

EXECUTIVE SUMMARY

PROJECT PROPONENTS

Tvl. KNR Constructions Limited,

S.F. Nos: 131/1A, 131/1B, 131/1C1, 131/2A, 131/2B, 132/1 & 132/2A

Extent: 4.83.5

Puliyampatti Village, Palani Taluk, Dindigul District, Tamil Nadu State

“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON FOREST LAND

*** CLUSTER EXTENT = 9.49.5 Ha**

Complied as per ToR Obtained vide

Lr No. SEIAA-TN/F.No.7721/SEAC/ToR-803/2020 Dated: 05.11.2020

Project Proponents

Tvl. KNR Constructions Limited,

Puliyampatti Village,

Palani Taluk,

Dindigul District – 624 617.



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, 28 & 38 Category 'A'

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

1. INTRODUCTION

Rough stone is the major requirements for construction industries. The proponent Tvl.KNR Construction Limited (1 Quarry - P1) applied for Rough stone quarry lease in Puliyampatti Village, Palani Taluk, Dindigul District, Tamil Nadu.

This EIA report is prepared by considering Cumulative load of the proposed and existing Rough stone quarry is falling in the cluster situation (One proposed and Three Existing Quarries) total extent of Cluster quarries 9.49.5 ha .

This EIA Report is prepared in compliance with ToR obtained vide letter No

- Tor – Lr No. SEIAA-TN/F.No.7721/SEAC/ToR-803/2020 Dated: 05.11.2020 – Tvl.KNR Construction Limited

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed projects is categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance.

“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 – Tvl.KNR Construction Limited

Name of the Project Proponent : Tvl.KNR Constructions Limited,
Thiru. K.Vinay Kumar Reddy
(Project Co-Ordinator and authorized signatory)

Address : Puliyampatti Village,
Palani Taluk,
Dindigul District.

State : Tamil Nadu

Pin code : 624 617

Mobile No : +91 94890 48702

Email id. :

The project proponent is Private Limited Company

1.1 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRY				
CODE	Name of the Owner	S.F. Nos	Extent	Status
P1	Tvl. KNR Constructions Limited, Puliyampatti Village, Palani Taluk, Dindigul District – 624 617	131/1A, 131/1B, 131/1C1, 131/2A, 131/2B, 132/1 &132/2A	4.83.5 ha	ToR obtained vide Lr No. SEIAA- TN/F.No./7721/SEAC/TOR- 803/2020 Dated 05/11/2020
TOTAL			4.83.5 ha	
EXISTING QUARRIES				
CODE	Name of the Owner	S.F. No	Extent	Status
E1	S.Ayyappan, S/o.K.R.Singaram, 193, Lakshmipuram, Palani Taluk, Dindigul District.	160/3, 160/4, 160/5,159/1, 132/2B and 131/1C2	1.90.5 ha	30.05.2020 – 29.05.2025
E2	V.Soundarapandiyan, S/o. Velusamy. No.33/2 Puliamatti, Palani Taluk, Dindigul District.	160/6(P) B- 2(W)	0.62.0	26.10.2015 to 25.10.2020
E3	KNR Constructions Limited, Puliamatti village, Palani Taluk, Dindigul District.	135	2.13.5	07.01.2020 to 06.12.2020
TOTAL			4.66.0ha	
TOTAL CLUSTER EXTENT			9.49.5 ha	

TABLE 1.2 SALIENT FEATURES OF THE PROPOSAL PROJECT

Name of the Quarry	Tvl.KNR Constructions Limited		
Toposheet No	58-F/10		
Latitude between	10°30'42.54"N to 10°30'52.33" N		
Longitude between	77°32'04.26"E to 77°32'13.78"E		
Highest Elevation	328.5 m AMSL		
Proposed Depth of Mining	43.5 m bgl (2m Gravel +1.5m Weathered Formation+40m Rough Stone)		
Geological Resources	Rough Stone in m ³	Weathered Formation in m ³	Gravel m ³
	21,21,795	70,727	94,302
Mineable Reserves	Rough Stone in m ³	Weathered Formation in m ³	Gravel m ³
	9,91,715	60,708	80,944
Proposal for this Plan Period	Rough Stone in m ³	Weathered Formation in m ³	Gravel m ³
	9,91,715	60,708	80,944
Ultimate Pit Dimension	196 m (L)* 245 m (W)* 43.5 m (D) bgl		
Water Level in the surrounds area	57 – 60m bgl		
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting		
Topography	The lease applied area exhibits plain terrain. The gradient is gentle towards Northwest and altitude of the area is 328.5m above from Mean sea level. The Massive Charnockite is clearly inferred from the nearby existing quarry pits. The most of the area is concealed under weathered formation having an average thickness of 1.5m.		
Machinery proposed	Jack Hammer	12 Nos	
	Compressor	3 Nos	
	Excavator with bucket and Rock breaker	3 Nos	
	Taurus	6 Nos	
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.		
Proposed Manpower Deployment	48 Nos		
Project Cost	Rs.1,11,70,000/-		
CER Cost @ 2% of Project Cost	Rs.2,24,000/-		
Nearby Water Bodies	Odai	160m East	
	Odai	310m East	
	Odai	560m South West	
	Kulam	800m North West	
	Paraipatti Tank	3.5Km West	
	Pudur Kulam	4.5Km South West	
	Shanmuga Nadi	5Km South West	
	Thoppampatti Tank	5.5Km North	
	Kanjanaickenpatti Lake	5.5Km East	
	Kanakkanpatti Lake	6Km South East	
Nallatungal Odai	6.5Km North East		
Greenbelt Development Plan	Proposed to plant 900 trees in 8,050 Sq.m area in the 7.5 m Safety Zone		
Proposed Water Requirement	8.6 KLD		
Nearest Habitation	1000 m South		

1.3 STATUTORY DETAILS

- Proposal submitted along with Form -I, Pre-Feasibility, Approved Mining plan in SEIAA on 29.07.2020
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/55303/2020 Date: 04.08.2020
- The proposal was placed in 178th SEAC meeting held on 01.10.2020 and the committee recommended for issue of ToR.
- The proposal was considered in 408th SEIAA meeting held on 28.10.2020 & 29.10.2020 and issued ToR vide Letter No SEIAA- TN/F.No./7721/SEAC/TOR-803/2020 Dated 05.11.2020

2. PROJECT DESCRIPTION

Puliyampatti Rough stone and Gravel Cluster Quarry project over an extent of 9.49.5 ha; it is a Non-Captive Mine, Opencast Mechanized Mine catering to needy customers at various destinations.

The proposed projects aim to produce 9,91,715m³ of Rough stone, 60,708m³ Weathered Formation, 80,944m³ Gravel for Five years plan period.

The area is a fresh land and no mining activity was carried out before, Topography of the area is plain topography (328.5m AMSL) with gentle sloping towards Northwest side. No major vegetation or trees within the project area, the project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarry.

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 - 7km on the South East (SH-83) Palani- Dharapuram –700m- West
Nearest Village	Puliyampati – 1.0Km- South
Nearest Town	Palani – 7.0Km –South West
Nearest Railway	Palani railway station– 7.0Km –South West
Nearest Airport	Coimbatore Airport – 85.0 Km-NW
Seaport	Kochi – 153 Km- SW

2.2 LAND USE PATTERN OF THE PROPOSED PROJECTS

Tvl.KNR Construction Limited		
Description	Present Area in (Ha)	Area at the end of life of quarry (Ha)
Area under quarry	Nil	4.00.0
Infrastructure	Nil	0.01.0
Roads	Nil	0.02.0
Green Belt	Nil	0.80.5
Un – utilized area	4.83.5	Nil
Total	4.83.5	4.83.5

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Tvl.KNR Construction Limited			
Particulars	Details		
	Rough Stone (5 Year Plan period)	Weathered formation (1 Year Plan period)	Gravel (1 Year Plan period)
Geological Resources in m ³	21,21,795	70,727	94,302
Mineable Reserves in m ³	9,91,715	60,708	80,944
Production for five-year plan period m ³	9,91,715	60,708	80,944
Mining Plan Period	5 Years		
Number of Working Days	300 Days		
Production per day in m ³	661	202	270
No of Lorry loads (6m ³ per load)	110	34	45
Total Depth of Mining	43.5 m (2m Gravel + 1.5m Weathered Formation + 40m Rough stone)		

Source: Approved Mining plan of respective quarry leases

FIGURE – 1: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA



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

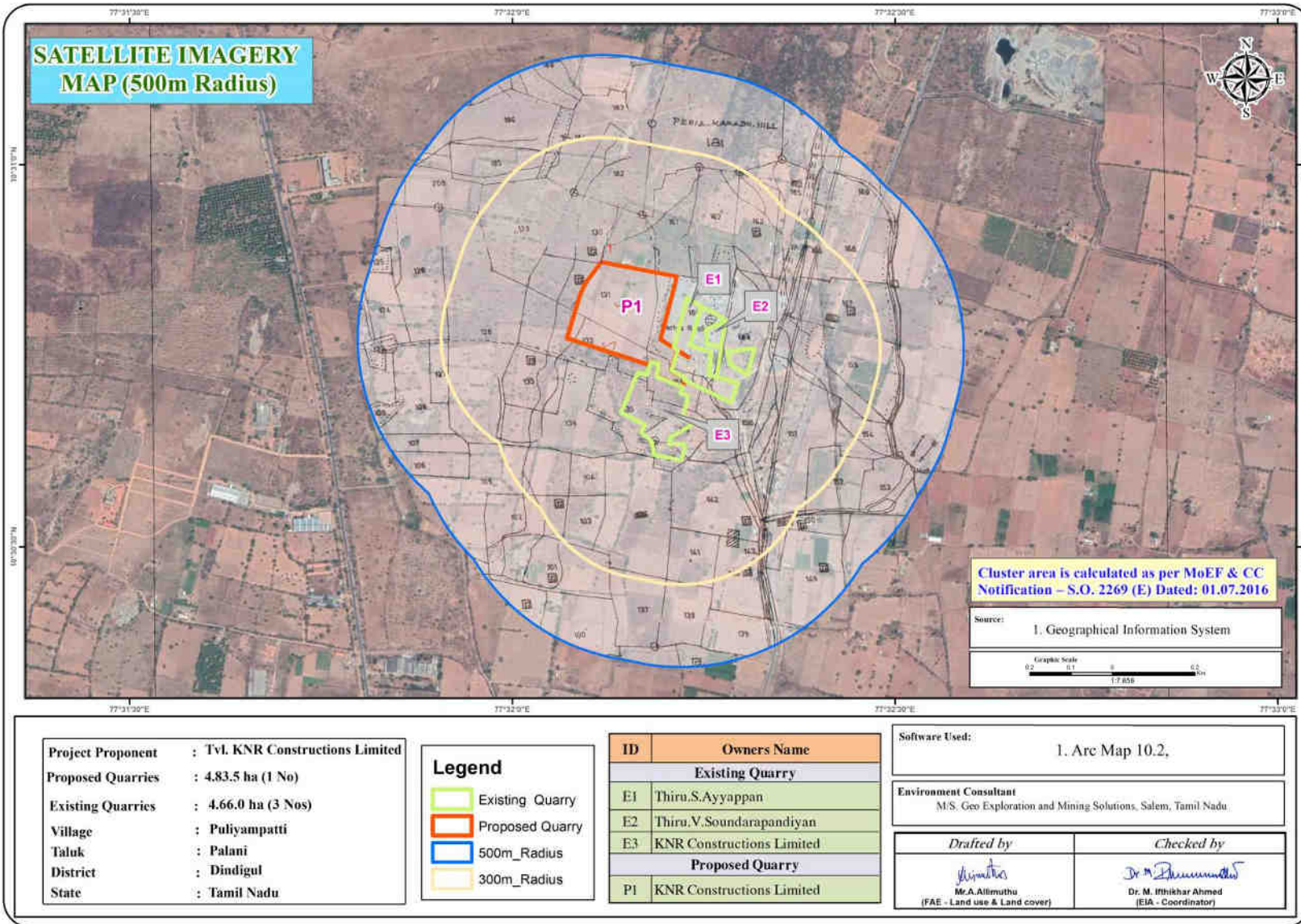


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

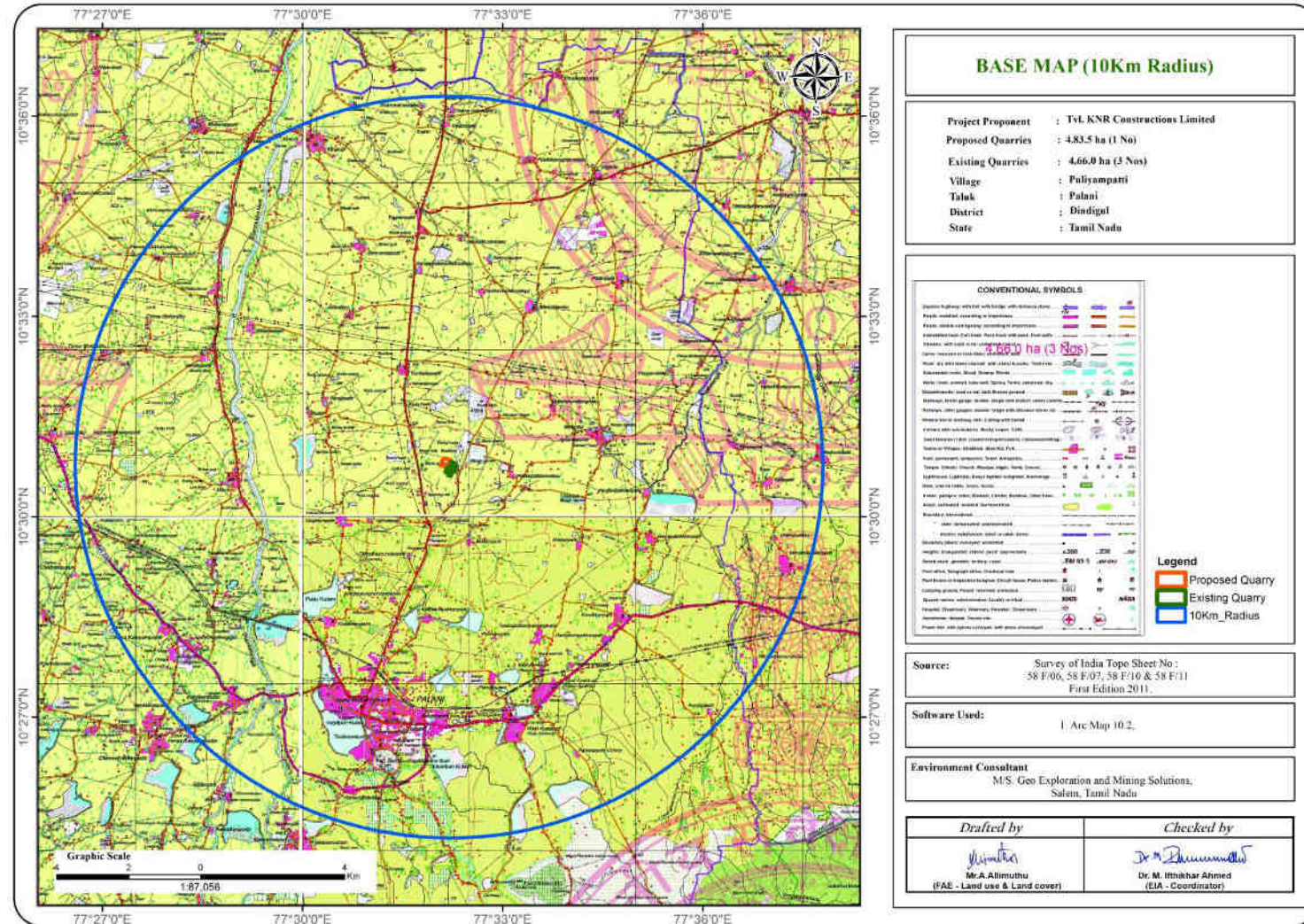


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

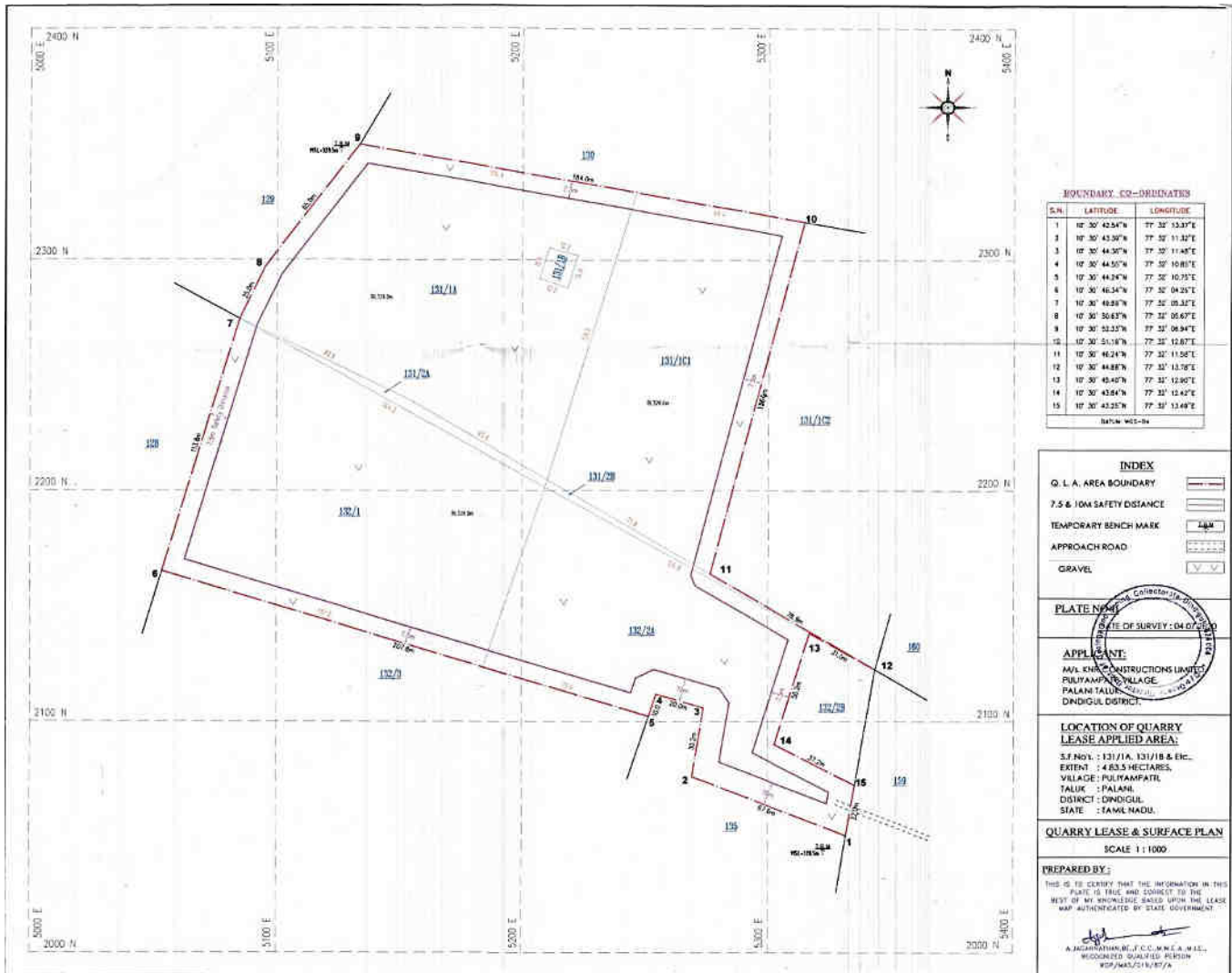


FIGURE –5 : PHOTOGRAPHS OF THE PROJECT AREA

2.4 METHOD OF MINING

Proposed Method of Mining is common for both the Proposed Projects – The proposed method of mining is Opencast Mechanized Mining Method 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 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.

2.4 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammer	12	1.2 to 2.0m	Compressed air
2	Compressor	3	400 psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit	3	300 HP	Diesel Drive
4	Tipper	6	20 Tonnes	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

- ✚ At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- ✚ After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem
- ✚ Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- ✚ The principle closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.

2.5 ULTIMATE PIT DIMENSION

Length in m	Width in m	Depth in m
196	245	43.5 (2m Gravel + 1.5m weathered formation + 40m Rough Stone)

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering October 2020, November 2020 & December 2020 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by OMEGAA LABORATORIES ISO 9001: 2008, OHSAS 18001: 2007 Certified & MoEF Notified Laboratory

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM10, PM 2.5, SO2, NO2	Continuous 24 hourly samples twice a week for three months at 8 locations (2Core & 6 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 4 ground water and 2 surface water locations once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was
5	Noise levels	Noise levels in dB(A)	8 locations (2 Core & 6 Buffer) – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 5 locations (1 Core & 4 Buffer) during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.

8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

3.2 LAND ENVIRONMENT

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 3.2: Land Use / Land Cover Table 10 Km Radius

S.No	Classification	Area_Ha	Area_%
1	Scrub Land	340.654	1.05
2	Built up-Urban	770.618	2.37
3	Builtup-Rural	787.956	2.43
4	Agriculture Land	1082.6	3.34
5	Water Bodies	753.847	2.32
6	Fallow Land	4378.08	13.5
7	River	1584.32	4.88
8	Barren Rocky	123.103	0.37
9	Mining Area	55.0068	0.16
10	Crop Land	22536	69.5
Total		32412.2	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) 72.84% followed by Water Bodies 2.32%, Built up Area 4.8 %, Barren lands 0.37% and Mining 0.16%

The total mining area within the study area is 55.0068 ha i.e., 0.16 %. The cluster area of 9.49.5 ha contributes about 17.26% 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

- ✚ Variation in pH of the soil in the study area was found to be moderately alkaline to strongly alkaline in nature (7.83.- 8.75).
- ✚ Mostly the soils collected from different location in the study area are Clay loam & bulk density of the soil in range between 1.24 to 1.56 g/cc.
- ✚ The available Nitrogen content range between 134 to 165 kg/ha
- ✚ The available Phosphorus content range between 28.6 to 46.2 kg/ha
- ✚ The available Potassium range between 26.3 to 46.8mg/kg

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 7.31 to 8.21 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 388 to 432 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 138 - 151 mg/l. Nitrates varied from 8.3 to 10.3 mg/l, while sulphates varied from 19.5 to 23.4 mg/l.

Ground Water

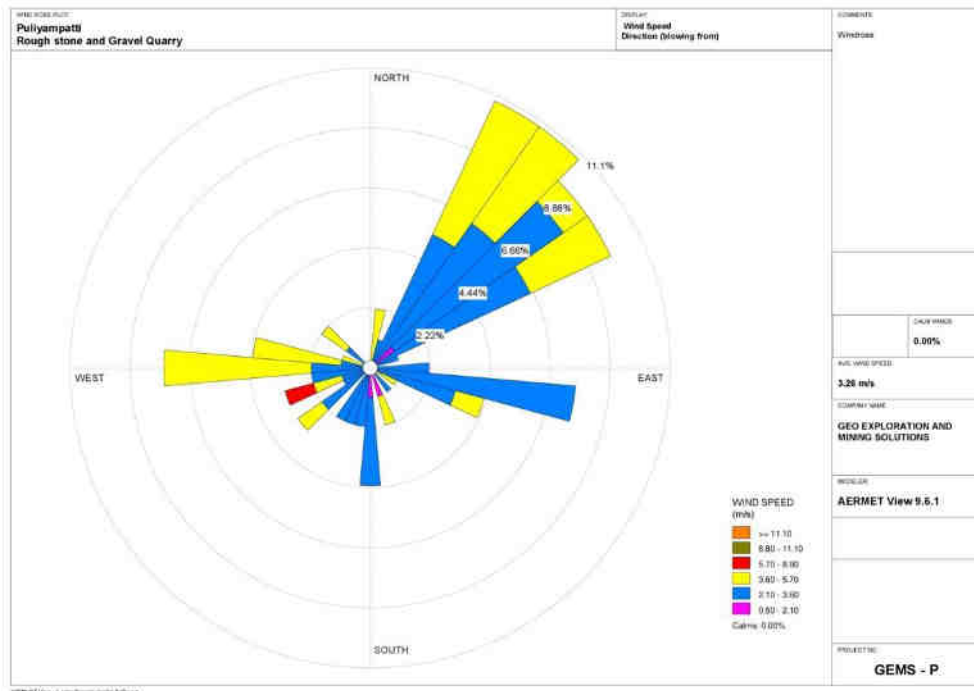
The pH of the water samples collected ranged from 7.16 to 7.41 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 315 - 492 mg/l in all samples. The Total hardness varied between 127 – 232 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 IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

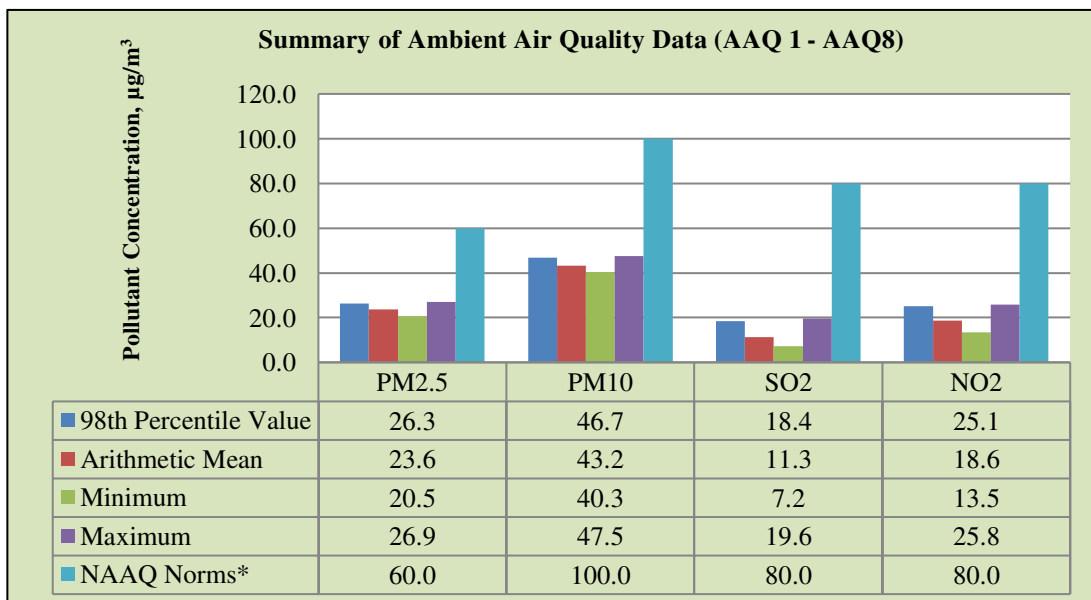
The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

The results of ambient air quality monitoring for the period (October to December 2020) are presented in the report. Data has been compiled for three months.



As per monitoring data, PM10 ranges from 40.3 µg/m³ to 47.5 µg/m³, PM2.5 data ranges from 20.5 µg/m³ to 26.9 µg/m³, SO₂ ranges from 7.2 µg/m³ to 19.6 µg/m³ and NO₂ data ranges from 13.5 µg/m³ to 25.8 µg/m³. 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

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 40.2 to 40.5 dB (A) Leq and during night time were from 37.6 to 38.7 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 38.8 to 40.8 dB (A) Leq and during night time were from 37.8 to 38.4 dB (A) Leq.

Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.8 ECOLOGICAL ENVIRONMENT

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10 km. An ecological survey of the study area was conducted particularly with reference to the listing of species and assessment of the existing baseline ecological (terrestrial) condition in the study area.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

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 48 persons to the local people there by improving the indirect employment opportunity in the area were around 100 persons 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

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. The total area applied for Rough stone quarry lease & the total Extent of the cluster is 9.49.5 Ha, the proposed project areas is patta land, no forest land involved in this Projects. The ultimate depth of the proposed project is quarrying is varying from 43.5m below the ground level and will not intersect the ground water table. The project is site specific.

MITIGATION MEASURES

Due to the quarrying activities in the project the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:

- In the Rough stone quarrying operation the degradation of land is insignificant, after completion of the quarrying operation the land will be allowed to collect rain water which will act as temporary reservoir, this rough stone does not produce any toxic effluents in the form of solid, liquid or gas
- The periphery of the mining lease area will be converted to a greenbelt to prevent Noise and sound propagation to the nearby lands
- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area

Barbed wire 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 WATER ENVIRONMENT

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. For the quarrying activity water will be utilized for water sprinkling on haul roads and greenbelt development. The quarrying activity will not intersect ground water table the ultimate depth in the quarries is 43.5m and water table is found at a depth of 57 - 60m BGL.

MITIGATION MEASURES

The following mitigation measures are suggested for water management

The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the proposed project areas. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project areas. There is no proposal Rough stone processing or workshop within the project area thus there is no effluent anticipated in the mines.

- With respect to Turbidity, Total Iron and Silica, Pre-treatment methods like settling or filtration, Water Softening (Ion Exchange) shall be adopted to make it fit for drinking purposes. But it can be used for other domestic purposes
- Rainwater will be collected in sump in the mining pit 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 onwards 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
 - Construction of garland drains to divert surface run-off into the quarrying area
 - Retaining walls with weep hole will be constructed around the dump to arrest silt wash off
 - Periodic 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
 - Wastewater 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 and analysing the quality of water in open well, bore wells and surface water

4.3 AIR ENVIRONMENT

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Rough Stone

ANTICIPATED IMPACT

The air borne particulate matter generated by quarrying operation and transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO₂) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Rough stone and overburden, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM₁₀) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration proposed production of 9,91,715m³ on air environment and net increase in emissions by Open pit source modelling in AERMOD Software.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500 meters around the project area is predicted by Open Pit Source modelling using AERMOD Software.

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 check-ups, 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 month once to assess effectiveness of mitigation measures proposed.

4.4 NOISE ENVIRONMENT**ANTICIPATED IMPACT**

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

- 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.

4.5 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

- ✚ None of the plants will be cut during operational phase of the mine.
- ✚ 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.
- ✚ 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.

Wild life is not commonly found in the cluster 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.

MITIGATION MEASURES

The project site has a land to develop greenbelt within the lease area, along roads and other vacant areas. The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. Although, the project will not lead to any tree cutting, it is proposed to improve the greenery of the locality by plantation services. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

- Plants that grow fast will be preferred.
- Preference for high canopy covers plants with local varieties.
- Perennial and evergreen plants will be preferred.

The development of Green Belt is an important aspect for any plant because:

- It helps in noise abatement for the surrounding area.
- It maintains the ecological balance.
- It increases the aesthetic value of site.

TABLE No.4.1 GREENBELT DEVELOPMENT PLAN

PROPOSAL – P1					
Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	180	80%	1610	Neem, Pongamia Pinnata, Casuarina etc.,	144
II	180	80%	1610		144
III	180	80%	1610		144
IV	180	80%	1610		144
V	180	80%	1610		144

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 48 persons and indirectly will get employment around 100 persons.

MITIGATION MEASURES

- Good maintenance practices will be adopted for plant 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.
- Appropriate 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, DMF, NMET etc, from this project directly and indirectly.

3. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

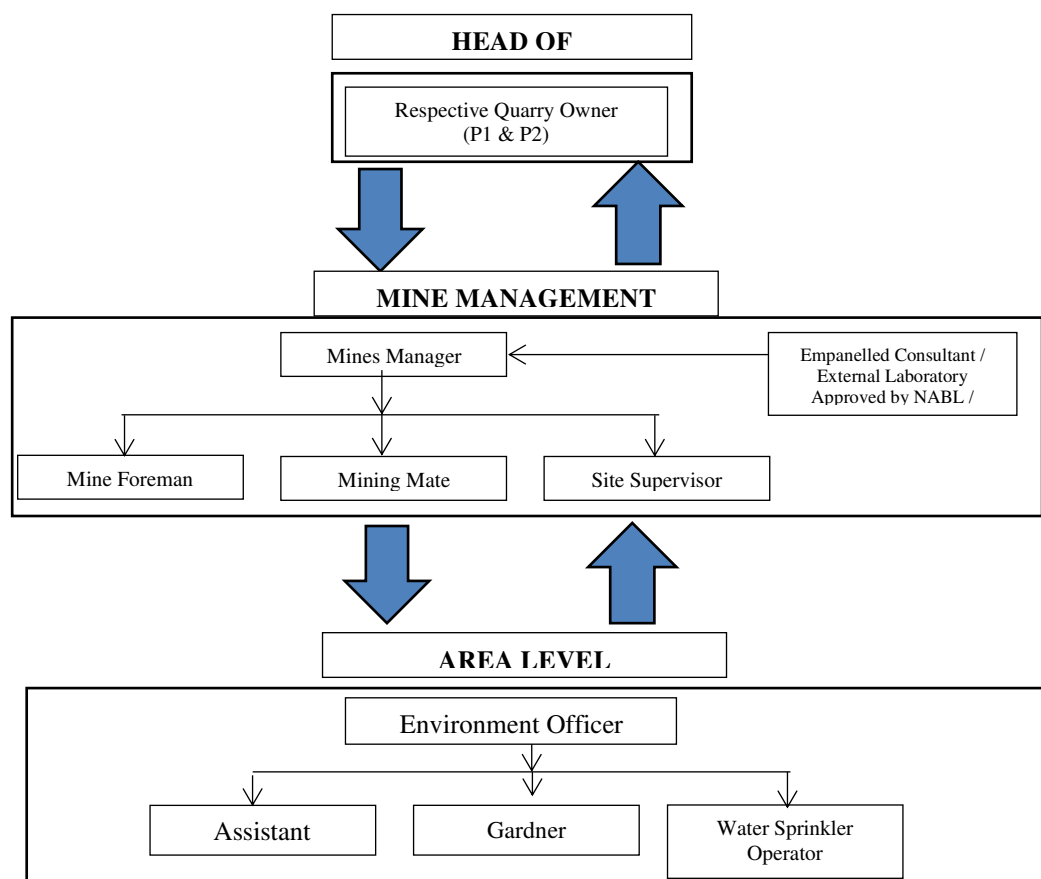
4. ENVIRONMENT MONITORING PROGRAM

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment.

The Objective of Monitoring -

- ✚ To check or assess the efficiency of the controlling measures;
- ✚ To establish a data base for future impact assessment studies

6.1 ENVIRONMENTAL MONITORING CELL



6.2 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 (1 SW & 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 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

**TABLE 7.1 CUMULATIVE IMPACT STUDY
CUMULATIVE PRODUCTION LOAD OF ROUGH STONE**

PROPOSED PRODUCTION DETAILS				
Quarry	5 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	9,91,715	1,98,343	661	110
Total	9,91,715	1,98,343	661	110
E1	82,921	16,584	55	9
E2	18,440	3,688	12	2
E3	74,806	74,806	249	42
Total	1,76,167	95,078	316	53
Grand Total	11,67,882	2,93,421	977	163

TABLE 7.2 CUMULATIVE PRODUCTION LOAD OF WEATHERED FORMATION

PROPOSED PRODUCTION DETAILS				
Quarry	1 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	60,708	60,708	202	34
Total	60,708	60,708	202	34
E1	-	-	-	-
E2	-	-	-	-
E3	6,992.5	6,992.5	23	4
Total	6,992.5	6,992.5	23	4

Grand Total	67,700.5	67,700.5	225	38
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TABLE 7.3 CUMULATIVE PRODUCTION LOAD OF GRAVEL

PROPOSED PRODUCTION DETAILS				
Quarry	1 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	80,944	80,944	270	45
Total	80,944	80,944	270	45

TABLE 7.4 CUMULATIVE PRODUCTION LOAD OF TOPSOIL

PROPOSED PRODUCTION DETAILS				
Quarry	1 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
E3	7167.5	7167.5	24	4
Total	7167.5	7167.5	24	4

TABLE 7.5 PREDICTED NOISE INCREMENTAL VALUES

Location ID	N1	N2	N3	N4	N5	N6	N7	N8
Maximum Monitored Value (Day) dB(A)	46.7	47.8	45.6	46.8	45.4	44.5	45.9	46.3
Incremental Value dB(A)	60.1	60.1	40.1	38.9	38.5	36.6	35.5	34.1
Total Predicted Noise level dB(A)	60.3	60.3	46.7	47.5	46.2	45.1	46.3	46.6
NAAQ Standards	Industrial Day Time- 75 dB (A) & Night Time- 70 dB (A) Residential Day Time- 55 dB (A) & Night Time- 45 dB (A)							

TABLE 7.6 SOCIO ECONOMIC BENEFITS FROM 3 MINES

Code	Project Cost	CER @ 2%
P1	Rs. 1,11,70,000/-	Rs. 2,24,000/-
Total	Rs. 1,11,70,000/-	Rs. 2,24,000/-
E1	Rs.26,50,000/-	Rs. 53,000/-
E2	Rs.63,90,000/-	Rs. 1,27,800/-
E3	Rs. 3,02,72,500/-	Rs. 6,05,500/-
Total	Rs.3,93,12,500/-	Rs. 7,86,300/-
Grand Total	Rs.5,04,82,500/-	Rs.10,10,300/-

8. PROJECT BENEFITS

Rough stone Cluster quarry projects belonging to Tvl.KNR Construction Limited aims to produce 9,91,715m³ of Rough stone for five-year plan period. 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
- To meet out the demand supply gap of Rough stone in construction industry

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

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest