053

MINING PLAN

(Under Rule 18 of Granite Conservation and Development Rules 1999)

SONTINURU COLOUR GRANITE QUARRY

(6.0 Ha),
S.No.1-2 OF SONTINURU VILLAGE,
NANDIGAM MANDAL, SRIKAKULAM DIST.

OF

M/s. ISMA GRANITES

Door No.230/A4,V.T.Extension,
T.V.K.Nagar, Harur,
Dharmapuri Dist.,
TAMILNADU

Joint Director of Mines & Geology * Govt. of A.P., Visakhapatnam *

PREPARED BY

Dr. G. Prabhakar
Recognised Geologist
D.M.G. Reg.No. RQP/DMG/HYD/056/2002
I.B.M. Reg. No. RQP/IBM/HYD/226/2003/A

CERTIFICATE

The provisions of Granite Conservation and Development Rules, 1999 have been observed in the mining plan of Survey No.1-2 of Sontinuru Village, Nandigam Mandal, Srikakulam District, over an extent of 6.0 Ha. Has been duly prepared by Dr. G. Prabhakar RQP/DMG/HYD/056/2002 and we agree to follow the same in accordance to the Provision of Law.

Date : 30.10.07.

Place : Vishakapatnam

G.Prabhakar
RPB/IBM/HYD/226/2003/A

Zonal Joint Director of Mines & Geology * Govt. of A.P. Visakhapatnam

CERTIFICATE

This is to certify that the Mining Plan in respect of our Q.L. area for Colour Granite situated in Survey No.1-2 of Sontinuru Village, Nandigam Mandal, Srikakulam District. over an extent of 6.0 Hact. Has been duly prepared by Dr.G.Prabhakar RPB/IBM/HYD/226/2003/A and we agree to follow the same in accordance to the Provision of Law.

For ISMA GRANITES

Proprietor

Applicant

Date : 30.10.2007

Place : Visaka patnam.

Zonal Joint Director of Mines & Geology
Govt. of A.P., Visakhapatnam

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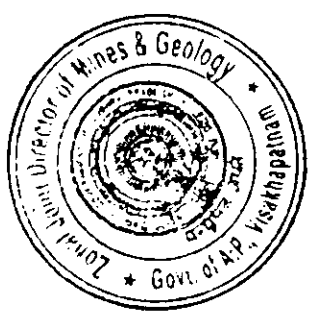

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MINING PLAN FOR SONTINURU COLOUR GRANITE QUARRY (6.0 HECTORS) OF M/s. ISMA GRANITES

INTRODUCTION:

This mining plan encompasses scientific and systematic assessment of the Colour Granite deposit and includes details of conservation of the deposit and the protection of environment in and around the mining area. M/s. Isma Granites is a granite company from Dharmapuri District, Tamilnadu. M/s. Isma Granites has applied Q.L. for Colour Granite occurring at Sy. No. 1-2 of Sontinuru Village, Nandigam Mandal, Srikakulam District over an extent of 6.0 hect.

The Director of Mines & Geology granted Q.L. for Colour Granite over an extent of 6.0 hect., in Sy. No. 1-2 of Sontinuru (V), Nandigam (M), Srikakulam Dist. In favour of M/s. Isma Granites vide proceedings No. 20888/R1-3/2004, dt: 14-09-2004 for a period of 20 years.

The Q.L. orders were executed Vide Proceedings No. 1376/Q/2004 on 25-09-2004 before the ADMG, Srikakulam, Srikakulam Dist. Since then the operations were under taken in these prospects (Annexure-IV).

The Director of Mines & Geology Hyderabad requested the applicant / company to submit for approval of Mining plan under rule 18 of GCDR, 1999. Accordingly the mining plan report prepared by RQP who is recognized by DMG Vid Reg. No. RQP/DMG/Hyd/056/2002, the present mining plan is prepared strictly adhering to the guidelines laid down by the DMG.

APPROVED

Zonal Joint Director
Mines and Geology
Govt of A.P
Visakhapatnam-1

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Govt. of A.P., Visakhapatnam

This Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No..... 8213/MP/05 Dated 6-11-07

1. GENERAL:

a)	Name of the Applicant	:	M/s Isma Granites
	Address	:	Door No. 230/AA, V.T.Extension T.V.K.Nagar,Harur. Dharamapuri District, TAMILNADU
	Phone No.	:	9848435998
b)	Status of the Applicant	:	Proprietor
c)	Granite Type / Colour	:	Colour Granite
d)	Period of Quarry Lease Granted	:	20 years
e)	Name of the RQP	:	Dr. G. Prabhakar
	Address	:	Plot No. 19, Sri Sri Nagar Colony, Uppal, Hyderabad - 39.
	RQP Registration Number	:	RQP/DMG/HYD/056/2002 RQP/HYD/226/2003/A
	Tele Phone No./Fax No.	:	9440549259
	E-mail	:	dgp@indiainfo.com

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LOCATION AND ACCESSIBILITY:

a) Location Map : Location map enclosed vide plate no.1

b) Details of Area :

Toposheet No. 74B/2 (scale 1:250000), Longitude: 84° 14' 20"
Latitude: 18° 34' 30"

Sl No	District	Mandal	Sl. No. & Village	Lease Area in Ha.	Type of Land				ADM&G Surveyed Map	Remarks
					GL	PL	FL	TL		
1	Srikakulam	Nandigama	1-2 Sontinuru	6.0 Ha	6.0 Ha	-	-	-	Lease sketch duly signed by ADMG enclosed vide Plate No. 2	Govt. land

INFRASTRUCTURE:

(Forest, Agriculture, Grazing, Barren)

Availability of Electricity, Postal, School, Market Facility.

The P.L area is connected by and B.T road with internal earthen road. The P.L area is at a distance of 8 Km from the Nandigam Mandal, 58 Kms from Srikakulam town. The nearest Railway Station is Naupada at a distance of 15 Km from the P.L. Area. The detailed location plan is given at Plate No.1.

Electricity facilities are available at Sontinuru Village. The main source of water in the area is open wells and bore wells. An Elementary School up to 5th standard is available at Sontinuru Village. Postal, Educational and medical facilities are available at Nandigam and Srikakulam towns. The telegraphic facility is also available at Nandigam & Srikakulam.

Regarding transport a number of APSRTC buses ply from Nandigam to Sontinuru. The nearest rail head is at Naupada where number of trains are available to reach Hyderabad, New-Delhi, Vijayawada, Vishakapatnam & Calcutta etc., Paddy, Cotton, Chilli are the major crops grown in the lands.

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The lease land is bound by the following boundaries:

North :- The land part of S.No 1 (Agricultural Lands).

South :- The land part of S.No., 1 (Hillock)

East :- The land of S.No. 1

West :- The land Part of S.No. 1 (Hillock)

II. GEOLOGY AND RESERVES:

a) Brief Description of Topography:

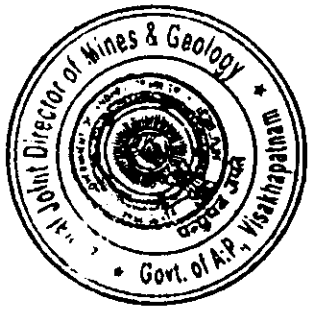
The Q.L. area is and undulating terrain interspersed with a number of hills and hillocks which are mostly covered by rock boulders. These boulders are of irregular shapes and vary widely in sizes and shapes. The hill feature is a result of weathering and denudation and raise in height from the general ground level is about 155 mts. The area thus presents a rugged topography.

The vegetation seen at Q.L. area comprises of shrubs on hill rock.

The general Soil cover in the area comprises of brown clayey type with Kankary encnstations. The Q.L. area is devoid of any forest or tree cover and the only vegetation seen comprises of shrubs. There are no agricultural lands on the applied are. The surrounding lands has been converted to form lands and are owned by local residents.

Regional Geological Setup:

The mine property forms a part of the Eastern Ghats Mobile Belt and is occupied by the Khondalite and charnockite suite of rocks and garnet – ferrous gnessic granites of Archean age. These rocks have been subjected to poly phase deformation with attendant granulate facies metamorphism and migmatisation. The above rock types are capped by laterite over large areas.



The general Geological Sequence of the rock types are of follows:

Tertiary to Recent _____ Laterite

Tertiary _____ Sand Stone

_____ Unconformity _____

Archaean	**EASTERN GHATS SUPER GROUPS**	**Charnockite Suites**	**i) Garneti ferrous – gneissic granite** **ii) Feldspar-quartz-garnet-hypersthen-biotite gneises (Acid to inter mediate gneissic charnockitees.** **iii) Hypersthene-diopside-biotie/Hornblende granulites (Basic charnockites).**
		Khondalite Suite	**i. Garnet-sillimanite gneiss** **ii. Garnetiferrous quartzite**

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Stratigraphic sequences established in the area as follows:

Cenozic	**Laterite**	
Pan African 1000Ma	**Pegmatite & quartz vein charnokite formed due to charnokitisation processes.**	
Early to Middle proterozoic	**Younger Instrusives**	**Gabbro**
		Leptynite
		Porphyritic
		Garnatirous
		Garnite, Rapakivi granite
	Migmatite group	**Migmatite after charnockite**
		Migamtic after khondalite
----------Unconformity----------		
Archean	Charnockite Group	i. Medium grained, greasy, grey acid to intermediate charnockites and charnokite gneiss
	Khondalite Group	ii Calegranulite, Cordierites silliminite, pyrozenegneiss, sappirine granulite, garnet ferrous quarterzied pathi silli manite of gneiss.
		iii Quartzite.

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SRIKAKULAM BLUE (MIGMATITE / MIGMATISED CHARNOCKITE):

The migmatite and migmatised charnockite are the predominant rock types exposed in Srikakulam District. Srikakulam Blue Granite is extensively quarried in Narasannapeta – Polaki, are in the Kotabommali – Nandigam – Saravakota triangle. Active quarries are located around Nandigam, Ravivalasa, jarjangi, pathupuram, Kurudu, Danta, Kottapalli, Sativada, Sidhi, Botu etc. the total area of operation is about 100 Sq. Km. Spread over five blocks. Viz. Nandigam, Kolabommali, Saravakota, Narasnnapet and Bontu – Pedalamba.

Migmatite and Migmatised Charnockite mostly occurs as hill type deposit, it is quarried locally as srikakulam Blue – Dark, Medium and light.

c) Local Geology

Migmatities and migmatised chamockitcs called in the trade circle as Srikakulam Blue Granite are seen in,the North Eastern part of Srikakulam District. They are mostly hill type features (Fig -1). The hill boulders are covered by weather soil (pure waste). It is a result of weather denudation. The boulders are of irregular shape and widely in sizes. Colour Granite consists essentially of blue quartz and bluish grey to light grey fed spars and accessory amounts of mafic like, hypersthenes, hornblendes, biotite etc. it being basically a migratite, display way banding, ptygmatic folding of bands and conspicuous mineral lineations, which import added beaty to the stone after cutting and polishing. Numerous quarries of Srikakulam blue granite exit at Nandigam, Pathapatnam and surroundings villages. The trend of the deposit in the E-W direction, the length of the colour granite 315m and 186m width.

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d) **Brief Description of litho units:**

Migmatite / Migmatised Charnockite with granite gneiss as the host rock.

i) **Petrographic Description:**

Megascopy:

The Quarry Lease area is a melanocratic rock, compact nature. Migmatite is of ten coarsely gneissose with some bands and patches consisting largely of quarz and hornblends and have a crystalloblastic appearances. Migmatites thus have the aspect of being formed of a mixture of igneous and metamporphic elements. They are commonly seen in area of high-grade regional metamorphism in the export building trade industry these rocks are called "SRIKAKULAM BLUE GRANITE" it is only a trade name.

Microscopy:

Minaralogical composition of colour granite (migmatite charnochite) microline, quartz, Oligoclase and hyporsthene. In addition magnetite biotite, and hornblende. Migmatite charnochite shows a typically granulitic texture. However in hand specimen a uniform medium grained is exhibited.

The lighter areas in migmatite are rich in quartz and feldspar the daker portions are richer in mafic constituents.

III. EXPLORATON:

a) **Present Status:** A surface geological map with the massive body marked on it is prepared after conducting a topographical survey. Since the quarry is under exploitation the body is exposed over a height of 155 meters. Thus colour Granite is exposed over a length of 315 M and 186M width.

b) **Future Programme**: In future it is proposed to Mine the deposit towards West direction – In this quarry the colour grnite is already exposed. Thus the future exploration is not required.

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IV. RESERVES:

Balance recoverable grade reserves (supported by standard method of estimation with reference to present status of Mining):

The geological reserves have been estimated using cross sectional method. The proved / measured category are those reserves which are exposed in three dimensions by actual trial mining/exploration. The probable/indicating reserves are those which are exposed in two dimension with good level of confidence. In the present case, Migmatite deposit is exposed in its strike direction as well as across the strike. 155Mtrs. depth is assigned for proved / measured category and depth of 20 Mtrs. below proved category is assigned for probable / indicated category. The last category i.e. possible/inferred has also been assumed as having a further depth of 20 mtrs. below the probable / indicated category.

Cross sections have been drawn along the strike length at A-A', B-B', C-C',D-D',E-E' & F-F' (R.F. Plate Nos. 3&4). The cross sectional area reserves have been measured and the volume of the geological reserves arrived by multiplying the sectional area with the influence at cross section. From the experience at actual mining all the rock available does not qualify for the export. It is estimated from the past experience that only 20% of the rock excavated will result in marketable colour granite block. Therefore, the volume of rock is multiplied with a recovery factor of 20% to obtain geological reserves, the balance 80% shall account for sub or marginal grade. This can be termed as intercalated waste and dumped in the yard allocated for this purpose. The details of calculations for Migmatite dolerite (Colour Granite) reserve have been given vide Annexure-1 and summarised as below.

Table-2. Summary of category-wise geological reserve at Sontinuru Colour Granite Quarry lease.

Category	Geological Reserves (Cu.m.)
Proved / Measured	461000
Probable / Indicated	195850
Possible / Inferred	181300
TOTAL	**838150**

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Mineable Reserves and life of the Mine:

The total quantity of mineable reserves are estimated leaving the safety slopes quantity blocks. Same is shown in Section plate No. 4A. In this way a total mineable reserves of 457800M^3 (Annexure II) is available at the Q.L. area. As the mine is proposed to produce 2240M^3 (Annexure-III) in one year of operations, the life of the mine's calculated as detailed below:

$$\frac{\text{Total Minerable reserves}}{\text{Actual anticipated annual production}} = \frac{457800M^3}{2240M^3}$$

Life of the mine = 204 Years

V. MINING

a) Types of Mining:-

Opencast / Mechanised / Semi Mechanised / Manual

- Opencast semimechanised

To cut down cost and for achieving targeted production of granite, the operations are planned to be carried out partly manually and partly by deploying in machinery listed in para. The use of various machinery listed is explained under method of working. The pocklain is to be deployed for Over Burden removal. The other pneumatic tools like jackhammers, etc., will be deployed for shot hole drilling and for drilling in sheet rock for taking out large blocks of granite. The crane will be deployed for removing large blocks jackhammers will be used in primary cutting of mother rock.

Over burden mining consist of soil, hard morum and weathered rock. The weathered rock and useless boulders can be drilled by jack hammers to fragment them into pieces to facilitate their removal. The excavator will load the waste into the tipper and then transport to the dump yard.

After removed o O.B. workable boulders of medium and small size are exposed these boulders are split into two or there pieces, so that blocks can be made out of them. Usually the advantages of natural joint presents in the boulders is taken for splitting them a line of drill holes are drilled and split it with the help feathers and wedges. Feather and wedges are placed I series of holes drilled for splitting the boulders.

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The separated pieces are examined for defects and lines, them the block or blocks are marked in clear area and holes drilled along the line of marking, with the help of feathers and wedges the waste portions are separated forming a rectangular blocks. A perfect block is that all sides shall make with each other 90 degrees.

b) Briefly describe the existing method of working involved in

- The following operations are being conducted

Drilling	--	Hand held jackhammers
Blasting	--	Occasionally using gunpowder
Loading	--	Use of hydraulic excavators are made
Hauling	--	By using tippers

Attach photographs of present scenario.

Two photographs has been taken from the surface to depict natural extent of Exploratory faces developed are enclosed as Fig.2 and 3.

- Removal/Excavation of O.B. and other quarry waste:

- The O.B. consist of soil and weathered colour granite boulders of various sizes. They shall be loaded into tippers by using excavators. The waste is then hauled to the proposed dump yard on South – Western side of the Q.L. area.

- Separation of Primary Blocks from Mother Rock

- After removal of the overburden the sheet formation is exposed. Then either naturally occurring vertical / inclined joint plane ie., attempted to develop a working face. After exposing the working face the rock splitting is effected by using jack Hammers operated by compressed air for putting line-holes for wedging. Alternatively, the rock splitting also can be effected by natural joints (both epi and syngenetic) joints are also helpful in primary rock separation from the mother rock. Separation of primary blocks from mother rock and obtained the block size 320 x200x200 cms.

- Sub-division of large primary blocks in to secondary block

After primary separation the rock mass will be carefully examined to avoid hair-line rocks, mineral seggnegations and veinsetc; the dressing of the rough blocks will be made by clipping the edges and geometrically equaling the edges of the block at the dressing yard. In case of extracting huge size during the stage of

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rock splitting, such blocks are cut by using Diamond wire-saw to suit the size of gang-saw. The rough blocks obtained after primary cut need to be dressed for obtaining good geometric shape. from one primary block two numbers of secondary blocks can be made dimensional shape of 1.0 to 3.0 M^3 in size, and the same measurements are 180x100x60 cm to 200x150x100 cm(Fig-4).

Machinery deployed:

1) Poclains	1-No.
2) Tippers-	2-No`s.
3) Compressors-	2-No`s
4) Jack-Hammers	6-No`s

- Production of Commercial Block

➢ The main idea is to bring the block to proper dimension after chipping the rough corners. It is done manually using hand held wedges. Flaws like black lines, fractures and penetrative cracks are taken care of at this stage of forming commercially marketable blocks.

1) **Mining Program for first five years:**

The Scheme of development and production for the first five years has been planned taking into consideration the development of the quarry is confined between 200-140 RL's enclosed five years working plan this area is demarked (Refer plate No. 4)

a) Year wise Development:

As a first step towards regular production schedule. The weathered rock boulders will be scrapped and removed. In this manner the sheet rock is exposed. It is envisaged to produce 2240M^3 of salable granite each year and to raise, this volume of rock, 11200M^3 of total rock mass has to mined. Projections are made for a five year period and the year wise figure and the quarry development schedule is detailed below. The year wise productions in shown in Annexure – III and development details are shown in plate No. 4.

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1st year: The quarry face will extend, to Eastern side it falls under X-Y section, bench level 200-187 m, sectional area 170 sq.m, Sectional influence 50mts. The bench will be developed as described earlier and the anticipated quantity 8500M^3 of rock mass will be extracted, with 20% recovery 1700M^3 of salable granite be recovered from granite reserves.

2nd year: The second year development will be between 190-175m bench level eastern side section X-Y sectional area 200 Sq mts, sectional influence 50mts. in by this way, a total of 10000M^3 of rock mass will be extracted. In this manner 2000M^3 of salable granite is expected to be won from Granites reserves.

3rd year: The third year development will be between 180-164 m bench level towards east, section X-Y sectional area 225 sq.m sectional influence 50m, the total quantity of rock mass 11250M^3 will be extracted 20% recovery 2250M^3 of salable granite be recovered.

4th year: The fourth year development will be between 168-150 m bench level towards east, comes under section X-Y, sectional area 250 sq.m, sectional influence 50m during 4th year 12500M^3 mass will be extracted, anticipated recovery 20% of 2500M^3 salable granite be recovered granite reserves.

5th year: A bench will be formed between 150-133 m bench level under section X-Y, its sectional influence 50m, sectional area 275sq.m. The total excavated rock mass 13750M^3, in this anticipated salable granite rock of 20% of 2750M^3.

This summarize it maybe stated that during the first five years of operations a total quantity of 11200M^3 at salable granite is expected be recovered from the mines (Annexure-III).

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➢ Details of given vide Annexure-III and summarised as below:

Year	Total waste Cu.m	Production Cu.m
2007-08	6800	1700
2008-09	8000	2000
2009-10	9000	2250
2010-11	10000	2500
2011-12	11000	2750
Total	**44800**	**11200**

b) Quantum of Excavation (OB& Granite):

➢ The total overburden/intercalated waste and Granites blocks of 56000cu.m shall be handled during the present plan period.

c) Production Schedule:

➢ During the first five years plan period, it is planned to produce granite blocks @ 2240 cu.m per annum.

d) Maganize, Type and Capacity:

➢ No maganize has been established.

e) Description of Processing Plant if any:

➢ No Processing plant has been established.

f) Marketing Analysis:

M/s Isma Granites has developed a very strong net-work of operating quarries—and established wide contacts with marketing agency both in India and outside.

The applicant is well equipped by efficient executives and technocrats with up to date knowledge on quarrying technology, advances in processing techniques, marketing strategies and financial management.

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M/s. Isma Granite has well-established contact with the buyers from Chennai, Bangalore, New Delhi, Hyderabad and Rajasthan. The sale of the granites at the international marketing is different from the marketing of other products. Applicant has plans to enter international market in a big way by purchasing sophisticated equipment for quarrying and processing.

Following factors govern the marketing: -

i) In view of demand in the international / domestic market the block produced @ 2240M^3 / annum will not have any problem in marketing.

ii) The lessee is well organised and well equipped earned the reputation for maintaining schedules of supply.

iii) Most of the material is exported to international market, with attractive Price, through agents.

Apart from the buyers and agents of Indian market, frequently the applicant also visit foreign countries, attending international Trade Fairs at Italy, Germany, USA, China, Japan etc. so as to directly interact with the foreign buyers to sustain the clientele and helpful in clearly comprehending the taste, standards and requirements of international market.

g) Organisation Chart: ,

➢ The subject lease will have the following manpower organisation.

Permit Manager

Supervisor/clerk (2)	Excavator Operator (2) Hlpers (2)	Compressor Operator (1)	Drillers (2) Helpers (6)	Tipper Driver (2) Helper (2)	Afforestation worker (1)	Watchmen (2)

h) Site Services:

➢ Regarding site services, a mine office has been established at the mine and other statutory constructions of rest shelter, drinking water supply, and first aid facilities have been provided. Routine maintenance and minor repairs shall be undertaken at the mine itself. The workers shall be communicating for work from the adjoining villages and, therefore, no colony shall be maintained.

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VI. SCHEME OF WASTE MANAGEMENT PLAN (SOLID AND LIQUID):

a) In view of that has been stated above, a huge waste dump will be built up and is likely to attain unmanageable proportion. It is necessary to plan the dumping yard as well, it will be possible to utilize the waste material for other uses like back filling of the excavated area. For building roads, and for some other general purpose, from the partly weathered rocks, a fair amount of unweathered rock material could be salvaged for the manufacture of flooring tiles. Small ornamental and decorative pieces etc. thus market exists certainly for partial utilization of the salvaged material from the mine wastes, thus reducing the quantum of mine waste and the management is aware of this and will make all efforts for utilization of mine generated waste to the extent possible. By this way the handling at a large quantity of solid wastes is expected to be minimised.

b) Solid Wastes for First Five years: As explained in the previous para it is planned to produce and market 2240M^3 marketable granite in one year. As recovery rate of only 20% is considered. To win possible 2240M^3 Granite Blocks, it will be necessary to handle 11200M^3 rock of thus about 80% waste from rock amounting to about 8960M^3. waste will be dumped at the dumping yard. So in first five year the quantity of such kinds of waste will be above 44800M^3. Much of the solid waste will be disposed for road construction back filling mine excavation and some other general purposes as enunciated above.

Year	Solid waste Cu.m.
2007-08	6800
2008-09	8000
2009-10	9000
2010-11	10000
2011-12	11000
Total	44800

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Dumping site particulars:

- The dumping site is located on the South – Western side of the Q.L. area.

Estimated Waste Quantity that will be generated over the entire period:

- From Annexure – II, it may be generated shall be 1831200cu,m during the entire life of the mine.

Utilisation of Waste if not prevented:

- Small sized waste shall be used as a road metal or for foundation filling etc., so that the material need not be left in the dump. Unusable material can be disposal off to local building or road metal making contractors.

c) Estimated waste quantities that will be generated over the entire life period of 204 years.

Envisaging a production of anticipating 457800M^3 dimensional granite, during in the lease period of 204years, the material to be handled for winning this quantity will be of about 2289000M^3. As explained in pervious para 80% of the mass handled for production is anticipated to be waste is 1831200M^3.

d) Liquid wastes:

The operation of the mine will not generate any appreciable quantity of liquid waste. The ground water table in this belt 20m below from the surface and since the quarry depth will not react up to this depth in the near future, flooding by ground water is not anticipated. However during rainy months, there is a possibility of wet conditions developing in the working pit. This will be minimized, if not altogether eliminated, by adopting simple techniques like digging trenches all round to train off rain water and presenting surface run off from entering and flooding working pit. The mine drainage can be effectively managed and the pit kept dry to keep up the production schedule.

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VII. ENVIRONMENT MANAGEMENT PLAN:

- An environment plan is enclosed covering 500m area around the QL area vide Plate No.7.

1. Base Line Information:

a) Land use pattern:

- The lease area bearing the dyke shall be utilised for quarrying. Remaining lease area used for dumping of waste. There are agricultural lands at a distance of 70m.

b) Water Region:

- Ground water is exploited more for irrigation purpose than domestic. Drinking water is drawn from open wells and tube wells.

  There are no perennial sources in and around the applied area with in 500m radius. The rain water flows throught the slopes of the area and rained off through a seasonal stream water drain.

c) Floral and Fauna:

- The floral species in the area are of common varieties. Like neem, palm tree, tumma and bushes like tangedu, mango plantation is very common. Agricultural crops like cotton, paddy and chilies are major crops in the locality.

  Domesticated animals like cows, buffaloes, sheep are common. Snakes like cobra, krait are common. Aves like eagle, common crows, sparrows, bats, pigeons are found in this area. There are no endangered or rare species in this area.

d) Quality of ambient air, noise level and water:

- The subject area is isolated from any habitation and other human industrial activities. As such the quality of ambient air, noise levels and water are good.

e) Climatic Conditions:

- The quarry lease area is situated in an arid zone, which has extreme climates, During summer season (April to June) the mercury touches 46°C. The predominant rainy moths are July to Sept. experiencing South-West monsoon. The return monsoon is rather weak.

The predominant wind directions are SW and NE and wind speeds reach 15 Kms/hour. The area experiences more than 10 sunshine hours per day for most part of the year.

f. Human Settlements:

- The applied area is surrounded by 4 villages with in the radius of 5.0 Km. The details of villages, location, distance and population is given in following table.

S.No.	Village	Direction	Distance	Population
1	Bydibondla	North	2Kms	900
2	Karlapudi	East	5Kms	700
3	Sontinuru	South	2Kms	600
4.	Jaipuram	West	3Kms	800

g) Public Buildings, Places of Worship and Monuments:

- There are no public buildings, places of worship and historic monuments in the vicinity. The structures have been shown in the Environment plan vide Plate No. 7

h) Attach Plans showing the locations of sampling stations:

- No sampling stations have been fixed.

i) Does area (partly or fully) fall under notified area under water (Prevention and Control of Pollution) Act, 1974.

(Prevention and Control of Pollution) Act, 1974

- The area falls under notified area under Water (Prevention & Control of Pollution) Act, 1974.

2. Environmental Impact Assessment:

i) Land Degradation:

- Quarry commences in the Western part of the Quarry lease and the proposed development of quarry is E-W as shown in plate No.4. during the course of quarrying, sizing and dressing generation of waste rock is inevitable.

- Due to the proposed quarrying activity, Western part of the Q.L area shall be excavated in order to collect useful colour granite blocks.

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- During the quarrying activity for first 5 years. 17 mtrs. depth of land is to be degraded by excavating 11200M^3 of granite for total life 204 years, 85 mtrs, depth of land is to be degraded by excavating 457800M^3 of granite. During quarrying whatever solid waste is generated shall be dumped at dumping site. During the quarrying activity is an elevated hillocks, the impact of the land degradation is limited and the waste generated from the quarrying will be useful for construction activity like foundation filling, road metal, concreting metal, reverting the water reservoir bunds. In fact the quarrying activity will be contributing for developing plain land which can be used for wild plantation. Eventually, there will not be any noteworthy impact in degrading the existing scenario of the land.

ii) **Air Quality :**

- Quarrying operations are semi mechanised to mechanised but there is involvement of labour too is not ruled out. During the course of over burden removing drilling and hauling dust is likely to be generated and also emissions of diesel vehicles such as NO_2, S, COetc. Blasting of shoot holes using gun powder also adds to noxious gases. The concentrations of all these gases are within a permissible limit as laid down by CPCB.

AIR QUALITY

	Base Level	**Permissable Level**
SPM=	140µg/m^3	360µg/m^3
RSPM=	60µg/m^3	120µg/m^3
SO_2 =	40µg/m^3	80µg/m^3
NO_2 =	40µg/m^3	80µg/m^3
CO =	1.0µg/m^3	5.0µg/m^3

iii) **Water Quality:**

- Effect of quarrying activities on the ground water regime are meagre and deterioration of ground water quality is ruled out as quarrying operations are in a small scale. The dumping yard may contribute by way of leaches during rainy season only, but every measure will be taken to stablise the waste dumps.

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IS 10 500 -1994

Sl.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 tp 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:

- Noise levels range from 60dB to 90dB are to the use of Heavy Earth moving Machinery. No. of personnel directly affected are the operators of these machines. Otherwise, there is no sound pollution, in the nearby village which is more than 1Km from the quarry.

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

v) Vibration Levels (due to Blasting):

- As explained above villages are located more than 1.0 kms away. It is proposed to use gun powder occasionally. This mode of blasting does not contribute to much vibrations. Thus the impact of vibrations due to blasting because of quarrying shall be negligible.

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vi) Water Regime:

- No effect on water regime.

vii) Socio-Economics:

- The impact shall be positive 24 number of people shall be employed directly and equivalent number of persons shall be employed indirectly in transportation and other allied activities. Therefore, about 50 number of families can have sustenance.

The quarrying activity also helps in improving the quality of life by improved transport and communications and purchasing power. The State Govt. And Central Govt. Will also earn revenue, which can flow back to improve the facilities of neighboring locality. The much-needed foreign exchange is also earned as some quantity is exported.

Historical Monuments etc.,

➢ Not applicable.

3. Environmental Management:

a) Temporary storage and utilisation of top soil:

➢ Generation of top soil is meagre, however, the top soil generation will be stacked separately for use in reclamation of mined at areas at a later date.

b) Year wise proposal for reclamation of land affected by mining activities during first five years:

➢ During first 5 years, no reclamation of the pit will be possible. However, the dumped out area can be reclaimed by planting tree saplings and bushes.

➢ Reclamation of the pit cannot be taken within 5 years. Once the depth reaches that it makes the quarrying an economic then the reclamation of pits will be taken up with prior intimation.

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c) In case abandoned quarries/pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilisation of such water be given:

- In future once the economically viable depth is reached in a part of the area, back filling shall be adopted. Alternately, the excavated pit shall be left for water storage.

  Conceptually, the worked out pit will be of the size of 0.0962 Ha with an average depth of 20m, this can hold 1.9 mcm of water, provided its gets filled. Taking only the rainfall of 1m avg., this can store 962 cu.m. of water every year. This water can be utilised for afforestation purposes.

d) Programme of afforestation, year wise for the initial five years. Indicating number of plants with name of species to be afforested under different areas in Hectares:-

- It is proposed go for avenue plantation in buffer zone area in 4 or 5 rows. Every year 150 plants shall be planted as shown below.

Year	Name of Plant sps.	No. of Plants	Area Spacing	Area Covered Ha	Survival %
2007-08	Neem, Tamarind, Palm, Mango	150	2m x 2m	0.06	70
2008-09	Neem, Tamarind, Plam, Mango	150	3m x 3m	0.06	70
2009-10	Neem, Tamarind, Plam, Mango	150	3m x 3m	0.06	70
2010-11	Neem, Tamarind, Plam, Mango	150	3m x 3m	0.06	70
2011-12	Neem, Tamarind, Plam, Mango	150	3m x 3m	0.06	70
	TOTAL:	750		0.30	

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e) Stabilisation and vegetation of dumps along with waste dump management year wise for the first five years:

- Waste dumps will be stabilized using top soil and planting grass / bushes to hold the dumps and to prevent erosion leaches.

f) Measures to control erosion/sedimentation of water courses:

- Only during monsoon season surface water is to be protected which is the precipitation water. For this steps like, garland drains, having a retention wall along the dump bottom and check dams, wherever required, shall be constructed.

g) Treatment and disposal of water from mines:

- Not applicable as the quality and quantity does not warrant any special measures.

h) Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity:

- Blasting is practiced using small dia, shot holes using gun powder, and the No. of holes blasted will be few which will not be produce any ground vibrations. However, to avert fly rock, muffle blasting will be practiced.
- Not applicable as there are no historical monuments in the vicinity requiring protection. No rehabilitation is required.

i) Protective measures for ground vibrations:

- Not applicable as explained in the para on impact assessment.

j) Remedies proposed for Air quality:

- The air pollution has an adverse effects upon the health of human beings as well as ecology. Control the air pollution concentrations with development of green belt around the lease area, offices, all along the approach and internal roads.

The plants are used as indicators of pollutants in air and to monitor their concentrations. Closely planted woody plants of growing along the roads help in reducing the contamination of lead from automobiles exhaust.

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- During the drilling pollution control devices such as settling chambers, bag filters, need to be used.
- Roads may be frequently sprayed with water therefore polluted air will not spread and rise around the mine.
- Conduct blasting during less breezy periods.
- Properly designed blasting operations.

k) Remedies proposed for minimizing Noise levels.

- The machinery function will be stopped when there is no work. Much of the noise may be due to in efficiency of the machinery e.g. damaged from blades, blunt saws, worn bearing and some times loose metal sheets. These defects will be repaired, then noise level will be decreased to a great extent.
- The noise is an essential part of their machines used there, and hence the workers are continuously exposed to sound hazards for a long period, they may suffer from annoyance, loss of efficiency and damage to hearing. Therefore it has become necessary that employees will be given ear defenders (or ear plugs) to protect them from such losses.
- A lot of noise can be absorbed by planting those trees, which are capable to absorb sound. Ex:- Coniferous trees (Pine, sprue, cedat,yew etc) and Deciduous trees (Milk teeth).
- One of the easiest ways to control noise and vibration from heavy vehicles is by maintaining properly approach and internal roads of mine.

l) Socio-economic benefits arising out of mining:

- Impact of quarrying is positive on socio-economic front. Following are the benefits:

1. Infrastructure development.
2. Improved employment
3. Improved health, hygiene, education, communications for the community.
4. Revenue for govt. and local bodies.

For ISMA GRANITES

Signature of the applicant
Proprietor

Place: Hyderabad.
Date: 30.10.2007

(G. PRABHAKAR)
RQP/DMG/HYD/056/2002

APPROVED

Zonal Joint Director of
Mines and Geology
Govt of A.P
Visakhapatnam-1
6/11/07

Director of Mines & Geology * Zonal * Govt. of A.P., Visakhapatnam

This Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No..... 9213/MD/07 Dated 6-11-07

ANNEXURE –I

CATEGORY WISE RECOVERABLE GRANITE (DIMENSION STONE) RESERVES OF COLOUR GRANITE OF SY. NO. 1-2 OF SONTINURU (V), NANDIGAM (M), SRIKAKULAM (D). OF M/s. ISMA GRANITES

	PROVED			PROBABLE			POSSIBLE			
Section	Sectional Area Sq.m	Sectional Influence m.	Volume of Reserves @ 20% recovery Cu.m	Sectional Area Sq.m	Sectional Influence m.	Volume of Reserves @ 20% recovery Cu.m.	Sectional Area Sq.m	Sectional influence m.	Volume of Reserves @ 20% recovery cu.m	Total Granite Reserves Cu.m.
A-A'	19100	50	191000	4200	50	42000	4200	50	42000	275000
B-B'	13500	50	135000	4000	50	40000	4000	50	40000	143000
C-C'	8200	50	82000	3900	50	39000	3900	50	39000	160000
D-D'	3600	50	36000	3600	50	36000	3700	50	37000	109000
E-E'	1700	50	17000	3495	50	34950	3500	50	35000	86950
F-F'	0	0	0	3300	65	42900	2100	65	27300	70200
			461000			195850			181300	

Total Reserves : Proved + Probable + Possible

= 461000M^3 + 195850M^3 + 181300M^3

= 838150M^3

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ANNEXURE – II

MINEABLE GRANITE (DIMENSION STONE) RESERVES AND WASTE CALCULATIONS OF COLOUR GRANITE OF SY. NO. 1-2 OF SONTINURU(V), NANDIGAM (M), SRIKAKULAM (D). OF M/s. ISMAGRANITES

	GRANITE RESERVES				
Section	Sectional Area Sq.m.	Sectional Influence. M.	Volume of Reserves @ 20% Recovery Cu.m.	Intercalated Waste @ 80% Cu.m.	TOTAL WASTE cu.m.
A-A'	10300	42.5	87550	350200	350200
B-B'	10500	50	105000	420000	420000
C-C'	10400	50	104000	416000	416000
D-D'	4600	50	**46000**	**184000**	**184000**
E-E'	6695	50	**66950**	**267800**	**267800**
F-F'	4200	57.5	**48300**	**193200**	**193200**
			457800	**1831200**	**1831200**

Zonal Joint Director of Mines & Geology
Govt. of A.P., Visakhapatnam

ANNEXURE - III

SCHEME OF YEAR DEVELOPMENT AND PRODUCTION FOR FIVE YEARS OF COLOUR GRANITE OF SY. NO. 1-2 OF SONTINURU (V), NANDIGAM (M), SRIKAKULAM (D). OF

M/s. ISMAGRANITES

Year	Section	Bench Level m.	Sectional area Sq.m.	Sectional influence m.	Recoverable Granite @20% recovery Cu.m.	Intercalated waste @ 80% Cu.m.
2007-08	X-Y	200-187	170	50	1700	6800
2008-09	X-Y	190-175	200	50	2000	8000
2009-10	X-Y	180-164	225	50	2250	9000
2010-11	X-Y	168-150	250	50	2500	10000
2011-12	X-Y	150-133	275	50	2750	11000
					11200	**44800**

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An average production

per year = $\frac{\textbf{11200M}^3}{\textbf{5 years}}$

= **2240M^3**

GOVERNMENT OF ANDHRA PRADESH
DEPARTMENT OF MINES AND GEOLOGY

Proceedings of the Assistant Director of Mines and Geology, Tekkali.
(Present: Sri K.Ramamohana Reddy, B.Sc.)
ASST.DIRECTOR.

Proceedings No.1376/Q/2004 Date: 25 -09-2004

Sub:- Mines and Quarries – Quarry lease for Colour Granite over an extent of 6.00 Hectares in S.No.1-2 of Sontinuru village, Nandigam ı Mandal Srikakulam District - Granted in favour of M/s ISMA GRANITES Prop: Sri K.S. Ismail - Execution of Lease Deed - Work orders issued - Regarding.

Ref:- 1. Proceedings No.20888/M1-A/2004 dt 14.9.2004 of the Director of Mines And Geology, Hyderabad.

2. Letter dt 24.09.2004 from M/s ISMA GRANITES .

ORDER:-

The Quarry lease for colour granite granted in favour of M/s ISMA GRANITES, Proprietor: Sri K.S.Ismail, 230/A4, V.T.Extension, T.V.K.nagar, Harur, Dharmapuri District , Tamilnadu , granted in S.No.1-2 of Sontinuru village, Nandigam Mandal, Srikakulam District, over an extent of 6.00 Hectares. for a period of 20 years. has been executed on 25-09-2004 by the undersigned .The Quarry lease is valid for a period of 20 years from 25 -09-2004 to 24 -09-2024.

The Grantee through their letter 2nd cited, has submitted all necessary documents and Mineral Revenue paid challans and requested for execution of the lease deed in favour of M/s ISMA GRANITES, Proprietor: Sri K.S.Ismail, 230/A4, V.T.Extension, T.V.K.nagar, Harur, Dharmapuri District , Tamilnadu , for the quarry lease granted area over an extent of 6.00 hectares in S.No. 1-2 of Sontinuru village, Nandigam ı Mandal, Srikakulam District, for a period of 20 years.

M/s ISMA GRANITES, Proprietor: Sri K.S.Ismail, 230/A4, V.T.Extension, T.V.K.nagar, Harur, Dharmapuri District , Tamilnadu, is hereby permitted to enter and work the Quarry area for colour granite granted in Survey No.1-2 of Sontinuru village, nandigam Mandal, Srikakulam District over an extent of 6.000 Hectares, for a period of 20 years under the provisions of A.P.Minor Mineral Rules, 1966 and Granite Conservation & Development Rules, 1999 and conditions laid down in G.O.Ms.No.317 Industries & Commerce Departemnt, dtd. 9.7.1992 and subsequent instructions issued on the matter from time to time. The lessee should submit the quarterly returns and the progress in cutting and polishing unit to the concerned District Industries Center, the Assistant Director of Mines and Geology, Tekkali, the Dy.Director of Mines and Geology, Visakhapatnam and the Director of Mines and Geology, Hyderabad. This work order is issued subject to the conditions that the Government reserve the right to cancel the quarry lease granted and executed under A.P.M.M.C. Rules,1966 and Granite Conservation & Development Rules,1999 , without assigning any reasons and giving notice and the conditions imposed in the grant order and appendix.

K Ramamohan Reddy
Asst.Director of Mines & Geology,
Tekkali, Srikakulam District.

Zonal Joint Director of Mines & Geology ★ Govt. of A.P. Visakhapatnam

TO:
M/s ISMA GRANITES,
Proprietor: Sri K.S.Ismail,
230/A4, V.T.Extension,
T.V.K.nagar, Harur,
Dharmapuri District , Tamilnadu

Copy submitted to :
1. The Director of Mines & Geology, Hyderabad for favour of information.
2. The Dy.Director of Mines and Geology, Visakhapatnam for favour Of information.
3. The District Collector, Srikakulam for favour of information.
4. The Revenue Divisional officer, Tekkali for favour of information
5. The Mandal Revenue Officer, Nandigam for information.

Fig-1 Photograph showing the Q.L area hillock to above surface level

Fig-2 Photograph showing the exploratory face of M/s Isma Granites

Deputy Director of Mines & Geology
Visakhapatnam

Fig-3 Photograph showing the exploratory face of M/s Isma Granites

Fig-4 Photograph showing the dimensional stones of M/s Isma Granites