

# EXECUTIVE SUMMARY

## *“Umsangat Limestone Deposit – I”*

**ha**

*Jaka: Umsangat, Village: Musiang Lamare (Rim),  
Sub post office: Chiehruphi, P.S: Lumshnong,  
District: East Jaintia hills Mihngi, Meghalaya.*

**Jingheh ka Jaka: 18.19 Ha.**

*Jingpynmih ba lah ban pynmih: 10,02,827.25 tonnes/annum u Mawshun,*

*OB/Waste Quantity: 529737.78 TPA*

**Na ka bynta jong**

***M/s. GOLDSTONE CEMENTS LIMITED***

*Musiang Lamare (Riang) Shnong, Khliehriat,  
East Jaintia hills Mihngi, Jylla Meghalaya – 793200*

tipbniah ia ka TOR : Issued from SEIAA, Meghalaya

Baseline data ba la pynmih : Lber' 2024 to Jymmang'2024 (Por Lyiur)

Project Jinglut : Rs.1177.60 Lakhs

***La Pynkhreh Da***

**NABET/EIA/2124/RA 0231-REV.02**



**GLOBAL ENVIRONMENT & MINING SERVICES**

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## ***EXECUTIVE SUMMARY***

### **1.0 INTRODUCTION**

Ka *M/s. Goldstone Cements Limited (GSCL)*, ka la pynbna ba ka don ia ka jingdon jong ka *Umsangat Limestone Deposit-I* hapoh ka jingheh kaba 44.95 Acre (18.19 Ha) jong ka Non-Forest Land ha Umsangat, Musiang Lamare (Old) Village, East Jaintia District, Meghalaya. Kane ka jaka pyniaid bor jong ka pule limestone ka la pynbna da ka Mining & Geology Department, Sorkar Meghalaya, lyngba ka shithi kaba don *No. MG.82/2022/343* ha ka tarik 27.02.2024.

Ka jingpyniaid ka don ka mining plan kaba la pdiang ban pynmih ia 1002827.25 metric ton shisnem (ha u snem ba san jong ka mining plan). Kane ka plan ka la shah pdiang da ka *Indian Bureau of Mines* lyngba ka shithi *No. MCDR-MPCP0CaF1/3/2024-GUH-IBM\_RO\_GUH* ha ka 13.08.2024.

Katkum ka jingpynbna ba la buh da ka Ministry of Environment Forests and Climate Change (MoEF&CC), sorkar India, ha ka tarik 14 Nailur, 2006 bad ki jingkylla ba la pynbeit, kane ka project ka hap hapoh *category B1*, kaba dei ka jingtrei ba kynthup ha 1(a) jong ka EIA Notification. Na kata ka daw, ka Environmental Impact Assessment (EIA) bad ka Environmental Management Plan (EMP) ki dei ban pynkhreh na bynta ka environmental clearance lyngba ki Terms of Reference (TOR) kiba la pdiang da ka State Level Environment Impact Assessment Authority (SEIAA) – Meghalaya.

Ban shongnia ia ka jingtah ba ka project kan pynlong ha ka mariang, ka long kaba donkam ban bishar bniah ia ka rukom long mynta jong ka mariang ha ka jaka project bad ki jingpyntreikam kiba thymmai. Kane ka Environmental Impact Assessment Report (EIA) bad ka Environmental Management Plan (EMP) la pynkhreh ban pynbiang ia ki jingdonkam bad jingmyntoi ia ka jingkyntiew mariang. Ki jingpule ha ka mariang ki la long hapoh 10 km radius na ka jaka mine naduh u bnai Lber 2024 haduh Jymmang 2024 (por Lyiur).

## 2.0 PROJECT DESCRIPTION

Table No.1 Project Details

Sl No	Item	Details
1	Ka kyrteng ka projek	Umsangat Limestone Deposit-I jong ka M/s. Goldstone Cements Limited (GSCL)
2	Ka jaka ka projek	Village – Musiang Lamare (Old), Taluk – Khliehriat, District – East Jaintia Hills, State – Meghalaya.
3	Jinglong ka Projek	Jingkhaiñ ia u dewiong limestone
4	Jingheh ka jaka pyniaid	18.19 Ha (44.95 Acres)
5	Jingthew ba la pynkhreh ban pynmih	Jingthew kaba palat duh ha shisnem ka long 1002827.25 metric tonnes bad ka rkhe ka long 529737.78 metric tonnes shisnem.
6	Kategori jong ka projek	B1
7	Jinglong ka khyndew	Non- Forest Land
8	Topo sheet	83C/8
9	Jingdon ki koordinat	N 25°11'08.97" to N 25°11'35.20" E 92°20'24.02" to E 92°20'42.29"
10	Jinglong ka projek thymmai/kylla	Projek thymmai
11	Jingkordor ka projek	Kane ka projek mining ka long ha ka jaka kaba iar bad riwspah bha ia u limestone, bad kan iarap ban pynmih dewbilat ha Goldstone Cement Plant
<b>Ki Jingdon Ka Mariang Bad Ka Jaka Project (Kumba Dei Ha Ka Jarak Aerial Na Ka Mining Lease Boundary)</b>		
12	Shnong ba janai	Umlong, kaba don ha ka jarak 2.7 km ha ka lammihngi-sih (Southwest) na ka jaka lease.
13	Sor ba janai	Khliehriat, kaba don ha ka jarak 24.0 km ha ka lammihngi (Northeast) na ka jaka lease.
14	National Highway ba janai	NH-06 (Shillong haduh Aizawl), kaba don ha ka jarak 5.1 km ha ka lama (East) na ka jaka mining.
15	Relwe, Port bad Airport ba janai	Nearest railway station Badarpur Railway Station is at a distance of 90 km. Nearest airport is Guwahati Lokapriya Gopinath Bordoi international Airport is located at a distance of 124 km from said mine. Pandu sea port is located at a distance of 218 km from said mine.
16	Ka jar ki Interstate Boundary	16.35 km (Meghalaya-Assam), lammihngi-sih (Northeast) na ka mining lease area.

17	Jaka ba don jingdon jingtip shaphang ka culture/history	Chieh Ruphi Presbyterian – ha ka jarak 5.3 km na ka mining lease area.
18	Ki jaka ba don Wildlife Sanctuary/Reserve Forest/Ka jingkieng jingthoh	Narpuh Wildlife Sanctuary – ha ka jarak 7.44 km ha ka lama Mihngi-Sih. Narpuh Reserved Forest – ha ka jarak 10.88 km ha ka lama Mihngi-Sih.
19	Um bad ki wah ba don hapoh 10 km radius	Wah Umkhar kaba don ha ka jarak 2.35 km ha ka lama shatei (West) na ka jaka mining. Seasonal nallah ka don tang 0.050 km.
20	Seismic Zone	Zone – V [Katkum IS 1893 (Part-I): 2002]
<b>Cost Details</b>		
21	Ka jinglut baroh (Project Cost)	₹1177.60 lakhs
22	Ka jinglut ban pyndait jingpynneh mariang (Recurring Cost)	₹12.36 lakhs

**MINING DETAILS**

Sl. No.	Particulars	Details
1	Method of Mining	Opencast Mining by Mechanized Method
2	Limestone Production Capacity	Max 1002827.25 tonnes/annum
3	Total Mineable Reserves	20152599 tonnes
4	Total waste generation till the end of Life of Mining	1622817.53 tonnes
5	Life of Mine	21 years
6	Bench Height	9m
7	Bench Width	9m
8	Elevation Range	Highest elevation is 712 mRL Lowest elevation is 643mRL
9	General Ground Level	625m AMSL
10	Ground water table	50-70m BGL
11	Ultimate working depth	30m
12	Overall pit slope	45°

**3.0 GEOLOGY:****3.1 TOPOGRAPHY:**

Kane ka mine limestone ka don ha ka jaka ba dur bad ba phyrnai, kaba don ka jingheh ha ka 860 mRL bad ka jingduna ha ka 190 mRL. Ka phew (slopes) ki leit sha ka lammihngi bad ka shatei. Ka jingheh ka hapoh ka *lease* area ka long 18 m na ka General Ground Level.

### 3.2 REGIONAL GEOLOGY:

Ka Leasehold ka dei ka bynta jong ka Meghalaya Shelf, kaba long ka extension jong ka Bengal Basin. Ki Khasiat jong ka stratigraphy ha ka thain ka long kawei.

Group	Formation	AGE	Rock-type
Barail Group		Oligocene	Sandstone and shale
Jaintia Group	Kopili formation	Upper Eocene	Alternation of shales and sandstones with bands of calcareous sandstone and shale.
	Shella Formation (Sylhet Limestone)	Middle Eocene	Prang Fossiliferous Limestone Nurpuh Sandstone
		Lower Eocene to Upper Paleocene	Umlatdoh limestone Lakadong Sandstone Lakadong Limestone
	Theria Formation	Lower Paleocene	Upper Hard Sandstone Lower Limestone and Calcareous Sandstone.
Mahadek/Langpur Formation		Upper Cretaceous	Sandstone, Limestone, Shale, Boulder bed,

### 3.3 LOCAL GEOLOGY:

Ka geological makeup jong ka jaka prospecting ka dei ha ki *Kopili* bad *Shella* formations jong ka *Jaintia Group*, kaba don ha ka *Meghalaya Shelf*. Ka long kaba kongsan ba ka don tang ka band ba phylliew ka limestone ha kane ka thain. Ka sandstone layer, kaba don sha shatei jong ka Prang limestone, ka lah ban don ka thickness ba 1.50 haduh 35.00 meters bad ka don ki kolor ba kynthup ia ka *pale white, yellow-brown, reddish-yellow*, bad *reddish-brown*.

Ka dei ka sandstone kaba *medium-grained*, kaba *soft*, bad ka don ki jingkylla ha ka *grain size* kaba na ka *fine* haduh ka *coarse*. Ha ka bynta ba heh bha jong ka, ka long ban thaw ne ka sniew bha kum ka sludge. Nalor kata, don ruh ki additional layers ha ka Prang Limestone, kynthup ia ka 2 haduh 3-meter-thick sandstone band bad ka 1-meter-thick shale band. Ki data jong ka *exploration* ki pynpaw ba ka thickness jong ka limestone band ka lah ban long 43.00 haduh 114.50 meters. Ki deposits ki la pyrkhath kum ki *extensive, uninterrupted, horizontally layered ne gently dipping*, bad ka don ka *minimal geological disturbance*, ka *abundant surface exposure*, bad ka *consistent quality*.

### 3.4 GEOLOGICAL RESERVES

Ka total estimated geological resources jong ka Limestone ha kane ka area ka long **13700991 m<sup>3</sup>**. Ki jingtip ha kane ka Table ba la kham pynpaw ha khappud ka jinglong jong ka limestone bad ka thong ba la pyndonkam ha ka mining.

**Table No – 2: GEOLOGICAL RESERVES**

<b>MEASURED MINERAL RESOURCES (331) OF APPLIED MINING LEASE AREA OVER AN EXTENT OF (18.19Ha.) OF M/s. GOLDSTONE CEMENTS LIMITED</b>				
<b>Sections</b>	<b>Sectional Influence in m</b>	<b>Sectional area in m<sup>2</sup></b>	<b>Volume in m<sup>3</sup></b>	<b>Qty. in T @ 2.5 t/m<sup>3</sup> B.D with 95% rec. Tonnes</b>
<b>1-1'</b>	100	36396	3639600	9826920
<b>2-2'</b>	109	31438	3426742	9252204
<b>3-3A'</b>	14	3666	51324	138575
<b>3B-3'</b>	101	10705	1081205	2919254
<b>4-4A'</b>	119	9197	1094443	2954996
<b>4A-4'</b>	88	3515	309320	835164
<b>5-5'</b>	99.5	14455	1438273	3883336
<b>6-6'</b>	92	10705	984860	2659122
<b>7-7'</b>	74.5	14352	1069224	2886904
<b>8-8'</b>	60	10100	606000	1636200
<b>Total</b>			<b>13700991</b>	<b>36992675</b>

### 3.5 Mineral Reserves:

Ka total mineral reserves jong ka limestone ha kane ka area mine ka long **20152599 tonnes**. Ki mineral reserves jong ka limestone ki la bishar bha na ka *indicated resources* katba la pynkynriah ia ki phylliew mawnong ba don ha ka *7.5m safety barrier*. Ki reserves ki la bishar da ka jingioh jingtip ha ka *cross sections* kiba la ioh ha ka *interval* ba 101m, kata na ka *availability* jong ka limestone bad ka jingkhain jong ka *lease*. Na ka *cross-sectional area* jong ka limestone zone, ka volume ka la long katkum ka *cross-sectional interval*. Ka recovery jong ka limestone ka long 95%.

### 3.6 MINING:

Ka proposal ka long ban pyndonkam ia ka *opencast mining* da ka *mechanized method*. Ka la pynkhreh ban pynmih ia ka jingdon maximum jong ka **1002827.25 tonnes/annum RoM** na kane ka mining ha u snem ba 5 jong ka plan period. Lai tylli ki *benches* kin wanrah ha kane ka plan period ha ka *strike* jong ka ore body. Ka jingheh jong ka bench ka long ban long 9m bad ka keng ka long 9m. Ka *individual bench slope* ka long 80° haduh 90°, hynrei ka *ultimate bench slope* ka long 45°.

Ka rukom treikam ka long *mechanized opencast mining method*. Ki kam kiba kynthup ia ki:

- Ki *benches* ha ka limestone bad ka overburden ki la pynkhreh ha ka jingheh ba 9 m.
- Ka keng jong ka bench ka long 9 m ha ka rukom ba ka keng kan long ba kham heh.
- Ka drilling bad ka blasting ki long da ka *Hydraulic Drill*.
- Ka *excavator* ka long ka machine ba pynkhreh ia ka excavation.
- Ka *mine workings* kin ia id katkum ka jingpynbeit ba la buh da ka *MMR 1961* bad ki jingpynbeit ba la pynkynriah.
- Ka sampling jong ka *face*, ki *exploration data* bad ka *experience* jong ki briew ki pynlong ia ka jingpyrkhat ia ka jingbha bad ka jingkylla ka mariang.
- Ka *ROM* kin wanrah sha ka *crushing* bad *screening plant* na ka bynta ka *processing*.
- Ka *reject* kin beit sha ka *dumping yard* ba la buh na ka bynta ka *dumping*.
- Ka *mud bund* ka long ban pynkhreh ha baroh ki *edge* jong ka lynti kum ka jingpyrkhat ia ka *protection wall*. Ka jingheh ka bund ka long 0.3 m haduh 0.5 m.
- Ki lynti bad ki ramps ki don ha ka proper gradient bad keng, 1 in 16 ki mainten ha ka *haulage road*.

Ka la pynkhreh ban pynmih ia ka **1002827.25 tonnes RoM** na kane ka Mining ha u snem ba 5 jong ka plan period. Ka *open cast, mechanized mine method*, kan long ka *method* ba pyndonkam ha kane ka jaka. Ka *Mine* ka la pynkhreh ha ka rukom ba kan shim bynta na ki *geological structures*, especially ha ka *major sets of joints*. Ka jingheh ka bench ka long 9m bad ka keng ka long 9m. Ka *bench slope* ka long 45°.

Ha ka *initial stage*, ka drilling kan long da ka *pneumatic jack hammers* (hole diameter 33mm) ha ki *intervals* ba hok (20-30 cms) sha ka jingduna ba donkam. Ka blasting ka long *smooth* da ka *gun powder*. Ki *loose joints* kin longbeid da ka *feather* bad *wedges*. Lada ki *joints* ki la *tight*, kumno ka methodology kan change katkum ka jingdonkam.

### **PROPOSED PRODUCTION:**

Ka recovery jong ka limestone ha kane ka Mining ka long kumba **100%**. Ki jingpynkhreh bad ki jingpynmih ba la buh ha shisnem ki long kumne ha ka **Table No. 3**.

Table No.3: -Proposed Production &amp; Development

Year	Waste/ Mineral rejects (Tonnes)	RoM (Tonnes)			Ore to over burden ratio
		Total ROM	Saleable	Subgrade/ Mineral rejects	
1	414870.75	496658.25	496658.25	0.00	0.84
2	529737.78	995733.00	995733.00	0.00	0.53
3	208041.75	1000807.65	1000807.65	0.00	0.21
4	254359.00	1002798.90	1002798.90	0.00	0.25
5	215808.25	1002827.25	1002827.25	0.00	0.22
<b>Total</b>	<b>1622817.53</b>	<b>4498825.05</b>	<b>4498825.05</b>	<b>0.00</b>	<b>0.36</b>

### 3.6.1 MINEABLE RESERVES AND ANTICIPATED LIFE OF THE MINE:

Ki mineable reserves ha ka lease area ki long **20152599.0 tonnes**. Ka la pynkhreh ban pynmih **4498825.05 tonnes** limestone na kane ka area ha kane ka plan period. Ki jingdonkam ba wanrah kin long ha ki sngi ba la dep; kumta ka por mynshwa jong ka mine ka long 23 snem.

Ka long kumba **1622817.53 tonnes** ka waste ba lah ban ioh ha kane ka plan period. Kane ka waste ka don ka jingduna ba khraw. Ka waste ba la wanrah ha ka Mining kan long pyndonkam ban ioh shong ba ki jingmyntoi ha ka strengthening jong ka existing approach roads sha ka mine. Ka waste kan nym lah ban iaid sha ki crushers ba la don hapoh ka por ba ka jingpynslem bad ka permit la ioh ba la kynmaw ha Department of Mines & Geology. Ka waste ka la ioh ka tippers da ka excavator bad la beit sha ka 2.15 Ha ka plan area da ka waste dumping.

### 3.8 DRILLING & BLASTING:

Ka maximum quantity jong ka limestone handling ka long ba **1002827.25 tonnes** ha u snem ba 5. Ka maximum quantity waste handling ka long ba **529737.78 tonnes** ha u snem ba 2. Ka jaka hiar kiap ka madon ki ki drilling and blasting. Hydraulic drilling kaba la pynkhreh da ki shtriem ba 3.0m X 4.5m *burden and spacing* bad 10m jingpoh 115mm dia.

### 3.9 EMPLOYMENT POTENTIAL:

Ka manpower kaba donkam kan long hapoh na ki jaka local. Ki truck drivers/ Operators ki ong kylli iaid janai pynsuai ki long local person. kumta do iaid ia outer population expected sook.



**Table No.4: -Employment Potential**

SI No	Particulars	No's
1	Skilled	50
2	Semi-Skilled	6
3	Un-skilled	5
<b>Total</b>		<b>61</b>

**3.10 SITE SERVICES:**

Ha ka por mynta, kiba dei na ka site services ki nym long, hynrei ka la pynkhreh ban pynshang ka *small office, rest shelter, first aid room*, bad ka *urinal* ha ka lynti ka jingstad jong ka lease area.

**4.0 LAND USE:**

Ka jingpynkhreh ka land use plan ba la pynkhreh ha ka por ba kut jong ka plan period, ka land ba la buh ban beit ba la *degraded* na ka Mining bad kiwei pat ki kam ba donkti ka long ha kane ka **Table No. 5**.

**Table No.5: -Land use at the end of Plan period & Conceptual Plan**

SI No	Particulars	Present Land Use (Acres.)	Land Use at the end of Plan Period (Acres.)	Land Use at the end of conceptual Period (Acres.)
1	Area for Mining	0.00	7.19	15.54
2	Area for Roads	0.67	0.73	0.00
3	Area for Greenbelt	0.00	2.29	2.29
4	Overburden/Waste Dumping	0.00	2.15	0.00
5	Others (Garland drain & Retaining wall)	0.00	0.26	0.36
6	Unused area	17.52	5.57	0.00
<b>Total</b>		<b>18.19</b>	<b>18.19</b>	<b>18.19</b>

**5.0 NATIONAL SANCTUARY / ARCHAEOLOGICAL IMPORTANCE SITES / INTERSTATE BOUNDARY WITHIN 10 KMS RADIUS:**

uh Wildlife Sanctuary ka don ha ka jarak 7.44 km ha ka lammihngi-sih (Southeast) na ka mining lease area. Ka ESZ jong Narpuh Wildlife Sanctuary ka don ha ka jarak 6.24 km na ka lease area. Narpuh Reserve Forest ka don ha ka jarak 10.88 km ha ka

lammihngi-sih (SE direction). Ka Archeological Place Chieh ruphi Presbyterian ka don ha ka jarak 2.52 km na ka mining lease area ba la buh.

## 6.0 PUBLIC BUILDINGS, PLACES OF WORKSHIP AND MONUMENTS:

Ki don no ki buildings bad monuments jong ka jingshemsheh ha ka ML area. Hynrei, ka *Church* ka long ha baroh ki shnong jong ka study area, kaba don ka jingthmu ba kongsan bad ka jingthmu jong ka paidbah ha ka mat jong ka pyrkhath jong ki brieve.

## 7.0 COST OF THE PROJECT:

Ka jingpynkhreh ka cost jong ka projek ka long **1177.60 Lakhs** ha kaba kheĩn na ka fluctuating market scenario bad ka jingpynlong thylli ka *domestic market conditions* jong ki products.

## 8.0 ENVIRONMENTAL STUDIES:

Ki *Environmental Monitoring Studies* ki long hapoh ka por Lber 2024 haduh Jymmang 2024 (Por Lyiur). Ki *Environmental Studies* ki long hapoh ka Core zone bad Buffer zone jong ka 10 km radius shaphang ki jingtip Meteorological, Air, Water, Noise, Soil, Flora, Fauna bad kiwei pat ki kam.

### 8.1 METEOROLOGY:

#### 8.1.1 Temperature

Ha ka jingpule jong ka temperature ba la dep ha ka 10 snem, ka phang ba heh ka long 30.00°C ha ka por peak summer season bad ka pynklum ia ka temperature heh haka shapoh ki sngi 7. Ka summary jong ka temperature data ha ka 3 bnai study period (Lber 2024 haduh Jymmang 2024) ka la long ha ka **Table No. 6.**

**Table No.6: -Monthly Maximum & Minimum Temperature**

Month	Temperature in °C		
	Min.	Max.	Avg.
March-2024	10.6	27.9	19.6
April-2024	17.1	29.3	23.3
May-2024	17.4	35.1	24.4

Ka jingpule jong ka mean monthly temperature data ka pynpaw ba ka temperature ba duna bad ba heh ka long **10.6°C** bad **35.1°C** kumjuh, kiba la shah jingdawa ha u bnai *March 2024 haduh May 2024.*

### 8.1.2 Relative Humidity

Ka data jong ka relative humidity ba la samla ha ka por shalor bad ka por mynsngi ka pynpaw ba ka humidity ba heh ka long **99%** ha *March, April*, bad *May 2024*, bad ka humidity ba duna ka long **34%** ha *March 2024*. Ki values jong ki bnai ba shaphang ka study period ki la pynpaw ha kane ka **Table No. 7**.

**Table No.7: - Monthly maximum & Minimum Relative Humidity**

Month	Relative Humidity in %		
	Min.	Max.	Avg.
March-2024	34	99	76.9
April-2024	42	99	84.6
May-2024	49	99	84.0

### 8.1.3 Rainfall

The summary of the rainfall data of month wise is given in the Table No.8.

**Table No.8: - Monthly Rainfall 2024**

Year	Rainfall (mm)
March-2024	106.3
April-2024	250.8
May-2024	532.1

Ka Maximum ka rainfall ka long **532.1mm** ha u bnai *May 2024*, bad ka Minimum ka rainfall ka long **106.3mm** ha u bnai *March 2024*.

### 8.1.4 Wind Velocity & Direction

Ki wind directions ba kongsan ha kane ka por ki long na ka *SW* (Southwest) sha ka *NE* (Northeast) sector. Ki wind speed ha kane ka por ki la jong ka jingkylla ba 6.2 haduh 27.8 kmph. Ki percentage frequency jong ki wind ha 16 direction ki la pyrkhata na ki data ba la ioh ha ka *winter season* ha ka study period ban ploh *wind rose diagram*. Ka maximum wind speed ka long **27.8 km/h** ha ka study period. Na ka bynta u bnai *March, April*, bad *May 2024*, ka flow vector ka la long ka *SW to NE*.

**Table No.9: - Monthly wind speed and direction 2024**

Month	Wind Speed in Km/hr.		Predominant wind Direction
	Min.	Max.	
March-2024	16.5	7.2	SW to NE
April-2024	16.3	7.3	SW to NE
May-2024	27.8	6.2	SSW to NNE

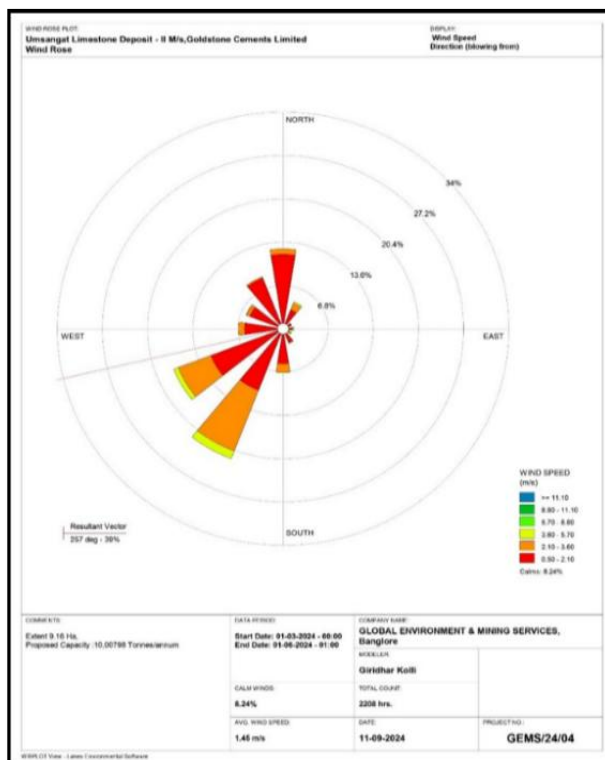


Fig: 1 Windrose Diagram of March 2024 to May 2024

**8.2 AIR ENVIRONMENT:**

Ka ambient air quality ha ka study area ka la bishar da ka network jong ki *nine (9)* ki monitoring stations, na ki 9 station, ar tylli ki la pynkhreh ha ka core zone, katba kiwei pat ki don ha shatei jong ka mining lease ha buffer zone bad hapoh ka radius jong 10 km. Ki concentrations jong ka *PM10*, *PM2.5*, *SO2* bad *NOx* ki la long ba kongsan na ka vehicular traffic bad ki local activities. Kane ka long ka summary jong ka ambient air quality ha ka study area.

**Table No.10: -Summary of Ambient Air Quality ( $\mu\text{g}/\text{m}^3$ )**

Station Code	Locations	24 hrs average contribution ( $\mu\text{g}/\text{m}^3$ )							
		PM <sub>10</sub>		PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>	
		Min	Max	Min	Max	Min	Max	Min	Max
A1	Core zone	32.56	62.15	12.54	23.56	5.11	12.50	7.12	15.10
A2	Downwind side	36.45	65.45	13.71	29.82	3.84	15.19	4.12	17.28
A3	Umlong	34.18	66.25	7.83	24.62	3.13	13.91	3.78	16.13
A4	Umrsiang	31.68	68.84	8.10	21.55	2.40	12.17	4.89	14.08
A5	Mynkre	41.48	69.82	11.88	21.94	3.36	13.10	4.25	14.08
A6	Thangskai	40.31	67.82	13.48	27.80	2.76	12.87	4.37	12.49
A7	Lumshnong	38.41	66.59	11.16	20.59	4.17	13.24	4.69	13.32
A8	Chieh ruphi	31.87	61.41	9.48	19.50	6.34	12.50	7.20	13.16
A9	Brishyrnot	30.15	67.12	8.21	22.53	3.36	13.03	5.19	13.11

Ha ka *Mining*, ka jingtrei ka la kynthup ia ka jingkyllut ka mariang ha ka air pollution, na ka daw ka jingpyntreikam jong ka mining equipment bad ka transportation. Ka mining ka la pynkhreh ban pyndonkam da ka *fully mechanized means*, ka long ba ka air pollution ka don. Hynrei, ki jingtip ba la ioh na ka ambient air quality ki la long ha ka *standards* bad ka lead ka long ha ka *below detectable limits*.

Ka *Dust* ka long ka major emission ba la wanrah ha ka mining activities. Ka *dust* kan long ha ki mines na ka drilling, bad ka transportation jong ka limestone ha ki dumpers, bad kiwei pat. Ha kane ka projek ba la pynkhreh, ki *control measures* jong ka air emission kin long kumne:

### CONTROL MEASURES

Ki *control measures* ba la buh ban weng ia ka air pollution ba wanrah na ki mining activities ki long kumne:

- Ha ka mining activities, kawei ka jingdonkam ba wanrah ka gaseous emissions ka long na ka diesel engines, kiwei pat ki kynbat bad ki equipment.
- Ka blasting jong ka explosive ka wanrah ia ka increase jong ki oxides of nitrogen ha ka air, kaba long ba pynsleh da ka kyiad. Ka blasting ba la pyndonkam ia ka explosive energy kaba *optimum* kan iarap ban wanrah ia ka reduction jong kine ki emissions.
- Ki emissions na ki diesel engines jong ki machinery ki lah ban long ha ka *smoke* ne ki gaseous emissions ba kim lah ban iohi, kum ka *Sulphur Dioxide, Oxides of Nitrogen* bad ki *un-burnt Hydrocarbons* na ka jingkyndria bad ka combustion ba la pynthut. Ki daw kin long ka quality jong ka fuel, ka jingtrei ba shem kylli jong ka engine, bad kumta.
- Ka jingpyrkhat ba kham bha jong ka *proper maintenance* jong ki machines kan pynbha ia ka combustion process bad kan weng ia ka pollution. Ka jingpynkylla jong kine ki gases kan long ha ka bynta ba don ka jingdon jong ki equipment ba treikam bad um noh sha kiwei pat ki shnong.

### 8.2.3 AIR EMISSION AND DISPERSION MODELING

Ka *Source dispersion analysis* ka la pynkhreh da ka AERMOD View™ model (Lakes Environmental Software). Kane ka model ka long ban pynkhreh ia ki pollutants, kum ka *Particulate Matter PM10 & PM2.5*, kiba la phylliew ha ka graphical format. Ki modeled pollutant concentrations ha ka operations phase scenario ki long kumne ha **Table No. 11**.

Table No.11: - Air Quality Predictions (March-2024 to May-2024)

Station No	Station Name	Baseline Max Value		Predicted GLC		Cumulative Concentrations	
		PM 10	PM2.5	PM 10	PM2.5	PM 10	PM2.5
AAQ1	Core Zone	62.15	23.56	0.022	0.011	62.172	23.567
AAQ2	Downwind Direction	65.45	29.82	0.776	0.383	66.226	30.202
AAQ3	Umlong	66.25	24.62	0.142	0.066	66.394	24.691
AAQ4	Umrasing	68.84	21.55	0.007	0.003	68.847	21.549
AAQ5	Mynkre	69.82	21.94	0.013	0.006	69.836	21.947
AAQ6	Thangskai	67.82	27.80	0.056	0.026	67.877	27.826
AAQ7	Lumshnong	66.59	20.59	0.058	0.027	66.647	20.613
AAQ8	Chieh ruphi	61.41	19.50	0.008	0.004	61.415	19.505
AAQ9	Brishyrnot	67.12	22.53	0.017	0.008	67.137	22.541

### 8.3 NOISE QUALITY

Ka *noise level* ha ka proposed mine ka long ba kan long na ka jingpyrshang jong ki *vehicles* ba iaid sha ka transportation jong ka limestone. Hynrei, ka jingshah khmih kaba khraw jong ka *noise* ka long tang na ka bynta ka bynta ba treikam. Nalor kata, ka mine ba la pynkhreh ban *opencast mechanized method* ha ka mining, kam don kano kano ka jingpynkhuslai ba heh ha ki shnong ba don ha ka shatei na ka mining operations.

Ka *noise pollution* ha ka *Mining area* ka long na ka jingwanrah ka *noise* na ka jingpyrshang jong ki *machinery* bad ka *transportation*. Ka *noise level* kan kham heh ha ka *core zone* na ka daw jong ka *drilling* bad ka *mining operations*. Hynrei, ka mine ba la pyntrei da ka *opencast mechanized method*, ki *noise levels* ki la long ba la pynkhreh katkum ki norms ba la buh da ki *governing agencies*. Ki jingtip ba la ioh ki la long ha kane ka **Table No. 12**.

Table No.12: -Summary of the Noise Level

Sl No	Location	Environ-mental Setting*	Average Day Noise level (dBA)			Average Night Noise level (dBA)			Day time (6.0 am to 10.0 pm)	Night time (10.00 pm to 6.00 am)
			Mar-2024	Apr-2024	May-2024	Mar-2024	Apr-2024	May-2024	Standard (Leq in dBA)	Standard (Leq in dBA)
<b>Core Zone</b>										
1	Core Zone	Industrial area	48.51	43.52	48.64	37.75	37.24	37.64	75	70
2	Guest house		48.92	43.37	52.93	43.11	34.14	38.35	75	70

Buffer Zone										
3	Umlong	Residential area	43.84	44.77	48.50	40.87	34.94	41.04	55	45
4	Umrasing		43.10	43.69	48.11	38.94	38.87	40.02	55	45
5	Musiang lamare (Old)		42.48	42.92	43.77	37.32	37.35	42.25	55	45
6	Thangskai		42.68	43.32	42.80	38.48	35.80	38.48	55	45
7	Mynkre		49.51	47.26	52.94	42.10	44.58	39.17	55	45
8	Chieh ruphi		49.43	49.71	49.85	38.22	38.18	39.84	55	45
9	Brishyrnot		51.82	51.89	52.40	41.62	41.65	41.17	55	45
10	Lumshnong		52.90	51.90	53.87	42.40	40.98	42.82	55	45

Ki *ambient noise levels* ki la thoh ha 10 tylli ki jaka ha kaba don ka Mine site. Ka *highest noise level* ka long ( $L_d/n = 61.8 \text{ dB (A)}$ ), kaba lah ban kynthup sha ka *local prevailing environment* (Traffic bad Mining activities). Hynrei, ki *noise levels* ba la ioh ha baroh ki jaka ki la long ba don ha ka *industrial zone limits* (75 dB (A)). Ha ki *villages*, ki levels ki la long ba don ha ka *permissible residential limits* (55 dB (A)).

### 8.3.2 NOISE CONTROL MEASURES

Ki *noise levels* kin long ha ka *acceptable limits* da kine ki *control measures*:

- Ka *sharp drilling bits*, ka *delivery of compressed air* ha ka *optimal pressure* bad ka *proper maintenance* jong ka *compressor*, *drilling machine*, *jack hammers*, bad ki *tipper trucks*. Ka *special attention* dei ban pyntikna ha ki *silencers* bad *mufflers*.
- Ki *ear muffs* ne kiwei pat ki *protective devices* kin long ba la buh sha ki staff kiba treikam ha ki *high noise prone areas* bad ka jingpynbiang ka rotation jong ki *workers* ban khanglad ia ka *exposure time*.
- Ka *limiting speed* jong ki *empty haulage vehicles/tippers* kan long ha ka *moderate level* ban weng ia ka *undue noise*.
- Ka *green belt* kin long ba pynkhreh ha baroh ka *lease boundary* ban *minimize* ia ka *propagation* jong ka *noise*.
- Ki *regular monitoring* jong ka *noise pressure level* kin long ba la pynkhreh hapoh bad shatei jong ka *mine lease area*.

### 8.4 WATER ENVIRONMENT

13 *water samples* ki la khanglad na kiwei pat ki jaka. Ar (2) ki *Ground water samples* bad 11 (11) ki *Surface water samples* ba la samla na ka study area ki la pynpaw ba ki parametres baroh ki long katkum ka *drinking water standard* jong ka IS 10500.

**Table No.13: -Summary of the Water Analysis Results  
(Ground water & Surface Water)**

Sl. No	Parameters	RESULTS Summer Season (Mar-2024 to May-2024)			Standards	
		Unit	GW1	GW2	Acceptable	Permissible
1	pH	-	7.31	7.82	6.5	8.5
2	Total Dissolved Solids	mg/l	204	290	500	2000
3	Total Alkalinity as CaCO <sub>3</sub>	mg/l	160.38	184	200	600
4	Total Hardness as CaCO <sub>3</sub>	mg/l	187.46	196	200	600
5	Calcium as Ca	mg/l	64.43	57.17	75	200
6	Magnesium as Mg	mg/l	6.39	21.16	30	100
7	Chlorides as Cl	mg/l	11.98	14.7	250	1000
8	Sulphates as SO <sub>4</sub>	mg/l	15.16	41.14	200	400
9	Nitrates as NO <sub>3</sub>	mg/l	3.56	6.19	45	NR
10	Fluorides as F	mg/l	0.48	0.1	1.0	1.5
11	Iron as Fe	mg/l	0.12	0.2	0.3	NR

GW1- Mynkre (Near Goldstone guest house) GW2- Lumshnong (Divine word secondary school)

Sl. No	Parameters	Unit	RESULTS Summer Season (March-2024 to May-2024)										
			SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11
1	pH	-	7.4	7.4	6.55	6.14	8.3	5.72	6.06	7.18	6.54	8.01	7.7
2	TDS	mg/l	191	184	760	82	210	93.2	144	163	124	210	293
3	DO	mg/l	5.1	6.4	4.9	5.5	6.5	5.7	4.9	5.2	4.8	5.6	7.2
4	Alkalinity as CaCO <sub>3</sub>	mg/l	41.63	41.62	23.76	40.58	112.86	31.34	65.34	20.82	31.24	95.04	114.42
5	Total Hardness as CaCO <sub>3</sub>	mg/l	47.53	153.01	49.44	47.46	160.68	56	133.9	162	66.43	189.52	170
6	Calcium as Ca	mg/l	16.3	40.83	16.32	16.37	53.85	16.3	40.8	12.3	12.28	61.2	48.94
7	Magnesium as Mg	mg/l	1.84	12.6	2.29	1.59	6.33	3.71	7.75	31.89	8.68	8.87	11.58
8	Chlorides as Cl	mg/l	24.6	19.81	13.82	14.7	12.9	19.73	14.74	24.6	19.72	15.66	24.6
9	Sulphates as SO <sub>4</sub>	mg/l	17.03	76.3	18.56	18.69	51.56	20.97	24.65	80.64	53.5	44.32	41.08
10	Nitrates as NO <sub>3</sub>	mg/l	3.56	6.3	2.11	3.19	4.32	3.15	5.32	5.4	5.93	5.89	3.17
11	Fluorides as F	mg/l	0.89	0.25	0.35	0.71	0.45	0.6	0.52	0.6	0.03	0.61	0.1
12	Iron as Fe	mg/l	0.14	0.14	0.09	0.12	0.1	0.1	0.12	0.15	0.16	0.11	0.1

Note:

- SW1- upstream surface water
- SW2- Downstream surface water
- SW3- Musiang lamare (Old) Tap water
- SW4- Musiang lamare (New) Tap water
- SW5- Umlong surface water
- SW6- Musiang lamare surface water (Nallah)
- SW7- Chieh ruphi
- SW8- Brishyrnot
- SW9- Thangskai
- SW10- Lumshnong



#### 8.4.1 Observation of Ground Water & Surface water:

##### Ki jingtip Analysis jong ka Ground Water ha ka Winter Season: -

- Ka *pH* ka pynkylla na **7.31** haduh **7.82**
- Ka *Total hardness* ka pynkylla na **187.46 mg/l** haduh **196 mg/l**
- Ka *Total dissolved solids* ka pynkylla na **204 mg/l** haduh **290 mg/l**

##### Ki jingtip Analysis jong ka Surface Water ha ka Winter Season ka pynpaw kumne:

- Ka *pH* ka pynkylla na **5.72** haduh **8.3**
- Ka *Total Hardness* ka pynkylla na **47.44 mg/l** haduh **189.52 mg/l**
- Ka *Total dissolved solids* ka pynkylla na **82 mg/l** haduh **760 mg/l**

#### 8.4.2 Impacts on Water Environment

Ka don *no seasonal nallah* ha ka leasehold area. Ka *seasonal nallah* ka lah ban iohi ha shatei jong ka leasehold area ha ka lammihngi-shatei (Eastern side). Ka *rainwater* ba wanrah na ki slopes bad ka slopes ha ka study area ka iar ia ka silt bad ka pebbles, kaba khaïr ba ka wanrah sha ka plateau area bad sha ka *water pond*.

Ka *rain water flow* ka ba shoh sha ka *waste dump area* kan long ban wanrah ia ka *waste dump erosion*. Ki *garland drains* ha ki jingheh ba heh kin long ban pynslem ia ka *entry* ka water flow na ka *dump*. Ka *steep dumping slope* ka wanrah ia ka *rolling* jong ka *waste material* na ka *dump*. Ka *retaining wall* kan long ban pynkhilut ha ka *foot* jong ka *dump* ban wah ia ka *rolling down* ka *waste material*.

#### Water Control Measures

Ki *adequate control measures* ki la pynkhreh ban weng ia ka wash-off na ka soil erosion bad ka *uncontrolled flow* jong ka *Mine water*. Ki *measures* ba la buh ki long kumne:

- Ha ka por *rains*, ka *water* kan *precipitate* ha ka mine bad ha ki jaka ba pyrshang, ban wah ia ka *velocity* ka *rain water flow* bad ka *settling* jong ki *heavy particles* da ka *gully checks* ban weng ia ka silt ba iaid lyngba ka *surface run-off* ha ki *valleys*.
- Ka *construction* jong ki *catch drains* bad *settling tanks* ha shatei jong ka dumps ban *channelize* ka *rainwater* bad ban weng ia ka *siltation/sedimentation*.
- Ka *green belt* kin long ba la pynkhreh ha baroh ka *lease boundary* ha ka *7.5 m safety barrier* bad ka jingdon ki *root bearing species*. Ka *garland drain* kan long ha baroh ka *lease boundary* ban pynslem ia ka *rainwater* sha ka *working pit*.
- Ka *water* ba la *stored* kan nym dei ban *release directly* sha ki *streams/nallah*.

Ka don no toxic element ha ka material ba la mine-out, kaba lah ban *contaminate* ka *ground/surface water*. Kumta, ka long kaba pher ba ka mining kan nym ktah ia ka surface water regime.

## 9.0 LAND ENVIRONMENT

Ka *Land use/Land cover map* ba la pyndonkam na ka satellite image ba thymmai ka la pynkhreh na ka bynta ka proposed project activity. Ka *limestone mine* ka long ka mine thymmai, ka *present land use* ha ka *core zone* (lease area) ka la pynpaw ha kane ka **Table No. 14.**

**Table No.14: -Land use Pattern**

Sl. No	Particulars	Present Land Use (Acres.)	Land Use at the end of Plan Period (Acres.)	Land Use at the end of conceptual Period (Acres.)
1	Area for Mining	0.00	7.19	15.54
2	Area for Roads	0.67	0.73	0.00
3	Area for Greenbelt	0.00	2.29	2.29
4	Overburden/Waste Dumping	0.00	2.15	0.00
5	Others (Garland drain & Retaining wall)	0.00	0.26	0.36
6	Unused area	17.52	5.57	0.00
<b>Total</b>		<b>18.19</b>	<b>18.19</b>	<b>18.19</b>

## 9.1 Soil Quality

Seven (7) tylli ki *Soil samples* ki la samla na ka bynta ka *analysis*. Ki *Soil samples* ki pynpaw ba don *no much variation* ha ka *chemical composition*. Ki *soils* ki long *mostly loamy sand* ha ka texture. Ki *soil analysis data* ki pynpaw ba ka *pH values* ka pynkylla na **7.2 haduh 9.5**. Ka *soil pH* ka long kaba kongsan ha ka jingdonkam jong ka *availability of nutrients*. Ka *soil microbial activity* bad ka *solubility* jong ki *metal ions* ki la dei ban long katkum ka *pH*.

**Table No.15: -Chemical Properties of Soil**

Sl No	Parameters	Unit	Results						
			S1	S2	S3	S4	S5	S6	S7
1	pH	-	7.51	7.21	8.34	7.11	8.52	9.51	9.28
2	Electrical Conductivity	µS/cm	90	76	114	64	95	69.47	168
3	Chloride	mg/kg	180.3	145.43	107.62	54.22	17.95	73.49	35.8
4	Sodium Absorption Ratio	meq/l	0.22	0.32	0.15	0.18	0.26	0.35	0.38

5	Moisture Content	%	2.26	1.15	2.15	1.92	1.85	1.62	1.75
6	Available Sodium	mg/kg	167.2	81.9	14.38	195.84	216	104.2	149.5
7	Available Potassium	mg/kg	152.08	102.83	69.3	171.3	78.64	82.49	108.6
8	Available Phosphor	kg/ha	23.21	35.82	39.2	30.28	410.47	149.63	29.4
9	Organic Matter	%	115.2	174.2	135.2	158.6	4.21	1.28	5.29

Locations: S1: Chiehruphi, S2: Thangskai, S3: Lumshnong, S4: Core zone, S5: Umlong, S6: Musiang lamare, S7: Mynkre

### 9.3 Solid Waste Management

ka plan mining period, ka jingdonkam jong ka *overburden waste material* ka long **1622817.53 Tonnes**. Kane ka waste material ka kynthup ia ka *weathered sandstone* kaba don ka *density* jong 2.45 tonnes/m<sup>3</sup>. Ka *total waste volume* ha ka plan period ka long **662374.50 m<sup>3</sup>** (1622817.53 tonnes) kaba la wanrah na u snem ba 1 haduh 5 jong ka plan period. Ka *overburden waste* kan beit sha ka *temporary waste dump* (TWD-1) ha ka jaka ba la buh ha 1.35 Ha, bad ka jingheh ka long 20.00m ha ka *terracing manner* ha kane ka plan period. Ha u snem ba 2, ka 0.79 Ha area (TWD-2) ka long 4 terrace ba ka *maximum height* ka long 10 m bad ka *repose angle* ka long 28 degree. Ka *waste material* ba la wanrah ha ka *mining operations* kan nym long ban *mix* bad ka *non-saleable sub-grade mineral*.

- Ki *retaining* bad *protective walls* ha ka *bottom* jong ki dumps kin long ba la pynkhreh.
- Ka *topsoil* ba la wanrah kan long pyndonkam na ka bynta ka *strengthen* jong ki *approach roads & Greenbelt development* ha ka *mining operations*.
- Ka *garland drains* kin long ba pynkhreh ha ka *bottom* jong ka dump na ka bynta ka *collecting drain water* bad na ka bynta ka *regulating* ka *water flow* na ka mine. Ka *water* na ka *garland drains* kan long beit sha ka *silt settling tank* (SST) bad ka *rain water harvesting pond* (RWHP). Ka *overflow* na ka RWHP kan beit sha ka *natural course* jong ka *rain water*.
- Ka *non-mineralized zone* bad ki *open areas* kin long shong na ka *suitable local trees*.

### 10.0 FLORA AND FAUNA

Ka *area* ka don ka *diverse flora* bad *fauna*, kaba don ki *dense forests* ba kynthup ia ka *pine, bamboo*, bad kiwei pat ki *endemic plant species*. Ka *rich biodiversity* ka don ki *animals* kum ki *elephants, leopards*, bad kiwei ki *bird species*, kaba pynlong ia ka *area* kum ka *heaven* na ka bynta ki *nature enthusiasts*.

Ka *vegetation cover* ka long ba duna na ka daw jong ka *scanty rainfall*, hynrei ha ki *valleys* kiba bun. Ka *vegetation type* ka lah ban *classify* kum ka *South Indian Tropical Moist Deciduous Forests* bad kiwei pat ki *elements* jong ka *Deciduous Teak forests* ki la long. Ka *mining operation* kan nym ktah ia ka *flora* ba don, na ka daw ba ka *deforestation* kan nym long.

Kum ka *jingpynshai*, ki *animals*, khamtam ki *vertebrates* bad ki *winged invertebrates* ki iaaid na kawei sha kawei pat na ka bynta ka *food, shelter, mate*, ne kiwei pat ki *biological needs*. Ki *wildlife habitats*, ki *wetlands* ne ki *IBAs* ki nym long ha ka study area. Kumta, ka don ka *nominal* ha kane ka study area, hynrei ka *core zone* bad *buffer zone* ki la long *no occurrence* jong ki *Rare, Endangered, Endemic, ne Threatened (REET) species*.

Ka don ka *no Sanctuaries, National Parks, Tiger Reserve, Biosphere Reserve, Elephant Corridor*, ne kiwei pat ki *protected areas* ha 10 km radius na ka *core zone*.

Ha ki *mammals*, ki *squirrels, mongoose, rats*, bad *rabbits* ki la long ki *rare* ha ka survey. Ki *monkeys* ruh ki long *rare*. Ha ki *reptiles*, ki *lizards* bad *garden lizards* ki long ba kham *common*. Ki *snakes* ne ki *monitor lizard* ki nym ioh ha ka survey. Ki *amphibians* ruh ki long *rare*. Ki *resident birds* kiba don na ka bynta ki *Crows, parrots, doves, Sparrows, swifts, quails*, bad *mynas*.

### **10.1 Disaster Management**

Limestone mine ka long ka mining ba shisien bad ka don shibun ka *risk* ha ka mining. Hynrei, kum ka *precautionary measure*, lada don kano kano ka *disaster* ha ka mining area, ka *first aid committee* jong ki mines kaba kynthup ia ki nongshong ba la buh, kin wanrah der sha ka *situation* bad lada donkam, ki *victim's* kin wanrah sha ka *primary health center*.

Ka *working* ka la pynkhreh ha ka jingduna ka jingheh, kumta ka *heavy blasting* ka nym donkam, kumta ka *risk assessment* ne *disaster management* ka nym donkam. Ki *high risk factors* kum ka *Earthquakes, Landslide, Subsidence, Flood, Fire* bad kiwei pat, ki nym long kiba ka project ka khmih shaphang, la kumno ka *five years plan period*. Kumta, ka *emergency plan* na ka bynta ka *quick evacuation* bad ki *protective measures* nym long ba la pynkhreh. Hynrei, ka long ruh ba *no local habitant* ka don, na ka daw ba ka *working area* ka long shabar na ka shnong.

### **10.2 Plantation Program**

Ka *Plantation* kan long ba la pynkhreh ha ka mining lease area katkum ka *plantation program*. Ki kam kiba la pynkhreh ki kham iarap ban kyntiew ia ka *floral cover* jong ka

area. Ka greenery bad ka plantation development kan wanrah ia ki micro fauna, ki birds, bad kiwei pat ha ka area. Ka assistance kan long na ka local forest department ha ka jingpynkhreh ki species plant ba kin long ha ka green coverage bad ban shna ka jingbha kham shyrkhei.

Ka land requirement na ka projek ba la pynkhreh ka long **18.19 Ha**, na ka **1.78 Ha land** ka la buh na ka green belt bad ka plantation, Kumjuh, ka plantation kan long ba pynkhreh ha baroh ki haulage road bad ha outside ka mine area.

**Table No.16: - Plantation area and No of plants proposed**

Description	Particular
Total land available for green belt (Ha)	1.78
No. of samplings per Ha	2000
Total no. of trees will be developed in the given area	3,540
Expected rate of survival	80%

Ka table ba la pynpaw ka long ha kane ka **year wise development** jong ka afforestation ha ka greenbelt bad kiwei pat ki proposed plantation area.

**Table No.17: -Schedule of afforestation**

Sl No	Year	Plantation/ Greenbelt area in Ha	No of plants
1	2024-25	0.34	680
2	2025-26	0.35	680
3	2026-27	0.32	640
4	2027-28	0.43	860
5	2028-29	0.34	680
<b>Total</b>		<b>1.78</b>	<b>3,540</b>

Ka total 3,540 Nos. ki shrubs bad trees ki la pynkhreh ha ka 1.78 acres ka green belt area. Ki trees kin long pynkhreh ha ki rows ba shym la don ha ka jingbuh jingrung >2000 trees/acres. Ki interspaces kin long pynkhreh da ki grasses, bushes, bad hedges ba don ki plants of medicinal value. Ki short trees (<10 m height) kin long ha ki first rows (shatei plant side) jong ka green belt. Ki tall trees (>10 m height) kin long ha ka outer row (away from plant side).

### **11.0 SOCIO-ECONOMIC BENEFITS**

Na ka bynta ki *environmental protection measures* kiba la pynkhreh, ka company ka la khein bha ia ka *corporate social responsibility* bad kum ka *good corporate citizen*, ka la pynlong ia kiwei pat ki kam ha ki *surrounding areas* jong ka mine.

Ban *enhance* ka jingdonkam jong ka *mining industry* bad *share a greater responsibility* naba ka long kum ka *employer* hynrei pat ka long kum ka *community* ba shong ha shatei jong ka lease area. Kumta, ka long kaba donkam ban *provide minimum facilities* ia ki *surrounding villages* na ka bynta ka *better living standard* jong ki.

Ka la pynkhreh ba ka *socio-economic development work* ha ki shnong ba *nearby* kan long da ka *mine management* ban *strengthen* ka jingdonkam *infrastructural needs* jong ki *villagers* kum ki *education, medical, drinking water* na ka bynta ki *human beings* bad *animals, road network, plantation, rain water harvesting* bad kiwei pat.

Ka *direct employment* kan long na ka *mining operations* bad ki *preference* kin long sha ki *nearby villagers* katkum ka *qualification/experience* jong ki, ka *indirect self-employment* ruh kan long na ka bynta ka projek mining ba la pynkhreh. *M/s. Goldstone Cements Limited* ka la pynkhreh ban *provide financial assistance* jong **Rs 10.0 Lakhs** na ka bynta ka *development of social infrastructure* jong ka area.

#### **Ka la pynkhreh ban pyntrei ia ki *CSR activities* ba la pyntip kumne:**

- Assistance sha ki educational institutions kiba don ha ka Taluk da ka jingpynbiang ia ki “Teaching aids, Books & Periodicals”.
- Ki Scholarships na ka bynta ki best outstanding students.
- Ka jingpynkhreh ia ki Health care camps bad ka distribution of medicines free, bad ka organizing occupational health camps lyngba ki trained doctors.
- Ka Employment oriented training sha ki youth.
- Ki training programs ba la pynkhreh na ka bynta 25 girl students na ki nearby villagers. Ka training programme kan long ha baroh ki snem.
- Computer training programmes na ka bynta ki SSLC passed candidates.
- Tailoring training.
- Fashion designing na ka bynta ki SSLC passed/failed candidates.

### Agricultural Improvement

Ki local's ha ka area kin ioh jingmyntoi na ki social program ba la pynkhreh. Ka help ha ka jingpynkhreh ha ka association bad ka nearby agricultural department na ka bynta ka soil testing bad ki technical inputs na ka bynta ka increasing yield.

### FINANCIAL IMPLICATIONS

Ka below table ka pynpaw ia ka overall investment ha ki environmental safeguards bad ka recurring expenditure na ka bynta ka successful monitoring bad ka implementation of control measures.

**Table No.18: - Cost of Environmental Protection Measures**

SI No	Particulars	Cost (Lakh Rs.)
<b>I</b>	<b>Pollution Control</b>	
1.1	Air Pollution (dust suppression along road water sprinklers)	6.00
1.2	Plantation & Maintenance	12.00
1.3	Environment Monitoring (Air, Water, Noise & Soil Monitoring)	6.50
1.4	Construction & Maintenance of Settling Tank, Garland Drains etc.	3.00
1.5	Personal Protective Equipment (Helmets, Safety Shoes, Dust Masks, Ear Plugs etc)	2.50
1.6	Provision of fencing around mine pit	8.25
1.7	CER activity as prescribed by SEAC	23.552
	<b>Total</b>	<b>61.802</b>

### 13.0 CONCLUSION

Ka projek ba la kyntait ka nym don kano kano ka *serious negative impact* ha ka mariang, hynrei ka la wanrah ka *improvement* ha ka *socioeconomics* jong ki paidbah kiba don bynta ha ka projek bad kiba shong ha shatei. Kane ka *Mining project* ka long ka projek ba kongsan na ka bynta ka *development* jong kane ka *backward area*.

Kumta, ka lah ban *summarize* ba ka *development* jong M/s. Goldstone Cement Limited kan don ka *positive impact* ha ka *socio-economic* jong ka *area* bad kan wanrah ia ka *sustainable development* jong ka *region*.

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