

EXECUTIVE SUMMARY

For

ULAGANI ROUGH STONE & GRAVEL QUARRY

Over an extent of 2.85.0Ha.

At

Survey No: 112/10A, 112/10B, 112/10C, 112/10D, 112/10E, 112/11,
112/8A AND 112/9

Villages: Ulagani

Taluk: Kallikudi

District: Madurai

State: Tamil Nadu

By

Tmt.J.Selvi,

No. 1/15,20, Ramachandra Nagar,

Aviyur Road,

Kariyapatti Taluk,

Virudhunagar District.

(Project termed under Schedule 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)

EIA Consultant

HUBERT ENVIRO CARE SYSTEMS PRIVATE LIMITED, CHENNAI

JULY 2021

EXECUTIVE SUMMARY

➤ Project Description

The total extent area of the quarry is 2.85.0.Ha, situated at S.F.112/10A, 112/10B, 112/10C, 112/10D, 112/10E, 112/11, 112/8A and 112/9 Ulagani Village, Kallikudi Taluk, Madurai District, Tamil Nadu State.

The Joint director/Assistant director of Madurai 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.1705/2017- mines, dated 04.09.2020.**

Subsequently, submitted the Mining Plan for the subject area and the same was approved by Joint director/Assistant director of Geology and mining, Madurai vide **Roc.No. 1705/2017- Mines, dated 28.09.2020**

Projects 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. 8168/2020.**

The proposal was appraised during 196th SEAC meeting held on 29.01.2021 and 425th SEIAA meeting held on 15.02.2021 and ToR was issued vide **Letter No. SEIAA-TN/F.No.8168/SEAC/ToR-856/2020, dated: 25.02.2021** 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.

➤ Management Commitment

Project Proponent will firmly address all the EC conditions and its requirements once obtained from SEIAA, TN and will execute the Environmental Management Plan.

➤ Environmental Sensitive Areas

As seen in **Table-I** below, there are no Environmental sensitive areas within 15km Radius. 5 no's of water bodies are located within 3km radius from the project site. 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	<p>Monuments:</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Name</th> <th>Distance (~km)</th> <th>Direction</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Rock cut cave and inscriptions Tiruparankundram</td> <td>11.64</td> <td>NNE</td> </tr> <tr> <td>2</td> <td>Cavern with Panchapandava beds on western slope of the hills and similar beds behind the Sikkandar mosque on the top Tirupparankunram</td> <td>12.00</td> <td>NNE</td> </tr> </tbody> </table>	S. No	Name	Distance (~km)	Direction	1	Rock cut cave and inscriptions Tiruparankundram	11.64	NNE	2	Cavern with Panchapandava beds on western slope of the hills and similar beds behind the Sikkandar mosque on the top Tirupparankunram	12.00	NNE																																
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2	Areas which are important or sensitive for ecological reasons – Wetlands, Watercourses or other water bodies, coastal zone, biospheres, mountains, forests	<p>Water Bodies :</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>TerukuAr/GundaruNadi</td> <td>0.12</td> <td>ENE</td> </tr> <tr> <td>2</td> <td>Canal near Ulagani</td> <td>0.28</td> <td>E</td> </tr> <tr> <td>3</td> <td>Pond near NedungulamPudur</td> <td>0.74</td> <td>W</td> </tr> <tr> <td>4</td> <td>Pond near Pudupatti</td> <td>1.67</td> <td>N</td> </tr> <tr> <td>5</td> <td>Canal near Mallampatti</td> <td>1.89</td> <td>SSW</td> </tr> <tr> <td>6</td> <td>Gavundanpatti/Gundar R/GavundanNadi</td> <td>5.19</td> <td>SSW</td> </tr> <tr> <td>7</td> <td>Lake near Paraikkulam</td> <td>6.25</td> <td>SSW</td> </tr> <tr> <td>8</td> <td>Canal near Valaiyapatti</td> <td>7.21</td> <td>NE</td> </tr> <tr> <td>9</td> <td>Lake near Tirumangalam</td> <td>9.06</td> <td>NW</td> </tr> <tr> <td>10</td> <td>KoothiyarkunduKanmai</td> <td>10.13</td> <td>N</td> </tr> </tbody> </table>	S. No	Places	Distance (~km)	Direction	1	TerukuAr/GundaruNadi	0.12	ENE	2	Canal near Ulagani	0.28	E	3	Pond near NedungulamPudur	0.74	W	4	Pond near Pudupatti	1.67	N	5	Canal near Mallampatti	1.89	SSW	6	Gavundanpatti/Gundar R/GavundanNadi	5.19	SSW	7	Lake near Paraikkulam	6.25	SSW	8	Canal near Valaiyapatti	7.21	NE	9	Lake near Tirumangalam	9.06	NW	10	KoothiyarkunduKanmai	10.13	N
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3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	None within 15km radial distance from the site boundary.																																												
4	Inland, coastal, marine or underground waters	<p>Water Bodies :</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>TerukuAr/GundaruNadi</td> <td>0.12</td> <td>ENE</td> </tr> <tr> <td>2</td> <td>Canal near Ulagani</td> <td>0.28</td> <td>E</td> </tr> <tr> <td>3</td> <td>Pond near NedungulamPudur</td> <td>0.74</td> <td>W</td> </tr> <tr> <td>4</td> <td>Pond near Pudupatti</td> <td>1.67</td> <td>N</td> </tr> <tr> <td>5</td> <td>Canal near Mallampatti</td> <td>1.89</td> <td>SSW</td> </tr> <tr> <td>6</td> <td>Gavundanpatti/Gundar R/GavundanNadi</td> <td>5.19</td> <td>SSW</td> </tr> <tr> <td>7</td> <td>Lake near Paraikkulam</td> <td>6.25</td> <td>SSW</td> </tr> <tr> <td>8</td> <td>Canal near Valaiyapatti</td> <td>7.21</td> <td>NE</td> </tr> <tr> <td>9</td> <td>Lake near Tirumangalam</td> <td>9.06</td> <td>NW</td> </tr> <tr> <td>10</td> <td>KoothiyarkunduKanmai</td> <td>10.13</td> <td>N</td> </tr> </tbody> </table>	S. No	Places	Distance (~km)	Direction	1	TerukuAr/GundaruNadi	0.12	ENE	2	Canal near Ulagani	0.28	E	3	Pond near NedungulamPudur	0.74	W	4	Pond near Pudupatti	1.67	N	5	Canal near Mallampatti	1.89	SSW	6	Gavundanpatti/Gundar R/GavundanNadi	5.19	SSW	7	Lake near Paraikkulam	6.25	SSW	8	Canal near Valaiyapatti	7.21	NE	9	Lake near Tirumangalam	9.06	NW	10	KoothiyarkunduKanmai	10.13	N
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5	State, National boundaries	Nil																																												
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	<ul style="list-style-type: none"> SH – 195 (Madurai – Viradhanur – Valayankulam) ~7.31km (ENE) NH – 38 (Vellore –Madurai– Tuticorin) ~5.80km (E) 																																												

7	Defence installations	None within 15km radial distance from the site boundary.																																														
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10	Areas already subjected to pollution or environmental damage (those where existing legal environmental standards are exceeded)	Nil																																														
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-II (Low Risk Zone).-																																														

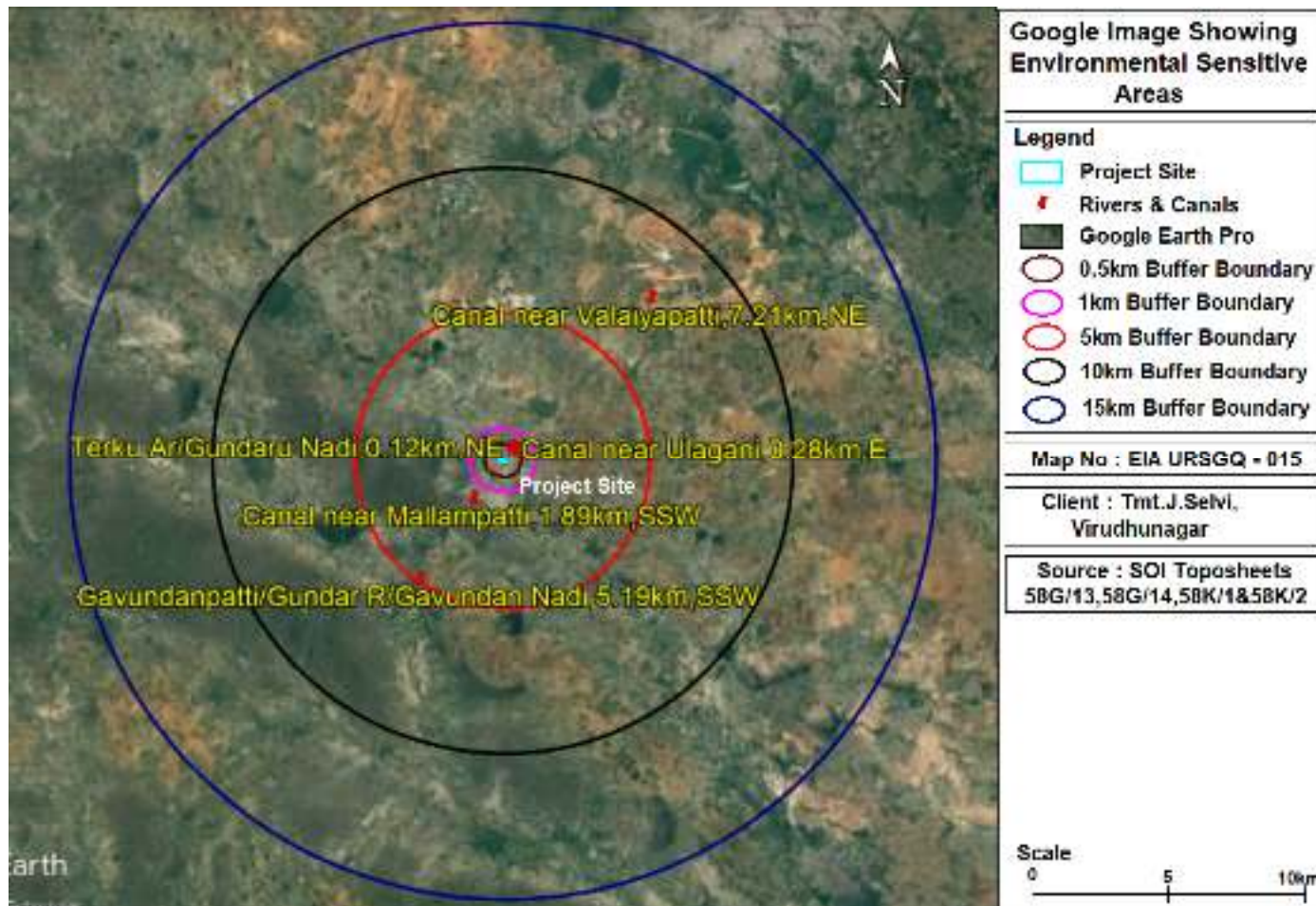


Figure-1 Google image for Environmental Sensitive areas demarcated within 15km radius of the project site

20110017

ANNEXURE IV

வட்டி, சி.பி. அறங்காவல இலாகா, சென்னை - தலை உரிமை விபரங்கள்



தமிழக அரசு
வருவாய்த் துறை

தலை உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு



மாவட்டம் : மதுரை

வட்டம் : திருமங்கலம்

வருவாய் பிரிவு : 97 உலகாணி

பட்டி எண் : 1038

உரிமையாளர்கள் பெயர்

1.	முன்பு		பின்னர்		மற்றவை	
	பெயர்	திருவி	பெயர்	திருவி	பெயர்	திருவி
	பெயர்	திருவி	பெயர்	திருவி	பெயர்	திருவி
109	0	--	0 - 11.00	0.31	--	--
110	100	--	0 - 12.00	0.34	--	--
111	11	--	0 - 11.00	2.09	--	--
112	4A	--	0 - 1.50	0.06	--	--
112	4B	--	0 - 26.00	0.69	--	--
112	5	--	0 - 5.00	0.12	--	--
112	7A	--	0 - 64.50	1.74	--	--
112	8A	--	0 - 7.00	0.21	--	--
112	9	--	0 - 21.50	0.37	--	--
113	3A	--	0 - 17.00	0.50	--	--
113	3L	--	0 - 44.00	1.22	--	--
113	4	--	0 - 11.00	0.31	--	--
			4 - 64.50	12.91		

குறிப்பு 2 :
1. பெறப்பட்ட தகவல் / எளிதில் தகவல் விவரங்கள் மீள் பரிசீலனைக்கு உட்பட்டவை. இவற்றை அளவளவு <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 24/23/097/01000/20712 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இது தகவல்கள் 02-11-2017 அன்று 01:30:27 PM நேரத்தில் அளவளவு வட்டி - து.

Figure 5 'A' Register

➤ **Rough Stone & Gravel Quarry Reserves**

- The estimated Geological Reserves of Rough Stone estimated based on the Geological cross sections was 10,86,888m³ of Rough Stone and 45,690m³ of Gravel.
- The Mineable Reserves have been arrived as 4,25,550m³ of Rough Stone and 34,998m³ of Gravel.
- The Proposed production capacity* is restricted to 3,89,860m³ of Rough Stone and 34,998m³ of Gravel for five years as per the ToR issued.

***Note:**

As per the Mining Plan and ToR application the production capacity was 4,25,550m³ of Rough Stone and 34,998m³ of Gravel, the depth of mining is 22m Minimum and 42m maximum from below ground level (Existing Depth of 10m BGL) for 5 years but in the proposed quarrying activity the production capacity and the depth of mining will be restricted as per the ToR issued by SEIAA, TN.

➤ **Summary of the Magnitude of Operation**

- The Rough Stone quarrying operation is proposed to be carried 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.
- The Proposed production capacity is 3,89,860m³ of Rough Stone and 34,998m³ of Gravel for five years as per the ToR issued.
- The mineable reserves have been computed 4,25,550m³ of Rough Stone and 34,998m³ of Gravel for five years.
- The effective geological reserves and mineable have been worked out 10,86,888m³ of Rough Stone and 45,690m³ of Gravel.
- The depth of the mine will be 32m (2+30m) as per the ToR issued.

➤ **Project Requirements**

I. Land requirement:

- The Ulagani Rough Stone and Gravel Quarry is over an extent of 2.85.0.Ha.
- Lease area located at S. F. No. 112/10A, 112/10B, 112/10C, 112/10D, 112/10E, 112/11, 112/8A and 112/9 Ulagani Village, Kallikudi Taluk, Madurai District, Tamil Nadu State, lies in the latitude of 09°46'19" N to 09°46'25" N and longitude of 78°02'13" E to 78°02'21" E.
- The lease area topography is plain terrain; site elevation is ~108m (max) MSL. The area is marked in the survey of India Topo sheet No. 58 K/01. The lithology of the mining

lease will be submitted on final EIA report. Land use Patterns is given in **Table-2**.

Table-2 Quarry Lease area breakup

S. No	Description	Area to be required at the present Mining Plan Period (Ha.)
1	Quarrying pit	1.89.0
2	Infrastructure	0.01.0
3	Roads	0.01.0
4	Green Belt	0.30.0
5	Unutilized	0.64.0
Total		2.85.0

II. Quarry Reserves

Table-3 Rough stone & Gravel Quarry Reserves

S. No	Description	Rough Stone (m ³)	Gravel (m ³)
1	Geological Resource	10,86,888	45,690
2	Mineable Reserves	4,25,550	34,998
3	Production capacity	3,89,860	34,998

III. Water Requirement

- The total water requirement is 3.0KLD (Drinking & Domestic purpose-0.5KLD, Dust suppression -1.5 KLD & for Greenbelt- 1.0 KLD). The total water requirement will be met from Private tankers.
- The Rough Stone and Gravel quarry will not produce any 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.

Table-4 Water requirement breakup

S. No	Description	Water Requirement(KLD)
1	Drinking & Domestic purpose	0.5
2	Dust suppression	1.5
3	Green Belt	1.0
Total		3.0

IV. Power & Fuel Requirement

- No power is required during mining operations. Working is restricted on day time only between 9AM to 6PM.
- 2,18,600 liters of HSD for the entire project life will be brought from nearby diesel

pumps.

Table-5 Power & Fuel Requirement

S. No	Details	Gravel (Liters)	Rough stone (Liters)	Source
1	Diesel Requirements approx. (Liters of HSD for 5 years)	5830	2,12,770	HP/BPCL/ IOCL/Reliance

V. Manpower

Manpower requirement for the proposed project is 23 Nos.

Table -6 Manpower requirement of the Project

S. No	Description	No of persons(Direct)
Skilled		
1	Operator	8
2	Mechanic	1
3	Mines manger/Mate	1
Semi – skilled		
1	Driver	3
Unskilled		
1	Musdoor / Labours	10
Total		23

VI. Solid Waste Generation & Management

❖ Municipal Solid Waste Management

Table -7 Municipal Solid Waste generation & Management

S. No	Type	Quantity Kg/day	Disposal method
1	Organic	6.21	Municipal bin including food waste
2	Inorganic	4.14	TNPCB authorized recyclers
Total		10.35	

As per CPHEEO guidelines: MSW per capita/day =0.45

❖ Hazardous Waste Management

Table -8 Hazardous Waste Generation and Management

Waste Category No	Description	Quantity (L/Year)	Mode of Disposal
5.1	Waste Oil	3.0	Will be Collected in leak proof containers and disposed to TNPCB Authorized Agencies for Reprocessing/Recycling

VII. Nearest Human Settlement

The detail of nearest human settlement from the project site is provided in **Table-9**.

Table-9 Nearest Human Settlement

S. No	Name of the villages	Distance (~km) & Direction	Approximate population as per the census 2011
1	Ulagani	0.45 (NE)	1,466
2	NedungulamPudur	0.36 (W)	897
4	PalaiyaNedungulam	0.69 (WNW)	240
3	ChinnaUlagani	0.90 (ENE)	920
5	Ettunali	1.46 (NNW)	200

➤ Industries

The details of Industries within 15km radius from the project site are given in **Table -10**.

Table -10 Industries within 15km radius from the project site

S.no	Industries	Dist (~km)	Direction
1	Sri Meenakshi Pavers and Flyash	3.97	E
2	VRD BestfoodsPvt Ltd	2.88	NNE
3	SRM Paper Boards	3.46	NNE
4	Sundram Fasteners Limited	7.33	SE
5	TVS Sundaram Brake Linings Ltd	10.38	ESE
6	Ayyanar Mills	10.77	SSE
7	MEPCO Speciality Products	8.15	SW
8	SrinivasaMaraine Chemicals	6.7	NW
9	First Garment Mfg Co	8.35	NE
10	Kern Logistics	8.6	NE
11	Jas Overseas Export Ltd	12.34	NE
12	Varna Bags	9.36	NNE
13	Indian Oil Corporation Ltd Madurai Terminal	8.35	N
14	Thiagarajar Mills Pvt Ltd	8.72	NNW
15	Britannia Industries	9.66	NNW
16	Jayakrishna Flour Mill	9.79	N
17	Exide Industries Limited	9.58	N
18	Shakti Cords Private Limited	9.42	N
19	Jasmine Towel Pvt Ltd	13.48	ENE

20	PARLE Biscuit Factory	10.06	N
21	VRL Logistics	8.7	N
22	Arun Polymers	10.41	W
23	Paramount Mills	10.6	W
24	Hindustan Petroleum Corporation Limited	8.58	N
25	Bharat Petroleum Corporation Limited	8.66	N

➤ **Project Cost**

The total capital investment on the project is Rs. 70,85,000/- including EMP cost is 4,45,000/- .The Capital investment of the Project is given in **Table-11**.

Table-11 Capital Investment on the Project

S. No	Description of the Cost	Amount in Rs.
➤ Fixed Cost		
1	Land Cost	11,40,000/-
2	First aid room and accessories	1,00,000/-
3	Laborers shed	1,00,000/-
4	Sanitary facilities	1,00,000/-
Total		14,40,000/-
➤ Operational		
1	Machinery to be used	50,00,000/-
2	Fencing Cost	2,00,000/-
Total		52,00,000/-
➤ EMP Cost		
1	Air Quality Sampling	40,000/-
2	Water Quality Sampling	40,000/-
3	Noise Monitoring	20,000/-
4	Ground Vibration	20,000/-
Expenditure		
1	Drinking water facility	1,00,000/-
2	Sanitary Arrangements	25,000/-
3	Safety Kits	50,000/-
4	Water Sprinkling	1,00,000/-
5	Afforestation	50,000/-
Total EMP Cost		4,45,000/-
Total Cost of the Project (A+B+C)		70,85,000/-

➤ **Mine Closure Plan:**

- There is no proposal for back filling reclamation and rehabilitation. The Quarried pits after the end of the life of lease will be fenced using Barbed wire fencing to prevent

inherent entry of public and cattle.

- Measures will be taken as per the Acts and Rules.
- Drilling will be carried out by wet drilling mode to control the dust propagation into the air.
- Blasting will be carried out on limited scale. Mist water spraying on haul road is proposed to prevent the dust propagation into the air.

➤ Description of Environment

Project Influence Area (PIA)/Study Area:

An area covering 10 km radius from Ulagani Rough Stone and Gravel quarry boundary has been earmarked as study area for baseline studies.

Study Period:

The baseline environmental surveys were carried out during (Feb to April 2021) within the study area.

Summary of Baseline Studies:

- Site has a Plain terrain with level ~108m MSL.
- The project site falls under Zone- II (Low Risk Zone) as per IS 1893 (Part- I).
- The predominant wind direction is North East during study period.
- Max Temperature: 41^oC Min Temperature:18^oC & Avg Temperature: 28.64^oC
- Average Relative Humidity:53.22 %
- Average Wind Speed: 2.25 m/s.

Table-12 Total maximum GLCs from emissions

Pollutant	Max. Base Line Conc. ($\mu\text{g}/\text{m}^3$)	Estimated Incremental Conc ($\mu\text{g}/\text{m}^3$)	Total Conc. ($\mu\text{g}/\text{m}^3$)	NAAQ standard	% contribution of concentration above Base line
TSPM	160	245	405	500	153.13
PM ₁₀	64	49	113	100	76.56
PM _{2.5}	31	29	60	60	93.55
SO ₂	14	1	15	80	7.14
NO _x	26	18	44	80	69.23

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):

- PM₁₀ ranged between 49 µg/m³ to 54 µg/m³ (NAAQ standard 100 µg/m³).
- PM_{2.5} values varied from 22 µg/m³ to 26 µg/m³ (NAAQ standard 60 µg/m³).
- SO₂ levels varied from 8 µg/m³ to 12 µg/m³ (NAAQ standard is 80 µg/m³).
- NO_x ranged between 17 µg/m³ to 22 µg/m³ (NAAQ standard is 80 µg/m³).

Noise Environment

- In industrial area day time noise levels was about 59.4 dB(A) and 53.7 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 47.2 dB(A) to 49.2 dB(A) and night time noise levels varied from 40.6 dB(A) to 41.9 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 6.8 to 8.01.
- TDS value varied from varied from 659mg/l – 1434 mg/l.
- The Sulphate content of the ground water of the study area is varied between 44.8 mg/l – 173.6mg/l meeting the acceptable limit of the IS 10500: 2012.

Surface Water Quality

- Surface water sample are within the limits as per ISI-IS2296-1982 Class C (Drinking water source with conventional treatment followed by disinfection).
- pH ranges from 6.5 to 7.61.
- Total Dissolved Solids range from 430 mg/l to 1771 mg/l.
- Total hardness ranges between 135.1mg/l to 563.2 mg/l.
- The BOD value ranges from 5.1 mg/l to 17.9 mg/l.
- COD value 17.3 mg/l to 77.3 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 6.08 to 8.11.
- Conductivity of the soil samples ranged from 112 to 380 µmhos/cm.
- Nitrogen content ranged from 126 mg/kg to 216 mg/kg
- Phosphorous ranged from 20.4 mg/kg to 209 mg/kg.
- Potassium content ranges from 67 mg/kg to 432 mg/kg.

Biological Environment

- The Rough Stone and Gravel quarry is located at Ulagani village. The proposed project will not have any impact of terrestrial ecology of the area. Quarry area will be developed with greenbelt by planting native species to maintain the good environment.
- There is no extinct flora and fauna species found in the study area. Observed species comes under least concern as per IUCN status
- There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Wildlife corridors and Tiger/Elephant Reserve found within 10 km radius of the project site.
- Therefore, no management plan is required.

Socio-economic Conditions:

- The project is located at Ulagani Village, Kallikudi Taluk, Madurai District, Tamil Nadu. According to 2011 Census, enumerated population were 30.38 lakh people in the district of which 11.91 lakhs were in rural areas and 18.47 lakh were in urban areas. In 2011 census, child sex ratio is 932 girls per 1000 boys compared to figure of 926 girls per 1000 boys of 2001 census data. In 2011, Madurai had population of 3,038,252 of which male and female were 1,526,475 and 1,511,777 respectively. In 2001 census, Madurai had a population of 2,578,201 of which males were 1,303,363 and remaining 1,274,838 were females. The Agricultural and livelihood study details will be submitted in the Final EIA report.

➤ 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.

- Ulagani Rough Stone & Gravel Quarry is a Patta land, over an extent of 2.85.0.Ha, at Ulagani village, Kallikudi Taluk, Madurai District, Tamil Nadu State. There are no R&R issues as it is leased patta land.

- The lease area topography is Plain terrain with site elevation is ~108mMSL. Ulagani Rough Stone & Gravel quarry 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, SO₂ and NO_x.
- The impact on air environment was studied through air quality modeling studies. The 1st highest 24hour average concentrations of NO_x, PM₁₀, PM_{2.5} and SO₂ 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 160µg/m³, PM₁₀ is 64µg/m³, PM_{2.5} is 31µg/m³, SO₂ is 14µg/m³ and NO_x is 26µg/m³, 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.

➤ **Risk Identification & Management**

❖ **Identification of Hazards in Open Cast Mining**

There are various factors, which can cause disaster in the mines. These hazards are as follows:

- Drilling

- Blasting
- Overburden handling
- Heavy Machinery

❖ **Safety Measures at the quarry**

- Adequate care has been taken in deciding the size of the bench for the working pit.
- The benches are properly sloped at an angle of 60 degree to avoid any spillage of benches.
- Adequate drainage system at the top of the pit and also on the benches shall be made to prevent erosion of the benches.
- The quarries will be protected by garland drains around the periphery for storm water drainage.

➤ **Post Project Environmental Monitoring**

Table -13 Post Project Environmental Monitoring Program

S. No	Area of Monitoring	Number of Sampling Stations	Frequency of Sampling	Parameters to be Analysed
1.	Meteorology	One	Hourly and Daily basis.	Wind speed and direction, Temperature, Relative Humidity, Atmospheric pressure, Rainfall.
2.	Ambient Air Quality	2 Stations (In downwind)	Twice a week:24 hourly period	PM ₁₀ , PM _{2.5} , SO ₂ , and NO ₂
3.	Noise	2 (two within site premises and two outside site premises)	Once every season	Ambient Equivalent continuous Sound Pressure Levels (Leq) at day and Night time.
4	Exhaust from DG set	Stack of DG set	Quarterly	PM ₁₀ , PM _{2.5} , SO ₂ & CO
5	Vehicular Emissions	Parking area	Periodic monitoring of vehicles	Air emission and noise, PCU
6	Soil	Two Locations within the Project Site	Yearly Once	Physico chemical properties, Nutrients, Heavy metals
7	Terrestrial Ecology	Within 10km, around the project	Once in three years	Symptoms of injuries on plants
8	Surface/ Ground water quality	Two Locations Within Project Site	Yearly Once	As per ISO 10500 Standard parameters

➤ **Disposal of Waste:**

The overburden in the form of Gravel, after the excavation of Gravel will be directly loaded into tipper to the needy buyers for road project and construction works for filling and leveling of low lying areas. A sustainable plastic waste management plan by installing bins for collection/Segregation of recyclable and non-recyclable plastic waste at the proposed project site will be implemented.

➤ **Occupational Health Measures**

- Adoption of dust suppression measures like spraying water, use of drill with dust collection system or wet drills etc.
- Plantation.
- Avoid blasting during unfavorable wind & atmospheric conditions.
- Use of personal protective equipment. Compliance with DGMS circulars.
- Emergency response plan that includes installation of emergency response equipment to combat events such as fire.
- All personnel required to handle hazardous materials will be provided with personal protective equipment suitable for the hazardous material being handled.
- On-site first aid facilities will be provided and employees will be extended to the local community in emergencies.

➤ **Greenbelt Development**

An area of 0.30.0Ha hectare land was allotted for greenbelt development during 5 years of mining plan. Mrs. J.Selvi has proposed to plant 40 No's of trees per year and Rs. 50,000/- will be spent for proposed greenbelt development and maintenance.

➤ **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.

➤ **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.

➤ **Emergency 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

➤ **Corporate Environmental Responsibility**

- The site has no Relocation and Rehabilitation.
- Most villages have benefitted mutually at Ulagani 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 promote economic growth in the villages.
- 2 % (Rs.1,41,700) on total cost will be allocated for CER activities as per MoEF & CC Office memorandum dated 1stMay, 2018.

➤ **Benefits of the Proposed Project**

- The quarrying activities in this belt will benefit to the local people 23 Nos.
- Improvement in Per Capita Income can be expected.
- 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.
