DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR

THE PROPOSED LYNTI DKHAR LIMESTONE QUARRY OF 32381 TPA (PEAK PRODUCTION) CAPACITY AT LYNTI DKHAR, SOHBAR SIRDARSHIP, RU-ING, BHOLAGANJ C&RD BLOCK, DISTRICT: EAST KHASI HILLS, MEGHALAYA

EXECUTIVE SUMMARY

Project Proponent: Shri Nebarson Tymmenniang

Prepared By:

Novomine India Private Limited

novomineinfo@gmail.com, www.novomineindia.com

NABET Category 'A' Certified Organisation [Sector 1 (a) (i)]

Vide Certificate No. **NABET/EIA/2326/IA 0124**

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1. INTRODUCTION

The applicant for Lynti Dkhar Limestone Quarry – Shri. Nebarson Tymmenniang, has obtained the Letter of Intent vide No. **KH/8/ML/Limestone/68/7735**, dated **23/03/2019** over an area of **1.24 ha** at Lynti Dkhar Area, Sohbar Sirdarship, Ru-ing, East Khasi Hills, Meghalaya.

The Divisional Forest Officer, East Khasi Hills & Ribhoi (T) Division, Shillong, Government of Meghalaya vide letter No. **KH/8/NOC/Limestone/41/Pt.IV/7600** dated **20/03/2019** stating that the proposed project falls under a non-forest land category.

The Mining Plan with Progressive Mine Closure Plan of Lynti Dkhar Limestone Quarry was approved by the Mining Engineer, Directorate of Mineral Resources, Shillong vide letter No. **DMR/MM/ML/35/2019/32** dated **30/08/2023**.

The project proponent has also obtained a cluster certificate from the Mining Engineer, Directorate Mineral Resources, Shillong vide letter No. **DMR/MM/35/2019/37** dated **08/02/2024**. As per the cluster certificate, seven limestone projects or mines with a total area of 21.2625 ha are lying within 500 m from the periphery of the proposed mining lease area.

The State Environment Impact Assessment Authority (SEIAA) of Meghalaya recommended the terms of reference (ToR) for the preparation of the EIA/EMP report and subsequently issued ToR vide File No. **ML/SEAC/SEIAA/PP/EKH/49/2024** dated **26th November 2024** to Shri Nebarson Tymmenniang.

The bounding latitudes of the project area are 25°10'54.50"N to 25°10'58.60"N and bounding longitudes are 91°44'48.40" E to 91°44'54.20" E with a maximum elevation of 82 mRL and minimum

elevation of 56 mRL. The area falls in the Survey of India Toposheet No. 78O/12 (Restricted).

The estimated total balance mineable reserve within the leasehold area is approximately 417178 Tonnes. Targeted peak production would be 32481 TPA. A few important details of the approved Modified Mining Plan with Progressive Mine Closure Plan are depicted in the **Table 11.1** below:

Table 1.1: Brief details of the project as per the approved Modified Mining Plan with Progressive Mine Closure Plan of Lynti Dkhar Limestone Quarry

Aspect	Value	Aspect	Value
Allotted Mine Lease Area (Ha.)	1.24	**Plan Period (Years)**	5
Total Mineral Reserve (Tonnes)	4,17,178	**Total Production (T) during the Plan Period**	1,61,687
Life of Mine (Years)	13	**Total Working Days/Year**	300
Manpower	31	**Mining Method**	Opencast, Semi-Mechanized

1.1. Mining Method

- Opencast semi-mechanized mining will be carried out in the area as the deposit is massive and compact in nature.
- Jack hammer drill machine will be deployed for drilling of shot holes ranging from 39 mm to 34 mm diameter. Breaking of limestone at the required size will be done manually.
- For blasting of holes with burden and spacing of 0.8 m x 1.0 m in a staggered grid pattern would be adopted.
- Muffle blasting will be adopted as a precautionary measure to control fly rocks. Excavation and handling of gritty soil will be done by excavator if necessary.
- The benching system 6m x 6m will be practiced in the area in order to comply with the provisions of Metalliferous Mines Regulations, 1961. Bench slope angle for stabilization of the benches will be maintained at 45°.

1.1.1. Raw Materials Required

Inputs	Approx. quantity required (KLD)
High Speed Diesel Water Requirement	
Diesel	~0.1
Water Requirement	
Water for Drinking and Domestic Purposes	~1.5 Water requirement for drinking & domestic per person is estimated to be 50 L/day. Therefore, requirement is 31x50 = 1550 L/day (~1.5 KLD)
Dust Suppression	2.5
Greenbelt Development/Plantation	2.0
Cleaning of HEMMs, and other machinery	2.0
Total	**8.0**

1.2. Location of the Project

Lynti Dkhar Limestone Quarry is located in Lynti Dkhar, Sohbar Sirdarship, Ru-ing, East Khasi Hills District, Bholaganj C&RD Block, District: East Khasi Hills, State: Meghalaya. The Location Plan of the project is provided in **Figure 1.1** below:

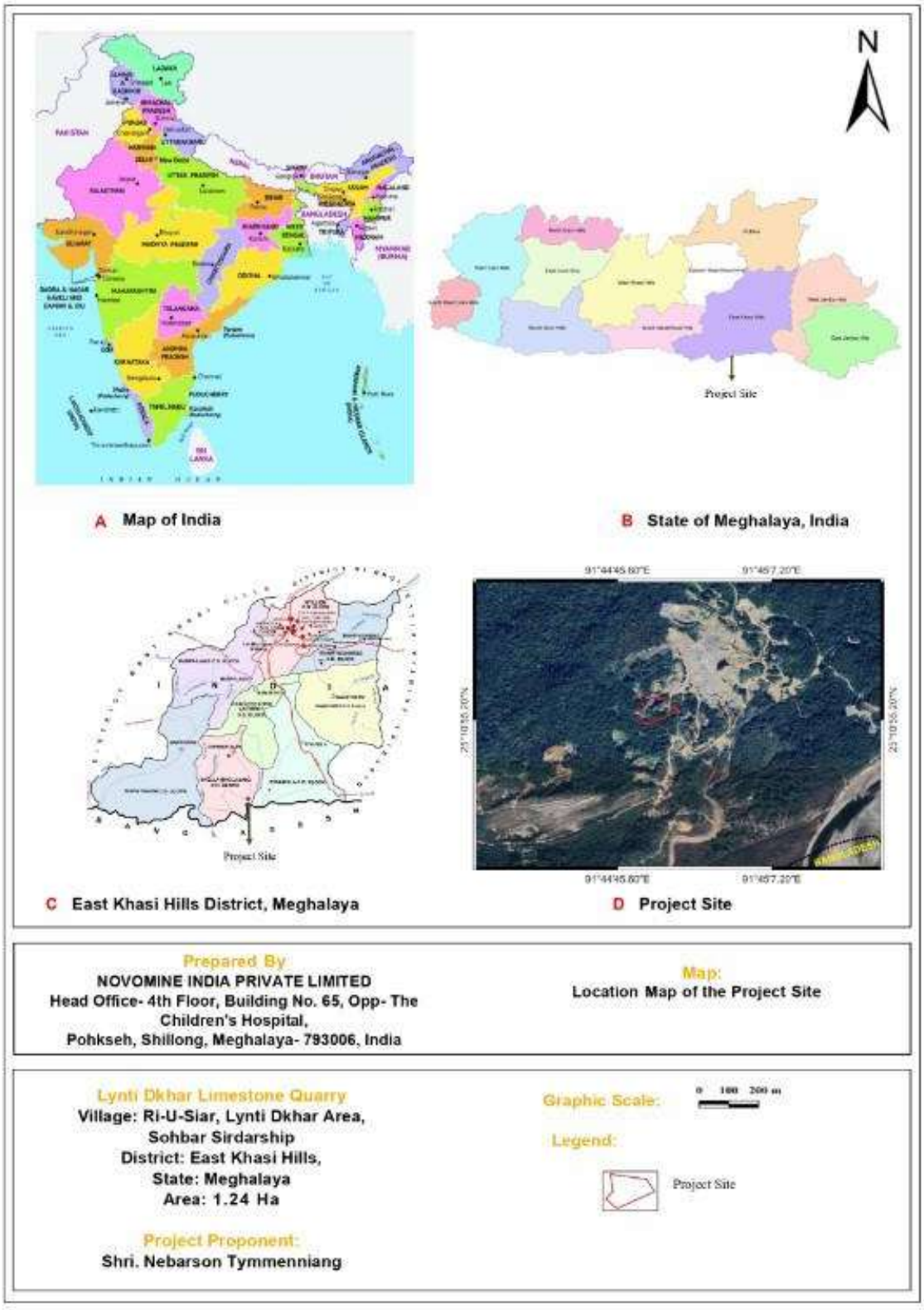

Fig 1.1: Location Plan of Lynti Dkhar Limestone Quarry

2. DESCRIPTION OF ENVIRONMENT

The baseline data has been collected from March 2024 to May 2024. The details area given below:

2.1. Micro-Meteorological Parameters

Temperature: Temperature of the area varied from 10.2°C to 35.1°C.

Relative Humidity: Relative Humidity of the area varied from 14.6% to 100%.

Wind Speed: Maximum wind speed was 10.8 m/s with average wind speed was 1.44 m/s. Calm wind was 16.21%.

2.2. Ambient Air Quality (AAQ) Results

Samples were collected from 5 sampling locations during the baseline data collection period. The results are given below:

Particulate Matter (PM_{10})

The results of PM_{10} of all the locations are showing variations from 44.5 µg/m^3 in the Ichamati Village to 59.6 µg/m^3 at the project site. Hence, the results are within the limits of the National Ambient Air Quality Standards (NAAQS).

Particulate Matter ($PM_{2.5}$)

The results of $PM_{2.5}$ of all locations are showing variations from 20.9 µg/m^3 in the Ichamati Village to 36.8 µg/m^3 at the project site. However, the results are within the limits of the National Ambient Air Quality Standards (NAAQS).

Gaseous Pollutants

The results of SO_2 concentration at all locations are showing variations from 5.5 µg/m^3 in the Ichamati Village to 8.8 µg/m^3 at the project site. However, the results are within the limits of the National Ambient Air Quality Standards (NAAQS).

The results of NO_2 concentration at all locations are showing variations from 10.6 µg/m^3 in the Ichamati Village to 13.3 µg/m^3 in the project site. However, the results are within the limits of the National Ambient Air Quality Standards (NAAQS).

Ambient Noise Level (ANL) Results

Samples were collected from 5 sampling locations during the baseline data collection period.

The results are given below:

The ambient noise level at day time varied from 46.3 dB (A) at Ichamati village to 63.2 dB(A) at the project site which is within the standard limits of an Industrial area of 75 dB(A). The night time noise result varied from 39.7 dB(A) at Ichamati village to 53.3 dB(A) at the project site which is within the standard limits of an Industrial area of 70 dB(A).

2.3. Water Quality Results

The samples were collected from 5 ground water locations and 3 surface water locations. The results are given below:

Groundwater Results

All results comply with the standard drinking water standards of India, i.e., **IS: 10500:2012**.

Surface Water Results

The surface water quality results of the upstream and downstream water sampling locations of Um Sohryngkew (Wah Tharia) and a sampling location near Ichamati (Wah Tyllap) are within the **IS 2296:1992** standards and prescribed CPCB Water Quality Criteria **Class - B**.

2.4. Soil Quality Results

Samples were collected from 4 sampling locations during the baseline data collection period. The results are given below:

pH ranging from 6.5 to 6.9 in the study area. Bulk density of the study area ranges between 1.38 gm/cm^3 S3 (Ichamati) to 1.49 gm/cm^3 at S4 (Sohbar). Electrical conductivity of the soil samples is found to be average and ranges from 362.5 µmhos/cm to 387.3 µmhos/cm. Organic carbon of the soil samples varies from 1.35% in S2 (Bholaganj) to 1.45% in S1 (Project Site). Available Nitrogen content in the surface soil of the study area varies between 248.5 Kg/ha at S1 (Project Site) to 286.1 Kg/ha at S4 (Sohbar). Available Phosphorus ranges between 4.4 Kg/ha at S2 (Bholaganj) to 5.7 Kg/ha at S4 (Sohbar). Available Potassium content in the study area ranges between 348.7 Kg/ha at S4 (Project Site) to 461.8 Kg/ha at S2 (Bholaganj).

Based on the provided data, it can be inferred that the soil in the study area has moderate to good fertility with sufficient levels of nitrogen and Organic Carbon for plant growth and foliage development.

2.5. Ecological Studies

Flora: The flora found in the whole of the study area are representative of mainly Deciduous/Semi-Deciduous vegetation and scrub type. The complete list of flora found in the study area has been given in **Chapter 3** of the report.

Fauna: A list of the faunal diversity of the study area is given in **Chapter 3**.

2.6. Demography and Socio-Economic Study Results

The study area encompasses 45 villages within the buffer zone. The study was conducted using a combination of primary surveys and secondary data sourced from the Census of India 2011. Summarized details are given below:

Population

The study area has a total population of 16819 residing in 3318 households. On average, each household consists of 5.07 members. The gender ratio in the study area was 952 in 2011.

Social Structure

In the study area, the Scheduled Tribes (ST) population accounts for 71.30% of the total population, while the Scheduled Caste (SC) make up 3.26% of the total population.

Literacy

Within the study area, the overall literacy rate is 58.88% of the total population. Among the literate population, male literacy stands at 52.38%, while female literacy is recorded at 47.62%. The project will provide direct employment opportunities for 37 individuals, with a focus on hiring local residents in addition to fulfilling any necessary statutory employment requirements.

3. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section summarizes the pollution potential of the proposed project, possible impacts on the surrounding environment during its operational phases and the environment management plan proposed for prevention and control of pollution.

3.1. Impacts Due to Air Pollution and their Mitigation Measures

Air borne particulate matter is the main air pollutant contributed by opencast mining due to drilling and blasting operations. Various emission sources are identified from the proposed mining operations. To mitigate this, water sprinkling and mist spraying via robust Air Pollution Control Equipment (APCEs) shall be done and workers will be given protective gears such as Personal Dust Samplers, full PPE which shall include protective goggles, dust masks, gloves, safety helmets, and safety shoes. A greenbelt of 7.5 m width, comprising of indigenous plant species, is also proposed to be developed all around the proposed ML area from before the start of mining operations, i.e., from the 0^{th} year to reduce the dispersion of airborne dust particles into the surrounding areas of the proposed mine, as much as possible.

3.2. Impacts Due to Noise Pollution and their Mitigation Measures

Due to mining operations such as machinery, drilling and blasting for mine development, excavation, transportation and sizing of limestone, it is anticipated that noise levels will increase. Proposed mitigation measures include maintenance of blasting parameters such as burden, spacing, charge per delay, sub-grade drilling, etc. Controlled blasting techniques such as pre- split blast, use of NONEL, etc. will be followed to minimize noise and generation.

Further, engines of HEMMs and other mine machinery and transport vehicles shall be properly maintained to reduce noise generation. Provision of incorporating silencers into the dumpers and other vehicles shall be suggested to control noise propagation. Acoustic enclosures shall be provided in the DG sets. All the workers will be provided with personal PPE such as ear plugs and ear muffs for noise attenuation.

The greenbelt development around the ML area shall also act as a noise barrier.

3.3. Impacts Due to Water Pollution and their Mitigation Measures

The main sources of water pollution are mine discharge and surface run-off containing suspended solids. The mine discharge water will be passed through settling ponds for removal of suspended solids.

About 8 KLD water is required for various requirements of the mine like dust suppression (2.5 KLD), HEMM washing at workshop (2 KLD), plantation (2 KLD) and drinking and domestic consumption (1.5 KLD).

As the system proposed is a closed loop, there will be no scope for wastewater to be discharged outside the proposed ML. Hence, there will be no wastewater discharge outside the mine premises and no contamination of surface and/or groundwater bodies. To further augment the artificial recharge of groundwater, a detailed Rainwater Harvesting and Artificial Recharge of Groundwater Plan is prepared and included as an annexure to this report.

3.4. IMPACTS DUE TO WASTE GENERATION AND THEIR MITIGATION MEASURES

The entire product of limestone will be used as building materials for construction activities. During the project's life, 8671 Tonnes of gritty soil will be removed which will be stacked in a specific stack yard and will be used for haul road dressing and plantation. Moreover, to prevent erosion during rainy as well as windy season, the stack yard will be planted with small varieties of plantation and grasses to prevent such erosion.

3.5. Impacts on Land and their Mitigation Measures

The Land Use pattern in the lease area may change as a result of different phases of mining operations. Land reclamation shall be done along with ongoing mining operations in order to minimize the negative consequences. After the end of mining operations, a total area of 0.32 Ha. of land within the safety barrier of the ML area shall be developed into a dense greenbelt area, and the remaining backfilled areas will be revegetated by plantation activities. Any remaining mine void shall be converted into a water body – which may act as a potential source of surface water and recharge for ground water in the future for the neighboring communities *(Sengupta,*

2015).

3.6. Impacts on Ecology and Biodiversity

As the mining activity will be restricted to the core zone – which does not include any forest area, no significant impact on the surrounding ecology of the area is anticipated. With the development of greenbelt around the mine, aesthetics of the area shall be improved.

3.7. Impact on the Socio-Economic Environment

The project will enhance direct and indirect employment in the area. Therefore, overall economic development is likely to improve after the commencement of the project.

4. ENVIRONMENTAL MONITORING PROGRAMME

A systematic environmental monitoring programme will be implemented within the mining lease area and a 10 km radius study area. A comprehensive network for monitoring has been developed, considering factors such as pollution sources from mining operations, wind direction, drainage pattern, topography, and the biological environment. Sampling locations have been identified accordingly to ensure comprehensive coverage and accurate assessment of environmental parameters. The Environment Monitoring Cell (EMC) will be responsible for successful implementation of the monitoring program.

5. ADDITIONAL STUDIES

Risk Assessment & Disaster Management Plan: Mining will be carried out by semi-mechanized opencast mining, with mining equipment as Jack Hammers, Hydraulic Excavator, Air Compressor, Rock Breaker, tippers etc. involving drilling and blasting. Mining will be done under strict supervision hence the rate of operational risks is minimal.

Rehabilitation and Resettlement: There is no human habitation at the project site. So, there will be no rehabilitation and resettlement issue.

6. PROJECT BENEFITS

The project will have a substantial positive impact on the socio-economic environment, supporting the overall development of the area. It will also significantly contribute to the state's economic growth via tax and cess payments to the state government and to the area by generating **direct employment for at least 31 individuals** and **creating numerous indirect employment opportunities for the local community**.

7. ENVIRONMENT MANAGEMENT PLAN

An EMP is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner. An effective EMP should ensure the application of best practice environment management to a project. Hence, to ensure effective environmental protection measures throughout and after the commissioning of the proposed mining project, the preparation of an Environmental Management Plan (EMP) is necessary. The EMP serves as a comprehensive framework for formulating, implementing, and monitoring environmental safeguards.

By the end of the lease period, green belt development programme will be carried out over an area of 0.32 ha. Native species will be considered for the plantation purpose.

The following objectives have been incorporated into the design of the EMP in order to mitigate the adverse environmental effects which will be caused due to mining:

- Biological reclamation and rejuvenation of the mined-out areas and active points of the mine lease area to the maximum possible extent possible, in line with the economy of mining operations, the drainage pattern, geological stability, vegetation, etc.;
- Minimal disturbance to the water environment and existing ecological status of the area and conservation of the same;
- Efforts towards improvement of the air quality, water quality and the land during and post mining activities; and
- Establishment of an environment which is conducive to improve the socioeconomic situation in the area.

7.1. ESTIMATED COST OF THE PROJECT

The proposed Lynti Dkhar Limestone Quarry over an area of 1.24 Ha. is privately owned by the applicant Shri Nebarson Tymmenniang. The estimated project cost is around ₹25 Lakhs (excluding the cost for implementing environmental protection measures). The project proponent will keep a budget of around ₹1.25 L as the project's Corporate Social Responsibility (CSR) budget. In addition to this, the project proponent will also keep aside a fund under the project's Corporate Environmental Responsility (CER) as prescribed by the SEIAA/SEAC to address all the concerns that may be raised during the Public Consultation. This is in line with the **MoEF&CC's OM No. 22-65/2017-IA.III** dated **25th February, 2021** regarding Corporate Environmental Responsibility.

8. CONCLUSION

From the detailed analysis of the environmental impacts and the mitigation measures proposed in the EMP, it is anticipated that no significant deterioration in the eco-system is likely to occur due to this limestone mine. On the other hand, the project is likely to have several benefits like improvement in indirect employment generation and economic growth of the area, by way of improvements in the infrastructure facilities and better socio-economic conditions.