EXECUTIVE SUMMARY OF 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

CLUSTER EXTENT = 6.12.0hectares

At

Berigai Village, Shoolagiri Taluk,

Krishnagiri District, Tamil Nadu State

TOR File No. 11325 and ToR Identification No. TO24B0108TN5127363N Dated:29.11.2024

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Production in m^3
M/s.Thimmarayaswamy Enterprises Partner, Mr.N.Mahesh No.2/26, Periyaelasakiri, Nallur, Begepalli Post, Hosur Taluk, Krishnagiri District, Tamil Nadu	1.50.0ha & 305/3B(Part), 313/1	Rough stone – 140588 Gravel - 19544

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

ENVIRONMENTAL LAB

EKDANT ENVIRO SERVICES (P) LIMITED

NABL Accredited and Recognised Laboratory

No. R7/1, avk Tower, North Main Road, Anna Nagar, West Exten.

Chennai – 600 101

NABL Certificate Number: TC- 11742,

Valid Until: 31/05/2025

Baseline Study Period – December 2024 – February 2025

EXECUTIVE SUMMARY

1 INTRODUCTION

As the proposed rough stone mining project (B1) falls within the quarry cluster of 500 m radius with the total extent of 6.12.0ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No.313/1 & 305/3B(Part) over the extent of 1.50.0ha is situated in the cluster falling in Berigai Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. The projects involved in the calculation of cluster extent are of one proposed quarry and two existing quarries.

2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes 12°47'33.05"N to 12°47'41.91"N and Longitudes from 77°57'32.79"E to 77°57'36.64"E in Berigai Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. According to the approved mining plan, about 140588m^3 of rough stone and 19544m^3 will be mined up to the depth of 30m (6m above ground level+24m below ground level) 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 DESCRIPTIONS OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during **December 2024 to February 2025** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Ekdant Enviro Services (P) 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 pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 11.1.

Table.11.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Bare Ground	2.43	0.03
2	Built Area	87.25	1.09
3	Crops	6307.01	79.08
4	Mining / Industrial wastelands	112.2	1.41
5	Rangeland	1136.76	14.25
6	Trees	157.34	1.97
7	Water bodies	172.86	2.17
Total		**7975.85**	**100.0**

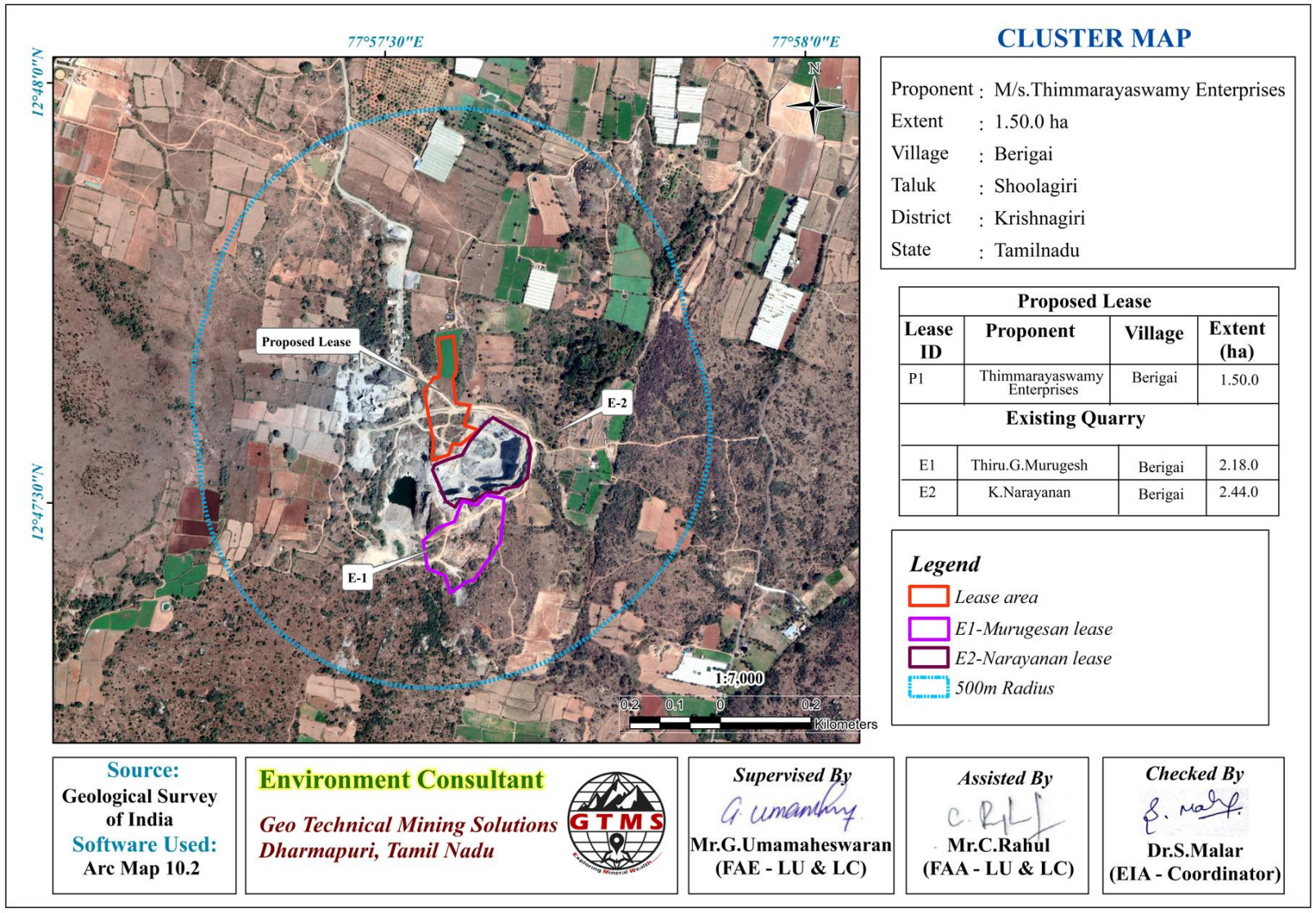

Figure1. Google Earth Image showing Cluster map

3.2 Soil Environment

The soil samples in the study area show sandy textures varying between sandy loam, Sandy Clay. pH of the soil varies from 7.82 to 8.62 indicating slightly acidic and alkaline nature. Electrical conductivity of the soil varies from 36.50 to 64.80 µmhos/cm.

3.3 Water Environment

Surface and Ground Water Quality Resources and Result

Berigai lake and Madivalam Lake are the two prominent surface water resources present in the study area. The proposed project area is located 2.06 km NE of the lake Berigai and 2.21 km NE of the Madivalam Lake. Totally, two surface water samples, known as SW1 and SW2 were collected from the lakes to assess the baseline water quality.

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Four groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from bore wells and open well were analysed for physico-chemical conditions and bacteriological contents in order to assess baseline quality of ground water. Results for ground water samples indicate that the physical, chemical and biological parameters are within permissible limits in comparison with standards of IS10500:2012.

3.4 Air Environment

As per the monitoring data, $PM_{2.5}$ ranges from 16.0µg/m^3 to 20.2µg/m^3, PM_{10} from 37.7 µg/m^3 to 52.3µg/m^3, SO_2 from 4.0 µg/m^3 to 5.9 µg/m^3, NO_X from 12.3µg/m^3 to 15.7g/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 45 causing minimal impact to human health.

3.5 Noise Environment

Noise level in core zone was 46.5dB (A) Leq during day time and 37.5dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 41.7 to 44.6dB (A) Leq and during night time from 35.6 to 39.7dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.6 Biological Environment

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections.

Flora in core zone

Taxonomically 17 species belonging to 13 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were 3 Tree followed by Herbs & Climbers & Grass 8, Shrubs 6. Details of flora with the scientific name were mentioned in Table.3.21-3.23.

Flora in 1km radius zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area, because of nearby agriculture land was found to be dominate in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of 89 species belonging to 43 families have been recorded from the buffer zone. The floral (89) varieties among them Trees 37 (42%) Shrubs 13 (14%) and Herbs & Climbers & Creeper & Cactus 39 (44%). Details of flora with the scientific name were mentioned in Table.3.26.

Fauna in 1km radius from the mine lease area

A total of 50 species belonging to 36 families have been recorded from the buffer zone area (Table.3.30). Based on habitat classification the majority of species were Birds 15 (30%), followed by Insects 14 (28%), Reptiles 13 (26%), Mammals 5 (10%) and Amphibians 3 (6%). 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

- Permanent or temporary change on land use and land cover.
- Change in topography of the mine lease area will change at the end of the life of the mine.

- Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- Degradation of the aesthetic environment of the core zone due to quarrying
- Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- Siltation of water course due to wash off from the exposed working area

Mitigation Measures

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m,10m safety barrier and other safety provided) so as to help minimize dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 Soil Environment

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 3.0 KLD 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.

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

- 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
- Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone
- Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours
- 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
- 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
- The un-metaled haul roads will be compacted weekly before being put into use
- 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
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

4.4 Noise Environment

Anticipated Impact

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. The peak particle velocity produced by the charge of 10kg is well below that of 0.3 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

Mitigation Measures

- The blasting operations in the cluster quarries will use shallow holes and delay detonators to reduce the ground vibrations
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during 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

- 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
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.5 Biological Environment

Impact on Ecology and Biodiversity

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- The Number of plants in the mining lease area is given in chapter 3 table 3.21 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 1316kg per day, 355369kg per year and 1776843kg over five years.

Mitigation Measures on Flora

- 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; new roads will not be constructed to reduce impact on flora.
- 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 11988kg of carbon per year. Therefore, we recommend 500 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 4.13), about 1,500 trees (Table 4.13) will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 14308kg of the total carbon.

Anticipated Impact on Fauna

- Direct impact is anticipated on fauna of core zone
- Insignificant impact is anticipated on fauna in the buffer area due to air emissions, noise, vibration, transportation, waste water discharges, and changes in land use

Mitigation Measures on Flora

- Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- The workers shall be trained not to harm any wildlife near the project site

4.6 Socio Economic Environment

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study 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 of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. Socio-economic study of an area provides a good opportunity to assess the socio -economic condition and possibly makes a change in living and social standards of the particular area benefitted due to the project.

4.7 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

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 NOx.
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 m BGL
5	Noise	2 Locations (1 Core & 1 Buffe	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

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 proposed project 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 the proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed project will allocate Rs. 5,00,000/- towards CER as recommended by SEAC
- The proposed project will directly provide jobs to 19 local people, in addition to indirect jobs
- The proposed project will plant 750 about trees in and around the lease area
- The proposed project will add 63PCU per day to the nearby roads.

7 Project Benefits

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

- Direct employment to 19 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. 366738** as capital cost and recurring cost as **Rs.1508396** 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.11501581**.