

EXECUTIVE SUMMARY

PROJECT PROPONENT

Sl. No.	Name	Extent of Mining Applied
1	Thiru. S. Thangavel	2.22.0 ha

KODANGIPALAYAM ROUGH STONE & GRAVEL QUARRY – CLUSTER – C

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

CLUSTER EXTENT = 15.85.89 ha

At

Kodangipalayam Village, Palladam Taluk, Tiruppur District

Complied as per ToR obtained for the Projects in Cluster Situation –
Cluster area is calculated as per MoEF & CC Notification – S.O. 2269

(E) Dated: 01.07.2016

✚ Lr.No. SEIAA-TN/F.No.8602/SEAC/TOR-1013/2021 Dated: 26.08.2021 for P1;

Environmental Consultant



GEO EXPLORATION AND MINING SOLUTIONS

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1. INTRODUCTION

Rough Stone & Gravel is the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Kodangipalayam Rough Stone & Gravel Quarries Cluster “C” consisting of 2 Proposed and 6 Existing Quarries with total extent of Cluster of 15.85.89 ha in Kodangipalayam Village, Palladam Taluk, Tiruppur District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR applied vide Letter No Lr.No. SEIAA - TN/F.No.8602/SEAC/TOR-1013/2021 Dated: 26.08.2021 for P1..

The Baseline Monitoring study has been carried out during the period of **October – December 2021** (Baseline Data Used is as per MoEF & CC Office Memorandum No. J-11013/41/2006-IA-II (I) (Part) Dated 29th August 2017 & MoEF & CC Office Memorandum F. No. IA3-22/10/2022-IA.III [E 177258] Dated: 08.06.2022) and this EIA and EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) individually to minimize those adverse impacts.

“Draft EIA report prepared on the basis of ToR Issued & Standard ToR 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 Proponent	Thiru. S. Thangavel
Address	S/o. Sinnasubbaiah Gounder, No.1/509, Ondikkarar Thottam, Chinna Kodangipalayam, Palladam Taluk, Tiruppur District
Mobile	+91 – 9095877599
Email	Kousikmithran306@gmail.com
Status	Proprietor

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	Name of the Owner	S.F. Nos	Extent	Status
P1	Thiru. S. Thangavel, S/o. Sinnasubbaiah Gounder, No.1/509, Ondikkarar Thottam, Chinna Kodangipalayam, Palladam Taluk, Tiruppur District	315/2D	2.22.0 ha	Obtained ToR- Lr.No. SEIAA- TN/F.No.8602/SEAC/TOR- 1013/2021 Dated: 26.08.2021
P2	Thiru. R. Shanmugam, S/o, P.C. Ramasmy, No.1/377, China Kodangipalayam, K.N. Puram (Via), Palladam Taluk, Tiruppur District	316/4	1.29.0 ha	1) Applied for ToR- Lr.No. SEIAA – TN/F.No.9293/2020 Dated: 06.06.2020 2) This Quarry included in Cluster area but not included in Public Hearing
TOTAL			3.51.0 ha	
EXISTING QUARRIES				
CODE	Name of the Owner	S.F. No	Extent	Status
E1	Thiru. M. Devaraj, S/o, Marappa Gounder, No.2/456, Ammakadu, Kodangipalayam, Palladam Taluk,	312/3,313/1, 313/2(P), 314/2(P)	3.16.0 ha	Lease Period 20.09.2018 – 19.09.2023

Tiruppur District				
E2	Thiru. M. Devaraj, S/o. Marappa Gounder, No.2/456, Kodangipalayam, Palladam Taluk, Tiruppur District – 641 662	304/1 & 308/3	2.04.5 ha	EC Obtained Dated: 02.02.2022
E3	Thiru. M. Ramasamy, S/o. Muthusamy, No.3/176, Aruljothy Nagar, Karanampattai, Palladam Taluk, Tiruppur – 641 662	314/1A(P), 1(B),324/2B& 324/2C	3.61.5 ha	EC Obtained Dated: 28.01.2022
E4	Thiru. S. Velusamy, S/o. Subbiyagounder, No.3/91, China Kodangipalayam, Palladam Taluk, Tiruppur – 641 662	324/2A	1.62.0 ha	EC Obtained Dated: 02.02.2022
E5	Thiru. M. Selvakumar, S/o. Murugasamy, No.4/32, Karanampettai, Palladam Taluk, Tiruppur District.	311/2 (P)	1.16.5 ha	EC Obtained Dated: 02.02.2022
E6	Thiru. P. Shanmugasundaram, S/o. Ponnusamy, No.3/177, Aruljothy Nagar, Karanampattai, Palladam Taluk, Tiruppur – 641 662	315/2A3B1 & 320/2B2	0.74.39 ha	EC Obtained Dated: 04.02.2022
TOTAL			12.34.89 ha	
TOTAL CLUSTER EXTENT			15.85.89 ha	

1.3 SALIENT FEATURES OF THE PROPOSAL

PROPOSAL – P1	
Name of the Quarry	Thiru. S. Thangavel Rough Stone & Gravel Quarry Project
Toposheet No	58-E/04
Latitude between	11°00'50.19" to 11°00'58.82" N
Longitude between	77°12'43.01" to 77°12'46.62" E
Highest Elevation	370 m AMSL
Proposed Depth of Mining	47 m bgl (2 m Gravel + 45 m Rough Stone)
Geological Resources	Rough Stone in m ³
	7,81,842
Mineable Reserves	Rough Stone in m ³
	2,35,150
Ultimate Pit Dimension	240 m (L) * 78 m (W) * 47 m (D)
Water Level in the surrounds area	65 – 70 m bgl
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting
Topography	The lease applied area exhibits flat terrain. The area has gentle sloping towards northern side. The altitude of the area is 370m above mean sea level. The area is covered by 2m thickness of Gravel and Massive Charnockite is found after 2m (Gravel) which is clearly inferred from the existing quarry pit.
Machinery proposed	Jack Hammer
	6 Nos
	Compressor
	2 Nos
Machinery proposed	Hydraulic Excavator
	2 Nos
Machinery proposed	Tippers
	3 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	28 Nos	
Project Cost	Rs.1,46,95,000/-	
CER Cost @ 2% of Project Cost	Rs 2,94,000/-	
Nearby Water Bodies	Kuttai	360m SW
	Odai	2.8km SE
	Samalapuram Lake	6.3km NW
	Noyyal River	7km NW
	Sulur Lake	10km West
Greenbelt Development Plan	Proposed to plant 220 trees in 2000 Sq.m area in the 7.5 m Safety Zone	
Proposed Water Requirement	3.0 KLD	
Nearest Habitation	480 m North West	

1.4 STATUTORY DETAILS

PROPOSAL – P1

- The proponent applied for Rough Stone Quarry Lease **Dated:** 24/11/2022
- Precise Area Communication Letter was issued by the District Collector **Rc.No.** 1498/mines/2020
- The Mining Plan was prepared and got approved by Assistant Director, Geology and Mining **Rc.No.** 1498/mines/2020 dated 05/05/2021
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/63789/2021 Dated: 09/06/2021

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 quarry.

Method of mining is common for all the proposed quarries in the cluster. 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	The Nearest National Highway (NH- 67) Trichy – Coimbatore -1 km- Southeast side The State Highway (SH-165) Kamanaickenpalayam – Somanur 3 km – Northwest side.
Nearest Village	Kodangipalayam – 1 km-NW
Nearest Town	Palladam – 7.0 km – SE
Nearest Railway	Somanur Railway station – 8.0 km – NW
Nearest Airport	Coimbatore Airport – 19 km – NW
Seaport	Kochi- 160 km – SW

2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

PROPOSAL – P1		
DESCRIPTION	PRESENT AREA IN (HA)	AREA AT THE END OF LIFE OF QUARRY (HA)
Area under quarry	1.04.8	1.72.1
Infrastructure	Nil	0.01.0
Roads	0.01.0	0.02.0
Green Belt	Nil	0.20.0
Un – utilized area	1.16.2	0.26.9
TOTAL	2.22.0	2.22.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

PROPOSAL – P1		
PARTICULARS	DETAILS	
	Rough Stone (5Year Plan period)	Gravel (3 Years Plan period)
Geological Resources in m ³	7,81,842	28,124
Mineable Reserves in m ³	2,35,150	22,176
Mining Plan Period	5 Years	
Number of Working Days	300 Days	
Production per day in m ³	157	25
No of Lorry loads (6 m ³ per load)	27	5
Total Depth of Mining	47 m bgl (2 m Gravel + 45 m Rough Stone)	

2.4 YEAR-WISE PRODUCTION PLAN

PROPOSAL – P1		
YEAR	ROUGH STONE (m³)	GRAVEL (m³)
I	46,350	13,056
II	54,230	4,408
III	38,750	4,712
IV	41,630	-
V	54,190	-
TOTAL	2,35,150	22,176

FIGURE – 1: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P1



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

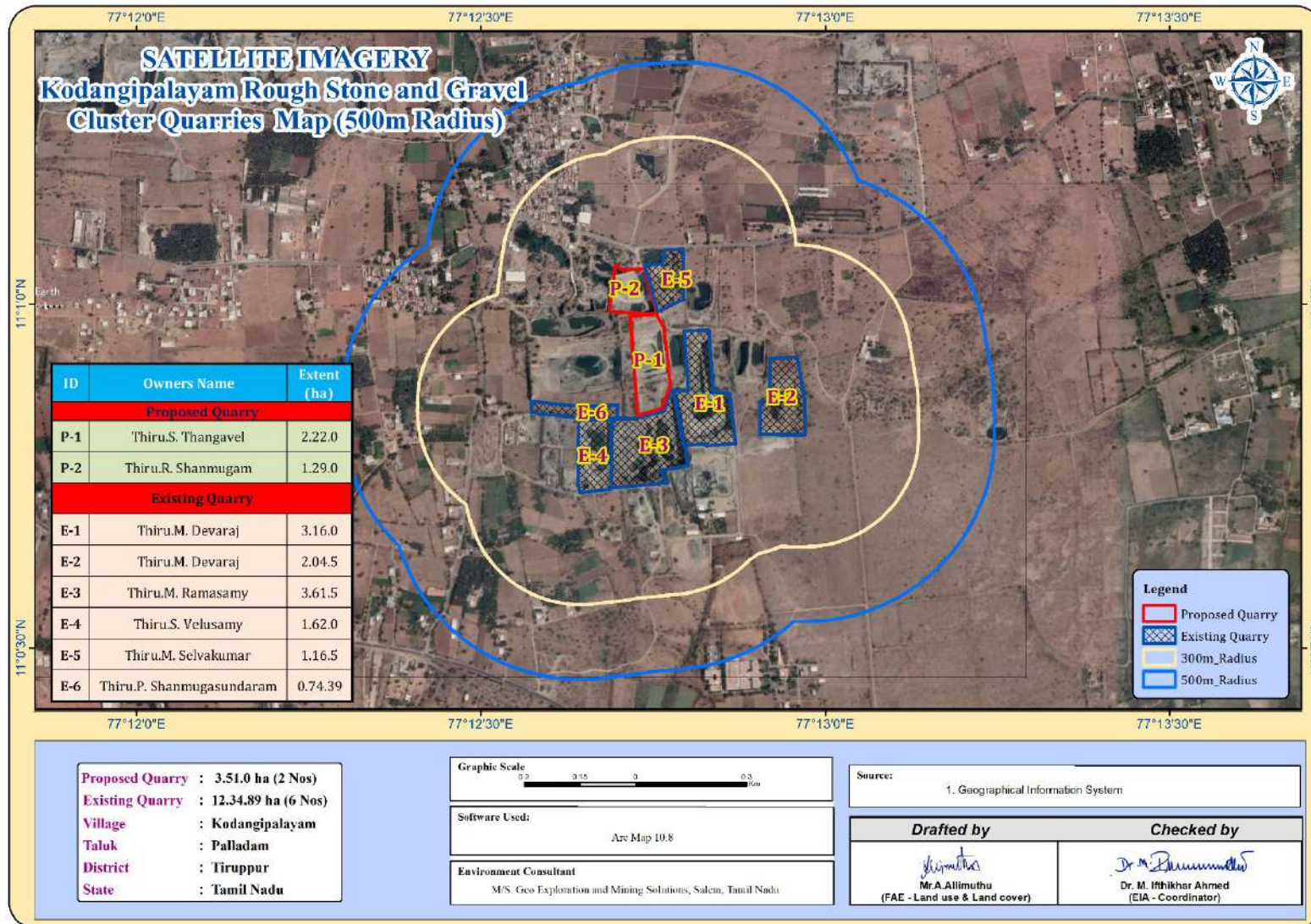
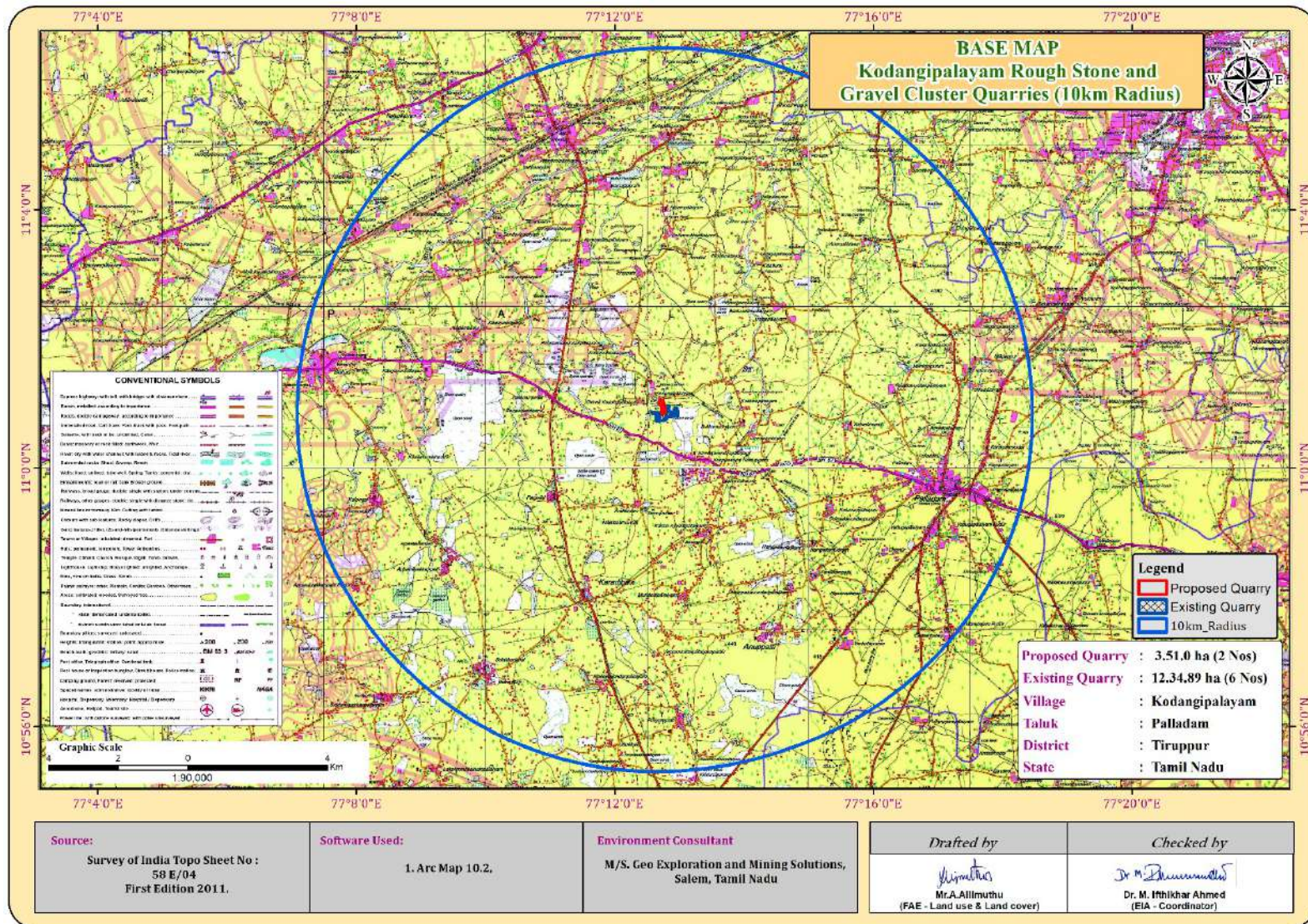


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS



2.5 METHOD OF MINING

Proposed Method of Mining is common for all the Proposed Project – The method of mining is 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.

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.

2.6 PROPOSED MACHINERY DEPLOYMENT

PROPOSAL – P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	6	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit 4	2	300 HP	Diesel Drive
4	Tippers / Dumpers	3	20 Tonnes	Diesel Drive

2.7 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.

2.8 ULTIMATE PIT DIMENSION

PROPOSAL – P1			
Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	240	78	47 m bgl

3. DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out during October to December 2021 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by KGS Enviro Laboratory Pvt Ltd., ISO/IEC 17025: 2017 NABL Certified & Notified Laboratory

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	Continuous 24-hourly samples twice a week for three months at 8 locations (2 Core & 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 6 locations – 3 ground water and 3 surface water samples; 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 collected from the Forest department.
5	Noise levels	Noise levels in dB(A)	7 locations – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 5 locations 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

S.No	CLASSIFICATION	AREA HA	AREA %
1	BUILT-UP URBAN	2784.36	8.23
2	BUILT-UP RURAL	3127.04	9.24
3	MINING	526.59	1.56
4	CROP LAND	14628.47	43.22
5	SCRUB LAND	1329.19	3.93
6	BARREN ROCKY	23.76	0.07
7	FALLOW LAND	8539.78	25.23
8	AGRICULTURE PLANTATION	2420.30	7.15
9	WATER BODIES	325.02	0.96
10	RIVER	143.47	0.42
	TOTAL	33848.00	100.00

The total mining area within the study area is 526.59 ha i.e., 1.56 %. The cluster area of 15.85.89 ha contributes about 3.01 % 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

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 1.02 – 1.32 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e., ranging from 38.2 – 42.5 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 7.15 to 8.32
- The available Nitrogen content range between 135 to 158 kg/ha
- The available Phosphorus content range between 1.13 to 1.32 kg/ha
- The available Potassium range between 39.8 to 59.4 mg/kg

3.4 WATER ENVIRONMENT

Surface Water

Ph:

The pH varied from 7.62 to 8.56 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 549 to 597 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 - 178 mg/l. Nitrates varied from 15.3 to 18.4 mg/l, while sulphates varied from 38.2 to 53.8 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.42 to 8.52 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 485 - 552 mg/l in all samples. The Total hardness varied between 118.3 – 198.2 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 – 5: WIND ROSE DIAGRAM

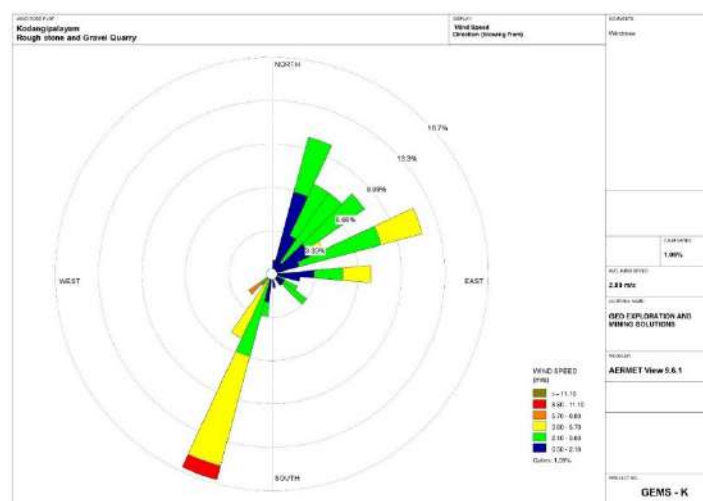
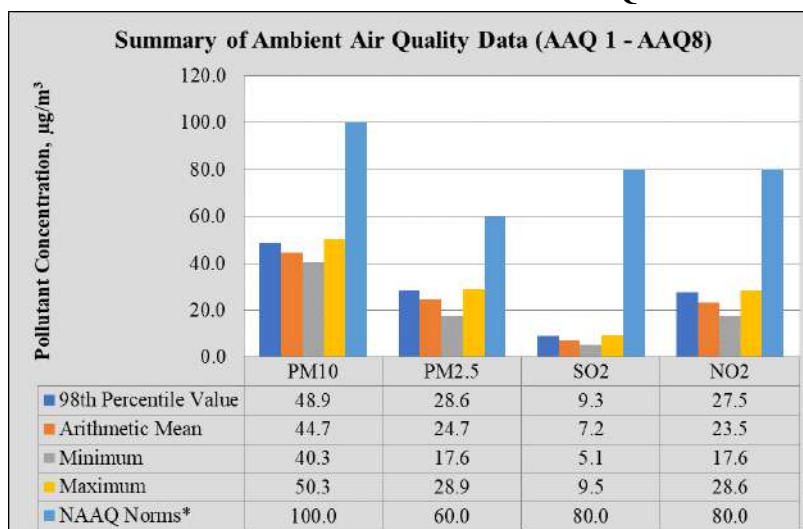


FIGURE – 6: SUMMARY OF AMBIENT AIR QUALITY DATA

The results of ambient air quality monitoring for the period (October to December 2021) are presented in the report. Data has been compiled for three months.

As per monitoring data, PM₁₀ ranges from 40.3 µg/m³ to 50.3 µg/m³, PM_{2.5} data ranges from 17.6 µg/m³ to 28.9 µg/m³, SO₂ ranges from 5.1 µg/m³ to 9.5 µg/m³ and NO₂ data ranges from 17.6 µg/m³ to 28.6 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 48.2 to 49.3 dB (A) Leq and during night time were from 38.8 to 40.5 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 46.7 to 49.0 dB (A) Leq and during night time were from 37.5 to 38.1 dB (A) Leq.

3.7 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

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.

3.8 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.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES – IN COMMON FOR ALL PROPOSED QUARRIES (P1)

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 soil 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 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

MITIGATION MEASURES

- Garland drains, settling tank will be constructed along the individual mining leases. The Garland drains of the individual leases will be connected to settling tank and after settling the 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 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
- 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 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 and analysing the quality of water in open well, bore wells and surface water

4.3 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 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 months 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

There are no National Park and Archaeological monuments within project area. There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. There are no wild animals in the area. No breeding and nesting site were identified in project site. No National park and Wildlife Sanctuary found within 10km radius. The dumps / bunds around the mine itself act as a good barrier for entry of stray animals. In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent fall of animals in the mine pits.

MITIGATION MEASURES

To reduce the adverse effects on natural flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation. Methodical and well-planned plantation scheme will be carried out.

4.5.1 GREENBELT DEVELOPMENT PLAN

PROPOSAL – P1					
Year	No. of trees proposed to be planted	Survival %	Area to be covered	Name of the species	No. of trees expected to be grown
I	1250	80%	Plantation along safety distance, panchayat road and village road	Neem, Pongamia pinnata, etc.,	1000

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 43 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.

5. 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.

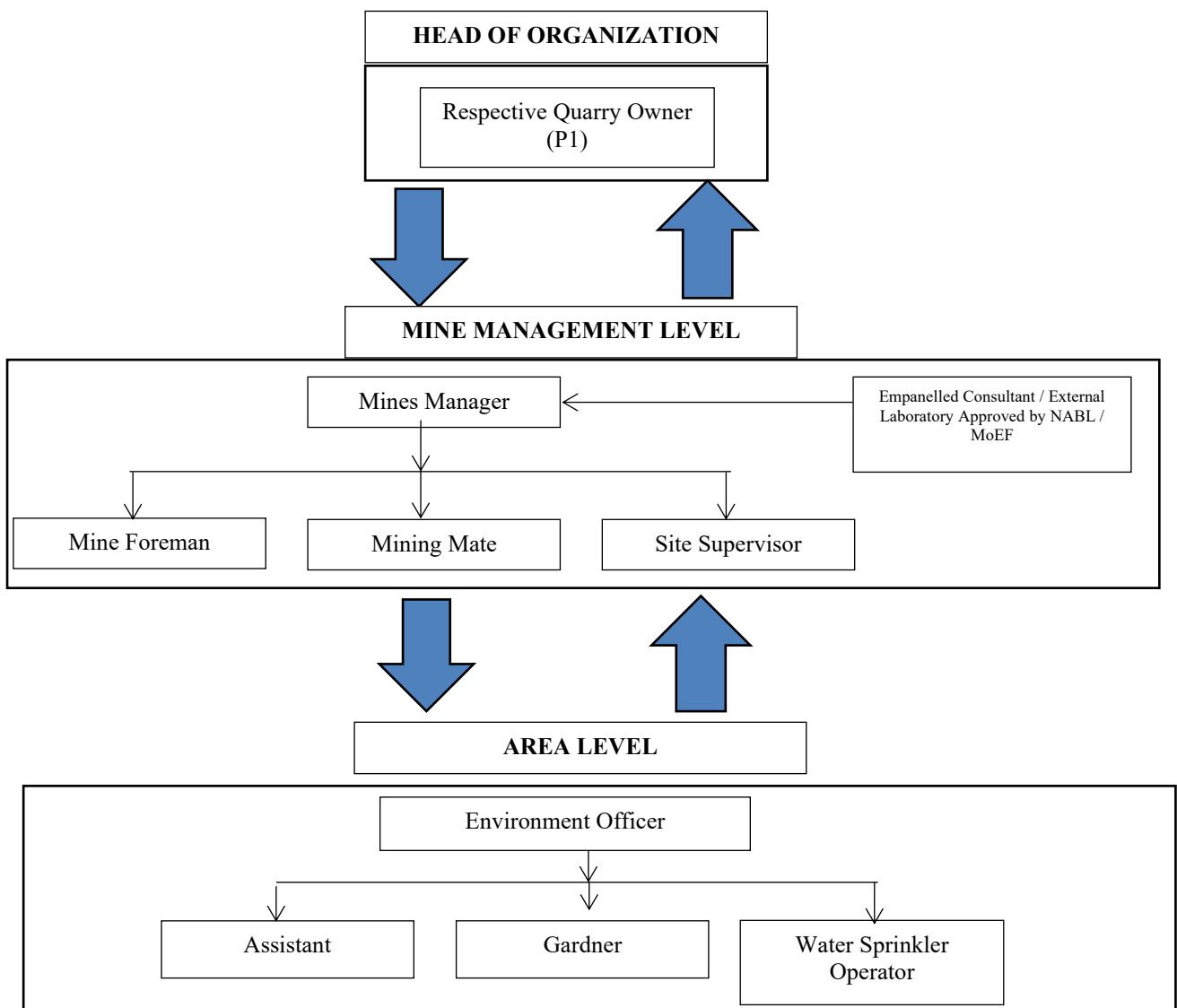
6. ENVIRONMENT MONITORING PROGRAM

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

IN COMMON FOR P1					
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 FOR P1

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 FOR P1

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

Quarry	PROPOSED PRODUCTION DETAILS			
	5 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	235150	47030	157	26
P2	69756	13951	47	8
Total	304906	60981	203	34
E1	204868	40974	137	23
E2	273180	54636	182	30
E3	301402	60280	201	33
E4	126000	25200	84	14
E5	73870	14774	49	8
E6	13815	2763	9	2
Total	993135	198627	662	110
Grand Total	1298041	259608	865	144

CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	PROPOSED PRODUCTION DETAILS			
	2 - 3 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	22176	7392	25	4
P2	0	0	0	0
Total	22176	7392	25	4
E1	19848	6616	22	4
E2	20623	6874	23	4
E3	2268	756	3	1
E4	11760	3920	13	2
E5	2688	896	3	1
E6	6662	2221	7	1
Total	63849	21283	71	13
Grand Total	86025	28675	96	17

PREDICTED NOISE INCREMENTAL VALUES IN 500 M RADIUS QUARRIES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	47.3	48.5	51.0	55
Habitation Near P2	45.5	50.0	51.3	
Habitation Near E1	43.6	46.7	48.4	
Habitation Near E2	39.3	43.4	44.9	
Habitation Near E3	43.3	45.3	47.4	
Habitation Near E4	40.8	46.1	47.2	
Habitation Near E5	44.4	50.0	51.1	
Habitation Near E6	43.7	48.5	49.7	

ANTICIPATED GROUND VIBRATIONS IN CLUSTER

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	49	480	0.577
P2	15	340	0.389
E1	43	470	0.538
E2	57	680	0.373
E3	63	550	0.567
E4	27	500	0.336
E5	16	320	0.451
E6	3	380	0.090

SOCIO ECONOMIC BENEFITS FROM CLUSTER

	Project Cost	CER @ 2%
P1	₹ 1,46,95,000	₹ 2,94,000
P2	₹ 92,55,000	₹ 1,85,000
Total	₹ 2,39,50,000	₹ 4,79,000
E1	₹ 2,12,99,650	₹ 4,25,993
E2	₹ 1,17,24,000	₹ 2,34,480
E3	₹ 1,70,52,500	₹ 3,41,050
E4	₹ 87,17,800	₹ 1,74,356
E5	₹ 83,05,593	₹ 1,66,111
E6	₹ 43,36,000	₹ 86,720
Total	₹ 7,14,35,543.00	₹ 14,28,710.00
Grand Total	₹ 9,53,85,543.00	₹ 19,07,710.00

EMPLOYMENT BENEFITS

	Employment
P1	28
P2	15
Total	43
E1	18
E2	28
E3	32
E4	21
E5	18
E6	12
Total	129
Grand Total	172

GREENBELT DEVELOPMENT BENEFITS FROM CLUSTER

CODE	No of Trees proposed to be planted	Survival %	Area Covered Sq.m	Name of the Species	No. of Trees expected to be grown
P1	1250	80%	Plantation along safety distance, panchayat road and village road	Neem, Casuarina	1000
P2	1000	80%			800
Total	2250				1800
E1	750	80%	3800	Neem, Casuarina	600
E2	150	80%	1200	Neem, Casuarina	120
E3	250	80%	2500	Neem, Casuarina	200
E4	125	80%	1200	Neem, Casuarina	100
E5	200	80%	1700	Neem, Casuarina	160
E6	160	80%	1400	Neem, Casuarina	130
Total	1635		11800		1310

8. PROJECT BENEFITS

Two Proposed Projects for Quarrying Rough Stone at Kondangipalayam Village aims to produce cumulatively 3,04,906 m³ Rough Stone & 22,176 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 FOR P1

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.