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 = 15.10.0 hectares

At

Irudukottai Village, Denkanikottai Taluk, Krishnagiri District,

Tamil Nadu State

ToR File No. 11945

ToR Identification No. TO25B0108TN5108832N, Dated.13/05/2025

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
M/s. Jayran Mines D.No.HIG-301, New Temple Land Hudco, Rajaji Road, Hosur Taluk, Krishnagiri District – 635 109.	1.09.0Ha & 1160/1 (P)	Color Granite 30% Recovery 7500m³

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,
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NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: 31.12.2026

ENVIRONMENTAL LAB

GREEN LINK ANALYTICAL AND RESEARCH LABORATORY (INDIA) PVT LTD

No.414/1, Tex Park Road, Coimbatore ,

Tamil Nadu Accreditation number Tc-6144,

Valid till 18.05.2025

Baseline Study Period March to May, 2024

APRIL 2025

EXECUTIVE SUMMARY

1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 15.10.0 ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 1160/1(P) over the extent of 1.09.0 ha is situated in the cluster falling in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. The quarries involved in the calculation of cluster extent are one proposed quarry and five existing quarries.

2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°25'38.1022"N to 12°25'43.1918"N Longitudes from 77°50'27.3805"E to 77°50'22.8344"E in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. According to the approved mining plan, colour granite 30% recovery of about 7500m^3 and Granite waste 70% of 17500m^3 will be mined up to the depth of 6m BGL in the five years. The quarrying operation is proposed to be carried out by open cast manual 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 – May 2024** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** 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	Extent (ha)	Area (%)
1	Water	10.91	0.13
2	Trees	1286.92	15.09
3	Crops	3222.86	37.78
4	Built Area	324.53	3.80
5	Mining/Industrial area	73.04	0.86
6	Bare Ground	2.47	0.03
7	Rangeland	3609.99	42.32
Total		**8530.72**	**100.0**

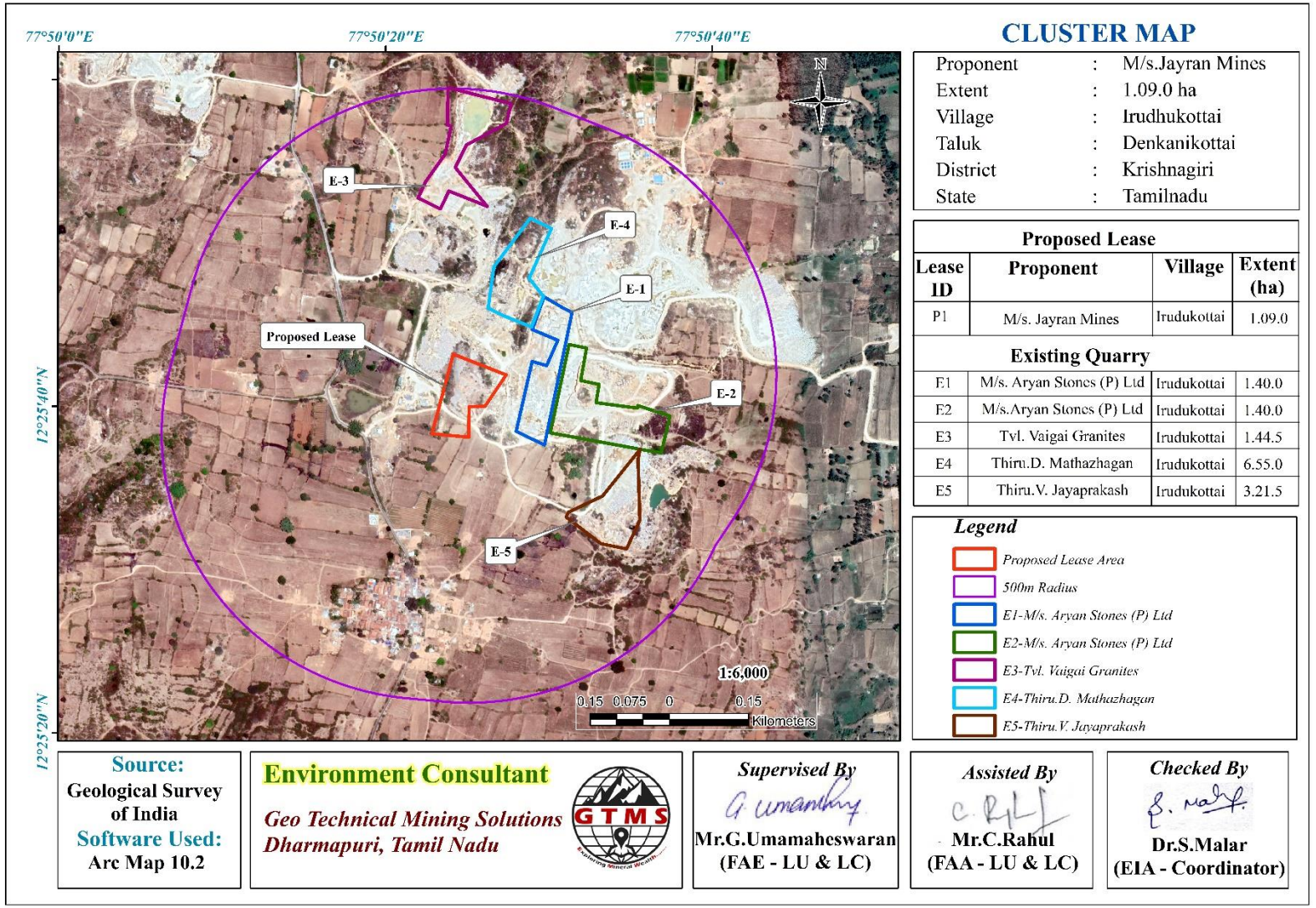

Figure 1 Location of Proposed and Existing Quarries in the Cluster of 500m Radius

3.2 Soil Environment

Physical Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.4 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 43.85 to 133.2 µs/cm Potassium ranges between 1077 and 3056 %, Calcium ranges between 4455 and 21085 mg/kg. Organic matter content ranges between 0.17 and 0.71%.

3.3 Water Environment

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the baseline quality of surface and ground water.

Four groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from open well and bore well and analysed for physico-chemical conditions, heavy metals. Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May, 2024 (Pre-Monsoon Season) and from October through December, 2023 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 21.77 to 24.57 m BGL in pre monsoon and 17.97 to 18.93 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2024 (Post-Monsoon Season) vary from 79.10 to 77.80 m and from 83.07 to 80.43 m for the period of March through May, 2025 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

From the maps of open well groundwater flow direction shown in Figures 3.8- 3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 9 located in SE direction of the proposed project site. The

groundwater flow maps in Figure 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 8. It is located in East direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

3.4 Air Environment

As per the monitoring data, $PM_{2.5}$ ranges from 13.4 µg/m^3 to 15.8 µg/m^3; PM_{10} from 35.7 µg/m^3 to 42.2µg/m^3; SO_2 from 2.4 µg/m^3 to 4.2 µg/m^3; NO_X from 6.7 µg/m^3 to 11.5 g/m^3. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

3.5 Noise Environment

Noise level in core zone was 49.7dB (A) Leq during day time and 36.4dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.0 to 45.1 dB (A) Leq and during night time from 37.5 to 39.4 dB (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

There are no trees in the quarry lease area, only shrubs, herbs and grasses. Taxonomically total of 28 species belonging to 16 families were recorded. Amongthem are herbs (23) and shrubs (5). Majority of the species belongs to the family of Fabaceae and Poaceae. The species richness (Margalef index) and plant details are given in Table 3.19-3.21. There are no endangered or threatened plant species in the quarry lease area.

Flora in 300 m radius zone

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 60 species belonging to 31 families. Among the 60 species, 22 herbs, 24 shrubs and 14 trees. the highest number of species were from the Poaceae family (7), followed by Fabaceae (6), Malvaceae (4), and Mimosaceae (4). Three species were recorded from the

Amaranthaceae, Apocynaceae, and Asteraceae families, while two species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.19 - 3.21. The Velamundi Reserve Forest is located 172 meters north of the quarry lease area. The reserve forest is predominantly populated with *Albizia amara, Vachellia leucophloea, Vachellia karroo, Chloroxylon swietenia*, and *Ziziphus mauritiana*.

Fauna Composition in the Core Zone

The faunal species observed in the study area are listed in Table 3.25. A total of 26 species were recorded in core zone of the project area. The core zone exhibited fewer species, with only a small number of insects, mammals, and reptiles, whereas the buffer zone showed greater species diversity. Among the 26 species recorded, the distribution was as follows: (10) insects, (03) reptiles, Avian and (04) mammals. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 21 species are categorized as Least Concern on the Red List, while 18 species were not listed. The analysis indicates that there are no REET species in the core zone of the proposed quarry site.

Fauna Composition in the Buffer Zone

The faunal species observed in the study area are listed in Table 3.26. Taxonomically a total of 82 species belonging to 49 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 50, followed by Insects 13, Reptiles 11, Mammals 5 and amphibians 3. There are 4 schedule II species and 28 schedule IV species according to Indian wild life Act 1972. Totally, 19 species of bird were sighted in the study area.

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 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.

4.3 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

- 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
- 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.

Mitigation Measures

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise;
- ❖ 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 will be developed around the project areas 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

4.5 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
- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 34 kg per day, 9065kg per year and 45326 kg over five years, as provided in Table 4.7.

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 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 13067 kg 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 4.19), about 935 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 65335 kg of the total carbon, as provided in Table 4.8.

4.6 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

4.7 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

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 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 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 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 four 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 proposed projects will allocate Rs. 10,00,000/- towards CER as recommended by SEAC
- The proposed projects will directly provide jobs to 17 local people, in addition to indirect jobs
- The proposed projects will plant 433 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 17 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. 10,00,000 will be allocated for CER

8 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs.39,00,810** as capital cost and **Rs. 10,73,410** 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 total recurring cost over 5 years is **Rs.59,31,269** and the overall EMP cost for 5 years will be **Rs.98,32,079**, as shown in Table 10.2.