EXECUTIVE SUMMARY

1 INTRODUCTION

The "Rusiar Limestone Mine" located at near Rusiar, Lynti Dkhar area Sohbar, Sohbar Sirdarship, District- East Khasi hills, Meghalaya. The total lease area of the project is 1.0 Ha. The mining activity is being/will be carried out by open cast semi-mechanized method.

The project activity is listed at item 1(a) B1 Mining of Minerals in Schedule of EIA Notification, 2006 and subsequent amendments thereafter as category "B1" project and hence require prior Environmental Clearance.

However, as per the EIA Notification No. S. O. 3977 (E) dated 14th August' 2018 for Sand Mining and other Minor Mineral Mining projects in Cluster situation having Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha comes under category "B2" and public hearing is not required for appraisal of EC.

As per the Ministry of Environment, Forest & Climate Change Office Memorandum dated 12th December, 2018 "If the cluster or an individual lease size exceeds 5 ha the EIA/EMP be made applicable in the process of grant of prior Environmental Clearance". The total cluster area is 5.23 Ha.

1.1 LOCATION OF LEASE AREA

The mining lease is located at village- Rusiar, Lynti Dkhar area Sohbar, Sohbar Sirdarship, District- East Khasi hills, Meghalaya. The mining lease area is 1.0 ha with proposed production capacity of 48,900 TPA of ROM (Mineral Limestone- 44,025 TPA & Mineral Waste/Subgrade- 4,875 TPA).

1.2 DETAIL OF MINING LEASE

S. No.	Particulars	Details
1.	Name of Project	Rusiar Limestone Mine
2.	Location	Rusiar, Lynti Dkhar area Sohbar, Sohbar Sirdarship, District- East Khasi hills, Meghalaya
3.	Lease Area	1.0 Ha.
4.	Land Type	Private Land
5.	Seismic Zone	zone V very high damage risk zone (MSK IX or more) category

2 PROJECT DESCRIPTION

The Letter of Intent (LOI) for mineral Limestone, Area: 1.0 hectare was sanctioned in favour of Smt. Seisoh Syiemlieh by Office of Divisional Forest Officer Khasi Hills Division & Ri Bhoi (T)Division, Shillong vide letter no. KH/8/ML/Limestone/2655 dated 30.08.2024.

The Mining Plan with PMCP has been approved by the Mining Engineer, Directorate of Mineral Resources Meghalaya: Shillong vide letter NO/DMR/MM/203/2024/04-A dated 27.11.2024.

The mineable reserves are about 2,76,345 MT to produce limestone at the rate of 48,900 TPA of ROM (Mineral Limestone- 44,025 TPA & Mineral Waste/Subgrade- 4,875 TPA). The mining operations will be carried out by open cast semi - mechanized method.

2.1 GEOLOGY

2.1.1 Regional Geology

The succession of rocks in the lease area is as given below:-

Table 1 Regional Geology

Geological Age	Group Name	Formation Name	Rock Type
Recent	Newer Alluvium	Unclassified	Sand, Silt and Clay
----------UNCONFIRMITY----------			
Pliestocene	Older Alluvium	Unclassified	Sand, Clay, Pebble, Gravel and boulder deposits
----------UNCONFIRMITY----------			
Mio- Pliocene	Dupitula Group	Unclassified	Mottled Clays, Feldspathic sandstone and conglomerate.
----------UNCONFIRMITY----------			
Oligo-Miocene	Garo Group	Chengopara Formation Baghmara Formation Simsang Formation	Sand, Siltstone, Clay, Mart Feldspathic Sandstone, Pebble, Conglomerate, Clay, Silty Clay. Shale, Sandstone, Mart

Eocene	Jaintia Group	Kopili Formation Shella Formation Langpar Formation	Siltstone-sandstone altemations, sand Altemation of sandstone- lime stone Calcareous Shale, Sandstone, Limestone
Upper Cretaceous	Khasi Group	Mahadek Formation Bottom Conglomerate Formation Jadukata Formation	Arkose (glauconitic) Conglomerate, Arkose Sandstone- Conglomerate altemation
----------UNCONFIRMITY----------			
Jurassic	Sylhet Trap	-	Basalt, alkali Basalt, Rhyolite acid tuff.
----------UNCONFIRMITY----------			
Pre- Cambrian	-	Intrusives (Acid and Basic) Shillong Group	Ponphyrithic and coarse granites, aplite, quartz vein,epidiorite, dolerite, basalt Quartzite, Phyllite, Conglomerate
----------UNCONFIRMITY----------			
Archaean	-	Gneissic Complex	Biotite- gneiss, Biotite-Hornblend gneiss, granitic gneiss, Migmatite, mica-schist, silllimanite- quartz schist, biotite- granulite-amphibolites, pynoxene-granulite etc.

Source: - Approved Mining Plan dated 27.11.2024

2.1.2 Local Geology: -

Table 1(a): Local Geology

Geological Age	Group Name	Formation Name	Rock Type
Recent	Newer Alluvium	Unclassified	Sand, Silt and Clay

----------UNCONFIRMITY----------			
Eocene	Jaintia Group	Shella Formation	Lime Stone

2.1.3 Physiography

The topography of the lease area is Hilly and Stony. The elevation range within the lease area is 183 mRL highest contour to 141 mRL lowest contour.

Drainage in the lease area is Southwesterly. General drainage outside the area is almost southerly by non-perennial nalahs. The area is hilly and stony. No habitation located in and near the lease area.

2.2 GEOLOGICAL AND MINEABLE RESERVES

Details are as follows: -

Table 2 UNFC Classifications of mineral reserves

A) Total Mineral Reserves	**Limestone (Tonnes)**
Proved Mineral Reserves	2,76,345
Probable Mineral Reserves	0
Total Mineable Reserves	2,76,345
B) Total Remaining Resources	
Feasibility Mineral Resources	5,35,005
Pre-Feasible Mineral Resources	0
Inferred Mineral Resources	0
Source: As per Approved Mining Plan along with PMCP dated 27.11.2024.	

Life of Mine	= Minable Reserves (Tonnes)/Average Production (Tonnes)
	=6.28 or Say 7 years

2.3 MINING

Opencast method of mining with semi mechanization is being/will be proposed to excavate the mineral and waste and for other mining activities. The salient features of mode of working as per approved Mining Plan with PMCP are: -

- Blasting is being/will be done by short or long holes with the permission of DGMS
- Bench height and width are being/will be maintained as 6 meters each considering semi-mechanization.
- In the period of mining plan the lessee will develop six benches i.e. From Bench levels 171 mRL (Top Bench), 165 mRL, 159 mRL, 153 mRL, 147 mRL and 141 mRL (Lowest Bench).
- The bench slope is being/will be maintained 85°. The loading of mineral is directly from pits or from temporary stack yard.
- The soil which may come across during mining in patches or in cavities is being/will be scraped and stacked separately to be used for plantation during each monsoon.
- The mineral waste is being/will be dumped in South-West (SW) side of the lease area near pillar '2' in 0.02 ha area for 6 meters in height in two terraces of 3 meters height each.
- Garland drains with parapet walls is being provided and will be mentioned around the pit to check the entry of monsoon flowing water towards working pit.
- The site services like site office, water tank, workshop, kitchen, bathroom etc. are already provided and will be maintained near mining lease in lessee's own land.

2.4 PRODUCTION DETAILS

The year wise development of mines for five years will progress as per the table below: -

Table 3 Production Details

Year	Tentative Excavation in Tons (ROM)	Waste/Sub Grade of Limestone in Tons	Mineral Limestone in Tons
First Year	48,900	4,900	44,000
Second Year	48,900	4875	44025
Third Year	48,900	4,900	44,000
Forth Year	48,900	4,900	44,000
Fifth Year	48,900	4,900	44,000
Total	**2,44,500**	**24,500**	**2,20,000**
Source: As per Approved Mining Plan along with PMCP dated 27.11.2024.			

2.5 LAND USE PATTERN

Land use plan of the mine lease area to encompass pre-operational, operational and post–operational phases is given below: -

Table 4 Land Use Pattern

S. No.	Land use Category	Present (Ha)	End of 5th year (Ha)	End of mine (Ha)
1.	Top Soil Dump	--	--	--
2.	Overburden Dump	--	0.02	0.02
3.	Excavation (voids Only)	--	0.64	0.64 (0.13 ha. -Plantation on Upper benches & 0.49 ha-Water reservoir)
4.	Roads	--	0.02	0.02
5.	Buildup Area	--	--	--
6.	Township Area	--	--	--
7.	Afforestation	--	0.10	0.20
8.	Reclamation (Backfilled)	--	--	--
9.	Mineral Storage	--	--	--
10.	Processing (Crushing)	--	--	--
11.	Undisturbed area	1.0	0.22	0.12
Total		**1.0**	**1.0**	**1.0**
Source: As per Approved Mining Plan along with PMCP dated 27.11.2024.				

3 DESCRIPTION OF THE ENVIRONMENT

For monitoring the environmental parameters like meteorology, air, water, soil and noise quality, the monitoring stations have been established at ten locations in the study area. The baseline data has been collected in the Post monsoon season (December 2024 to February 2025). The detail of the sampling locations is given in below:-

Table 5 Sampling Location

S. No.	Sampling Location	Distance (Km)	Direction	Components
1.	Mine Site (Smti. Seisoh Syiemlieh)	--	--	Air, Ground Water, Noise, Soil
2.	Bholaganj Bazar	0.9	E	Air, Ground Water, Noise, Soil
3.	Bholaganj	2.3	S	Air, Ground Water, Noise, Soil
4.	Chakalabasti	4.0	SW	Air, Ground Water, Noise, Soil
5.	Diengkain	3.85	WSW	Air, Ground Water, Noise, Soil
6.	Mawthang	3.65	NW	Air, Ground Water, Noise, Soil
7.	Sohbar	4.3	NNE	Air, Ground Water, Noise, Soil
8.	Mawpathaw	5.9	ENE	Air, Ground Water, Noise, Soil

3.1 LAND ENVIRONMENT

3.1.1 Soil Quality

Soil samples were collected at eight representative sampling locations. The soil analysis results are given below: -

pH	:	7.32 to 7.84
Soil Conductivity	:	298 to 451 µmhos/cm
Nitrogen as N	:	of 0.041 to 320 Kg/ Hectare
Phosphorus as P	:	10.84 to 18.67 mg/kg

3.2 WATER ENVIRONMENT

3.2.1 Ground Water

Eight ground water samples have been considered in the study area. The analysis results are as given below: -

The analysis results indicate that pH of the groundwater was found to be in range of 7.26-7.65. The TDS were found to be in the range of 285-448.0 mg/l. Other parameters like Calcium, Magnesium, Chlorides, Sulphates and Nitrates were found within the prescribed limits. The physico – chemical analysis for the other parameters were also within the permissible limits as per the standards as per IS: 10500. The water quality is non- potable in nature.

3.3 AIR ENVIRONMENT

To assess the baseline status of the air quality in the study area systematic ambient air quality monitoring has been carried out for criteria pollutants (PM_{10}, $PM_{2.5}$, NO_X, SO_2 and CO) at eight representative ambient air quality monitoring stations.

Ambient Air Quality

Ambient air quality monitoring has been carried out with a frequency of two days a week at eight locations covering one complete season i.e. December 2024 to February 2025. Various statistical parameters like 98th percentile, average, maximum and minimum values have been computed from the observed raw data for all the AAQ monitoring stations. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for rural and residential zone.

The observation based on the perusal of the results is summarized below: -

PM_{10}:-The maximum value for PM_{10} observed at Mine Site 79.82 µg/m^3 and minimum value for PM_{10} observed at Mawthang 53.4 µg/m^3. The 24 hours applicable limit for Industrial, Residential Rural and Other Areas is 100 µg/m^3.

$PM_{2.5}$:-The maximum value for $PM_{2.5}$ observed at Mawpathaw 45.22 µg/m^3 and minimum value for $PM_{2.5}$ observed at Mawthang 19.21 µg/m^3. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 60 µg/m^3.

SO_2:- The maximum value for SO_2 observed at Diengkain 18.56 µg/m^3 and minimum value for SO_2 observed at Bholaganj Bazar 5.84 µg/m^3. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 80 µg/m^3.

NO_x: -The maximum value for NO_2 observed at Diengkain 20.31 µg/m^3 and minimum value for NO_2 observed at Bholaganj Bazar 9.45 µg/m^3. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 80 µg/m^3.

CO: -The maximum value for CO observed at Mine Site-0.92 mg/m^3 and minimum value for CO observed at Bholaganj Bazar 0.25 mg/m^3. The 8 hours applicable limit for Industrial, Residential Rural and other areas is 2.0 mg/m^3.

Conclusion: The results of the monitored data indicate that the ambient air quality of the region in general conforms to the norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

3.4 NOISE ENVIRONMENT

The noise monitoring has been conducted for determination of noise levels at seven locations in the study area. The noise levels at each location were recorded for 24 hrs. The results obtained were compared with the national standards and were found to be within the standards.

A) Day time Noise Levels L_{eq} (day)

The day time Leq (day) noise levels at all locations were observed to be in the range of 51.6-58.7 dB (A). The maximum noise level of 58.7 dB (A) was observed at Mine site and the minimum noise level of 51.6 dB (A) was observed at Mawpathaw during the study period. It is observed that the day time noise levels are in accordance to the prescribed limit of 75dB (A) in the study area.

B) Night time Noise Levels Leq (night)

The night time L_{eq} (night) noise levels at all the residential locations was observed to be in range of 38.5- 43.2 dB (A). The maximum noise level of 43.2 dB (A) was observed at Sohbar and the minimum noise level of 38.5 dB (A) at Diengkain during the study period.

It has been found that the night time noise levels at Mine Site were found to little very high due to vehicular movement, within the prescribed standard of 70 dB(A).

3.5 SOCIO-ECONOMIC ENVIRONMENT

The study area encompasses the project site and a 10 km radius around it, covering five tehsils: Pynursla, Shella Bholaganj, Mylliem, Mawphlang, and Khatarshnong Laitkroh, including 53 villages. There are 3,879 households, averaging five members each. Of these, 4.92% are within 0-2 km, 41.48% within 2-5 km, and 53.60% within 5-10 km. The total population is 19,716, with 5.31% living in the 0-2 km range, 41.76% in 2-5 km, and 52.93% in 5-10 km. Among them, 51.45% are male and 48.55% are female, resulting in a sex ratio of 944 females per 1,000 males. The child population aged 0-6 years accounts for 19.74%, with a sex ratio of 923 girls for every 1,000 boys.

3.5.1 METHODOLOGY

In the study area, 4.33% of total population belongs to Schedule Caste community. Out of which, 50.31% are males 49.69% are females, creating the sex ratio of 988 females per 1000 males in this community.

Scheduled Tribe Community: In the study area, population belongs to Scheduled Tribe community is 49.50% of the total population. Out of the total ST population, 49.50% are males and remaining 50.50% are females, creating the sex ratio of 1020 females over 1000 males among the ST community.

3.5.2 LITERACY STATUS OF THE STUDY AREA

In the study area, 56.68% of the total population is literate persons. Out of the total literates, 52.66% are male literates and 47.34% are female literates.

On the other hand, 43.32% of total population are illiterate, out of the total illiterate 49.06 % are males and 50.94% are females.

3.5.3 WORKER'S PROFILE & OCCUPATIONAL STRUCTURE

The overall work participation in the study area is just 35.55% of the total population. Out of this, the male work participation is 68.98% and female work participation is 31.02%.

Out of the total workers, 85.62% are the main workers 14.38% are marginal workers.

Among all the work forces, males are mostly working in the nearby small industries, agriculture & allied activities, laborers, etc. However, women on the other hand work as marginal workers due to their occupancy in household and domestic chores. Apart from the household works, most of the women work as marginal cultivators in their agricultural lands.

3.6 BIOLOGICAL ENVIRONMENT

The biological environment of Meghalaya, encompassing diverse terrestrial and aquatic ecosystems, is assessed for environmental impact to protect flora and fauna. The state's 22,429 km² area includes 8,514 km² of forests, with 722.36 km² under direct State Forest Department control. Forest types are classified as tropical, subtropical, and temperate, with variations including evergreen, semi-evergreen, moist and dry deciduous, and grasslands. The temperate forests occur at higher elevations, while grasslands result from deforestation. As of 2001, Meghalaya's forest cover is 15,584 km², about 69.5% of the state's area, with significant portions managed by local councils and traditional institutions..

Table 6 Floral Diversity in Study Area

Study Area
Flora
Climbers –19 Species
Herbs – 40 Species
Shrubs - 70 Species
Tree – 74 Species
Orchids- 8 Species
Fauna
Reptiles - 9 Species
Butterfly/ Moth –28 Species
Mammals –15 Species
Avifauna-79 species

4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The summary of anticipated adverse environmental impacts due to the existing mine and mitigation measures are given below: -

Soil Environment		
Aspects	**Impact**	**Mitigation Measures**
Geomorphology	Mining alters landforms, creates voids, and disrupts terrain.	Implement land reclamation, minimize disturbance, control erosion, manage water effectively, protect biodiversity, engage with the community, and monitor restoration efforts.
Soil Erosion and Degradation	Mining disturbs soil, leading to erosion and compaction.	Construct garland drains and siltation ponds, plant vegetation, reduce heavy machinery use in wet conditions, and apply soil amendments for reclamation.
Deforestation and Habitat Destruction	Mining causes deforestation and disrupts ecosystems.	Conduct plantation in statutory barriers, around infrastructure, and unworked areas. More than 33% of lease area will be under plantation till the conceptual stage 33% of lease area (i.e. 0.33 ha.) will be covered under plantation which includes 0.20 ha. Undisturbed area and 0.13 ha area of upper benches of excavated pit.
Visual Impact and Aesthetic Degradation:	Mining alters landscapes and scenic views.	Establish landscaping and vegetation buffers to minimize visible disturbance
Change in Topography, Sinkholes, and Subsidence	Mining creates land subsidence and alters drainage patterns.	Confine impacts to the lease area, focus on careful planning, reclamation, phase-wise plantation, and develop water reservoirs. 0.49 Ha area out of total area of excavation pit (0.6 Ha) will be developed as a water reservoir at the end of mine life.
Earthquake Zone V	Mining in high-risk areas poses significant environmental harm.	Implement strict environmental controls, advanced technology, and comprehensive monitoring; maintain bench slopes as per the mining plan and conduct slope stability

		studies.
Removal of Soil Cover and Waste Generation:	Mining generates significant waste and soil. As per the Mining Scheme around 83,625 tons of waste will come across during the period of 5 year of Mining Scheme and around 1,32,240 tons of total wastewill be generated till the end of life of mine.	Manage waste through proper dumping, stabilize waste dumps with retaining walls, and use extracted soil for plantation to avoid permanent stockpiles. The mineral waste is being/will be dumped in southwestern side side of the lease area near pillar '1' & '3' in 0.02 ha area for 6 meters in height in two terraces of 3 meters height each. The waste dump will be stabilized by retaining walls of rubble stone. Parapet wall and drain will also be constructed towards lower altitude side to check the wash-off during monsoon
Water Environment		
Ground Water		
Groundwater table intersection and depletion; changes in aquifer properties.	Mining may intersect and contaminate groundwater and affect aquifer properties.	Pit limits are set to avoid groundwater. Water needs (5.0 KLD) is being/will be met through tanker supply from nearby water streams, not groundwater. Post-mining, natural recharge will be restored, and groundwater quality will be regularly monitored.
Sewage from septic tanks and soak pits.	Sewage could percolate and contaminate groundwater.	Sewage (0.7 KLD) is being/will be managed with septic tanks and soak pits. Stabilized sludge is being/will be used for plantation.
Leaching of chemicals and heavy metals.	Leaching from mine wastes could contaminate groundwater.	No chemicals or heavy metals is being/will be used. Proper tailings management, containment liners, and effective water management is being/will be enforced.

		Regular monitoring will ensure groundwater protection.
Surface Water		
Contamination of nearby water bodies.	Runoff may carry sediments and chemicals, potentially degrading water quality and harming aquatic life.	No chemicals or heavy metals is being/will be used. Water management plans will effectively manage runoff through the use of containment ponds and sedimentation facilities
Alteration of hydrology.	Mining can alter drainage patterns and reduce downstream water availability, affecting ecosystems.	Natural drainage will remain unaffected. Post-mining restoration will return the area to its original condition. Rainwater is being/will be managed and utilized, with erosion control measures in place to protect water quality.
Air Environment		
Emissions from heavy machinery and transport vehicles	Emission of pollutants (NOx, SO2, VOCs) contributes to air pollution.	Equip machinery with modern emission controls, perform regular maintenance, and reclaim disturbed areas with vegetation to stabilize soil and reduce dust. Engage local communities in air quality management plans.
Dust and pollutants from mine sites	Dust and pollutants escaping from mine sites contribute to air pollution.	Reclaim disturbed areas with vegetation to stabilize soil and reduce dust. Involve and inform local communities in air quality management plans to address concerns and improve transparency.
Noise Environment		
High Noise Levels	Disturbs workers, nearby communities, and wildlife.	Construct noise barriers, maintain equipment, use anti-vibration mounts, schedule noisy activities during less sensitive times, implement noise reduction technologies, plan controlled blasting, and ensure smooth haul roads.

Continuous Operation	Sustained noise pollution from conveyor belts and crushers.	Regular maintenance of machinery, limit truck speeds, install silencers in equipment, and provide closed cabins for operators
Health Effects	Hearing loss, stress, sleep disturbances, and disruption of animal behavior.	Provide hearing protection, implement administrative controls, rotate tasks, carry out perimeter plantation, conduct regular health checkups, and perform periodical noise monitoring.
Socio-Economic Environment		
Negative Impacts & Mitigation		
Social Challenges	Increased population and economic activity can strain local social services and infrastructure.	Partnerships will be developed with local governments and NGOs to enhance social services. Community development programs to address social challenges will be implemented.
Cultural Impact	Mining operations can disrupt traditional lifestyles and cultural practices of indigenous or local communities	Local communities will be engaged in culturally sensitive planning and decision-making processes. Cultural preservation initiatives will be supported and local traditions respected.
Community Health	mining activities can include issues such as air and water pollution, noise pollution, increased risk of respiratory diseases, potential exposure to hazardous chemicals, and disruption of access to clean water sources	Regular health check-up of workers and nearby locals is being/will be conducted. Records of the worker's health and safety is being/will be maintained. Training is being/will be provided to the workers. Personal Protective equipment's is being/will be provided to workers. The safety and well-being of workers is being/will be ensured in accordance with mining rules and regulations.

Human Settlement	Mining projects can also cause, displacement, increased crime, economic inequality, infrastructure strain, and long-term legacy problems, significantly impacting nearby human settlements and their quality of life.	Nearest settlement is 2.3 km away in SSW. There is no physical or economic displacement due to the project and also not predicted in future also. Mitigation measures for nearby human settlements include, investing in community health and infrastructure, ensuring fair economic benefits, involving local communities in decision-making etc.

Positive Impacts

Income and Revenues

- Enhancement of average income for locals engaged in similar mining activities directly and indirectly.
- Increase in tax revenues of local and central government.
- Successful operation of the plant will attract additional industrial investments, benefiting both society and the nation.

Livelihoods

- Approximately 19 No. of people will get directly employed from the mining project.
- Anticipated creation of new direct and indirect employment opportunities.
- Expected increase in non-agricultural livelihood opportunities, both directly and indirectly related.
- The minimal influx of personnel is expected during the operational phase.

Physical Infrastructure

- The road and power networks in the area are expected to be strengthened as part of sequential development.

Biological Environment

• Clearing of Vegetation • Noise and Vibration from Mining Activities • Discharge of Polluted Water • Dust Generation • Removal of Vegetation for Excavation.	• Deforestation, disturbance to wildlife, and degradation of aquatic flora and fauna. • Displacement of animals and birds, disturbance to local wildlife. • Degradation of aquatic flora and fauna. • Impact on nearby vegetation and biological environment. • Loss of flora and potential disruption to the local ecosystem.	**Conduct Assessments**: thorough EIA report has been prepared to understand potential impacts and design appropriate mitigation measures. **Avoid Sensitive Areas**: The mining lease is situated on private land, and there are no national parks or wildlife sanctuaries within a 10-kilometer radius of the lease area. Therefore, the likelihood of impacting sensitive areas is minimal. **Species Surveys**: A survey has been conducted to determine the presence of any Schedule I species or sensitive flora and fauna within the study area. There is not any sensitive flora fauna or schedule 1 species found in the study area. **Restoration Plans**: Develop plans for ecosystem restoration and use native species for replanting. **Water and Air Management**: Control water contamination and air pollution through proper management and monitoring. **Safe Disposal**: Handle mining waste responsibly and explore recycling opportunities. **Soil Stabilization**: Implement erosion control methods like silt fences and vegetation planting. **Stakeholder Involvement**: Engage with local communities and address their concerns through education and feedback. **Continuous Monitoring**: Track

		environmental impacts and report on compliance with mitigation measures. **Adhere to Regulations**: Follow environmental regulations and permit requirements

5 ENVIRONMENTAL MONITORING PROGRAMME

5.1 AIR

Air quality monitoring is being/ will be carried out as per norms of SPCB and CPCB.

5.2 WATER

Regular monitoring of ground water quality is being/will be carried out at suitable locations. Water samples will be collected four times in a year i.e. Pre - Monsoon, Monsoon, Post - Monsoon and Winter.

5.3 NOISE

Noise level is being/will be recorded periodically at mine site near operating machines during day and night time.

5.4 HEALTH AND SANITATION

Periodical medical checkup of workers is being done and medical facility provided. The Initial Medical Examination (IME) is conducted at the start, while the Periodic Medical Examination (PME) is required every 3 years for those over 45 and every 5 years for those 45 or younger.

Toilets and urinals is being/will be provided near the mine site. Drinking water is being/will be made available to the workers.

6 ADDITIONAL STUDIES

6.1 PUBLIC HEARING

The draft EIA/EMP report is being submitted. Public hearing will be conducted as per the guidelines of EIA Notification14th September, 2006 and its subsequent amendments.

6.2 RISK ASSESSMENT & MANAGEMENT

Risk analysis is the systematic study of uncertainties and risks encountered in various areas. Risk analysts seek to identify the risks involved in mining operations, to understand how and when they arise, and estimate the impact (financial or otherwise) of adverse outcomes. It also defines and analyzes the dangers to individuals, businesses and government agencies posed by potential natural and human-caused adverse events.

However, there are various factors, which can create unsafe working conditions/ hazards in mining of Limestone (minor minerals). The following types of hazards are identified during the limestone mining operations: -

1. Accident during mineral loading, transportation and dumping
2. Accident due to vehicular movement
3. Inundation/ Flooding

Following procedure will be followed for effective management of any disaster in the mine.

Step 1: Identification of Disaster risk.

Step 2: Identification of persons at risk

Step 3: Removal of Hazard

Step 4: Evaluation of the risk

Step 5: Control measures to be taken

Step 6: Maintain Assessment records

Step 7: Review

7 PROJECT BENEFITS

7.1 Summary of Project Benefits:

General Benefits:

- Provision of well-paid employment adhering to accepted labor standards.
- Education and training programs.

- Development of local industries and businesses.
- Support for government initiatives and social activities.
- Investment in community infrastructure.
- Health and sanitation programs, such as malaria prevention.
- Compliance with local, state, and federal laws.
- Increase in local employment and skilled workers.

Employment:

Direct Employment: About 19 people are employed directly during the operational phase, with some skilled personnel sourced externally and unskilled or semi-skilled personnel from the local area.

Indirect Employment: Local people is being/will find indirect work in sectors like tea shops, vehicle repairs, transportation, warehousing, and logistical activities. Additionally, vocational training will be provided to build a skilled workforce for local mines.

Improvements in Infrastructure:

Physical Infrastructure:

- Improved road communication and community facilities.
- Rainwater reservoirs to enhance water availability.
- Skill development programs and vocational training for income generation.
- Awareness programs like health camps and family welfare activities.

Social Infrastructure:

- Positive impacts in socio-economic development, including new employment and better educational and health facilities.
- Health care initiatives, including community health camps.
- Enhanced employment potential and contributions to the state and central government.

Health:

- Regular medical checkups as per Mines Act/Rules.
- Social development activities aimed at improving health standards in nearby communities.

8 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) aims at the reservation of ecological system by considering in – built pollution abatement facilities at the mine site. Some of the major criteria governing the environmental measures will be adopted.

8.1 LAND USE MANAGEMENT

The following reclamation plan will be adopted in this mine.

- At the end of life of mine, total excavated area will be of 0.12 Ha.
- At the conceptual stage, 33% of lease area (i.e. 0.33 ha.) will be covered under plantation which includes 0.20 ha. Undisturbed area and 0.13 ha area of upper benches of excavated pit.

8.2 WATER POLLUTION MANAGEMENT

Some of the control measures adopted for controlling water pollution are as follows: -

- Based on results from monitoring corrective regulatory measures will be taken.
- Measurement of water level fluctuations to assess impact of mining activity on the water table depletion in close proximity of dug wells and bore wells.
- Regular monitoring and analysis of water samples at strategic locations is being/will be carried out to monitor the water quality.
- Domestic waste water will be channelized into septic tank followed by soak pit.

8.3 AIR POLLUTION MANAGEMENT

Following mitigation measures are envisaged: -

- The speed of the vehicles is being/will be maintained uniform.
- Regular pollution checks and certification of vehicles is being/will be done.
- Limited number of mine-related vehicle is being/ will be maintained on the public roadways to reduce the traffic to minimize impacts on local people.
- The loaded vehicles are being/will be covered with tarpaulin.
- Over loading is being/will be avoided and free board will be left in the loaded trucks to prevent spillage.
- Regular cleaning is being/will be done to reduce the chances of road dust to become airborne.
- Water sprinkling is being/will be done on a fixed stretch of paved road.

- Natural barriers are being developed and /will be maintained along the roadside to control the dispersion of dust particles.
- Speed breakers will be constructed to restrict the speed of transporting vehicles. However, limiting of vehicular speed will be adopted.
- Regular monitoring and analysis is being/will be carried out through collection of air samples from strategic monitoring sites. If the parameters go beyond the permissible tolerance limits, corrective regulation measure will be taken.

8.4 NOISE POLLUTION MANAGEMENT

The following control measures are to be undertaken to bring down the noise levels:-

- Noisy activities are being/will be scheduled at normal working hours (daytime hours) to the extent possible when the environment is least sensitive to noise impact.
- Regular inspection and maintenance of vehicles and equipment is being/will be performed to ensure efficiency and worn parts will be replaced.
- The vehicles are being/will be maintained in good condition and overloading will not be done.
- Speed limits is being/will be enforced in relation to road conditions and on-route communities.
- Noise monitoring is being/will be conducted on a regular basis to determine compliance with noise criteria.
- Personal Protective Equipment's i.e., earmuffs and earplugs are being/will be provided to workers, working in high noise areas.
- Periodical medical checkup is being/will be organized for all workers to check any noise related health problems.
- Operational noise level status is being/will be displayed on machines to identify the extent of noise level and to control the exposure times at which worker are exposed to higher noise levels.

8.5 OCCUPATIONAL HEALTH AND SAFETY

- To avoid any adverse effect on the health of the workers due to dust, noise etc. extensive measures has to be adapted related to safety aspect.
- Regular maintenance and testing all the tools & equipment's as per manufacturer's guidelines.
- Provision of personal protective equipment to the workers working in the mine.

- Periodical Medical Examination of all workers by medical specialists will be conducted.
- Awareness program will be organized for workers.

8.6 SOCIO-ECONOMIC MANAGEMENT

- Environmental Officer will be responsible to take care the performance of mine on environmental issues.
- Approx. 19 local workers are being directly employed and More employment opportunities will create in future from the project.
- Employment opportunities along with periodical training to generate local skills.
- Local employment is being/will be ensured. On the job training to local people is being/will be given and periodically upgraded.
- Regular health camps are being/will be carried out.

8.7 BIOLOGICAL MANAGEMENT

No adverse impact & no genetic diversity loss are anticipated from the mining activity. However due care & extensive plantation activity will be undertaken to reduce impact from the activity.

9 CONCLUSION

EIA study was performed as per the approved ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP has been dynamic, flexible and subject to periodic review.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local people. The greenbelt development programme will help in increasing the green cover in the nearby areas. Thus, the existing project is not likely to affect the environment or adjacent ecosystem adversely. The Senior Management will be responsible for the project review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

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