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 = 11.83.90hectares

At

Punnam Village, Pugalur Taluk,
Karur District, Tamil Nadu

ToR Identification No. TO25B0108TN5570948N on 07/11/2025, File No.12764

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
Mr.T.Prabhakaran S/o.Tamilarasan, No.201, Old Post Office Street, Vengamedu, Karur District – 639 006.	5.43.40Ha & 1083(P),1084/1(P), 1084/2(P),1086/1(P), 1089/1(P),1089/2(P)	Rough Stone-1076126m^3 or 2959346 Ts Gravel-131604m^3 or 263208Ts

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

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 to May 2025

EXECUTIVE SUMMARY

1. INTRODUCTION

As the proposed rough stone and gravel mining project (B1) falls within the quarry cluster of 500 m radius with the total extent of 11.83.9ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F. Nos. 1083(P), 1084/1(P), 1084/2(P), 1086/1(P), 1089/1(P), 1089/2(P) over the extent of 5.43.40ha is situated in the cluster falling in Punnam Village, Pugalur Taluk, Karur 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 10°58'50.43"N to 10°59'3.18"N Longitudes from 77°59'4.95"E to 77°59'12.95"E in Punnam Village, Pugalur Taluk, Karur District, Tamil Nadu. According to the approved mining plan, about 1076126m^3 & 2959346Ts of rough stone and 131604m^3 & 263208Ts of gravel will be mined up to the depth of 50 m BGL in the ten 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 pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 1.

Table.1 LULC Statistics of the Study Area

S. No.	Classification	LU in 2020 in Ha	LU in 2025 in Ha	Change in percentage
1	Water Bodies	0.64	14.38	0.16
2	Plantation	382.30	410.96	0.34
3	Crop Land	4298.18	3004.86	15.41
4	Built-up Lands	1558.43	1863.19	3.63
5	Mining/Industrial area	382.01	406.44	0.29
6	Fallow Land	1770.01	2691.72	10.99
Total		**8391.56**	**8391.56**	**No Change**

Source: Sentinel II Satellite Imagery

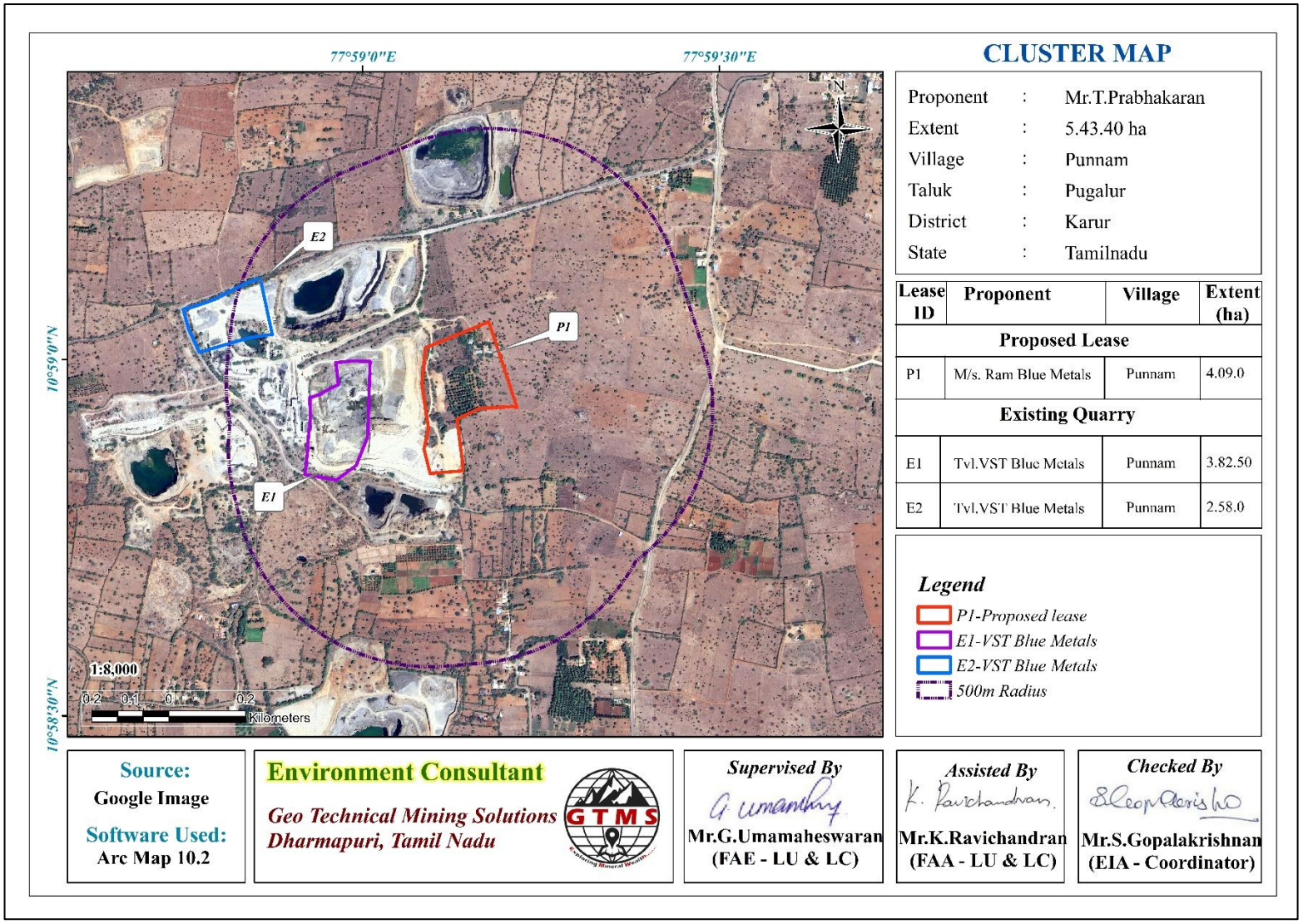

Figure 1. Google Earth Image Showing in cluster map

3.2 Soil Environment

The soil physical characteristics examined were bulk density, porosity, water holding capacity, pH, electrical conductivity (EC) and texture. In the study area soil pH ranged from 7.64 to 8.24 indicating a slightly alkaline environment. Soil EC measured from 0.28 to 0.40 mS/m reflecting the soluble salt content. Low bulk density is associated with good soil physical conditions while high bulk density signals poor conditions for crops.

3.3 Water Environment

Ground water

The analysis of surface water in the study area shows that the water quality is excellent and meets the standards for drinking (after simple disinfection), irrigation, domestic use, and supporting aquatic life.

Key findings include:

- The **pH** value ranges from 7.12 to 8.02 mg/DL. The World Health Organization (WHO) and the Bureau of Indian Standards (BIS) recommend a pH range of 7.0 to 8.5 for drinking water and the values are within the acceptable limits.
- **Turbidity** is measured by a nephelometric turbidimeter. NTU is the current standard for measure the intensity of scattered light caused by these particles rather than the amount of light transmitted through the sample. The **turbidity** value is less than 1 NTU in open well water and 5NTU in surface water.
- The **TDS levels** ranged from 408 to 583 mg/L. In open well water the TDS is higher than the WHO recommendation of 500 mg/l for drinking water. High TDS levels can affect the taste of water potentially making it salty or bitter. In the long-term excessive TDS can irritate the stomach and according to some health sources may lead to kidney stones and cardiac issues.

Chemical Parameters:

- The **calcium** levels range from 61.2 to 87.5 mg/L which is within the permissible limit of 200 mg/L but slightly above the acceptable limit of 75 mg/L. High calcium levels can cause scaling in domestic equipment, reduced detergent efficiency and potential health issues like constipation, gas and bloating.
- The **magnesium** levels range from 4.5 to 6.4 mg/L which is within both the acceptable and permissible limits. However, elevated magnesium levels can cause diarrhoea and vomiting in children.

- The **chloride** levels range from 110.2 to 157.4 mg/L which is within the acceptable and permissible limits of 250 mg/L and 1000 mg/L respectively. Chloride levels exceeding permissible limits can cause a bitter taste in the water and contribute to corrosion.
- The **total alkalinity** levels ranging from 126 to 169 mg/L are within the acceptable limit of 200 mg/L and within the permissible limit of 600 mg/L
- The **hardness** levels ranging from 147 to 210 mg/L, are within the permissible limit but higher than the acceptable limit. Hardness can lead to corrosion and scaling problems, increased soap consumption and a salty taste.

3.4 Air Environment

As per the monitoring data $PM_{2.5}$ ranges from 16.20µg/m^3 to 19.78µg/m^3, PM_{10} from 42.38µg/m^3 to 52.89µg/m^3, SO_2 from 5.09µg/m^3 to 5.68µg/m^3, NO_X from 10.23µg/m^3 to 12.11g/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 46 causing minimal impact to human health.

3.5 Noise Environment

Noise level in core zone was 45.7dB (A) Leq during day time and 37.8dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.8 to 48.1dB (A) Leq and during night time from 36.1 to 41.8dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.6 Biological Environment

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

Flora in core zone

The core zone presents in tree, shrubs, herbs and grasses. Taxonomically total of 25 species belonging to 18 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were Herbs 9 followed by Trees 115, Shrubs 9 and Climbers 5.

Flora in 10 km radius buffer zone

Similar type of environment occurs in both core and buffer zone but more floral diversity noticed in buffer zone compared with core zone area. Buffer area contains a total species belonging to 38 families have been recorded. The floral (75) varieties among them 35 Trees (46%), 15 Shrubs (15%) Herbs and Climbers, Creeper, Grass & Cactus, 25 (33%) were identified.

Fauna in Core 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 No.3.20. 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 No.3.20. A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people.

Fauna in Buffer Zone

A total of 50 species belonging to 36 families have been recorded from the buffer zone area (Table.3.25). 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.

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 3.5 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.

4.4 AIR ENVIRONMENT

Anticipated Impact from proposed project

- During mining at various stages of activities such as excavation, drilling 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

- 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

4.5 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.

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.

4.5.1Ground 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 0.911mm/s.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 Biological Environment

Anticipated Impact

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region. There are no trees in mine lease area.
- Carbon released from quarrying machineries and tippers during quarrying would be 498kg per day, 134448kg per year and 793714kg over ten 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.

Existing roads will be used; new

- 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 65143kg 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 2894 trees (Table 4.14) will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 325714kg 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 2 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 NO_x.
2	Meteorology	At mine site before start of Air Quality	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature,

		Monitoring & IMD Secondary Data			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 m 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

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. 15,00,000/- towards CER as recommended by SEAC
- The cluster projects will directly provide jobs to 81 local people, in addition to indirect jobs
- The cluster projects will plant 5920 about trees in and around the lease area.

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 22local 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. 1,37,38,716** as capital cost and recurring cost as **Rs. 44,22,519** 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 10 years will be **Rs. 7,06,21,374.**