the dme
Department:
Minerals and Energy
REPUBLIC OF SOUTH AFRICA

Private Bag X6076, PORT ELIZABETH 6000,
Cnr Mount & Diaz Road, Mt Croix,
Port Elizabeth, 6000
Tel: [041] 396 3900
Enquiries: N. Mkhacane
REF: EC 30/5/1/3/3/2/1 (0246) EM

13 January 2010

The Manager
South African Heritage Resources Agency
P.O. Box 758
GRAHAMSTOWN
6140

ATTENTION: MR. T. LUNGILE

Case ID: 2452

ACKNOWLEDGMENT OF SCOPING REPORT RECEIVED IN SUPPORT OF AN APPLICATION TO MINE STONE AGGRAGET/GRAVEL ON PORTION 7 OF FARM RIET KUIL, FARM 396, DIVISION OF UITENHAGE, EASTERN CAPE.

1. Attached herewith, please find a copy of the Scoping Report received for the proposed mining activity.

2. Please forward any written comments or requirements your Department may have in this regard, to this office no later than **6 March 2010**. Failure to do so, will lead to the assumption that your department has no objection(s) or comments with regard to the said document.

3. Consultation in this regard has also been initiated with other relevant State Departments.

4. Please use the reference number as indicated above, in all future correspondence.

5. Your cooperation is appreciated.

Sincerely,

Regional Manager
Eastern Cape

STELLENRYCK ENVIRONMENTAL SOLUTIONS

SCOPING REPORT FOR HARD ROCK QUARRY AND ASSOCIATED BENEFICIATION PLANTS ON ON PORTION 7 OF FARM RIETKUIL 396, UITENHAGE

PREPARED FOR:

Bigwill Enterprises 10 (Pty) Ltd
P.O. Box 2179
North End
6056

DECEMBER 2009

Tel. & Fax: 041- 3672049 · Cell 0824140464/0824140472 · 4 Josephine Avenue LORRAINE 6070
Member: J. A. van As: B.Sc (Botany & Zoology), B.Sc (Hons) (Eco-Physiology), M.Sc (Plant Physiology)

1. Introduction

1.1 Background & Motivation

An application by Bigwill Enterprises 10 (Pty) Ltd for a Mining Right to mine sandstone bedrock and red gravel from Portion 7 of the farm Rietkuil 396 in the Uitenhage District was submitted to the Department of Minerals and Energy (DMR) in December 2009

An extension to the south and south-west of the existing Prima Quarries Pty Ltd mining scar within the boundaries of the study area is proposed. The mining operation will be carried out in independent phases, the details of which will be provided under separate heading.

HISTORIC MINING ON PROPERTY

Mining of quartzitic sandstone in the north-western portion of portion 7 of the farm Rietkuil 396 has been ongoing since 1981 when the quarry was known as Patcor Quarry, under ownership of Mr. C. Van der Touw. The concern was then sold to Prima Klipbrekers trading as Prima Quarries 1987 (Pty) Ltd. In 2007 Scribante Holdings (Pty) Ltd became the 100% owner of the latter company and production at the mine has increased substantially over the past 24 months. The duration of mining within this 20ha quadrant of the property proves that competent rock is available on the property and from that perspective the proposed Bigwill Enterprises 10 (Pty) Ltd mining venture would be a sustainable mining concern.

AVAILABLE SANDSTONE RESERVES AT THE PRIMA QUARRIES 1987 (PTY) LTD MINING AREA

Prior to the purchase of Prima Quarries 1987 (Pty) Ltd historical mining has, according to the previous owners, resulted in 80% of the reserves at the quarry been mined out and the remaining reserves would have lasted approximately five years and formed the basis for Scribante Holdings (Pty) Ltd to convert the existing mining license. In order to ensure adequate future reserves for Prima Quarries Pty Ltd, application for a Prospecting Right was lodged in March 2009 in the name of Bigwill Enterprises 10 (Pty) Ltd to confirm existing prospecting results obtained for a portion of the farm depicted as Quarry A on the mine plans provided and to establish the quartzite reserves in the other areas of the proposed mining area. However, recent data acquired through blasting and drilling at the Prima Quarries 1987 (Pty) Ltd mining area revealed that the information previously received on the available reserves has been incorrect and contact has already been established with unusable shale deposits located on the northern perimeter of the quarry. The quarry is already mined out to the west and eastward expansion is curtailed by a provincial road. Mining into the floor is not possible since the sandstone is underlain by extensive shale layers. Extension to the south is mostly curtailed by the crushing plant and permanent quarry infrastructure, which left Prima Quarries 1987 (Pty) Ltd with approximately seven months' reserves. In order to prevent the layoff of personnel and extensive loss of market share, Bigwill Enterprises 10 (Pty) Ltd has therefore been forced to immediately lodge a mining right

application since adequate information is available on the quality and quantity of stone within the Quarry A area. Once a mining right has been acquired, prospecting within Quarry areas B, C & D as depicted on plan will be conducted. Results of stone quality and quantity in these areas are not of immediate importance, since Quarry A would be able to sustain the company's market requirements for approximately 20 years.

The entire farm reflects sandstone outcrop but particular attention will be directed to the area south of the imaginary north-east south-west line dissecting the property in two halves. Current mining has revealed inferior quality of stone to the north of this line. Failing to find alternative reserves will result in the entire workforce to be retrenched.

The study area has been subject to unauthorised mining of red gravel and vegetation clearing that has largely destroyed the natural environment on the plateau areas. The lower valley sides and water courses are still relatively intact and will receive the necessary protection.

AVAILABLE SANDSTONE RESERVES IN PORT ELIZABETH

Competent sandstone reserves in Port Elizabeth are limited as some of the available rock formations found in the area reflect inferior quality and is not suitable for the aggregate market, whilst other reserves have been sterilized for example by establishing residential areas and by the drive to proclaim the Van Der Kempskloof Nature Conservation area which for all practical reasons will prevent future rock mining in close proximity to the Port Elizabeth. Considering the fuel prises of the past two years, it is not viable to investigate any alternative quarry sites further away from the city. The entire farm that constitutes the subject of this application reflects sandstone outcrop and is located distant to residential areas and any areas of high ecological sensitivity and constitutes the logical sandstone deposit to exploit.

1.2 Contact Details

PARTICULARS OF APPLICANT

Bigwill Enterprises 10 (Pty) Ltd
P.O. Box 2179
North End
6056

PARTICULARS OF CONTACT PERSON, PROXY & SIGNATORY OF BIGWILL ENTERPRIZES

Mr. A. G. Scribante
P. O. Box 2179
NORTH END
6056

Tel: 041 – 484 7211 Fax: 041 – 484 6231 Cell: 083 283 0500

PARTICULARS OF PROSPECTING MANAGER

Mr. M. D. Pledger ID 7508225012082
P. O. Box 2179
NORTH END
6056

Tel: 041 – 484 7211 Fax: 041 – 484 6231 Cell 0837129944

DETAILS OF LAND TO BE PROSPECTED

Title Deed Description

T 88844/2000 (Annexure 2),
Portion 7 of farm Rietkuil 396. (Excluding the existing quarry area of 20ha)

Landowner

Mr. C. van der Touw
P.O. Box 28886
Sunridge Park
6008

COMPANY DETAILS AND ASSOCIATIONS

Scribante Holdings (Pty) Ltd owns 74% of Bigwill Enterprises 10 (Pty) Ltd whilst Shaeeda Assaf owns 26%. Scribante Holdings (Pty) Ltd is also the owner of a number of subsidiary companies which will influence the proposed mining operation from a financial, technical and strategic planning point of view.

Scribante Holdings (PE) (Pty) Ltd is represented in a number of provinces and has also business interests in some of the neighbouring countries and are therefore a well established mining and earthmoving company and distributor of a wide range of concrete products. The company has a sound financial and technical history and is one of the larger mining and construction companies in the Eastern Cape and would therefore be in a position to ensure the successful establishment of the mining concern, as well as the implementation of the provisions of the MPRDA 28 of 2002 and the Mine Health & Safety Act 29 of 1996.

The following companies will be directly involved with the Bigwill Enterprises mining operation:

Prima Quarries 1987 (Pty) Ltd

Prima Quarries 1987 (Pty) Ltd was purchased from Prima Klipbrekers two years ago and is 74% owned by Prima Quarries 1987 (Pty) Ltd whilst Shaeeda Assaf owns 26% of the company. Prima Quarries 1987 (Pty) Ltd will be responsible for the finances and required equipment to develop the mining concern. The company is at present mining the same mineral within the same geological formation to the north-east of the proposed mining concern.

SupaCrush Quarry (Pty) Ltd

Prima Quarries 1987 (Pty) Ltd is in the process of converting its old order mining right to a new order mining right and is trading as SupaCrush Quarries (Pty) Ltd, which in turn is 74% owned by Scribante Holdings (Pty) Ltd and 26 % by Shaeeda Assaf. All business transactions are done in the name of SupaCrush Quarries (Pty) Ltd.

SupaCrush (Pty) Ltd

This company is 80% owned by Scribante Construction (Pty) Ltd and 20% by Mark Pledger and will provide the technical expertise to develop the proposed mining concern. The company is currently also performing all physical mining, crushing and production of concrete products at the abutting Prima Quarries (Pty) Ltd premises.

Shaeeda Assaf

Ms. S. Assaf represents the BEE partner of Prima Quarries as well as of Bigwill Enterprises 10 (Pty) Ltd). Ms. S. Assaf is a well-known business woman in Port Elizabeth and will through joint decision

making be responsible to ensure that Bigwill Enterprises 10 (Pty) Ltd is strategically correctly positioned within the Eastern Cape mining sector and to expand the company's current market share.

2 Methodology Applied To Conduct Scoping

TERMS OF REFERENCE

Stellenryck Environmental Solutions has been appointed to conduct the mining right application, Scoping Report, Public Participation Process and EIA & EMP for the development of a hard rock quarry on Portion 7 of farm Rietkuil 396. Where S.E.S finds it applicable, additional special studies will be conducted. Since the December is a holiday period, advertising the proposed mining development will be postponed to the first week in January 2010.

The contents of the Scoping Report are based on information obtained from:

1. Three site visits to the study area.
2. Plant analysis done by Adrian Odgers
3. Environmental data obtained from Department of Water Affairs
4. Environmental data obtained from Department of Environmental Affairs
5. SM Pierce & AD Mader - STEP Handbook
6. SANBI – Environmental data & maps
7. Eastern Cape State of the Environment Report
8. Information obtained from Council for Geoscience
9. NM MOSS.
10. Personal knowledge of the mining industry gained over 14 years.
11. Consultation with John Victor Surveys, Mr. A Scribante & M. Pledger
12. Bigwill Enterprises Prospecting Right Application & EMP
13. Bigwill Mining Right Application

OBJECTIVES

The Environmental Scoping Phase has been undertaken in accordance with the requirements of regulation 49 (1) of the MPRDA 28 of 2002 and basic requirements of NEMA. The objectives of the Scoping Phase are to:

1. Ensure that the process is open and transparent and involves the Authorities, proponent and stakeholders;
2. Identify the important characteristics of the affected environment;
3. Ensure that feasible alternatives are identified and selected for further assessment;
4. Assess and determine possible impacts of the proposed project on the biophysical and socio-economic environment and associated mitigation measures; and
5. Ensure compliance with the relevant legislation.

6. Ensure all relevant stakeholders have been identified and invited to engage in the scoping process;
7. Raise awareness, educate and increase understanding of stakeholders about the proposed project.
8. Create open channels of communication between stakeholders and the applicant.
9. Provide opportunities for stakeholders to identify issues or concerns and suggestions for enhancing potential benefits and to prevent or mitigate impacts;
10. Accurately document all opinions, concerns and queries raised regarding the public participation phase.
11. Ensure the identification of the significant alternatives and issues related to the mining project.

SCOPING REPORT REQUIREMENTS

This Scoping Report has been compiled in accordance with the following requirements:

a) Providing the details and expertise of the EAP undertaking the EIA process;
b) Describing the proposed locations for the activities along with all applicable alternatives;
c) Describing the property on which the activity will be undertaken;
d) A baseline description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed project;
e) Identifying all relevant legislation and guidelines that have been considered for the project;
f) A description of the environmental issues and potential impacts, including cumulative impacts that have been identified;
g) Providing the methodology that will be adopted in assessing the potential impacts that have been identified, including any specialist studies that will be undertaken;
h) Outlining the Public Participation Process that has been undertaken for the project;

ASSUMPTIONS

- The impact of mining within the Quarry A footprint will almost be similar to that of mining in the Prima Quarries footprint.
- The impact of mining within Quarry B & Quarry C will be slightly higher with regards to social impact (dust noise production capacity of boreholes) to that of mining in the Prima Quarries footprint & Quarry A footprint.
- Mining will not impact on the watercourses in the mining footprint if the correct remedial measures are implemented.

LIMITATIONS

- The preliminary specialist reports, undertaken during the Scoping phase, were based primarily on desktop investigations and limited field investigations in accordance with the requirements

for scoping as stipulated in the EIA Regulations. It must be emphasized that more detailed specialist's investigations will take place during the detailed assessment phase of the EIA process and the results thereof will form part of the EIA Report;

- A current limitation, specific to the Scoping Phase pertains to the lack of detailed information in terms of abutting infrastructure to determine blasting impacts. However, the relevant information will be available during the detailed assessment phase of the EIA process and will therefore form part of the EIA Report;
- Risks associated with the transport of explosives will not be dealt with in the scoping or EIA reports since it falls under the jurisdiction of the Police' Explosives Unit.
- Dust and noise levels will be verified during the EIA process.

3 Market Research and Mining Technique

Nature of Business

Bigwill Enterprises 10 (Pty) Ltd will produce high quality crushed sandstone aggregate for building, construction and concrete purposes. The concern will be an extension to the abutting Prima Quarries Quarry that has been an economically viable and sustainable business venture for the past 25 years and enjoys a solid reputation for supplying good quality material at cost effective rates.

Bigwill Enterprises 10 (Pty) Ltd is upholding the SA Governments Black Economic Empowerment (BEE) objectives as ownership of the mine is 26% HDSA and the total workforce has a much greater HDSA ratio. The ratio of 10% women in the workforce has also almost been achieved and will receive further attention from mine management to attain the desired ratios in the work force. The Bigwill Enterprises 10 (Pty) Ltd mining operation will continue to facilitate the intended transformation within the Mining Sector to previously excluded communities.

Financial Research Overview

The financial overview, much of which was provided in the Mining Right Application points out the following:

- The Bigwill Enterprises Quarry will be a continuation of the abutting Prima Quarries operation therefore the crushing plant, provisional stockpile areas related infrastructure and earthmoving equipment are already in place. A new office area, upgraded workshop and weigh bridge have been established and will remain in place for the Bigwill Enterprises mining operation. The stockpile areas have also been extended to cater for the increased production rate of Prima Quarries and will provisionally be used to stockpile material extracted during the initial phases of quarry development. A larger silt dam has been constructed immediately east of the future stockpile area to prevent flow into this area and to retain silt from the larger Prima Quarries

stockpile area. The water reticulation network and power service points are already available at the premises of Prima Quarries, but will need extension to the new proposed stockpile and plant area.

Costs related to the establishment of Bigwill Enterprises are related to the development of the quarry and establishment of a new plant area and is provided below. Costs will be funded from accumulated profits of Prima Quarries (Pty) Ltd

Total Rand Value	Activity		
	Clearing of loose overburden	Removal weathered quartzite	Development of 1st production bench
300 000	20 000	80 000	200 00
	Installing water reticulation system	Extending Eskom line	
85 000	15 000	70 000	
	Cutting of new stockpile and off loading platforms & Partial infill of valley	Haul of overburden from quarry for complete valley infill	Relocation of crushing plant
1 150 000	250 000	100 000	800 000
	Establishment of storm water control system at bottom of quarry and plant		
50 000	R50 000		
1 585 000			

- Annual production costs will equate to about R22 million.
- Net profit will equate to about 4, 2 million.

The above data assumes a mining production of about 149 000 m^3 of aggregate and 36000 m^3 red gravel per annum, depending on what type of materials are being produced/ ordered.

The Competition & Markets

There are two major crushed rock aggregate competitors in the market in Port Elizabeth District namely Denver Quarries and Lafarge. Two additional cobblestone concerns are located along the Swartkops River namely Sandman Quarry and Harbron Quarries but compete in a very limited manner with the mentioned opencast concerns. The existing Prima Quarries operation has co-existed with the mentioned competitors for at least ten years hence it is rather certain that Bigwill Enterprises 10 will be able to compete in similar manner, which will ensure the sustainability of the concern. It is further anticipated that with the westward extension of Port Elizabeth and the lack of reserves at Lafarge's Moregrove Quarry (due to social impact), competition for Bigwill Enterprises 10 will decrease substantially.

MARKETS

All material produced at the Bigwill Enterprises Quarry will be crushed to the same products that are currently produced at Prima Quarries and will all be sold to the latter company. Prima Quarries (trading as SupaCrush Quarries) will still be responsible for all contractual agreements, market strategies and sales.

In the late nineties the market for Patcor Quarries retracted substantially due to the establishment of Denver Quarries closer to the city centre and because of poor marketing strategy. In addition thereto, City Council decided to halt westward extension of city boundaries and to rather concentrate on infill development within existing suburbs. The owner then sold the quarry to Prima Klipbrekers trading as Prima Quarries and with the necessary cash injections and financial backup from Prima Klipbrekers, markets were slowly re-established. Since Prima Klipbrekers was also involved with major road construction activities, an additional market for road stone was established. With the decision of the Competition Board that Prima Klipbrekers may not operate two quarries in Port Elizabeth, the quarry was sold to Scribante Holdings (Pty) Ltd, the 74% shareholder of Prima Quarries (Pty) Ltd.

Scribante Holdings (Pty) Ltd consists of a number of subsidiary companies such as Mzonzi Mix/Supa Mix and SupaCrush Quarries and over an extensive period of more than 30 years, an extensive clientele basis was developed by three generations of the Scribante family, resulting in a vast additional market for the material produced at SupaCrush Quarries. The availability of construction material from their own mining concern enables the mentioned companies involved to sell material at a much more competitive rate as what was the case when the material had to be obtained from other commercial concerns. A fourth important parameter that has emerged over time, is that westward extension of Port Elizabeth has resumed and a number of construction activities have already taken place in relative close proximity to the SupaCrush Quarry and a substantial amount of required material for these developments were supplied from the quarry. A few of these developments are still in process whilst other is currently in the EIA stage, which will cause the Bigwill Enterprises Quarry to be ideally positioned. The westward extension of the city, the only available option for Port Elizabeth, will cause the importance of Bigwill Enterprises Quarry as a supplier of various aggregate products to increase over time and will further expand the clientele basis and market share. Considering the lifespan of the quarry to be in excess of 70 years, it will within the next 10-15 years increase its market share by at least 20% as development advances westward. The advantage that the Bigwill Enterprises Quarry will have in future is its association with the construction/earth moving arm of Scribante Construction (Pty) Ltd, which will enable the company to function as a one-stop-shop during tendering processes related to future developments.

It should be noted that under the management structure of Scribante Holdings, SupaCrush and SupaCrush Quarries, sales have improved substantially after takeover in 2008 as reflected by the financial statements cited. However, the Bigwill Enterprises Quarry will initially have to deal with the economic cool-down currently experienced by all quarry concerns, but nearer to the end of 2010 this mining concern will be ready to embrace the economic upturn that is anticipated for this period.

An additional, extensive market for construction materials has been maintained over the past three years, due to numerous construction activities related to the development of the Coega Industrial Zone and Coega Deep Water Harbour, back of port infrastructure and road & rail infrastructure servicing these development areas. This demand will, as a minimum, be maintained over the next three to five years as back of port construction activities and infill developments in phase 1 of the IDZ have only started at the end of 2007. The construction of a multibillion oil refinery by PETROSA in the IDZ will stretch the production capacity at all Port Elizabeth Quarry concerns and will thus also benefit the Bigwill Enterprises. Although the Alcan Alumina smelter is off the cards for the interim period due to ESKOM's inability to produce power, this development has been approved and it is anticipated that with the completion of the first power plant in 2012, it will again be a market that need to be supplied.

Being a household name in the construction fraternity, Scribante has a large clientele basis in this sector and includes the following companies:

Civil & Road Construction Contractors

Randcivils, WK, Rumdel, SJW, Mawethu, Masakeni, Concrete 4 U, Concor Technicrete, Shakuma, Deranco .

Medium users

Builders Friends, Hardware stores, Building contractors, Cement Block Producers, etc.

Small users

General public.

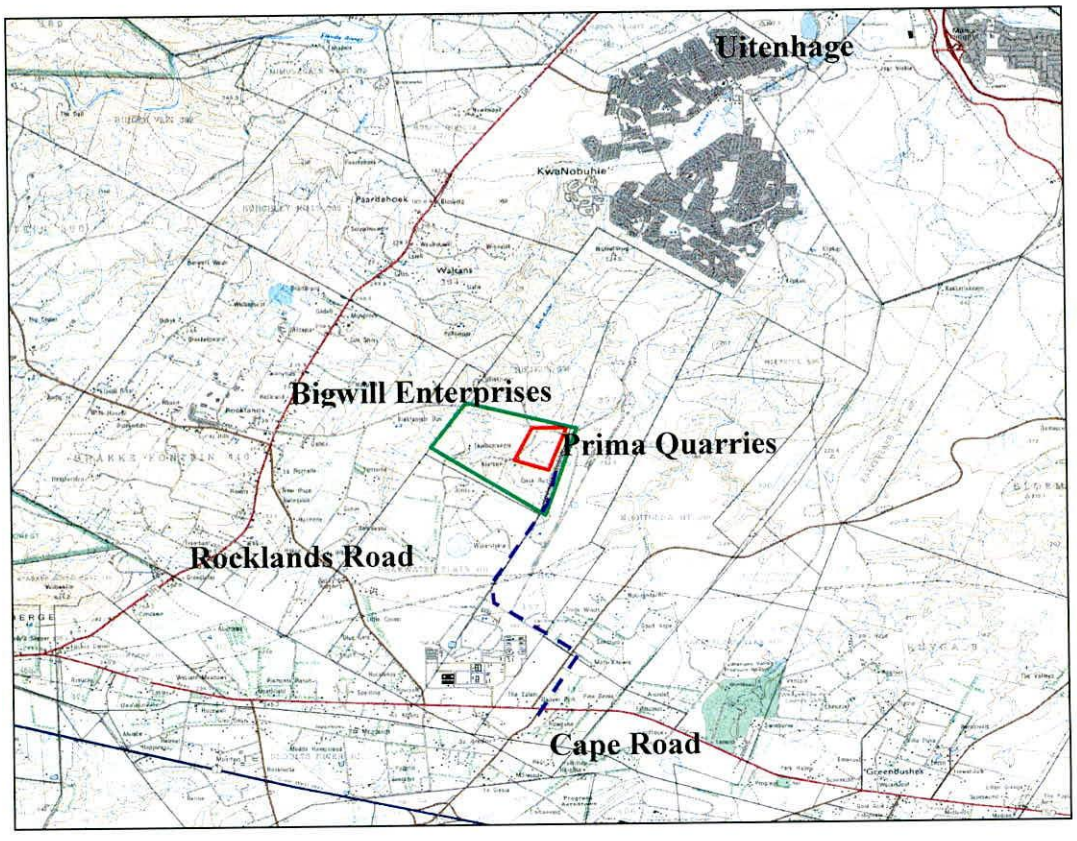
The following products will be offered for road building and general construction purposes:

CODE					
Concrete Aggregate	**Surfacing Aggregate Road Stone**	**Base**	**Sub Base**	**Dust Products**	**Other Products**
6,7mm	6,7mm	G1 Base Coarse	G5 Sub Base	Coarse Grit	Rock fill
9,5mm	9,5mm	G2 Base Coarse	G7 (Crushed)	Fine Grit	Gabion
13,2mm	13,2mm	G3 Base Coarse	G7/ G8/ G9 (no spec)		Kerbmix
19mm	19mm	G4 Base Coarse	Blasted overburden / Fill		Builders mix/ Crusher run
37,5					

4 Proposed Mining Operation

LOCALITY OF THE MINE

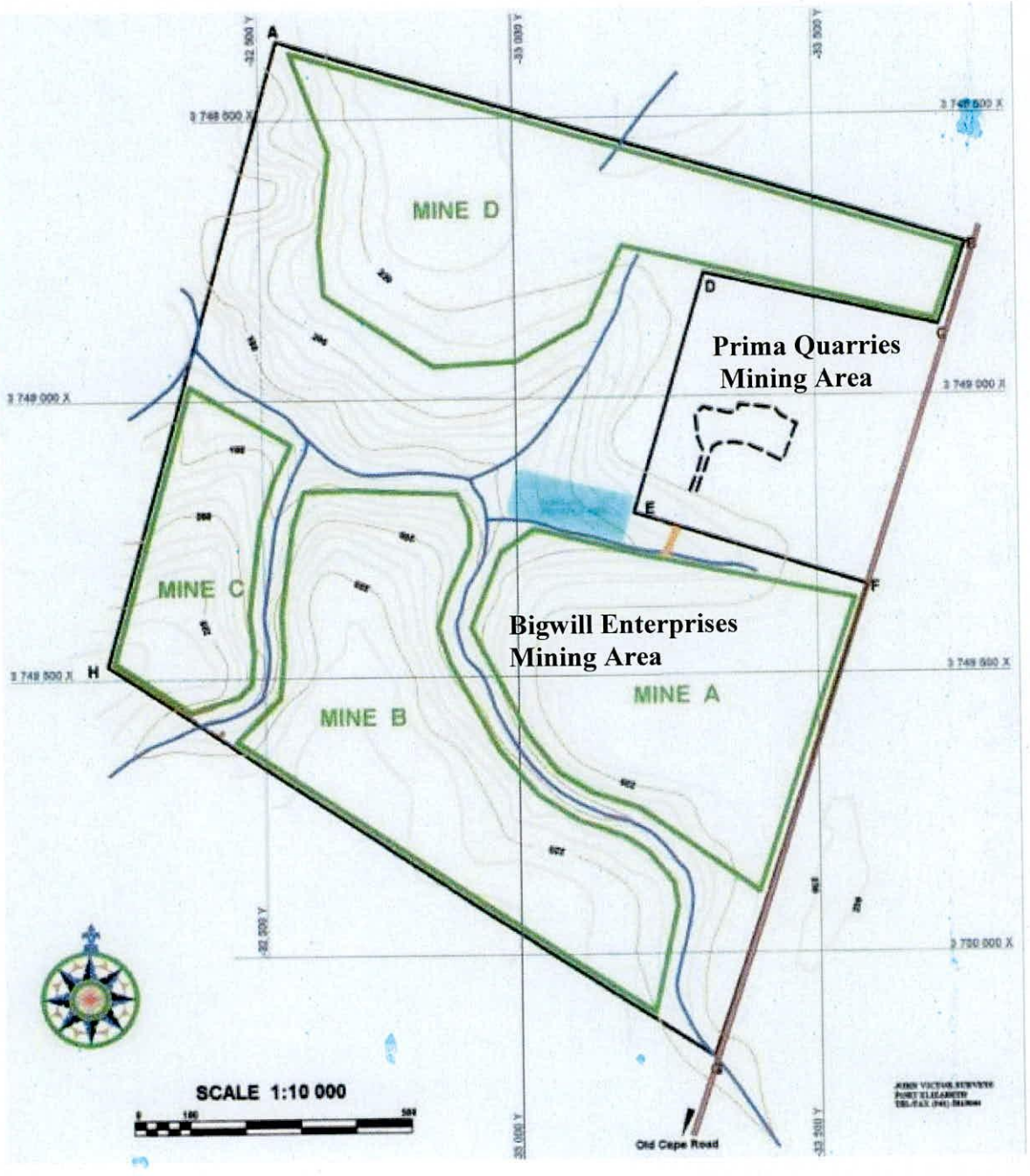
The proposed mine area is situated in the Brak River catchment, approximately 11 km north-west of the eastern edge of Port Elizabeth (the closest suburb being Rowallan Park) and 12 km west of Uitenhage. Surrounding land hosts a number of smallholdings and small farms. The active mine areas will extend to the property boundary, but the required buffer zone will be retained taking into consideration the final depth of the mine. The farm Rietkuil 397 to the north-east has no farmstead; only a disused vehicle test track. Brakwater Flats 410 ±1.2km to the southwest disposes of a farmstead and air strip whilst the Remainder of farm Rietkuil to the north represents vacant land.



MINE AREA

Aggregate, stone and gravel will be extracted in four areas on most of portion 7 of the farm Rietkuil 396, Uitenhage. The mine area hosts competent rock outcrops, but these are dissected by three watercourses, which will be excluded from mining activities since they drain areas outside the mining areas and feed into the Brak River system, which is depended on runoff from this upper catchment area. The mine area has been divided in four quarry areas depicted as Quarries A, B, C & D on the mine plan.

The extent of the mining area is approximately 151.63 ha as per mine plan drawn up by John Victor Surveys.

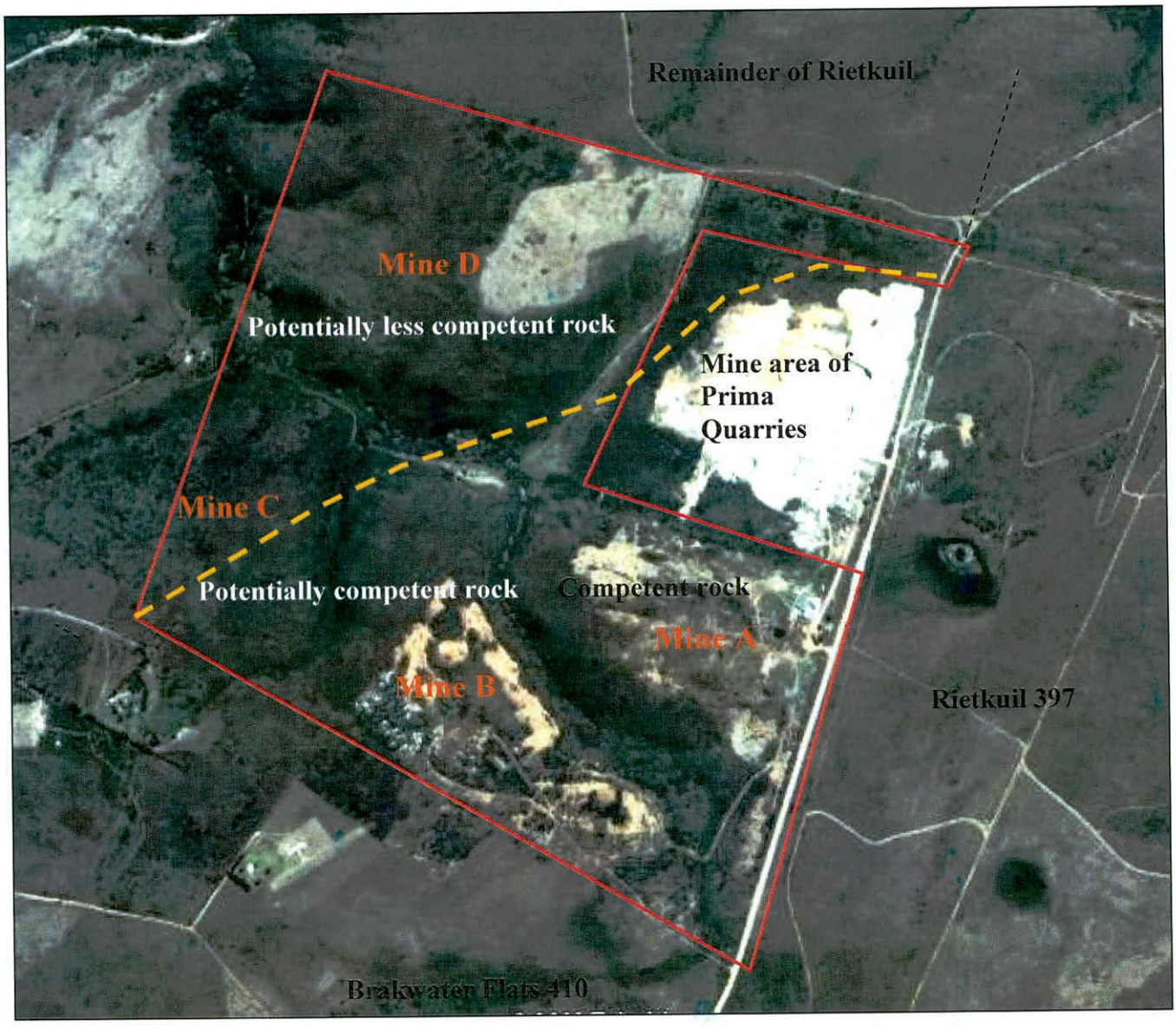


A	Y -32 576,6	X 3 748 065,4
B	Y -33 817,4	X 3 748 436,1
C	Y -33 767,4	X 3 749 583,1
D	Y -33 343,4	X 3 748 485,6
E	Y -33 212,4	X 3 748 914,1
F	Y -33 633,4	X 3 749 047,1
G	Y -33 347,1	X 3 749 897,0
H	Y -32 260,5	X 3 749 181,6

AREA 151,63 HA

CO-ORDINATE SYSTEM WGS 84
EAST 25°

CO-ORDINATES CONVARTED TO WGS 84 FROM PROPERTY CO-ORDINATES OF THE FARM RIETKUIL396/7



QUARRY AREAS & AVAILABLE MINERAL RESOURCES

Quarry A

Quarry A area has been cleared of red gravel during previous illegal mining conducted by the landowner and therefore disposes only of quartzitic sandstone.

Quarry B

Quarry B area has been cleared of red gravel during previous mining conducted by the landowner and therefore disposes only of quartzitic sandstone.

Quarry C

Quarry C area disposes of a red gravel surface layer and subsurface quartzitic sandstone.

Quarry D

Quarry D area disposes of a red gravel surface layer and most probably subsurface shale/mudstone.

Mined rock will be beneficiated to a wide range of aggregate and concrete products.

THE EXTENT OF MINABLE QUARTZITE RESERVES IS:

Quarry A = 26,8 ha
Quarry B = 29,6 ha
Quarry C = 10,5 ha

THE EXTENT OF MINABLE RED GRAVEL IS:

Quarry D = 30,6 ha

TIMEFRAMES APPLICABLE TO EACH MINING PHASE TAKING INTO CONSIDERATION ANTICIPATED SALES.

QUARRY A		QUARRY B			QUARRY C
Phase 1	Phase 2	Phase 1	Phase 2	Phase 3	Total area
Approximate time frames					
2010-2030	2031- 2048	2049 - 2063	2064 -2076	2077 - 2088	2089 - 2100
Red Gravel reserves (cubic meters)					
Phase 1		Phase 2		Phase 3	
Approximate time frames					
2010 -2014		2015 - 218		218 - 2020	

MINERAL DISTRIBUTION

Mineral to be mined is well sorted in that the top of the geological strata, except for Quarries A & B disposes of red gravel that will be removed and sold during the first phase of mining in each relevant area. Once the red gravel has been removed, a layer of weathered sandstone is removed, crushed and stockpiled and used as sub-base material or for filling material. Below the weathered material, solid quartzitic sandstone is found and is removed through blasting.

Quarry D disposes of a very subordinate sandstone deposit.

In the drainage line areas all red gravel and most of the quartzitic sandstone have been removed through historic water erosion and therefore no mining activities will be conducted within these areas.

MINERAL CONTENT

Sandstone

The sandstone to be mined consists of white, resistant, medium- to coarse-grained quartzose sandstone which is commonly quartzitic which indicates that the stone was historically subject to extreme thermal activities or pressure. Shale is very subordinate and may occur as thin bands within the sandstone. The upper and lower contacts are usually transitional.
The red gravel layer consists of sandstone that is much coarser grained and gritty forming a matrix-supported, small-pebble conglomerate. Some of the sand-clayey subsoil has percolated into this conglomerate and providing material with higher pH and plasticity.

The underlying shale deposit in Quarry D will be mostly clay based with subordinate sandstone.

MINING TECHNIQUE

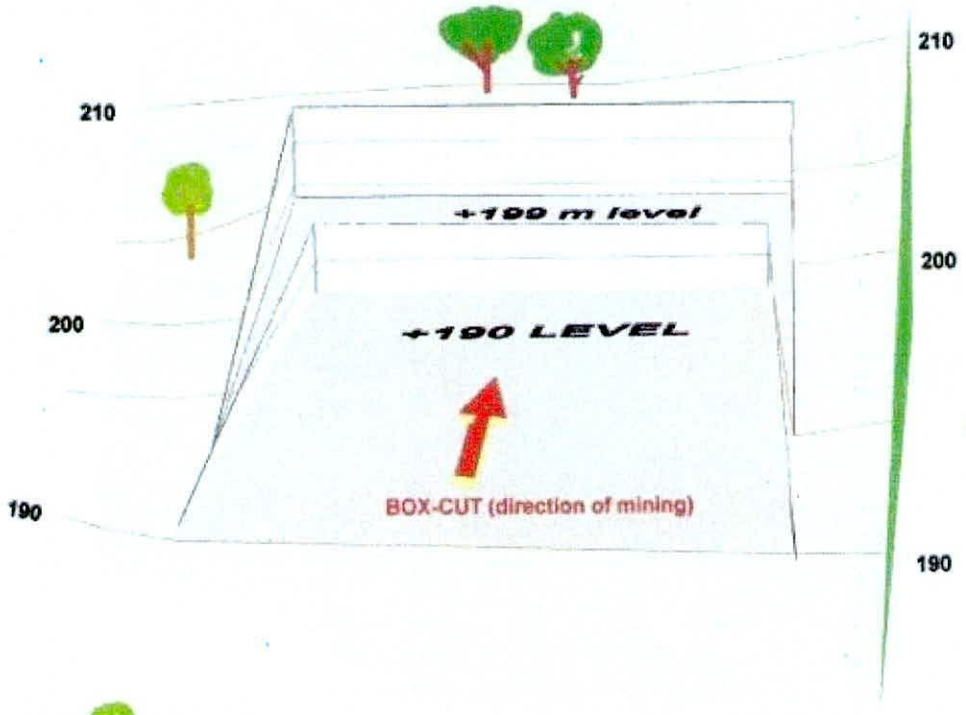
The identified production area will be drilled to a depth of approximately 9m, depending on the benches to be established, blasted and the shot rock loaded by excavator on dumper trucks, which in turn offloads the shot rock in the holding bin of the primary jaw crusher. From the primary crusher partially crushed rock is passed over a screen to remove crusher dust (<6mm) and then fed consecutively into secondary Gyrodisc crusher, tertiary Gyrodisc crusher and finally a Barmak for shaping when required. The crushed material is then screened and separated into aggregate fractions such as 6,7mm, 9,5mm, 13,2mm, 18mm, 37,5m, and crusher grid. During periods of high demand, a mobile crushing unit will be used inside the pit to produce similar quarry products once adequate floor space has been achieved or alternatively the mobile crusher will be positioned at the existing Prima Quarries stockpiling area.

Quarry products will then be transported to stockpiles, located either in the new stockpile area to be established or in the existing Prima Quarries stockpiling area from where it will be distributed with five 5 -10 cubic meter trucks to local markets. In periods of high demand a contractor (Stu Davidson) will be used to assist with production and delivering quarry products to offset points. In certain cases clientele will transport their own material.

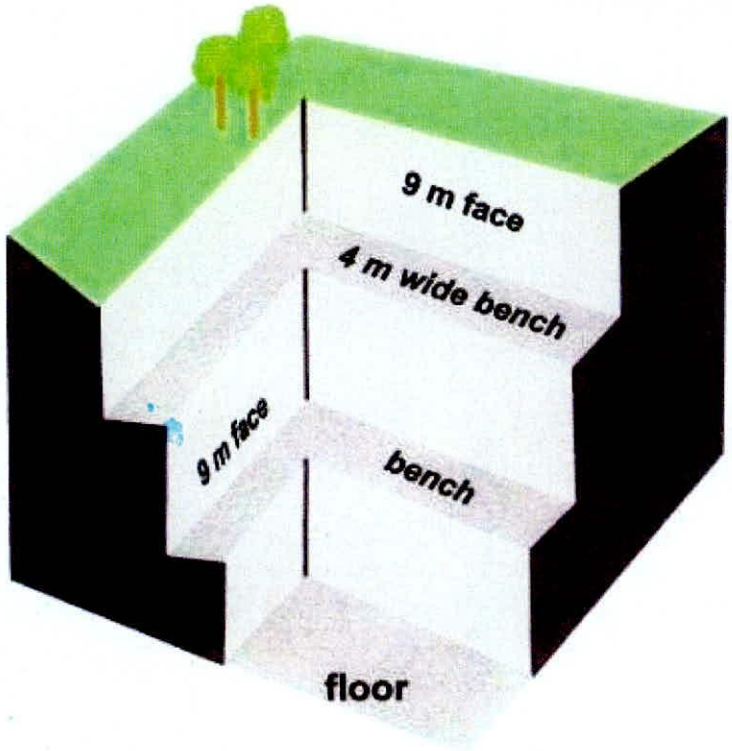
Red gravel will be extracted by means of typical slot mining where material is removed with an excavator to a depth of two meters and loaded onto 10-20cubic meter trucks and directly carted to identified markets.

The above mine procedures are pretty standard in the crushed rock aggregates industry and no major changes are envisaged for the immediate future. All available topsoil and some of the overburden will be stockpiled and earmarked for use in post-quarrying rehabilitation.

Mine Development



INITIAL BOX-CUT



DIAMETRIC 3-D VIEW OF PROPOSED MINING OF FACES AND BENCHES

MINING WILL COMMENCE WITH A BOX-CUT AT THE 190 M CONTOUR ABOVE MSL.

THIS BOX-CUT WILL BE EXTENDED TO PROVIDE THE NECESSARY NUMBER OF WORKING FACES TO SUPPLY DEMAND

FACE HEIGHTS WILL BE IN THE REGION OF 9 METERS IN HEIGHT WITH HORIZONTAL BENCHES OF 4 m WIDE.

5 Prospecting

DEPTH OF PROPOSED MINE

Gravel that derived from the Skurweberg Formation is approximately 1-2m thick and is removed and sold prior to engaging into rock extraction. The material is applied as road construction material and as filling material.

Underlying overburden of weathered sandstone has an average depth of 2-4m and will be crushed and used as sub-base and filling material.

Solid quartzitic rock has a depth up to 400m, but at approximately 45m the deposit is seemingly interrupted by a shale band, which is evident at the abutting Prima Quarries.

Drilling results obtained from previous mine owner for Quarry A revealed very good, solid sandstone up to a depth of 30m, but varies slightly from borehole to borehole. Dampness was observed at lower levels along the drainage lines but no aquifer was intersected, which concurs with the scenario at the Prima Quarries. No data is available for Quarries B, C & D and these areas will be drilled as part of the mining operation. The drilling programme that will be followed and that was submitted as part of the prospecting application is appended for review. The depth of quartzitic sandstone at mine B and part of Quarry C should be similar to the depth at the Prima Quarries mining area and Quarry A, since it forms part of the very same geological formation and outcrop. According to the geological map consulted, Quarry D and northern part of Quarry C will not dispose of good quality sandstone and it is almost certain that only the red gravel will be removed. This assumption will be tested during the prospecting phase and if required, the mining work programme will be amended.

PROSPECTING

Drilling Results

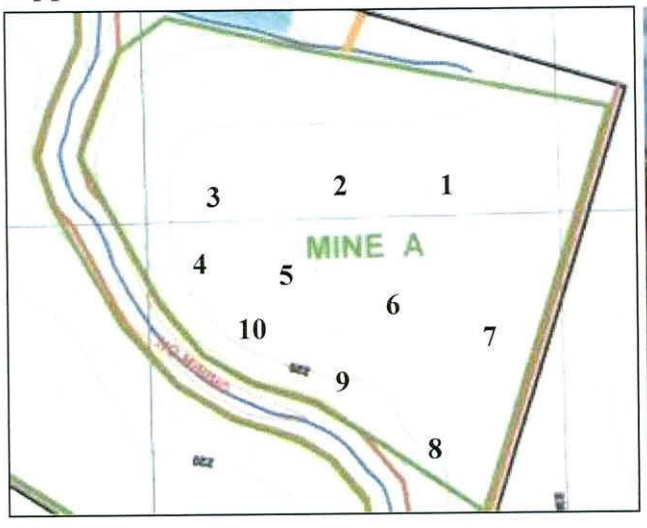
Existing borehole statistics for Quarry area A

Borehole	Weathered Sandstone	Shale/Brecciate zones	Competent rock	Groundwater
1	3,5m	12,1m-12,5	3,5-30m	-
2	3,1m	12,2m-12,5	3,1-30m	-
3	2,5m	12,1m-12,4	2,5-30m	Dampness observed
4	2,3m	12,3m-12,5	2,3-30m	Dampness observed
5	3,6m	12,4m-12,6	3,6-30m	-
6	3,6m	12,4m-12,7	3,6-30m	-
7	3,8m	12,5m-12,8	3,8-30m	-
8	3,4m	-	3,4-30m	Dampness observed
9	3m	-	3-30m	Dampness observed
10	2,8	-	2,8-30m	-

Prima Quarries

Mining at the abutting Prima Quarries concern has been ongoing for at least 25 years and produces competent rock and aggregate that is used in all sectors of the construction industry. The pictorial record provided reveals competent rock up to 40m. This very same scenario is expected at Quarries A & B, since it is part of the same outcrop and located within the same geological formation.

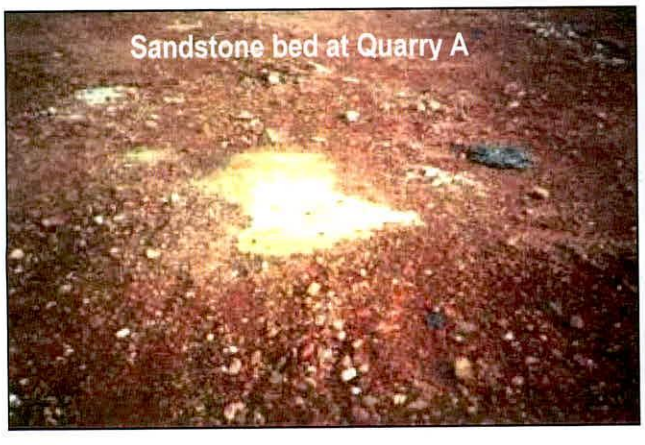
Approximate locality of boreholes

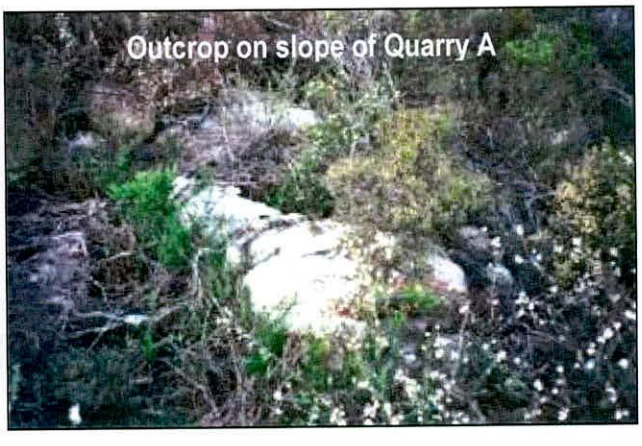


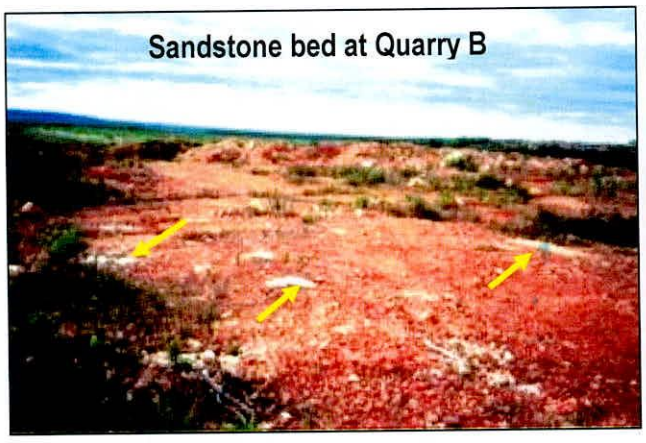
Prima Quarry

Bigwill Enterprises Quarry area

Field investigations revealed that the bulk of the red gravel was removed from Quarries A & B and exposed sandstone beds in both areas. Sandstone outcrops are also prevalent on the slopes of these areas, as well as in parts of Quarry C.







6 Appropriate Procedure To Plan & Develop The Proposed Mining Concern

The layout of the proposed mining infrastructure as well as the mining method that was chosen determined by a number of factors namely:

1. The depletion of the mineral reserves on the northern side of the Prima Quarry, which require southward extension of the pit to mine out the last sandstone reserves.
2. Southward extension of the mine area requires the relocation of some of the Prima Quarry buildings and the entire crushing plant.
3. Current box-cut mining at the Prima Quarry result in an extremely expensive mining operation since material has to be hauled out of the pit of approximately 40m deep resulting in an enormous fuel bill. This scenario was to be avoided at the Bigwill mining operation.
4. A box cut mine is very expensive to profile and rehabilitate and is in most cases not extremely successful due to the slopes involved. In this case it is even less desirable since the previous landowner has removed most of the topsoil of Quarry A & B. This scenario must be avoided at the Bigwill mine, especially since it will eventually consist of three quarry areas.
5. Considering that three quarries will be developed, it will result in a severe visual 7 aesthetic impact if a box-cut development strategy is followed. Taking into account that the site is located at the head of a very scenic valley, this environmental impact must be avoided.
6. The crushing plant cannot be moved to the current stockpile area since it will cause eventually to run out of stockpile area.
7. The crushing plant must be as close as possible to all three excavations to avoid unnecessary hauling costs which, due to the high fuel price, are currently the biggest contributor to aggregate production costs.

8. The location of the crushing plant must be close to all three hard rock quarry areas and cannot be relocated again due to the enormous cost involved to relocate a stationary plant.
9. A block yard, Ready-Mix plant and Asphalt plant needs to be established in the mine area, but as far as possible away from the drainage lines. Due to the topographical outlay caused by the watercourses onsite, the most appropriate place would be on the eastern side of Quarry A.
10. If nr. 7 is the only viable option, then the plant needs to be established in the middle of Quarry A area, which will cause it to be relocated when the reserves beneath it is required. However, the plant cannot be established ahead of the production faces to safety and financial risk reasons.
11. The Quarry A area is also flat and will require the applicant to build a number of platforms to ensure that the movement of aggregate is down a gradient.
12. The only workable situation is to relocate the existing plant to the slope immediately north of the toe of Quarry A. It has the following benefits:
    a. From there, all three hard rock mining areas can be accessed.
    b. The plant can be established on terraces that can be easily cut into the hillside and need never to be relocated.
    c. The plant is out of the way of the direction of future blasts.
    d. Stockpile areas of the current Prima Quarry can be utilised.
    e. The plant will be located in the valley, which will extensively reduce the impact of wind on dust generation.
    f. The plant will be on the same level as the quarry areas, which will reduce hauling costs
    g. The development strategy will result in the hill areas to be cut away leaving only one high production face on the eastern and southern ends of Quarry A, B & C respectively.
    h. The above strategy will result in a flat quarry floor that will be very amenable to rehabilitation strategies, which will favour the closure process and rehabilitation success.

DEVELOPMENT STRATEGY

Construction phase

The construction phase will entail:

1. The development of the first cut on the north-western slope of Quarry A to develop the first production face.
2. Establishing a new crushing plant and stockpile area and above it a platform for tipping material in the primary crusher holding bin. This will require that the head of a dry watercourse be partially filled in to create adequate space for the plant and additional stockpile areas.
3. Installation of a power point and water reticulation system.
4. Relocation of the crushing plant.

Development of 1st production face

A road will be cut along the base of the hill opposite to Quarry A to the north-western toe of Quarry A and will cross the stream via a culvert that will be constructed to ensure free flow of runoff to the Brak River. The first cut of approximately 50-100m wide into the hill will then be blasted to establish a proper working face. The vertical component of each bench will be 9m high. The first stage of this process will entail the stripping of the weathered upper 2-4m of the sandstone deposit and hauling it to the plant area to partially fill in the valley opposite the proposed new plant area.
Development of the Quarry A production face will be done concurrently with mining of the last reserves of the southern production face of the Prima Quarries and will take approximately 2-3 months to be completed and be completed by July 2010.

Development of new crushing plant and stockpile area

A cut will be made into the hill opposite Quarry A to establish a platform area of approximately 30-40m wide. In order to increase the width of the platform, overburden generated during the establishment of first production face will be used to partially fill in the valley, which will increase the width of the platform to approximately 60m. This material will be covered with material generated by creating the cut into the hill. Approximately 4m above the eastern section of the stockpile area a second cut will be made to create another platform to cater for dumper trucks tipping blasted rock into the primary crusher holding bin. This platform will be linked with Quarry A and the weighbridge through a 4m wide haul road as depicted on plan.

Runoff from the catchment above the platform area will be attenuated by the new silt dam that was constructed in 2008 and any overflow will be channelled around the platform area to the remaining section of the drainage channel located at the base of Quarry A.

Development of the new crushing plant and stockpile area will be done concurrently with the development of the first Quarry A production face and will take approximately 2 months to be completed by June 2010.

Installation of a power point and water reticulation system

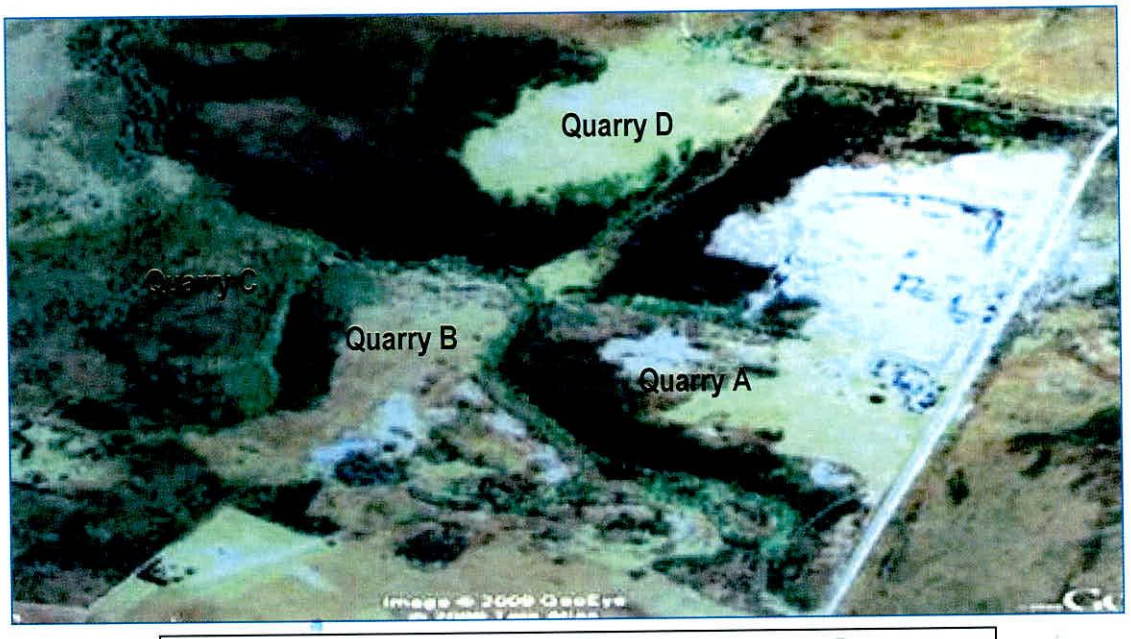
This service infrastructure is already available at the Prima Quarries' premises and just needs to be extended to the new quarry area and will be completed in August 2010, after the earthworks were completed.

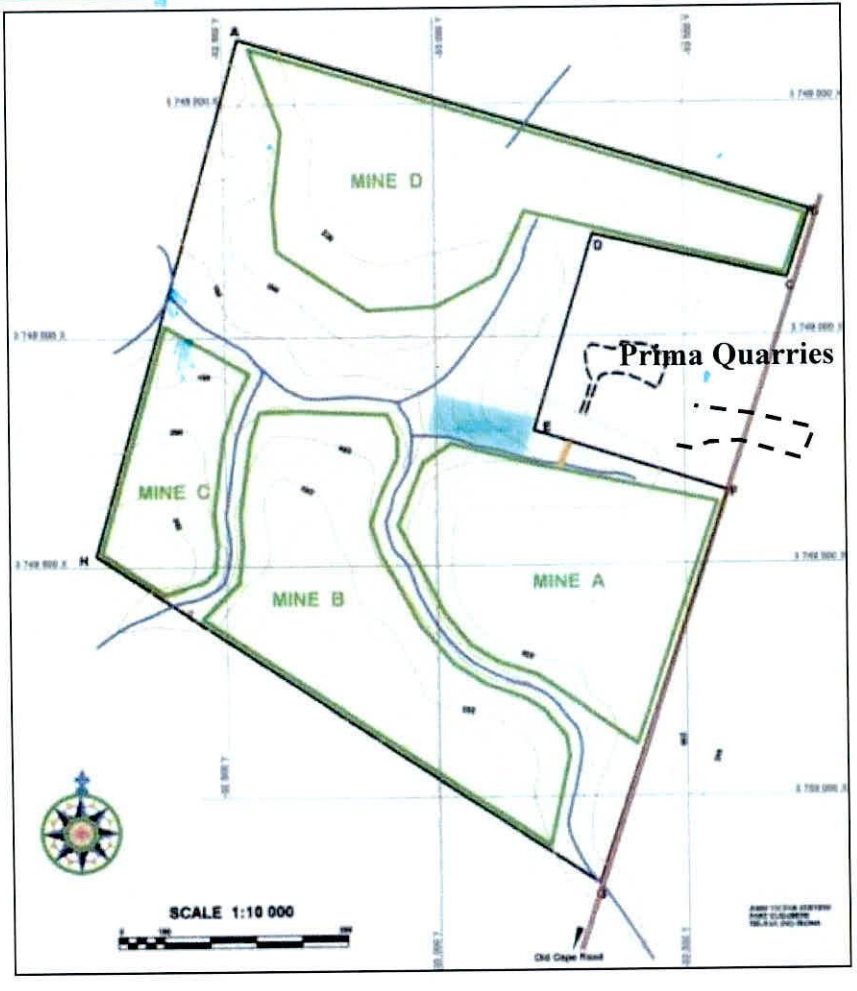
Relocation of the crushing plant

The crushing plant will be relocated at the start of August 2010 and be in operation by end October 2010.

Quarry development plan

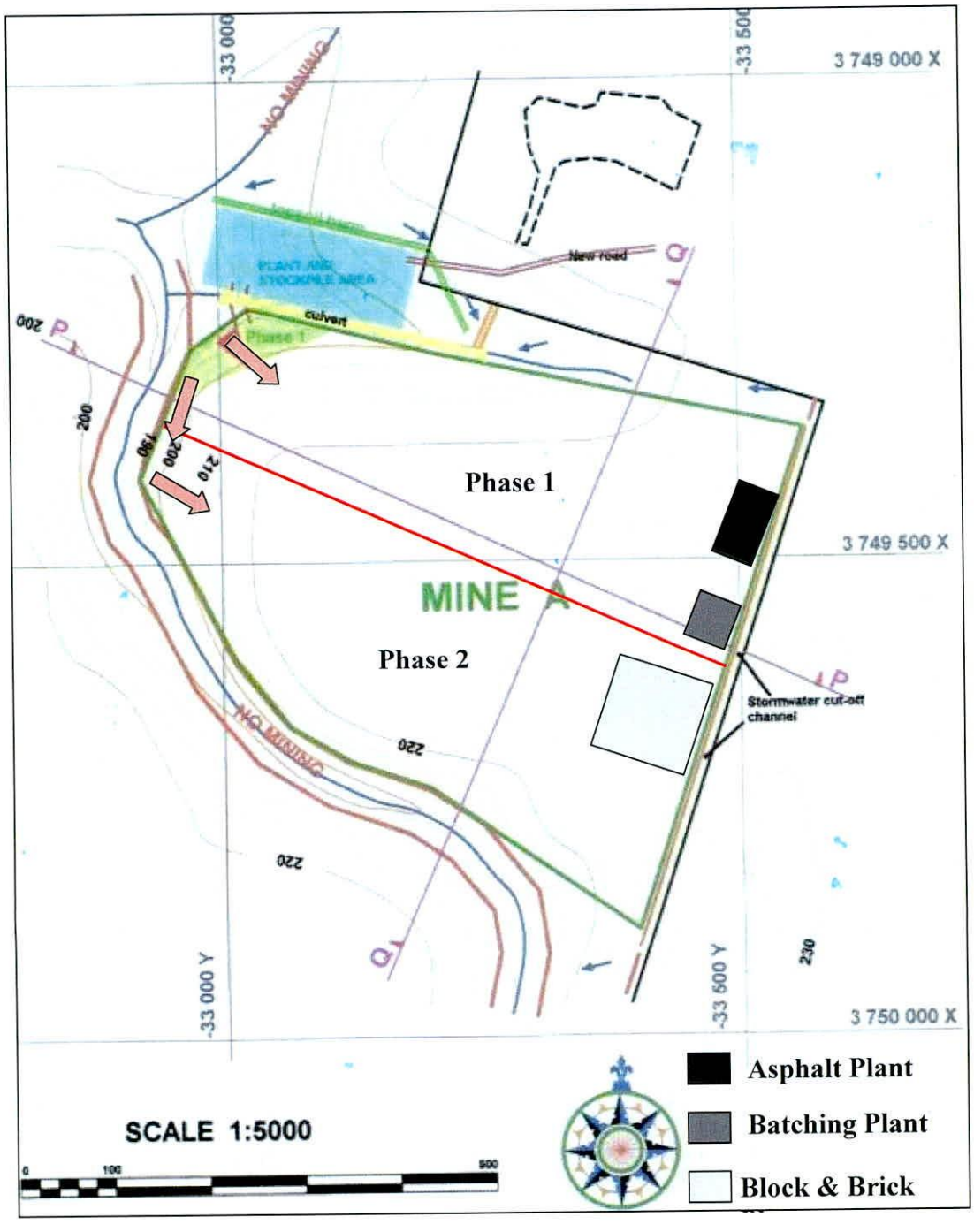
The mining area applied for will be divided in four separate quarry areas as depicted on plan due to a number of streams that cut through the mining area and in order to ensure that water quality of the Brak River is not detrimentally affected.

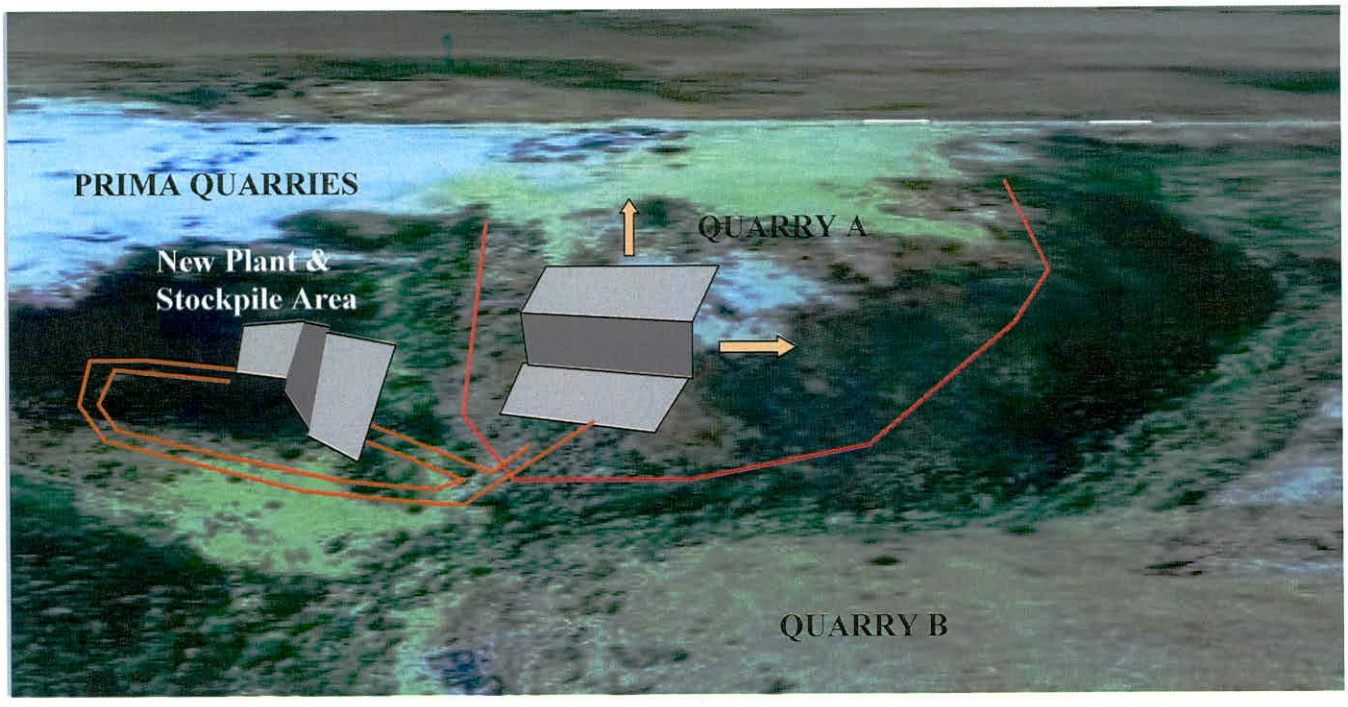




Quarry A

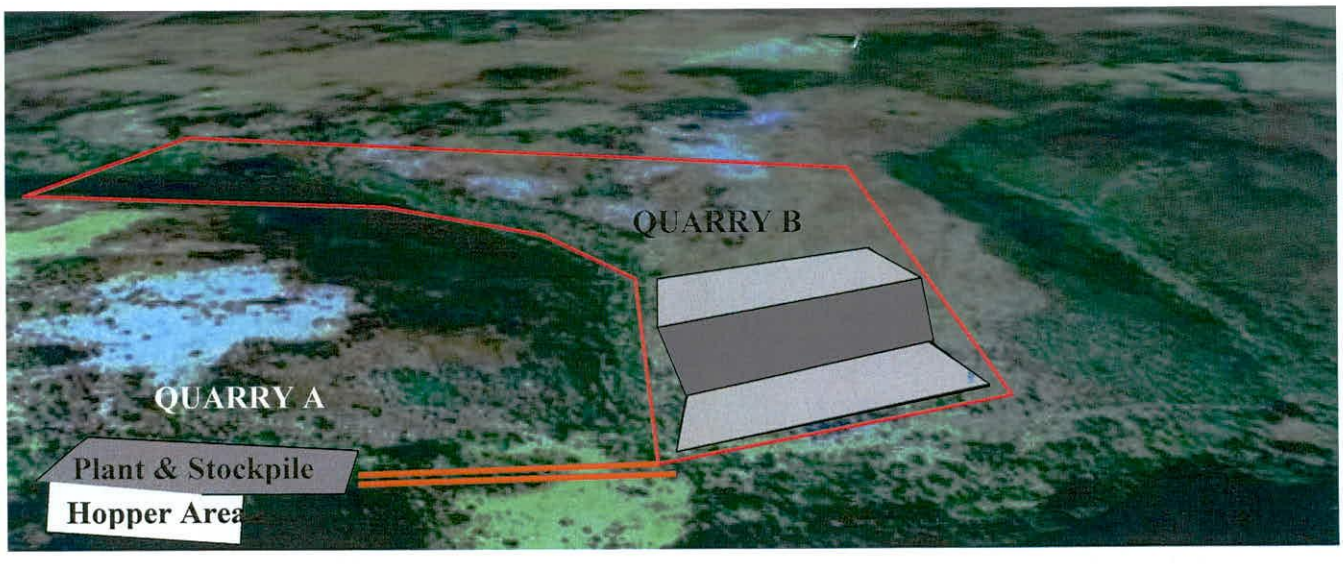
This quarry area will be developed from the west along the 105m contour in two phases as depicted on plan and each production face will be approximately 200m wide and 600m long. Depth of the quarry will vary from zero on the western end and 40m on the eastern perimeter. Benches will be 9m high and 4-8m wide and advanced alternatively. The eastern perimeter will therefore reflect 4 benches. Available rock in each phase will be approximately 3,8 million (tight) which equals approximately 4,5 million cubic meters (loose)

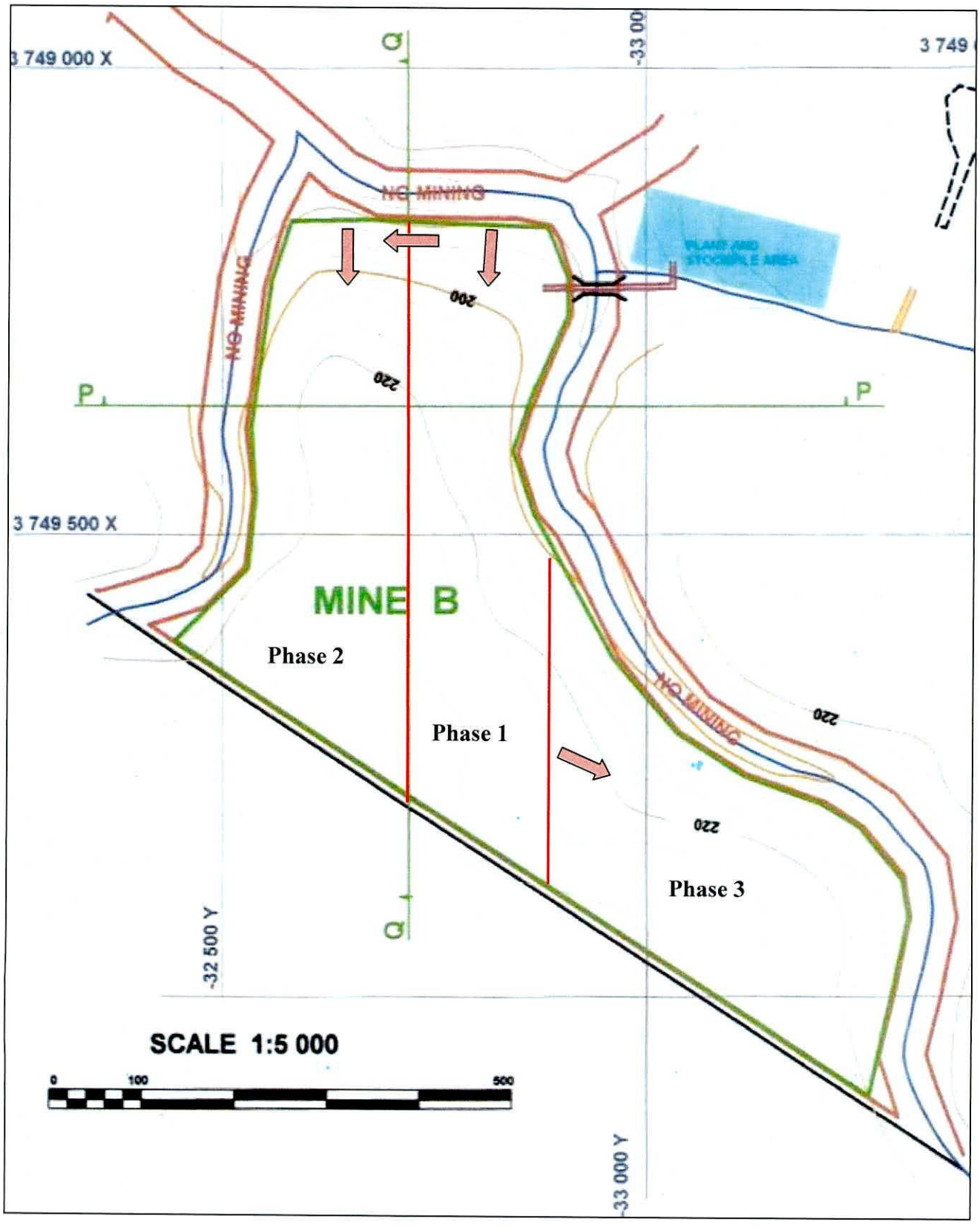




Quarry B

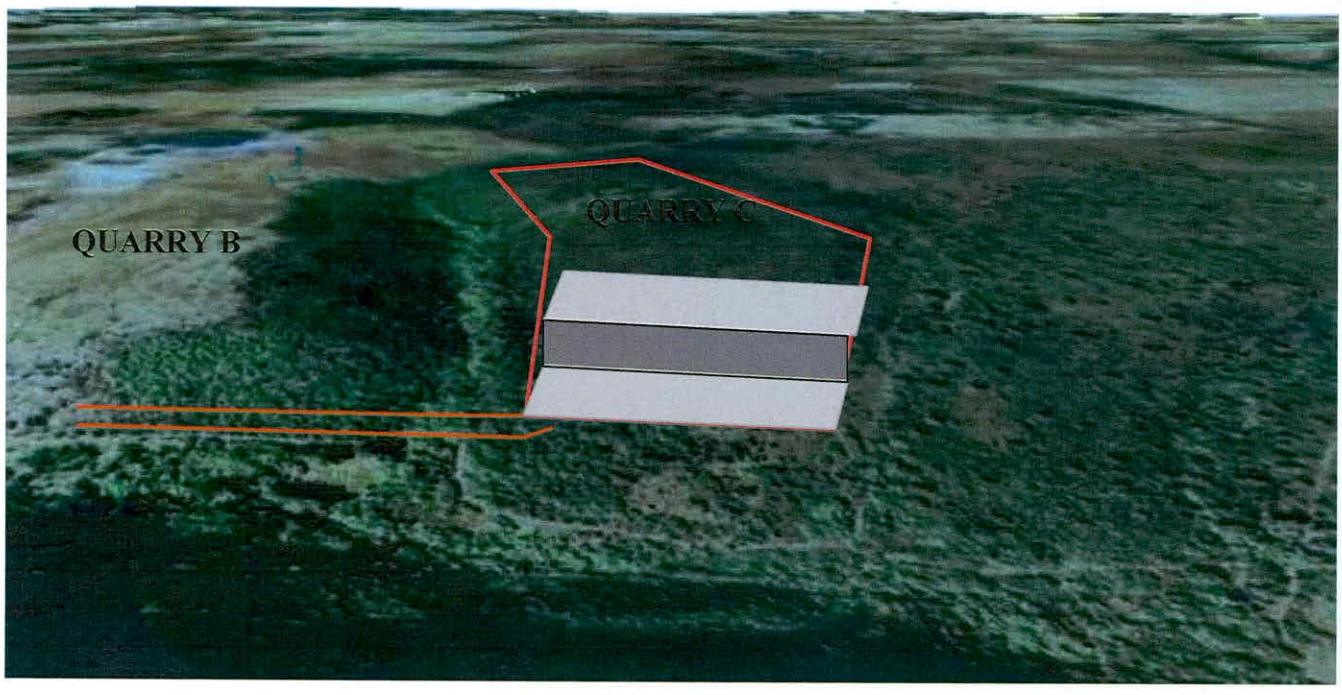
Four months before Quarry A has been worked out, a new road will be constructed to Quarry B and preparation for the first production face will commence. This quarry area will be developed from the north along the 180m contour in three phases as depicted on plan and each production face will be approximately 150m wide and 550m long. Depth of the quarry will vary from zero on the northern end and 30m on the southern perimeter. Benches will be 9m high and 4-8m wide and advanced alternatively. The southern perimeter will therefore reflect 3 benches. Available rock in each phase will be approximately 2,533 million cubic meters (tight) which equals approximately 3,3 million cubic meters (loose). Total material available (loose) = 9,8 million cubic meters.

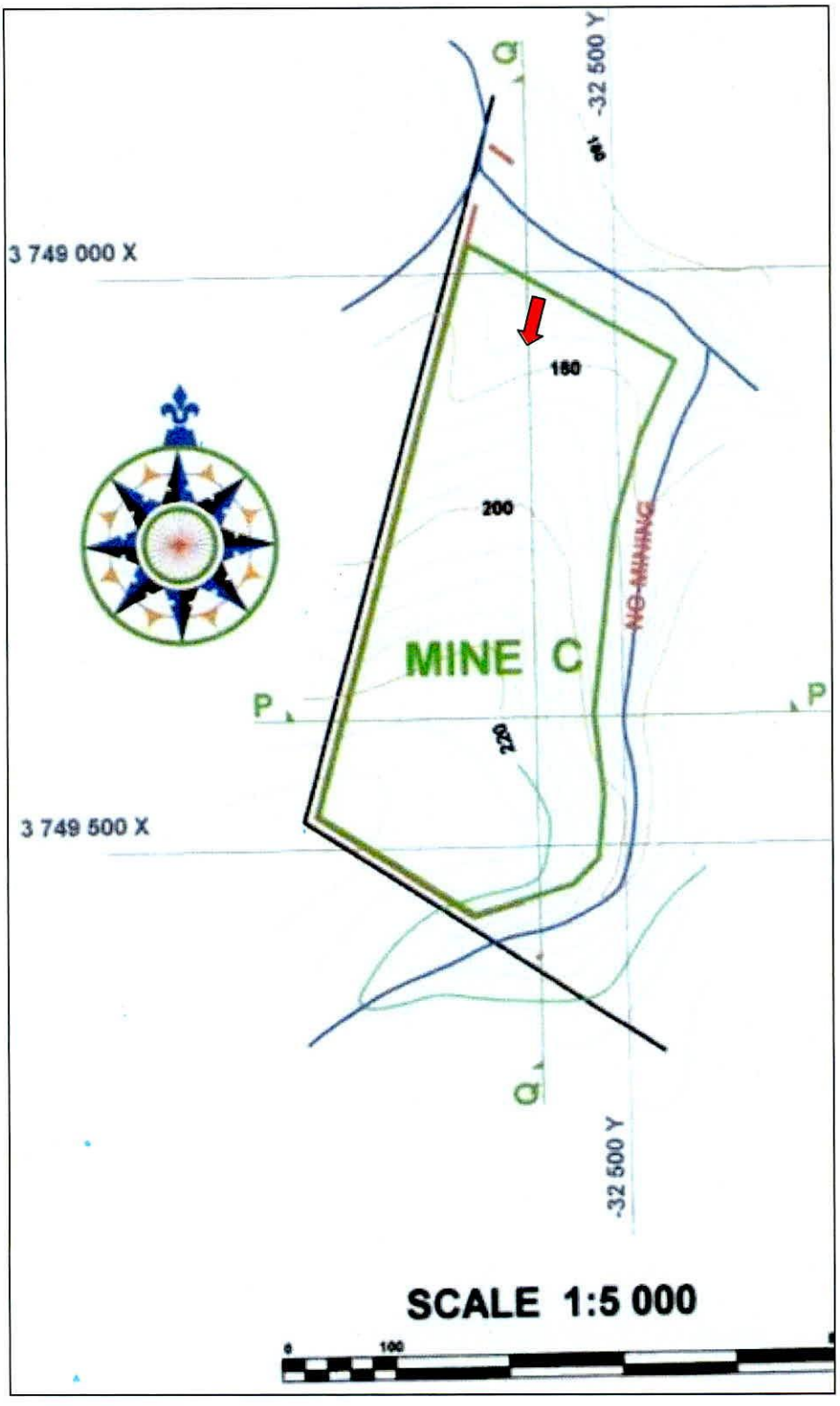




Quarry C

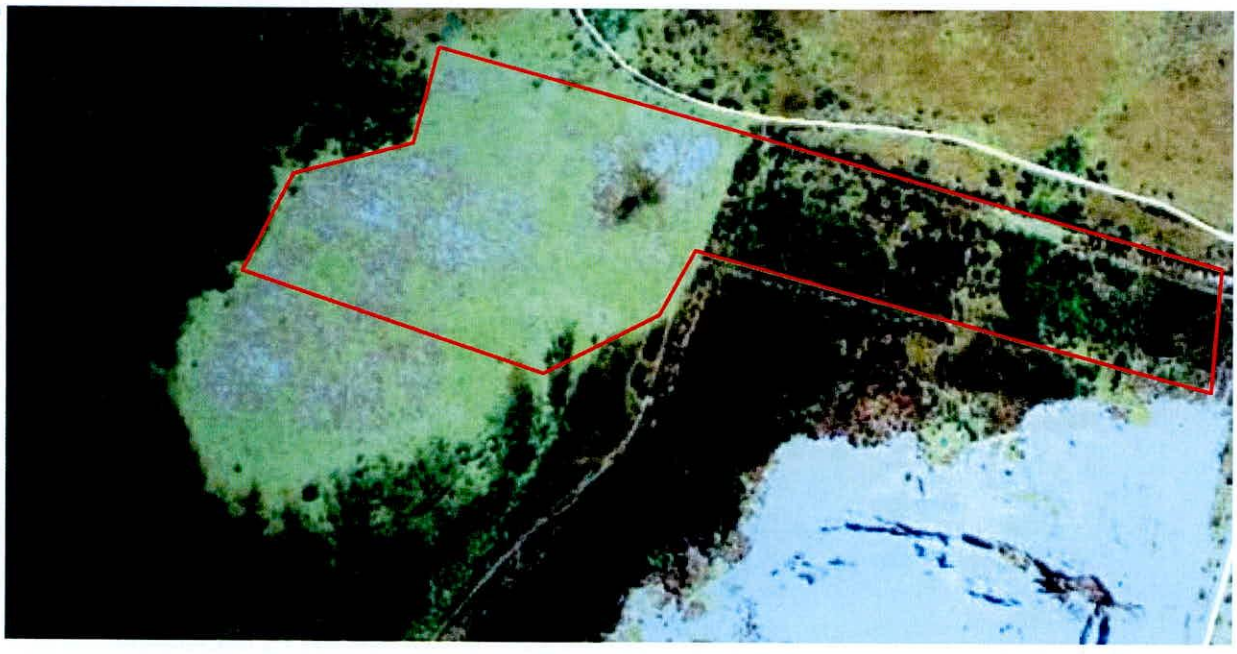
Four months before Quarry B has been worked out, a new road will be constructed to Quarry C and preparation for the first production face will commence. This quarry area will be developed from the north along the 170m contour as depicted on plan and the production face will be approximately 200m wide and 500m long. Depth of the quarry will vary from zero on the northern end and 30m on the southern perimeter. Benches will be 9m high and 4-8m wide and advanced alternatively. The southern perimeter will therefore reflect 3 benches. Available rock will be approximately 1,9 million cubic meters (tight) which equals approximately 2,47 million cubic meters (loose).

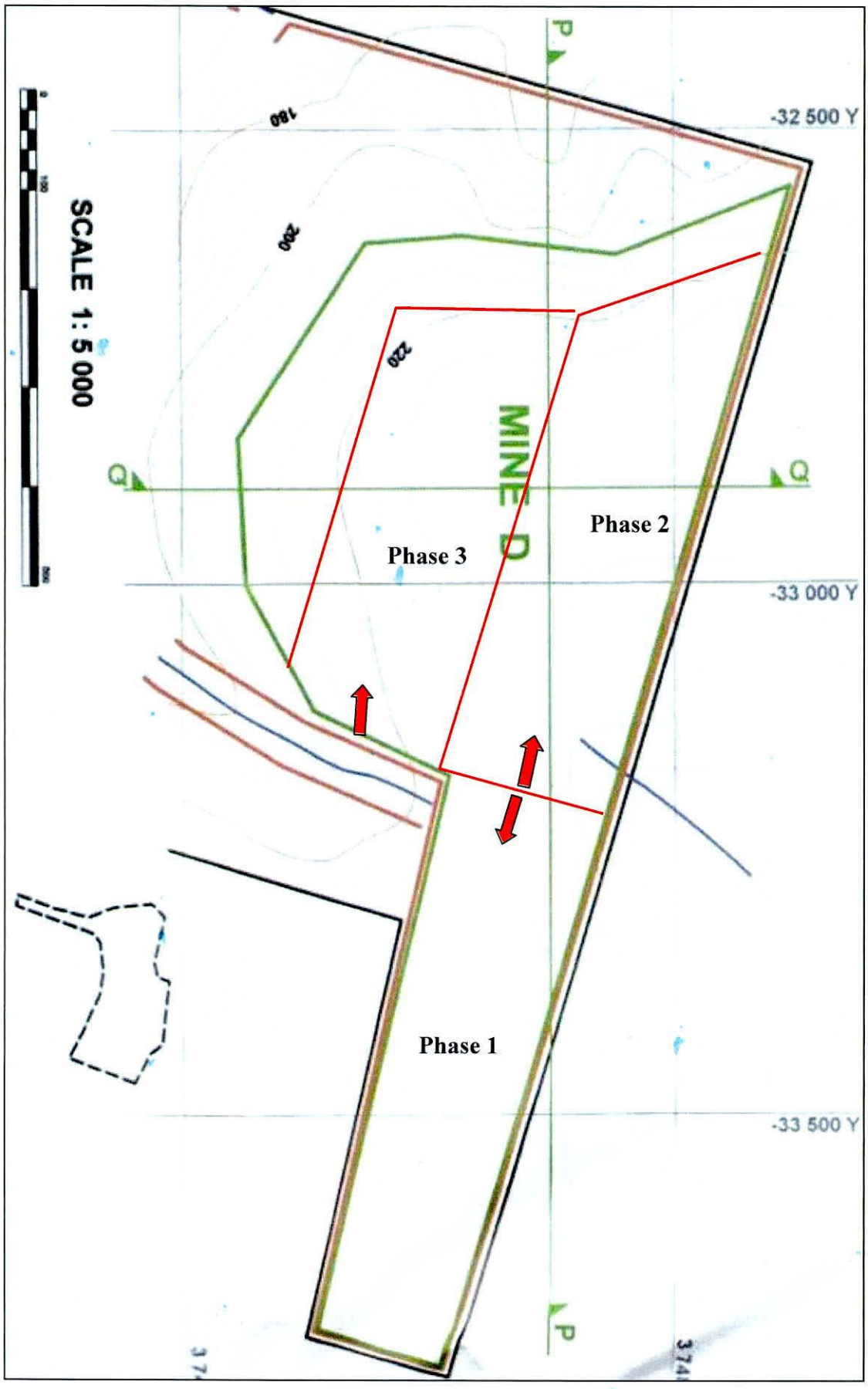




Quarry D

If prospecting reveals the area concerned disposes of quality red gravel, mining in this area will take place in tandem with the development of quarry A. This quarry area will be developed from the east in four phases as depicted on plan. Each slot will be approximately 120m wide and 500m long. Depth of the quarry will vary from 1,5-2m. Available gravel will be approximately 360000 cubic meters (tight) which equals approximately 468000 cubic meters (loose).



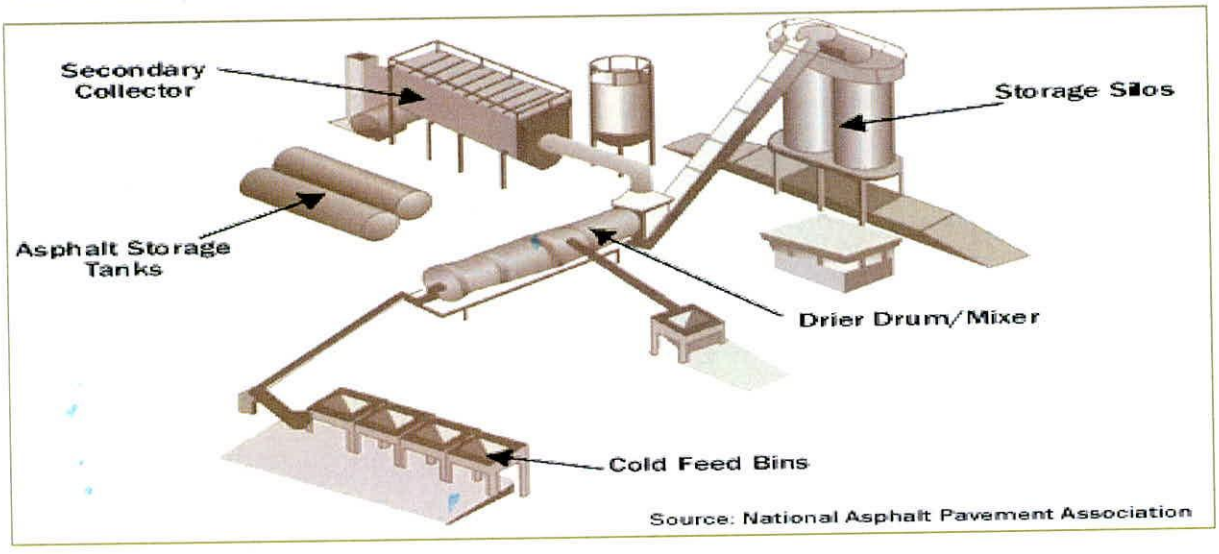


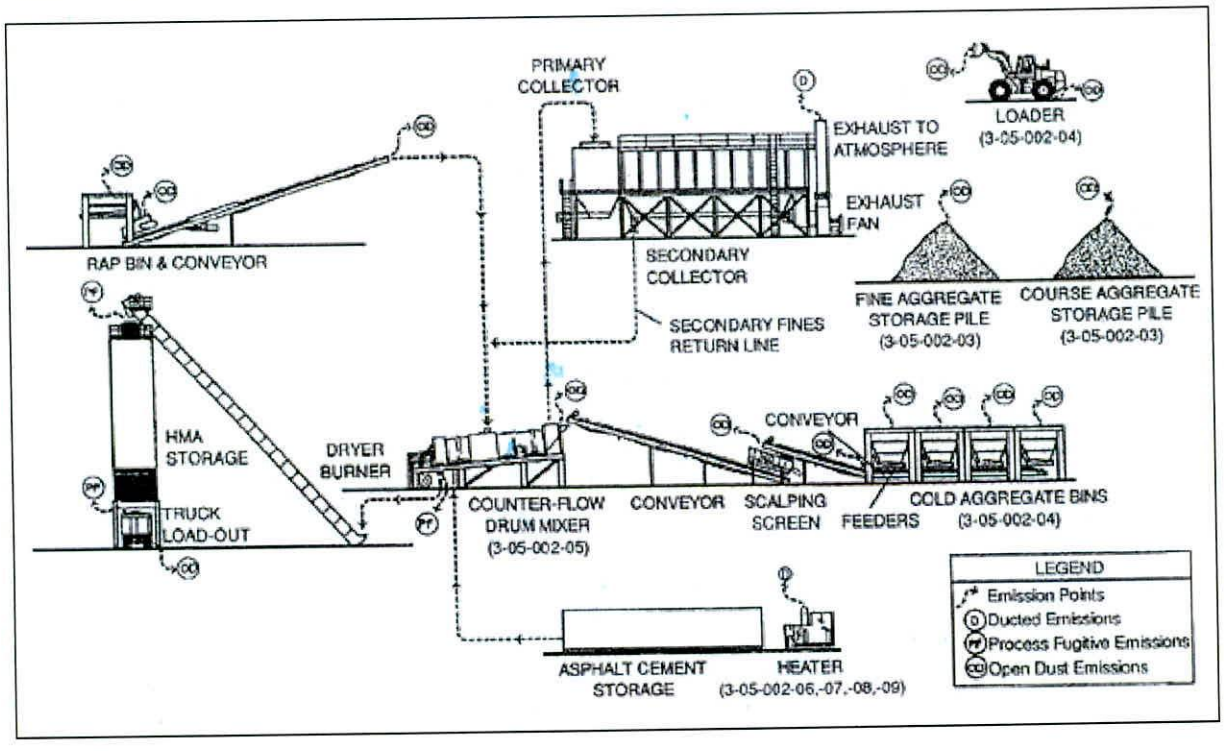
7 Proposed Mine Layout

The proposed crushed rock aggregate mining operation detailed in this Scoping Report, will require normal quarry infrastructure but some of it is already in place at the Prima Quarries site. Since the two sites will operate in tandem some of the existing infrastructure will remain in their current position for the duration of the Bigwill Enterprise 10 mining operation. The following mining infrastructure will be required:

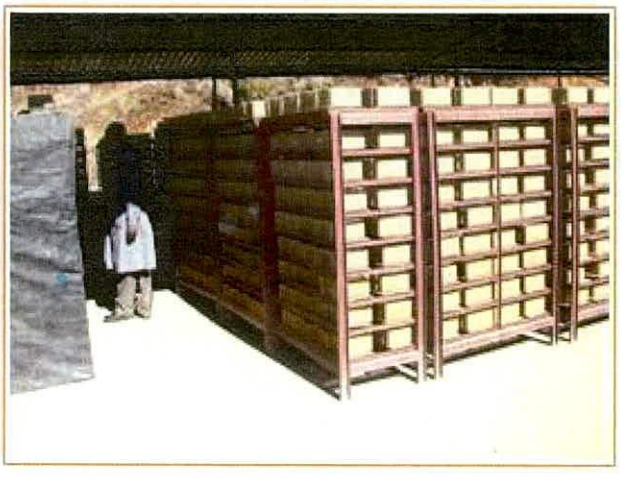
- Administration Office – Newly built complex at Prima Quarries will be used
- Workshop - Existing complex at Prima Quarries will be used
- Weighbridge and Control Office - Newly constructed facility at Prima Quarries will be used
- Primary and secondary crushers – Existing plant will be used but relocated to the valley area below the Prima Quarries stockpile area
- Equipment (tipper trucks, excavators, loaders, drilling rigs etc) - Existing equipment will be used and parked at the Prima Quarries premises
- Diesel tanks & used hydrocarbon facilities - Existing facilities at the Prima Quarries premises will be used
- Water tanks – New elevated tanks will be established at the new plant and stockpile area.
- Stockpile yards – Additional stockpile area will be established west of the new plant area since current stockpile area is too small during periods of high demand.
- Waste facilities - Existing facilities at Prima Quarries premises will be used as final deposition point. Facilities will however be extended to the new plant area to ensure that the environment is kept clean
- Salvage yard - Existing facility at Prima Quarries will be used.
- Storm water control dams – A new dam was recently constructed on the Prima Quarries site above the new plant area. Additional dams with associated diversion berms will be constructed below the new plant and stockpile area and below the various quarry areas to ensure that drainage lines are not affected. Cut-off berms will be constructed ahead of the new plant and stockpile area.
- In order to improve Scribante Holdings' ability to improve sales in general and to strengthen the company's ability to tender for road construction work as well as other construction activities that involves the use of Asphalt products, it is anticipated to establish an Asphalt plant in the northern corner of Quarry A. In order to formulate an understanding of the processes and infrastructure involved at an Asphalt plant the necessary pictorial record is provided below.

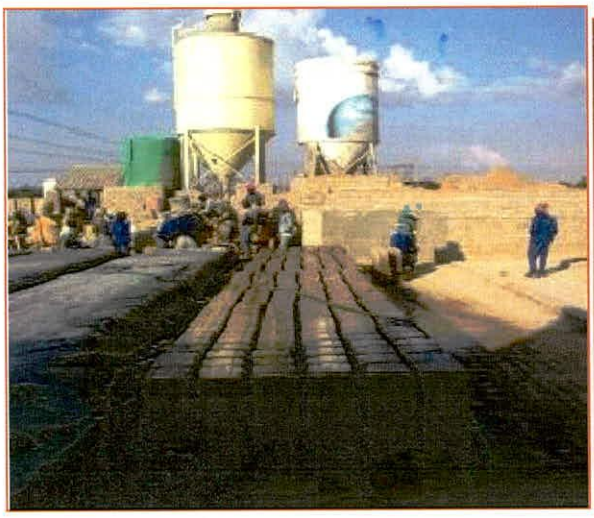
Typical outlay of an Asphalt plant





- The housing sector is increasingly making use of cement bricks since they 1) are increasing in strength over time and 2) bonding between cement bricks and plaster is significantly better and therefore provide for stronger buildings. In addition, cement blocks are also being used instead of clay bricks since blocks are much bigger and reduce construction time and thus labour costs. It has a further advantage in that excess crusher grit is used in the manufacturing process, which will cause to reduce environmental costs with regards to dust suppression and extent of impacted area that needs to be rehabilitated. In order to formulate an understanding of the processes and infrastructure involved at a cement brick yard the necessary pictorial record is provided below.

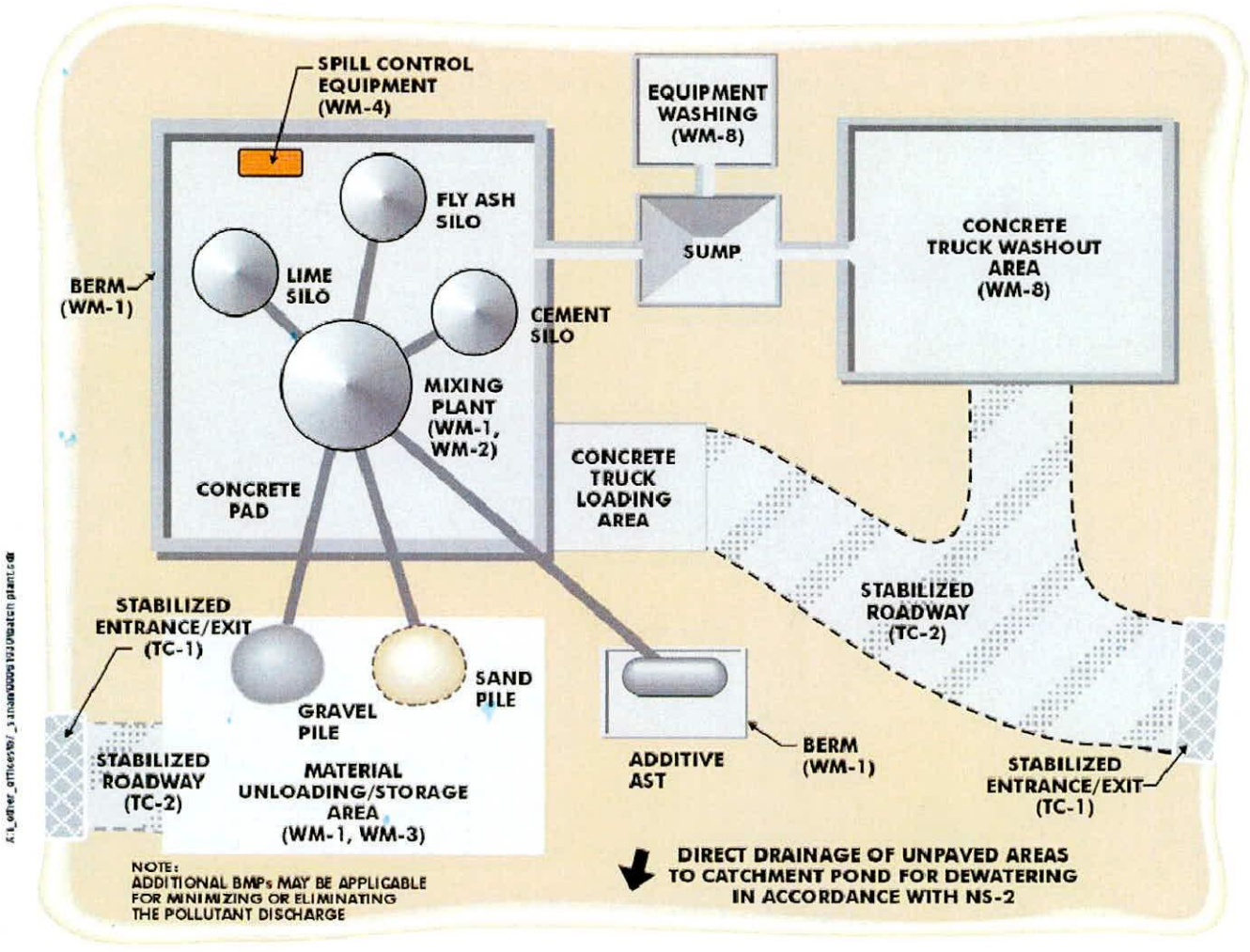




- To complete the range of quarry products that will be provided onsite an automated material batching plant will be established on the eastern side of Quarry A. Typical outlays are provided below.

Small batching plant

Medium size batching plant



8 Public Participation Process

Press Advertising

Since the Public Participation Process would have taken place over the December period, it was decided that the placement of a press notice in the legal section of the Herald, will be postponed till the first week in January 2010. Should any comments on the advert be received, it will be submitted to the DME and captured in a final scoping report to be submitted to the DMR not later than 29 January 2010. Any concerns raised will be addressed in the EIA & EMP.

Consultation of Abutting Landowners

An application for a prospecting right was submitted in March 2009 on the same footprint and was subsequently executed in December 2009.

There is only a limited number of farm/small holding residents in the area with only six residents in the immediate surrounds of the prospecting area and are located to the south, west and north-west. The associated public participation phase entailed the following procedure:

- Prior to the submission of the prospecting application, the applicant engaged with the property owner regarding the sale of the land for quarry purposes but no agreement could be reached and the application was then lodged with the DME. The property owner was consulted in writing on the matter and was provided a copy of the prospecting work programme. A meeting were also held with him in the presence of his lawyer and the application and process to be followed, was outlined to him. He was again given the opportunity to sell the land concerned at a reasonable market related price, but was interested in a higher figure, which the applicant could not afford. No written comments were received from the landowner.
- All abutting landowners were consulted in writing and all acknowledged receipt of the consultation letter. It was indicated that the prospecting work programme was available for perusal on request. No comments/objections were received on the project.
- The prospecting EMP was submitted to all Government Departments and the NMBM for comment but no concerns were raised.

It can therefore be fairly assumed that all interested & affected parties are conversant with the potential establishing of a mine within the prospecting footprint.

Since the initial prospecting consultation phase was concluded, follow up meetings resolved in an agreement with the landowner on the sale price of the property and the transfer of the property is currently in process.

With regards to the mining right application, Stellenryck Environmental Solutions compiled the consultation documents, which were handed over to the applicant for hand delivery to abutting landowners. This documentation is included for easy reference. No response to these letters was received.

This scoping report will be submitted to all affected authorities and it can therefore be assumed that once the advert was posted in the Hearald, that all I&APs had been consulted on the establishment of the Bigwill Enterprises 10 mining concern. The lack of interest during the two consultation processes is interpreted as a general acceptance of quarrying activities at the Butterworth Quarry.

9 Reasonable land use or development alternatives to the proposed operation, alternative means of carrying out the proposed operation and the consequences of not proceeding with the proposed operation

CONSEQUENCES OF NOT PROCEEDING WITH THE PROPOSED OPERATION

The lack of available sandstone reserves in close proximity to Port Elizabeth and outside areas hosting protected plant communities will cause Prima Quarries to close down as it would not be able to compete with other quarry concerns if it has to relocated to potentially available areas west of the Rockland Road. This will result in the loss of approximately 60 jobs and will severely impact on the Scribante Enterprise in terms of the supply of aggregate and concrete products. It will further result in the termination of the Social & Labour Plan, which has a current value of R100 000 per annum to the NMBM and PD communities.

REASONABLE LAND USE OR DEVELOPMENT ALTERNATIVES

Other than mining the potential land use options for properties in this area are restricted to smallholdings with limited grazing and cultivation capacity, formal developments or conservation.

Agriculture

The property constitutes a very small farm and is in addition dissected by a number of watercourses that limits potential grazing and arable land area. More than 60% of the property has already been disturbed by mining with extensive loss of topsoil. Of the unaffected land, more than 30% constitute sandstone outcrop and steep gradients whilst the remaining, intact platform areas dispose of a very shallow soil horizon. The farm has therefore very limited agricultural value. It needs to be mentioned that the farm was bought by the landowner for the purpose of mining and that no agricultural activities took place on the farm since the early eighties.

Formal development

Due to the extensive rock outcrops in the study area and especially since most of the B-horizon (red gravel) has been removed, development activities will be difficult and expensive. The immediate area however still falls outside the NMBM town development plans. This option is therefore not a viable option at this stage, although it might change in future. The post mining profiles of large flat areas located close to stream environments could in future present the option to develop upmarket residential units in this area with the valleys forming part of an mutual informal conservation/game area provided that the correct mining and rehabilitation approach is enforced by authorities throughout the lifespan of the proposed quarry operation.

Residential

This option is a possibility but it is doubtful whether any person will be interested in staying on such a degraded property in terms of agricultural potential and aesthetic value. This option will not result in any financial gain. The recent selling price that was agreed on between the landowner and the applicant was extensively higher than normal property prices in this area. This is indicative thereof that the existing Prima Quarries mining operation and the mineral reserves on the remainder of the property has increased the value of the property and therefore the preferred option, taking the ecological value of the land into consideration.

Conservation

Due to the extensive degradation of the natural environment on the plateau areas, this area has no formal conservation potential as it would simply cost too much to restore the original environment. The valley areas have been much less affected by mining and have ecological value, especially from a corridor perspective. It could potentially form part of a larger conservation area if areas closer to Uitenhage are incorporated in such area. The valley areas should remain reasonably intact and the mining methodology to be adopted would ensure objective.

ALTERNATIVE MEANS OF CARRYING OUT THE PROPOSED OPERATION

Two alternatives to the proposed mining methodology is available. The first alternative is to mine the entire site including the valley areas and the second alternative is to mine Quarries A, B & C as box cut operations.

Mining of the entire area

This option will provide extensive additional reserves but will cause the watercourses to be degraded and will affect the ecology of the Brak River downstream. It will also result in the mining area getting flooded occasionally. From an environmental as well as operational perspective this alternative is not sustainable.

Develop Quarries A, B, & C as box-cut operations

This option will result in an extensive loss of sandstone reserves and would from an extraction perspective result in an unsustainable mining operation. When developing a mine, the lifespan should be as long as possible to prevent relocation of it to another area, which will increase its impact area. This option would, from an environmental perspective, ensure that the valley sides remain intact and that the watercourses are not affected. However, it must be mentioned that the upper section of most of the valley sides has been affected by historic mining and are therefore ecologically less important to conserve. In addition, the quarry will have to be provided with an exit to drain the area during rainy periods therefore the impact on the drainage channels cannot be eliminated entirely.

Taking the above into consideration it is from a rehabilitation as well as mining perspective the better option to remove the upper sections of the valley sides provided that no activities may take place in the area between the final perimeter and the drainage lines.

Relocation of plant

The option not to relocate the plant has been discussed on page 19 and is not a viable option.

10 PRE-MINING ENVIRONMENT, PRELIMINARY IMPACT ASSESSMENT AND MANAGEMENT PLAN

The impacts of the Bigwill Enterprises mining programme on environmental parameters are assessed in this section in accordance with the criteria of the Minerals and Petroleum Resource Development Act 28 of 2002 and where applicable Environmental Conservation Act. The report will highlight the impacts and emphasized the required remedial measures. Impacts were assessed according to the criteria listed below:

Extent	Whether the impact will occurs on a scale limited to the immediate site of the proposed activity, local area and immediate communities and settlements, sub-regional (municipal), regional (provincial) or national scale
Duration	Whether the time span of the impact will be short term (0-5 years), medium term (5-15 years), long term (in excess of 15 years) or permanent where natural processes or mitigation processes cannot eliminate the impacts.
Intensity (Magnitude)	Whether the size of the impact is low, medium, high or negligible.
Probability	The probability of the impact actual occurring as either unlikely, probable, likely or definite

These criteria are evaluated in terms of

- Significance (Insignificant-low-moderate-high)
- Status (positive-negative-neutral)
- Confidence (based on academic information, specialist knowledge, site evaluations, applicants approach)

The significance of the impact on the parameters of the affected environment are rated as:

Low Significance	The project will not cause any major adverse or beneficial changes to the biophysical, social or economic environment. Impacts experienced will abate almost immediately after cessation of activities and the biophysical, social or economic system should recover and return more or less to the natural state. No expensive mitigating measures will be needed to address any of these impacts. Ecological functions will continue undisturbed and no complaints from Interested and Affected Parties (I&APs) are anticipated. No rare and endangered species or sensitive areas exist in the area.
Moderate Significance	The project will induce moderate short to medium term changes to the biophysical, social or economic environment. The impact would be induced outside the development area and also possibly on a sub-regional level. Over the medium term the impacts could fade away but the implementation of mitigation measures are normally required to eliminate these impacts. The impacts would be experienced for some time after cessation of activities but would not affect the biophysical, social or economic environment

	severely. With mitigation the biophysical, social or economic system should recover but the return to the natural state would be very slow and in some instances may not be achieved. I&APs might express some concerns and complaints may be received on an *ad hoc* basis. Rare and endangered species or sensitive areas may exist in the area and could be marginally affected.
High Significance	The project will induce extensive long-term changes to the biophysical, social or economic environment. The impact would be induced outside the development area and also possibly on a regional to national level. The possibility of secondary impacts arising from the project is high. Over the long term the impacts could fade away but the implementation of expensive mitigation measures are normally required to eliminate or mitigate these impacts. These impacts would be experienced after cessation of activities and could affect the biophysical, social or economic environment severely. With mitigation the biophysical, social or economic system could possibly recover but the return to the natural state would be or normally not be achieved. Ecological functions will be permanent disturbed and major complaints from Interested and Affected Parties (I&APs) could be expected. Rare and endangered species or sensitive areas exist in the area might be critically affected.

Should the impact assessment as a minimum reflect 2-3 impacts of high significance and 2-3 impacts of moderate significance the project shall be viewed as a potentially flawed and continuation of the project should be seriously reconsidered or special engineering or biophysical/social intervention must be implemented.

Descriptive terms

Spatial extent:	None/Insignificant (0), Site (1), Local (2), Regional (3), Unknown (3),
Duration:	None/Insignificant (0), Short Term (1), Medium Term (2), Long Term (3), Permanent (4)
Intensity:	None/Insignificant (0), Low (1), Medium (2), High (3), Unknown (3)
Probability:	None/Insignificant (0), Unlikely (1), Likely (2), Definite (3), Unknown (3)
Significance:	0-2 = Insignificant; 3-4 = Very Low; 5-8 = Low; 9-12 = Low-Moderate 13-15 = Moderate; 16-20 = Moderate-High; 21-27 = High; 28-30 = Very High

BIOPHYSICAL ENVIRONMENT

The study area falls within a transitional zone between terrestrial thicket nearer to the drainage lines and Fynbos/Renosterveld on the slopes and plateau areas. The area has been significantly transformed by previous unauthorized mining, dumping and agricultural activities. Heavy infestation of alien plants species in some areas has also lowered the ecological value of the study area.

A broad overview of the biophysical components within the area is described in the sub-headers below. The status of the faunal assemblages within the greater area has been conducted as a desk top study for the purpose of this prospecting application.

CLIMATE

Climatic data obtained from the South African Weather Bureau (Weather SA) were used to describe the prevailing climate in the Port Elizabeth area. A climate summary for Port Elizabeth (Period = 1961-1990) in terms of the Köppen classification scheme can be regarded as Subtropical with no distinct dry season.

The mean annual rainfall is 624 mm, equitably distributed throughout the year. August (64 mm) is the wettest month and December (34 mm) the driest. Mean annual rainfall has ranged from 1068 mm in 1968 to 406 mm in 1969 (1961-1990). The wettest day on record (1961-1990) was the 1 September 1968 when 429 mm fell. Daily rainfall in excess of 10 mm and 30 mm can be expected 17 and 4 times per year respectively.

November had the most (n = 10.7) number of rain days with rainfall in excess or equal to 0.1 mm, while June (8.4 days) had the least. This would appear to indicate that for rain delays to be kept to a minimum, prospecting work should be carried out in the winter months (May = 8.5 days, June = 8.4 days, July = 8.1 days). Rainfall in the Port Elizabeth region is usually associated with the passage of both low pressures (cold fronts) and high pressure weather systems.

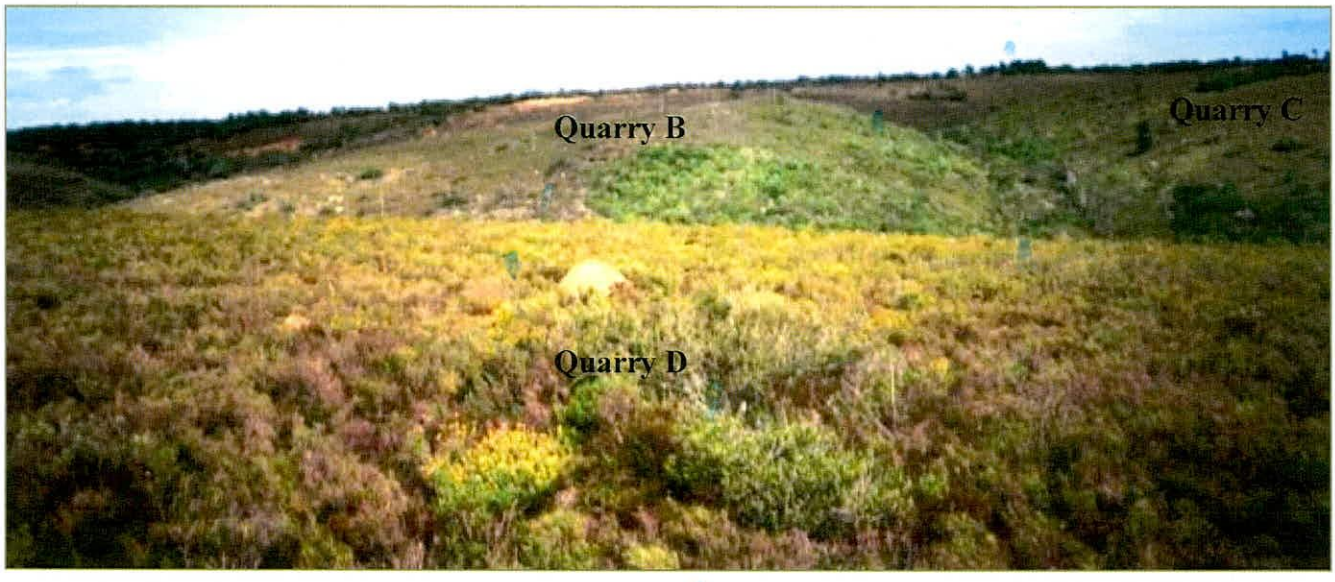
The mean annual temperature at Port Elizabeth airport (Station No 0035179 5), located at a height of about 60 meters above mean sea level, is 22.3°C. January is the hottest (Mean = 21.7°C) month and July the coldest (Mean = 14.3°C). The corresponding mean annual daily maxima and minima are 25.4°C and 14.3°C respectively. Mean daily maxima are greatest in January and February (both 25.4°C) and lowest in July (19.6°C). Similarly, the mean daily minima are greatest in January and February (17.9°C) and lowest in July (8.8°C). The respective highest and lowest temperatures recorded at Port Elizabeth airport are 40.7°C (11 March 1965) and -0.5°C (27 June 1964 and 2 July 1967).

The region experiences very windy conditions with mean annual wind speed of approximately 4,3m/s with prevailing direction from the west-southwest and subordinate south-easterly winds in summer.

TOPOGRAPHY

The study area occupies a palaeo (ancient) marine terrace (sea-level platform) that was formed during an inter-glacial (higher than present sea-level) during the Tertiary Period (about 60 million years ago). This higher sea-level resulted in the erosion of the bedrock material below the surf zone leaving behind the level topography (terrace) currently exposed to the west of Port Elizabeth. It is characterized by deep, steep sided valleys which incised into the plateau and slope steepness varies between 1:5 & 1:10. The gradient of the marine terrace is generally about 1:300 seaward in quartzitic sandstone bedrock, a condition that has been modified in the study area by the ephemeral drainage channels in the centre of the study area

The study area occurs at an average height of about 120-130 meters above mean sea-level sloping steeply towards the drainage lines that dissects the study area in 4 rolling hills depicted on the mining plan.



These drainage channels form part of the upper headwaters of the Brak River, which flows into the Swartkops River to the north. No fluvial seeps and gulley head environments (wetlands) were noted on the plateau area or upper section of the valley sides.

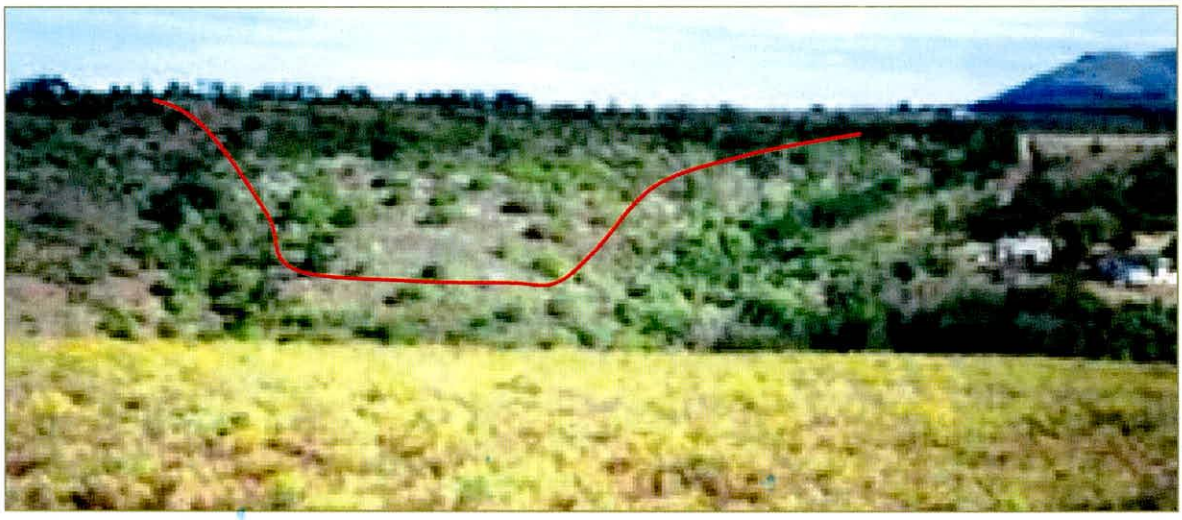
The plateau area of Quarry A was lowered by previous red gravel mining by two meters and sides were reasonably profiled. Quarry A re-vegetated naturally. Quarry B was lowered by approximately 2m on both the plateau and upper section of the valley side and was left non-profiled and mostly non-vegetated. The topographies of phases 3 & 4 were not disturbed.

Quarry A (View from the east)

(View from the south-west)

Quarry B (View from the north)

Quarry D (View from the east)



Preliminary impact assessment

Hard rock mining will result in the hills depicted as Quarry A-C on the mine plans to be cut away entirely too approximately 5-7m above the watercourses flanking these three mining sites. At the tow end of the mining areas these excavations will resemble flat areas but as mining progresses eastwards (Quarry A) and southwards (Quarry B & C) respectively production faces will develop on the southern and northern sides (Quarry A) and on the eastern and western sides (Quarry B & C) to facilitate a flat quarry floor. These faces will increases in height from 0-20m and will be benched to facilitate rehabilitation. However on the eastern side (Quarry A) and on the southern side (Quarry B & C) these faces will be approximately 40m high and will be appropriately benched to facilitate the rehabilitation thereof.

Only one hill will be mined at a time and will be split in two or more faces, except for Quarry C that will be mined in one phase, to limit the environmental impact. The topographical impact of individual phases is rated of low significance but combined the impact at closure of Quarry C, the impact is rated of high significance. Should Quarry C not be developed because of poor rock quality, the impact is rated of moderate to high significance. Due to the hardness of the rock in these quarry areas, erosion will not contribute to cumulative impact on the topography.

Development of the new plant and stockpile area will result in 1) two cuts (platform areas) of approximately 30m (bottom for plant & stockpiles) and 20m (top for dumping shot rock into hopper) into the south-western aspect of the hill in which Prima Quarries was developed and the infill of a portion of a minor valley in-between Prima Quarries and Quarry A. This impact is rated of low-moderate significance.

Mining of Quarry D (red gravel) will result in reducing of the topography of the hill with two meters on the crest and will not result in any cumulative impact. However, if the sub-layers consist of softer material, the erosion risk is rated high and it is essential that mining should not take place on the slopes, especially on the western slope. Mining should therefore take place above the 210m contour.

If the proposed development plan is not followed and no mitigations measures are put in place, erosion within the drainage channels could take place outside the mine area towards Uitenhage.

Due to the proposed locality of the new plant and stockpile area construction of roads will be limited and on hard surfaces and it is not anticipated that it increase the impact on the topography. The road to Quarry D already exists and will pose no additional impact.

The combined impact on the topography of the farm and thus on the head of the Brak River Valley over a 100 year period is rated of very high significance with no mitigation in place. Although rehabilitation cannot undo the impact on the topography it will be able to mask the impact to a moderate extent and it is therefore of importance that performance assessment be implemented as a cradle to grave approach.

The establishment of the brickyard, Asphalt plant and batching plant infrastructure will be mobile and thus temporary and will thus only impose a minor cumulative impact on the topography.

Total impact on topography.

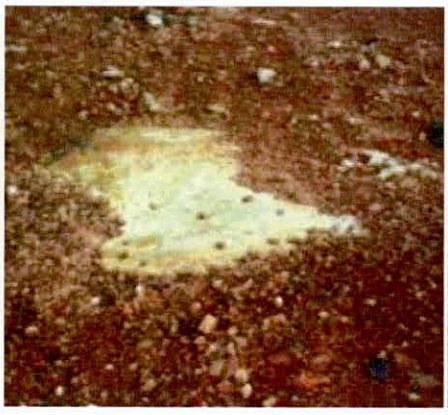
	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Municipal	3	Local	2	Site Specific	1
Duration	Permanent	4	Permanent	4	Permanent	4
Intensity	Very High	7	Very High	7	Very High	7
Probability	Definite	4	Definite	4	Definite	4
Status	Very Negative		Negative		Negative	
Confidence	High		High		High	
Significance	Very High	56	**High**	**52**	**High**	**48**

LITHOLOGY

The entire study area is underlain by weathered quartzitic sandstone bedrock of the Peninsula Formation, Table Mountain Group, of the Cape Supergroup (see geological map, Appendix 1). The Peninsula Formation of the Table Mountain Group forms the basal litho-stratigraphic unit of the Cape Supergroup in the Eastern Cape Province.

This formation generally comprises a thick succession of quartzitic sandstone with minor conglomerate and shale. Excessive thrusting and faulting in the Port Elizabeth area has also resulted in softer shear zones containing fault breccia and mylonite.

Red gravel profile. **Solid rock underlying red gravel.** **Sandstone outcrop on valley sides.**


Geology of Quarry A area and most of Quarry B area were disturbed during previous mining activities by the removal of the red gravel horizon overlying the solid rock. The geology of phases 3 & 4 are still intact. The northern corner of the property has already been mined out and will result in a cumulative impact.

Preliminary impact assessment

The impact on the geology of the farm is rated of high significance but considering the Peninsula Formation a very extensive geological formation in Port Elizabeth that extends from north of the city westwards towards the Western Cape the impact will be reduced. Mining of Quarries A –C will therefore result in a low sub-regional impact. If the other mining operations in Port Elizabeth are taken into consideration a moderate cumulative impact will be imposed. The initiative to conserve the Grootkloof area, which includes a very large portion of the Peninsula Formation, will ensure that a large portion of this Formation with its sometimes unique plant communities will be kept intact. The Peninsula sandstone deposit in the Port Elizabeth area is not a strategic mineral and since the site is not a geo-site, the abovementioned impact is therefore of less importance. The impact on the geology is site specific and permanent.

If the proposed development plan is not followed and erosion not be controlled on the property, the impact will be extend to areas outside the mine area.

The infrastructure related to the establishment of the brickyard, Asphalt plant and batching plant will be mobile and temporary and thus will only impose a minor cumulative impact on the topography.

Impact on geology

	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Local	2	Site specific	1	Site specific	1
Duration	Permanent	4	Permanent	4	Permanent	4
Intensity	Very Low	1	Negligible	0	Negligible	0
Probability	Definite	4	Definite	4	Definite	4
Status	Negative		Negative		Negative	
Confidence	High		High		High	
Significance	**Low-Moderate**	**28**	Low	20	Low	20

SOILS

Soils of the area are derived from the Table Mountain Group quartzites and consist of red-brown orthic, well-drained, low fertility and acidic soils. Weathering of bedrock thickens towards Lady Slipper but is fairly shallow in the study area with bedrock within 1-2m. In terms of the soil classification system it is an S8 soil and is categorized as an imperfectly drained soil, seasonally wet and often with a plinthic horizon functioning as a cut-off layer. Soils are very sandy at the top due to the influence of the parent material. Despite the general lack of clay material the soils are fairly cohesive and have a low erodibility.

In general the soil profile consists of an Orthic A horizon (topsoil), underlain by a Pedukutanic B horizon (red gravel) followed by a Saprolite horizon (solid quartzite) constituting the Swartland soil form. Where deeply weathered soils are encountered (only in center of plateau areas) they become more clayey with depth. The clayey material tends to be gleyed (mottled), an indicator of perched water table activity after wet periods. These water tables tend to occur at the interface between the overlying sandy material and the underlying, less-pervious, clayey (completely weathered bedrock) material.

Rocky outcrops, especially at the rim of the plateau areas were noted in the study area during the field investigation, indicative of the presence of target material and shallow soil horizons.

Soils of Quarry C are still intact but in general very shallow. Soils of Quarry A & B have been severely disturbed by previous illegal mining operations and seemingly most have been removed from site as only a few topsoil stockpiles were noticed in these areas. Erosion was noticed on the upper valley slope of Quarry B. Although the vegetation cover of Quarry D was removed, soils have remained mostly intact but some topsoil loss through sheet flow has definitely occurred over time.

From the above it is clear that the impact on topsoil has already been previously imposed and future mining will have only a minor cumulative impact on soils in the Quarry A & B areas. With regards to Quarries C & D the impact would be substantially higher and will be assessed separately.

Preliminary impact assessment

Soil fertility

Soil fertility can be influenced through structural degradation, loss of humus content, impaired mineral cycles, soil pollution, soil loss and compaction.

Soil fertility at Quarry A & B has already been severely affected since most of it was removed or lost through sheet erosion. In addition the B-horizon was completely removed, which will limit future vegetation growth. Since these areas do not dispose of vegetation that could contribute to humus build up and because of the thin topsoil that remained or developed since previous mining, these soils will be very marginal. Mining will therefore only impact marginally on the soils in Quarry A & B. If

remaining soils are properly removed and stockpiled, upgraded and grassed, its fertility will improve over time.

At Quarry C & D as well as at the new plant and stockpile area long term stockpiling of topsoil will impact severely on fertility but if properly fertilised and grassed after it was stockpiled in low berms, the impact will be of low-moderate significance, but only if a portion of the B-horizon is retained to recreate a proper soil profile during future rehabilitation phases.

The brickyard, Asphalt plant and batching plant will be positioned on the eastern perimeter of Quarry A, where topsoil was already removed and will pose a negligible impact on soil fertility.

Topsoil quantity

Quarry areas A & B will not generate adequate topsoil for rehabilitation, especially since the surface area will be drastically increased by the establishment of quarry faces. If no topsoil and subsoil is imported, this scenario will increase the impact on soil fertility and soil erosion and will result in the quarry areas to remain completely bare and non-vegetated.

Topsoil quantities in Quarry areas C & D and at the new plant and stockpile area will be adequate but then all topsoil must be removed, stored and protected against erosion according to acceptable standards. Topsoil must also be stored away from the valley slopes and any drainage line to prevent it being washed away.

Soil Pollution

Within the mine area no soil pollution will occur through minor oil spills from vehicles operating in these areas since soils would have been removed and stockpiled. The same scenario would be applicable to the plant and stockpile area. It needs to be remembered that all maintenance on vehicles will be done at the current Prima Quarries workshop and no additional impact is anticipated in this regard. These minor hydrocarbon spills could migrate towards the watercourse areas where it could affect the soils and potentially the ecology of the watercourses, but such hydrocarbon movement will be retained in silt ponds that will be constructed below the mentioned areas.

Soil pollution will mostly be restricted to contamination with sandstone fines generated through the blasting and crushing processes. Within the mine area the impact will be very limited since blasting will only be done a few times per month and dust that settles on the valley slopes will periodically be washed away or will form part of the soil forming process. However, quartzitic material washed from the quarry floors towards the slopes below the quarry areas and to the watercourses could pollute these soils and cause them to become infertile over time. It is therefore essential that appropriate silt dams be established below the quarry areas. In the crushing area, large quantities of silt will be produced and immediate areas will become complete sterile hence it is important that soil be removed far enough from this area to limit the impact. Silt runoff to water courses will cause a substantial impact on these soils and a series of silt dams need to be constructed around the site. It would be essential that

fines be removed from the crushing area on a regular basis to reduce the amount being washed off to the silt traps and potentially the watercourses.

The brickyard, Asphalt plant and batching plant will produce cement and bitumen/tar spills as well as quartzite fines and if left uncontrolled, which could end up on the slopes above the valleys and in the watercourses where it will impact on soil fertility. It is thus essential that berms be constructed around these plants and individual components thereof to facilitate deposition in appropriately constructed sumps.

Soil erosion

The development strategy for the hard rock quarries will facilitate mining from the toe of each hill into the hill and will preclude any activity around the perimeter of the site and thus on the slope between the excavation and watercourses hence no soil erosion is anticipated in these areas. It should be mentioned that currently the slope below Quarry A do not display erosion but that erosion do occur on the slopes of Quarry B, which was previously disturbed and thus support the assessment made above. However, such erosion will only result in shallow erosion furrows due to the limited depth of the A & B soil horizons on the slopes and would not lead to major topographical interference but will indeed cause the siltation of watercourses that in turn will affect the ecological integrity thereof. If the removal of red gravel at quarry D is not restricted to the crest area, severe erosion can be expected down slope. It is also essential that this area be developed in very small sub-phases and that rehabilitation must take place concurrently and that the area be protected by contours.

Once the quarry areas have been established large volumes of water will emanate from the quarry and will affect the stability of soils on the slopes below and integrity of the watercourses. This runoff must be controlled through the establishment of silt traps with appropriate design and capacity. The same scenario will be applicable to the plant and stockpile area. In order to address the runoff volumes the required cut-off berms must be constructed ahead of production faces and the plant area.

Filling in of the valley will increase erosion potential of this loose material, which will impact on the ecological integrity of the watercourses and stability of the plant area. It is thus essential that this material must be stabilised.

Once mining is completed, the placement of topsoil on almost bare or blasted rock (slopes and benches) will result in the displacement of topsoil through sheet flow during heavy rain events if these areas are not suitably protected. This particular impact would be much more pronounced on the slopes and such a scenario will eventually preclude the establishment of vegetation. The worst-case scenario would be erosion gullies of approximately 40cm deep and material eroded will be fanned out on the quarry floors or be retained within the silt traps and will therefore not be lost. If left unattended, these gullies will be increasing in extent and eventually bare rock will be exposed and total loss of vegetation will be prevalent.