

# **EXECUTIVE SUMMARY**

For

## **ANAIMALLUR ROUGH STONE QUARRY**

**Over an extent of 4.50.0Ha.**

At

**Survey No: 374/5 (Part 12)**

**Villages: Anaimallur**

**Taluk: Arcot**

**District: Vellore (Earlier)**

**State: Tamil Nadu**

By

**Mrs. S. Arutselvi,**

**W/o.Mr.A.V.Sarathy,**

**No. 34, R-1, Vellore Main Road,**

**Arcot, Vellore District, Tamil Nadu.**

**Pincode : 632503**

(Project termed under Schedule of 1(a) Mining of Minor Minerals 'B1' category as per EIA Notification 2006 and its Amendments thereafter and As per the O.M issued vide F.No. L-11011/175/2018-IA-II (M), dated: 12.12.2018)

**EIA Consultant**

**HUBERT ENVIRO CARE SYSTEMS PRIVATE LIMITED, CHENNAI**

**November 2020**

## EXECUTIVE SUMMARY

### 1. Project Description

The total extent area of the quarry is 4.50.0Ha, situated at S.F. No.374/5 (Part 12), Anaimallur village, Arcot Taluk, Vellore District, Tamil Nadu State.

The District Collector of Vellore had issued the precise area communication letter to produce the approved Mining Plan within a period 90 days as per Rule 8-C (3b) of Tamil Nadu Minor Mineral Concession Rules, 1959 vide RC No. 317/2019(Mines), dated 26.11.2019.

Subsequently, submitted the Mining Plan for the subject area and the same was approved by directorate of Geology and mining, Vellore vide Rc.No.317/2019, dated 28.01.2020.

Project termed under Schedule of 1(a) Mining of Minor Minerals 'B2' category as per EIA Notification 2006 and its Amendments thereafter and as per the O.M issued vide F.No. L-11011/175/2018-IA-II (M), dated: 12.12.2018 considering the cluster the project is termed under Schedule 1(a) Mining of Minor Minerals 'B1' Category, TN SEIAA vide File No. 7679/2020.

The proposal was appraised during 169<sup>th</sup> SEAC meeting held on 07.08.2020 and 399<sup>th</sup> SEIAA meeting held on 24.09.2020 and ToR was issued vide Letter No. SEIAA-TN/F.No.7679/SEAC/ToR-770/2020, dated: 06.10.2020 for the preparation of EIA/EMP report.

The draft EIA/EMP report will be submitted for Public Hearing (PH). After completion of Public Hearing, the minutes issued will be incorporated in the EIA report along with action plan by the proponent. Final EIA will be submitted to TNSEAC for further appraisal of the project and obtaining Environment Clearance.

### 2. Management Commitment

Project Proponent will firmly address all the EC and its requirements and will execute the Environmental Management Plan.

### 3. Environmental Sensitive Areas

As seen in **Table-I** below, there are no Environmental sensitive areas within 15km Radius. Thus the project does not attract the special conditions and general conditions as per EIA Notification.

**Table-1 Environmental Sensitive areas within 15km of the project**

S. No.	Areas	Distance & Direction from project boundary			
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	<b>Monuments:</b>			
		<b>S.No</b>	<b>Monuments</b>	<b>Distance (~Km)</b>	<b>Direction</b>
		1	Rock sculptures and caves Vilapakkam	4.50	N
		2	Cannon Arcot	10.86	NE
		3	Adjoining Building to the masjid and two ponds Arcot	10.84	NE
		4	Masjid and two ponds in the west of the citadel Arcot	10.80	NE
		5	Delhi gate Arcot	11.56	NE
		6	North Eastern corner of the outer rampart of the old fort at Arcot Muppadvetti	11.63	NE
2	Areas which are important or sensitive for ecological reasons – Wetlands, Watercourses or other water bodies, coastal zone, biospheres, mountains, forests	<b>Water Bodies :</b>			
		<b>S. No</b>	<b>Places</b>	<b>Distance (~Km)</b>	<b>Direction</b>
		1	Kaveri odai	2.83	N
		2	Palar River	10.38	NNE
		3	Ponnai River	12.11	N
		4	Otterikanar R	12.81	VNW
		5	Mahandravadi Channel	12,97	ENE
		6	Kaveripak Main channel	12.9	ENE
		7	Isanayakanopu R	14.4	WSW
		8	Naganadi R	13.83	SW
		9	Irumbedumaduwu R	12.39	SSE
		<b>Reserve Forest:</b>			
		<b>S. No</b>	<b>Places</b>	<b>Distance (~Km)</b>	<b>Direction</b>
		1	Palamadai RR	10.05	W
		2	Kaniyambadi RF	8.05	WSW
		3	Punganur South RF	5.69	W
4	Punganur RF	4.91	NW		
5	Punganur RF	12.85	NW		
6	Kilminnal RF	14.44	NNW		
7	RF	14.89	NNW		
8	Tiruvalem RF	13.58	N		

		9	Puttur Estate RF	3.21	SSE
		10	Vettiyantoluvam RF	8.53	SSW
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	Nil			
4	Inland, coastal, marine or underground waters	<b>Water Bodies :</b>			
		<b>S. No</b>	<b>Places</b>	<b>Distance (~Km)</b>	<b>Direction</b>
		1	Kaveri odai	2.83	N
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		9	Irumbelumaduvu R	12.39	SSE
5	State, National boundaries	Nil			
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	➤ SH-129 ≈ 3 km (W)			
7	Defence installations	Nil			
8	Densely populated or built-up area (Nearest Town, City, District)	<b>S. No</b>	<b>Places</b>	<b>Distance (~Km)</b>	<b>Direction</b>
		1	Anaimallur	2	N
		2	Nambarai	1.3	S
		3	Padi	1.5	E
		4	Vedarajipuram	1.8	W
					<b>Population as per Census 2011</b>
					2494
					1618
					382
					1532

9	Areas containing important, high quality or scarce resources, (groundwater resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	<p><b>Water Bodies :</b></p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Places</th> <th>Distance (~Km)</th> <th>Direction</th> </tr> </thead> <tbody> <tr><td>1</td><td>Kaveri odai</td><td>2.83</td><td>N</td></tr> <tr><td>2</td><td>Palar River</td><td>10.38</td><td>NNE</td></tr> <tr><td>3</td><td>Ponnai River</td><td>12.11</td><td>N</td></tr> <tr><td>4</td><td>Otterikanar R</td><td>12.81</td><td>VNW</td></tr> <tr><td>5</td><td>Mahandravadi Channel</td><td>12.97</td><td>ENE</td></tr> <tr><td>6</td><td>Kaveripak Main channel</td><td>12.9</td><td>ENE</td></tr> <tr><td>7</td><td>Isanayakanopu R</td><td>14.4</td><td>WSW</td></tr> <tr><td>8</td><td>Naganadi R</td><td>13.83</td><td>SW</td></tr> <tr><td>9</td><td>Irumbelumaduvu R</td><td>12.39</td><td>SSE</td></tr> </tbody> </table> <p><b>Reserve Forest:</b></p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Places</th> <th>Distance (~Km)</th> <th>Direction</th> </tr> </thead> <tbody> <tr><td>1</td><td>Palamadai RR</td><td>10.05</td><td>W</td></tr> <tr><td>2</td><td>Kaniyambadi RF</td><td>8.05</td><td>WSW</td></tr> <tr><td>3</td><td>Punganur South RF</td><td>5.69</td><td>W</td></tr> <tr><td>4</td><td>Punganur RF</td><td>4.91</td><td>NW</td></tr> <tr><td>5</td><td>Punganur RF</td><td>12.85</td><td>NW</td></tr> <tr><td>6</td><td>Kilminnal RF</td><td>14.44</td><td>NNW</td></tr> <tr><td>7</td><td>RF</td><td>14.89</td><td>NNW</td></tr> <tr><td>8</td><td>Tiruvalam RF</td><td>13.58</td><td>N</td></tr> <tr><td>9</td><td>Puttur Estate RF</td><td>3.21</td><td>SSE</td></tr> <tr><td>10</td><td>Vettiyantoluvam RF</td><td>8.53</td><td>SSW</td></tr> </tbody> </table>	S. No	Places	Distance (~Km)	Direction	1	Kaveri odai	2.83	N	2	Palar River	10.38	NNE	3	Ponnai River	12.11	N	4	Otterikanar R	12.81	VNW	5	Mahandravadi Channel	12.97	ENE	6	Kaveripak Main channel	12.9	ENE	7	Isanayakanopu R	14.4	WSW	8	Naganadi R	13.83	SW	9	Irumbelumaduvu R	12.39	SSE	S. No	Places	Distance (~Km)	Direction	1	Palamadai RR	10.05	W	2	Kaniyambadi RF	8.05	WSW	3	Punganur South RF	5.69	W	4	Punganur RF	4.91	NW	5	Punganur RF	12.85	NW	6	Kilminnal RF	14.44	NNW	7	RF	14.89	NNW	8	Tiruvalam RF	13.58	N	9	Puttur Estate RF	3.21	SSE	10	Vettiyantoluvam RF	8.53	SSW
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10	Areas already subjected to pollution or environmental damage (those where existing legal environmental standards are exceeded)	Ranipet is critically polluted area as per CEPI & at a distance of 14.73 km N.																																																																																				
11	Areas susceptible to natural hazard which could cause the project to present environmental problems, (earthquakes, subsidence, landslides, erosion or extreme or adverse climatic conditions)	The area under study falls in Zone-III.																																																																																				

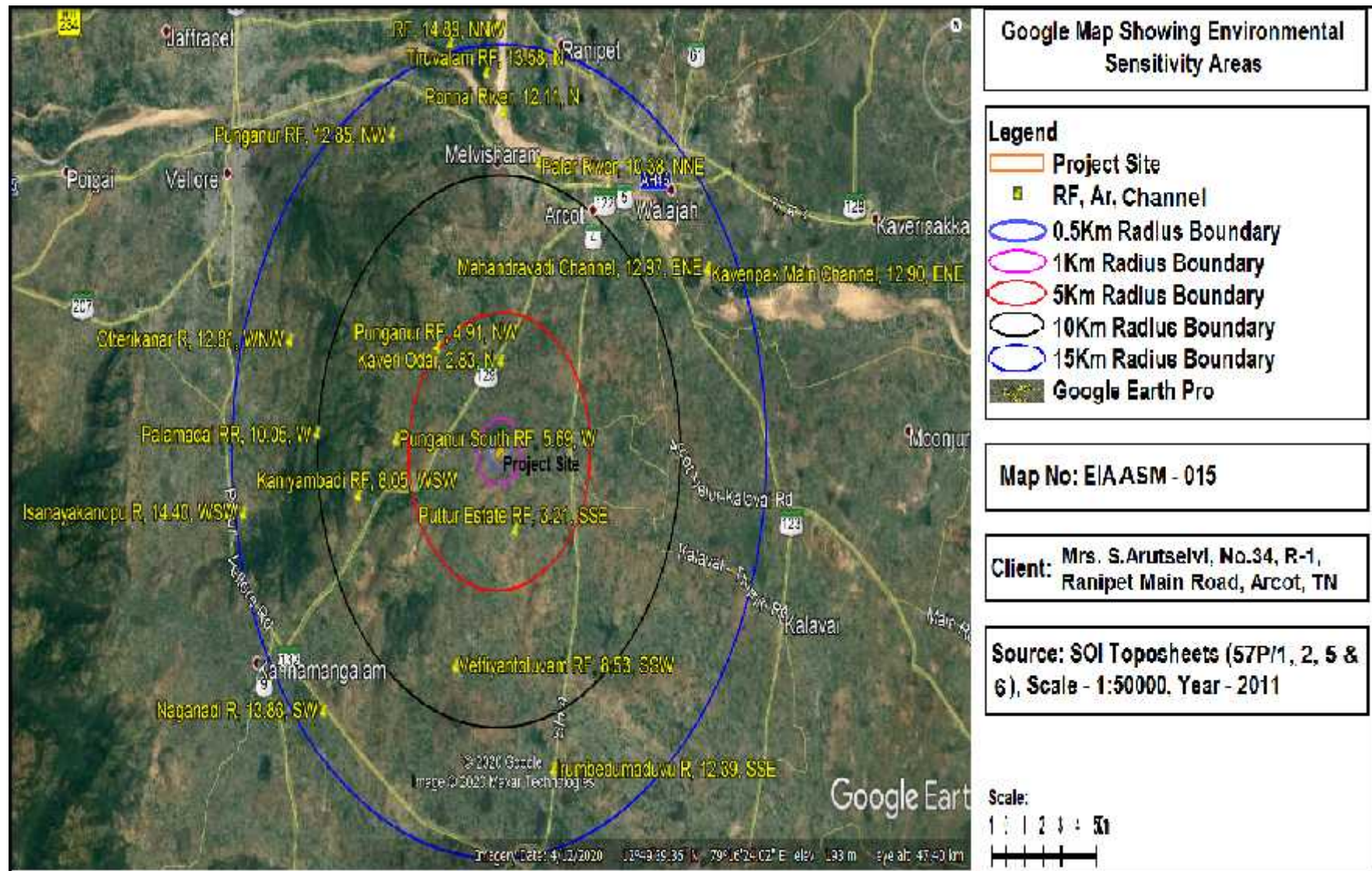


Figure-2 Google image for Environmental Sensitive areas demarcated within 15km radius of the project site

#### 4. Rough Stone & Gravel Quarry Reserves

- The estimated Geological Reserves of Rough stone estimated based on the Geological cross sections was 31, 28,158 m<sup>3</sup> of Rough stone and 48,888 m<sup>3</sup> of Weathered rock.
- The Mineable Reserves have been arrived as 13, 28,158 m<sup>3</sup> of Rough Stone and 35,728 m<sup>3</sup> of Weathered rock.
- The Proposed production capacity is 13, 28,158 m<sup>3</sup> of Rough Stone and 35,728 m<sup>3</sup> of Weathered rock for five years.

#### 5. Summary of the Magnitude of Operation

- The Rough stone quarrying operation is proposed to carry out by opencast semi mechanized method by formation of benches. Benches are proposed with a height of 5m & 5m width. Major machineries are Compressor, Jack hammer, and excavator is used in proposed quarry. Tippers and dumpers will be used for transportation.
- Proposed Production Capacity is 13, 28,158 m<sup>3</sup> of Rough Stone and 35,728 m<sup>3</sup> of Weathered rock for five years for 5 years.
- The mineable reserves have been computed 13, 28,158 m<sup>3</sup> of Rough Stone and 35,728 m<sup>3</sup> of Weathered rock for five years.
- The effective geological reserves and mineable have been worked out as 31, 28,158 m<sup>3</sup> of Rough stone and 48,888 m<sup>3</sup> of Weathered rock.

#### 6. Project Requirements

##### I. Land requirement:

- The Rough stone mine is over an extent of 4.50.0 Ha.
- Lease area located at S. F. No. 374/5 (Part-12), Anaimallur village, Arcot Taluk, Vellore District, Tamil Nadu State., lies in the latitude of 12°49'18.52" N to 12°49'28.99" N and longitude of 79°16'13.20" E to 79°16'21.80" E.
- The lease area topography is hilly terrain; site elevation is 240 to 295m (max) AMSL. The area is marked in the survey of India Topo sheet No. 57 P/5.

##### Quarry Lease area breakup:

S. No	Description	Area to be required at the present Mining Plan Period (Ha.)
1	Area under Quarrying pit	3.34.08
2	Infrastructure	0.01.00
3	Roads	0.02.00
4	Unutilized	0.64.57
5	Green belt	0.48.35
<b>Total</b>		<b>4.50.0</b>

## **II. Water Requirement**

- The total water requirement is 5.4 KLD (Drinking & Domestic purpose-1.9KLD, Dust suppression -1.5 KLD & for Greenbelt- 2.0 KLD). The total water requirement will be met from Road tankers.
- The rough stone quarry will not produce toxic effluent in the form of solid, liquid or gas.
- No wastewater will be discharged by quarry operation. Domestic wastewater will be disposed to Septic Tank followed by soak pit.

## **III. Power & Fuel Requirement**

- No power is required during mining operations. Working is restricted on day time only between 7 Am to 6 Pm.
- 10,46,140 liters of HSD for the entire project life will be brought from nearby diesel pumps.

## **IV. Manpower**

- Manpower requirement for the proposed project is 40 Nos.

## **V. Solid Waste Generation & Management**

- Municipal solid waste (18 kg/day) will be segregated as Organic (10.8 Kg/day) will dispose through local municipal bins and inorganic waste (7.2 kg/day) will be disposed through TNPCB authorized recyclers.
- Waste diesel Oil will be collected in leak proof containers and disposed to TNPCB Authorized Agencies for Reprocessing/Recycling.

## **7. Project Cost**

- The total capital investment on the project is Rs. 4,62, 30,000/- including EMP cost is 7, 50,000/-.

## **8. Description of Environment**

### **Project Influence Area (PIA)/Study Area:**

An area covering 10 km radius from Anaimallur Rough stone quarry boundary has been earmarked as study area for baseline studies.

### **Study Period:**

The baseline environmental surveys were carried out during (Jan to March 2020) within the study area.



### **Summary of Baseline Studies:**

- Site has an undulating terrain with level 240 – 295 m Above MSL.
- The project site falls under Zone- III as per IS 1893 (Part- I).
- The predominant wind direction is East during study period.
- Max Temperature: 35<sup>0</sup>C Min Temperature: 20<sup>0</sup>C & Avg. Temperature: 27.5<sup>0</sup>C
- Average Relative Humidity: 71.56 %
- Average Wind Speed: 2.86 m/s

### **Ambient Air Quality Monitoring**

The ambient air quality has been monitored at 8 locations for 12 parameters as per NAAQS, 2009 within the study area. Maximum concentrations of all the parameters are well within the National Ambient Air Quality Standards (CPCB, NAAQS, 2009):

- PM<sub>10</sub> ranged between 52.88 µg/m<sup>3</sup> to 61.37 µg/m<sup>3</sup> (NAAQ standard 100 µg/m<sup>3</sup>)
- PM<sub>2.5</sub> values varied from 27.48 µg/m<sup>3</sup> to 31.78 µg/m<sup>3</sup> (NAAQ standard 60 µg/ µg/m<sup>3</sup>)
- SO<sub>2</sub> levels varied from 7.86 µg/m<sup>3</sup> to 11.45 µg/m<sup>3</sup>. (NAAQ standard is 80 µg/m<sup>3</sup>)
- NO<sub>x</sub> ranged between 14.71 µg/m<sup>3</sup> to 21.92 µg/m<sup>3</sup>. (NAAQ standard is 80 µg/m<sup>3</sup>)

### **Noise Environment**

- In industrial area day time noise levels was about 66.7 dB(A) and 41.5 dB(A) during night time, which is within the prescribed limit by CPCB (75 dB (A) Day time & 70 dB (A) Night time).
- In residential area day time noise levels varied from 52.8 dB(A) to 54.8 dB(A) and night time noise levels varied from 42.5 dB(A) to 44.5 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels in Residential area is within the limit prescribed by CPCB (55 dB (A) Day time & 45 dB (A) Night time).

### **Ground Water Quality**

- The prevailing status of water quality at 8 locations for ground water has been assessed during the study period. Groundwater samples are within the permissible limits specified for drinking water quality standards as per IS: 10500 (2012).
- The average pH ranges from 6.77 and 8.11
- TDS value varied from varied from 506 mg/l – 1313 mg/l.
- The sulphate content of the ground water of the study area is varied between 35.7 mg/l – 146.7 mg/l meeting the acceptable limit of the IS 10500: 2012.

### **Surface Water Quality**

- Surface water samples are within the limits as per ISI-IS2296-1982 Class C (Drinking water source with conventional treatment followed by disinfection).
- pH ranges from 7.08 to 8.22
- Total Dissolved Solids range from 361 mg/l to 1129 mg/l.
- Total hardness ranges between 176.4 mg/l to 464.6 mg/l.
- The BOD value ranges from 1.9 mg/l to 18 mg/l.
- COD value 12 to 97 mg/l.
- The concentration of heavy metals like As, Cd, Cr, Pb, Mn, Hg, Ni and Se at all locations are within the limits of IS 2296:1992(Class-C: Drinking water with conventional treatment followed by disinfection.)

### **Soil Quality**

- Soil sampling was carried out at eight (08) locations in the study area. It is observed that, Soil types are Sandy Clay Loam, Loam, Loam sand, and clay and the soil samples are slightly alkaline in nature.
- The pH of the soil samples ranged from 6.72 to 7.94
- Conductivity of the soil samples ranged from 127 to 652 µmhos/cm.
- Nitrogen content ranged from 149 mg/kg to 304 mg/kg
- Phosphorous ranged from 12.1 mg/kg to 34.6 mg/kg.
- Potassium content ranges from 167 mg/kg to 306 mg/kg.

### **Biological Environment**

- The rough stone quarry is located at Anaimallur village. Therefore, no management plan is required. The proposed project will not have any impact of terrestrial ecology of the area. Quarry area can be developed with greenbelt by planting native species to maintain the good environment.
- There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Wildlife corridors and Tiger/Elephant Reserve found within 10 km radius of the project site.

### **Socio-economic Conditions:**

- The total population of Vellore district was 3,936,331 and it is ranked 3<sup>rd</sup> place in terms of the highest population in Tamil Nadu. The population density of Vellore district has 648 persons per sq.km.
- The 2011 Census states that, the Vellore district has 43.2 % urban population.
- As per the 2011 Census, sex ratio of the district is 1007, higher than the State Sex ratio of 996. The district has recorded the literacy rate of 79.2 %.

## 9. Anticipated Environmental Impacts with Mitigation Measures

Anticipated impacts on the environmental and social attributes, which are likely to arise due to quarry operations have been identified, predicted and evaluated.

- Anaimallur Rough stone is a Government land, over extent of 4.50.0Ha, at Anaimallur village, Arcot Taluk, Vellore District, Tamil Nadu. There are no R&R issues.
- The lease area topography is hilly terrain with site elevation is 240m – 295 m AMSL. Anaimallur Rough stone will be provided with self-sufficient infrastructure like office, Toilets, to minimize impact/strain on the existing infrastructure.
- All the necessary Air pollution control measures will be adopted to control the fugitive emissions, particulates, SO<sub>2</sub> and NO<sub>x</sub>.
- The impact on air environment was studied through air quality modeling studies. The 1<sup>st</sup> highest 24hour average concentrations of NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and SO<sub>2</sub> at all receptor locations are found to be well within the National Ambient Air Quality Standards (NAAQS), 2009. The maximum concentration observed due to proposed mining for TSPM is 232 µg/m<sup>3</sup>, PM<sub>10</sub> is 37 µg/m<sup>3</sup>, PM<sub>2.5</sub> is 28 µg/m<sup>3</sup>, SO<sub>2</sub> is 0.33 µg/m<sup>3</sup> and NO<sub>x</sub> is 7 µg/m<sup>3</sup>, respectively. So it can be concluded that even after operation of quarry the impact envisaged is moderate.
- Baseline study showed that the noise levels in both Industrial area and in Residential area are observed that the day equivalent and night equivalent noise levels at all locations are within the prescribed CPCB standards. The designed equipment with noise levels not exceeding beyond the requirements of Occupational Health and Safety Administration Standard will be employed.
- The water demand for the project will be met from private tankers. Proper garlands will be provided around the quarry. Domestic sewage will be disposed to septic tank followed by soak pit. Septic Tank will be cleaned periodically. There is no effluent generation due to mining activities.
- The solid waste generated may impact soil quality, water quality and public health if not regulated properly. Municipal Solid Wastes including food waste are disposed to municipal bin. Waste Diesel oil will be properly disposed through authorized recycler as per the Hazardous and Other wastes (Management and Transboundary Movement) Rules 1989 and subsequent amendment in 2016. Top soil will be stored and used for afforestation within lease area.
- To reduce the adverse effects on flora/fauna status that are found in project area due to deposition of dust generating from mining operations, water sprinkling and water

spraying systems will be ensured in all dust prone areas to arrest dust generation.

#### **10. Greenbelt Development**

An area of 0.48.35 Ha hectare land was allotted for greenbelt development during first 5 years of mining plan. Mrs. S. Arutselvi has proposed to plant 200 No's of trees per year and Rs. 1,50,000/- will spend for proposed greenbelt development and maintenance.

#### **11. Analysis of Alternatives**

The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise. No R&R, no Sensitive area etc., making the site suitable for the mining of rough stone & gravel. The site meets the requirement of all critical factors that are important for success of mining in the state and could be a pre-eminent location.

#### **12. Environment Monitoring Programme**

Environmental monitoring programme has been formulated for the environmental attributes (Air, Water, Noise, and Soil) and the same will be implemented as per CPCB guidelines. The effective implementation and close supervision of the environmental management to mitigate the environmental impacts due to mining activities.

#### **13. Disaster Management Plan**

The salient features of Disaster Management Plan include

- Emergency shutdown procedure
- Fire protection system
- Emergency safety equipment & Reporting and response to emergency
- Emergency Help from nearby industries and tie up with nearby industries

#### **14. Corporate Environmental Responsibility**

- The site has no Relocation and Rehabilitation.
- Most villages have benefitted mutually at Anaimallur where the mining industry has provided indirect jobs for labor and villages provide accommodation for the labor and staff.
- Supportive industries like food supply and essential shops are economic growth in the villages.
- 2 % ( Rs.9,25,000) on total cost will be allocated for CER activities as per MoEF&CC Office memorandum dated 1<sup>st</sup> May, 2018.

#### **15. Benefits of the Proposed Project**

- The quarrying activities in this belt will benefit to the local people 40 Nos.
- Improvement in Per Capita Income.

- The socio - Economic conditions of the village and distance will enhance due to the project, hence the project should be allowed after considering all the parameters.
- It can thus be concluded that the project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.

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