriptions:

Domestic waste

The contractor staff must be made aware of the different waste streams (i.e. industrial and domestic will be sufficient) as well as the procedures for the handling of each.

All domestic waste is to be kept in the operators' vehicle or on his / her person until the end of the day and disposed of in suitable facility in town. The volumes will be extremely low and will be restricted to lunch wrappers, cooldrink bottles and the like.

Storage of fuel and lubricants

There is no bunded fuel tank and nor is there any requirement for such facility. Diesel will be brought in as required by contractor (probably in 500 litre to 1000 litre bowzers).

Refuelling in the veld:

Staff must be supplied with suitable equipment to perform such task (i.e. suitable funnels, pumps and drip trays).

Emergency repairs in the veld:

In the event of a breakdown with repair being required in the field, the staff should be trained in use of drip trays and suitable funnels (not to drain oil into the sand) for filling and draining of lubricants and the staff shall be provided with such equipment to prevent oil contamination.

In addition:

- Used/replaced filters, hoses, belts, cloths, etc. are to be placed in a black bag/s for transport to contractor head office for handling in terms of their industrial waste management programme. Used filters are not to be buried at the site of repair.
- In the event of soil contamination, the soils are to either be:
 - treated in-situ with a suitable decontaminant such as the OT8 or Spillsorb range of products
 - or removed in black bags along with at least 5cm of sand below the leaked lubricants.

All staff involved in mobile plant operation and maintenance is to be made aware of these oil and lubricant procedures. Staff will require instruction in the:

- Deleterious effects of oil / fuel on the environment
- Use of OT8 / Spillsorb products and the treatment of soil.

Other General Provisions

- All operators are to check their equipment for leaks and report such leaks on a daily basis.
- No used oils are to be used as dust suppressants on manoeuvring areas.
- All staff to be instructed to report oil spills immediately and be trained in fire fighting and the use of biodegradable solvents such as OT8 or Spillsorb or similar products in the clean-up operation.

There will be no vehicle wash bay

20.6 Palaeontological Find Procedure

The following sections are copied directly from the Pether report attached as Annexure C:

As a working hypothesis, it is suggested that BQ Unit 1 (=EQ Unit B) may be the “missing” early Pliocene regressive unit and may actually be subaerially-reworked marine deposits. Neither EQ Unit B nor BQ Unit 1 have been studied in any detail hitherto. Sparse terrestrial fossils apparently occur in BQ Unit 1. Although BQ Unit 1 is not the target of mining, its uppermost part will be extensively exposed in the “footwall” of the phosphate quarries, affording the opportunity to verify the suspected presence of fossil vertebrate bones. The unit could also be exposed to greater depth in trenches and sumps for quarry drainage.

BQ Unit 1 also has a sparse, “ambient” content of enigmatic, phosphatized, skeletal material, probably of fish origin, but micromammalian material could potentially also

occur. This should be sampled and investigated more thoroughly, for its potential to elucidate aspects of the poorly-known upper parts of the Varswater Formation.

Although the BQ Unit 2 channel infills were not convincingly exposed in the prospecting trenches, they are bound to be encountered at some stage during mining. As the main source of previously-recovered fossils, special effort should be directed at obtaining more potentially-identifiable specimens from the channel fills.

No major finds of fossil material were encountered during the inspection of the prospecting trenches. Given the historical finds in the area, it is very likely that fossils were unearthed, but they are not easily seen due to the wet, clayey, nodular and stained nature of the deposits. It is thought likely that the previous finds were mainly revealed during washing and screening of the deposits and were collected on an *ad hoc* basis by Baard' Quarry mine personnel.

In an ideal world it is preferable that the fossils are spotted when they are still *in situ* or nearly so, in the sides and floors of the quarries. Given that the fossils are usually obscured to various degrees by adhering matrix material, such finds are fortuitous and the spotting of the fossils can only be improved by a deliberate alert for them, with diligent checking of possibilities. Fossils could be fortuitously seen during the excavation, moving and stockpiling of the deposits.

The visibility of fossils will be enhanced after rainfall, when surface material is washed cleaner. In general, the fossils are more visible in quarry faces that have "aged" and been cleaned up by weathering away of matrix. The drying of stockpiled deposit, with crumbling away of matrix and some wind erosion is very effective at disclosing the fossil content. Careful inspection of quarry faces and stockpiles after these conditions is bound to yield finds.

According to the mining application Scoping Report, wet screening (washing) of the excavated phosphatic material will not be done. It is being dry-screened and crushed at an unknown off-site location. Nevertheless, it is at this processing facility that the fossil bones and teeth are most likely to be seen. It is therefore a priority that for effective mitigation a means of monitoring this process be set up. The details of a fossil monitoring and recovery plan depend on the plant setup and the practicalities of observing the material and being able to obtain or "snatch" fossils from the process. Safety considerations will have to be taken into account.

A vital part of the mitigation process is the recording of the context of the fossils and the nature of the deposits in detail. However, it is clear that ascertaining the source bed of a fossil found in excavated deposits present difficulties, previously "overcome" by placing emphasis on the state of the fossil, whether Fe-stained (BQ Unit 3) or strongly mineralized (Unit 2). Some caution must apply, as the deposits are influenced by a fluctuating water table and pedogenic/diagenetic processes are likely continuing today. It can only be hoped that at some stage *in situ* fossils will be spotted and can be examined in the quarry faces.

It is impossible for a specialist to routinely monitor the quarries and mined material. Routine monitoring can only be achieved by the co-operation of the people on the ground. By these are meant personnel in supervisory/inspection roles, such as the geologist, surveyor, pit foremen, *etc.*, who are willing and interested to look out for occurrences of fossils. A monitoring presence is critical for immediately spotting a major “strike” of fossils and stopping further damaging excavation.

Background information in the form of some training should be provided to mine personnel. There must be guidelines to be followed for finds and a reporting/action protocol in place when finds are uncovered during monitoring. A “Fossil Finds Procedure” is provided in Section 8.

20.6.1 palaeontological mitigation in the EMP

It is recommended that a long term mitigation plan be formulated for the quarrying operation. The inevitable loss of valuable fossils as a consequence of mining operations would be counterbalanced by the acquisition of a fossil archive which may otherwise have remained concealed indefinitely; the proviso here is that adequate mitigatory measures are implemented, involving:

- **Access.** Ready access to the site by specialists/mitigators and associated personnel should be permitted by the mining company.
- **Training.** Gecko Fert staff should be adequately trained in the detection and in certain instances, collection of fossil material.
- **Communication.** The mitigators should be timeously informed of important fossil discoveries.
- **Motivation.** Successful mitigation will largely hinge on the voluntary cooperation of Gecko Fert staff. The mitigators should motivate personnel via lectures, feedback on the significance of fossil finds and their publicization.
- **Documentation.** Gecko Fert should assist in the onsite documentation of fossil finds. This could involve provision of mine plans, work area and temporary storage facilities, materials and labour.
- **Costs.** The underlying philosophy is that the need to create an artificial fossil archive is precipitated by the destruction of the natural *in situ* archive. The mining company should therefore be liable for the costs incurred in the creation of the new archive. As a general guide, the costs of onsite mitigatory measures and preliminary curation at scientific institutions should be borne by Gecko Fert. The costs of subsequent study of the fossils should be the responsibility of the scientific organisation concerned.

It is envisaged that the IZIKO S. A. Museum, HWC, the Council for Geoscience and the West Coast Fossil Park will all be involved in some way at various times in the monitoring and rescue of fossil material during the quarrying operations. The personnel of the

adjacent WCFP are well situated to respond to fossil finds, for the reasons of expertise, reduced response times and reduced costs of travel.

20.6.2 Fossil Find Procedure

In the context under consideration, it is improbable that fossil finds will require declarations of permanent “no go” zones. At most a temporary pause in activity at a limited locale may be required. The strategy is to rescue the material as quickly as possible.

The procedures suggested below are in general terms, to be adapted as befits a context. They are couched in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur.

Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

20.6.2.1 ISOLATED BONE FINDS

In the process of digging the excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds 6 pieces, the finds must be treated as a bone cluster (below).

Response by personnel in the event of isolated bone finds

- **Action 1:** An isolated bone exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside.
- **Action 2:** The site foreman and ECO must be informed.
- **Action 3:** The responsible field person (site foreman or ECO) must take custody of the fossil. The following information to be recorded:
 - Position (excavation position).
 - Depth of find in hole.
 - Digital image of hole showing vertical section (side).
 - Digital image of fossil.
- **Action 4:** The fossil should be placed in a bag (*e.g.* a Ziplock bag), along with any detached fragments. A label must be included with the date of the find, position info., depth.
- **Action 5:** ECO to inform the developer, the developer contacts the standby archaeologist and/or palaeontologist. ECO to describe the occurrence and provide images asap. by email.

Response by Palaeontologist in the event of isolated bone finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established.

20.6.2.2 BONE CLUSTER FINDS

A bone cluster is a major find of bones, *i.e.* several bones in close proximity or bones resembling part of a skeleton. These bones will likely be seen in broken sections of the

sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

Response by personnel in the event of a bone cluster find

- **Action 1:** Immediately stop excavation in the vicinity of the potential material. Mark (flag) the position and also spoil that may contain fossils.
- **Action 2:** Inform the site foreman and the ECO.
- **Action 3:** ECO to inform the developer, the developer contacts the standby archaeologist and/or palaeontologist. ECO to describe the occurrence and provide images asap. by email.

Response by Palaeontologist in the event of a bone cluster find

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out asap.

It will probably be feasible to “leapfrog” the find and continue the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with developer/owner and the environmental consultant.

The field assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted (see AIA). The find must be evaluated by a human burial specialist to decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in an palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.

20.6.2.3 RESCUE EXCAVATION

Rescue Excavation refers to the removal of the material from the just the “design” excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonably rapid to avoid any or undue delays, e.g. 1-3 days and definitely less than 1 week.

In principle, the strategy during mitigation is to “rescue” the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossils and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material in sand.

- Fragile material in loose/crumby sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar.

If the fossil occurrence is dense and is assessed to be a “Major Find”, then carefully controlled excavation is required.

20.6.2.4 MAJOR FINDS

A Major Find is the occurrence of material that, by virtue of quantity, importance and time constraints, cannot be feasibly rescued without compromise of detailed material recovery and contextual observations.

A Major Find is not expected.

Management Options for Major Finds

In consultation with developer/owner and the environmental consultant, the following options should be considered when deciding on how to proceed in the event of a Major Find.

Option 1: Avoidance

Avoidance of the major find through project redesign or relocation. This ensures minimal impact to the site and is the preferred option from a heritage resource management perspective. When feasible, it can also be the least expensive option.

The find site will require site protection measures, such as erecting fencing or barricades. Alternatively, the exposed finds can be stabilized and the site refilled or capped. The latter is preferred if excavation of the find will be delayed substantially or indefinitely. Appropriate protection measures should be identified on a site-specific basis and in wider consultation with the heritage and scientific communities.

This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.

Option 2: Emergency Excavation

Emergency excavation refers to the “no option” situation wherein avoidance is not feasible due to design, financial and time constraints. It can delay mining construction and emergency excavation itself will take place under tight time constraints, with the potential for irrevocable compromise of scientific quality. It could involve the removal of a large, disturbed sample by excavator and conveying this by truck from the immediate site to a suitable place for “stockpiling”. This material could then be processed later.

Consequently, emergency excavation is not a preferred option for a Major Find.

20.6.3 DRAFT PROCEDURES FOR THE MITIGATION OF MINING IMPACTS ON PALAEONTOLOGICAL RESOURCES AT THE GECKO FERT (PTY) LTD QUARRIES

20.6.3.1 ACCESS TO SITE

1. Gecko Fert, or their representative, will allow the appointed mitigation specialist and any other academic specialists, approved or nominated by Heritage Western Cape or the South African Museum, access to the site to monitor the exposure of fresh sections and to conduct sampling.
2. Site visits must be arranged at least 48 hours in advance with the contact person for the mine.
3. All visitors to the site must be fully conversant with and adhere to all safety regulations and procedures of the mine.
4. Gecko Fert will ensure effective liaison and regular reporting of mining progress to the appointed specialist.

20.6.3.2 MITIGATION OF MINING IMPACT ON PALAEONTOLOGICAL RESOURCES

1. Mitigation of palaeontological material must begin as soon as possible as “trial mining” has already taken place. The appointed specialists must acquaint themselves with the operation and determine feasible mitigation strategies.
2. A plan for systematic sampling, recording, preliminary sorting and storage of palaeontological and sedimentological samples will be developed during the early stages of the project, in collaboration with the South African Museum and West Coast Fossil Park.
3. Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labelled, boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.

20.6.3.3 FUNCTIONAL RESPONSIBILITIES OF GECKO FERT

1. Ensuring, at their cost, that a representative archive of palaeontological samples and other records is assembled to characterise the palaeontological occurrences affected by the mining operation.
2. Provide field aid, if necessary, in the supply materials, labour and machinery to excavate, load and transport sampled material from the mine areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the mine area or crushers.
3. Facilitate systematic recording of the stratigraphic and palaeoenvironmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, by providing aid in the survey in of positions.

4. Provide safe storage for fossil material found routinely during mining by mine personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds.
5. Provide covered, dry storage for samples and facilities for a work area for sorting, labelling and boxing/bagging samples.
6. Costs of basic curation and storage in the sample archive at the South African Museum (labels, boxes, shelving and, if necessary, specifically-tasked temporary employees).

20.6.3.4 DOCUMENTARY RECORD OF PALAEOLOGICAL OCCURRENCES

1. The mine will make the mining plan available to the appointed specialist, in which the following information will be indicated on the plan by the mine in conjunction with the appointed specialist:
2. Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the mining period
3. Locations of samples and measured sections will be pegged and routinely accurately surveyed. Sample locations, measured sections, etc., must be recorded three-dimensionally.

20.6.3.5 FUNCTIONAL RESPONSIBILITIES OF THE APPOINTED PALAEOLOGIST

1. Establishment of a representative collection of fossils and an contextual archive of appropriately documented and sampled palaeoenvironmental and sedimentological geodata at the South African Museum
2. Undertake an initial evaluation of potentially affected areas and of available exposures in excavations.
3. On the basis of the above, and evaluation during the early stages of quarry development, develop, in collaboration with Gecko Fert management, more detailed practical strategies to deal with the fossils encountered routinely during mining, as well as the strategies for major finds.
4. Informal on-site training in responses applicable to “normal” fossil finds must be provided for Gecko Fert staff by the appointed specialist (see Section 8).
5. Respond to significant finds and undertake appropriate mitigation.
6. A quarterly? visit to “touch base” with the monitoring progress, process and document interim “normal” finds and to undertake an inspection and documentation of new mine faces.
7. Transport of material from the mine to the South African Museum.
8. Reporting on the significance of discoveries, as far as can be preliminarily ascertained. This report is in the public domain and copies of the report must be deposited at the IZIKO S.A. Museum and Heritage Resources Western Cape. It must fulfil the reporting standards and data requirements of these bodies.
9. Reasonable participation in publicity and public involvement associated with palaeontological discoveries.

20.6.3.6 EXPOSURE OF PALAEONTOLOGICAL MATERIAL

1. In the event of mining exposing new palaeontological material, not regarded as normative/routine as outlined in the initial investigation, such as a major fossil bone finds, the following procedure must be adhered to:
2. The appointed specialist or alternates (WCFP, South African Museum) must be notified by the responsible officer (e.g. the ECO or mine geologist), of major or unusual discoveries during mining, found by the mine geologist or other personnel.
3. Should a major *in situ* occurrence be exposed, mining will immediately cease in that area so that the discovery is not disturbed or altered in any way until the appointed specialist or scientists from the South African Museum, or its designated contractor, have had reasonable opportunity to investigate the find. Such work will be at the expense of Gecko Fert.
4. Section 8 of this report is a more detailed Fossil Finds guideline.

20.6.3.7 FUNCTIONAL RESPONSIBILITIES OF THE WEST COAST FOSSIL PARK

1. Assist in the training of Gecko Fert personnel in the recognition of fossil material.
2. Provide a rapid response in the event of significant finds.
3. Monitor the “normal” fossil finds at suitable intervals and take temporary custody of such at the WCFP.

Subject to agreement.

20.6.3.8 FUNCTIONAL RESPONSIBILITIES OF THE IZIKO SOUTH AFRICAN MUSEUM

1. Labelling, sorting, boxing, shelving, storage and cataloguing of physical and documentary material in the sample archive at the South African Museum. Eventual storage in an electronic data base of the catalogued and documentary material.
2. Maintenance of the Gecko Fert palaeontological archive at the South African Museum.

20.6.3.9 PERMITS

1. The specialist contracted by Gecko Fert will possess the required excavation permit from the Heritage Western Cape (HWC) in respect of palaeontological sites.
2. The mine officer with responsibility for fossil discoveries must also possess a HWC permit.

20.7 Noise and Dust Reduction Measures

Noise:

Noise will result from earthmoving activities and delivery vehicles. However, the activities of earthmoving vehicles are located so far from any possible impactee that it

will not present any impact requiring attenuation (except perhaps in terms of employee health).

However, there is a risk of delivery vehicle noise impact on some of the houses near the rail line crossing (at the old Rail station). These houses are located adjacent to the Langebaanweg Airforce Base.

If noise does present itself to be a problem in this area then the only feasible actions are:

- Always ensure vehicle silencers are in place
- No hooting
- Restrict delivery vehicle access and exit to standard working hours

Dust:

Dust resultant from the actual excavation generated by earthmoving equipment will not impact on any surrounding landowner / occupier. However, the dust generated by delivery vehicles and others may impact on the houses at the rail crossing particularly under almost all wind vectors. It must be remembered that Northerly winds are normally associated with wetter weather. Be that as it may, it is the applicant's responsibility to ensure that there is no dust impact on the houses.

Figure 14 shows the location of the houses in respect of the access road. The short section (between the existing tar road, across the rail line to the property boundary of 185/7) measures $\pm 70\text{m}$ only and will need dust reduction measures in southerly and westerly wind vectors (indicated as purple in the figure below). The applicant has committed to ensuring that the affected section is wet by water cart until surfacing of such section takes place.

In addition, another section of approximately 50m long will need dust reduction measures applied under dry northerly winds (the southern portion of which is indicated as orange in figure below). So, under dry northerly conditions, the applicant must ensure no dust generation from the areas indicated both orange and purple.

The applicant (Mr B Burger) is currently in negotiation with Mr Dries Mouton (083 293 7544) in respect of the upgrading and maintenance of rail crossing at Section 1.



Figure 15 Wind / dust considerations at entrance to Section 1

21 Action plans to achieve the objectives and specific goals contemplated in Regulation 50 (a).

The time frames for the implementation of each of these activities is as per general phase plan:

	Years																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Establishment Phase: Section 1																			
Operational Phase: Section 1																			
Decommissioning rehabilitation: Section 1																			

	Years																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Establishment Phase: Section 2																			
Operational Phase: Section 2																			
Decommissioning rehabilitation phase: Section 2																			
Aftercare Phase																			
Closure Application																			

21.1 Operational Rehabilitation

NOTE: It is incumbent on the applicant to provide a rehabilitation fund guarantee to cover the costs of decommissioning rehabilitation. Such guarantee must be lodged prior to the Mining Right being issued. The fund has to be calculated:

1. At application stage and annually during the life of mine
2. As if the mine were to shut down immediately at the time of highest impact
3. As if all work had to be conducted by outside contractors

It is therefore advantageous to the applicant to continuously conduct operational rehabilitation during the life of mine to reduce the size of the “immediate closure fund” and the decommissioning rehabilitation costs. Most operational rehabilitation is geared toward reducing the amount and value of decommissioning rehabilitation of the site but some is geared toward maintaining a neat and effective quarry site.

As such, operational rehabilitation will consist of at least the following elements:

- As a “strip mining method” is to be employed, the most important operational rehabilitation elements are:
 - The proper shaping of mined out areas in accordance with diagram in para 20.4
 - The covering of mined out areas with topsoil from subsequent mining blocks
 - Keeping the current mining block as small as possible. It should never measure more than 1ha (which represents approximately 1 years work)
- General housekeeping of the site must be of high order and the site must be kept neat at all times. Vegetation of certain areas and banks, demarcation of movement areas etc. all contribute to a pleasing aesthetic.
- Continual monitoring of the site by management and staff
- Conducting of Environmental Performance Assessments every two years during full production.

21.2 Decommissioning rehabilitation

The closure objective requires that the mined out areas be rehabilitated for use as pasture or grain cultivation. Remember however that the landowner wishes to incorporate these excavations into his current game farm establishment and expansion project.

As a result, the decommissioning rehabilitation merely consists of the rehabilitation of the final block of mining through shaping of side walls to 1:3, levelling of the floor and cover with topsoil sourced from the first mining block.

22 Procedures for environmentally related emergencies and remediation.

Only two high evidential risk probabilities/possibilities are identified namely:

- (i) fuel/oil spills (Possible); or
- (ii) veld fires (Unlikely).

To this end the following procedures must be brought to the attention of all staff and suitable material/equipment provided to deal with them.

(i) Fuel/oil spills

The reporting procedure in terms of which any person on site who sees an oil/fuel spill occurring must:

- Ensure the safety of any person nearby by evacuating such person from the danger area.
- Having assessed the volume of the spills and if safe, then:
 - Report the spill to the office personnel who shall notify the manager
 - Use either shovels or mechanical equipment (loader, etc.) to either dig a low trench or construct a wall to contain the spill and especially to restrict it from draining into the soil or veld.
- The manager (plant production manager or mobile plant manager) shall implement the product specifications as to the methods of clearing up the spill and treating the affected soil.

In addition, all staff must report oil/fuel leaks from mobile equipment no matter how small the leaks are.

The manager shall ensure that oil spill treatment product is held in stock and available at all times and that a notice for its use be posted in the storage area where it is kept.

(ii) Fire

Should any fire derived from the mine or elsewhere be noted in the veld (highly unlikely), the manager must immediately be notified, whereupon he shall notify the land owner and adjacent land owner and muster all available persons recruited on site to beat the fire or use the water cart if available to assist.

The relevant telephone numbers including after-hours & emergency numbers must be clearly displayed.

When appropriate they should then notify the local authority's fire department.

23 Planned monitoring and environmental management programme performance assessment.

Refer part 15

24 Financial provision in relation to the execution of the environmental management programme:

24.1 Plan showing the location and aerial extent of the aforesaid main mining actions, activities, or processes anticipated.

Refer Figures 8 & 9.

24.2 Annual forecasted financial provision calculation:

In terms of the Mining Work Programme cash flow forecast, it was estimated that in addition to the Rehabilitation fund quantum that was required to be provided up front, the cost for progressive operational rehabilitation was included in the contractor cost.

24.3 Confirmation of the amount that will be provided should the right be granted.

Refer Annexure F for calculation of quantum in terms of the "Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine". The total amount is as follows:

Comp onent No	Main description	Units	Quantity	Master rate	Multiplication factor	Weighting 1	Weighting 2	Amount in Rands
10	General surface rehabilitation, including grassing of all denuded areas	ha	3	52600	1	1	1.05	R 165 690
14	2 to 3 years of maintenance and aftercare	ha	3	7000	1	1	1.05	R 22 050
Total								R187 740

24.4 The method of providing financial provision contemplated in Reg 53.

The fund will be supplied by financial guarantee.

25 Environmental Awareness Plan (Section 39 (3) (c))

Section 39(3)(c) requires that an applicant who prepares an EMProgramme or EMPlan must "develop an environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risks which may result from the work and the manner in which the risks must be dealt with in order to avoid pollution and degradation of the environment".

Environmental Awareness is required not only for management and employees (as described in Section 39(3)(c)) but also for visitors to the site. To this end, the following strategies and plans will be put into place for each of the parties.

25.1 Visitor Environmental Awareness:

Visitor/sub-contractor environmental awareness will be generated through the provision of a signboard describing very briefly the environmental considerations applicable to them. The signboard should contain the following information:

- Statement of the applicant's commitment to environmental principles.
- List of the "rules" to which the visitor must abide. This will include:
 - No littering. Dispose of all waste in the bins provided.
 - No fires
 - Stay on demarcated roadways and paths only
 - Kindly report any environmental infringements they may notice
 - Check your vehicle/equipment for diesel/oil leaks

Staff of sub-contractors must also be given Environmental Induction Training as per Annexure G.

25.2 Senior and Middle Management Environmental Awareness:

Achieving environmental awareness at upper levels of management is slightly different from the process at the operational level. There is often a fair level of the general value of environmental awareness but site-specific issues will most often need to be communicated. This will be achieved by:

- The management must make themselves fully au fait with the EMProgramme.
- Ensuring that there is a spare copy of the approved EMProgramme at his/her disposal. The management is encouraged to make notes in the document regarding the difficulty / ease of implementing the environmental management measures. These notes should be sent to the consultants to assist in future revisions of the EMProgramme
- If the manager feels comfortable conducting the environmental performance assessments (required in terms of the Act), then he/she should do them. However should outside help be required then the manager must be avail him/herself to accompany the environmental performance assessment team on their rounds.
- The manager must ensure that the operators perform regular monitoring of their workstations / areas.

In the management's execution of their activities/being at the site, the management must be constantly aware of and observant of especially the following:

- | | |
|----------------------|--|
| - dust levels | - movement outside of demarcated areas |
| - litter management | - general housekeeping |
| - topsoil management | - fuel/oil management/leaks/changes |

- success of operational revegetation
- alien vegetation

25.3 Operator / Workforce Environmental Awareness:

Achieving environmental awareness amongst the operators and labour is probably the most important because they are usually present at the place where most environmental transgressions take place or in fact cause them. It is the aim of increased environmental awareness to reduce any such environmental transgressions.

Increasing environmental awareness at these levels can be achieved through the following strategies:

- **Induction environmental training:** (As per the draft Environmental Induction Training document in Annexure G) must take place prior to any contract period.
- **Training:** Each and every employee (contractor or not) must go through an environmental training process where at least the following items area covered:
 - The oil/fuel management policy must be explained to the employees. The reason for the policy must also be explained (i.e. to not impact on groundwater, surface water, soil quality etc.).
 - The domestic and industrial waste management policy & method must also form part of the training
 - The topsoil handling method and the reasons for preserving topsoil (i.e. post mining revegetation, erosion prevention etc.)
 - Alien vegetation management: How to recognize and remove such species
 - Protection of the natural veld by not driving/manoeuvring or walking through the demarcated protection areas. Reporting that demarcation posts/tape is broken or removed
 - Emergency management procedures such as dealing with oil spills or fires must also be drilled
 - Such training will, in this case, be carried out by the site manager/resident engineer or the designated Environmental Control Officer (ECO)

(Refer Annexure G for preliminary Induction Training manual)

26 Attachment of specialist reports, technical and supporting information. (Provide a List)

Annexure B:	Specialist Botanical Assessment by Fynbos Ecoscapes
Annexure C:	Specialist Palaeontological Impact Assessment by John Pether
Annexure D:	Specialist Archaeological Impact Assessment by Jonathan Kaplan
Annexure E:	Specialist Groundwater Impact Assessment by John Weaver
Annexure F:	Rehabilitation Fund Quantum Calculation according to DMR guideline document

27 SECTION 39 (4) (a) (lii), Capacity to manage and rehabilitate the environment

CV's of the relevant personnel as well as technical ability of the contractor was demonstrated as part of the Mining Work Programme which has to be lodged with the application.

In addition, mining has been taking place on site for the last 2 years and minor rehabilitation has taken place (given the proposal to use the existing mine as first mining block). Such rehabilitation is satisfactory – refer photo 1.

28 UNDERTAKING

28.1 The Environmental Management Programme will, should it comply with the provisions of section 39 (4) (a) of the Act and the right be granted, be approved and become an obligation in terms of the right issued. As part of the proposed Environmental Management Programme, the applicant is required to provide an undertaking that it will be executed as approved and that the provisions of the Act and regulations thereto will be complied with.

See cover of report for such undertaking.

29 IDENTIFICATION OF THE REPORT

See Cover of report for signatures

Name: Braam Burger

Designation: Director