EXECUTIVE SUMMARY OF DRAFT ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

Schedule Sl. No. 1 (a) (i): Mining Project

"B1" CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND

Rough Stone & Gravel Quarry for Five Years

CLUSTER EXTENT = 16.22.0hectares

At

Karudayampalayam Village, Pugalur Taluk,
Karur District, Tamil Nadu

ToR Identification No. TO25B0108TN5285596N on 01.12.2025, File No.12920

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F. No.	Mineral Production
Mrs. K. Dhanamal, W/o. Kandasamy, No.2/110, Kariyampatti, Karudayampalayam Village, Pugalur Taluk, Karur District – 639111.	4.02.50Ha & 288	Rough Stone- 410116m^3 or 1127819MT Gravel- 42834m^3 or 85668MT & Depth- 20m (BGL)

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

No: 1/213-B, Ground Floor, Natesan Complex
Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com
NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: 31.12.2026

INTERSTELLAR TESTING CENTRE Pvt. Ltd

Plot.No.2, Site No.12/2A,

Industrial Estate, Perungudi, Chennai, Tamil Nadu

NABL Certificate Number: TC-6952,

Valid Until: 30.07.2026

Baseline study period- March through May 2025

DECEMBER- 2025

EXECUTIVE SUMMARY

1 INTRODUCTION

As the proposed rough stone and gravel mining project (B1) falls within the quarry cluster of 500m radius with the total extent of 16.22.0Hect, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F. No. 288 over the extent of 4.02.50Hect is situated in the cluster falling in Karudayampalayam Village, Pugalur Taluk, Karur District, Tamil Nadu. The projects involved in the calculation of cluster extent are of Two proposed quarry and three existing quarries.

2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes 10°56'46.96"N to 10°56'53.78"N Longitudes from 77°57'58.93"E to 77°58'8.51"E in Karudayampalayam Village, Pugalur Taluk, Karur District, Tamil Nadu. According to the approved mining plan, about **410116 m^3 & 1127819Ts of rough stone** and **42834m^3 & 85668Ts of gravel** will be mined up to the depth of **20m BGL** in the five years. The quarrying operation is proposed to be carried out by open cast semi-mechanized mining method involving drilling and formation of benches of the prescribed dimensions.

3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during **March through May 2025** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Interstellar Testing Centre Private Limited** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

3.1 Land Environment

Land Use and Land Cover (LULC) map, as shown in Figure 3.4 & 3.4a was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 6 LULCs were mapped using ArcGIS software version-10.2. The areal extent of each LULC is provided in Table 3.5. of the total cluster area, mining area covers only 309.50 ha accounting for 3.72 %, of which lease area of 4.02.50ha contributes only about 0.049%. Hence very least percentage of mining activities shall not have any significant impact on the land environment.

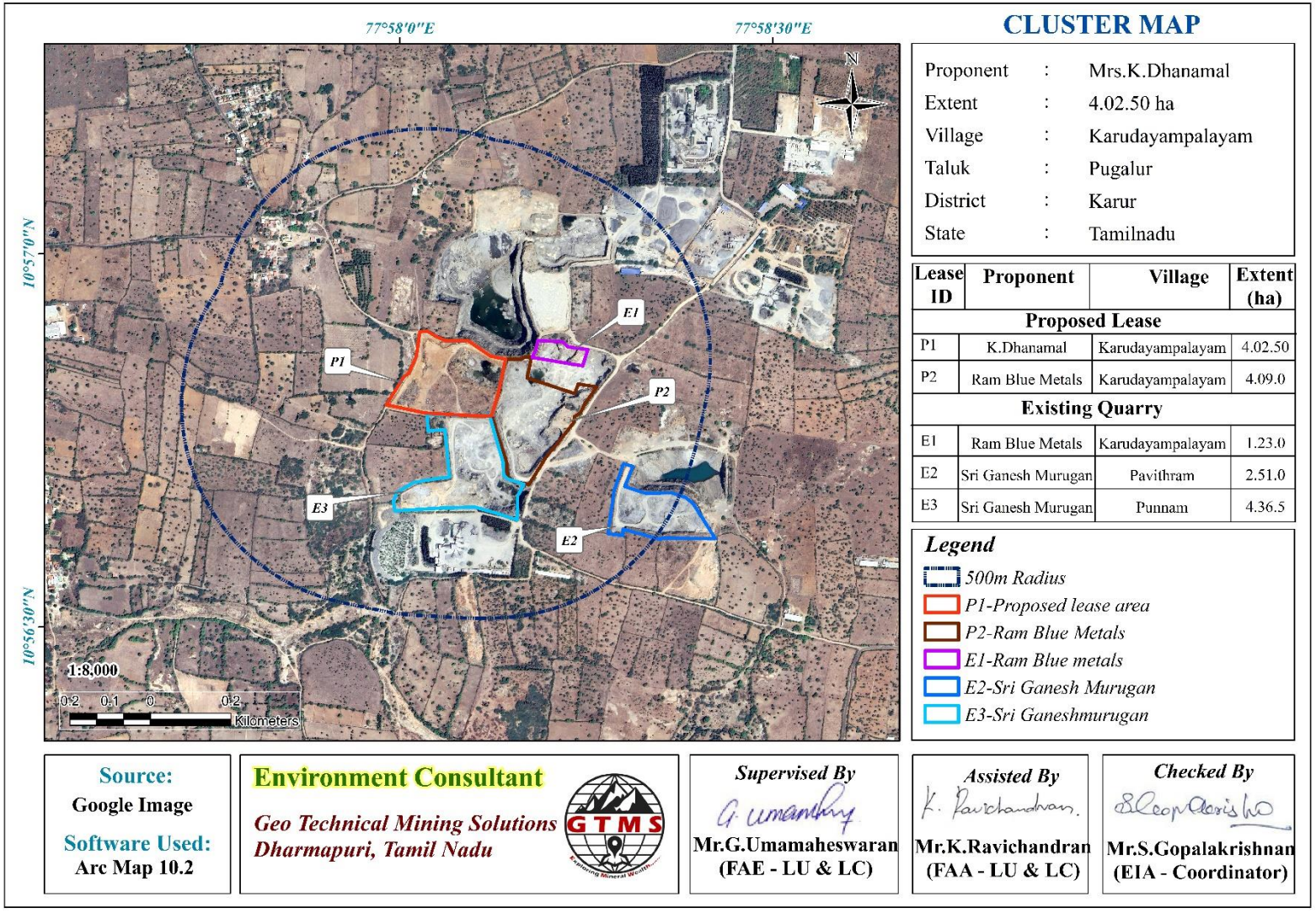

Figure 1 Location of Proposed and Existing Quarries in the Cluster of 500m Radius

Comparative study of Land Use Land Cover (LULC) Changes within 5km Radius (2020 vs 2025) was done and significant changes in land use and land cover were observed (Table 3.5a). Crop land has decreased from 5598.72ha (67.30%) to 4151.44ha (49.91%), indicating the decrease in agricultural activities, this change is due to the land are not suitable for agriculture and source of irrigation is uncertain. But that cultivation land is included in the fallow land whose extent have been increased. Mining activity has been increased to a little extent from 302.12 ha (3.63%) to 309.50 ha (3.72%), suggesting increased demand of building materials for various infrastructure developments. The increase in common vegetation has noticed of 2.12 ha (0.03%) in last five years due to the afforestation activities carried out by the past quarry proponents. Built-up areas also rise from 1027.48 ha (12.35%) to 1289.69 ha (15.50%), pointing out the urban development due to increase in economic activity. In fact, the agricultural land has been reduced but that too included in fallow land which can be reversible during availability of irrigation factors.

3.2 Soil Environment

The soil is nutrient-rich, well-balanced, and structurally suitable for agriculture. No corrective measures are immediately necessary, but continued monitoring and sustainable land management practices are recommended to maintain soil health.

Physical Characteristics & Chemical Characteristics

1. Soil pH and Electrical Conductivity (EC):

- **pH ranged from** 7.89 to 8.64 indicating that the soil is **neutral to slightly alkaline**, which is favourable for most crops.
- **EC** value ranged from 0.19 to 0.45 ms/m, suggesting low salt concentration and non-saline soil across the sampling area.

2. Physical Properties

- **Bulk Density** values ranged from 1.12 to 1.38 g/cc, which are within the typical range for loamy soils and support good root penetration and aeration.

3. Soil Fertility Status:

- **Organic matter** levels ranged from 0.16 to 0.28% by weight, classifying soils as low to moderately fertile in terms of organic matter.
- **Nitrogen (N)** content varied from 0.04 to 0.08% by mass indicating moderate nitrogen availability.
- **Potassium (K)**ranged from 0.0018 to 0.0042% by mass moderate fertility potential in terms of potassium.

4. Base Elements and Cation Ratios:

- **Calcium (Ca)** levels were highest with 1086 mg/kg and lowest with 2248 mg/kg.
- **Magnesium (Mg)** ranged from 288 to 768 mg/kg.

Conclusion:

The soils in the study area are generally non-saline, neutral to slightly alkaline, and moderately fertile with low contamination levels. They exhibit good permeability, porosity, and suitable textural classes for agriculture and greenbelt development. The absence of heavy metals confirms that baseline soil conditions are unpolluted and safe for reclamation and vegetation growth.

3.3 Water Environment

1. Ammonia, Phenolphthalein Alkalinity, Potassium, RFC, BOD, COD, Chromium, Zinc – All " Below the Limit of Quantification (BLQ)"

- These are toxic heavy metals. Their presence in groundwater is usually due to industrial effluents or natural geogenic sources (minerals in rocks).
- Since all are below detection limits, there is no sign of industrial or geogenic contamination from these toxic metals.
- This is positive from an environmental and health risk perspective.
- Interpretation: No heavy metal pollution.

2. Calcium (56.2 – 107.1 mg/l)

- Calcium contributes to hardness of water. High calcium makes water hard but is not harmful.
- Acceptable limit is 75 mg/l, permissible up to 200 mg/l.
- Slightly above acceptable but within limits.
- Interpretation: Slightly hard water, no major concern.

3. Magnesium (3.6 – 6.9 mg/l)

- Also contributes to water hardness.
- BIS acceptable limit: 30 mg/l (permissible up to 100 mg/l).
- Some samples exceed acceptable but are still under permissible limits.
- Interpretation: Water is moderately hard, but usable.

4. Chloride (107.2 – 204.2 mg/l)

- High chloride affects taste and can cause corrosion in pipelines.
- Acceptable limit: 250 mg/l; permissible up to 1000 mg/l.
- Your values are slightly above the acceptable limit but safe.
- Interpretation: Mild salinity – may affect taste but not health.

5. Fluoride (0.18 – 0.44 mg/l)

- Fluoride is beneficial in small quantities but harmful in excess (>1.5 mg/l causes fluorosis).
- All values are below the 1.0 mg/l limit.
- Interpretation: No risk of dental or skeletal fluorosis.

6. Nitrate (7.63– 14.53 mg/l)

- Nitrates come from agricultural runoff or sewage.
- Safe limit is 45 mg/l (to avoid blue baby syndrome in infants).
- Your values are below the limit.
- Interpretation: No significant nitrate pollution.

7. Iron (0.19 – 0.56 mg/l)

- Iron causes staining, bad taste, and bacterial growth when >0.3 mg/l.
- Your samples are well below the limit.
- Interpretation: No iron-related issues.

8. pH (6.98 – 8.01)

- pH is 6.5–8.5 for drinking water.
- All values within this range.
- Interpretation: Neutral pH, no corrosion or scaling tendency.

9. Total Dissolved Solids (TDS) (401 – 765 mg/l)

- TDS represents total minerals and salts in water.
- Acceptable limit is 500 mg/l; permissible up to 2000 mg/l.
- BW01, BW03, and BW05 exceed the acceptable but are within permissible.
- Interpretation: Slightly mineral-rich water; taste may be affected but safe to use.

10. Electrical Conductivity (EC) (692 – 1342 µS/cm)

- Indicates overall ionic concentration in water.
- Higher EC = higher salinity.
- EC > 1000 µS/cm (in BW01 and BW05) suggests moderately saline water.
- Interpretation: Suitable for irrigation, but may need softening for drinking.

11. Total Alkalinity (116 – 242 mg/l)

- Indicates the buffering capacity (resistance to pH change).
- Acceptable: 200 mg/l; Permissible: 600 mg/l.
- High alkalinity may indicate presence of bicarbonates/carbonates.
- Interpretation: Alkaline nature is common in groundwater. No health issue but may affect taste.

12. Total Hardness (TH) (157 – 352 mg/l)

- Acceptable: 200 mg/l; Permissible: 600 mg/l.
- TH > 200 (BW03, OW01) means moderately hard water.
- Interpretation: May require softening for household use.

13. Turbidity (0.4 – 1.8)

- Very clear water, no suspended solids.
- Interpretation: Visually and physically very good water quality.

14. Silica (6.02 – 11.47 mg/l)

- No BIS standard, but useful for understanding scaling potential in boilers and pipes.
- Normal in groundwater.

Conclusion:

The groundwater quality assessment reveals that the water is generally safe and suitable for drinking, domestic, and irrigation purposes. All tested heavy metals such as barium, boron, copper, lead, mercury, arsenic, chromium, and zinc were found to be below detection limits, indicating no industrial or geogenic contamination. Key health-related parameters including fluoride, nitrate, iron, and pH levels are well within the acceptable standards, posing no health risk. Some Physico- Chemical parameters like Calcium, Magnesium, Total Hardness, Total Dissolved Solids (TDS), Electrical Conductivity (EC), and Chloride showed slightly elevated levels in a few samples, but they remain within permissible limits prescribed by BIS standards.

3.4 Air Environment

As per the monitoring data, $PM_{2.5}$ ranges from 15.87 µg/m^3 to 19.52 µg/m^3; PM_{10} from 41.50 µg/m^3 to 50.74 µg/m^3; SO_2 from 5.08 µg/m^3 to 5.80 µg/m^3; NOx from 10.15µg/m^3 to 11.95g/m^3. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 44 causing minimal impact to human health.

3.5 Noise Environment

Noise level in core zone was 48.1dB (A) Leq during day time and 39.8 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 41.1 to 46.7dB (A) Leq and during night time from 36.8 to 40.6dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.6 Biological Environment

Biological study of the ecosystem is essential to understand the impact of rough stone quarry on existing flora and fauna of the study area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact, if any. A survey was conducted to study the flora and fauna in 10km radius by direct and indirect sightings/ data. Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the wild plants as well as cultivated crop plants was made, and all the available information was recorded.

Flora Composition in Core Zone

The core zone presents in tree, shrubs, herbs and grasses. Taxonomically total of 13 species belonging to 6 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were Herbs 3 followed by Trees 3, Shrubs 3 and Climbers 2. The result of core zone of flora studies shows that Fabaceae and Solanaceae are the main dominating species in the study area it mentioned in Table 3.24 & 3. 25. No species found as threatened category.

Flora Composition in buffer Zone

There are 144 different species identified in the buffer zone. Among the identified, floral (144) species were 50 trees, 39 herbs, 31 shrubs, 11 climbers, 5 Creepers, and 8 grasses. According to the findings of the buffer zone flora studies, the dominant species in the study area are Fabaceae, Asteraceae, and Euphorbiaceae, as shown in Table 3.26. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. Details of flora with the scientific name were mentioned in Table 3.26. A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.26.

Fauna in Core Zone

A total of 14 varieties of species were observed in the Core zone (Table.3.28). Among them are 7 Insects, 2 Reptiles, 2 Mammals and 3 Avian. A total of 14 species belonging to 12 families were recorded from the core area. The study shows that number of species decreases towards the mining area. This might be due the lack of vegetation. None of these species in the

core zone are threatened or endemic. The survey was conducted to identify species listed in IUCN Red List. According to the field data, any species are not of Schedule I and nine species are of schedule IV. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table 3.28.

Fauna in Buffer Zone

A total of 49 species belonging to 36 families have been recorded from the buffer zone area (Table.3.29). Based on habitat classification the majority of species were Birds 15, followed by Insects 13, Reptiles 13, Mammals 5 and Amphibians 3. There are 7 Schedule II species and 27 species are under schedule IV according to Indian wild life Act 1972. A total fifteen species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable and endemic species were observed.

3.7 Socio Economic Environment

The proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of people's standard of living.

4 Anticipated Environmental Impacts and Mitigation Measures

4.1 Land Environment

Anticipated Impact

- Change in land use and land cover and topography of the mine lease area
- Problems to human habitations due to dust and noise caused by movement of heavy vehicles
- Soil erosion and sediment deposition in the nearby water bodies during the rainy season
- Siltation of water course due to wash off from the exposed working area
- Deterioration of soil quality in the surrounding area due to runoff from the project area
- Decrease in the agricultural productivity of the surrounding land due to soil quality degradation.

Mitigation Measures

- Construction of garland drains, settling pits, and check dams to prevent runoff and siltation.
- Runoff water will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site.
- The vegetation will be retained at the site wherever possible.

- Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.2 Soil Environment

Anticipated Impact

- Removal of protective vegetation cover
- Exposure of subsurface materials which are unsuitable for vegetation establishment

Mitigation Measures

- Run-off diversion– Garland drains will be constructed 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

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 3.5KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

Mitigation Measures

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits.

- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

4.4 Air Environment

Anticipated Impact

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software. The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further.

Mitigation Measures

Haul Road and 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 to < 20 km/hr to avoid generation of dust
- Water sprinkling on haul roads and 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 and reduces pollution.
- The un-metaled haul roads will be compacted weekly before being put into use.
- Overloading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate.
- Haul roads and service roads will be graded to clear accumulation of loose materials.

Green Belt

- Planting of trees all along mine haul roads outside the lease and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of tractors/ tippers.
- Green belt of adequate width will be developed around the project site.

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 and tipper drivers.
- Ambient air quality monitoring will be conducted every six months to assess effectiveness of mitigation measures proposed

4.5 Noise Environment

Anticipated Impact

- Mining operations generate significant noise impacting both worker health and nearby communities.
- These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise is crucial to mitigate these adverse effects.

Sources of Noise in Mining:

- ***Drilling and Blasting:*** Prolonged exposure to high-intensity noise from drilling and blasting can lead to hearing loss and other auditory problems
- ***Heavy Machinery:*** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- ***Loading and Transportation:*** The movement and handling of materials within the mine site contribute to noise pollution.

Common Mitigation Measures

The following noise mitigation measures are proposed for control of noise:

- Optimizing blast design to minimize ground noise.
- Constructing noise barriers or enclosing noisy equipment can help reduce noise propagation.
- Proper maintenance and operation of mining equipment can help minimize noise generation.
- 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
- Greenbelt/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 though training and awareness
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects

Ground Vibrations

Noise and Vibration:

- Mining operations generate significant noise and vibration impacting both worker health and nearby communities.
- These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise and vibration is crucial to mitigate these adverse effects.

Sources of Noise and Vibration in Mining:

- ***Drilling and Blasting:*** A primary source of both noise and ground vibrations, with the intensity dependent on the amount of explosives, atmospheric conditions and proximity to the blast.
- Heavy Machinery: Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- Loading and Transportation: The movement and handling of materials within the mine site contribute to noise pollution.

Common Mitigation Measures

- The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators which reduce the ground vibrations
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting
- Adequate safe distance from blasting will be maintained as per DGMS guidelines
- Blasting shelter will be provided as per DGMS guidelines
- Blasting operations will be carried out only during day time
- The charge per delay will be minimized and preferably a greater number of delays will be used per blasts
- During blasting, other activities in the immediate vicinity will be temporarily stopped
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 Biological Environment

Anticipated Impact

- 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. There are no trees in mine lease area.
- Carbon released from quarrying machineries and tippers during quarrying would be 752kg per day, 203070kg per year and 1015352kg over five years.

Mitigation Measures

- During conceptual stage, 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.
- None of the plants in the lease area will be cut during operational phase of the mine. we recommend uprooting and planting of the 10 trees along the 7.5 m safety zone to prevent environmental pollution during quarrying. As the survival rate due to uprooting was only 30%, 100 seedlings will be procured at the rate of 10 seedlings per tree and planted in 7.5 m safety zone.
- Existing roads will be used and new roads will not be constructed to reduce impact on flora.
- Green belt of adequate width will develop around the project site. Dust catching species like *Alstonia scholaris, Bombax ceiba, Terminalia arjuna, Cassia fistula, Bombax ceiba, Azadirchta indica, Nyctanthes arbor-tristis, Psidium guajava, Tectona grandis* etc will be planted in green belt.
- To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 495976kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 2012 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 2479885kg of the total carbon.

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

4.8 Occupational Health

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spiro metric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and Eye test
- Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost.
- The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

5 Environment Monitoring Program

Table 1.1 Environment Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	6 Locations (1 Core & 5 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	7 Locations (2 SW & 5 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 m BGL
5	Noise	6 Locations (1 Core & 5 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	7 Locations (1 Core & 6 Buffer)	–	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

Source: Guidance of manual for mining of minerals, February 2010

6 ADDITIONAL STUDIES

6.1 Risk Assessment

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. 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 for proposed project.

6.2 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:

- Rescue and treat 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.

6.3 Cumulative Impact Study

- The results on the cumulative impact of the three proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from three proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s.
- The cluster projects will allocate Rs. 25,00,000/- towards CER as recommended by SEAC
- The cluster projects will directly provide jobs to 104 local people, in addition to indirect jobs
- The cluster projects will plant 8113 about trees in and around the lease area.
- The cluster projects will add 575PCU per day to the nearby roads.

7 Project Benefits

Various benefits are envisaged due to the three proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- Direct employment to 23 local people
- Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- Strengthening of existing community facilities through the Community Development Program
- Skill development & capacity building like vocational training.
- Rs. 5,00,000 will be allocated for CER

8 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs.27.99 lakhs** as capital cost and recurring cost as **Rs. 36.18 lakhs** as recurring cost/ annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs.227.83 lakhs.**

9 OVERALL STUDY AREA CONCLUSION

The Environmental Impact Assessment (EIA) for the proposed rough stone and gravel quarry project in Karudayampalayam Village, Pugalur Taluk, Karur District, Tamil Nadu, has comprehensively evaluated the baseline environmental conditions and projected impacts

associated with quarry operations. The study concludes that the project is environmentally sustainable with appropriate mitigation and management practices in place.

The land use analysis using Sentinel- II imagery reveals that agricultural land dominates the study area, with limited urbanization and industrial activity. While minor land use changes are expected due to quarrying, these are localized and reversible.

The soil environment is assessed to be healthy and agriculturally productive, with good moisture retention, neutral to slightly alkaline pH, and moderate nutrient levels.

Surface and groundwater quality are generally good. Surface water meets all drinking and irrigation standards with minimal treatment, and groundwater is safe for consumption after mild treatment for hardness and taste. No microbial contamination was detected, and key parameters fall within permissible limits.

Air quality and noise levels are within Central Pollution Control Board (CPCB) norms, and the Air Quality Index remains causing minimal impact to human health. Quarrying impacts on air and noise can be effectively controlled through dust suppression, green belt development, and controlled blasting techniques.

The biological environment in the core zone shows limited flora and fauna due to existing quarry activity, but the buffer zone hosts a healthy diversity of species with no presence of endangered or migratory species. Green belt development and post-mining reclamation plans are proposed to enhance biodiversity and carbon sequestration.

The socio-economic environment will benefit from direct and indirect employment, infrastructure development, and improved livelihoods. The project also contributes to the local economy through taxes, royalty payments, and community development initiatives under Corporate Environmental Responsibility (CER).

Potential environmental impacts such as dust, noise, and runoff are anticipated but can be managed with the proposed Environment Management Plan (EMP). Adequate provisions have been made for water management, air pollution control, soil conservation, occupational health, and post-mining restoration. Risk assessment and a disaster management plan have been integrated to ensure safety and emergency preparedness.

Overall, the study concludes that the proposed quarry project is technically feasible, environmentally sound, and socio-economically beneficial. With strict implementation of the mitigation measures and monitoring programs, the project can proceed without causing significant adverse impacts on the environment or local communities.