

EXECUTIVE SUMMARY

SANGARAYAPURAM & MUTHUR ROUGH STONE AND GRAVEL QUARRY

NAME OF PROPOSED PROJECT PROPONENTS APPLYING IN CLUSTER

Sl. No.	Name	Village	Extent of Project site
1	Thiru. S. N. Sivasamy	Sangarayapuram	1.20.0 ha
2	Thiru. S. P. Ramalingam	Muthur	2.00.5 ha

“B1” CATEGORY/ MINOR MINERAL /CLUSTER/ NON-FOREST LAND/ PATTALAND

*** CLUSTER EXTENT = 17.16.0 ha**

* Cluster Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

ToR Obtained vide

Lr No. SEIAA-TN/F.No.8771/SEAC/ToR-1090/2021 Dated: 17.03.2022 – Thiru. S.N. Sivasamy
Lr No. SEIAA-TN/F.No.8786/SEAC/ToR-1230/2022 Dated: 25.08.2022 – Thiru. S. P. Ramalingam

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS



Old No. 260-B, New No. 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004, Tamil Nadu, India



Accredited for sector 1 Category ‘A’, sector 31 & 38 Category ‘B’
Certificate No : NABET/EIA/2225/RA 0276



Phone: 0427-2431989,

Email: ifthiahmed@gmail.com, geothangam@gmail.com

Web: www.gemssalem.com

Baseline Monitoring Period - October to December 2022

Environmental Lab

Chennai Mettex Lab Pvt Ltd

(Approved by AAI, AGMARK, APEDA, BIS, EIC, FSSAI, GAFTA, IOPEPC, MOEF & TEA BOARD)
Jothi Complex, 83, M.K.N, Road, Guindy, Chennai – 600 032, Tamil Nadu, INDIA

March 2023

1.0 INTRODUCTION

Rough Stone is the major requirement for construction industry. This EIA Report is prepared by considering Cumulative load of proposed & existing quarries within 500m radius from the proposal of Sangarayapuram & Muthur Rough Stone and Gravel Quarry. Total extent of Cluster of 17.16.0 ha at Sangarayapuram & Muthur village, Kinathukadavu taluk, Coimbatore District and Tamil Nadu State, cluster area is calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA report is prepared for Thiru. S. N. Sivasamy Rough stone and Gravel quarry over an extent of 1.20.0 Ha (S.F.Nos 247/1, 2A, 2B1 & 2B2) of Sangarayapuram Village and Thiru. S. P. Ramalingam Rough stone and Gravel quarry over an extent of 2.00.5 Ha (S.F.Nos 99/A1A(P), A2F & A2G(P) of Muthur Village located at Kinathukadavu taluk, Coimbatore District.

The proponents have obtained necessary statutory clearances from the Department of Geology and Mining, Coimbatore District, Tamil Nadu (Statutory Clearance Documents are enclosed along with Mining plan as Annexure No III). The total Extent of the quarries within the radius of 500m from this proposal is > 5Ha, hence the proposal falls under “B1” Category project as per the EIA notification, 2006 (As amended timely).

Proponent applied for Environmental Clearance to SEIAA, Tamil Nadu and obtained ToR vide

Lr No. SEIAA-TN/F.No.8771/SEAC/ToR-1090/2021 Dated: 17.03.2022 – P1

Lr No. SEIAA-TN/F.No.8786/SEAC/ToR-1230/2022 Dated: 25.08.2022 – P2

for carrying out EIA/ EMP studies for the Rough Stone and Gravel Quarry.

To carry out the EIA studies and to prepare EIA/EMP studies the proponent Thiru. S. N. Sivasamy & Thiru. S. P. Ramalingam have engaged a consultant M/s. Geo Exploration and Mining Solutions, Salem, Tamil Nadu. The Baseline Monitoring study has been carried out during summer season (October - December 2022) considering the provisions of MoEF & CC Office Memorandum Dated: 29.08.2017 and MoEF & CC Notification S.O. 996 (E) Dated: 10.04.2015.

Environmental Impact Assessment (EIA) study is a process, used to identify the Environmental, Social and Economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing

“Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”

1.1 DETAILS OF PROJECT PROPONENT

PROPOSAL ‘P1’	
Name of the Project	Thiru. S. N. Sivasamy Rough stone and Gravel Quarry
S.F. No.	247/1, 2A, 2B1 & 2B2
Extent & Classification	1.20.0 ha – Patta Land
Village Taluk and District	Sangarayapuram village, Kinathukadavu taluk, Coimbatore District.
PROPOSAL ‘P2’	
Name of the Project	Thiru. S. P. Ramalingam Rough stone and Gravel Quarry
S.F. No.	99/A1A(P), A2F & A2G(P)
Extent & Classification	2.00.5 ha – Patta Land
Village Taluk and District	Muthur village, Kinathukadavu taluk, Coimbatore District.

The project proponent is an individual.

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	Name of the Proponent and Address	S.F. Nos	Extent	Status
P1	Thiru. S.N.Sivasamy, S/o. Nattarayagounder, No.105/A, Singaiyanpudur, Sokkanur Post, Kinathukadavu, Coimbatore District – 642 109	247/1, 247/2A, 247/2B1 & 247/2B2	1.20.0 ha	Lr No. SEIAA- TN/F.No.8771/SEAC/ToR- 1090/2021 Dated: 17.03.2022
P2	Thiru. S.P.Ramalingam, S/o. Pappareddy, No.476, Anna Nagar, Ezhur Post, Vadaputhur, Coimbatore District – 641032	99/A1A (P), 99/A2F & 99/A2G (P)	2.00.5 ha	Lr No. SEIAA- TN/F.No.8786/SEAC/ToR- 1230/2022 Dated: 25.08.2022
NEARBY PROPOSED QUARRIES				
P3	Thiru.S.Rangasamy, S/o.Senniappa Gounder, No.2/57, 10 Muthur, Kinathukadavu Taluk, Coimbatore District – 641 109	95(Part)	1.34.5 ha	EC Granted
P4	Thiru. V.Gunasekaran, No.288, Vellakinar Pirivu, G.N.Mills (PO), Coimbatore District – 641 209.	98A(Part) Pit - 1	1.75.5 ha	EC Granted
P5	Thiru.V.Gunasekaran, No.288,Vellakinar Pirivu. G.N.Mills (PO), Coimbatore District – 641 209	98A(Part) Pit - 2	1.36.5 ha	EC Granted
P6	Thiru. R.Rathinasamy, S/o. Ramasamy Gounder, No.2/38, 10 Muthur, Kinathukadavu, Coimbatore – 641 109	98A(Part) Pit - 3	1.26.5 ha	EC Granted
P7	Thiru. K.Pachalingam, S/o. Kandasamy Gounder, No.2/271, Near MR Hall, Bank of Baroda back side, Vadaputhur, Elur, Kinathukadavu Taluk, Coimbatore District – 641 032	98A(Part) Pit - 4	1.12.0 ha	EC Granted
P8	Thiru. K.Sivaprakash, S/o. Kumarasamy Gounder, No.2/15, 10 Muthur, Kinathukadavu Taluk, Coimbatore District – 642 109	98A(Part) Pit - 5	1.20.5 ha	EC Granted
TOTAL			11.26.0 ha	
EXISTING QUARRY				
CODE	Name of the Proponent and Address	S.F.Nos	Extent	Lease Period
E1	S. Rangasamy	97/B1B	1.32.5 ha	11.04.2017 To 10.04.2022
E2	S. Santhalingam	97B2A, 97B2C	1.08.5 ha	25.01.2019 To 24.01.2024
E3	R. Rangadurai	138/A2(P),138/C(P)	1.42.0 ha	09.12.2016 To 08.12.2021

TOTAL			3.83.0 ha	
EXPIRED QUARRY				
CODE	Name of the Proponent and Address	S.F.Nos	Extent	Lease Period
EX1	V. Ramalingam	94/B1	2.07.0 ha	28.07.2016 to 27.07.2021
TOTAL			2.07.0 ha	
ABANDONED QUARRIES				
CODE	Name of the Proponent and Address	S.F.Nos	Extent	Lease Period
A1	Tmt. Pappammal	248/1	1.62.0	30.05.2005 To 29.05.2010
TOTAL			1.62.0 ha	
TOTAL CLUSTER EXTENT			17.16.0 ha	

TABLE 1.3: SALIENT FEATURES OF THE PROPOSED PROJECTS IN CLUSTER

Name of the Mine	Thiru. S. N. Sivasamy Rough stone Quarry	
Toposheet No	58-B/13	
Latitude Between	10°48'06.07"N to 10°48'11.46"N	
Longitude Between	76°58'05.22"E to 76°58'08.64"E	
Highest Elevation	275m (max) AMSL	
Proposed Depth of Mining	42 m (40m Rough Stone + 2m Topsoil)	
Water Level in the surrounds area	68 – 73m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is a plain terrain and gentle slope towards Southern side. The area covered by topsoil formation of 2m thickness and massive Charnockite formation is notice clearly inferred from the existing quarry pit. The altitude of the area is 275m (max) above Mean Sea level.	
Machinery Proposed	No Machinery has involved in this site. Splitting of rock mass of considerable volume from the parent rock mass by hand hammer, chisel and mild explosives like expanding chemical	
Proposed Blasting Method	No blasting involved in the site	
Manpower Proposed	33 Nos	
Mining Plan Period / Lease Period	5 Years/5 Years	
Existing Pit Dimension	101m (L) x 85m (W) x 16m (D) (bgl)	
Proposed Pit Dimension	101m (L) x 85m (W) x 42m (D) (bgl)	
Nearby Water Bodies	Odai	80m - SE
	Odai	140m - SW
	Odai	300m - SE
	Varattar Odai	2.0km - NW
	Kodavadi Odai	5.7km - SE
500 m Radius Quarries	Proposed Quarry – 8 Nos (11.26.0 ha) Existing Quarry – 3 No (3.83.0 ha)	
Project Cost	Rs. 42,29,000/-	
CER Cost	Rs 5,00,000	
Greenbelt Development Plan	Proposed to plant 720 trees in Approach Road and nearby periphery of the village Road after consulting the local Panchayat authority and Agriculture Experts area 7.5 m & 10m Safety Zone	
Nearest Reserve Forest	Bolampatti I R.F. 12.0 Km – North west	

Proposed Water Requirement	2.5 KLD	
Nearest Habitation	410m Southwest	
	Rough Stone	Topsoil
Geological Resources in m ³	3,39,295 m ³	879 m ³
Mineable Reserves in m ³	91,309 m ³	-

Name of the Mine	Thiru. S. P. Ramalingam Rough Stone and Gravel Quarry	
Toposheet No	58-B/13	
Latitude Between	10°47'53.54"N to 10°48'00.61"N	
Longitude Between	76°58'05.69"E to 76°58'12.04"E	
Highest Elevation	284m AMSL	
Proposed Depth of Mining	27 m (25m Rough stone+ 2m Gravel)	
Water Level in the surrounds area	60 – 65m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is a plain terrain and gentle slope towards Southern side. The area covered by Gravel formation of 2m thickness and massive Charnockite formation is notice clearly inferred from the existing quarry pit. The altitude of the area is 284m (max) above Mean Sea level.	
Machinery Proposed	Jack Hammer	3
	Excavator bucket & Rock breaker attached	1
	Compressor	1
	Tippers	2
Proposed Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Manpower Proposed	19 Nos	
Mining Plan Period / Lease Period	5 Years/5 Years	
Existing Pit Dimension	Pit 1: 92m (L) x 62m (W) x 5m (D) (bgl) Pit 2: 70m (L) x 23m (W) x 4m (D) (bgl)	
Proposed Pit Dimension	Pit 1: 136m (L) x 63m (W) x 27m (D) (bgl) Pit 2: 77m (L) x 41m (W) x 17m (D) (bgl)	
Nearby Water Bodies	Odai	15m - SE
	Odai	50m - NW
	Odai	70m - SW
	Varattar Odai	2.4km - NW
	Kodavadi Odai	5.5km - SE
500 m Radius Quarries	Proposed Quarry – 8 Nos (11.26.0 ha) Existing Quarry – 3 No (3.83.0 ha)	
Project Cost	Rs. 52,62,000/-	
CER Cost	Rs 5,00,000	
Greenbelt Development Plan	Proposed to plant 1200 trees in Approach Road and nearby periphery of the village Road after consulting the local Panchayat authority and Agriculture Experts area 7.5 m & 10m Safety Zone	
Nearest Reserve Forest	Bolampatti I R.F. 12.0 Km – North west	
Proposed Water Requirement	3.0 KLD	
Nearest Habitation	330m - North West	
	Rough Stone	Gravel
Geological Resources in m ³	4,95,397 m ³	28,234 m ³
Mineable Reserves in m ³	1,16,971 m ³	10,532 m ³

Source: Approved Mining Plan of the respective proposals

1.4 STATUTORY DETAILS

Project – P1 –

- The proposal for Quarrying Rough stone and Gravel in opencast Mechanized method
- Thiru. S. N. Sivasamy applied Rough stone and Gravel Quarry Lease on 15.02.2021.
- The application was processed by the District Collector, Coimbatore and issued Precise Area Communication Letter vide letter Rc.No.260/(Kanimam)/2021 Dated: 09.08.2021.
- The Mining Plan was prepared under the provision of amendment rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and submitted for approval to Department of Geology and Mining, Coimbatore District.
- The Mining Plan was approved by Assistant Director, Department of Geology and Mining, Coimbatore District for an ROM Capacity of 3,40,174m³ (3,39,295m³ Rough Stone + 879m³ Topsoil) vide Letter Rc.No.260/(Mines)/2021 Dated: 24.08.2021
- There is Eight Proposed and Three Existing quarry located within the radius of 500 m as certified by Assistant Director, Department of Geology and Mining, Coimbatore District vide Letter Rc.No.260/(Mines)/2021 Dated: 24.08

Project – P2 –

- The proposal for Quarrying Rough stone and Gravel in opencast Mechanized method
- Thiru. S. P. Ramalingam applied Rough stone and Gravel Quarry Lease on 05.08.2019.
- The application was processed by the District Collector, Coimbatore and issued Precise Area Communication Letter vide letter Rc.No.543/(Kanimam)/2020 Dated: 20.01.2021.
- The Mining Plan was prepared under the provision of amendment rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and submitted for approval to Department of Geology and Mining, Coimbatore District.
- The Mining Plan was approved by Assistant Director, Department of Geology and Mining, Coimbatore District for an ROM Capacity of 5,23,631m³ (4,95,397m³ Rough Stone + 28,234m³ Gravel) vide Letter Rc.No.543/(Mines)/2019 Dated: 03.08.2021
- There is Eight Proposed and Three Existing quarry located within the radius of 500 m as certified by Assistant Director, Department of Geology and Mining, Coimbatore District vide Letter Rc.No.543/(Mines)/2019 Dated: 03.08.2021.

2. PROJECT DESCRIPTION

The proposed projects are site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries. Rough Stone is proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	(NH-209) Coimbatore – Dindigul – 5.0Km – SouthEast (SH-163) Palladam – Cochin Frontier Road – 10.0Km – NorthWest
Nearest Village/Habitation	330m – North West
Nearest Town	Kinathukadavu– 6.0Km –NorthEast
Nearest Railway	Kinathukadavu– 6.0Km –NorthEast
Nearest Airport	Coimbatore Airport – 24.0Km – NorthWest
Seaport	Kochi – 123.0 km – SouthWest

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

Proposed – P1		
Description	Present area in (ha)	Area at the end of life of quarry (ha)
Area under quarry	0.88.3	0.88.3
Infrastructure	Nil	0.01.0
Roads	0.01.0	0.01.0
Green Belt	Nil	0.27.3
Un – utilized area	0.30.7	0.02.4
Grand Total	1.20.0	1.20.0
Proposed – P2		
Description	Present area in (ha)	Area at the end of life of quarry (ha)
Area under quarry	0.50.0	1.05.0
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.15.0
Un – utilized area	1.48.5	0.77.5
Grand Total	2.00.5	2.00.5

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

PARTICULARS	DETAILS-P1	
	Rough Stone (5Year Plan Period)	Topsoil (1 Year Plan Period)
Geological Resources in m ³	3,39,295	879
Mineable Reserves in m ³	91,309	-
Production for five-year plan period in m ³	91,309	-
Mining Plan Period	5Years	
Number of Working Days	300 Days	
Production per day in m ³	60	-
No of Lorry loads (6m ³ per load)	10 Nos	-
Total Depth of Mining	42m (2m Topsoil + 40m Rough stone) BGL	
PARTICULARS	DETAILS-P2	
	Rough Stone (5Year Plan Period)	Gravel (3 Year Plan Period)
Geological Resources in m ³	4,95,397	28,234
Mineable Reserves in m ³	1,16,971	10,532
Production for five-year plan period in m ³	1,16,971	10,532
Mining Plan Period	5Years	
Number of Working Days	300 Days	

Production per day in m ³	78	12
No of Lorry loads (6m ³ per load)	13Nos	Will be preserved in safety barrier
Total Depth of Mining	27 (2m Gravel + 25m Rough stone) BGL	

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA



SATELLITE IMAGERY OF P1



SATELLITE IMAGERY OF P2

FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

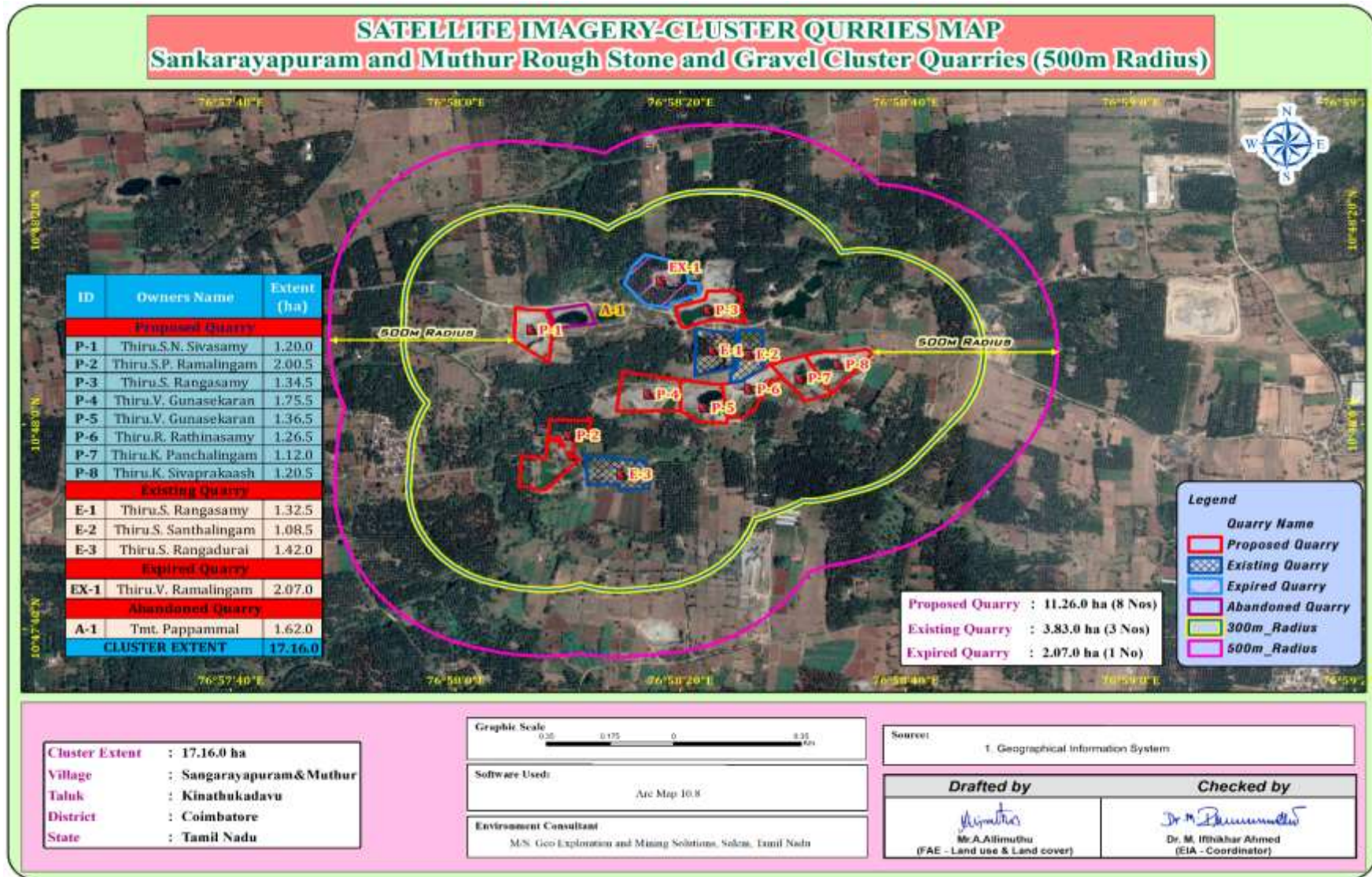
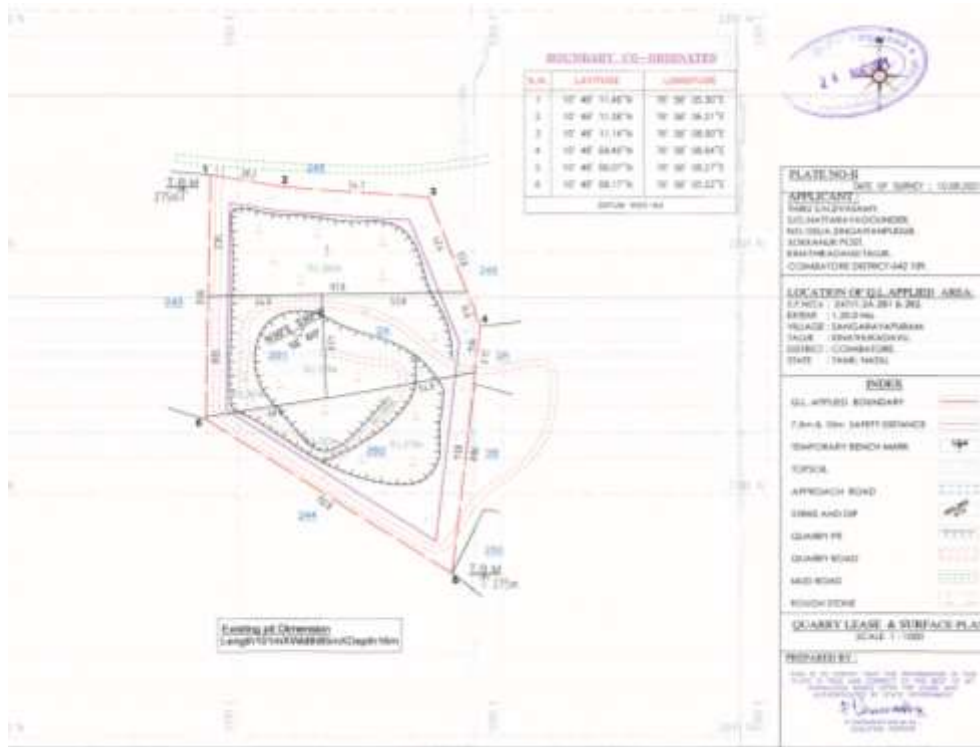


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

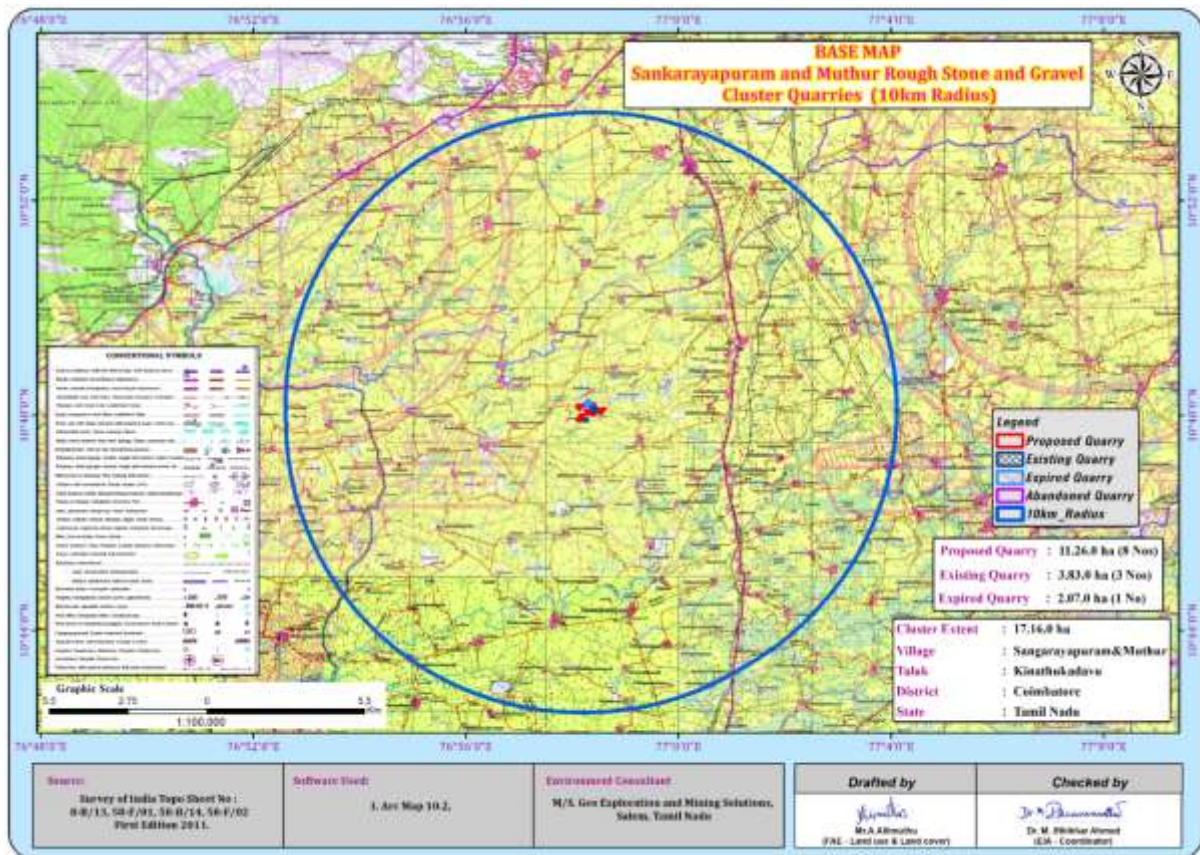
P1



P2



FIGURE 2.5 IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS



2.4 METHOD OF MINING

Opencast Mechanized Mining Method is being proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The top layer of Topsoil will be Excavate directly by Hydraulic Excavators and preserved all along the safety barrier to facilitate greenbelt development during Mine Closure Stage. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers

2.5 PROPOSED MACHINERY DEPLOYMENT

Proposal- P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Tipplers / Dumpers	1	20 Tonnes	Diesel Drive
Proposal- P2				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Tractor Mounted Compressor	1	400psi	Diesel Drive
2	Jack Hammer	3	1.2m to 2.0m	Compressed air
3	Excavator with Bucket / Rock Breaker Unit	1	0.90 m ³ Bucket Capacity	Diesel Drive
4	Tipplers / Dumpers	2	20 Tonnes	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc

2.7 ULTIMATE PIT DIMENSION

PROPOSAL-P1			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	101	85	42m (bgl) (2m Topsoil + 40m Rough stone)
PROPOSAL-P2			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	136	63	27m (bgl) (2m Gravel + 25m Rough stone)
II	77	41	17m (bgl)

3.0 DESCRIPTION OF THE ENVIRONMENT

The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering October – December 2022 as per CPCB & MoEF & CC guidelines.

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
Soil	Physio-Chemical Characteristics	Once during the study period	6 (2 core & 4 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	7 (2 surface water & 5 ground water)	IS 10500& CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data& Secondary Data from IMD Station

	Dry bulb temperature Rainfall			
Ambient Air Quality	PM ₁₀ PM _{2.5} SO ₂ NO _x Fugitive Dust	24 hourly twice a week (3 Months)	8 (2 core & 6 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (2 core & 6 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrat & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

3.2 LAND ENVIRONMENT

A visual interpretation technique has been adopted for land use classification based on the keys suggested in the Chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping.

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover. The main objective of this section is to provide a baseline status of the study area covering 10 km radius around the mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future.

TABLE 3.1: LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
1	Fallow Land	6960.74	19.94
2	Crop Land	13425.3	38.47
3	Agricultural Land	11046.5	31.65
4	Builtup-Rural	537.472	1.54
5	Builtup-Urban	2700.57	7.739
6	mining area	153.036	0.438
7	Water bodies	71.173	0.203
	Total	34894.8	100

From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture land (includes crop land) 70.12% followed by Built-up Lands 9.279%, Mining – 0.438% and Water bodies 0.203%.

The total mining area within the study area is 153.036 ha i.e., 0.438 %. The cluster area of 17.52.75 ha contributes about 11.45% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment

3.3 SOIL ENVIRONMENT

Soil quality of the study area is one of the important components of the land environment. The composite soil samples were collected from the study area and analysed for different parameters

Interpretation & Conclusion

- Variation in pH of the soil in the study area was found to be 7.63 to 8.61
- Mostly the soils collected from different location in the study area are clay loam in texture.
- The bulk density of the soil in the study area ranged between 0.97 – 1.24 g/cc.
- Organic carbon of the soil in the study area ranged between 0.70 - 1.37 %.
- Available Nitrogen, available phosphorous and potassium content is low
- –

3.4 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the water quality characteristics for critical parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity. The water samples were collected and transported as per the norms in pre-treated sampling cans to laboratory for analysis.

Surface Water

Ph:

The pH varied from 7.88 – 7.93 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 425 – 459 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

. Ground Water

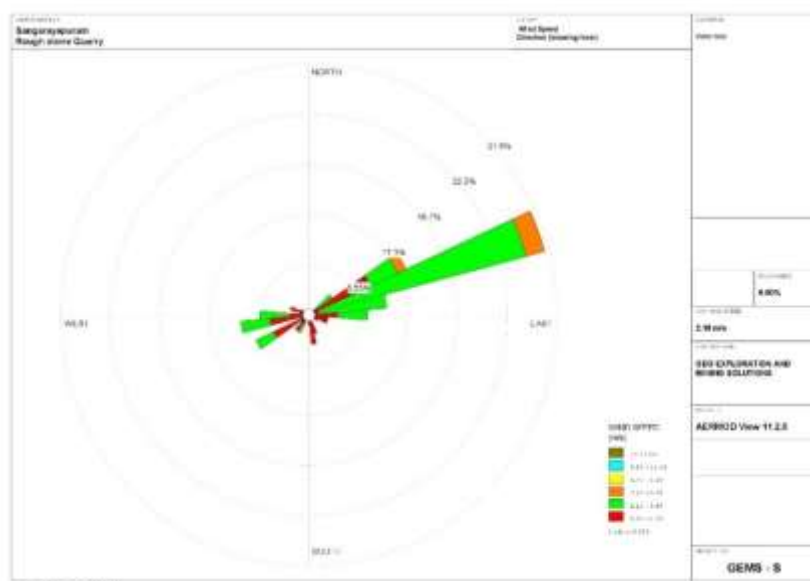
The pH of the water samples collected ranged from 6.92 to 7.99 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 357 to 414 mg/l in all samples. The Total hardness varied between 115.05 to 187.0 mg/l for all samples.

On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with ISO 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information. The sources of air pollution in the region are mostly due to existing quarries, vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed mine..

FIGURE – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM10 ranges from 40.2 $\mu\text{g}/\text{m}^3$ to 49.0 $\mu\text{g}/\text{m}^3$, PM2.5 data ranges from 18.1 $\mu\text{g}/\text{m}^3$ to 28.4 $\mu\text{g}/\text{m}^3$, SO2 ranges from 6.0 $\mu\text{g}/\text{m}^3$ to 9.0 $\mu\text{g}/\text{m}^3$ and NO2 data ranges from 19.10 $\mu\text{g}/\text{m}^3$ to 28.6 $\mu\text{g}/\text{m}^3$. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.7 NOISE ENVIRONMENT

The existing quarry operations, vehicular movement, HEMM, Drilling & Blasting are the major sources of noise in study area, the environmental assessment of noise from the mining activity and vehicular traffic can be undertaken by taking into consideration various factors like potential damage to hearing, physiological responses, and annoyance and general community responses.

The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site

Interpretation & Conclusion

- Ambient noise levels were measured at 8 (eight) locations around the proposed project area.
- Noise levels recorded in core zone during day time were from 41.9 – 42.4 dB (A) Leq and during night time were from 38.0 – 39.3 dB (A) Leq.
- Noise levels recorded in buffer zone during day time were from 39.8 – 41.1 dB (A) Leq and during night time were from 37.6 – 39.5 dB (A) Leq.
- The noise level for Industrial and Residential area meets the requirements of The Noise Pollution (Regulation and Control) Rules, 2000; (The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.)

3.8 ECOLOGICAL ENVIRONMENT

Ecology is a branch of science which dealing the relations and interactions between organisms and their environment. An ecological survey of the study area was conducted, particularly with reference to listing of species and assessment of the existing baseline ecological conditions in the study area. The main objective of biological study is to collect the baseline data regarding flora and fauna in the study area. Data has been collected through extensive survey of the area with reference to flora and fauna. Information is also collected from different sources i.e. government departments such as District Forest Office, Government of Tamil Nadu. On the basis of onsite observations as well as forest department records the checklist of flora and fauna was prepared.

3.9 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed project will aim to provide preferential 145 persons to the local people there by improving the indirect employment opportunity for 50 persons and in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

4.1 LAND ENVIRONMENT: ANTICIPATED IMPACT

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course
-

MITIGATION MEASURES

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined out pit will be used for greenbelt
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

IMPACT ON SOIL ENVIRONMENT

- Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

- Site preparation will entail stripping and removal of the topsoil which contains most of the nutrients and organisms that give soil a living character and productivity
- However, as the project design takes into account the preservation of the top soil and its subsequently use for topping up of the rehabilitated land. The impact on soil quality will be insignificant considering the mitigation measures proposed to be implemented.

MITIGATION MEASURES FOR SOIL CONSERVATION

- Run-off diversion – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry works areas. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

4.3 WATER ENVIRONMENT

• ANTICIPATED IMPACT

- The major sources of water pollution normally associated due to mining and allied operations are:
 - Generation of waste water from vehicle washing.
 - Washouts from surface exposure or working areas
 - Domestic sewage
 - Disturbance to drainage course in the project area
 - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table
- Detail of water requirements in KLD as given below

MITIGATION MEASURES

- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage.
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water.

4.4 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area

MITIGATION MEASURES

Drilling – To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar

Advantages of Wet Drilling:-

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.
- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting include Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation –

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials

Green Belt –

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored
- Annual medical checkups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed

4.5 NOISE ENVIRONMENT**ANTICIPATED IMPACT**

Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are:

- Source data
- Receptor data
- Attenuation factor

Source data has been computed taking into account of all the machinery and activities used in the mining process

TABLE 4.10: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY

Sl.No.	Machinery / Activity	Impact on Environment?	Noise Produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack Hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
Total Noise Produced			95.8

MITIGATION MEASURES

- The following noise mitigation measures are proposed for control of Noise
- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;

- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

4.6 BIOLOGICAL ENVIRONMENT ANTICIPATED IMPACT

The impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics, mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the faunal and floral status of the project area. However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved. Impact prediction is the main footstep in impact evaluation and identifies project actions that are likely to bring significant changes in the project environment. The present study was carried out to predict the likely impacts of the proposed project at Sangarayapuram and Muthur village and the surrounding environment with special reference to biological attributes covering habitats/ecosystems and associated biodiversity.

The proposed mining activities include removal of some scattered bushes and other thorny species. Although impacts on key habitat elements will occur on a local scale, but on a regional scale they would not be critical for the life cycle needs of the species observed or expected. More over during conceptual stage, the mined out areas on the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time. Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Wild life is not commonly found in the project area and its immediate environs because of lack of vegetal cover and surface water. Except few domestic animals, reptiles, hares and some common birds are observed in the study area.

- I. None of the plants will be cut during operational phase of the mine.
- II. There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.
- III. Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.

MITIGATION MEASURES

Keeping all this in mind the mitigations have been suggested under environmental management plan. With the understanding of the role of plant species as bio-filter to control air pollution, appropriate plant species (mainly tree species) have been suggested conceding the

area/site requirements and needed performance of specific species. The details of year wise proposed plantation program are given in Table 4.13.

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas

In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly in proposed areas falls in the cluster earmarked for plantation program as per Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone.

The objectives of the green belt cover will cover the following:

- Noise abatement
- Ecological restoration
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

4.7 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

- Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- Approach roads can be damaged by the movement of tippers.
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

MITIGATION MEASURES

- Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly.
- From above details, the quarry operations will have highly beneficial positive impact in the area

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

No alternatives are suggested as the mine site is mineral specific

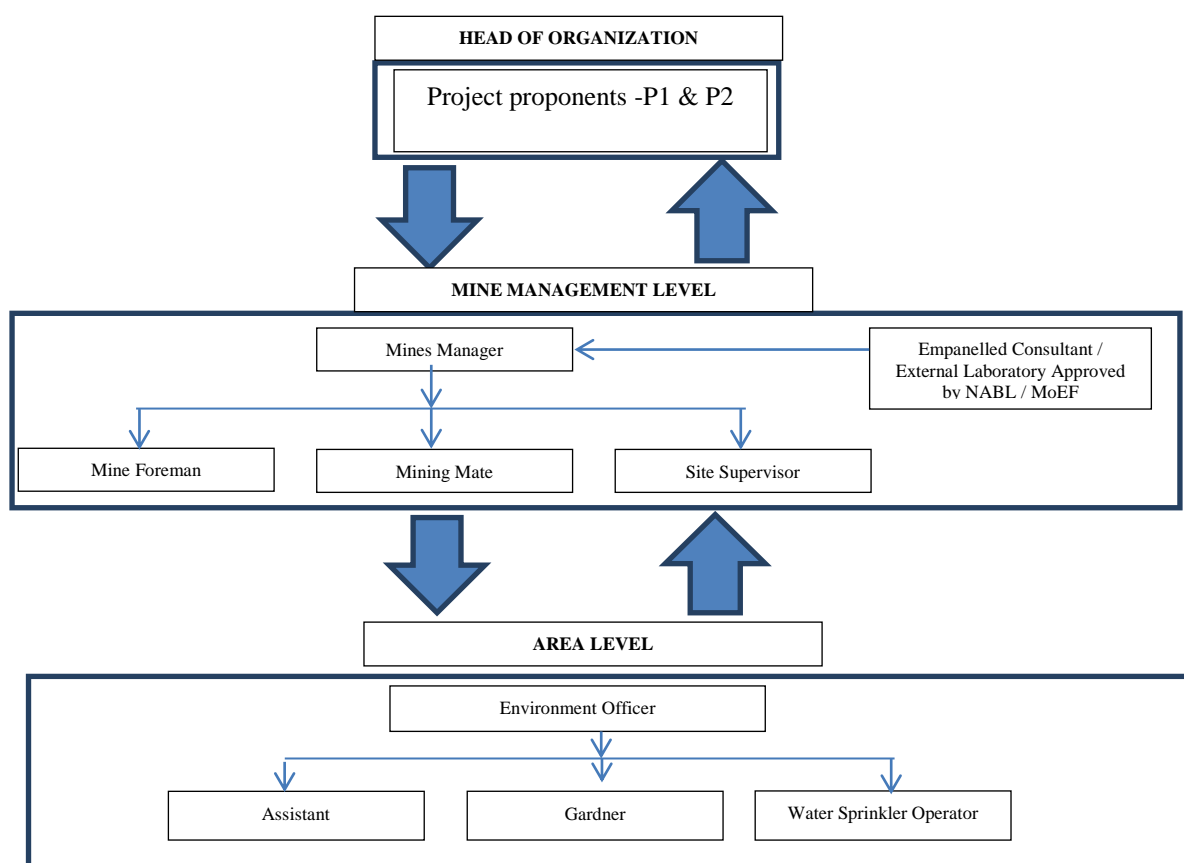
6 ENVIRONMENT MONITORING PROGRAM

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed.

6.1 ENVIRONMENTAL MONITORING CELL



5.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall

3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

- The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.
- The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening

7.2 DISASTER MANAGEMENT PLAN

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- Rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;

- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE IN CLUSTER

Quarry	Proposed 5 Year Mining Plan Period Reserves in m ³	Avg. Per Year Production m ³	Per Day Production m ³	Number of Lorry Load Per Day
P1	90,759	18,151	60	10
P2	1,16,971	23,394	78	13
P3	2,32,393	46,479	155	26
P4	3,49,348	69,870	233	39
P5	3,76,337	75,267	251	42
P6	2,73,811	54,762	183	30
P7	2,26,797	45,359	151	25
P8	3,10,974	62,195	207	35
Total	19,77,390	3,95,477	1,318	220
E1	33,405	6,681	22	4
E2	46,585	9,317	31	5
E3	79,453	15,891	53	9
Total	1,59,443	31,889	106	18
Grand Total	21,36,833	4,27,366	1,424	238

CUMULATIVE PRODUCTION LOAD OF GRAVEL IN CLUSTER

Quarry	2 - 3 Years production in m ³	Avg. Per Year Production m ³	Per Day Production m ³	Internal Trips – Lorry Load Per Day
P1	0	0	0	0
P2	10,532	3,510	12	2
P3	0	0	0	0
P4	0	0	0	0
P5	0	0	0	0
P6	0	0	0	0
P7	0	0	0	0
P8	0	0	0	0
Total	10,532	3,510	12	2
E1	8,906	2,969	10	2
E2	5,668	1,889	6	1
E3	1,066	1,066	4	1
Total	15,640	5,924	20	4
Grand Total	26,172	9,434	32	6

PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	40.3	48.1	48.7	55
Habitation Near P2	40.2	49.7	50.2	
Habitation Near P3	46.1	44.8	48.5	
Habitation Near P4	49.2	42.5	50.0	
Habitation Near P5	47.1	40.1	47.9	
Habitation Near P6	47.9	10.1	48.6	
Habitation Near P7	43.2	41.2	45.3	
Habitation Near P8	44.6	42.0	46.5	
Habitation Near E1	40.9	42.5	44.8	
Habitation Near E2	42.7	44.8	46.9	
Habitation Near E3	43.7	41.2	45.6	

SOCIO ECONOMIC BENEFITS

Location ID	Direct Employment	Indirect Employment
P1	33 Nos	15 Nos
P2	19 Nos	10 Nos
P3	23 Nos	10 Nos
P4	30 Nos	15 Nos
P5	31 Nos	15 Nos
P6	27 Nos	10 Nos
P7	26 Nos	10 Nos
P8	27 Nos	10 Nos
Total	216Nos	95Nos
E1	10Nos	10 Nos
E2	11Nos	10 Nos
E3	12 Nos	10 Nos
Total	33 Nos	30 Nos
Grand Total	249Nos	125Nos

8. PROJECT BENEFITS

Eight Proposed Projects for Quarrying Rough Stone at sangarayapuram & Muthur Village aims to produce cumulatively 19,77,390 m³ Rough Stone & 10,530 m³ of Gravel over a period of 5 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

- Increase in Employment Potential
- Improvement in Socio-Economic Welfare
- Improvement in Physical Infrastructure
- Improvement in Social infrastructure

9. ENVIRONMENT MANAGEMENT PLAN

The Environment Monitoring cell discussed formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

- ✚ Monitoring of the water/ waste water quality, air quality and solid waste generated
- ✚ Analysis of the water and air samples collected through external laboratory
- ✚ Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- ✚ Co-ordination of the environment related activities within the project as well as with outside agencies
- ✚ Collection of health statistics of the workers and population of the surrounding villages
- ✚ Green belt development
- ✚ Monitoring the progress of implementation of the environmental monitoring programme
- ✚ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10. CONCLUSION

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.