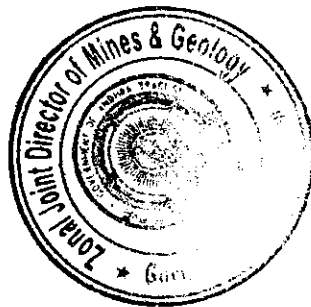


MINING PLAN
Over an extent of 5.000 Hectares in Sy.No. 34
Meelisathivada (V), Tekkali (M), Srikakulam Dist. A.P.

For

M/s. KOUSALYA ENTERPRISES
Srikakulam



Prepared By

V.T. CHANDER

Consultant Geologist & RQP
(RQP / DMG / HYD / 02 / 2001)

H.No. 10-1, Flat No. 202, Mahalaxmi Ganapathi Complex,
Sai Baba Temple Lane, Beside Sri Sai Grammar High School,
P & T Colony, Dilsukhnagar, Hyderabad - 500 060.

☎ : 040-40138229 ✉ : 9393383357

DECLARATION

This mining plan for Coloured Granite, over an extent of 5.000 Hectares in Sy. No. 34 of Meelisathivada (V), Tekkali (M), Srikakulam District, Andhra Pradesh., has been prepared in full consultation with us and we understand its contents and agree to implement the same in accordance with the law.

Date: 29/7/08

Place : Srikakulam

FOR KOUSALYA ENTERPRISES

వ.కె.మలసమ
PROVIDED

For M/s. KOUSALYA ENTERPRISES



CERTIFICATE

This is to certify that Mining Plan in respect of Quarry Lease area Over an extent of 5.000 Hectares in Sy. No. 34 of Meelisathivada (V), Tekkali (M), Srikakulam Dist. Andhra Pradesh. Has been prepared by Sri V.T. Chander, Consultant Geologist & RQP and we agree to follow the same in accordance to the provision of Law.

Date : 29/7/08

Place : Srikakulam

For KOUSALYA ENTERPRISES

వ.వ. చుల సముద్ర
ప్రొ.వై.సి.సి.

For M/s. KOUSALYA ENTERPRISES



CERTIFICATE

The provision of Granite Conservation and Development Rules '1999 have been observed in the Mining Lease of Coloured Granite, over an extent of 5.000 Hectares in Sy. No. 34 of Meelisathivada (V), Tekkali (M), Srikakulam District, Andhra Pradesh, for M/s. Kousalya Enterprises, Srikakulam. Whenever specific permissions are required the lessee will approach the concerned authorities.

It is also certified that the information's furnished in the above Mining Plan are true and correct to the best of our knowledge

Date : 28th July '2008

Place : Hyderabad



RQP
(Signature)
(V.T. CHANDER)

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LIST OF PLATES

PLATE	TITLE	SCALE
I	LOCATION & KEY PLAN	1 : 50,000
II	LEASE AREA PLAN	1 : 4,000
III	GEOLOGICAL MAP	1 : 1,000
IV	GEOLOGICAL CROSS SECTIONS	1 : 1,000
V	MINE LAY OUT & YEAR WISE PRODUCTION PLAN AND CROSS SECTIONS	1 : 1,000
VI	CONCEPTUAL PLAN & CROSS SECTIONS	1 : 1,000
VII	ENVIRONMENTAL MAP	1 : 5,000

LIST OF ANNEXURES

- I Copy of the Asst. Director, Mines & Geology, Srikakulam. Proceedings No. 1493 / Q / 2003 dated 13 - 07 - 2006.



MINING PLAN ON COLOUR GRANITE
Over an extent of 5.000 Hectares in Sy.No. 34
Meelisathivada (V), Tekkali (M), Srikakulam Dist. A.P.

For

M/s. KOUSALYA ENTERPRISES
Srikakulam

By

V.T CHANDER
Consultant Geologist & RQP

1.0 INTRODUCTION

M/s. Lokesh Enterprises, Srikakulam, a Private Firm, was granted Quarry Lease for 20 years for Colour Granite over an extent of 5.000 Hectares spread over in Sy.No. 34 of Meelisathivada Village, Tekkali Mandal, Srikakulam Dist. A.P. Vide Director, Department of Mines and Geology, Hyderabad. Proceedings No. 1493 / Q / 2003 dated 24-04-2004. The lease deed was executed on 24-04-2004 and permission was granted by the Asst. Director, Mines and Geology, Srikakulam Vide Proceedings No. 15370 / R1-3 / 2003 dated 11-03-2004 to commence Quarry operations for a period from 24-04-2004 to 23-04-2024.

The quarry lease was transferred in favour of M/s. Kousalya Enterprises, Prop. Smt. V. Tulasamma, Opposite to Ayyappaswamy Temple, Adivarampeta, Balaga, Srikakulam District, for the un-expired period of quarry lease i.e., upto 23-04-2024.

The transfer of quarry lease deed has been executed by the Asst. Director, Mines & Geology, Tekkali on 13-07-2006 for the un-expired period of the quarry lease i.e., upto 23-04-2024.

M/s. Kousalya Enterprises, Srikakulam, approached Sri V. T. Chander, Consultant Geologist and RQP (RQP / DMG / HYD / 02 / 2001) for preparation of Mining Plan in the above mentioned quarry. Accordingly Mining Plan is prepared as per the guidelines given by Govt. India. Ministry of Steel & Mines, Under Rule 12 of GCDR '1999 for the existing quarry.



APPROVED

N. Subrah
ZONAL JOINT DIRECTOR OF
MINES AND GEOLOGY
GOVT. OF A.P.
VISAKHAPATNAM

This Mining plan is Approved subject to
the Conditions / Stipulations indicated in
the Mining plan Approval letter No. 49172/2003 Dated 5-8-08

2.0 GENERAL

- 2.1 Name and address of the applicant : **M/s. KOUSALYA ENTERPRISES**
Prop. Smt. V. Tulasamma,
Opposite : Ayyappaswamy Temple,
Adivarampeta,
Balaga,
Srikakulam District
- 2.2 Status of the applicant : Private Firm
- 2.3 Mineral for which applicant intends to mine : Colour Granite
- 2.4 Name and address of the RQP who prepared the Prospecting Report : **V.T. CHANDER**
RQP / DMG / HYD / 02 / 2001
H.No. 10-1, Flat No. 202,
Mahalakshmi Ganapathi Complex,
Sai Baba Temple Lane,
Beside Sri Sai Grammar High School,
P & T Colony, Dilsukhnagar,
Hyderabad - 500 060.
☎ : 040-40138229.
☎ : 9393383357
- 2.5 Name and address of the Prospecting Agency : **M/s. Kousalya Enterprises,**
Srikakulam District
- 2.6 Details of the Area

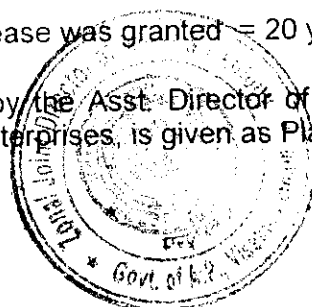
The applied area falls in the Survey of India, Toposheet No. 74 B / 2 and is bounded East Longitude 84° - 12' - 00" and North Latitude 18° - 37' - 00". It is situated 4 Km North West of Tekkali. The road leading from Tekkali to Temburu will lead to the site. The location of the area is indicated in Key Cum Location Map (Plate - I).

DETAILS OF THE AREA

District State	Mandal	Village	Sy.No.	Extent	Ownership of Occupancy
Srikakulam Andhra Pradesh	Tekkali	Meelisathivada	34	5.000	Govt. Land (Existing Quarry)

- 2.7 Period for which Quarry lease was granted = 20 years

Cadastral Map certified by the Asst. Director of Mines & Geology, Srikakulam in favor of M/s. Kousalya Enterprises, is given as Plate No. 1 I.



2.8 Infrastructure and Communication

Availability of Water	The Ground Water level is about 6 to 7.0 Mts. below ground level at the foothill.
Availability of Electricity	Electricity is available at the Quarry area.
Communication Network	It is situated 4 Kms North West of Tekkali Town. The road leading from Tekkali to Temburu will lead to the Site. Amenities like Post & Telegraph Office, Police Station, Primary Health Center etc., are available at Tekkali.
Road Network	The Tekkali Town is located 60 Kms North of Srikakulam on NH 5 from Visakhapatnam to Calcutta. The town is well connected with the road network.
Nearest Rail Head	Nearest Rail Head is located at Amudalavalsa (Srikakulam Road Station), which is located 16 Kms from the Srikakulam and 76 Kms from Tekkali.
Port Facility	Vishakapatnam Port is about 150 Kms from area.
School	Education Facilities from Primary School to College are available in Tekkali Town.
Medical Facility	Medical Facility available in Tekkali Town.

Boundaries

North	Barren Lands
South	Barren Lands
East	Barren Land & Area surveyed to M/s. B. Chitti Babu Granite & Polishing Unit
West	Quarry Lease Area of M/s. Prameela Granites

Further vast potential exists for the employment of unskilled labour in the existing Granite Quarries and Allied Small - Scale Industries. The area experiences Semi - Arid Climatic conditions with an average Annual rainfall of 1000 MM. The local day temperature varies from 25° C in November to 48° C in April & May Months. The general wind direction reported is SW to NE and SE to NW.

3.0 GEOLOGY

3.1 Physiography

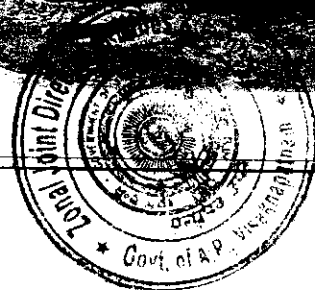
The quarry area is located on the eastern flank of the hill; steeply sloping due South East & East i.e., the lease area almost becomes ground level with an average relief of 39 M in the grids N 200 - N 250 & E 00 - E 50. Vegetation is developed in between the joints and soil areas. The areas in the North and West are quarries and in the East agricultural lands and cashew nut plantations.



PHOTOGRAPH SHOWING THE VIEW OF THE BOULDERS & THEIR DISPOSITION



PHOTOGRAPH SHOWING THE VIEW OF THE PIT EXHIBITING THE NATURE OF BOULDERS & WASTAGE GENERATED



3.1.1 Regional Geology

The Eastern Ghat Mobile Belt (EGMB) is more than 600 Km in Length from Srikakulam in the North to Ongole in the South. This belt is more than 100 Km in width in Northern part and tapers down to less than 20 Km in the South, it has broad actuate trend with west ward convexity. The NNE - SSW trend in the southern part of the belt changes NE - SW in the North. EGMB is divided into 3 longitudinal zones viz.

1. Western - Charnockitic zone,
2. Central - Khondalite Zone
3. Eastern - Migmatite Zone

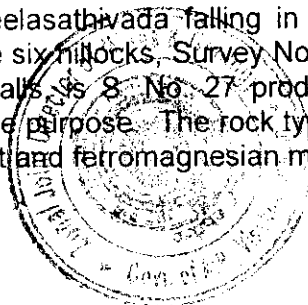
While in the Northern parts in Srikakulam, Vizianagaram & Vishakapatnam Districts the central Khondalite Zone occupies major part of the area. Where as Western Charnockite Zone occurs in the Southern part. The rocks in this belt are represented High Grade Granulite facies of Metamorphism and suffered by complex deformation. The stratigraphic succession of EGMB is as follows :

INTRUSIVES	Layered Anorthisites and associated Mafics and Chromiferous Ultra Mafics
CHARNOCKITE GROUP	Charnockites with Mega Crystic K- Felspar Charnockite Pyroxene Granulite / Amphibolites.
KHONDALITE GROUP	Calc-Sillicate-Granulites Garnet-Silliminite-Quartz-Biotite-K-Felspar- Graphite Gneiss (Khondalite) Quartzite-Garnet-Silliminite
GRANITOID SUITE	Granitoid with Mega Crystic K-Felspar Un differentiated (with Migmatitic Dia Tectite, Augen) Perferoblastic Granite and Gniesses Garnet - Biotite Homophanus Granite/Gniess Leptinite, Local Charnockite Neosomes and Relics

In Srikakulam district the EGMB is represented by vide range of litho units Viz : Charnockites, Khondalites, Twopyroxene Granulites, Migmatites, Leptinites and Intrusive Porphyroblastic Charnockites. Large enclaves of Acid Charnockites, Khondalites and Meta-Basic rocks occur within Migmatites, which are largely seen in the area lying between R.Vamsadhara and Coastline.

3.2 Geology of the Area

There are six hillocks in Meelasathivada falling in Survey No's. 27, 34, 70, 73, 112/2 and 117/10. Out of the six hillocks, Survey No's. 27, 34 and 73 occupy large extent. The hillock, which falls in No. 27 produce dark blue granite blocks, which are useful for decorative purpose. The rock type contains quartz, feldspar as essential minerals with garnet and ferromagnesian minerals as accessory minerals.



The total hillock is covered under lease. The hillock is Survey No's. 34, 70 and 112/2 contains good boulders and sheet rock, but the leases have been cancelled due to non-working of quarries. It is also learnt that due to presence of colour variation and black patches (concentration of ferromagnesian minerals).

The Migmatites and Migmatized Charnockite deposits are commercially known as "Srikakulam Blue". The Migmatite essentially consists of Blue Quartz and Bluish Grey to Light Grey Felspar with accessory minerals like Hypersthene, Hornblends and Biotite. The rock displays Wavy Banding, Ptygmatic folding of Bands, Paleosom – Mesosom – Leucosom and Minimal Lineation. A number of parallel slips trending N-S, NNW-SSE and NNE-SSW cut across the Wavy Banding, Pinching and Displacing the Bandings, which imparts additional beauty to the stone besides its Blue Colour. The arrested enclaves of Charnockite (Locally known as Oil Patches) and healed hairline fractures (Known as White and Coloured Lines) cutting across the wavy banding are considered defects.

Lithology

The area is occupied single Lithological Unit Migmatized Charnockite, but on Weathering it has produced following litho type

0 – 0.5 Red Soil + between Boulders & interstices of joints and fractures

0.5 – 6 Weathered & Highly Fractured and Fissured Boulders

6 M Below Fresh Boulders of Migmatized Charnockites

Three sets of major joints :

1. N – S
2. N 35° W – S 35° E
3. E – W

GEO TECHNICAL PROPERTIES

a) Parameters for Evaluation of Deposit

Quarrying in the locality (Addukonda hill) has helped in studying the following parameters for evaluation of the deposit. Frequency of occurrence of the fractures and joints :

Three sets of joints are recorded in the Charnokite

1.	N – S Vertical Nature
2.	N 35° W – S 35° E Sub Vertical
3.	E - W



These joints are closely spaced at the contact of the country rock and on the surface giving raise to bouldery nature to the dyke. On the other hand they are widely spaced in the depth as noticed in the quarry sections.

1.	Variation of Strike	Not Applicable
2.	Splitting Pattern of Strike	Even
3.	Foliation	Absent
4.	Occurrence of Intrusives	Absent
5.	Interaction of Host Rock incase of Dyke Rock	Not Applicable
6.	Extent of Weathering	Restricted along the Joint Planes only
7.	Amount of Weathering	Limited
8.	Climatic Condition	The area experiences Semi Arid Climatic conditions with summer day temperatures raising upto 47° and receives an average rainfall of 1,050 mm, the prevalent wind direction is SW-NE and SE-NW.

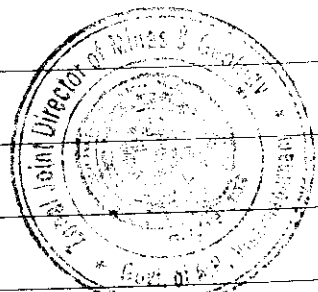
Exploitable Stone available and possible output per month :

Total Mineable Reserves Estimated to be - 1,81,675.2 M³

On an average 720 M³ Per annum output is anticipated.

b) **Important Parameters for evaluation of Stone Quality**

1.	Texture and Grain Size	Medium – Fine Grained, Equigranular
2.	Colour and Aesthetic Beauty of the Stone	Bluish
3.	Hardness	Varying between 6 – 7 on Moh's Scale
4.	Minerological Composition	Generalized Minerological composition of Migmatized Charnockites of Eastern Ghats is as follows :
a)	Augite	25 – 40%
b)	Plagioclase Felspars	42 – 50%
c)	Clino Pyroxene	15%
d)	Amphibole	> 5%
e)	Biotite	2.7%
5.	Density / Specific Gravity	The bulk density of Charnockite is 4.5



6.	Water Absorption Ratio	Fresh Rock has no water absorption capacity
7.	Porosity	Porosity is negligible
8.	Compression Strength	Not Measured
9.	Abbrasiveness	Not Measured
10.	Permeability	The Charnockite in the fresh state is totally impermeable.
11.	Rock Quality, Designation	RQD test not conducted
12.	Young's Modulus Elasticity	Not Measured
13.	Degree of Weathering under Hand Lens / Microscope	Degree of Weathering varying with depth of rock, it is 2 – 3 Cm deep on the surface and it is absent in deep seated rock
14.	Glossiness	Samples taken good polish

c) **Defects in Dimensional Stone**

1.	Criss Crossing of Veins	Fine thread like acidic veins seen in the rock, but rarely occurring
2.	Closely Spaced Joints	Closely Spaced Joints trending in different directions both vertical and horizontally disposed restricted to weathered upper layers only.
3.	Dark Or White Patches	Dark Patches or Striations recorded in some of the outcrops, but they have a limited aerial extent
4.	Greater Texture Variations	Textural Variation is absent. Texturally the rock is uniform
5.	Alteration due to Metamorphism and Weathering	No alteration due to Metamorphism is noticed. However, in the upper layers white clayey veins are seen in the weathered layer of the rock
6.	Defects at Contact Zone due to Mineralogical Textural and Colour Changes	The rock in lease area is represented by a single rock unit Migmatised Charnockites. Hence, no defects in the rock are noticed.



4.0 EXPLORATION / MINING ACTIVITY

4.1 Present Status

The Mining Plan is prepared for the existing Granite Mine, which is under operation since 2000 by the firm.

Mining Operations Carried Out

The deposit is occurring as both floating boulders embedded in the soil and weathered zone. The quarry was opened during the year 1999. In the first year developmental operations carried out include :

- Clearing of Bushes on the Deposit, Removal of Soil Cover and Small Floating Boulders.
- Laying of roads on the deposit and developing the infrastructure at Quarry Site, such as Shelters, Office Room, Lavatory, and Drilling of Borewell for Drinking Water etc.
- Deployment of Excavator for removal of over burden and boulders.

Pit

The mining operations were carried out starting along the Eastern boundary of the lease area towards North West direction. A pit of 6 M was developed in 290 x 30 M dimensional area from which 2,000 M³ of Rough Blocks of Market Grade were retrieved from this pit.

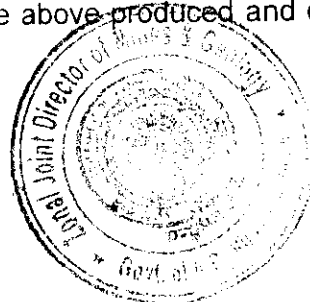
The average production of this quarry is only 400 M³ per year this is due to the highly defective rock mass and poor recovery.

Based on the above it is to state that the recovery % is 3.83. the percentage of recovery is anticipated to increase in depth to the tune of 10 – 15%

The Details of Production Pit :

Pit No.	Dimensions (M)	Volume of Material Excavated (M ³)	Lithology	Remarks
1	290 x 30 x 6	52,200	0 – 1.5 M	Weathered & Joint Rock Mass
			1.5 – 6.0 M	Fresh Boulders

The Srikakulam Blue Granite is having international demand. Hence, the mine owners prefer to export only in Gang Saw Size. It is reported out of 2,000 M³ dispatched, since the inception of quarry about 40% are the blocks with sizes ranging 300 x 200 x 200 and 270 x 140 x 150 and the balance 220 x 150 x 100 & 180 x 100 x 100. Therefore, all the above produced and dispatched rough blocks of this size only.



Year	Dispatches (M ³)
19-06-2004 to 14-12-2004	227.893
04-01-2005 to 24-12-2005	820.749
21-01-2006 to 09-02-2006	64.925
Total	1113.567

About 80 M³ of undressed rough blocks are available at the quarry site.

The following machines are used :

1. Excavators - 2 No's.
2. Compressor - 4 No's.
3. Tractor - 1 No.
4. Tipper - 1 No.

The following labour employed :

1. Supervisors - 4 No's.
2. Drillers - 24 No's.
3. Cutters - 15 No's.
4. Non Master Labour - 4 No's.

4.2 Future Programme

Since the deposit is already proved during the mining in the previous years, no further exploratory programme is recommended.

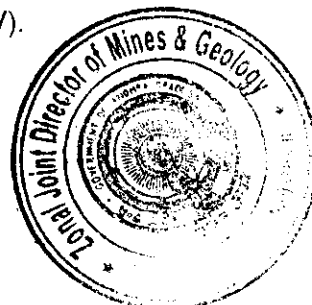
5.0 RESERVES

5.1 Geometry of Deposit

Geological Traverses and the study exposures on the hill facilitated to assess the shape and size of the deposit in the area. It is in irregular shape. The surface of sheet rock is wavy and irregular.

5.2 Method of Estimation of Reserves

The exposed deposit is found to be irregular in shape as it is exposed on hill. The Cross Sectional method was adopted for estimation of reserves. Plano Meter was deployed for estimation. 4 cross sections A-A1 to D-D1 were drawn at equal intervals for estimation (Plate - IV).



5.3 Categorization of Reserves & Total Mineable Reserves

The deposit is exposed in the lease area. The deposit exposed on the surface is classified under "Proved"

i) Insitu Reserves

Section	Sectional Area (M ²)	Sectional Influence (M)	Total Rock Mass (M ³)
A - A1	5827.20	70	4,07,904
B - B1	7389.00	70	5,17,230
C - C1	4393.30	70	3,07,531
D - D1	4018.50	70	2,81,295
Total Insitu Geological Reserves :			15,13,960

ii) Recoverable Deposits

As undersize boulders, defective boulders, soil creep form 80 -90% of the Rock Mass. Hence deduction of the waste from insitu reserves form recoverable reserves (12% Recovery)

$$= 15,13,960 \times 0.12 = 1,81,675.2 \text{ M}^3$$

Since, the lease area falls a part of the hill and rising above the ground level, no deposit will be blocked under safety slopes.

iii) Market Grade Reserves

Since buyers prefer only Gang Saw Size hence total Market Grade Reserves considered as Economic Grade Reserves.

$$\text{Life of the Mine} = 1,81,675.2 / 720$$

$$= 252 \text{ Years}$$

5.4 Economic Marketable Reserves

The Granites, having good export market, rough blocks free of defects like Fractures, Joints, Shears, Hair Line Cracks, Segregation Veins, Drastic Colour variation and having 120 up size (Gang Saw size) are mostly preferred by Exporters and International Buyers, These are known as Economic or Market Grade. The recovery in future is anticipated as 20% from the Total Recoverable Deposits 1,81,675.2 M³

$$\text{Economic Marketable Reserves} = 1,81,675.2 \text{ M}^3$$



6.0 MINING

6.1 Type of Mining

Quarrying of Colour Granite in the existing Quarry by Open Cast Semi Mechanised method.

Opening of Mine

The Colour Granite in this area is proposed to be mined by Open Cast, Semi-Mechanized method the Granite deposit in this area is exposed on a hill with a maximum height rising upto 135 M above Ground Level (E 150 – E 200 & N 150 – N 200) with boulders.

The following method of working is proposed :

Stage 1

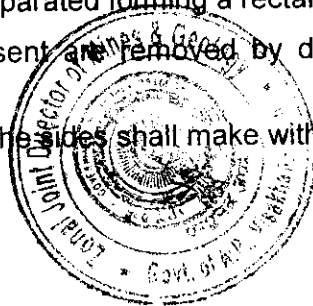
Over Burden / Talus / Side Burden Removal :

Consists of development which includes removal of Weathered, Undersized and Defective Boulders using Proclaim / Excavator and using Tipper, this waste is dumped at dumping yard. A ramp already constructed during exploratory Mining will be further developed to reach the working pits.

Stage 2

Extracting Boulder and Cutting them into Blocks with Conventional Methods :

- After removal of Weathered, Undersized and Defective Boulders the fresh boulders exposed.
- These boulders will be wedged out (Removed) from the insitu condition with the help of excavator and will be rolled to the lower area for further processing.
- If the boulder is large then it will be split into two or three pieces so that blocks can be made out of them.
- As the production is only for gang saw size, the boulders are split to the required size at the insitu stage.
- The undersized and defective blocks are removed. Usually, the advantage of natural joints present in the boulders are taken for splitting them or a line of shot holes are drilled vertically and horizontally at 10 – 15 Cm distance and the primary blocks will be wedged out or split it with the help of feathers and wedges.
- If the boulder or big enough one or two holes are drilled and wedged out using chemical compound AGFRACT.
- The separated blocks are examined for defects and lines, then the block or blocks are marked in clear area and holes are drilled along the line of marking, with the help of feathers and wedges.
- The waste portions are separated forming a rectangular blocks.
- Any bulges that are present are removed by drilling and wedging making it perfect blocks.
- A perfect block is that all the sides shall make with each other 90°.



Dressing

After primary separation the rock mass will be carefully examined to avoid hairline cracks, mineral segregation's and veins etc. The dressing of the rough blocks will be made by chipping the edges and geometrically equating the edges of the block at the dressing yard. The rough blocks obtained after primary cut it will be dressed for obtaining good geometric shape of coloured granite.

Dressing of dimensional rough blocks for export :

Dressing is the final phase of mining operation, wherein the secondary rough blocks are squared into regular perfect rectangular sizes, thereby avoiding uneven bulge or cavities and other defects. Jackhammers with compressor, feather end wedges and sledgehammers are the equipment generally used for dressing the block.

6.2 Mining Programme for the next 5 Years

6.2.1 Scheme of Mining & Year Wise Production

As the North Eastern flank has already proved the recovery, the applicant proposes to continue the mining operations in extension of the present workings towards West.

During mining operations the applicant proposes to produce 720 M³ of Coloured Granite Per Year. In order to produce this quantity an area of 1,000 M² will be utilized.

1st Year :

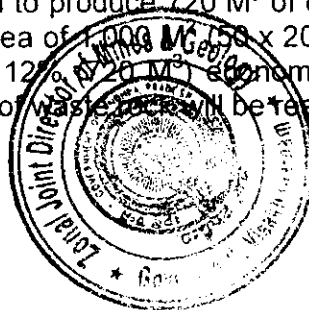
The mining operations will commence from Northern part of the existing Pit No. 3 forming a bench height of 6 M and the bench will advance towards South in the grids N 100 – N 200 & E 150 – E 250. During the first year a total area of 1,000 M² will be utilized.

In the first year it is planned to produce 720 M³ of economic grade rough blocks. To produce this quantity an area of 1,000 M² (50 x 20 M) will be utilised. Producing 6,000 M³ of rock from which 12% (720 M³) economic grade rough blocks will be obtained and 88% (5,280 M³) of waste rock will be realised.

2nd Year :

In the 2nd year the mining continue South of the first year working pit. The mining continues towards South with North oriented faces advance maintaining average of 6 M bench height in the N 100 – 200 & E 150 – E 250. An area of 1,000 M² will be covered during this year.

In the second year it is planned to produce 720 M³ of economic grade rough blocks. To produce this quantity an area of 1,000 M² (50 x 20 M) will be utilised. Producing 6,000 M³ of rock from which 12% (720 M³) economic grade rough blocks will be obtained and 88% (5,280 M³) of waste rock will be realised.



3rd Year :

In the 3rd year the mining will continue West of 1st year pit with North oriented faces advance further North maintaining average of 6 M bench height in the N 100 – N 150 & E 200 – 250. An area of 1,000 M² will be covered during this year.

In the third year it is planned to produce 720 M³ of economic grade rough blocks. To produce this quantity an area of 1,000 M² (50 x 20 M) will be utilised. Producing 6,000 M³ of rock from which 12% (720 M³) economic grade rough blocks will be obtained and 88% (5,280 M³) of waste rock will be realised.

4th Year :

In the 4th year the mining will continue North of 3rd year workings and West of 2nd year workings in the grids N 50 – N 150 and E 200 – E 250 of working pit. Maintaining average of 6 M bench Height. An area of 1,000 M² will be covered during this year

In the fourth year it is planned to produce 720 M³ of economic grade rough blocks. To produce this quantity an area of 1,000 M² (50 x 20 M) will be utilised. Producing 6,000 M³ of rock from which 12% (720 M³) economic grade rough blocks will be obtained and 88% (5,280 M³) of waste rock will be realised.

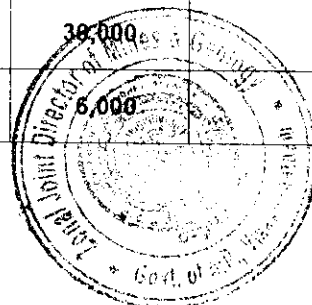
5th Year :

In the 5th year the mining will continue North of 4th year pit. South oriented faces advance further North maintaining average of 6 M bench height in the N 50 – N 150 & E 150 – E 250. An area of 1,000 M² will be covered during this year.

In the fifth year it is planned to produce 720 M³ of economic grade rough blocks. To produce this quantity an area of 1,000 M² (50 x 20 M) will be utilised. Producing 6,000 M³ of rock from which 12% (720 M³) economic grade rough blocks will be obtained and 88% (5,280 M³) of waste rock will be realised.

YEAR WISE PRODUCTION FOR NEXT FIVE YEARS

Year	Dimensions L x W x Bench Height (M)	Volume (M ³)	Market Grade Rough Blocks @ 12% (M ³)	Waste Generation @ 88% (M ³)
1 st Year	50 x 20 x 6	6,000	720	5,280
2 nd Year	50 x 20 x 6	6,000	720	5,280
3 rd Year	50 x 20 x 6	6,000	720	5,280
4 th Year	50 x 20 x 6	6,000	720	5,280
5 th Year	50 x 20 x 6	6,000	720	5,280
Total :		30,000	3600	26,400
Average :		6,000	720	5,280



The mine layout for production of coloured granite rough blocks first five years is showed in Plate No. V.

CONCEPTUAL PLAN

In the ultimate context, part of the lease hold with coloured granite will be mined out. Out of the total lease area of 5.00 Ha, the area proposed to be utilized for mining is about 4.45 Ha.

Considering the Geological, Mining, Environmental and Site Specific Constraints, the total deposit in its horizontal and vertical extent will be worked. The ultimate pit limit has been designed considering safety zone of lease hold area. Conceptually the ultimate pit layout will be irregular in shape.

Conceptually pit profile of two pits is expected to be irregular in shape. Ultimate pit slope would be 56° to provide the stability. Minimum bench width would be kept as 6 M from the faces at the end of ultimate pit limit (Refer Plate - VI Conceptual Plan)

6.2.2 Quantum of Excavation

To retrieve $6,000 \text{ M}^3$ of Market Grade Rough Blocks a quantum of $30,000 \text{ M}^3$ of Rock Mass has to be excavated out of which $26,400 \text{ M}^3$ is waste in the form of under size boulder, defective boulder, soil creep and rock debris generated during production of Rough Blocks.

6.2.3 Production Schedule

The production of colour granite continuous to through out year expect during monsoon. That is 10 working months, 20 working days per month are considered. The production of 720 M^3 per year can be easily achieved in a single shift with sufficient men and machinery.

a) Magazine Type and Capacity :

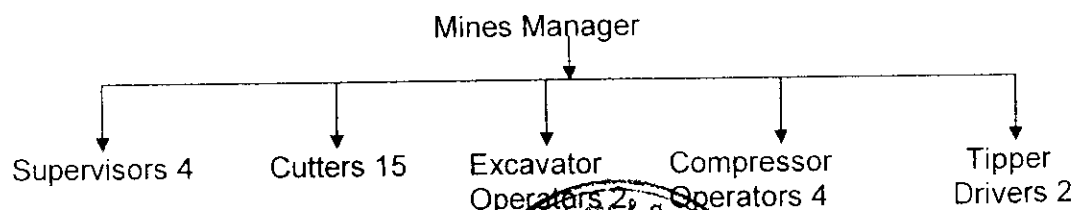
Not Applicable. (No permission for storing the blasting material will be granted by the District Administration). The applicant proposes to use AGFRACT Chemical Compound whenever required.

b) Description of Processing Plant :

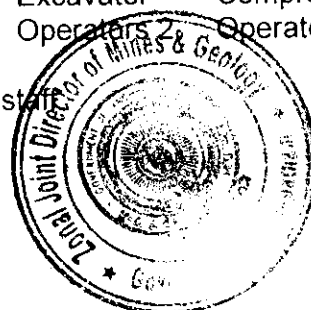
M/s. Kousalya Enterprises, doesn't possess Granite Processing Plant

c) Organizational Chart :

The organ gram of the quarry in this area is as follows :



Besides above managerial and skilled staff



- Semi-Skilled of about 10 members.
- Unskilled workers 4 members are required for the quarry work.

d) **Site Services :**

The company at Quarry Site (in the Patta Land purchased adjacent to the lease area) has already provided Rest Rooms, First Aid Room, Shelters, Lavatory and Bore well for Drinking Water.

e) **Market Analysis :**

i) Assured and expected supply contracts

Mining activity in the adjacent quarries has revealed that only Gang Saw Size of (Economic Grade) Rough Blocks of 2.4 x 1.4 x 1.2 & 3 x 1.9 x 1.8 sizes are required by exporters and will be dispatched to different exporters in Bangalore & Mumbai. The lessee has dispatched 1113.567 M³ to the market.

ii) Ability to supply consumer in time

Lessee is having sufficient men and machinery, besides huge and good quality rock at shallow depth. Therefore he is able to supply the material to the consumer in time.

iii) Pattern of demand

Srikakulam Blue Granite/ Bahama Blue of Srikakulam district is having very good demand in the international market. The prices of rough blocks of gang Saw size ranging between Rs. 8,000 to Rs.10,000 depending upon the colour of the rock.

Therefore, the material is having good demand and market is already established for the material from this mine.

7.0 **SCHEME OF WASTE MANAGEMENT PLAN (SOLID & LIQUID) :**

i) **Solid waste for the first five years :** The granite body exposed to the surface. Hence, the weathering on the surface of the rock closely spaced joints and shears along with inherent defects like Moles, Dark patches and acidic veins contribute a large extent of waste generation during the mining.

It is estimated that in the next five years a total of 26,400 M³ of waste is expected to be generated with an average of 5,280 M³ per annum. The year wise waste generation in 5 years is as follows :

Year	Waste Generated (M ³)
1 st	5,280
2 nd	5,280
3 rd	5,280
4 th	5,280



5 th	5,280
Total :	26,400
Average	5,280

- ii) **Dumping site particulars :** For dumping of waste generated during mining will be dumped on the existing dumps located in the grids N 00 – N 50 & E 100 – E 250 in the buffer zone and also in the Patta Land procured by the firm along the Eastern margin of the lease area (Plate – V).
- iii) **Estimated waste quantity that will be generated in the entire period :** At the rate of 5,280 M³ per year the volume of waste generated in balance lease period i.e., 15 years is estimated to be 79,200 M³.
- iv) **Utilisation of waste if not prevented :**
- Soil will be utilized for reclamation of degraded area.
 - Weathered rock if it is sufficiently soft and devoid of rock fragments can be utilized for roads, filling of road side ditches, formation of approach roads to quarries, construction works etc.
 - Large and medium sized waste rock can be used as revetment for deep cut stream sections from preventing from soil erosion.
 - The waste generated during the mining will also be used for back filling of the mine pit after completion of mining.

8.0 ENVIRONMENTAL MANAGEMENT PLAN

8.1 Baseline Information

i. Existing Land Use Pattern

The applied area is hill. The land is steeply sloping due North and East. The whole land is covered by sparse vegetation. The soil existing in the applied area is bouldery and unfertile. The hill is exposed 39 M above Ground Level and occupies entire quarry lease area. The surrounding hill areas are active with mining and the foot hills and valleys are agricultural lands.

ii. Water Regime

No Streams or Drainage lines exist in and around Quarry Lease area. Excepting the sheet flows during rainy days

iii. Flora and Fauna

The whole area is occupied by scattered sparse vegetation of thorny trees and small bushes. In the applied area no wild animals are witnessed as per the statements collected from the local population, since 50 years.

iv. Quality of Air, Ambient Noise Level and Water

- Air quality is good but at quarries is filled with dust due to haulage on the road, blasting etc



- The noise generated mostly due to blasting, drilling, vehicular traffic
- Granite mining will not effect water quality.

v. Climatic Conditions

The area is falling under semi-arid tropical zone. The area is having dry climate. The temperature recorded in this area is 25°C, in winter and about 48°C. in summer seasons. The wind direction is in SW to NE. The average annual Rainfall of the area is 1000 MM.

vi. Human Settlement

The village Gopalapuram is situated 2 Km due South East of the area. The population of this village is about 500. The village is surrounded by agricultural lands. The details of the villages in 2 Km, surrounding from the applied area is given in following table.

HUMAN SETTLEMENT (PLATE NO - I)

S. No.	Village	Direction	Distance (Km)	Population
1.	Gopalapuram	South East	2	500
2.	Kothuru	North West	1.2	500
3.	Bheempuram	North West	2	500
4.	Dubbaguddi	North	1	300
5.	Sidipeta	South West	1.75	300

The main occupation of the local population is agriculture and sheep raring / Breeding.

vii. Public Building, Palace and Monuments

No of public buildings, palaces and monuments are witnessed in and at the vicinity of the area.

viii. Quality of Air and Water

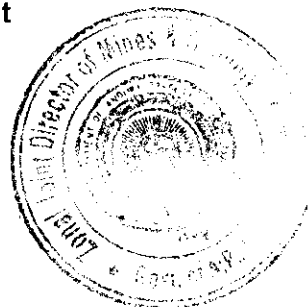
The air and water of the area are free from any kind of pollution, since no industries are established in the area.

ix. Whether the area falls under notified area under water act. 1974

The area will not fall under notified area under water Act. 1974.

8.2 Environmental Impact Assessment

i. Landscape Changes



i) Land Degradation

Granite mining will alter the physiographic scene; a small portion of the hill will alter its shape in the Eastern boundary the hill will be sliced by 6 M covering an area of 5,000 M² and a huge rock debris in the form of dump (Defective, undersized boulders).

ii) Air Quality

Air quality is good but at quarries it is filled with dust, due to haulage on the road, blasting etc. but it will be within the permissible limits by sprinkling water on roads and covering the drill rods with cloth.

Air quality will not be disturbed, as the quarrying is very limited.

AIR QUALITY

Base Level	Allowable Level
SPM = 140 $\mu\text{g}/\text{m}^3$	360 $\mu\text{g}/\text{m}^3$
RSPM = 60 $\mu\text{g}/\text{m}^3$	120 $\mu\text{g}/\text{m}^3$
SO ₂ = 40 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$
NO ₂ = 40 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$
CO = 1.0 $\mu\text{g}/\text{m}^3$	5.0 $\mu\text{g}/\text{m}^3$

Air quality is good but at quarries it is filled with dust, due to haulage on the road, blasting etc., but it will be within the permissible limits by adopting the following:

- The dust rising due to drilling will be controlled by covering the drill rods with cloth, dust extractors will also be employed.
- Dust suppression on Haul road with sprinkling of water with chemical additives.
- Proper functioning of dust suppression arrangements in the equipment

iii) No water course is passing through the area excepting run off streams during monsoon.

The mining of Granite, no adverse effect is anticipated on the water regime of the area.

IS 10 500 - 1944

S.No.	Characteristic	Desirable Limit	Maximum Permissible Limit
1	Colour	5	25
2	Order & Taste	Un Objectionable	
3	Turbidity	5 NTU	10 NTU
4	pH Value	6.5 to 8.5	No Relaxation
5	TDS	500 mg. per ltr.	2000 mg. per ltr.
6	Total Hardness	300 mg. per ltr.	600 mg. Per ltr.



iv) Noise Levels

The blasting and the haulage and the drilling of boreholes generate Noise. However, the probable noise level will be within the permissible limits and will not cause harm the applicant will provide suitable protective gear to the workers for minimizing the noise pollution and the machinery will be well maintained. The noise levels for various activities are

1. Compressor - 84 to 98 dB(A)
2. Tipper Empty - 88 to 91 dB(A),
Tipper Loaded - 95-103 dB(A)
3. Poclaim - 90 to 96 dB(A)
4. Blasting - 89 to 95 dB(A)

PERMISSIBLE NOISE EXPOSURE FOR DIFFERENT PERIOD OF TIME IS GIVEN BELOW

Duration Per Day (Hrs)	Sound Level Dba
16	80
8	85
4	90
2	95
1	100
1/2	105
1/4	110
1/8	115

The haulage, machinery and the drilling of drill holes generate Noise. However, the probable noise level will be within the permissible limits with in 100 d B (A) and will not cause harm.

- The machinery will be maintained properly to reduce the noise
- The protective noise reducing gear like earmuffs, the company will provide earplugs.
- Proper maintenance of equipment

v) Vibration Levels

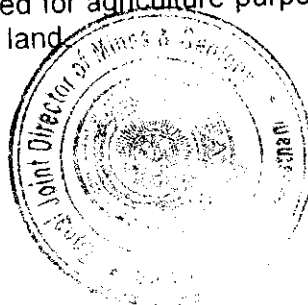
It is proposed to use low explosives and less quantity to minimise the effects so that the vibration generated will be feeble within 8 Hz

vi) Aesthetic Environment

There is no aesthetic environment prevailing in and around the applied area.

vii) Soil and Land Use Pattern

The soil cover is absent in the high-elevated areas. However, soil mixed with boulders, which are unfertile, is deposited along the east margin of the lease area. Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land.



- viii) Agriculture
The applied area is barren land and far away from agricultural lands. Therefore there is no adverse effect on agriculture.
- ix) Forest
The applied area is not coming under forest zone. However, the applicant is proposing to undertake afforestation in the area.
- x) Vegetation
The applied area is covered with scattered vegetation of small shrubs, herbs and Thorny bushes. However, no cutting of trees is involved in mining activity.
- xi) Socio Economic Environment
5 villages within a distance of 2 Kms surround the applied area. The main occupation of villagers is agriculture and sheep rearing. The commencement of mining activity in this area improves the socio-economic status of the local people by creation of employment.
- xii) Occupation Health and Safety
The mining in this area does not involve any hazardous methods. The mining is simple and open cast mining method. In this the possibilities of small injuries is anticipated. This applicant will be providing First Aid facilities at quarry site.
- xiii) Human Settlement
The nearest village Gopalapuram is situated 2 Km from the area. Therefore there is no anticipation of adverse affect on the human settlement.
- xiv) Recreational Facility
The surrounding villages people will go to Tekkali Town for purchases, medical & recreation.

8.3 Management Plan

1. Soil Conservation Methods

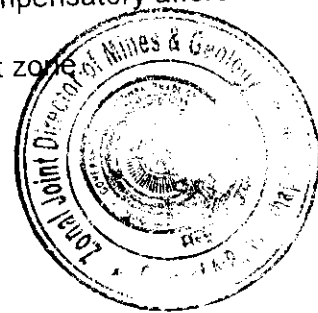
The soil cover is absent. However, soil mixed with boulders is unfertile, Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land

2. Proposed for Reclamation of Land affected by Mining activity during and at the end of mining

Even after end of the lease period (15 Years) the hill remains except the reduction of elevation and slopes by the pits that will be formed along the Eastern margin.

3. In case of forest programme for phased compensatory afforestation

The applied area will not come under forest zone



4. Measures for Dust Suppression

The mining will not involve dust rising methods. The dust anticipated during dry seasons, by transportation on road will however be suppressed by sprinkling water on roads. For this purpose, tractor mounted sprinklings will be deployed at this place. The dust rises during blasting will be negligible because of less production and rare blasting.

5. Measures to minimum use vibrations due to blasting and check noise pollution

It is proposed to use low explosive and less quantity to meet the production requirement and also to minimize the affects & feeble vibration generated during blasting.

The noise generated by compressors, drilling & machinery like proclain / excavators and tippers will be high. The workers in the quarry area will be provided suitable headgear and noise reducing protective gear (like cotton mufflers etc.)

6. Treatment and disposal of water from the mine at beneficiation plant
Granite Mines does not require beneficiation.

7. Measures for minimising adverse effect on water regime

No Streams or Drainage lines exist in and around Quarry Lease area. In this area, the mining is confined to elevated place. Therefore no adverse effect is anticipated to water regime

8. Afforestation Programme

Since the entire Quarry Lease area is occupied by the deposit except along the Eastern margin of the applied area (Buffer Zone) with soil mixed with boulders is deposited Afforestation program is proposed in the land procured by the firm by planting suitable type with 2 M spacing. (Plate V).

9. Preparation of dumping ground for stacking toxic mineral substance

No toxic minerals are present

9.0 ANY OTHER RELEVANT INFORMATION

All the statutory provisions applicable to granite mining leases, such as Mines & Mineral Concessional Rules, Granite Conservation and Development Rules 1999, Mineral and Mining Rules, Indian Explosive Act, Payment and Wage Act, Workmen Welfare Act, Employees Provident Fund Act shall be adhered.



RQP
(Signature)
(V. T. CHANDER)

LESSEE
(Signature)
APPROVED
(Signature)
ZONAL JOINT DIRECTOR OF
MINES AND GEOLOGY
GOVT. OF A.P.
VISAKHAPATNAM

This Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No. 988 (M.P.L.S. dated 5.9.05)

OFFICE OF THE ASSISTANT DIRECTOR OF MINES & GEOLOGY, TELUKAJI, SRIKAKULAM DISTRICT
M. Kousalya Enterprises
Assistant Director

640-6673/1102 Ref: V.T. Chandrasekhar
Date: 13-07-2006

Proceedings No. 14300/2006

Subj: Mines & Quarries - Quarry lease for Colour Granite over an extent of 5,000 hectares in Survey No. 34 of Meerabalarada village, Tekkali Mandal, Srikakulam District - Previously executed by M/s Laksh Enterprises of Sri R. Saravanan on 24.4.2004 for a period of 20 years. Now transferred in favour of M/s Kousalya Enterprises, Propy. Smt V. Tulasaamma - for the unexpired period of the Quarry lease i.e. upto 23.4.2024 - Transfer of Lease Deed Executed - Order issued - Regarding.

- 1. Proceedings No. 14300-R1-1-2006 dt 17.5.2006 from the Director of Mines and Geology, Hyderabad
- 2. Letter dt. 14.7.2006 from M/s Kousalya Enterprises

ORDER

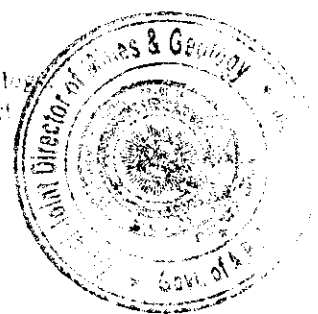
In the above cited quarry lease for Colour Granite held by M/s Laksh Enterprises, Proprietor Sri R. Saravanan, S/o P.E. Dharmudu, Dpor No. 16, Emay Nagar, Tekkali, Srikakulam District, over an extent of 5,000 hectares in Survey No. 34 of Meerabalarada village, Tekkali Mandal, Srikakulam District, was transferred in favour of M/s Kousalya Enterprises, Propy. Smt V. Tulasaamma, opposite to Ayyappaaswamy Temple, Adivarampeta, Balaganu, Srikakulam District, for the unexpired period of Quarry lease i.e. upto 23.4.2024.

Now, as per the above cited, the Transfer of Quarry Lease Deed in favour of M/s Kousalya Enterprises, Propy. Smt V. Tulasaamma, opposite to Ayyappaaswamy Temple, Adivarampeta, Balaganu, Srikakulam District, has been executed. All necessary documents are filed in the Department of Mines and Geology to execute the Transfer of Quarry Lease Deed in the subject area.

The Transfer of Quarry Lease Deed has been executed by the undersigned on 13-07-2006 for the unexpired period of the Quarry lease i.e. upto 23.4.2024.

In the above circumstances, M/s Kousalya Enterprises, Propy. Smt V. Tulasaamma, opposite to Ayyappaaswamy Temple, Adivarampeta, Balaganu, Srikakulam District, is hereby permitted to enter and work the Quarry lease for Colour Granite over an extent of 5,000 hectares in the subject area for the un-expired period of the Quarry lease (i.e. upto 23.4.2024) under the provisions of the Mines & Quarries Act, 1952 and the Mines & Quarries (Consolidation & Development) Rules, 1952 and the Mines & Quarries (Transfer of Lease Deed) Rules, 1952.

[Signature]
Assistant Director of Mines & Geology,
Telukaji, Srikakulam District



To
M/s Kousalya Enterprises
Propy. Smt V. Tulasaamma
Opposite to Ayyappaaswamy Temple,
Adivarampeta, Balaganu, Srikakulam District - 531102

- Copy submitted to:
- 1. The Director of Mines & Geology, Hyderabad for the purpose of information
 - 2. The Deputy Director of Mines & Geology, Telukaji for the purpose of information
 - 3. The District Collector, Srikakulam for the purpose of information
 - 4. The Revenue District Officer, Tekkali for the purpose of information
 - 5. The Mandal Revenue Officer, Tekkali for the purpose of information

GOVERNMENT OF ANDHRA PRADESH
O/g. THE ZONAL JOINT DIRECTOR OF MINES AND GEOLOGY
VISAKHAPATNAM.

Dated: 5 - 06 - 2008.

Letter No. 498/MP/2008

From

N.Subrahmanyam M.Sc.,LL.B.,
Zonal Joint Director of Mines and Geology,
M.V.P Colony (Double Road),
Visakhapatnam.

To

M/s. Kousalya Enterprises
Prop: Smt.V.Tulasamma,
Opp. Ayyappaswamy Temple,
Palakonda Road, Balaga,
Srikakulam - 532 001

Sub: Mines and Quarries - Approval of Mining Plan for Colour Granite over an extent of 5.000 Hectares in Sy.No. 34, Meelisathivada (V), Tekkali (M) Srikakulam District - In favour of M/s. Kousalya Enterprises, Prop: Smt. V.Tulasamma - According Approved - Reg.

Ref: 1. Circular memo No. 28594/PII(RQP) 01, dated 31-10-2006 of the Director of Mines and Geology, Hyderabad.

2. Your letter dated: 29-01-2008.

3. This office Letter No. 498/MP/2008 dated: 28-06-2008.

4. Your letter dated. 21-08-2008 along with five fair copies of Draft Mining Plan.

.....

In exercise of the power conferred as per Sub-Rule 5 of Rule 17 of Granite Conservation and Development Rules 1999, I hereby approve the Mining Plan submitted by M/s.Kousalya Enterprises, Prop: Smt. V.Tulasamma for extraction of Colour Granite over an extent of 5.000 Hectares in Sy.No. 34, Meelisathivada (V), Tekkali (M) Srikakulam District. This approval is subject to the following conditions:

1. This Mining Plan is approved without prejudice to any other Laws applicable to the mine area from time to time whether made by the central Government, State Government or any other authority.
2. The approving authority does not owe the responsibility with regard to assessment of the reserves, erroneous certification made by the RQP if any and the approval is tentative subject to modifications on any new findings at a later date.

Yours faithfully,



Zonal Joint Director of Mines and Geology,
Visakhapatnam.

Copy to Sri V. T. Chander, RQP., House No. 10-1, Flat No. 202, Mahalaxmi Ganapathi Complex, P&T Colony, Diluknagar, Hyderabad - 500 060.
Copy to the Regional Controller of Mine, IBM Sultan Bazar, Hyderabad
Copy to Director of Mines safety, Hyderabad
Copy submitted to the Director of Mines and Geology, Hyderabad for favour of information