

MINING PLAN FOR COLOURED GRANITE
Over an extent of 5.00 Hectares in Sy.No. 71
Lingalavalasa (V), Tekkali (M), Srikakulam District, A.P.

(Under Rule 17 of GCDR 1999)

For

M/s. Lakshmi Narasimha Enterprises
Srikakulam

12/05/2001



APPROVED

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.

☎ : 55618351, 24068218 ☎ : 31056234

CERTIFICATE

This is to certify that Mining Plan in respect of Quarry Lease area over an extent of Over an extent of 5.00 Hectares, Sy.No 71, Lingalavalasa (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 : 17TH MARCH 09

Place : SRIKAKULAM


For **M/s Lakashmi Narasimha Enterprises**
Srikakulam



CERTIFICATE

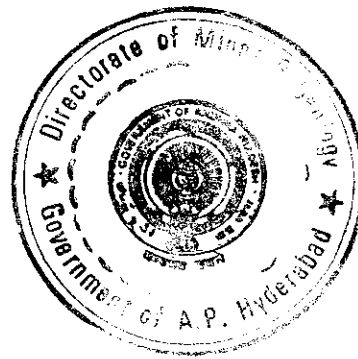
The provision of Granite Conservation and Development Rules 1999 have been observed in the Mining Lease of Coloured Granite, over extent of Over an extent of 5.00 Hectares, Sy.No 71, Lingalavalasa (V), Tekkali (M), Srikakulam Dist. Andhra Pradesh. For M/s Lakashmi Narasimha Enterprises, Srikakulam. Under Rule 17 of GCDR 1999.

Whenever specific permissions are required the applicant 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 : 15th Nov 2009

Place : Hyderabad



V.T. Chander
RQP 15/3

(V.T. Chander)

LIST OF PLATES

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III	GEOLOGICAL MAP	1: 1000
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V	MINE LAY OUT & YEAR WISE PRODUCTION PLAN & CROSS SECTION	1: 1000
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LIST OF ANNEXURES

- I Copy of the Notice No. 1798 / Q / 98 dated 19-06-1998.
- II Year Wise Production for 5 Years
- III Statement Showing last 5 years Production and Dispatch Details.



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Lingalavalasa (V), Tekkali (M), Srikakulam District, A.P.

(Under Rule 17 of GCDR 1999)

For

M/S Lakshmi Narasimha Enterprises
Srikakulam

By

V.T Chander
Consultant Geologist & RQP

This Mining Plan is Approved subject to the
Conditions/Stipulations Indicated in the
Mining Plan Approval Letter No.
2632/MP/1/04, dated 05-2004

INTRODUCTION


M/s. Lakshmi Narasimha Enterprises, Srikakulam a Private Limited was granted Quarry Lease for 15 Years for Colour Granite over an extent of 15.00 Hectares Spread Over in Sy. No. 1 of Addukonda Village, Tekkali Mandal, Srikakulam District, Andhra Pradesh Vide Director, Department of Mines and Geology, Hyderabad. Proceedings No. 19070 / R1-3B / 97 dated 29-04-1998. The lease deed was executed on 26-06-1998 and permission was granted by the Asst. Director, Mines and Geology, Srikakulam Vide No.1793/Q/98 dated 19-06-1998 to commence quarry operations.

As per the GCDR Rule 17 of 1999, all the owners of the existing quarries required to submit the mining plan to the Director of Mines & Geology, Hyderabad. For approval within stipulated time

M/s. Lakshmi Narasimha 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, GCDR Rules 1999, for the existing quarry



APPROVED


Dr. P. DAYASANKAR
JOINT DIRECTOR
DEPT. OF MINES & GEOLOGY
GOVT. OF A.P., HYDERABAD.

1.0 GENERAL

- a) Name of the applicant : M/s. Lakshmi Narasimha Enterprises
C/o. Sri. T. Vaikunta Rao,
Plot No. 5,
Vysya Bank Colony,
Srikakulam.
- b) Status of applicant : Private Firm
- c) Granite Type / Colour : Colour Granite
- d) Period of Quarry Lease granted: 15 Years (For the period from 19 - 6 - 98
to 19 - 6 - 2013).
- e) Name and address of the RQP who prepared the prospecting report : V.T. Chander
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.
☎ : 55618351, 24068218
☎ : 31056234

RQP Registration No. RQP/DMG/HYD/02/2001

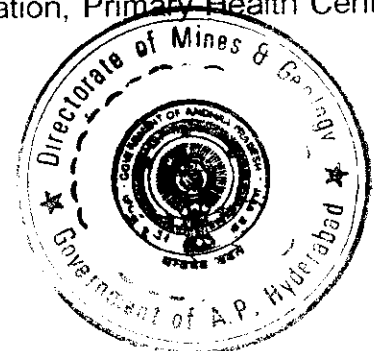
2.0 LOCATION AND ACCESSIBILITY

- a) Location Map : Location Map Enclosed as Plate - I
- b) Details of Area : Survey of India Toposheet No.74 B/2 and is
bounded East Longitude 84° – 10' – 04" and North
Latitude 17° – 36' – 36".

District State	Mandal	Village	Sy.No.	Extent	Type of Land	ADMG Surveyed Map
Srikakulam Andhra Pradesh	Tekkali	Lingalavalasa	71	5.00	GL	Enclosed as Plate - II

Infrastructure and Communication

- The applied area is 5 Km North West of Tekkali. The area can be approached by road from Tekkali –Temburu will lead to Site.
- Amenities like Post & Telegraph Office, Police Station, Primary Health Center etc. are available at Tekkali.
- Tekkali is the Mandal Head Quarters.



PHOTOGRAPH SHOWING THE VIEW OF THE FACE DEVELOPED



PHOTOGRAPH SHOWING THE RECOVERY OF BLOCKS AND WASTAGE



- Vishakapatnam Port is about 150 Km from area.
- Electricity is available at the Quarry area. The area is having good Ground Water Potential.
- The Ground Water level is about 6 - 7.0 M below ground level at the foothill.

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.

Boundaries

North	M/s. Ganesh Gayathri Granites & M/s. Annan Granites
South	M/s. Karunai Granites
East	Barren Lands
West	Blue Rock International Incorporation

3.0 GEOLOGY

3.1 Brief Description of Topography

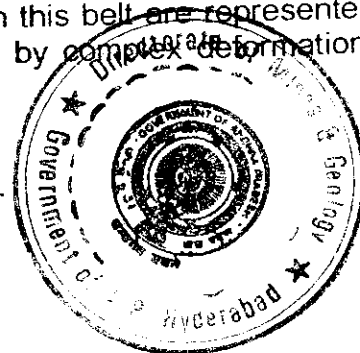
The Quarry area is located on hill steeply sloping due North & South . the relief of the area is 45 M. Vegetation is developed in between the joints and soil areas. The area is unfit for agriculture as it is strewn with boulders.

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 20Km 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 - Kondalite 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. Two 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 wide 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

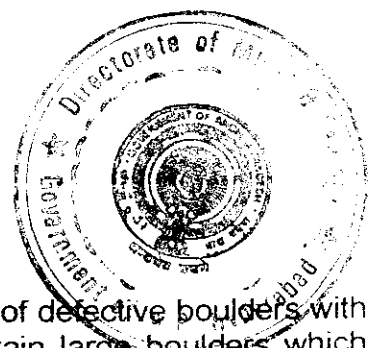
The Migmatites and Migmatized Charnockite deposits are commercially known as "Srikakulam Blue". The Migmatite essentially consists of Blue Quartz and Bluish Grey to Light Grey Felspar with accessory minerals like Hypersthene, Hornblende and Biotite. The rock displays wavy banding, pygmatic folding of 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.

Three sets of major joints :

1. E - W
2. N 30 °W - S 30° E
3. N 40 ° W - S 40° E

About the Deposit

The Western position of the leased area is found to be more of defective boulders with huge quantity of soil creep. The Eastern position has certain large boulders which may yeild sizable economic grade blocks.



4.0 EXPLORATION

4.1 Present Status

The Mining Plan is prepared for the existing Granite Mine under operation Since 1998, by M/s Lakshmi Narasimha enterprises, Srikakulam.

The lease was granted vide Proc No 1793/Q/98 dated 19-6-1998 for a period of 15 years.

The Mine is in operation since 1999. In the quarry pits of 80 x 25 x 5 M, 80 x 20 x 5 M, a total of 18,224 M³ rock mass was retrieved from mother rock and after primary cutting and dressing 4,781 M³ of economic grade rough blocks (Gang Saw) were reported to be recovered and dispatched showing the recovery percentage of about 25.

The following machinery was used :

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

The details of Production Pits

S.No.	Dimensions (M)	Volume of Material Excavated (M ³)	Lithology	Remarks
1.	80 x 25 x 5	10,000	0 - 1.5 M	Weathered & Jointed Rock with Soil Creep
			1.5 - 5 M	Large Sized Boulders with Soil Creep
2.	80 x 20 x 5	8,000	0 - 1.5 M	Weathered & Jointed Rock with Soil Creep
			1.5 - 5 M	Large Sized Boulders with Soil Creep

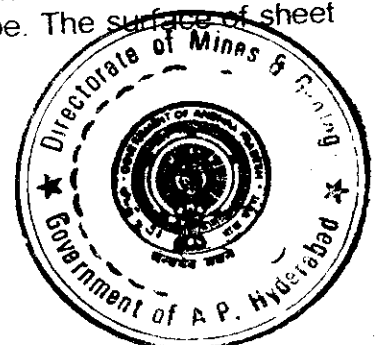
4.2 Future Programme

Since the deposit is proved no further exploratory programme is recommended. Only quarrying the economic grade rough blocks (discussed in the following chapters).

5.0 RESERVES

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.



Method of Estimation of Reserves

The exposed deposit is found to be irregular in shape as it is exposed on hill, the volume is computed by cross sectional area method by drawing 9 cross sections perpendicular to the strike direction.

Categorization of Reserves

The deposit exposed on the surface and RL 70 to RL 115 in section A – B is classified under "Proved". The total rock mass in the lease area is worked out to be 22,00,865.2 M³. After deducting the deposit blocked under Safety Slopes (4,23,375.2 M³) balance rock mass is 17,77,490 M³.

Reserve Estimation

Section	Sectional Area (M ²)	Sectional Influence (M)	Volume of Rock Mass (M ³)
A – A1	2324.6	56	1,30,177.6
B – B1	3576.0	56	2,00,256.0
C – C1	5956.3	56	3,33,552.8
D – D1	5310.1	56	2,97,365.6
E – E1	4541.7	56	2,54,335.2
F – F1	2769.1	56	1,55,069.6
G – G1	2338.0	56	1,30,928.0
H – H1	2319.6	56	1,29,897.6
I – I1	2145.7	68	1,45,907.6
Total :			17,77,490.0



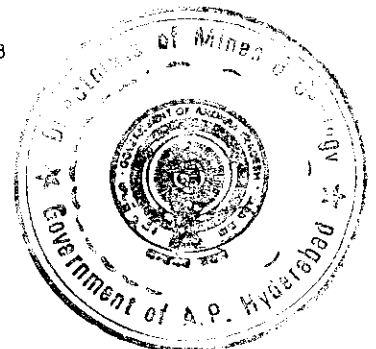
Reserves Blocked Under 60° Safety Slopes

Section	Along	Section Area (M ²)	Sectional Influence (M)	Volume (M ³)
A - A1	A	313.7	56	17,567.2
	A1	650.2	56	36,411.2
B - B1	B	461.1	56	25,821.6
	B1	352.5	56	19,740.0
C - C1	C	583.6	56	32,681.6
	C1	645.2	56	36,131.2
D - D1	D	461.1	56	25,821.6
	D1	520.3	56	29,136.8
E - E1	E	720.5	56	40,348.0
	E1	410.5	56	22,988.0
F - F1	F	461.1	56	25,821.6
	F1	352.5	56	19,740.0
G - G1	G	097.4	56	05,454.4
	G1	352.5	56	19,740.0
H - H1	H	043.4	56	02,430.4
	H1	460.5	56	25,788.0
I - I1	I	094.7	68	06,439.6
	I1	460.5	68	31,314.0
Total Geological Reserves Blocked :				4,23,375.2

Total Mineable Reserves

The deposit blocked under safety slopes are not available for mining. Deduction of reserves blocked above from total geological reserves indicate total mineable reserves, which are as follow :

$$\begin{aligned}
 \text{Total Deposit Blocked} &= 7,97,562 \text{ M}^3 \\
 \text{Total Mineable Reserves} &= \text{Total Geological Reserves} - \text{Deposit Blocked Under Safety Slopes} \\
 &= 22,00,865.2 \text{ M}^3 - 4,23,375.2 \text{ M}^3 \\
 &= 17,77,490 \text{ M}^3
 \end{aligned}$$



Further the Rock Mass in the section I – I1 area in the west margin is highly defective which has to be deducted from the total Rock Mass i.e., 1,45,907.6 M³.

$$= 17,77,490 \text{ M}^3 - 1,45,907.6 \text{ M}^3$$

$$= 16,31,582.4 \text{ M}^3$$

From the total mass of 16,31,582.4 M³ of Rock Mass. 60% of the material is Soil Creep and Defective material.

$$= 16,31,582.4 @ 60\%$$

$$= 9,78,949.44 \text{ M}^3$$

The balance of 40% i.e., 6,52,633 M³ is the deposit from this only 40% can be recovered = 2,61,053.2 M³.

$$\text{Life of the Mine} = 2,61,053 / 3000$$

$$= 87 \text{ Years}$$

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, Exploratory mining carried out in applied area revealed 25% of recovery of 1.2 Cu.M (gang saw). As percentage of recovery would increase to 40%, therefore,

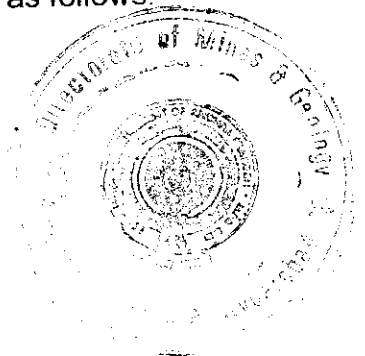
$$\text{Economic Marketable Reserves} = 2,61,053.2 \text{ M}^3$$

6.0 MINING

The Quarry is in operation since 1999.

During 1999 – 2003

- Total number of 2 pits were excavated
- Total 18,224 M³ rock retrieved from the Quarry during last 4 years.
- @ 25% recovery 4,781 M³ total commercial grade blocks were obtained.
- During the Mining Operation in last 4 years a total of 13,443 M³ of waste rock was generated.
- During the last 5 years the Explosive material consumed is as follows:-
- Safety Fuse 1,675.2 Mtrs



Man Power

- Mines Manager 1 No
- Skilled 4 No's
- Excavator Operators 2 No's.
- Compressors Operators 2 No's
- Tipper Drivers 2 No's.
- Helpers 6 No's.
- Daily Waged 10 No's
- Watch & Ward 1 No.
- To retrieve 4,781 M³ of Market Rough Blocks in the last five years

Machinery Deployed

- Excavator 2 No's.
- Air Compressors 2 No's
- Tippers 2 No's.

A) Type of Mining :

Quarrying of Colour Granite in the existing Quarry by Open Cast semi-mechanised method.

B) Mining Operations Carried Out :

The deposit was occurring 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 :

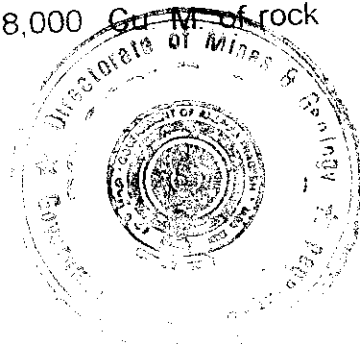
- Clearing of bushes on the deposit, removal of soil cover and small floating boulders.
- Laying of roads on the deposit and developing the infrastructure near the quarry site, such as Shelters, office Room, Lavatory, drilling of Bore well for drinking water etc.
- Deployment of excavator for removal of over burden and boulders

PIT No 1

The mining operations were carried out starting from North of the lease area towards South directions. A pit of 5 Mtrs was developed in 80 x 25 dimensional area from which 10,000 Cu. M. of rock was retrieved from this pit.

PIT No 2

The quarrying operation started from North and advanced further South direction. A pit of 80 x 20 was developed with a height of 5 Mtrs. A total of 8,000 Cu. M. of rock mass was retrieved.



6.1 DETAILS OF PRODUCTION SO FAR MINED FROM THE BEGINNING OF THE QUARRY

Details Furnished in Annexure III

6.2 MINING PROGRAMME FOR THE NEXT 5 YEARS

Brief description of method of future Mining

a) Over Burden Removal

During the next five years the mining will continue in the existing quarry only. No overburden is anticipated

a) Primary Splitting

The excavator will remove the under sized weathered and defective boulders and hauled to dumping yard.

The large sized boulders will be subjected to splitting with the help of Jack hammers drilling holes vertically and where ever required horizontally also and the block is separated.

The benches of 3 – 6 M will be developed. The drill holes will be drilled closely at regular intervals of 30 – 40 Cm apart and the holes are charged with special gelatin and blasted to form a crack connecting all the drill holes releasing the block from the mother rock.

b) Secondary Splitting

The block separated from the boulder will be keenly examined for defects like hairline fractures, patches, lines and other defects. Depending on the disposition of these defects, it will be planed to separate these defects and the area will be marked for secondary splitting using drill holes/feathering & wedging and hammering. By this method rough blocks of even shaped will be recovered.

c) Dressing

Dressing is the final phase wherein the secondary rough blocks are squared into perfect rectangular shape i.e. all the sides will have 90° angle. These blocks will be made into different sizes for marketability using jackhammers, feathers and wedges and sledgehammers.

b) Drilling & Blasting

Drill hole pattern for primary and secondary smooth blasting holes of 3 M depth will be drilled in a single row with spacing of less than 0.3Mts and burden of 1.6Mts or more shall be maintained uniformly. This arrangement will yield rock size of 3 M x 2 M cross section. A bench height of 6.0 M will be tackled in two steps.



Drilling Parameters

- i) Drill hole diameter 32 MM up to 3 M Long
- ii) Depth and inclination of drill hole

Generally drilled vertically in an alignment, however in primary cutting in the absence of sheet joints to develop bottom level horizontal holes also will be drilled.

- iii) Spacing and Burden

The spacing shall be about 0.1M to 0.3M from hole to hole and burden goes up to 1.6Mt for the splitting of the rock.

- iv) Stemming & Charging of Bore Hole

Gun Powder is used.

- v) Explosive Type

Wherever required gunpowder is used for splitting the block, special gelatin along with electric detonator also used, if necessary.

- vi) Quantity of Explosive used

Blasting is occasionally using gunpowder after full development resorted mine 500 Kgs per month special gelatin may be required.

6.3 Scheme of Mining & Year Wise Production

During mining operations the applicant proposes to produce 1,032 M³ of Coloured granite per year @ 40% recovery. (As the mining proposed is in the existing quarry area, the recovery % is likely to increase) In order to produce this quantity an area of 2,200 Sq. Mts. will be utilized.

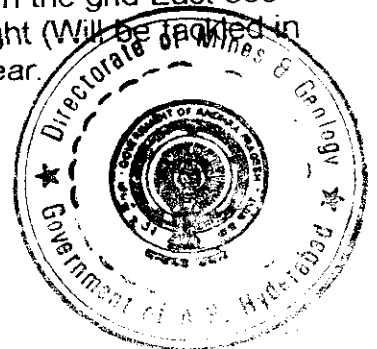
Ist Year

The mining operations start from the existing pit, located in the grid East 800 - 900 and North 200 - 400 forming a bench height of 6 M (Will be tackled in two stages) and the bench will advance towards from western end of the pit towards West. During the first year a total area of 400 Sq. Mts. will be utilized.

In the First year it is planed to produce 960 M³ of economic grade rough blocks. To produce this quantity an area of 400 (20 x 20 M) Sq. Mts. will be utilised. Producing 2400 Cu. M. of rock from which 40% (960 Cu. M.) economic grade rough blocks will be obtained and 60% (1,440 Cu. M.) of waste rock will be realised.

IInd Year

In the 2nd year the mining advances below the first year working in the grid East 800 - 900 and North 200 - 400 maintaining average of 6 M bench Height (Will be tackled in two stages). An area of 400 Sq. Mts. will be covered during this year.



In the **Second year** it is planned to produce 960 M³ of economic grade rough blocks. To produce this quantity an area of 400 (20 x 20 M) Sq. Mts. will be utilised. Producing 2,400 Cu. M. of rock from which 40% (960 Cu. M.) Economic grade rough blocks will be obtained and 60% (1,440 Cu. M) of waste rock will be realised.

IIIrd Year

In the 3rd year the mining will start South of previous years working between grids East 800 - 1000, North 200 - 300 advances further South maintaining average of 6 M bench Height (Will be tackled in two stages). An area of 500 Sq. Mts. will be covered during this year.

In the **third year** it is planned to produce 1,080 M³ of economic grade rough blocks. To produce this quantity an area of 500 (20 x 25 M) Sq. Mts. will be utilised. Producing 3,000 Cu. M. of rock from which 40% (1,080 Cu. M.) economic grade rough blocks will be obtained and 60% (1,920 Cu. M.) of waste rock will be realised.

IVth Year

In the 4th year the mining will continue below the third year pit in the grids East 800 - 1000 & North 200 - 300. Maintaining average of 6 M bench Height (Will be tackled in two stages). An area of 400 Sq. Mts. will be covered during this year

In the **fourth year** it is planned to produce 1,080 M³ of economic grade rough blocks. To produce this quantity an area of 400 (20 x 25 M) Sq. Mts. will be utilised. Producing 3,000 Cu. M. of rock from which 40% (1,080 Cu. M.) economic grade rough blocks will be obtained and 60% (1,920 Cu. M.) of waste rock will be realized

Vth Year

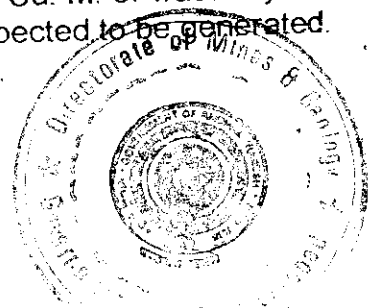
In the 5th year the mining will continue South of 3rd & 4th year pit in the grids East 800 - 1000 & North 200 - 300. North oriented faces advance further South maintaining average of 6 M bench Height (Will be tackled in two stages). An area of 500 Sq.M will be covered during this year

In the **fifth year** it is planned to produce 1,080 M³ of economic grade rough blocks. To produce this quantity an area of 500 (20 x 25 M) Sq. Mts. will be utilised. Producing 3,000 Cu. M. of rock from which 40% (1,080 Cu. M.) economic grade rough blocks will be obtained and 60% (1,920 Cu. M.) of waste rock will be realised.

The mine layout for production of coloured granite rough blocks first five years is showed in Plates - V & VI.

a) Quantum of Excavation

In the next five years it is proposed to produce a total of 5,160 Cu. M. of commercial grade rough blocks to obtain this at the rate of 40% recovery, a huge mass of rock waste will be generated. It is estimated that a total of 8,640 Cu.M waste will be generated for the next 5 years period with an average of 1,612 Cu. M. of waste / year. Since this is an operating mine not much of the overburden expected to be generated.



b) **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 1,032 Cu. M. per year can be easily achieved in a single shift with existing men and machinery.

c) **Magazine Type and Capacity**

The District Administration does not permit for possession of Magazine.

d) **Cycle of Operation**

Development

- Excavators will clear the rubble and pave way for ramp / approach road and to expose the boulders.
- Excavators will role down the defective and undersized boulders.

Production

- The boulders will be split with help of Jack Hammers and wedged out.
- The excavator will roll the boulder to dressing yard.
- The tippers will remove the muck and undersized boulders to the waste dump.

Dressing

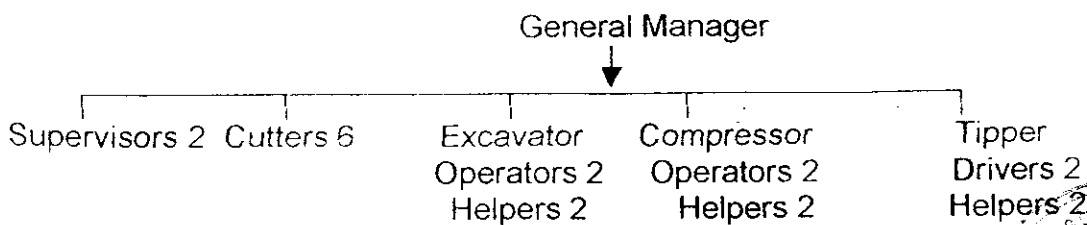
- Primary blocks will be resorted to drilling and hammering to square the blocks.
- The blocks after dressing will be transported by trucks to the destination.
- The process continuous.

e) **Description of Processing Plant**

The applicant does not possess Granite Processing Plant.

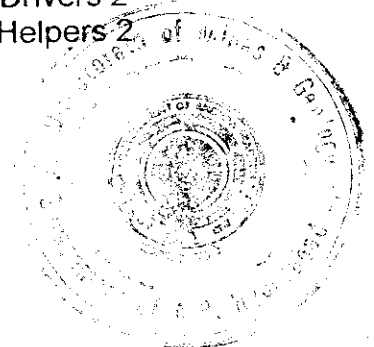
f) **Organizational Chart**

The organogram of the quarry in this area is as follows :



Besides above managerial and skilled staff

- Un-skilled of about 30 members



g) **Site Services**

Rest Rooms, First Aid Room, Shelters, Lavatory. Bore well for Drinking water are available at Quarry Site.

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 8,640 M³ of waste is expected to be generated with an average of 1,612 M³ per annum. The year wise waste generation in 5 years is as follows:

Year	Waste Generation in M ³
i	1440 M ³
ii	1440 M ³
III	1920 M ³
IV	1920 M ³
V	1920 M ³

- ii) **Dumping Site Particulars :**

For dumping of waste generated during mining will be dumped on the existing dump.

- iii) **Estimated Waste Quantity that will be generated in the Entire Period :**

At the rate of 1,612 M³ per year the volume of waste generated in balance lease period i.e. 10 years is estimated to be 16,120 Cu.M.

- iv) **Utilisation of Waste if not Prevented :**

- o Soil can be utilised for reclamation of degraded area.
- o Weathered rock if it is sufficiently soft and devoid of rock fragments can be utilised for roads, filling of road side ditches, formation of approach roads to quarries, construction works etc.
- o Large and medium sized waste rock can be used as revetment for deep cut stream sections from preventing from soil erosion.
- o 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 Base Line Information

i) Existing Land Use Pattern

The applied area is hill land. The land is steeply sloping due West and East. The whole land is covered by sparse vegetation. The soil existing in the applied area is bouldery and unfertile. The deposit is exposed 35 M above GL and occupies entire quarry lease area.

ii) Water Regime

No permanent Streams or Drainage lines exist in the Quarry Lease area. A tank is located 500 M South of the hill in Lingalavalasa village limits.

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 it 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 human settlements located around the lease area are

S. No.	Habitation	Direction & Distance	Population
1	Lingalavalsa	1 Km SW	750
2	Sathewada	1 Km NE	300
3	Bajarampuram	2 Km NW	750
4	Laxmipuram	1.75 Km SE	2,500
5	Polavaram	1.75 Km SE	1,000



vii) Public Buildings, Places & Monuments

No public buildings important places and monuments are seen in and around the area.

viii) Does area (Partly or Fully) fall under notified area under water (Prevention and Control of Pollution) Act 1974.

Not Applicable

8.2 Environmental Impact Assessment

1) Land Scape Changes

The mineral deposit is exposed raising 35 M above GL. In 5 years plan period it is proposed to produce 14300 M³ of rough blocks. To meet this production an area of 2200 Sq. M. will be utilized. The mining will alter the shape of the present hill with the quarry pits.

2) Aesthetic Environment

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

3) Soil and Land Use Pattern

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

4) Agriculture

The applied area is barren land and far away from agricultural lands. Therefore there is no adverse effect on agriculture.

5) Forest

The applied area is not coming under forest zone. However, the applicant is proposing to undertake afforestation in the area.

6) Vegetation

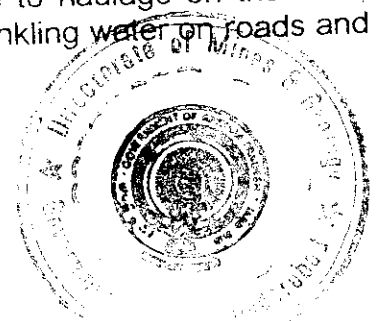
The applied area barren hill with an exception of small shrubs, herbs and Thorny bushes grown along the interspaces of boulders and joints where some soil exists.

7) Water Environment

No Streams or Drainage lines exist in and around Quarry Lease area.

8) 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

- 9) 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.

- 10) 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
½	105
¼	110
1/8	115

The blasting, 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

11) 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

12) Aesthetic Environment

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

13) Soil and Land Use Pattern

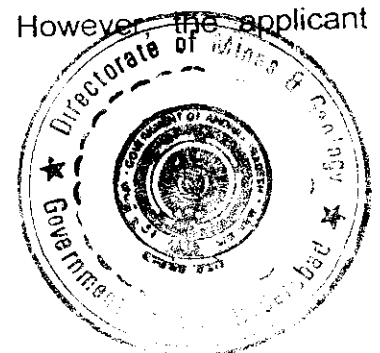
The soil cover is absent in the high-elevated areas. However, soil mixed with boulders, which are unfertile, is deposited along the east margin of the lease area. Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land.

14) Agriculture

The applied area is barren land and far away from agricultural lands. Therefore there is no adverse effect on agriculture.

15) Forest

The applied area is not coming under forest zone. However, the applicant is proposing to undertake afforestation in the area.



16) 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.

17) 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.

18) 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.

19) Human Settlement

The nearest village Lingalavalasa is situated 1 Km from the area. Therefore there is no anticipation of adverse affect on the human settlement.

20) Recreational Facility

The surrounding villages people will go Tekkali Town for purchases, medical & recreation.

8.3 MANAGEMENT PLAN

1. Soil Conservation Methods

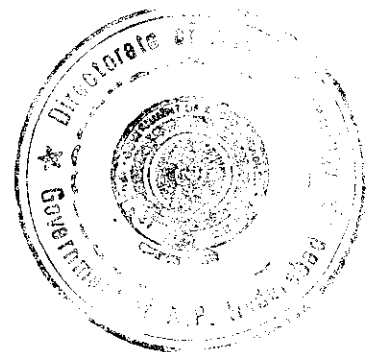
The fertile soil available will be used for plantation around site services on dumps and all along the road. Soil mixed with boulders is unfertile which will be used for laying roads.

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

Even after 20 years the hill remains except the reduction of elevation and slopes by the pits that will be formed.

3. In case of forest programme for phased compensatory afforestation :

The applied area will not come under forest zone.



Mining Plan Approval Letter No.....

...2432/MPT/2004, dated 10.5.2004

4. Measures for Dust Suppression :

The mining will involve dust rising methods. The dust anticipated during dry seasons, due to haulage will be suppressed by sprinkling water. For this purpose, tractor mounted sprinkler will be deployed. The dust generated during the drilling will be suppressed by covering the drill rods by gunny cloth and dust extractors will also be deployed

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

The blasting is minimum. It is proposed to use low explosive and less quantity to meet the production requirement.

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.)

The machinery will be maintained properly for minimizing the noise

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 the Quarry Lease area. The mining is confined to elevated place. Therefore no adverse effect is anticipated to water regime

8. Afforestation Programme :

The area that is not suitable for mining that is the Western part of the lease area. Phased plantation will be taken up in this area. The plantation will also be taken up at the site services, office and on both sides of road.

9. Preparation of dumping ground for stacking toxic mineral substance :

No toxic minerals are present

9.0 ANY OTHER 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.

For M/s Lakshmi Narasimha Enterprises

APPROVED

[Signature]
1373
RQP
(V.T. Chander)



[Signature]
Dr. P. DAYASANKAR
JOINT DIRECTOR
DEPT. OF MINES & GEOLOGY
GOVT. OF A.P., HYDERABAD,

ANNEXURE-I

Government of Andhra Pradesh
Department of Mines and Geology.

Proceedings of Asst. Director of Mines and Geology, Srikakulam.

(Present: Sri D. Santhappa, M.Sc.,)
Asst. Director.

Proceedings No.1793/Q/98,

Dated 16-6-98.

Sub: MINES AND QUARRIES - Quarry Lease for colour granite over an extent of 5-00 Hectares in S.No.71 of Lingalavalasa Village, Tekkali Mandal, Srikakulam Dist. - Granted in favour of M/s Lakshmi Narasimha Enterprises Execution of Quarry Lease - Work Orders - Issued - Regarding.

- Ref: 1.Proc.No.19070/R1-SB/97, d.29-6-98 from the Director of Mines and Geology, Hyderabad.
2.D.Dis.4613/97, d.3-11-97 from the Dt. Collector, Srikakulam.
3.Letter dt.26-6-98 from M/s Lakshmi Narasimha Enterprises, Srikakulam.

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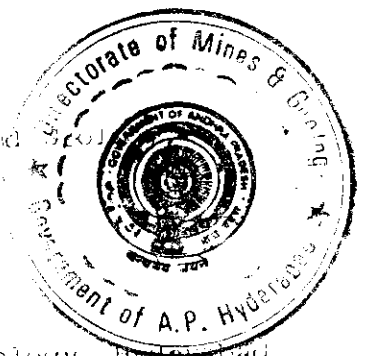
ORDER

The Quarry Lease granted in favour of M/s Lakshmi Narasimha Enterprises, Srikakulam for colour granite in S.No.71 of Lingalavalasa Village, Tekkali Mandal, Srikakulam District over an extent of 5-00 Hec., for a period of 15 years has been executed on 16-6-98 by the undersigned. The Quarry Lease is valid for a period of 15 years from 16-6-98 to 16-2013.

M/s Lakshmi Narasimha Enterprises, Srikakulam is hereby permitted to enter and work the quarry area under the provisions of A.P.M.N.C.Rules, 1966 and conditions laid down in G.O.No.317, Industries and Commerce Department, 18-9-7-92 and subsequent instructions issued on the matter from time to time. The Asst lessee should submit the Quarterly Returns to the Asst. Director of Mines and Geology, Srikakulam, the Dy. Director of Mines and Geology, Visakhapatnam and the Director of Mines and Geology, Hyderabad. This work order is issued subject to the condition that the Government reserve the right to cancel the quarry lease granted and executed under A.P.M.N.C.Rules, 1966 without assigning any reasons and giving notice and the conditions imposed in the grant order and Appendix.

Asst. Director of Mines and Geology,
Srikakulam.

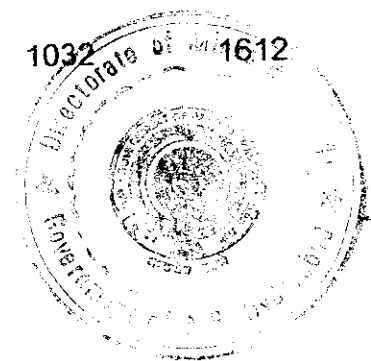
To
M/s Lakshmi Narasimha Enterprises,
c/o Sri V. Venkunta Rao,
Plot No.5, Vysya Bank Colony,
S R I K A K U L A M.



- Copy submitted to the Director of Mines and Geology, Hyderabad for favour of information.
Copy submitted to the Dy. Director of Mines and Geology, Visakhapatnam for favour of information.
Copy submitted to the Dt. Collector, Srikakulam for favour of information.
Copy submitted to the Chief Executive Officer, Z.P., Srikakulam for favour of information.
Copy submitted to the Revenue Divisional Officer, Tekkali for favour of information.
Copy to the Mandal Revenue Officer, Tekkali for information.
Copy to the Mandal Development Officer, Tekkali for information.
Copy to the Sarpanch, Lingalavalasa (V) Tekkali (M) for information.

ANNEXURE II

YEAR	L x W x BENCH M M M HEIGHT	VOLUME IN M ³	MARKET GRADE ROUGH BLOCKS WITH 40%	WASTE GENERATED IN M ³
1 ST	20 x 20 x 6	2400	960	1440
2 ND	20 x 20 x 6	2400	960	1440
3 RD	20 x 25 x 6	3000	1080	1920
4 TH	20 x 25 x 6	3000	1080	1920
5 TH	20 x 25 x 6	3000	1080	1920
	TOTAL		5160	8640
	AVERAGE			



ANNEXURE - III

STATEMENT SHOWING LAST FOUR YEARS PRODUCTION
AND DESPATCH DETAILS

	YEAR	PRODUCTION	DESPATCH
1.	1999 to 2000	561.861	561.861
2.	2000 to 2001	1188.074	1188.074
3.	2001 to 2002	1085.387	1085.387
4.	2002 to 2003	1347.096	1347.096
5.	2003 to 2004	600.000	500.000
		-----	-----
		4782.418	4682.418
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