

Executive Summary of the Project

SUDAP BISIK (CHIRAN SONGMA) STONE MINE

at

VILLAGE- SUDAP BISIK (CHIRAN SONGMA) , P.O.- DHANUA,
P.S. – GAROBADHA, DIST - WEST GARO HILLS, STATE- MEGHALAYA.

AREA-4.94 ACRE (2.00 HECT.)

AKING NO. - III-26(8)

IN NON-FOREST AREA

PRODUCTION OF 51,129 CUM. PER YEAR (MAX.) / 1,38,048 TONS PER YEAR
BOULDER STONE

STUDY PERIOD: 1st Feb. to 30th April, 2022

[Project listed under activity 1(a) Mining of Minerals of EIA Notification, 2006 and falls
under Category 'B1' as the area of mining is in Cluster]

APPLICANT

SHRI BALNEN CH. SANGMA
S/O- SHRI ONJENG CH. MARAK
VILLAGE –CHIRAN SONGMA, P.O. - SELSELLA,
DIST.-WEST GARO HILLS, STATE- MEGHALAYA.

CONSULTANT



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Environmental Clearance For 4.94 Acres/ 2.00 Ha Sudap Bisik (Chiran Songma) Stone Mine Project of Shri Balnen Ch. Sangma at Village – Sudap Bisik (Chiran Songma) , P.O. - Dhanua, P.S. – Garobdha, Dist- West Garo Hills, State- Meghalaya.

EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 The Project

The proposed project is for mining of boulder stone at Sudap Bisik (Chiran Songma) Stone Mine. Stone Mine located at village – Sudap Bisik (Chiran Songma) , P.O. – Dhanua, P.S.- Garobadha, Dist. – West Garo Hills, State – Meghalaya over an area of 1.00 Hectares.

The project envisages 2,45,214 cubic meters (6,62,078 Tons) of stone production from Sudap Bisik (Chiran Songma) Stone Mine during the planed period. Maximum production per year from the Mine will be 51,129 Cubic meters (maximum) / 1,38,048 Tons per year (max.).

1.2 Project Proponent of the Project

The State Government has issued Mining Lease to carry out Mining operation in Sudap Bisik (Chiran Songma) Stone Mine is located at village – Sudap Bisik (Chiran Songma) , P.O. – Dhanua, P.S.- Garobadha, Dist. – West Garo Hills, State – Meghalaya, over an area of 2.00 Hectares (4.94 Acres).

The land area of 2.00 Ha. (4.94 Acres) has been assigned by Govt. of Meghalaya for carrying out Stone Mining operation and has been taken on lease for 20 years by Shri Balnen Ch. Sangma resident of Village –Chiran Songma, P.O. - Selsella, Dist.- West Garo Hills, State- Meghalaya from the land owner Smt. Kaljak Sangma, resident of Village –Chiran Songma, P.O. - Selsella, Dist.-West Garo Hills, State- Meghalaya. The Lol has been issued by Govt. of Meghalaya under the Meghalaya Minor Mineral Concession Rules, 2016 on 28th September, 2020.

1.4 Location of the Project & Communication

The Sudap Bisik (Chiran Songma) Stone mine is located at village – Sudap Bisik (Chiran Songma) , P.O. – Dhanua, P.S.- Garobadha, Dist. – West Garo Hills, State – Meghalaya, over an area of 2.00 Hectares (4.94 Acres).

The mine is well connected to S.H.-2 (Singimari – Tura road) at a distance of 0.23 Km (aerial distance) from the lease area in SW direction. The mine is at a distance of 29.60 Km. (aerial distance) from Tura, the district headquarter in SE direction. The nearest railway station Mendi Pathar Railway Station at a distance of 73.90 km (aerial distance) in NE side of the lease area.



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Table 1: Location Details of the Project

Particulars	Details		
Village	Sudap Bisik (Chiran Songma)		
Co-ordinates	Sl.no	Latitude	Longitude
	1	25° 39' 22.00" N	89° 57' 17.60" E
	2	25° 39' 25.40" N	89° 57' 20.70" E
	3	25° 39' 23.60" N	89° 57' 25.40" E
	4	25° 39' 19.90" N	89° 57' 23.20" E

1.5 Type of the Project

The project is a standalone project for Stone Mining and listed under activity 1(a), Mining of Minerals under the Schedule of EIA Notification, 2006 and categorized as Category-B1 as the Mining Lease area in cluster.

1.6 Purpose of the Report

The proposed project is for Mining and listed at activity 1(a) Mining of Minerals under Schedule of EIA Notification, 2006. The project, being in cluster with another mine, falls under Category 'B1' as per the MoEF&CC Office Memorandum File No. L-11011/175/2018-IA-II (M) dated 12th December, 2018. As per the District Mining Officer, west Garo Hills letter no. DMO – W/MP/15/2019/26 dated 02nd jul., 2021, the following mine comes within 500 meters from the Sudap Bisik (Chiran Songma) Stone Mine.

1.7 Need for the Project

Boulder Stone is base of all types of Building construction, Construction of Road etc. The need of Stone in all fields is very essential as it is a compulsory material for all types of construction. Stone aggregate also used for railway ballast and as an aggregate in cement concretes.

Focus of governments is on improvement of basic infrastructure like roads, and other social infrastructure, both in rural and urban areas. There is a constant need for ensuring regular supply of Stone boulder and aggregates (stone chips) for use in the road & infrastructures development in Meghalaya State. The mining project will be located in a rural/remote area of the State. It also has the potential to generate



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employment opportunities to the local people. Apart from that, the mining projects will improve the Socio-economic condition of the local people. Moreover, partly weathered boulders, being recovered with overburden, have good market as pitching storage in river embankments & road slopes.

2.0. RESERVE ESTIMATION

Sudap Bisik (Chiran Songma) Stone Mine comes under Category – B (semi mechanized category). Therefore, conceptual plan of the mine has been prepared on the basis of life of the deposit considering the proved existence of the mineral up to 70 m RL. Conceptual mining plan has been prepared following the guidelines of IBM, keeping in view the present knowledge of the deposit, topography of the area, surface drainage pattern, mineable reserves available, mining technology and sites for waste disposal, etc.

Table 2: Quantity Geological & Mineable Reserves

Reserve	Quantity Cubic Meters	Quantity Tons
Geological Reserve	5,88,450	15,88,815
Mineable Reserve	2,58,565.50	6,98,126.85

Source: Mining Plan

3.0. PROJECT DESCRIPTION

Mining will be carried out by Semi- mechanized Open Cast mining method using Shovel- Dumper combination. Drilling and blasting will be carried out for mining of hard rock. However, no blasting is proposed for removal of Over Burden. Jack hammer drill will be used for drilling of holes for blasting. SMS slurry explosive will be used for blasting of holes.

The salient features of the Mine are as given in **Table 3:**

Table 3: Salient Features of the Proposed Mine

Sl. No	Particulars	Details
1	Name of the Project	Sudap Bisik (Chiran Songma) Stone Mine,
2	Name of Project Proponent	Shri Balnen Ch. Sangma



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Sl. No	Particulars	Details		
3	Proposal	Proposal is for obtaining Environment clearance for Stone Production of 51,129 (max.) cubic meters / 1,38,048 (max.) Tons Per Annum from Stone Mine area of 2.00 Ha.		
4	Location of the Mine	Village – Sudap Bisik (Chiran Songma) , P.O.- Dhanua, P.S.- Garobadha, Dist. – West Garo Hills, State – Meghalaya.		
5	Co-ordinates of the Mine	Sl.no	Latitude	Longitude
		1	25° 39' 22.00" N	89° 57' 17.60" E
		2	25° 39' 25.40" N	89° 57' 20.70" E
		3	25° 39' 23.60" N	89° 57' 25.40" E
		4	25° 39' 19.90" N	89° 57' 23.20" E
6	Topo-sheet No.	78G/14		
7	Land Use	Waste (Non-forest) Land – 2.00 Ha.		
8	Total Reserve	Geological Reserve – 5,88,450 Cum. Mineable Reserve – 2,58,565.50 Cum		
9	Life of Mine	5.27 Years		
10	Proposed Production	Year	Annual Production Plan	
			In Cubic Meters	In Tons
		1st	51,129	1,38,048
		2nd	49,140	1,32,678
		3rd	50,787	1,37,125
		4th	46,575	1,25,753
		5th	47,583	1,28,474
Total	2,45,214	6,62,078		
11	Method of Mining	Semi-mechanized open cast mining. Shovel Dumper combination with deep hole drilling & blasting shall be used.		
12	Over Burden Generation	15,210 cum during the current planed period 15,210 cum per year (maximum)		



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Sl. No	Particulars	Details
13	Mineral Transport	Through Tipper within lease area. By truck, outside lease area
14	Working Regime	300 days/ year, 1 shifts/day, 8 hours/shift
15	Fuel Requirement	HSD – 384 liters / day (115.2 KL/year)
16	Requirement of Explosive	22.5 tons per year
17	Requirement of Water	10.29 KLD
18	Requirement of Power	Nil. 20 KVA DG Set proposed
19	Man-power Requirement	23
20	Proposed Investment	Rs. 83.70 Lakhs

Source: Approved Mining Plan

4.0. PRODUCTION

Year-wise proposed production plan for 5 years is given below in Table 4:

Table 4: Production during Planned Period

SUMMARY OF YEARWISE OF PRODUCTION					
YEARS	Production in CUM/year	Production in CUM/Day	Over Burden Production in CUM/Year	Production in Tons/year	PROD. IN TONS./Day
1st	51129	170	15210	138048	460.16
2nd	49140	164	0	132678	442.26
3rd	50787	169	0	137125	457.08
4th	46575	155	0	125753	419.18
5th	47583	159	0	128474	428.25
Total	245214	163	15210	662078	441.39

5.0. MANPOWER REQUIREMENT



Sathi Planners Pvt. Ltd., Ranchi

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By the mining of stone in Sudap Bisik (Chiran Songma) Stone Mine, total 23 unskilled, semi-skilled & high skill workers will be deployed by the lessee including statutory personal, based on the DGMS requirement. About 90% manpower will be recruited from local villages, on contractual basis.

6.0 REQUIREMENT OF RAW MATERIAL, WATER, POWER, FUEL WITH SOURCE OF SUPPLY (QUANTITATIVE)

Raw Materials Requirement

Table 5: Raw Materials Requirement

Raw Material	Consumption	Unit
High Speed Diesel	384 (115.2)	Litres /day (kl / year)
Explosive consumption	22.5	Tons/year
Delay Detonators	1,500	Nos./year

Water Requirement

Water will only be required for domestic use, dust suppression and plantation. About 10.29 KLD water shall be required for the project:

Table 6: Water Requirement

Purpose	Maximum Water Demand in KLD
Domestic Consumption	0.35
Dust suppression	1.38
Plantation	8.56
Total	10.29

Water will be sourced from nearby tube-well & dug well for drinking purpose. For other requirements like drilling, dust suppression and plantation, water requirement will be met from Water Tankers, to be purchased locally.

Power Requirement

No power requirement. All mining equipment are diesel operated. 20 KVA DG Set has been proposed as stand by.



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7.0. LAND USE PATTERN

Table 7: Existing and Proposed land use of the Mining Block Area

Sl. No.	Pattern of Utilization	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 in (Ha)	Area to be converted in the conceptual period
1	Mining Activities	0.00	1.51	1.51	Water Body – 0.92 Ha. Green Belt- 0.59 Ha.
2	Offices/ Store /crusher/ Magazine etc.	0.00	0.01	0.01	Green Belt
3	Dumping	0.00	0.04	0.04	Green Belt
4	Mining Road	0.00	0.01	0.01	Approach Road
5	Garland drain	0.00	0.02	0.02	Garland Drain
6	Green belt/Safety Zone	0.00	0.41	0.41	Green Belt
7	Stone Stock yards	0.00	0.00	0.00	-
	Utilized	0.00	2.00	2.00	-
8	Unutilized	2.00	0.00	0.00	-
9	Total	2.00	2.00	2.00	-

8.0. PROJECT COST

Capital cost of the project is **Rs. 83.70 lakhs** and operating cost is **Rs. 11.24 lakhs** per year.

9.0. PROJECT BENEFITS

Stone is one of the essential and most sought-out material for building and infrastructural development projects, being hard in texture and its property of durability, it is mainly used for construction of roads and building. It has high demand in the market due to increased domestic, industrial and other infrastructural activities.

The execution of the project will bring overall improvement in the locality, neighborhood

1. Opportunity to create direct and indirect employment

Approx. 23 persons will be given direct employment and many more will be engaged in transportation of stone and some pet shops like tea shop, vehicle repair etc.

2. The project will improve the physical infrastructure of the adjoining areas.

Road Transport: Construction of approach road and maintenance of existing transportation facility



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Market: By improving the economic status of local habitants through employments will attract market to develop their facilities and services near to the project site

Infrastructure: proposed project will provide the raw material for the infrastructure development like Construction projects.

Enhancement of Green Cover: 2852 nos. of trees have been proposed to be planted on Safety / Barrier Zone, Reclaimed area and along the approach road

3. The mining activity in the region will have positive impact on the social economic condition by way of creation of new employment opportunities, infra-structural development, better educational and health facilities.
4. The Mine will contribute to the Exchequer to State & Central Government.

10.0. DESCRIPTION OF ENVIRONMENT

Baseline environmental data– air quality, surface and ground water quality, soil Characteristic, flora and fauna, socio-economic condition of the nearby population

4.1 Baseline Environmental Study

To predict the impact of the proposed activities on the surrounding environment, the current baseline environmental status was studied by collecting the data and carrying out monitoring for the period of 1st Feb. to 30th April, 2022. The baseline data for ambient air quality, surface and ground water quality, noise and soil quality was collected and analyzed for various parameters are as per norms.

Parameters	No. of Sites	Description	Permissible Level
Air Quality	8	<ul style="list-style-type: none"> • PM2.5: 34.40 $\mu\text{g}/\text{m}^3$ and 36.38 $\mu\text{g}/\text{m}^3$ • PM10: 68.30 $\mu\text{g}/\text{m}^3$ to 71.16 $\mu\text{g}/\text{m}^3$ • SO2: 9.35 $\mu\text{g}/\text{m}^3$ to 11.70 $\mu\text{g}/\text{m}^3$ • NO2: 15.25 $\mu\text{g}/\text{m}^3$ to 16.70 $\mu\text{g}/\text{m}^3$ • CO: 0.242 $\mu\text{g}/\text{m}^3$ to 0.245 $\mu\text{g}/\text{m}^3$ 	60 $\mu\text{g}/\text{m}^3$ 100 $\mu\text{g}/\text{m}^3$ 80 $\mu\text{g}/\text{m}^3$ 80 $\mu\text{g}/\text{m}^3$ 2 mg/m^3
Ground Water Quality	8	<ul style="list-style-type: none"> • pH (at 25⁰C): 6.79 to 7.04 • Total Hardness: 52.8 to 5.4 mg/l • TDS: 26.7 to 32.5 mg/l 	6.5-8.5 200-600 mg/l 500-2000 mg/l



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Parameters	No. of Sites	Description	Permissible Level
Surface Water Quality	3	<ul style="list-style-type: none"> pH (at 25⁰C) 6.75 to 6.84 Total Hardness 72.4 to 84.6 (mg/l) TDS 368 to 382 mg/l 	----
Soil Quality	8	<ul style="list-style-type: none"> pH 6.68 – 6.86 Potassium K 121 to 134 (Kg/hect) Avl. Nitrogen N 208 to 224 (Kg/hect) Organic matter 0.52% - 0.68% (kg/hect.) 	----
Noise Level	8	<ul style="list-style-type: none"> Day Time (6:00 a.m. to 10:00 p.m.) 52.9 Leq dB(A) to 58.1 Leq dB(A) Night Time (10:00 p.m. to 6:00 a.m.) 39.2 Leq dB(A) and 41.1 Leq dB(A) 	75 Leq dB (A) 70 Leq dB (A)

11.0. LIKELY IMPACT OF THE PROJECT ON AIR, WATER, LAND, FLORA-FAUNA AND NEARBY POPULATION

11.1 Construction Phase

In the Stone Mining project, no construction is involved, except temporary construction of Mining Office with First aid Center and Rest Room with Toilet facility. Hence, no major impact on the environment due to the construction.

11.2 Operation Phase

11.2.1 Impact on Land Use

The proposed opencast mine will result in disturbance of the land use pattern of the ML area. The land degradation is expected during mining activities like excavation of mineral / overburden, top soil etc.

Land is already in possession and no Rehabilitation and Resettlement is involved under the present proposal.

11.2.2 Impact on Air Environment & Mitigation Measures

Dust is the main air pollutant generated from the stone mining. Stone mining will be carried out by opencast semi mechanized method. The air borne particulate matter generated by mining of mineral (drilling & blasting), handling of minerals and



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transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) are from diesel operated excavation/loading equipment, Compressor, DG set and vehicles plying on haul roads.

Drilling

Blast hole drilling generate considerable amount of dust in the open cast mining. Sharp drill bits will be used. Water will be sprinkled in the area where drilling will be done.

The operating crew of the drills will also be provided with dust masks to prevent their exposure to dust.

Blasting

Blasting is relatively minor contributor to total dust emissions. However, blasting dust in the form of concentrated cloud, that is highly visible and may have potential impact on neighbors at downwind of the blast.

The use of Site Mixed Emulsion (SME)/ Site Mixed Slurry (SMS) explosives will also be explored for reduction in dust emissions.

In addition to this, blasting under unfavorable wind and atmospheric conditions i.e. during foggy weather or during nights and when low visible clouds, will be avoided to protect areas adjacent to the mine.

Haul Roads

Loading of boulder stone and waste material into tippers / trucks usually occurs within the mine. The tippers /trucks, then transport the waste rock and stone to its next destination i.e. waste dumps and to customer, respectively, through designated haul routes. Fugitive dust emissions are caused by the contact of the tyres with the unsealed road surface that affect the total distance travelled.

- Vehicular emissions are being controlled through regular and proper preventive maintenance schedules. Emissions tests are also being done with diesel smoke meter to ensure emission values.
- Water sprinklers of 12 kl capacity will be used for water sprinkling on haul roads and approach road. Haul road water sprinkling will be done continuously in production shifts to ensure effective suppression of dust on haul roads.
- Proper maintenance of transport vehicles
- Avoiding overloading and enforcing speed limit on dumpers



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11.2.3 Impact of Mining on Surface Water and Mitigation Measure

No waste water generation is envisaged due to mining operations. Sanitary waste water will be discharged to the Septic Tank.

The area has no perennial nalla passing through the mining area, hence there will not be any impact of mining on surface water regime. Hence, there is no possibility of any siltation in natural streams and reduction of vertical percolation. It is therefore apparent that there is hardly any impact of mining on the surface water regime.

Sources of water pollution from the Mine shall be as follows:

- Domestic waste water from Office & Rest Room
- Run-off from waste dump in rainy season

Adequate control measures will be adopted to check not only the wash-off from soil erosion but also uncontrolled flow of mine water.

Mitigation Measures

- Garland drain shall be made around the Waste dump and the rain water shall be collected in garland drain and allowed to settle in a small pit for settling suspended particles before allowing discharge to natural drainage system.
- For domestic waste water Septic Tank with Soak Pit shall be provided, discharge from Soak Pit, if any shall be used for plantation.

It shall be ensured that quality of drinking water for the worker is hygienic and good sanitation system shall be made available.

11.2.4 Impact of Mining on Ground Water and Its Mitigation Measures

Mining is planned to above the ground water table. Therefore, pumping of ground water from mine pit does not arise in this mine. The rain water during rainy season is proposed to settle in a pit and shall be use for dust suppression and plantation.

Mitigation Measure

- Mining is planned to above the ground water table. Therefore, pumping of ground water from mine pit does not arise in this mine. The rain water during rainy season is proposed to settle in a pit and shall be use for dust suppression and plantation. Excess water, if any shall be discharged in natural stream after settling of suspended particles in the pit. Pump having required capacity will be



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installed to lift accumulated rain water from working pit and pumped to the settling tank.

11.2.5 Impacts of Noise/Vibrations and Mitigation Measures

Ambient noise levels measured in and around the Mine during the study period indicated that the noise levels at all the locations were within the permissible limits at most of the times. The proposed project may increase the work-zone and ambient noise levels to some extent.

Mining operations involve deployment of mining machineries, drilling, blasting, excavation and transportation of stone.

The mine will have following source of noise:

- Drilling
- Blasting
- Operation of Excavator & Vehicular Movement

Mitigation measures

- Selection of new low-noise equipment from the manufactures failing which use of additional retrofits, if available.
- Providing silencers or enclosures for noise generating machines such as DG sets, compressors, etc.
- Generation of noise during blasting shall be controlled by delay blasting and use of adequate charge per blast.
- Diesel powered machineries, which is major source of noise in open cast mining shall be properly maintained. Attention shall be paid towards rigorous maintenance of the silencer of the diesel engines.
- Protective devices shall be provided for use of persons employed in the vicinity of high noise areas.
- Plantation around the lease boundary will cut the noise levels.

11.2.6 Impact due to Blasting & Mitigation Measures

In order to loosen the material blasting in hard formations is the required. The noise produced by blasting will be for extremely short duration though with a high intensity. Noise of blast is site specific and depends on type, quantity of explosives, dimensions of drill holes, degree of compaction of explosive in the hole and rock.



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Mitigation measures

Due attention will be given to the following factors:

- Quantity of explosive: The quantity of explosive blasted will be decided as per Vibration Study or trial blasting results
- Controlled blasting with proper spacing, burden and stemming will be maintained
- Stemming material: Stemming material to be used is the drill cuttings and chips of triangular shape.
- NONEL means of initiation will be used except in a few unavoidable cases detonating fuse will also be used to a minimum extent.
- Delay system: Down the hole delay will be provided are used for providing Row-to row delay.
- Blasting time: Blasting will be done in day time preferably during the shift change over period as per requirement.
- Blasting Frequency: Blasting frequency will be limited to 3-4 per week as per the development requirement.
- Warning: Before blasting is done, warning sound shall be given and placards/flags will be displayed so that people can move to safe places.
- Secondary blasting will be reduced;

11.2.7 Impact Due to Fly Rock

Fly Rock

Fly rock fragments shall be controlled to ensure safety of personnel, as well as to protect the structures/machineries within the blasting zone from damage. Depending upon the diameter of the holes, bench height, spacing & burden and the charge weight per delay, the maximum distance to which rock fragments usually fly has been observed to be within a distance of 100 to 150 m. The following measures will be taken to control the fly rock during blasting operations at the proposed mining blocks:

1. Muffle blasting will be done wherever any blasting is to be taken within 200 m of any structure.
2. Proper burden and spacing will be maintained according to the bench height, nature of rocks and diameter of the holes.
3. Length of the stemming column shall not be less than the burden.



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4. Angular holes will be made in conformity with the slope of the bench.
5. As far as possible holes will be located beyond weak zones
6. All loose pieces of rocks from the blasting site will be cleared before charging the hole.
7. Drill hole depths will be checked before loading by the Blasting In-charge.
8. Proper warning signals, flags are posted before blasting at various locations.
9. Blasting Shelters have been constructed with thick MS sheets with enclosures on all sides except one side, to take shelter for persons engaged in blasting.
10. Besides the above, the blasting personnel ensures, physically that all personnel have been withdrawn from the danger zone. Guards are be posted on all access roads leading to the blasting site, who prevent unauthorized entry of mine personnel.

11.2.8 Impacts on Ecology & Biodiversity and its Mitigation Measures

No National Park, Wild Life Sanctuary, Bio-sphere Reserve, Elephant Reserve, Tiger Reserve or Elephant Corridor etc. is present within 10 km of mining lease area. Also, there is no Schedule-I flora or fauna present in the study area. However, the Mine is dedicated and committed to conserve the species.

Under the proposed expansion, 2852 trees will be planted in the safety zone, reclaimed area and on approach road, during the planned period.

There may be some impact on the biological environment due to the air pollution during stone mining and transportation of stone to the end users. This will be taken care by transportation of minerals in covered truck with tarpaulin and regular water sprinkling on the approach road. Plantation along the approach road will further reduce the impact. There is no water discharge from the mine, hence impact due to effluent discharge in surrounding area is ruled out.

11.2.9 Socio Economic Impact of the Project and Safety Measures

Critically analyzing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the proposed project in the region that are stated below:

- The project does not envisage any leasing or acquisition of private land. Hence R&R plan is not applicable under the present proposal.



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- Increase in Job Opportunities - Direct employment of 23 nos. of manpower will be required for mining operations. Many more will be indirect employment.
- Minimal Burden in the Existing Infrastructure Facilities - Local work force will be given first preference in the activity due to which influx of the outsiders is not envisaged or it will be very minimal. Thus, there will not be the necessity of provision of housing facility for the local workers and not stressing on the existing civic amenities of the area.
- Improvement in Infrastructure
- The impact from the air emissions are controlled efficiently using air pollution control equipment and will be designed in such a manner that in future, after the implementation of the project, the Mine will adopt effective control systems at all the identified sources of emission
- Awareness programs shall be arranged on health, hygiene and sanitation
- Periodic health check-up camps, distribution of medicines, providing other medical facilities shall be organized by project authority for villagers, contract laborers, employees and their family
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area
- Awareness programs will be taken to make people aware about the environmental protection, need of water conservation etc.
- At the work place, first aid facilities shall be maintained at a readily accessible place.
- Sufficient supply of potable drinking water shall be provided at suitable places.
- Sanitary facilities shall be provided at accessible place and kept in a good condition

12.0 WASTE MANAGEMENT

There is generation of very little quantity of Top soil and approx. 15,210 cubic meter of Over Burden generation during the planned period. Top soil, though negligible quantity, will be separately stored and used for plantation. Over burden will be temporarily dumped with suitable precautions like constructing parapet wall and garland drain around the dump.



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13.0 GREENBELT DEVELOPMENT

Greenbelt on the safety / barrier zone and approach route for transportation of minerals will be properly developed and also cover with greenbelt to arrest the spread of dust during mining operation. Total 2852 trees will be planted on Safety Zone/ Barrier, reclaimed area and approach road. Capital Budget of Rs. 3.21 lakhs for greenbelt development and annual budget of Rs. 0.70 lakh for maintenance of greenbelt has been kept.

14.0 RAIN WATER HARVESTING

To avoid surface run-off during the monsoon season and in order to augment groundwater resources of surrounding area and for betterment of groundwater regime, mine shall implement groundwater recharge measures within the lease area. The Mines will construct one Settling Pond with desilting chambers. Slope of storm water drains shall be maintained in such a way to facilitate natural flow to the Settling Pond.

The harvested water (Evaporation and other handling losses account to 50% reduction) may be utilized for greenbelt development, domestic sanitation and dust suppression. Apart from this the mines will augment groundwater resources of surrounding area and for betterment of groundwater regime.

15.0 BUDGET FOR ENVIRONMENTAL MONITORING PROGRAM

In order to maintain the environmental quality within the stipulated standards and monitoring of various environmental components necessary for compliance of as per conditions, a **budget of Rs. 3.05 lakhs per year** has been kept.

16.0 BUDGET FOR ADDRESSING THE ISSUES RAISED DURING PUBLIC HEARING

Office Memorandum issued by Ministry of Environment, Forest & Climate Change on 30th September, 2020 states that EAC will deliberate on the commitments made by the project proponent to address the concerns raised during the Public Hearing. Therefore, action plan to address the issues raised in the public hearing along with its budget for implementation of the activities proposed based on the issues raised during the Public Hearing shall be prepared. Budget of Rs. 3.0 lakh has been kept for implementation of action plan for addressing issues raised during public hearing.

17.0. ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides a delivery mechanism to address potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective



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mitigation of every potential biophysical and socio-economic impact identified in the EIA. The Environmental Management Plan provided information for each operation, which could otherwise give rise to impact. The estimated capital cost and recurring cost of Environment Management is **Rs. 12.21 lakhs & Rs. 6.20 lakhs/year** respectively.

