EXECUTIVE SUMMARY

OF

ENVIRONMENTAL IMPACT ASSESSMENT

For

MANGGAPARA STONE MINE

Village- Manggapara, Post- Zikabari, District: West Garo Hills, Meghalaya Area – 1.28 Ha Proposed capacity: - 79,464 TPA.

Applicant:

M/s A. STONE QUARRY (Prop. Shri Jengna Marak) Address: Village- Wakrugre, Post- Zikabari, P.S.- Tura, Dist- West Garo Hills State- Meghalaya



Prepared By CONSULTANT

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INTRODUCTION OF PROJECT & PROPONENT

The proposed project is an opencast mechanized mining project, where mining of Boulder Stone mine will be done. The estimated project cost of the mine is Rs 21.0 Lakhs with average production of 79,464 TPA. The lease area lies near Village: Manggapara, Post: Zikabari, District: West Garo Hills, State: Meghalaya. The project falls in Manggapara Category B1 as per EIA notification 2006 and its subsequent amendment thereof. (Total lease area 5.30 ha which is more than 5 ha hence proposed projects falls in category B1).

The deed of land was executed in favor of Project Proponent by the DC office, Tura, Meghalaya. Vide regd. deed No. 8344, Dated 15-10-2020.

LOI was granted in favor of Project proponent vide letter No. B/16/VII/2294, Dated 21th August 2017.

TOR letter has been granted on 18-01-2024. Via letter no ML/SEIAA/MIN/WGH/P-372/2023/713.

LOCATION

The mine area is located near Village: Manggapara, Post: Zikabari, District: West Garo Hills, State: Meghalaya. The mining lease / proposed project area falls in Survey of India Toposheet No. G46M2. The co-ordinates of the mine lease area are:

	Point	Latitude	Longitude	
Coordinates	1	25°37'29.40"N	90°00'39.02"E	
	2	25°37'29.16"N	90°00'43.80"E	
	3	25°37'31.92"N	90°00'43.84"E	
	4	25°37'31.89"N	90°00'39.04"E	
Nearest Railway Station	Dhubri Railway station, approx. 44.16 km toward North direction.			
Nearest Airport	Shillong Airport, Approx.197.28 km towards East direction.			
Nearest Highway	SH-2, Approx, 0.46 km towards WSW Direction.			

RESERVES

Total Geological Reserves	1157738 Tonnes
Total Mineable Reserves	794456 Tonnes
Proposed Production	79,464 TPA

• MINING PROCESS

Mining work in this lease hold will be carried out open cast mechanized methods. the operation like drilling of shorts whole sorting form stone and breaking at this size will be done manually loading and transporting bill done by machineries drilling and blasting will be careed by deploying 34 to 39 mm dia Jack hammer drilling and blast holes. having burden and spacing of 1.0 m x 1.5 m in stagger grip pattern. to avoid fly rock problem at the age of the hill, light charged muffle blasting shall be Under taken.

Blasting Parameters –

Bench Height – 3.0 m Depth of Hole- 3.3 m Burden – 1.0m. Spacing – 1.5m

EQUIPMENT REQUIREMENT

No	Туре	Nos.	Size/Capacity	ModeofOperation
1	Jack Hammer Drill	03	100mm dia	-
2	Hydraulic Excavator	01	0.9 cum	Diesel
3	Truck/Tractor	04	10 ton	Diesel
4	JCB	01	-	-
5	Water Tanker	01	12000 litter	Diesel
6	Tulu Pump	01	5/10hp	Diesel
7	D.G. set	01	20KVA	Diesel

• WATER DEMAND

Water consumption will be there mainly for dust suppression, green belt development, drinking and other domestic purpose during mining operations. The total requirement of water will be **7.09~7.0 KLD**.

• EMPLOYMENT

As per the proposed production the total manpower requirement will be limited to a specific number of miners. However, the number of unskilled labour may increase/decrease depending on the quantum of overburden removal. The lessee will employ around 32 skilled and unskilled workers for removal of overburden, quarry cleaning and road repairing, etc. which includes the following

Serial No.	Designation	Working forces per day
1.	Mine manager 2 nd class	01
2.	Foreman	01
3.	Mining Mate	01
4.	Blaster	02
5.	Blaster helper	02
6.	Store keeper	01
7.	Attendance clerk cum register keeper	01
8.	Quarry Munsi	01
9.	Compressor Operator	01
10.	Driller	05
11.	JCB Operator	01
12.	Dumper Operator	04
13.	Minor (Semi Skilled)	05
14.	Unskilled workers	06
	Total	32

Manpower Requirement

BASE LINE DATA

This section contains the description of baseline studies of the 10 km radius of the area surrounding. The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed. Environmental data has been collected in relation to proposed mining for:-

(a) Air

- (b) Noise
- (c) Water
- (d) Soil
- (e) Ecology and Biodiversity
- (f) Socio-economy

Attribute	Baseline status	
Ambient Air Quality	Oct, 2023 to Dec, 2023	
	Ambient Air Quality Monitoring reveals that the minimum &	
	maximum concentrations of $PM_{2.5}$ for all the 8 AQ monitoring	
	stations were found to be $13.76\mu g/m^3$ and $38.74\mu g/m^3$ respectively.	
	The minimum & maximum concentrations of PM_{10} for all the 8 AQ	
	monitoring stations were found to be $32.58\mu g/m^3$ and $74.66\mu g/m^3$,	
	respectively.	
	As far as the gaseous pollutants SO_2 and NO_x are concerned, the	
	prescribed CPCB limit of 80 $\mu g/m^3 and$ 100 $\mu g/m^3$ for residential and	
	rural areas has never surpassed at any station. The minimum &	
	maximum concentrations of SO_2 were found to be $4.24\mu g/m^3 t_1$	
	9.48µg/m ³ respectively. The minimum & maximum concentration	
	of NO _x were found to be $7.09\mu g/m^3$ to $15.27\mu g/m^3$ respectively.	
Noise Levels	Noise monitoring was carried out at 08 locations. The results of the	
	monitoring program indicated that both the daytime and night time	
	levels of noise were well within the prescribed limits of NAAQS.	
Water Quality	5 Groundwater samples and 2 surface water samples were analyzed	
	and concluded that:	
	The ground water from all sources remains suitable for drinking	
	purposes as all the constituents are within the limits prescribed by	
	drinking water standards promulgated by Indian Standards IS:	
	10500.	
	From the surface water analysis it is evident that most of the	
	parameters of the samples comply with 'Category C' standards of	

BASELINE ENVIRONMENTAL STATUS

	CPCB Drinking water source with con-ventional treatment followed by disinfection.
Soil Quality	Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 6.56 to 7.64, which shows that the soil is alkaline in nature. The water holding capacity is found in between 25.0 % to 28.8 %.
Ecology and Biodiversity	There are no Ecologically Sensitive Areas present in the study area.

ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

• **BIOLOGICAL ENVIRONMENT**

Impacts on Biodiversity

As the mining activity is restricted to core zone, no significant impact on the flora of the buffer zone due to the proposed mining is anticipated. The incremental dust generations due to the mining operations, at the boundary of the mine lease are insignificant and it is also expected that with the adoption of mitigatory measures as suggested in EMP, the impact due to operation of the mine will be minimal on the terrestrial ecosystem and also on the adjacent forest area.

The proposed progressive plantation over a period of time will reduce the impact, if any, on the fauna.

Impacts on agriculture

No agriculture activity is going on in mine lease area. Therefore no significant impact on the agriculture around the project site is expected.

Mitigation Measures

There is a requirement to establish a stable ecosystem with both ecological and economic returns. Minimization of soil erosion and dust pollution enhances the aesthetic value of the core and the buffer zone. To achieve this, it is planned to increase the area of green cover of plantation and green belts activities. The basic objectives of plantations are as follows:

- Improvement of Soil quality,
- Quick vegetative cover to check soil erosion,
- Improvement in mining site stability,

- Conservation of biological diversity of plants, birds and animals,
- As dust receptor and dust filter, this is likely to be produced during mining.
- If birds are noticed crossing the core zone, they will not be disturbed at all;
- Labors will not be allowed to discards food, plastic etc., which can attract animals/birds near the core site;
- Only low polluting vehicles having PUC will be allowed for carrying mining materials.
- Noise level will be maintained within permissible limit (silent zone-50dB (A) during day time or residential zone 55dB (A)) as per noise pollution (regulation and control), rules, 2000, CPCB norms.

• LAND ENVIRONMENT

Various components of land environment have been identified for study of impact of the mine operations. Details of the same are given below:

Solid waste generation and management

The land will be affected by excavation of mineral and dumping of waste. Land use planning is suggested for minimizing the adverse impact of mining activities on environment and also helps in economy of the project as well as effective restoration and enhancement of land surface with the help of plantation through proper and planned green belt development in 7.5 m barrier zone.

Impact on land use & reclamation of mined out areas

The area likely to be degraded due to quarrying, pitting. The total mined out area at the ultimate stage shall be left as water reservoir and the water which shall be utilized by local people for agriculture & domestic use. Plantation along the safety zone has been proposed as a part of rehabilitation of the area. The impact on land use will also be limited.

The various modifications due to mining allied & activities during next five years are given below.

Sl. No	Pattern of Utilization	Present/Existing Land use pattern in (ha.)	Proposed Land use for Current plan period (ha.)	Land used at the conceptual stage i.e. end of mine life (ha.)
1)	Mining Area	0.45	1.00	1.00 (water body)
2)	Offices/Store/Magazine etc.	0.00	0.00	0.00
3)	Road	0.05	0.00	0.00
4)	Dump yard	0.00	0.00	0.00
5)	Garland drains	0.00	0.28	0.28 (Plantation)
6)	Safety Zone	0.00		
7)	Settling Tank	0.00		
8)	Unutilized	0.78	0.00	0.00
	Total	1.28	1.28	1.28

LANDUSE PATTERN OF THE MINE AREA (HECTARES)

As the mineral is non-replenishable, the excavated area at the end of mine life will be converted into water body.

• AIR ENVIRONMENT

Anticipated impacts and evaluation

Information on air quality was studied and various modelling techniques predicted that the mining activity will not affect the air quality in a significant manner. In mining operations, loading, transportation and unloading operations may cause deterioration in air quality due to handling dry materials. In the present case, from the Air modelling results it is anticipated that the incremental pollution will remain within the limit and becomes insignificant outside the mine lease area. Also, the blasting is not prescribed and will be only done in the utmost requirement and that too for a very short duration of mere significance.

Mitigation measures

The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water spraying will be done on the roads. Utmost care will be taken to prevent spillage from the trucks. Overloading will be prevented. Plantation activities along the roads will also reduce the impact of dust in the nearby villages.

• WATER ENVIRONMENT

To find out the effect on ground water an extensive hydro-geological study has been conducted and from the study it can be safely concluded that there is no noticeable effect on surrounding ground water resource due to mining.

Mining of stone does not have any significant impact on the water quality and parameters as the mining does not intercept with the ground water level.

In this project, it is not proposed to divert or truncate any stream. No proposal is envisaged for pumping of water from the river. There will not be any adverse impact on surface hydrology and ground water regime due to this project. The contractor will adhere to all guidelines and rules for proper and scientific method of mining during the period of extracting the stone. Thus, the project activities shall not have any adverse affect on the physical components of the environment and therefore may not have any effect on the recharge of ground waters or affect the water quality.

• NOISE ENVIRONMENT

Anticipated impacts and evaluation

Noise generated at the mine is due to mechanized mining operations and truck transportation activities. The noise generated by the mining activity dissipates within the mine. There is no major impact of the mining activity on the nearby villages. However, pronounced effect of above noise levels is felt only near the active working area.

Noise at lower levels (sound pressure) is quite acceptable and does not have any bad effect on human beings, but when it is abnormally high- it incurs some maleficent effects.

In this case the impact of noise on the nearby settlements is negligible as they are far located from the mine workings.

Mitigation measures

On-site

a) Blasting only if required will be done by a licensed blaster.

b) Maintenance of Machinery: Regular maintenance of machinery will keep the generated noise level below the minimum prescribed limit i.e. not exceeding 90 dB (A) at a distance of 2 m from the machine. All machines will be as per stipulated standards and will be used at their optimum capacity.

- c) **Trained Operators:** Only trained operators will be allowed to operate machines during mining to reduce any chance of safety failures.
- d) Vegetation: Plantation will be carried in the 7.5m safety zone of the lease area.

e) Hearing Protection: All the miners will be provided with Personal Protective equipments such as ear-muffs.

Off-site

The off-site receptors are not significantly affected as they are located far away from the mine site. But some disturbances due to vehicle movement cannot be avoided. Plantation will be done along the roadsides, civic amenities, etc. which will more or less dampen the off-site noise level.

SOCIO-ECONOMIC ENVIRONMENT

The implementation of Manggapara Stone Mining project will throw opportunities to local people for both direct and indirect employment. Since the quarries will be leased out to successful allottees, stone mining operation in the state will get legalized and it will fetch income to the state exchequer. The project will also provide impetus to industrialization of the area. With the implementation of the proposed mining project the occupational pattern of the people in the area will change making more people engaged in industrial and business activities rather in agriculture. Thus there will be a gradual shifting of population from agriculture to mining and industry. Further, the mining and industrial activities in the area may lead to rapid increase in population and thereby urbanization. Due to urbanization of the area, employment opportunities will further increase.

• ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Proper environmental management plan is proposed for ManggaparaStone Mining project to mitigate the impact during the mining operation.

- No overburden or loose sediments will be kept in the working benches particularly during monsoon months.
- The possibility of the project activity contributing to the pollution of watercourses of the region or to the ground water regime is so less that this does not significantly constitute an area of concern.
- Construction of well-compacted roads.

- Regular water spraying on haul roads and waste dumps by tankers.
- Provision of dust collectors for the drilling machines.
- Controlled blasting (if any).
- Supply of personal protective equipments like dust masks, earplugs, helmets, safety boots etc. for the miners.
- Plantation of wide leaf trees, creepers, tall grasses around quarry sites, waste dumps, road and other surrounding barren zones.
- Proper and regular maintenance of vehicles, compressors and jack hammers.
- Provision of supplying earplugs for jackhammer drillers and crusher operators.
- Care should be taken that noise produced during vehicles movement for carrying stone is within the permissible noise level.
- Carrying of blasting (if any) only during daytime (not during cloudy weather and when strong wind is blowing towards residential areas). Blasting will be carried out with limited explosives at a time so that the noise generation can be well maintained with the prescribed limits.
- Provision of Green Belt (thick foliage) along the lease boundary and road.
- Strict observance of the provisions of Acts, Rules and Regulations in respect of safety both by management and the workers.
- Proper planning and designing of work in order to reduce the risk of hazards.
- Specific instructions and supervisions of working where danger due to fall of side (overhanging, undercutting of bench, fall of objects from higher benches/places is apprehended).
- Training of work persons and the officials.
- Since the haul road will be of considerable length, due importance will be given in the construction of road. The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- A code of practices for tipping in stock piles/dumping of overburden at dump yard and loading point will be implemented.
- In respect of contract work, safety code for contractors and workers will be implemented.

- They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centres. All personal protective equipments will be supplied to them.
- A code of practice for fighting fire will be implemented.
- Competent persons like fitters, mechanics will imparted with special attention to project impact.
- The safe handling of materials while attending to repairs, maintenance of HEMM.
- Provision of pit safety committee meeting every month (20th day) to discuss the safety of the mines and the persons employed.
- Celebration of annual mines safety week and environmental week in order to develop safety awareness amongst employees.
- Pre joining medical check up shall be done and regular health check up in 6 monthly interval is planned for the employees.
- Care will be taken that no cooking, or burning of woods will be allowed in the adjoining area.
- If some causality or injury to animal occurs, it should be informed to forest department and proper treatment should be given.
- Corridor movement of wild mammals (If exists) should be avoided.

• ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION

Environmental Management Plan serves no purpose if it is not implemented with true spirit. Some loopholes in the EMP can also be detected afterwards when it is implanted and monitored. Thus, an implementation and monitoring programme has to be prepared.

The major attributes of environment are not confined to the mining site alone. Implementation of proposed control measures and monitoring programme has an implication on the surrounding area as well as for the region. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented within the mining area relating to the following specific areas:

- a) Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.
- b) Collection of soil samples at strategic locations once in every year and analysis thereof with regard to deleterious constituents, if any.
- c) The effectiveness of drainage system depends upon proper cleaning of all drains provided in the surrounding of mine area. Any blockage due to siltation or loose material will be checked at least once in a month.
- d) Measurement of water level fluctuations in the nearby ponds, dug wells and bore wells.
- e) Measurement of noise levels at mine site, stationary and mobile sources, and adjacent villages will be done in every quarter of the year.
- f) Plantation/afforestation as should be done as per program. Regular watering of plant and fencing to protect them from cattle/goats has to be provided. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

Greenery development: The project will not lead to any tree cutting. However, a social responsibility, greenery will be developed in 7.5m barrier zone of lease area. Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted.

During the plan period, 700 plants will be planted in 7.5m barrier zone of lease area.

Mine management will be in regular touch with local surrounding villages to update the various developmental schemes made by them. They will also consider any immediate requirement, which could be taken care of in near future.

Mine management will be in regular touch with State Pollution Control Board and Indian Bureau of Mines and send them annual progress report. Any new regulations considered by State/Central Pollution Control Board for the industry will be taken care of.

BUDGET ALLOCATION FOR EMP IMPLEMENTATION

COST OF EMP

Sl. No	Description	Capital Cost (Rs.)	Recurring Cost (Rs.)
1	Pollution Control & Dust Suppression		2,00,000
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil Pollution iv) Noise Pollution		14,000 (4 samples) 8,000 (2 GW & 2 SW) 8,000 (2 samples) 7,000 (2 samples)
3	Plantation	1,40,000	1,00,000
4	Construction and maintenance of haul road	1,63,750	90,000
	TOTAL	3,03,750	4,27,000

Note: *700 plants * 200 Rs (for each plants including hedges and fences) = 1.40 lakh Salary of Labor for haul road maintenance 1 labor*300 =300 per day 300* 300 = 90000/-

* 2.5 lakh per kilometer (250000 * 0.655 km haul road = 1,63,750/-)

MONITORING SCHEDULE AND PARAMETERS

Monitoring Schedule and Parameters

S.No.	Description of Parameters	Schedule and Duration of Monitoring
1	Air Qualitya)In the vicinity of the mineb)In the vicinity of the transportation network	24 hourly samples twice a week for one month in each season except monsoon season.
2	 Water Quality a)Water quality of groundwater around the site b)Drinking water must conform to drinking water standards 	Once in a season for 4 season in a year.
3	Ambient Noise Level	Twice in a year for couple of years & then once in a year.
4	Soil Quality	Once in two years on project monitoring area.

5	Inventory of Flora(tree plantation, survival etc)	Once in two years on project monitoring area.
6	Socio-economic condition of local, population, physical survey	Once in 3 or 4 years.

BENEFIT OF MINING

PHYSICAL BENIFITS

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas.

- a. **Road Transport:** There will be improved road communication due to the proposed project and maintenance will also be done time to time.
- b. **Market:** Generating useful economic resource for construction. Excavated mineral will provide a good market opportunity.
- c. **Enhancement of green cover:** As a part of reclamation plan, plantation will be carried along the river banks or along the road sides or near the civic amenities.
- a. **Creation of community assets** (infrastructure) like provision for drinking water, construction of school buildings, village roads/ linked roads, dispensary & health centre, community centre, market place etc, as a part of corporate social responsibility.

SOCIAL BENEFITS

- a) **Increase in Employment** Potential due to the project activity. Employment opportunities will increase both directly as well indirectly.
- b) **Contribution to the Exchequer** as the saleable minerals will be given royalty. Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer.
- c) **Strengthening of existing community** facilities through the Community Development Programme.

CORPORATE ENVIRONMENTAL RESPONSIBILITY

CER 2% of capital cost of the project cost will be allotted for the Corporate Environmental Responsibility as per OM dated 1st May 2018. The following has been proposed considering the needs & demand of the people.

For each activity the funds to be earmarked by the proponent will be decided after discussion with the local authority/people and the beneficiaries during Public Hearing. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CER programme.

Activity	Capital Cost (in Rs.)
Fund for distribution of medicine in nearby village	50,000
Fund for health check up camp in nearby village	50,000
Total	1,00,000

CONCLUSION

Based on the EIA study it is observed that there will be an increase in the dust pollution, which will be controlled by wet drilling, sprinkling of water and plantation. There will be an insignificant impact on ambient environment and ecology due to the mining activities moreover the mining operation will lead to direct and indirect employment generation in the area. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the stone mine. Monitoring program will be followed till the mining operations continue. Hence, it can be summarized that the development of the mine will have a positive impact on the socio-economic of the area and lead to sustainable development of the region. The per capita income of villages is much below the national average. It will increase the profitability of the company and will have positive impact in the socio-economic status of the people in the region & will increase opportunities for employment

The study area is still lacking in education, health, housing, water, electricity etc. It is expected that same will improve to a great extent due to proposed mining project and associated industrial and business activities. Proposed activities and expenses on Corporate Environmental Responsibility will be as per Mandate of the Government.