ENVIRONMENTAL MANAGEMENT PLAN

For

OVER AN EXTENT OF 4.812 HECTARES OF MICA, QUARTZ & FELDSPAR MINE

In

Sy. No: 76 (P) & 48/2 (P) of Jogipalli Village, Sydapuram Mandal,
SPSR Nellore District, Andhra Pradesh

Proposed By

M/s Lakshmi Venkateswara Swamy Mines & Minerals
Jogipalli, Sri Srinivasa Auto Garage, Bypass Road,
Opp: H.P. Petrol Bunk, Gudur Town-524407.
SPSR Nellore District.A.P.

Prepared By

M/s. GLOBAL ENVIRO LABS
(Accredited by Quality Council of India – NABET, New Delhi)
2-2-1075/14/A/1, Tilaknagar "X" Roads , Bagh Amberpet,
Hyderabad – 500 072. Ph.: 040-65582886; Telefax:040-27407969
E.Mail: globalelabs@rediffmail.com

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1. INTRODUCTION

1.1 INTRODUCTION

M/s. Lakshmi Venkateswara Swamy Mines & Minerals, Mg. Partner: Sri N.Naresh proposed Mica, Quartz & Feldspar mine over an extent of 4.812 Ha in Sy.Nos. 76 (P) & 48/2 (P)of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District, Andhra Pradesh . In principle of application of quarry lease notice issued by Director of Mines and Geology, Ibrahimpatnam, Govt. of A.P for 20 years vide Notice No. 437/R3-1/2019 dated 21.03.2019. Mining Plan was approved by the Joint Director of Mines and Geology and Deputy Director of Mines & Geology, Guntur and Government of Andhra Pradesh vide Letter No. 1008/MP/Quartz/NLR/2019 Dt:20.04.2019.

The Lessee proposes to produce about Mica-4505 TPA,Quartz-3003TPA,Feldspar-15015 TPA minerals from the Mining lease over an extent of 4.812 Ha. The Cost of the Project is Rs.50 Lakhs.

M/s. Lakshmi Venkateswara Swamy Mines & Minerals, Mg. Partner: Sri N.Naresh is conscious of its responsibility towards the society in minimizing the pollution load due to this proposed activity and according to EIA notification, 14th September 2006 issued by MoEF, GOI, New Delhi for obtaining Environmental Clearance from SEIAA, A.P.; the project proponents intends to obtain Environmental Clearance for its proposed mine and has prepared an Environmental Management Plan.

Cluster Clarification: Assistant Director of Mines & Geology, Nellore has issued a letter vide Lr.No. 3986/P/2018 Dated:1305.2019 and as per the ADMG, Nellore within the 500 mtrs from the mine lease boundary there are four mines are there over an extent of cluster area including present proposed mine area is 45.99 Hect. But in cluster 3 mines are granted before 09 Sept, 2013 (extent is 7.183 Ha + 8.672 Ha + 24.155 Ha = 40.01 Ha) these area is exempted from cluster area) and one mine is obtained LoI i.e 1.169 Ha. Remaining area is 4.812 Ha. i.e present proposed for EC. The cluster mines details are given below table.

Statement showing the Existing leased area and LOI granted areas are present within 500 mts radius from the LOI granted area of M/s. Lakshmi Venkateswara Swamy Mines and Minerals.

S.No	Names of the Lease	Location	Extent	Mineral	Status of LOI/Lease Period	EC status	EC No. & Date	Production (TPA)	Remarks
1	M/s. Durga Mineral Corporation	Sy.No. 39 & 40 of Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(17.75 Acres) 7.183 Ha	Mica, Quartz, Feldsapar & Vemiculite	25.01.202 to 24.01.2022	EC not granted	--	--	Lease executed on 25.01.2002
2	Sri A. Srikiran	Sy.No. 41,42,& 43 Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(21.43 Acres) 8.672 Ha	Mica, Quartz, Feldsapar & Vemiculite	22.03.1994 to 21.03.2014 (Renewal applied)	EC not granted	--	--	Lease executed on 23.03.1974
3	M/s Sri Sai Pavan Mines & Minerals	Sy.No. 529 of Molakalapundia Village, Sydapuram Mandal, SPSR Nellore District	(59.69 Acres) 24.155 Ha	Quartz & Feldsapar	13.07.2001 to 12.07.2021	EC not granted	--	--	Lease executed on 13.07.2001
4	Smt. Pallapu Suseelamma	Sy.No. 47/1 & 47/2 of Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(2.89 Acres) 1.169 Ha	Mica, Quartz & Feldsapar	LOI issued	--	--	--	LOI granted area
5	M/s. Lakshmi Venkateswara Swamy Mines & Minerals	Sy.No. 76 (P) & 48/2 (P) of Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(11.89 Acres) 4.812 Ha	Mica, Quartz & Feldsapar	LOI issued	--	--	--	Present LoI granted area
Total Area			45.99 Ha						

Note : S.No. 1,2,3 Mines are executed before 09 Sept,2013 and S.No. 4th mine got LOI.

ADMG,Cluster Given Below 3,4,5 pages

GOVERNMENT OFANDHRARADESH
DEPARTMENT OF MINES & GEOLOGY

From:
Sri T. Rajasekhar, M.Sc.,
Asst. Director of Mines & Geology,
Nellore.

To
M/s. Lakshmi Venkateswara Swamy Mines and Minerals,
Mg.Pt. Sri N.Naresh,
Jogipalli, Sri Srinivasa Auto Garage, Bypass Road, Opp.HP Petrol Bunk, Gudur, SPSR Nellore District.

Letter No. 3986/P/2018, Dated: 13-05-2019

Sir,

Sub:- Mines & Minerals – Quarry Lease applied area details which are at outermost boundary of 500 mts surrounding of the mining project of M/s. Lakshmi Venkateswara Swamy Mines and Minerals, Mg.Pt. Sri N.Naresh for Mica, Quartz & Feldspar over an extent of 4.812 Hectares / 11.89 Acres in Sy.No. 76.P & 48/2(P) of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District – Certain information – Furnished - Reg.

Ref:- Representation of M/s. Lakshmi Venkateswara Swamy Mines and Minerals, Mg.Pt. Sri N.Naresh dated 29.04.2019 and received by this office on 13.05.2019.

*****

I invite attention to the subject and reference cited, wherein through the reference, M/s. Lakshmi Venkateswara Swamy Mines and Minerals, Mg.Pt. Sri N.Naresh has requested this office to furnish the information with regard to mining projects located within 500 mts radius of the mining project of M/s. Lakshmi Venkateswara Swamy Mines and Minerals, Mg.Pt. Sri N.Naresh as evidence to establish the status of cluster formation as per MoEF & CC Notification S.O.No.141 (E), dated 01.07.2016 consideration for issue of Environmental Clearance.

In this connection it is informed that, the subject LoI granted area of M/s. Lakshmi Venkateswara Swamy Mines and Minerals for Mica, Quartz & Feldspar over an extent of 4.812 Hectares / 11.89 Acres in Sy.No. 76.P & 48/2(P) of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District is more than 5 Kms distance from the State boarder and there are three (3) existing Quarry Leases and one (1) LoI granted area are present within 500 mts radius of the subject LoI granted area (List enclosed).

The map showing the subject three (3) Quarry Leased areas and two (2) LoI granted areas including the present applicant LoI area M/s. Lakshmi Venkateswara Swamy Mines and Minerals.

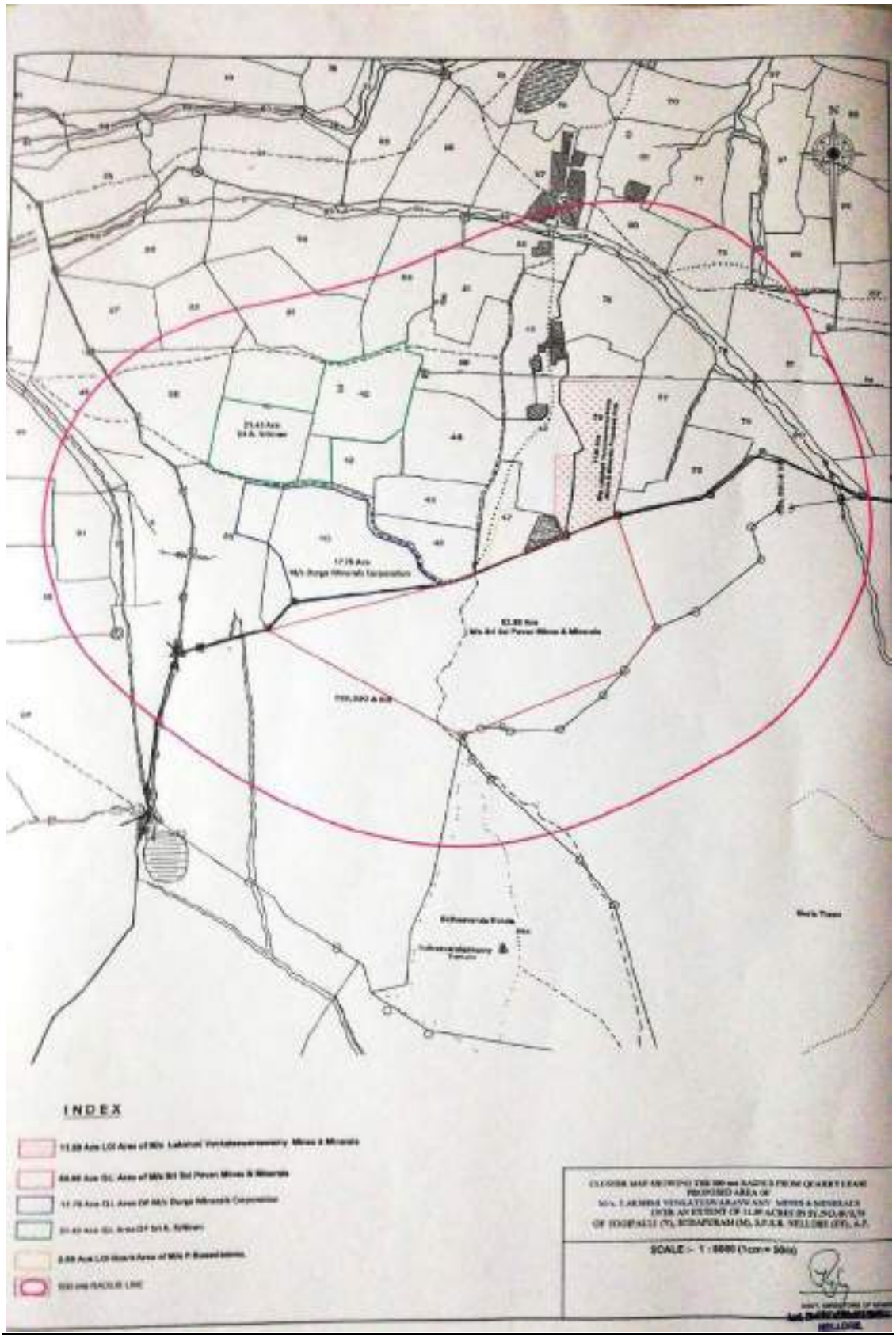
Encl: As above.

Asst. Director of Mines & Geology,
Nellore.

Staement showing the Existing leased areas and LOI granted areas are present within 500 mts radius from the Loi granted area of M/s Lakshmi Venkateswara Swamy Mines and Minerals

Sl. No	Name of the Lease	Location	Extent	Mineral	Status of LOI / Lease Period	EC Status	EC No. & Date	Production (TPA)	Remarks
1	M/s Durga Mineral Corporation	Sy.No. 39 & 40 of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District	17.75 Acres	Mica, Quartz, Feldspar & Vermiculite	25.01.2002 to 24.01.2022	EC not granted	--	--	Lease executed on 25.01.2002
2	Sri A.Srikiran	Sy.No. 41, 42 & 43 of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District	21.43 Acres	Mica, Quartz, Feldspar & Vermiculite	22.03.1994 to 21.03.2014 (Renewal applied)	EC not granted	--	--	Lease executed on 23.03.1974
3	M/s Sri Sai Pavan Mines & Minerals	Sy.No. 529 of Molakalapundla Village, Sydapuram Mandal, SPSR Nellore District	59.69 Acres	Quartz & Feldspar	13.07.2001 to 12.07.2021	EC not granted	--	--	Lease executed on 13.07.2001
4	Smt. Pallapu Suseelamma	Sy.Nos. 47/1 & 47/2 of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District	2.89 Acres	Mica, Quartz & Feldspar	LoI issued	--	--	--	LoI granted area
5	M/s Lakshmi Venkateswara Swamy Mines & Minerals	Sy.Nos. 76(P) & 48/2(P) of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District	11.89 Acres	Mica, Quartz & Feldspar	LoI issued	--	--	--	Present LoI granted area

Asst. Director of Mines & Geology,
Nellore.


INDEX
SCALE :- 1 : 5000 (1cm = 50m)

Geo Coordinates (latitude & longitude in WGS 84 – Datum) for all boundary pillars of AQ.L.- Indian topo-sheet No: 57 / N / 11 & 16

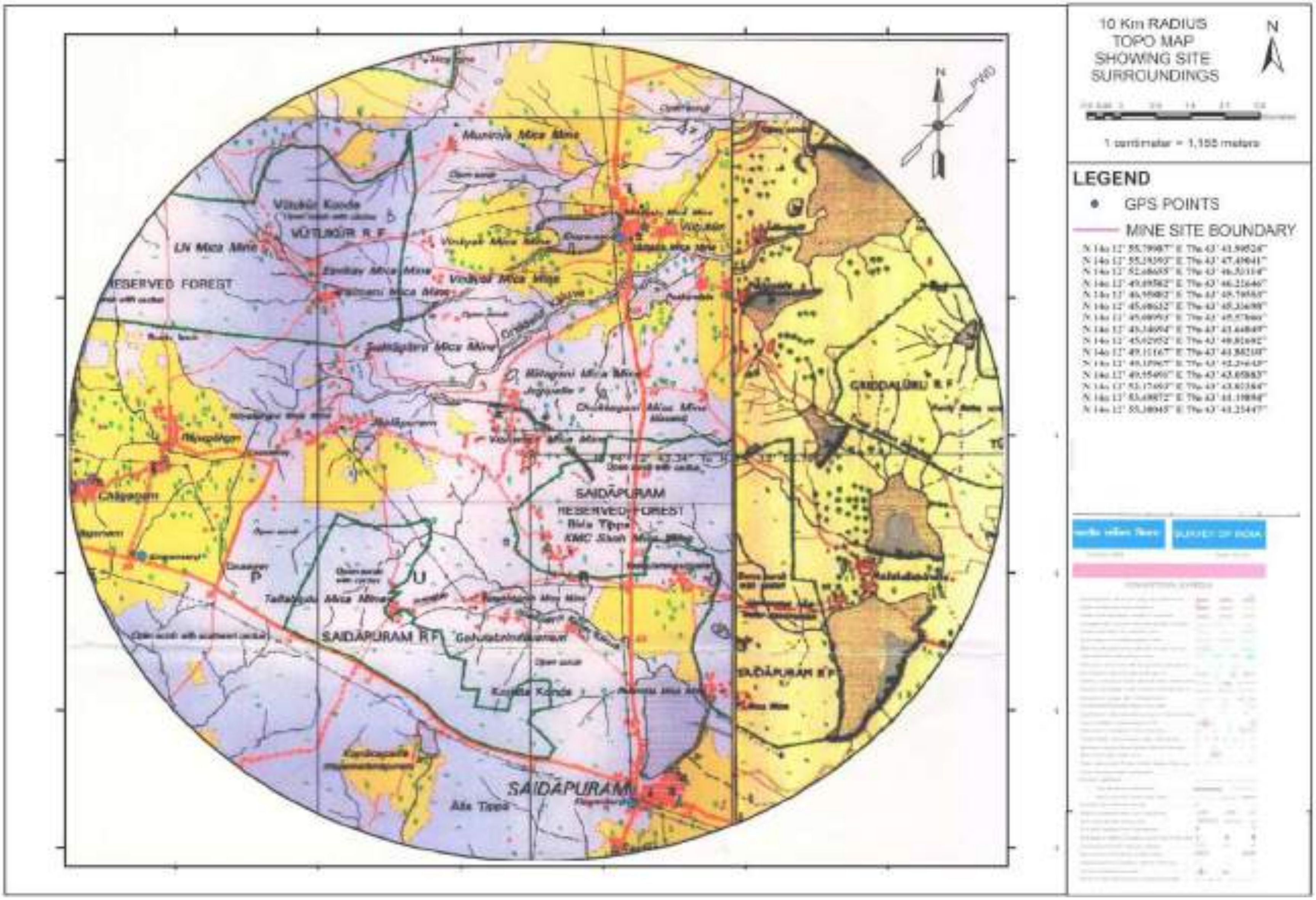
B.P.No.	Latitude	Longitude
1	N 14^o 12’ 55.79987”	E 79^o 43’ 41.90524”
2	N 14^o 12’ 55.39393”	E 79^o 43’ 47.49041”
3	N 14^o 12’ 52.68655”	E 79^o 43’ 46.53114”
4	N 14^o 12’ 49.89582”	E 79^o 43’ 46.22646”
5	N 14^o 12’ 46.95802”	E 79^o 43’ 45.70553”
6	N 14^o 12’ 45.60632”	E 79^o 43’ 45.33698”
7	N 14^o 12’ 45.00993”	E 79^o 43’ 45.57066”
8	N 14^o 12’ 43.34694”	E 79^o 43’ 41.64049”
9	N 14^o 12’ 45.02952”	E 79^o 43’ 40.82602”
10	N 14^o 12’ 49.11167”	E 79^o 43’ 41.88210”
11	N 14^o 12’ 49.15967”	E 79^o 43’ 42.34643”
12	N 14^o 12’ 49.95491”	E 79^o 43’ 43.05883”
13	N 14^o 12’ 52.17493”	E 79^o 43’ 42.02284”
14	N 14^o 12’ 53.69872”	E 79^o 43’ 41.19894”
15	N 14^o 12’ 55.30045”	E 79^o 43’ 41.25447”

Table – 1: SALIENT FEATURES OF THE STUDY AREA

Details of the Study Area	
District & State	SPSR Nellore , Andhra Pradesh
Mandal	Sydapuram
Village	Jogipalli
Nature of the Area	Patta Land (Sy.No.76 (P) & 78/2 (P))
General Climatic Conditions	
Maximum Temperature	44^{o}C
Minimum Temperature	12^{o}C
Annual Rainfall	620 mm
Wind Pattern	East -West
Accessibility	
Road Connectivity	Jogipalli Village is 0.5 km from ML area.
Rail Connectivity	The nearest Railway station is located at Gudur at a distance of 22 km from the Mining Lease Area.
Airport	Renigunta (TPT)- 80 Km
Nearest Village	Jogipalli Village- 0.5 Km
Nearest Town	Sydapuram -06 km from ML area
Historical / Important Places	
Archaeologically Important Site	Nil within the study area
Historically Important Site	Nil within the study area
Sensitive Places	Nil within the study area
Sanctuaries / National Parks	Nil within the study area
Nearest Forest	Sydapuram RF-0.5 Km,Utukur RF -2.5 Km ,Griddaluru RF -3.5 Km
Nearest Water Bodies	Griddaluru Kaluva -01Km, and few more water ponds and canals are there with in the 10 kms of ML area

Figure 1 shows the 10 km radius of the study area around the proposed Mine Lease area.

Present Site Photo Graphs of the Mine Lease Area:


10 Km RADIUS
TOPO MAP
SHOWING SITE
SURROUNDINGS
N
1 centimeter = 1,155 meters
LEGEND
GPS POINTS
MINE SITE BOUNDARY
VUTUKUR R F
RESERVED FOREST
GIDDALURU R F
SAIDAPURAM
RESERVED FOREST
SAIDAPURAM R F
SAIDAPURAM R F
SAIDAPURAM
SURVEY OF INDIA


Jogipalle
M/s Lakshmi Venkateswara Swamy Mines and Minerals
4.812 Ha,Jogipalli Vl,Sydapuram M,SPSR Nellore Dist.
Google Earth
© 2018 Google
Image © 2019 DigitalGlobe
Legend
Jogipalle
Lakshmi Venkateswara Swamy Mines & Minerals
N
1000 ft

2. PROJECT DESCRIPTION

2.1 THE PROJECT

The mine lease area of **M/s. Lakshmi Venkateswara Swamy Mines & Minerals** deals with the production Mica-4505 TPA, Quartz-3003 TPA, Feldspar-15015 TPA minerals in Survey No: 76 (P) & 48/2 (P) of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District and Andhra Pradesh. The lease area will be worked by Open cast Semi-mechanized method with Drilling and Blasting.

The area is located in Survey of India Topo Sheet No. 57 / N / 11 & 16 and it is bounded by N 14^o 12' 43.34'' to 14^o 12' 55.79" Latitudes and E 79^o 43' 40.82'' to 79^o 43' 47.49'' Longitudes. The area is located at a distance of 0.5 km from Jogipalli village.

2.2 NEED FOR THE PROJECT

In order to meet the statutory requirements the lessee intends to obtain Environmental Clearance from Statutory Authorities.

2.3 TOPOGRAPHY:

The subject area belongs to undulating terrain**.** In general the area is elevated on Western side and sloping towards NE. There is a maximum relief of 5 m (51 – 46m) from West to East direction. The applied area was used for mining activity in old and days.

Due to old workings, seven pits old pits and nine waste dumps are located in the applied area from north to south direction. The locations of the old pits and dumps are shown on plate-2A of surface plan and the sizes of dumps and pits are furnished below.

Old Pit sizes:

Sl.No.	Pit No.	Max. Size of the Pit (m)	Depth of the Pit (m)	Area covered by the pit (m^2)
1	Pit-1	48 x 28	10	1020
2	Pit-2	45 x 12	4	453
3	Pit-3	65 x 10	3	510
4	Pit-4	20 x 12	2.5	216
5	Pit-5	14 x 10	3.5	120
6	Pit-6	16 x 12	4	166
7	Pit-7	120 x 10 to 24m	8	2160
			Total	4645

Old Waste Dump Sizes:

Sl.No.	Dump No.	Max. Area Covered by Dump (m^2)	Max Height of the Dump (m)
1	Dump-1	1193	2
2	Dump-2	1142	2

3	Dump-3	972	2
4	Dump-4	350	1.5
5	Dump-5	780	2.5
6	Dump-6	218	1.5
7	Dump-7	4024	3
8	Dump-8	1142	2.5
9	Dump-9	1811	3.2
	Total	11632	

2.4 GEOLOGY

2.4.1 REGIONAL GEOLOGY:

The main geological formation of this area belongs to Archean age. According to Sri B.C. Roy (G.S.I.) the major rock types of Nellore Schist belt has been stratigraphically grouped as below.

Alluvium

Cuddalore Sand Stone

Rajmahal Plant Beds

Granite/Schist – With associated veins of Pegmatite and Vermiculite

Period of Diastrophism: Pre-Cambrian – Kandra Volcanics, Schistose Series.

Kandra Volcanics: The Kandra Volcanics are basically metamorphosed igneous rocks consisting of staurolite, amphibolites, chlorite, kainite, garnet and also epidorites and dolerites tuffs. In the region the Kandra Volcanics are devoid of pegmatites.

Schistose Series: Schistose Series consist mainly Pegmatites, Quartz, Quartzite Schist, Mica, garnet and Hornblende Schist and Phyllites, vermiculite also. Vermiculite is commonly an intrusive into these schistose rocks mostly as veins.

2.4.2 Local Geology:

Two distinct litho- units constitute the subject area, are (1) Schist and (2) Pegmatite. Out of these two litho-units, the Pegmatite is occurring as concealed lens below 1.5m soil & morum and it is trapped between the Schist as hanging & footwalls. This is normally found deeply penetrated with step dip keeping the limited width. In this area pegmatite is formed in NNW-SSE strike direction over a length of 345 m and to a width of varies from 6m to 20m. The pegmatite is dipping towards West with 70^{o}. Even though pegmatite vein is covered by the soil, it is well exposed in seven old pits, located along the strike direction from one end to other end to a maximum thickness of 10 m in between the RLS of 50 m –

40 m and the mineralization is continuing further depth from bottom of old pits. It is observed from pits that the pegmatite is rich in Potash Feldspar, associated with Quartz and Mica. The applied lease area is covered by the soil around the working pits on the surface and the contact of Pegmatite with schist is clearly seen from old pits.

Description of the Litho Units:

Schist: It is seen exposed in old pits, located in the lease area. It is medium to fine grained and it is in light grey colour. It is the main host rock for formation of pegmatite in this area.

Pegmatite: The pegmatite, associated with Potash (Feldspar), Quartz & Mica is formed in this area as a vein. There are seven old pits, located on pegmatite vein and it is exposed to a max. thickness of 10m in old pits. It is soft in nature and it shows grey to white in colour.

Soil: Alluvium soil is mixed with gravel and it is covering the lease area to a thickness of about 1.5m from the surface.

2.5 GEOLOGICAL RESERVES

Geological Reserves of Quartz, Feldspar & Mica:

Category	Section	Influence Distance	Sectional Area (m^2)	Volume (m^3)	Minerals Reserves (t) (@ 2.5t/m^3)			M.Waste @25% (m^3)
					Quartz @10%	Feldspar @50%	Mica @15%	
Proved (UNFC: 111)	A-A’	55	96	5280	1320	6600	1980	1320
	B-B’	50	228	11400	2850	14250	4275	2850
	C-C’	50	193	9650	2413	12063	3619	2413
	D-D’	50	87	4350	1088	5438	1631	1088
	E-E’	50	35	1750	438	2188	656	438
	F-F’	50	66	3300	825	4125	1238	825
	G-G’	40	62	2480	620	3100	930	620
	Total				9554	47764	14239	9554
Probable (UNFC: 111)	A-A’	55	97	5335	1334	6669	2001	1334
	B-B’	50	158	7900	1975	9875	2963	1975
	C-C’	50	144	7200	1800	9000	2700	1800
	D-D’	50	77	3850	963	4813	1444	963
	E-E’	50	57	2850	713	3563	1069	713
	F-F’	50	93	4650	1163	5813	1744	1163
	G-G’	40	68	2720	680	3400	1020	680
	Total				8628	43133	12941	8628

Total Geological Reserves of Quartz = 18182 tons

Total Geological Reserves of Feldspar = 90897 tons

Total Geological Reserves of Mica = 27180 tons

Blocking of Mineral Resources under 7.5m barrier and Final pit Slope: The reserves will be blocked in 7.5m barrier and under final pit slope on N and W side of the area and the reserves are calculated by cross sectional method and the same is furnished in the following tables.

Non-Mineable Reserves blocking under 7.5m Barrier:

Category	Section	Influence Distance	Sectional Area (m^2)	Volume (m^3)	Minerals Reserves (t) (@ 2.5t/m^3)			M.Waste @25% (m^3)
					Quartz @10%	Feldspar @50%	Mica @15%	
Proved (UNFC: 111)	A-A'	7.5	70	525	131	656	197	131
	D-D'	28	32	896	224	1120	336	224
	Total				355	1776	533	355
Probable (UNFC: 112&122)	A-A'	7.5	56	420	105	525	158	105
	D-D'	28	41	1148	287	1435	431	287
	Total				392	1960	589	392
	Grand Total				747	3736	1122	747

Non-Mineable Reserves blocking under final pit slope:

Category	Section	Influence Distance	Sectional Area (m^2)	Volume (m^3)	Minerals Reserves (t) (@ 2.5t/m^3)			M.Waste @25% (m^3)
					Quartz @10%	Feldspar @50%	Mica @15%	
Proved (UNFC: 111)	A-A'	10	31	310	78	388	116	78
	D-D'	28	24	672	168	840	252	168
	Total				246	1228	368	246
Probable (UNFC: 112&122)	A-A'	10	54	540	135	675	203	135
	D-D'	28	35	980	245	1225	368	245
	Total				380	1900	571	380
	Grand Total				626	3128	939	626

Total Reserves Blocking under 7.5m Barrier & Final Pit Slope = Quartz: 1373 t, Feldspar: 6864t and Mica: 2061 t.

Mineable Reserves:

Category	Geological Reserves In tons (1)	Reserves Blocking in 7.5m Barrier In Tons (2)	Reserves Blocking in Final Pit Slope in Tons (3)	Mineable Reserves In tons 4=1-(2+3)
Proved & Probable Quartz	18182	747	626	16809
Proved & Probable	90897	3736	3128	84033

Feldspar				
Proved & Probable Mica	27180	901	1160	25119
Total	136259	5384	4914	125961

Total Reserves as per UNFC Classification:

Classification	Code	Quartz	Feldspar	Mica	Grade of Minerals
Total Mineral Resources (A+B)		18182	90897	27180	SiO_2= 97.98 % $Fe_2 O_3$ = 00.95 %
A. Mineral Reserves					
1. Proved Mineral Reserve	111	8807	44028	13338	
2. Probable Mineral Reserve	121&122	8002	40005	11781	
		16809	84033	25119	
B. Remaining Resources					
1. Feasibility Mineral Resources	211	1373	6804	2081	
2. Prefeasibility Mineral Resources	221&222	----	----	----	
3. Measured Mineral Resources	331	----	----	----	
4. Indicated Mineral Resources	332	----	----	----	
5. Possible Mineral Resources	333	----	----	----	
6. Possible Resources	334	----	----	----	

Grade: The mineral samples collected from the applied area are chemically analyzed and the analysis of the samples is furnished under table-9.

Life of the Mine: @ 15015 (max) tons of Feldspar,3003 (max) tons of Quartz & 4505 (max) tons of Mica production per year, the expected life of the mine: 125961 / 22523 = 5.59 or 6 Years.

2.6 MINING:

The mine workings will be carried out by open cast method under supervision of Qualified "Mines Manager". For excavation of Quartz, Feldspar & Mica, jackhammer drilling and blasting is required. The workings will be carried out in three benches of 6m height each from the surface of this area. Since the mineral is exposed to surface without overburden, the development is required for O.B and side burden before to obtain the ore body.

The insitu pegmatite body excavated with the help of drilling and blasting and the blasted Pegmatite ROM lumps will be loaded into tractor cum trolley with the excavator and it will be transported to the crushing and screening plant, which is going to be setup in the lease area on Northern side. The Pegmatite ROM lumps will be crushed and screened for separation of the Quartz, Feldspar and Mica. The screened saleable mineral will be supplied to the user industries by loading into hired trucks of 17 to 20 tons capacity. The

contaminated mineral, which could not be separated as saleable minerals will be treated as mineral waste and it will be stocked on NE side of the lease area.

Proposed Method of Mining:

The firm intends to extract the Quartz, Feldspar & Mica production to the tune of 22500 tons / y. To achieve the target production, about 30000 tons of ROM and 5337 m^3 or 10674 tons of side burden / O.B. to be handled per annum on an average during first five years of the plan period.

Total excavation of ROM & Over/side burden per annum =(30000+10674)=40674 tons

Capacity of Pegmatite ROM raising per annum= 30000 tons

Capacity of Saleable mineral rising per annum (@75%) =22500 tons (avg.)

No of Working Days considered per annum= 300

Quantity of saleable mineral excavation per day= 22500 (avg) / 300 = 75 tons / day

In first five years of the plan period, the production of 3000 (avg) tonnes of Quartz, 15000 (avg) tons of Feldspar and 4500 (avg) tons of Mica will be raised per year by deploying the machinery like jackhammer drilling, compressor, excavator and Tractor cum trolley. The mineral excavations will be carried out in three benches of 6 m height each from surface between the Grid of E30 – E100 and N145 – N300. The excavated Pegmatite ROM will be supplied to the crusher, which is going to be setup on Northern side of the lease area. The Pegmatite is crushed for separation of saleable minerals of Quartz, Feldspar & Mica. The saleable minerals will be supplied to the user industries. The machinery required to get the target production is listed below.

S.No.	Name of Machinery's	Capacity	Numbers
1	Excavator	200 Lc	1 No
2	Tractor cum trolley	4 tones	3 Nos
3	Jackhammer drills	32 mm dia	2 Nos
4	Tractor Mount Compressor	---	1 No
5	Water Tanker	2000 Ltrs	1 No

DRILLING & BLASTING:

Drilling and blasting is required for excavation of the Pegmatite. The side burden / overburden consisting of gravel & Schist will be excavated with the help of excavator without drilling. So, the applicant is advised to get the explosive licence. The drill holes

will be drilled by using jackhammers in two stages by keeping spacing and burden at 2m x 1.0m and to a depth of 3m each. These drill holes will be charged with low strength slurry based explosives and ANFO of 2 kgs. Blasting operations will be carried out from a blasting shelter provided in the lease area under supervision of a person having a competent 'Blaster' certificate.

Blasting Parameters:

S.No.	Description	Unit	Quantity
1	Production of Pegmatite per annum	Tons	30000
2	Production per Day	Tons	30000 / 300 = 100
3	Spacing and Burden	m	2.0 x 1.5
4	Depth of the Each Hole	m	3.0
5	Yielded from Each hole	Tons	2.0m x 1.0 m x 3m x 2.5 = 15 ton
6	No of holes required / day	No	100 / 15 = 6.6 or 7
7	Charge per Hole	Kg/ hole	2
8	Power Factor	t/kg	15 / 2 = 7.5
9	Total explosives required/ day	kgs	7 x 2 = 14

Storage of Explosive: The applicant does not have any explosive licence at present. So, the applicant is advised to get explosive licence for 50kg capacity. After getting the explosive licence, the explosive will be stored in a magazine, located on Eastern side of the applied area. The location of the magazine is shown on plate-4.

Magazine Type and Capacity: It is advised the applicant to get the blasting licence and to establish a portable magazine in applied lease area. The capacity of the proposed magazine will be 25 kg slurry based explosives, 25 nos detonators and 25 kgs ANFO.

Precautions to be taken at the time of Blasting: The blasting activity will be carried out under supervision of Blaster certificate holder from a blasting shelter, provided in the lease area. Before going to fire the blast holes, all the precautions like evacuation of the farmers/ workers located within 500 m radius from the blasting area by giving the siren. The blasting should be conducted in a particular time and the time schedule of blasting to be displayed around the lease area. The security persons will monitor that no one should pass close to the lease area during blasting time.

Haulage and Transport of Minerals & Waste: The excavated Pegmatite lumps will be loaded into Tractor cum trolley by excavator and it will be transported to the crushing unit, proposed to construct on NE side of the lease area. Due to crushing of Pegmatite the

saleable minerals of Quartz, Feldspar & Mica will be generated and it will be sold to the user industries.

USE OF MINERAL:

Mica: The mica excavated from the mine is mostly export oriented. Therefore the whole production of mica is exported to foreign country from Chennai port. Very little quantity of mica is used in India as washers, heat resistant materials in electrical devices. All varieties of mica are saleable.

Feldspar: The main use of feldspar is in ceramic and porcelain industry mainly as glaze material. It is also used in the manufacturing of some specialized electrodes.+12mm size lumps with sodium or potassium contents are the buyer's minimum requirement. No other specifications are required.

Quartz: Use of Quartz is mainly in ferrosilicon, silicon carbide industries and abrasive industries. +99% silica content with below 10EC is the buyer's minimum requirement.

2.7 MINERAL BENEFICIATION

There is no beneficiation of minerals, only hand picking of marketable feldspar and quartz by manpower is practiced. No changes are proposed.

2.8 SITE SERVICES

It is proposed to provide site services like Mines office and other statutory constructions like rest shelter, first aid, work shed and drinking water as required Near the quarry lease area.

2.9 EMPLOYMENT POTENTIAL

The mining activity is providing the job facilities to the local people. It will have 1 Mines manager, supervisor, skilled & unskilled labour about 33 persons.

3. EVALUATION OF IMPACTS

3.0 INTRODUCTION

Opencast mining activity causes some adverse impacts on the surround environment unless proper environmental management plan is adopted. Selecting suitable sites for mining and adopting the guidelines prescribed by the Ministry of Environment & Forests (MoEF) and Indian Bureau of Mines (IBM), one can minimize the major possible impacts.

In this chapter, an attempt has been made to quantify the possible environmental impacts on various features such as air, water, noise, land, ecology and socio-economies. The following aspects have been studied to identify the possible impacts while achieving the proposed total production of Mica-4505 TPA, Quartz-3003 TPA, and Feldspar-15015 TPA of minerals.

The magnitude and significance of the environmental pollution caused by mining depends on method of mining, scale and concentration of mining activity.

3.1 AIR ENVIRONMENT

The impacts on air environment from a mining activity depend on various factors like production capacity, machinery involved, operations and maintenance of various equipments and vehicle. Apart from these, there will be other activities associated viz transportation of mineral and waste, stacking facilities and dump management within the mine lease area that may contribute to pollution.

3.1.1 SOURCES OF DUST EMISSION

Mining is carried out by open cast method by using small scale drilling & blasting. Based on the various operations involved in the production of minerals, the various emission sources have been identified as given below.

a. Point soruces

b. Area sources.

c. Line sources.

Drilling operations of the mine are considered as point sources. Extraction of mineral from mine, are considered as area sources. Transportation of material from mining

benches to various end points is considered as line source. The impact of above sources on air environment is discussed below:

a) Drilling & Blasting

Drilling and Blasting is required only to a very small extent to mine the minerals in this area. The drill holes of diameter 32 mm, will be drilled to maximum depth of 1.5 m, by keeping spacing and burden at 0.8 m respectively, with the help of jackhammer. Drilling and blasting is required for total production of Mica-4505 TPA, Quartz-3003 TPA, and Feldspar-15015 TPA drilling is required .The average production per day considering 300 working days per annum is Mica-15.01 TPD, Quartz-10.01 TPD, and Feldspar-50.05 TPD of minerals. Blasting will done using small diameter slurry based explosives and detonators. Air pollutants will be generated during blasting are in the form of particulate matter. Blasting will be carried out during day time only and that too once every week. Blasting will be avoided during high windy periods.

The concentrations due to instantaneous blasting will be high and is confined to a maximum distance of 100 m from the area of the blast around each pit. These concentrations will not be emitted continuously. However presence of personnel near the blasting site during blasting will be totally avoided. So, the impact of blasting on the air environment will be minimal. All the necessary precautions as per the statute shall be followed for Drilling and Blasting.

Haulage &Transportation: In the operating mine, the excavated material form mine face to the consumers is transported by Tractor. The Tractor will be well maintained so that exhaust smoke does not contribute abnormal values of noxious gases and unburnt hydrocarbons. The other sources of air pollution, is due to the dust generated during the movement of Tractor on the haul road.

In the operating mine, the excavated material form mine face to the stockyard is transported by Tractor. The Tractor are well maintained so that exhaust smoke does not contribute abnormal values of noxious gases and unburnt hydrocarbons. The other sources of air pollution are due to the dust generated during the movement of dumpers/ Tractor on the haul road.

The above sources, which include drilling, blasting, excavation, haulage for transport of mineral will contribute to dust pollution in the air.

The dust generated in the operating mine is that of topsoil with quartz.

3.1.2 ANTICIPATED IMPACTS

The impacts envisaged due to mining activity are evaluated based on various factors. The emission inventory of the pollutants is as follows, the main air pollutant would be dust or particulate matter generated by handling and transportation of ore. But the impact of mining operations on air quality is minimum as mining involves opencast method by using small scale drilling & blasting and as the production quantity is very less i.e Mica-15.1 TPD, Quartz-10.01 TPD, and Feldspar-50.05 TPD by means of an excavator.

3.1.2.1 Dust Generation and Control

The air pollutant would be dust or particulate matter generated by handling and transportation of ore. The dust generated due to mining operations will be controlled by water sprinkling through water tankers.

3.2 NOISE ENVIRONMENT

Noise produced at the mine is due to drilling, blasting, movement of vehicles and other machinery. The noise generated by the mining activity is dissipated within a small zone around the mine. There is no major impact of the mining activity on the vicinity however; pronounced effect of above noise levels will felt only near the active working area and on the personnel working in the vicinity. The impact of noise on the villages is negligible as the villages are located far from the mine site.

3.3 WATER ENVIRONMENT

The Mining activity will be carried out on the gentle slope will not have any effect on the ground water and the static water table in this area is below 30 m- 40 m.

3.3.1 Impact on Surface Water

There are no major streams and rivers, which can get effected by the mining. Hence, there will be no effect on the surface water

The rainwater drains the slopes of the area and joins to seasonal nallahs, which is running in outside the area.

3.3.2 Impact on Ground Water

Mining activity will be above the BWL (30m -40m). Hence, there will be no effect on the ground water regime.

3.3.3 Impact on Water Quality

Water quality in the buffer zone has indicated that the ground water is free from heavy metal concentration and these mining activities will not interference on the water quality.

3.3.4 Water Consumption & Wastewater Generation

The water requirement for this proposed mining activity will be 6.0 KLD. Breakup details are:

Sl. No	Purpose	Quantity (KLD)
1	Dust suppression purpose	4.0
2	Domestic purpose	1.0
3	Greenbelt purpose	1.0
	Total	**6.0**

There is no generation & discharge of wastewater from this mine.

3.4 LAND ENVIRONMENT

Various components of land environment have been identified for study of impact of the mine operations.

3.4.1 Solid Waste Generation

About 4505 TPA of waste will be generate .Since this area is covered by the O.B./S.B, the waste rock of 26686 m^3 will be generated as mineral. The waste will be stocked on NE & SW side of the lease area. The year wise waste generation particulars are furnished in the following table.

Year	Quantity of Mineral Waste (m^3)	Dumping Area (m^2)	Height of the Dump (m)	Quantity of Waste Rock (m^3)	Dumping Area (m^2)
1st Year	2870	410	10	7070	1010
2nd Year	3001	429	10	6196	885
3rd Year	3001	429	10	6196	885
4th Year	3003	429	10	3612	516
5th Year	3003	429	10	3612	516
Total	14878	2125		26686	3812

The mineral waste will be generated due to crushing & screening. So, the mineral waste dumping is selected on NE & SW side of the lease area.

Method of Dumping and Maximum Height and Spread of Dumping: In each year the waste will be dumped over an extent of 410 m^2 1010 m^2 and to a height of 10 m by keeping the dump slopes of less than 45^o angle.

Precautions for Confinement of Dumps to Prevent Pollution of Surface water bodies/ courses: The waste dumps will be stabilized by erecting a retaining wall and making a garland drain around the toe of the dump to prevent pollution of the surface water courses.

3.4.3 Impact on Land use

The mine is located in an area of 4.812 Ha. of Patta Land. The mining lease area is not a part of any type of forest. Most of mine lease area is non-agricultural and sparsely vegetated, hence all the impact on land use is positive because of the proposed afforestation activities carried out by mine Lessee.

Due to opencast mining activities, the landscape gets changed. There may not be much effect on the aesthetic environment of the lease area due to mining. The aesthetic beauty can be maintained by proper reclamation programme. Since this is an opencast mining proposal the land use on surface will not affect in any way.

Impact of ground vibrations: Fragmentation of rock by blasting is an important operation in mining project, where hard ore occurs. Blasting is essential only to limited extent i.e about 60% of total production only. Blasting of the mineral at the proposed mine will be done by using small dia slurry explosive and detonators.

The ground vibrations caused by blasting will not have any affect for the blasting pattern followed in the proposed mine.

3.5 BIOLOGICAL ENVIRONMENT

There is no adverse impact anticipated due to the mining activity on biological environment. However, with the implementation of the environmental management measures, there will be improvement in the parameters of biological environment.

The tree species found with the core zone represent the common type of flora species along with small shrubs and bushes. Due to mining activities community structure of the vegetation will not change. Whereas diversity of plant species and food web index of the area shall be reduced to certain extent.

However, if the proposed reclamation of the mining area and dumped out area using proper re-vegetation techniques and development of green belt around the ultimate pit limit and roadside, there shall be an improvement in the species diversity and food web index compared to the existing level.

3.6 SOCIO- ECONOMIC ENVIRONMENT

3.6.1 No Rehabilitation

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc. exist within the lease area or in the vicinity. The mining operations will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated.

3.6.2 Improvement in Socio Economic Status

It will be obvious to assume that the activities of the mining operations have to be produced some improvements in the socio-economic levels in the study area.

The Lessee is providing employment to local population and it will give preference to the local people whenever there is requirement of manpower.

The mining activities shall provide employment to persons of different skills and trades. The employment potential ameliorated economic conditions of these families directly and provided employment to many other families indirectly who are involved in business and service oriented activities. This in-turn will improve the socio-economic conditions of the area.

3.6.3 Occupational Health and Safety

The mine is going to be developed by opencast mining method. No major crushing or pulverization will be done here. The small-scale mining will not have any ill effects on the health of workers or employees.

Excessive dust and noise are the chief health hazards for the miners. As already mentioned these causative factors are well within the safety limits and the proponents will strictly implement the prescribed safety measures. The health of the workers will be regularly checked and suitable medical facilities should be created on or close to the site. Highest safety will be ensured in the working conditions of the miners.

4. ENVIRONMENTAL MANAGEMENT PLAN

4.0 INTRODUCTION

The mining development in the study area needs to intertwine with judicious utilization natural resources within the limits of permissible assimilative capacity. The assimilative capacity of the study area is the maximum amount of pollution load that can be discharged in the environment without affecting the designated use and is governed by dilution, dispersion and removal due to natural physio-chemical and biological processes. The Environmental Management Plan (EMP) is required to ensure sustainable development in the study area.

This chapter covers the genesis of pollution, the principal sources of pollution, the nature of pollution, the proposed measures required for meeting the prevailing statutory requirements of gaseous emissions, wastewater discharge characteristics, noise levels etc. for environmental management purpose in connection with the mining and mining related activities in the study area.

This section discusses the management plan for mitigation/abatement impacts and enhancement of beneficial impacts due to mining. The Environmental Management Plan (EMP) has been designed within the framework of various Indian legislative and regulatory requirements on environmental and socio-economic aspects.

Environmental Management Plan giving the environmental protection measures at mine to meet the stipulated norms of IBM/MoEF are as detailed.

4.1 AIR POLLUTION CONTROL MEASURES

The present ambient air quality measurements in the mine area are well within the limits. Due to the proposed production of Mica-15.01 TPD, Quartz-10.01 TPD, and Feldspar-50.05 TPD of minerals, there will be marginal increase in dust concentrations.

Mitigative measures suggested for air pollution control are based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that air quality should be monitored on a regular basis to check it vis-à-vis the standards prescribed by CPCB. The following dust prone areas are identified for adopting proper control measures in the mine area.

i) Drilling & Blasting

ii) Excavation

iii) Transportation

The environmental control measures which will be implemented to control the fugitive dust released from the proposed production are given below:

- Wet drilling
- Use of sharp drill bits for drilling holes. Charging the holes by using optimum charge and using millisecond delay detonators
- Water sprinkling arrangements such as specially fabricated tankers mounted on tipper are deployed at mine site to control the fugitive dust generation from the haulage roads.
- Regular grading of haul roads and service roads to clear accumulation of loose material
- The blasted piles (temporary) are wetted by spraying water
- Avoiding blasting during high windy periods, night times and temperature inversion periods.
- Excavation operations are suspended during periods of very strong winds.
- Avoiding over filling of Tractor and consequent spillage on the roads
- Massive afforestation for control of dust
- Spraying of water on sub grade stacks
- The vehicles and machinery are kept in well-maintained condition so that emission of fugitive constituents is minimized.
- Plantation of wide leaf trees, creepers, tall grass around working pit, along roads will help suppress dust.
- Tall trees with an average height of 5 m will be developed all along the boundary of the lease area to minimize the dispersion of the dust from the mining.
- Periodical monitoring of air quality to take steps to control the pollutants.

4.1.1 OCCUPATIONAL HEALTH & SAFETY MEASURES

All the precautions would be adopted to prevent dust generation at site and to be dispersed into the outer environment. However, for the safety of workers at site, engaged at strategic locations/dust generation points like drilling, loading and unloading points,

etc., dust masks would be provided. Dust masks would prevent inhalation of RSPM thereby reducing the risk of lung diseases and other respiratory disorders. Regular health monitoring of workers will be carried out.

4.2 NOISE POLLUTION CONTROL MEASURES

The ambient noise level monitoring is carried out in and around the proposed mine shows that ambient noise levels are well within the stipulated limits of CPCB.

Noise generation may be for an instant, intermittent or for continuous periods, with low to high decibels. Periodic inspection and checks of the risk prone areas and equipments have to be conducted.

To control noise pollution during the proposed mining operations following steps will be practiced.

- The noise generated by the machinery will be reduced by proper lubrication of the machinery and equipment.
- The workers employed should be provided with personal hearing protection equipment, with earmuffs and earplugs combined, as a protection from the high noise level generated at the plant site.
- The provision of green barrier along the boundary will further reduce the propagation of noise level generated.
- Limiting time exposure of workers to excessive noise.
- Carrying out blasting only during daytime and avoiding the same on cloudy days and when strong wind blows across.
- Speed of trucks entering or leaving the mine is limited to moderate speed of 25 kmph to prevent undue noise from empty Tractor.

4.2.1 CONTROL OF GROUND VIBRATIONS

- During blasting, proper blast pattern should be adopted. The latest technology delay blasting should be adopted to reduce the impact on the ground vibration and noise generation during blasting operations.
- Shock tube initiation system with sequential blasting should be adopted
- Blasting should be done in only one bench at a time.

- Charge weights per delay should be properly adopted so that the peak particle velocity will be maintained as per the DGMS requirement.

All the above-mentioned points will be taken care, while planning and conducting blasts.

4.2.2 Safety in Blasting

Care should be taken to evacuate the mining area completely at the time of blasting operations. The blasting team should be equipped with all personal safety and precautionary measure. The following safety measures will be given attention while conducting the blasting operations.

- A blasting SIREN should be used at the time of blasting for audio signal.
- Before blasting and after blasting, red & green flags should be displayed as visual signals.
- Warning notice boards indicating the time of blasting and NOT TO TRESPASS are displayed prominently.

4.3 WATER POLLUTION CONTROL MEASURES

The action program for minimizing adverse affects on water regime is to prevent wash-off of mine water and uncontrolled run-off water during monsoon. Proposed measures for this are as follows:

a) Building/extending of retention/toe walls at the foot of the dumps

b) Construction of Garland drains along the slopes to divert the rainwater course away from the dumping areas.

c) Covering of dump slopes with grass plantation to stabilize and prevent erosion.

d) Plantation of trees along the ridges and slopes.

e) Stabilization of worked out slopes by planting appropriate shrub/grass species on the slopes to prevent material wash off.

4.4 LAND ENVIRONMENT

The Environmental Management Plan of land environment is divided into the following three components.

a) Solid waste management
b) Reclamation of degraded areas
c) Afforestation/plantation/Greenbelt Development

4.4.1 Solid Waste Management

About 4505 TPA of waste will be generate .Since this area is covered by the O.B./S.B, the waste rock of 26686 m^3 will be generated as mineral. The waste will be stocked on NE & SW side of the lease area. The mineral waste will be generated due to crushing & screening. So, the mineral waste dumping is selected on NE & SW side of the lease area.

In each year the waste will be dumped over an extent of 410 m^2 1010 m^2 and to a height of 10 m by keeping the dump slopes of less than 45^o angle.

Precautions for Confinement of Dumps to Prevent Pollution of Surface water bodies/ courses: The waste dumps will be stabilized by erecting a retaining wall and making a garland drain around the toe of the dump to prevent pollution of the surface water courses.

Land Degradation: The following area is required for mining activity in this plan period.

Mining Activity	Area Covers in Ha
Working Area	0.4045
Mineral Waste Dump Area	0.2256
Mineral Waste Stock Area	0.3782
Sub-Grade stock	0.1040
Backfilled / Reclamation	Nil
Plantation	0.1500
Mine Roads	0.1035
Site Services & Crusher	0.0220
Retaining wall & G. Drain	0.0440
Total area	1.4318 Ha

Reclamation of Mined out Areas:

Mined-Out Land: During first five years the proposed exploration will be completed and the actual depth of the mineral occurrence will be proved. So, no reclamation or closure of the first five years working pit is proposed. Based on the present data the life of the mine is estimated as 6 years. If there is no mineral is occurring beyond 18m depth, the worked out pit will be reclamated / backfilled at the end of the life of the mine i.e. at the end of 6^{th} year. By the end of the life of the mine 0.9935 Ha will be covered by the working pit and about 36800 m^3 of waste will be generated in addition to the old waste of 22000 m^3.

The total waste of 58800 m^3 will be used for backfilling of the worked out pit on Southern side over an extent of 0.3675 Ha and to an average depth of 16m. The remaining pit portion of 0.6260 Ha will be used for rainwater harvesting. The land use pattern for life of the mine is detailed below.

The progressive land use pattern for first five years of the lease period is detailed below.

Year	Land degradation at the beginning	Additional area required for Mining (Ha)	Total Area (Ha)	Reclamation in the year (ha)	Degraded area at the end of the year (Ha)
1st Year	0.4645 Ha	0.0809	0.5454	Nil	0.5454
2nd Year	0.5454 Ha	0.0809	0.6263	Nil	0.6263
3rd Year	0.6263 Ha	0.0809	0.7072	Nil	0.7072
4th Year	0.7072 Ha	0.0809	0.7881	Nil	0.7881
5th Year	0.7881 Ha	0.0809	0.8690	Nil	0.8690

The land degradation in subsequent five years of the life period.

Year	Land degradation at the beginning	Additional area required for Mining (Ha)	Total Area (Ha)	Reclamation in the year (ha)	Degraded area at the end of the 5 years (Ha)
2nd 5 Years	0.869 Ha	0.1245	0.9935	0.3675	0.6260

In case of Abandoned Quarries / Pits, proposal for uses Reservoir, size, water holding capacity and its Utilization: During 6 years of the lease period about 0.9935 Ha of the area will be covered by the working pit to a depth of 16 m and about 36800 m^3 of the waste will be generated. Part of the worked out pit area on Southern side will be backfilled over an extent of 0.3675 Ha to a depth of 16 m and remaining pit portion of 0.626 ha will be used for rainwater harvesting at the end of the life of the mine.

4.4.2 Green Belt Development:

The green belt will be developed on Western side of the lease area in 7.5m barrier. 50 m x 6 m area will be planted with 1000 plants at 2m x 2m interval.

About 1000 saplings of different species are proposed to be planted at the 7.5m buffer zone. For plantation development 1.5 lakhs rupees will be used as capital cost. and later on plantation will be maintained regularly.

Apart from the green belts and aesthetic plantation for eliminating fugitive emissions and noise control, all other massive plantation efforts shall be decided and executed with the assistance and co-operation of the local community. Based on the community needs the afforestation would mainly aim at:

a) Protection & Development of Natural Vegetation
b) Protection of soil erosion

c) Plantations of fuel wood blocks to meet the energy requirements

4.5 SOCIO ECONOMIC BENEFITS

There is positive impact on socio-economics of people living in the villages. The villages in buffer zone depend upon agriculture. Mining operations in the subject area has positive impact by providing direct and indirect job opportunities. There will be indirect employment opportunities in transportation of ore to destination.

Rs.2, 00,000/-(capital cost) will be used for CSR activates like providing of computers to nearest school or R.O plant to nearest village ect.

4.6 POST PROJECT MONITORING

The Lessee will monitor the environmental parameters as per APPCB/IBM/CPCB guidelines.

4.7 IMPLEMENTATION OF EMP & MONITORING PROGRAMME

The environment management plan is detailed on the basis of impact assessment. Control and mitigation measures for the adverse impacts envisaged. As the major environmental attributes have been confined to the project area alone, implementations of the proposed control measures and monitoring thereof will be undertaken on the regional basis. The Lessee will ensure the implementation of the measures within the mine area and carryout efficient monitoring. In order to implement the measures suggested for mitigating the adverse impacts on the environment, it is suggested to monitor the environmental parameters regularly.

A detail of investments to carry out the regular monitoring and pollution control measures is given below in table.

Table : Cost of Environmental Protection Measures

Sl.No	Description	Item	Capital Cost in Rs./-	Recuring Cost in Rs/-	Remarks
1	Air pollution	Nose Masks	7,500.00	5,000.00	Replaceable, and cost can increase with time
		Cloth for drillers	24,500.00	20,000.00	Issued thrice in a year
		Gunny bags for covering the surface of jackhammer holes	-	1,000.00	As and when needed

		Road wetting and plant water feeding	250,000.00	120,000.00	Water tanker cost @ 2 tankers per day for 8 months
2	Green Belt	Plantation on road side and in bugffer zone	150,000.00	100,000.00	Green belt will be develop in first year of plan peroid.
3	Water pollution	Construction of garland drains	300,000.00	150,000.00	Once only (For manual de-silting)
		De-silting operations	-	30,000.00	Yearly and manual operations
		Construction of silting ponds	150,000.00	75,000.00	Once in year, cost incurred is to buy sand bags and filling sand
		Construction of retaining wall for waste dump	250,000.00	60,000.00	Cost of construction of wall around the dip side of the dump.
4	Noise Pollution	Maintenance of machinery	40,000.00	20,000.00	Included in main cost
		PPE's like Ear muffs	7,000.00	4,000.00	Once in six months
5	Occupational Health & Safety	Providing First aid kits – and fire extinguishers	7,000.00	5,000.00	Once in year, replace by conducting periodical checkup
		Providing Personal protective equipments to all employees (hand gloves, safety shoe and helmets)	35,000.00	20,000.00	Included in air pollution and noise pollution
		Training and awareness programs on risk factors during emergencies by the experts	15,000.00	10,000.00	Once in six months and create sign boards about the risk and safety precautions regularly
		Periodical medical checkup and supply of medicines – Rs. 200 per head	6,000.00	3,000.00	Once in a year and supply of medicines for every three months

6	Environmental monitoring	Ambient air quality studies – Once in six months – 3 locations	-	25,000.00	MoEF /NABL recognized laboratories
		Water quality studies – Once a year – 3 Locations	-	8,000.00	
		Noise studies – once in six months – 3 Locations	-	7,000.00	
		Vibration studies – Once in year – 1 location	-	10,000.00	
Total in Rupees			**1,242,000.00**	**673,000.00**	

Conclusion

Based on the EMP study it is observed that there will be a marginal increase in the dust pollution, which will be controlled by sprinkling of water and transportation of mineral in closed trucks.

There will be negligible impact on ambient environment & ecology due to mining activities, moreover the mining operations will lead to direct and indirect employment generation in the area.

Hence, it can be summarized that the development of these mines will have a positive impact on the socio-economics of the area and lead to overall sustainable development of the region.

CLUSTER
ENVIRONMENTAL MANAGEMENT PLAN
Cluster of Mica, Quartz & Feldspar Mines

1. INTRODUCTION

Introduction:

a. M/s. Lakshmi Venkateswara Swamy Mines & Minerals, Mg. Partner: Sri N.Naresh proposed Mica, Quartz & Feldspar mine over an extent of 4.812 Ha in Sy.Nos. 76 (P) & 48/2 (P) of Jogipalli Village, Sydapuram Mandal, SPSR Nellore District, Andhra Pradesh. In principle of application of quarry lease notice issued by Director of Mines and Geology, Ibrahimpatnam, Govt. of A.P for 20 years vide Notice No. 437/R3-1/2019 dated 21.03.2019. Mining Plan was approved by the Joint Director of Mines and Geology and Deputy Director of Mines & Geology, Guntur and Government of Andhra Pradesh vide Letter No. 1008/MP/Quartz/NLR/2019 Dt: 20.04.2019.

The Lessee proposes to produce about Mica-4505 (max) TPA, Quartz-3003 (max) TPA, Feldspar-15015 (max) TPA minerals from the Mining lease over an extent of 4.812 Ha.

b. **Location details:** The cluster of leases contains 05 quarries. The cluster is located at a distance of 0.5 km from Jogipalli village.

c. **Legal status of the quarries in cluster :** Assistant Director of Mines & Geology, Nellore has issued a letter vide Lr.No. 3986/P/2018 Dated:1305.2019 and as per the ADMG, Nellore within the 500 mtrs from the mine lease boundary there are four mines are there over an extent of cluster area including present proposed mine area is 45.99 Hect. But in cluster 3 mines are granted before 09 Sept, 2013 (extent is 7.183 Ha + 8.672 Ha + 24.155 Ha = 40.01 Ha) these area is exempted from cluster area) and one mine is obtained LoI i.e 1.169 Ha. Remaining area is 4.812 Ha. i.e present proposed for EC. The cluster mines details are given below table.

Statement showing the Existing leased area and LOI granted areas are present within 500 mts radius from the LOI granted area of M/s. Lakshmi Venkateswara Swamy Mines and Minerals.

S.No	Names of the Lease	Location	Extent	Mineral	Status of LOI/Lease Period	EC status	EC No. & Date	Production (TPA)	Remarks
1	M/s. Durga Mineral Corporation	Sy.No. 39 & 40 of Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(17.75 Acres) 7.183 Ha	Mica, Quartz, Feldsapar & Vemiculite	25.01.202 to 24.01.2022	EC not granted	--	--	Lease executed on 25.01.2002
2	Sri A. Srikiran	Sy.No. 41,42,& 43 Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(21.43 Acres) 8.672 Ha	Mica, Quartz, Feldsapar & Vemiculite	22.03.1994 to 21.03.2014 (Renewal applied)	EC not granted	--	--	Lease executed on 23.03.1974
3	M/s Sri Sai Pavan Mines & Minerals	Sy.No. 529 of Molakalapundia Village, Sydapuram Mandal, SPSR Nellore District	(59.69 Acres) 24.155 Ha	Quartz & Feldsapar	13.07.2001 to 12.07.2021	EC not granted	--	--	Lease executed on 13.07.2001
4	Smt. Pallapu Suseelamma	Sy.No. 47/1 & 47/2 of Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(2.89 Acres) 1.169 Ha	Mica, Quartz & Feldsapar	LOI issued	--	--	--	LOI granted area
5	M/s. Lakshmi Venkateswara Swamy Mines & Minerals	Sy.No. 76 (P) & 48/2 (P) of Jagipalli Village, Sydapuram Mandal, SPSR Nellore District	(11.89 Acres) 4.812 Ha	Mica, Quartz & Feldsapar	LOI issued	--	--	--	Present LoI granted area
Total Area			45.99 Ha						

Note : S.No. 1,2,3 Mines are executed before 09 Sept,2013 and S.No. 4th mine got LOI.

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Approach and accessibility: The applied lease area is located at a distance of 0.5 km due South of Jogipalli and applied area is connected by a cart track from Jogipalli village. The village Jogipalli is connected by B.T. road of 2 km length from the village Vutakur, which is located at a distance of 6km from Sydapuram on the way of Podalakur. Sydapuram is the mandal headquarters and it is located at a distance of 14 km from Gudur Town. Gudur is the nearest Railway Station to the applied area and it is located close to N.H-5 between Nellore & Chennai. Nellore is the District headquarters and it is located 75km from the applied area on N.H-5.

2. PRODUCTION DETAILS

Production details of the independent quarries and cluster as a whole:

S.No	Names of the Lease	Extent	Production	Production per day
1	M/s. Durga Mineral Corporation	7.183 Ha	30,000 TPA	100
2	Sri A. Srikiran	8.672 Ha	25,000 TPA	83.3
3	M/s Sri Sai Pavan Mines & Minerals	24.155 Ha	45,000 TPA	150
4	Smt. Pallapu Suseelamma	1.169 Ha	10,000 TPA	33.3
5	M/s. Lakshmi Venkateswara Swamy Mines & Minerals	4.812 Ha	22523 TPA	75.0

Note: Production values are assumption except present proposed mine

The present quarry is in principle granted to produce **22523 TPA of Minerals**. The other quarry in the cluster produces **1,10,000 Tonnes per year** (assumption) Total production of cluster mines is **132523** TPA.

The present quarry will produce 3003cum/Year (Max) of mineral waste will generate and other mine will generate 55000 Cum/ Year of waste (Assumption) Total waste mineral of cluster mines is 58003 Cum/Year. The generated top soil will be stored separately and used for plantation purpose.

3. THE PEAK PRODUCTION SCENARIO

The peak production scenario:

a. Total production quantities of the cluster: The 05 mines in cluster to produce a quantity of **132523TPA** of mineral.

b. Waste handling for the cluster as a whole during peak production: During peak production the waste is 58003 Cum. Present **proposed mine** will produce less quantity of Waste i.e 3003 cum/year (max) of waste will be generate and this waste will be dumped at dumpin site over an extent of 1.5445 Ha (for plan period)

c. Water utilization for the cluster as a whole including for sprinkling on common roads: The data is from the Environmental clearance granted .The water consumption for all mine leases are given below table.

S.No:	Name of the Lease Holder	Water requirement
1	M/s. Lakshmi Venkateswara Swamy Mines & Minerals	6.0 KLD
2.	Other 04 mines of cluster	20.0 KLD
Total		**26.0 KLD**

Thus the total quantity of water consumption for internal consumption of Mines in the cluster is 26 KLD. However additional water requirement is envisaged for sprinkling on the common roads that will be used by the quarries in the cluster.

The total road length outside the lease areas is 01 km. Out of this road outside the lease area, a span of 0.5 km will exclusively used by present proposed mine. The remaining length of 0.5 (approximately) km is the common road on which both the tractorss plying out of the quarries will ply. The projected water requirement is a rough estimate and around 10 KLD of water is needed per day for the common road span.

d. Power requirement for the cluster: The cluster mines operations do not need electricity. Moreover the operations are limited to only daylight hours and street lighting is also not needed.

4. ENVIRONMENTAL IMPACT OF THE CLUSTER

Environmental impact of the cluster as a whole:

a. Impact on air environment:

i. Dust due to dispatch vehicles: All mines estimated production per day (working of 300 days a year) given below table

S.No	Names of the Lease	Extent	Production per day
1	M/s. Durga Mineral Corporation	7.183 Ha	100
2	Sri A. Srikiran	8.672 Ha	83.3
3	M/s Sri Sai Pavan Mines & Minerals	24.155 Ha	150
4	Smt. Pallapu Suseelamma	1.169 Ha	33.3
5	M/s. Lakshmi Venkateswara Swamy Mines & Minerals	4.812 Ha	75.0

ii. For the transportation of for this material per day around 100-150 trips will be needed per day. Thus during peak production 25-35 tractors per day will be moving out from the quarry. This will generate dust which cannot be readily quantified but we can arrive at the fact that around one tractor for every 40-45 minutes will move out.

iii. **Exhaust fumes due to equipment in the cluster:** The exhaust fumes will be generated due to the above tractors due to cluster operations apart from the in-quarry operations. The impact due to in-quarry operations were already described in the respective EMP. Since there is lot of gap between each tractors' movement the accumulation of exhaust fumes in one place will not take place.

a. **Impact on water environment:** The area does not fall under any major catchment of any river or water course. Therefore the impact of cluster on water environment is not envisaged.

b. **Impact of noise on persons working:** The additional impact apart from that of the in-quarry impact is only due to tractors plying on the common roads. As explained above there will be only one tractor that will move in

every 15 to 20 minutes which will carry dispatch material of both quarries. There may not be any major impact of noise on persons working in the quarries due to the tractors moving out.

c. **Impact due to vibration:** Apart from the vibration impacts predicted in the respective EMPs there will not be any additional impact due to vibrations due to cluster operations conducted at the same time. Only precaution to be taken is that, if any blasting operations are planned on the same day in both the quarries, they shall not be conducted at the same time. This may cumulate the vibrations effect.

d. **Land degradation:** Apart from the land degradation that is envisaged in the respective quarry plans, there will not be any additional land degradation due to cluster operations.

e. **Safety of persons:** Due to increase in movement of tractors on the common road, the accident proneness will increase to the persons moving on the road for quarry works.

5. ENVIRONMENTAL MANAGEMENT

a. Management of air environment: The present ambient air quality measurements in the mine area are well within the limits. Due to the proposed production of 441.3 TPD of minerals. There will be marginal increase in dust concentrations.

Mitigative measures suggested for air pollution control are based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that air quality should be monitored on a regular basis to check it vis-à-vis the standards prescribed by CPCB and in cases of non-compliance appropriate mitigative measures shall be adopted.

The total common road length is 0.5 km. The width of road planned is 6mts. The total area = 0.5 X 6 = 03 Sq. mts. 1 Sq. mt needs 1.5 litres of water for sprinkling. Thus 4.5 KLD of water is needed per trip. It is proposed to utilize around 10 KLD per a day for sprinkling on roads average and another 5 KLD is needed for the plantation along the raods in the cluster which would be in total of 15 KLD.

Mitigative measures suggested for air pollution control are based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that air quality should be monitored on a regular basis to check it vis-à-vis the standards prescribed by CPCB and in cases of non-compliance appropriate mitigative measures shall be adopted.

The following dust prone areas are identified for adopting proper control measures in the mine area.

- Wet drilling
- Use of sharp drill bits for drilling holes. Charging the holes by using optimum charge and using millisecond delay detonators
- Water sprinkling arrangements such as specially fabricated tankers mounted on tipper are deployed at mine site to control the fugitive dust generation from the haulage roads.
- Regular grading of haul roads and service roads to clear accumulation of loose material
- The blasted piles (temporary) are wetted by spraying water

- Avoiding blasting during high windy periods, night times and temperature inversion periods.
- Excavation operations are suspended during periods of very strong winds.
- Avoiding over filling of tippers and consequent spillage on the roads
- Massive afforestation for control of dust
- Spraying of water on sub grade stacks
- The vehicles and machinery are kept in well-maintained condition so that emission of fugitive constituents is minimized.
- Plantation of wide leaf trees, creepers, tall grass around working pit, along roads will help suppress dust

b. Management of water environment: No additional measures are needed for management of water environment for the cluster operations. However general water management measures will implement as follows

- Building/extending of retention/toe walls at the foot of the dumps
- Construction of Garland drains along the slopes to divert the rainwater course away from the dumping areas.
- Covering of dump slopes with grass plantation to stabilize and prevent erosion.
- Plantation of trees along the ridges and slopes.
- Stabilization of worked out slopes by planting appropriate shrub/grass species on the slopes to prevent material wash off.

C.Reduction of impacts due to noise and vibration: One precaution needed to be taken for reduction of noise and vibration is that, the blasting if needs to be conducted on the same day, the timings should be staggered. This will not only prevent the cumulative effect of the noise and vibrations, but also will ensure safety of workers.

Noise pollution control measures:

To control noise pollution during the proposed mining operations following steps will be practiced.

- The noise generated by the machinery will be reduced by proper lubrication of the machinery and equipment.

- The workers employed should be provided with personal hearing protection equipment, with earmuffs and earplugs combined, as a protection from the high noise level generated at the plant site.
- The provision of green barrier along the boundary will further reduce the propagation of noise level generated.
- Limiting time exposure of workers to excessive noise.
- Carrying out blasting only during daytime and avoiding the same on cloudy days and when strong wind blows across.
- Speed of tractorss entering or leaving the mine is limited to moderate speed of 25 kmph to prevent undue noise from empty tippers.

Control of ground vibrations:

- During blasting, proper blast pattern should be adopted. The latest technology delay blasting should be adopted to reduce the impact on the ground vibration and noise generation during blasting operations.
- Shock tube initiation system with sequential blasting should be adopted
- Blasting should be done in only one bench at a time.
- Charge weights per delay should be properly adopted so that the peak particle velocity will be maintained as per the DGMS requirement.

All the above-mentioned points will be taken care, while planning and conducting blasts.

Safety in Blasting:

- A blasting SIREN should be used at the time of blasting for audio signal.
- Before blasting and after blasting, red & green flags should be displayed as visual signals.
- Warning notice boards indicating the time of blasting and NOT TO TRESPASS are displayed prominently.

d. Recovery and rehabilitation of land degraded: Since no additional land will be degraded due to cluster operations, special precautions need not be taken for any rehabilitation of the land.

e. Safety of persons: For ensuring safety of persons moving on the common road the following measures are proposed.

i. To post sign boards for caution about tractorss moving,
ii. To post one person at vulnerable places to caution persons moving,
iii. To form speed breakers on road at important places, and
iv. To lead the long tractorss carrying the Dimension Stone with a light vehicle to caution persons.

6. ENVIRONMENTAL BUDGET

The environment budget needed for the cluster operations is as given in the table below.

Sl.No.	Environmental work	Periodicity	Budget needed per anum in Rs
1	Water sprinkling	2 Trips/hour i.e. 25 KLD	Estimated to be Rs.200/- per trip. Daily Rs.1000. For 300 days Rs.3,00,000/- per year. (Leaving monsoon)
2	Posting sign boards etc	As and when needed	Around Rs.8,000/- per year.
3	Construction of Boulder Arrester wall over a length of 500 mts to a height of 2.0 m.	While starting the mining operations.	Rs.7,00,000/- LS
4	Environmental Monitoring on common roads	Three times a year (Pre monsoon, post monsoon, and summer)	Rs.1,50,000/- per year
	Total		Rs.11,58,000/-

Conclusion: From the above it can be seen that the total EMP budget needed is Rs. 11,58,000/-per year and both the quarries have to share the same.