EXECUTIVE SUMMARY

1 INTRODUCTION

The "Boulder Stone Mine" located at Village- Syllai Madan, Laitkynsew, Laitlyngkot Khyrim Syiemship, District- East Khasi Hills, State- Meghalaya. The total lease area of the project is 4.23 Ha. The mining activity 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 9.22 Ha.

1.1 LOCATION OF LEASE AREA

The mining lease is located at Village- Syllai Madan, Laitkynsew, Laitlyngkot Khyrim Syiemship, District- East Khasi Hills, State- Meghalaya. The mining lease area is 4.23 ha with proposed production capacity of 4,75,200 TPA ROM (Boulder stone - 95,040 TPA & Waste/Subgrade - 3,80,160 TPA).

1.2 DETAIL OF MINING LEASE

S. No.	Particulars	Details
1.	Name of Project	"Boulder Stone Mine"
2.	Location	Village- Syllai Madan, Laitkynsew, Laitlyngkot Khyrim Syiemship, District- East Khasi Hills, State- Meghalaya
3.	Lease Area	4.23 Ha.
4.	Land Type	Private Land
5.	Seismic Zone	zone V very high damage risk zone (MSK IX or more) category

2 PROJECT DESCRIPTION

Initially the letter of Intent (LOI) for Boulder Stone mining, Area: 4.23 hectare was sanctioned in favour of Shri Khrikshon Lyngkhoi by Office of Divisional Forest Officer Khasi Hills Division, Shillong in favour of Shri Khrikshon Lyngkhoi vide order No.KH/8/ML/Stone/69/332 dated 19.04.2018.

Mining Lease was granted by Office of Divisional Forest Officer Khasi Hills Division, Shillong in favour of Shri Khrikshon Lyngkhoi vide order NO.KH/8/KL/196/3953 dated 10.09.2018.

LOI Extension order by Office of Divisional Forest Officer: East Khasi Hills & Ribhoi Territorial Division Shillong vide order No.KH/8/ML/stone/69/1705 dated 10.07.2024 for a period of 3 month from the issue of this letter.

Approval of Mining Plan submitted to DEIAA for grant of EC was approved by Mining Engineer, Directorate of Mineral Resources Meghalaya: Shillong vide order No.DMR/MM/116/2017/2090 dated 08.01.2018.

Earlier EC issued by Office of Deputy Commissioner: DEIAA, Eastern Khasi Hills District, Shillong, Govt. of Meghalaya vide order No.EKJ.20/17/2017/17/72/543 dated 08.08.2018.

There has been no production from the mining lease to date, and it will commence after the grant of the Environmental Clearance (EC) from SEIAA Meghalaya.

The mining lease area is 4.23 ha with proposed production capacity of 4,75,200 TPA of ROM (Boulder stone - 95,040 TPA & Waste/Subgrade - 3,80,160 TPA).

The mining operations will be carried out by open cast semi - mechanized method.

2.1 GEOLOGY

2.1.1 Local Geology

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

Table 1 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

Source: - Approved Mining Plan dated 10.06.2024

2.1.2 Physiography

The elevation range within the lease area is 1815 mRL to 1790 mRL. The mineral is exposed in the whole lease area.

Drainage in the lease area is almost easterly. General drainage outside the area is almost southerly. 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	**UNFC Code**	**Boulder Stone (Tonnes)**
Proved Mineral Reserves	111	13,66,600
Probable Mineral Reserves	121 & 122	16,31,700
Total Mineable Reserves		
B) Total Remaining Resources		
Feasibility Mineral Resources	211	2,41,160
Pre-Feasible Mineral Resources	221+222	6,99,420
Measured mineral resources	331	
Indicated Mineral resources	332	
Inferred Mineral Resources	333	7,77,040
Reconnaissance mineral resource	334	

Life of Mine	= Minable Reserves (Tonnes)/Average Production (Tonnes)
	= 29,98,300 /3,80,160 = 7.97 or Say 08 years

2.3 MINING

The mining will be done by open cast semi-mechanized method of mining. The salient features of mode of working as per approved Mining Plan with PMCP are:-

- Blasting will be done by short or long holes with the permission of DGMS
- Bench height and width will be maintained as 6 meters each considering semi-mechanization.
- Total seven benches will be developed i.e. from Bench levels 1781 mRL (Top Bench), 1775 mRL, 1769 mRL,1763 mRL, 1757 mRL, 1751mRL, 1745 mRL (lowest bench).

- The approach roads up to faces will be provided and will be maintained time to time for movement of vehicles.
- The bench slope 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 will be scraped and stacked separately to be used for plantation during each monsoon.
- The mineral waste will be dumped outside the area and a part of inside the lease area. In the area towards south-eastern side in the area in 0.12 ha area for 8 meters in height in two terraces of 4 meters height each.
- The stone walls will be provided and will be maintained towards lower altitude side of the dumps to arrest the solid wash off.
- Drilling is either by wet process or by using dust extractors.
- Garland drains with parapet walls will be provided 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. 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	ROM (T)	Mineral Boulder Stone (T)	Waste/sub-grade of Stone (T)
1st	4,62,000	92,400	3,69,600
2nd	4,62,000	92,400	3,69,600
3rd	4,68,600	93,720	3,74,880
4th	4,68,600	93,720	3,74,880
5th	4,75,200	95,040	3,80,160
Total	23,36,400	4,67,280	18,69,120

Source: - Approved Mining Plan with PMCP dated 08.01.2018

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	--	0.01	--
2.	Waste Dump	--	0.12	0.12 (Reclaimed by plantation)
3.	Excavation (voids Only)	--	3.25	3.31 (Plantation on upper benches – 0.81 ha & Water Reservoir-2.50 Ha)
4.	Roads	--	0.04	--
5.	Build-up Area	--	0.01	--
6.	Township Area	--		--
7.	Afforestation	0.2	0.80	0.80
8.	Reclamation (Backfilled)	--	--	--
9.	Mineral Storage	--	--	--
10.	Processing (Crushing)	--	--	--
11.	Undisturbed area	4.03	--	--
Total		**4.23**	**4.23**	**4.23**

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 (Oct' 2023 to Dec' 2023). The detail of the sampling locations is given in below: -

Table 5 Sampling Location

Sampling Location	Distance (Km)	Direction	Components
Mine Site	--	--	Air, Water, Noise, Soil
Pomlum	1.3	ENE	Air, Water, Noise, Soil
Mawkajem	1.1	ESE	Air, Water, Noise, Soil
Dymmlew	2.6	SSE	Air, Water, Noise, Soil
Umktieh	2.5	S	Air, Water, Noise, Soil
Lewmawlong	2.1	WNW	Air, Water, Noise, Soil
Setthliew	5.3	NNW	Air, 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	:	7.21 to 7.64
Soil Conductivity	:	275.0 to 416.15 µmhos/cm
Available Nitrogen	:	0.021 to 0.046 Kg/ Hectare
Phosphorus as P	:	10.67 to 14.3 mg/kg

3.2 WATER ENVIRONMENT

3.2.1 Ground Water

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

The pH of the water sample ranged from 7.25 to 7.89, indicating a slightly alkaline nature. Total Dissolved Solids (TDS) were measured between 298 and 390 mg/l, while hardness levels were found to be between 148 and 190 mg/l. Fluoride concentrations ranged from 0.16 to 0.26 mg/l. Other parameters such as calcium, magnesium, chlorides, sulphates, and nitrates were all within the prescribed limits.

Overall, the physico-chemical analysis of the water confirmed that all measured parameters complied with the standards set by IS: 10500. As a result, the water quality is deemed potable, making it safe for consumption.

3.2.2 Surface Water

The analysis results indicate that pH of the surface water was found to be in range of 7.36 to 7.59. The COD and DO were found in range of 15 to 18 mg/l and 7.3 to 7.6 mg/l respectively.

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. Oct' 2023 to Dec' 2023.

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 air quality monitoring results reveal the following observations: For PM10, the maximum concentration was recorded at the Mine site (87.48 µg/m³) and the minimum at Setthliew (61.64 µg/m³), both remaining below the 24-hour limit of 100 µg/m³. PM2.5 levels ranged from a maximum of 48 µg/m³ at the Mine site to a minimum of 24.61 µg/m³ at Setthliew, also within the limit of 60 µg/m³. Sulfur dioxide (SO2) levels were highest at the Mine site (11.04 µg/m³) and lowest at Lewmawiong (5.55 µg/m³), remaining below the 24-hour limit of 80 µg/m³. Nitrogen dioxide (NO2) concentrations ranged from 20.27 µg/m³ at the Mine site to 10.81 µg/m³ at Setthliew, within the same permissible limit. Carbon monoxide (CO) levels were observed at a maximum of 1.45 mg/m³ at the Mine site and a minimum of 0.24 mg/m³ at Pomlum, well under the 8-hour limit of 2.0 mg/m³.

In conclusion, the monitored data indicates that the ambient air quality in the region generally complies with the National Ambient Air Quality standards set by the CPCB at all locations assessed.

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.

The noise level monitoring revealed that daytime Leq levels ranged from 50.2 to 59.6 dB(A), with the maximum recorded at the Mine site and the minimum at Dymmiew, all within the prescribed limit of 75 dB(A). In contrast, nighttime noise levels at residential areas ranged from 38.0 to 43.1 dB(A), peaking at Umktieh and dipping to 38.0 dB(A) at Mawkajem. Although nighttime levels at the Mine site were elevated due to vehicular movement, they remained within the acceptable standard of 70 dB(A).

3.5 SOCIO-ECONOMIC ENVIRONMENT

The study area encompasses a radius of 10.0 km from the project location, including a total of 39 villages and urban areas. Within this area, three villages or urban locations are situated within a 0.0 to 2.0 km radius, five are located between 2.0 and 5.0 km, and 31 fall within the 5.0 to 10.0 km range.

The study area contains a total of 4,037 households, distributed by distance as follows: 5.05% within 0 to 2 km, 16.62% within 2 to 5 km, and 78.33% within 5 to 10 km. The total population in the area is 20,767, with 4.82% living within 0 to 2 km, 17.63% in the 2 to 5 km range, and 77.55% in the 5 to 10 km range. The male population represents 49.23% of the total, while females account for 50.77%, resulting in a sex ratio of 1,031 females for every 1,000 males. Families typically consist of 4 to 5 members, and 21.12% of the population is aged 0 to 6 years, with a sex ratio of 973 females per 1,000 males in this age group.

In the study area, the Schedule Caste (SC) population constitutes 0.01% of the total, having 2 individuals which are male, In contrast, the Schedule Tribe (ST) population makes up 99.58%, totaling 20,679 individuals, with a sex ratio of 1,034 females per thousand males. Literacy rates are at 62.52%, with 60.45% of male and 64.54% of female populations literate. Work participation stands at 46.82%, with male participation at 51.49% and female at 42.29%. Main work participation is 42.89%, dominated by males, while marginal participation is shared, with women primarily engaged in domestic chores and marginal cultivation.

3.6 BIOLOGICAL ENVIRONMENT

During the biodiversity assessment and concern with local stakeholder revealed that the project study area does not fall in migration route of migratory Birds. On the other hand, none of significant fauna present in core zone project area and no habitation of significant wild life in core zone of project. All the floral and faunal species reported from the core zone are common and widely distributed in the buffer zone also. So, it can be stated that the proposed project and associated activities are unlikely to influence any floral and faunal components significantly provided that the suggestions/recommendations in this report are implemented. Strict implementations of EMP/ mitigation measures are required to ensure that the biodiversity of the study area should not impacted negatively.

Table 6 Flora and Fauna Present in Buffer Zone

Buffer Zone
Flora
Climbers –**19** Species
Herbs – **40** Species
Shrubs - **70** Species
Tree – **74** Species
Fauna
Reptiles - **9** Species
Butterflies –**28** Species
Mammals –**15** Species
Avifauna-**79** species

Aquatic Ecology (Phytoplankton and Zooplankton) Phytoplankton

Table 7 Phytoplankton in the Study Area

Study Area
Cyanophyceae- Blue green algae - 06 Species
Cholorophycae- Green Algae - 12 Species
Euglenophycae /Flagillates – 02 Species
Bacillariophycae-Diatoms – 11 Species

Table 8 Zooplankton at different sites of Umngot river

Taxa at different sites of Umngot river
Protozoa - 05 species
Rotifera - 09 species
Copepoda - 03 species
Cladocerans - 06 Species
Ostracods - 02 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; ensure more than 33% of the lease area is replanted by the end of mining. 0.20 hectares of the total leased area are already under plantation. Additionally, 0.60 hectares will be planted with 600 trees within the Safety Zone and Unworked Area inside the mining lease in the next 5-year plan period At the conceptual stage, approximately 120 trees will be planted to stabilize 0.12 hectare area of the waste dump, and 810 trees will be planted over 0.81 hectare area of the upper benches
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. A water reservoir covering an area of 2.50 hectares (bottom benches) will be developed to enhance the aesthetic beauty of the area, improve the local groundwater table, and provide a water

		source for the local community.
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 the total waste generated will amount to 4,67,280 tons during the conceptual period, and 3,80,950 tons during the next five-year plan period.	Manage waste through proper dumping, stabilize waste dumps with retaining walls, and use extracted soil for plantation to avoid permanent stockpiles. Maximum waste will be used in construction and maintenance of approach roads, construction of site services and rest will be dumped outside the area and a part of inside the lease area. In the area towards southeastern side in the area in 0.12 ha area for 8 meters in height in two terraces of 4 meters height each. Some waste will be dumped outside the area in own land of lessee. 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 planned to avoid groundwater table intersection. Water needs (8.4 KLD) 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.	Waste water ((2.0 KLD) will be managed with septic tanks and soak pits. Stabilized sludge will be used for plantation.

Leaching of chemicals and heavy metals.	Leaching from mine wastes could contaminate groundwater.	No chemicals or heavy metals will be used or generate. Proper tailings management, containment liners, and effective water management 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 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 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 (NO_x, SO_2, 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 will be conducted. Records of the worker's health and safety will be maintained. Training will be provided to the workers. Personal Protective equipment's will be provided to workers. The safety and well-being of workers will be ensured in accordance with mining rules and regulations.
Human Settlement	Mining projects can also cause, displacement,	Nearest settlement is 1.3 km away in ENE. (Village – Laitkynsew).

	increased crime, economic inequality, infrastructure strain, and long-term legacy problems, significantly impacting nearby human settlements and their quality of life.	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 55 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 will be carried out as per norms of SPCB and CPCB.

5.2 WATER

Regular monitoring of ground water quality 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 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 will be 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 will be provided near the mine site. Drinking water 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 55 people will be 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 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.

- 0.20 hectares of the total leased area are already under plantation. Additionally, 0.60 hectares will be planted with 600 trees within the Safety Zone and Unworked Area inside the mining lease in the next 5-year plan period.

- At the conceptual stage, approximately 120 trees will be planted to stabilize 0.12 hectare area of the waste dump, and 810 trees will be planted over 0.81 hectare area of the upper benches.

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 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 will be maintained uniform.
- Regular pollution checks and certification of vehicles will be done.
- Limited number of mine-related vehicle will be maintained on the public roadways to reduce the traffic to minimize impacts on local people.
- The loaded vehicles will be covered with tarpaulin.
- Over loading will be avoided and free board will be left in the loaded trucks to prevent spillage.
- Regular cleaning will be done to reduce the chances of road dust to become airborne.
- Water sprinkling will be done on a fixed stretch of paved road.
- Natural barriers will be developed 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 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 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 will be performed to ensure efficiency and worn parts will be replaced.
- The vehicles will be maintained in good condition and overloading will not be done.
- Speed limits will be enforced in relation to road conditions and on-route communities.
- Noise monitoring will be conducted on a regular basis to determine compliance with noise criteria.
- Personal Protective Equipment's i.e., earmuffs and earplugs will be provided to workers, working in high noise areas.
- Periodical medical checkup will be organized for all workers to check any noise related health problems.
- Operational noise level status 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. 55 local workers will be directly employed and about 30-40 will be indirectly employed.
- Employment opportunities along with periodical training to generate local skills.
- Local employment will be ensured. On the job training to local people will be given and periodically upgraded.

- Regular health camps 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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