

EXECUTIVE SUMMARY

For
ARIYUR ROUGH STONE AND GRAVEL QUARRY

Extent of 1.29.0 Ha of Patta land

At

S.F. No.: 326A/4C
Ariyur Village
Vellore Taluk,
Vellore District,
Tamil Nadu State.

Applicant

Tmt. S.Tamilarasi,
W/o. (Late) Sabapathi,
No. 1, Narayansamy 1st street,
Pennathur Village,
Vellore Taluk,
Vellore District.

(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)

EIA Consultant

HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI

May 2022

EXECUTIVE SUMMARY

➤ **Project Description**

The total extent area of the quarry is 1.29.0 Ha, situated at S.F.No. 326A/4C Ariyur Village, Vellore Taluk, Vellore District, Tamil Nadu State.

The Assistant director of Department of Geology and Mining, Vellore had issued the precise area communication letter to produce the approved Mining Plan vide Rc. No.33/2021(Mines) dated 11.10.2021.

Subsequently, submitted the Mining Plan for the subject area and the same was approved by Assitant director, Department of Geology and Mining, Vellore vide Rc. No.33/2021(Mines) dated: 22.10.21.

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.

The proposal was appraised during 251st SEAC meeting held on 04.03.2022, Minutes received on 19.03.2022 and 495th SEIAA meeting held on 23.03.2022 and ToR was issued vide Letter No. SEIAA-TN/F.No.8935/SEAC/ToR-1127/2021, dated: 23.03.2022.

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 for 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. 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.	Monuments	S. No	Places	Distance (~km)	Direction
		1.	Vellore Fort	6.20	N
		2.	Old mosque in the fort	6.49	N
		3.	Jalakanteswara Temple	6.78	N
2.	Heritages	S. No	Places	Distance (~km)	Direction
		1.	Anna Kalaiaragam	6.25	NNE
		2.	Queen Victoria Jubilee Memorial Pillar	6.28	NNE
		3.	Sepoy Mutiny Commemoration Pillar	7.03	NNE
		4.	Muthu Mandapam	8.30	NNE
		5.	French Castle, Vellore	14.40	SE
3.	Reserved Forests & Wild Life Sanctuary	S.No	Places	Distance (~km)	Direction
		1.	Kailasagarh RF	2.85	W
		2.	Palamadi RF	4.35	ENE
		3.	Attiyur RF	5.09	SW
		4.	RF near Sekanur	5.5	WNW
		5.	Vellore Fort Hill RF	6.24	NNE
		6.	Punganur South RF	7.18	E
		7.	Kaniyambadi RF	7.22	SSE
		8.	Arasampattu RF	7.85	SSW
		9.	Punganur RF	8.37	E
		10.	Ammundi RF	8.88	NNW
		11.	RF near Anpundi	9.59	NW
		12.	RF near Cholamur	9.99	NW
		13.	Punganur RF	10.12	NE
		14.	Appukallu RF	10.26	W
		15.	Tellai RF	10.47	SSW
		16.	Senur RF	11.1	N
		17.	Virinchipuram RF	12.07	NW
		18.	Pusimalaikuppam RF	12.91	SE
		19.	RF near Vadugantagal	13.12	NW
		20.	Malaiyalam RF	13.48	SSW
		21.	Nellimalai RF	14.17	W
		22.	Panamadangi RF	14.8	N

4.	Environmental Sensitive Water bodies	S. No	Places	Distance (~km)	Direction	
		1.	Otterikanar R	3.96	ENE	
		2.	Magadamkanar R	6.22	WNW	
		3.	Isanayakanopu R	7.33	SSE	
		4.	Kaveri Odai	7.79	ENE	
		5.	Palar R	7.84	N	
		6.	Vairkanarangal R	7.86	W	
		7.	Naganadi R/Amerdiar R	9.19	S	
		8.	Kottar R	9.94	NW	
		9.	Tellalar R	10.35	SSW	
5.	Water Bodies	S. No	Places	Distance (~km)	Direction	
		1.	Pond near Kesavapuram	0.25	SSW	
		2.	Pond near Sitteri	0.49	N	
		3.	pond near Sirukalamur	0.94	S	
		4.	Ariyur Eri	0.99	NW	
		5.	Otterikanar R	3.96	ENE	
		6.	Sedupperi Tank	4.87	NNW	
		7.	Magadamkanar R	6.22	WNW	
		8.	Isanayakanopu R	7.33	SSE	
		9.	Kaveri Odai	7.79	ENE	
		10.	Palar R	7.84	N	
		11.	Vairkanarangal R	7.86	W	
		12.	Naganadi R/Amerdiar R	9.19	S	
		13.	Kottar R	9.94	NW	
14.	Tellalar R	10.35	SSW			
6.	State, National boundaries	TN-AP State Boundary~13.43km, N (as per Google maps)				
7.	Nearest Highways	<ul style="list-style-type: none"> ➤ MDR-1028(Satturmadurai-Ariyur Road) ~ 1.48km, SW ➤ SH-207(Vellore-Ussoor) ~ 2.15km, NW ➤ NH-38(Vellore-Thoothukudi) ~ 1.58km, E 				
8.	Nearest Railway access	<ul style="list-style-type: none"> ➤ Railway Junction - Katpadi Junction ~ 12.32km, N ➤ Railway Station - Pennathur Railway Station ~ 2.33km, SSE ➤ Railway Track - (Pennathur RS - Vellore Cantonment) ~ 0.05km, ENE 				
9.	Nearest Airport/ Port	<ul style="list-style-type: none"> ➤ Tirupati International Airport ~ 95.17km, NNE ➤ Vellore Airport (Under Construction) ~ 7.31km, NW ➤ Chennai port~128.81km, E 				
10.	Densely populated or built-up area (Nearest Town, City, District)	S. No	Places	Distance (~km)	Direction	Population
		1.	Reddipalaiyam	0.44	SE	Within Ariyur(CT),7251
		2.	Chinna Sitteri (Edayansathu)	0.51	NE	4,566
		3.	Sitteri	0.69	N	Within Ariyur(CT),7251
		4.	Sirukalamur	0.78	S	1,657
		5.	Tuttupattu	0.78	SE	1,223
11.	Earthquake Zone	The project site comes under Zone-III (Moderate Damage Risk Zone)				

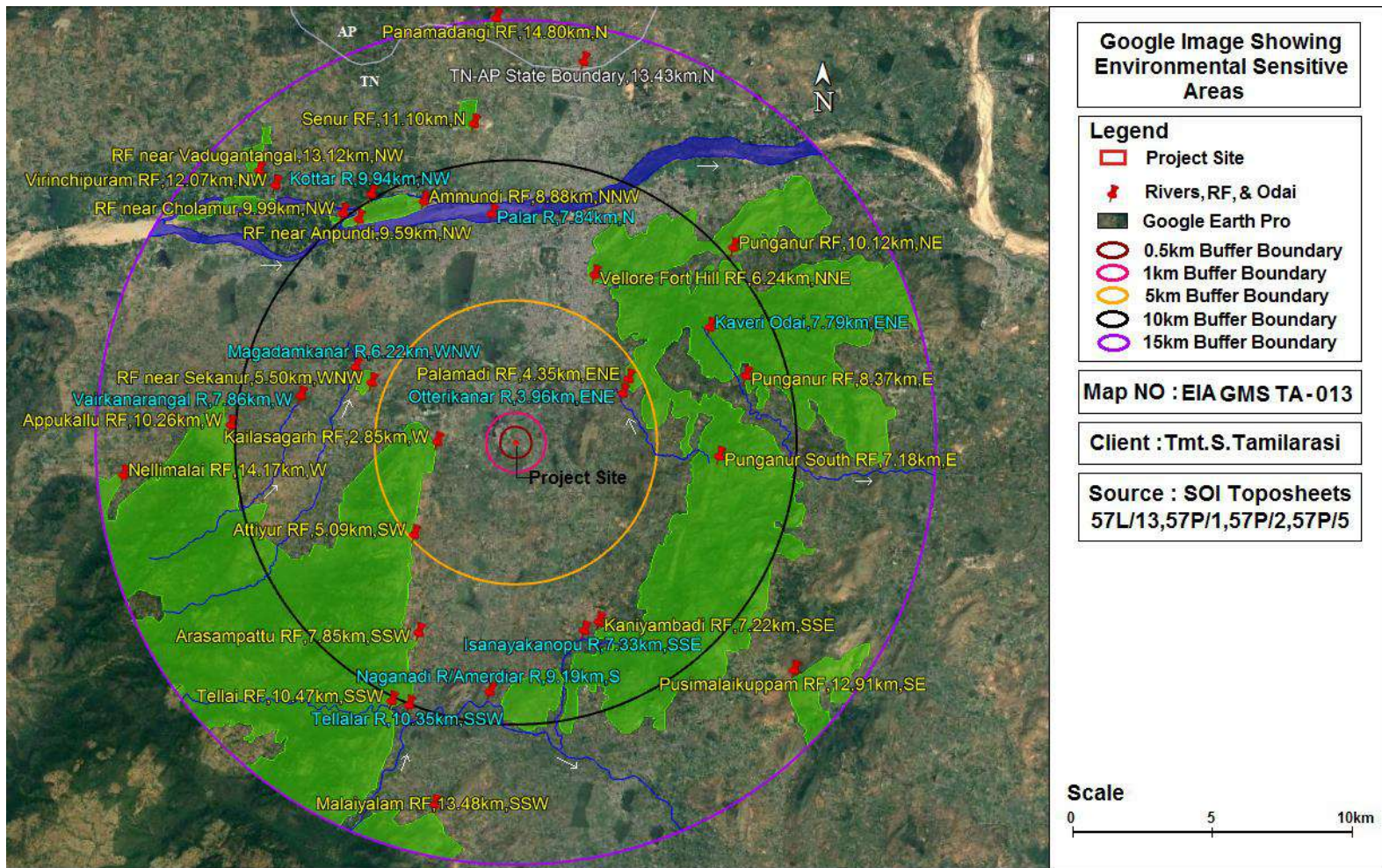


Figure-1 Google image for Environmental Sensitive areas demarcated within 15km radius of the project site

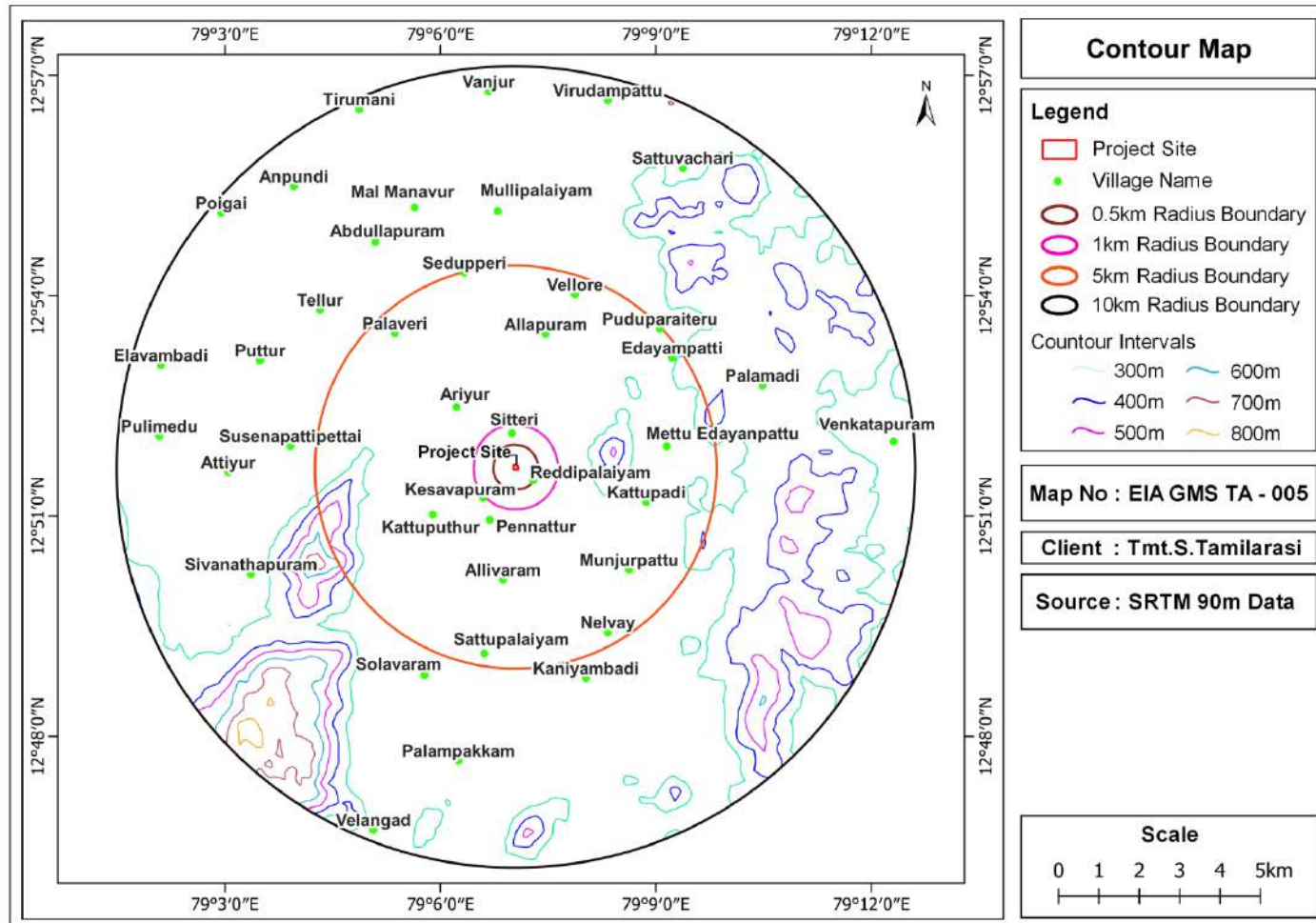


Figure 2 Contour Map of the Project Site

➤ **Rough Stone & Gravel Quarry Reserves**

- The estimated Geological Reserves of Rough Stone and Gravel estimated based on the Geological cross sections was 5,78,835m³ of Rough stone and 25,726m³ of Gravel.
- The Mineable Reserves have been arrived as 1,25,690m³ of Rough Stone and 5,390m³ of Gravel.
- The Proposed production capacity is restricted to 1,25,690m³ of Rough Stone and 5,390m³ of Gravel for five years.

➤ **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 1,25,690m³ of Rough Stone and 5,390m³ of Gravel for five years.
- The Mineable Reserves have been arrived as 1,25,690m³ of Rough Stone and 5,390m³ of Gravel for five years.
- The estimated Geological Reserves of Rough Stone estimated based on the Geological cross sections was 5,78,835m³ of Rough stone, and 25,726m³ of Gravel.
- The depth of the mine will be 47m(Existing depth 27m and Proposed depth 20m) BGL.

➤ **Project Requirements**

I. Land requirement:

- The Ariyur Rough Stone and Gravel Quarry is over an extent of 1.29.0Ha.
- Lease area located at S. F. No.326A/4C, Ariyur Village, Vellore Taluk, Vellore District, Tamil Nadu State, lies in the latitude of 12°51'38.17" N to 12°51'41.87" N and longitude of 79°07'01.09" E to 79°07'06.00" E.
- The lease area topography is plain terrain; site elevation is ~236m AMSL. The area is marked in the survey of India Topo sheet No. 57P/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	Present Area (Ha.)	Area in use during the quarring period (Ha.)
1.	Quarrying Pit	0.64.0	0.87.0
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.10.0
5.	Unutilized	0.64.0	0.30.0
Total		1.29.0	1.29.0

II. Quarry Reserves

Table-3 Rough stone & Gravel Quarry Reserves

S.No	Description	Rough Stone (m ³)	Gravel (m ³)
1.	Geological Resource	5,78,835	25,726
2.	Mineable Reserves	1,25,690	5,390
3.	Production Capacity	1,25,690	5,390

III. Water Requirement

- The total water requirement is 2.5 KLD (Drinking & Domestic purpose-0.5KLD, Dust suppression – 1.0 KLD & for Greenbelt- 1.0KLD). 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	1.0
3.	Green Belt	1.0
Total		2.5

IV. Power & Fuel Requirement

- No power is required during mining operations. Working is restricted in day time only between 9AM to 6PM.
- 1,01,460 liters of HSD for the entire project life will be brought from nearby diesel pumps.

Table-5 Power & Fuel Requirement

S. No	Details	Quantity	Source
1.	Diesel Requirements approx. (Litres of HSD for 5 years)	1,01,460	Nearby diesel pumps

V. Manpower

Manpower requirement for the proposed project will be 19 Nos.

Table -6 Manpower requirement of the Project

S. No	Description	No of persons (Direct)
Skilled		
1	Operator	6
2	Mechanic	1
3	Mines manager/Mate	1
Semi – skilled		
1	Driver	3
Unskilled		
1	Musdoor/Labours	8
Total		19

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	5.13	Municipal bin including food waste
2	Inorganic	3.42	TNPCB authorized recyclers
Total		8.55	

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

❖ 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 details 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.	Reddipalaiyam	0.44	SE	Within Ariyur(CT),7251
2.	Chinna Sitteri (Edayansathu)	0.51	NE	4,566
3.	Sitteri	0.69	N	Within Ariyur(CT),7251
4.	Sirukalamur	0.78	S	1,657
5.	Tuttupattu	0.78	SE	1,223

➤ **Project Cost**

The total capital investment on the project is Rs. **64,16,000/-** including EMP cost is 4,50,000/-
The Capital investment of the Project is given in **Table-10**.

Table-10 Capital Investment of the Project

S.No	Description of the Cost	Amount in Rs.
A. Fixed Cost		
1.	Land Cost (40,000/1 Ha)	5,16,000/-
2.	First aid room and accessories	1,00,000/-
3.	Labourers shed	1,00,000/-
4.	Sanitary facilities	1,00,000/-
Total		8,16,000/-
B. Operational		
1.	Machineries	50,00,000/-
2.	Fencing Cost	1,50,000/-
Total		51,50,000/-
C. 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	50,000/-
3.	Safety Kits	50,000/-
4.	Water Sprinkling	1,00,000/-
5.	Afforestation	30,000/-
Total EMP Cost		4,50,000/-
Total Cost of the Project (A+B+C)		Rs. 64,16,000/-
CSR Cost (2% of Total Project Cost)		Rs. 1,28,320/-

➤ **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 cattles.
- 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 Ariyur 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 (January 2022 – March 2022) within the study area.

Summary of Baseline Studies:

- Site has a Plain terrain with level ~236m AMSL.
- The Project site comes under Zone-III (Moderate Damage Risk Zone)
- The predominant wind direction is North East during study period.
- Max Temperature: 39^oC , Min Temperature: 18^oC & Avg Temperature: 28.28^oC
- Average relative Humidity: 63.30%
- Average Wind Speed : 6.52m/s

Table-12 Total maximum GLCs from emissions

Pollutant	Max. Base Line Conc. (µg/m ³)	Estimated Incremental Conc. (µg/m ³)	Total Conc. (µg/m ³)	NAAQ standard	% contribution of concentration above Base line
TSPM	183	72	255	500	39.34
PM ₁₀	73	18	91	100	24.65
PM _{2.5}	36	9	45	60	25.0
SO ₂	12	2	14	80	16.66
NO _x	23	13	36	80	56.52

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 44.7µg/m³–73.8µg/m³ (NAAQ standard 100 µg/m³).
- PM_{2.5} values varied from 19.6µg/m³ –35.9µg/m³ (NAAQ standard 60 µg/ µg/m³).
- SO₂ levels varied from 7.0µg/m³– 13.1µg/m³ (NAAQ standard is 80 µg/m³).

- NO_x ranged between 10.7µg/m³ –23.4µg/m³ (NAAQ standard is 80 µg/m³).

Noise Environment

- In Industrial areas day time noise levels was about 58.6 dB(A) and 48.9 dB(A) during night time, which is within prescribed limit by CPCB (75 dB(A) Day time & 70 dB(A) Night time).
- In residential areas day time noise levels varied from 52.6 dB(A) to 54.7 dB(A) and night time noise levels varied from 42.8 dB(A) to 44.7 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels is within the prescribed limit 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 ground water results of the study area indicate that the pH range varies between 7.32 and 7.81. It is observed that the pH range is within the permissible limit of IS 10500:2012.
- The Total Dissolved Solids range of the collected ground water sample is varied between 640 mg/l – 873 mg/l. All the samples are within the permissible limit of IS 10500: 2012.
- The acceptable limit of the chloride content is 250mg/l and permissible limit is 1000 mg/l. The chloride content in the collected ground water samples in the study area ranges between 144 mg/l – 245 mg/l. It is observed that all the samples are within the permissible limit of IS 10500:2012.
- The acceptable limit of the sulphate content is 200mg/l and permissible limit is 400mg/l. the sulphate content in the collected ground water samples in the study area is varied between 60.77 mg/l – 106.09 mg/l. It is observed that all the samples are meeting the acceptable limit of the IS 10500: 2012.
- The Total hardness ranges is between 178 mg/l – 298 mg/l for ground water samples. It is observed that all the samples are within the permissible limit of the IS 10500: 2012.
- It is observed that all ground water sample collected within the study area are meeting the drinking water standards 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 in the collected surface water samples varies between 7.28 to 8.05 where all the samples are within the limit of IS 2296:1992.
- The Total Dissolved Solids (TDS) value of collected surface water sample ranges from 545 mg/l to 1144 mg/l.
- The Total hardness value of the collected surface water sample ranges between 178.9 mg/l to 425.8 mg/l.
- The concentration of heavy metals like As, Cd, Cr, Pb, Mn, Hg, Ni and Se are within the limits of IS 2296:1992.

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 7.12 to 8.22
- Conductivity of the soil samples ranged from 134 to 498 $\mu\text{mhos/cm}$.
- Nitrogen content in the collected soil samples ranged from 154.8 mg/kg to 357.9 mg/kg.
- Phosphorous content ranged from 54.2 mg/kg to 348.1 mg/kg.
- Potassium content ranges from 167.3 mg/kg to 418.1 mg/kg.

Biological Environment

- The Rough Stone and Gravel quarry is located at Ariyur 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.
- There is one Reserve Forest which is located at a distance of 2.85km from the project site.
- Therefore, no management plan is required.

Socio-economic Conditions:

The project is located at Ariyur Village, Vellore Taluk, Vellore District, Tamil Nadu. As

per the 2011 Census, the total population of Vellore district was 3,936,331 and it is ranked 4th place in terms of the highest population in Tamil Nadu. The population density of Vellore district was 800 persons per sq.km. The district sex ratio was 1007, higher than the State sex ratio of 996. The district has recorded the 3rd highest Scheduled Caste sex ratio of 1026 among the districts. The 2011 Census states that, the Vellore district has 43.2 % urban population and 56.8 % rural population. The child sex ratio in the district during 2011 census was 944 and this was 943 in 2001 census. The literacy rate in the district has increased in 2011 census compared to 2001 census. As per 2011 Census, the literacy rate of the district was 79.17%. The average literacy of the district was 70.47%, compared to the national average of 72.99%

➤ **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.

- Ariyur Rough Stone & Gravel Quarry, is a patta land over an extent of 1.29.0 Ha in survey number 326A/4C, Ariyur Village, Vellore Taluk, Vellore District, Tamil Nadu State. There are no R&R issues as it is a patta land.
- The lease area topography is Plain terrain with site elevation is ~236m MSL. Ariyur 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 PM₁₀ is 73µg/m³, PM_{2.5} is 36µg/m³, SO₂ is 12µg/m³ and NO_x is 23µg/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 Industrial area are slightly exceeded the limit prescribed by CPCB. The designed equipment with noise levels not exceeding beyond the requirements of Occupational Health and Safety Administration Standard will be employed.
- The total water requirement is 2.5 KLD (Drinking & Domestic purpose - 0.50 KLD, Dust suppression -1.0 KLD & for Greenbelt - 1.0 KLD). The total water requirement will be met from Private tankers. 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.
- 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 Analyzed
1.	Meteorology	One	Hourly and Daily basis.	Wind speed and direction, Temperature, Relative Humidity, Atmospheric pressure, Rainfall.
2.	Ambient Air Quality	8 Stations (1 upwind, 2 downwind, 5 stations around the project site within 10km buffer)	Twice a week:24 hourly period	PM ₁₀ , PM _{2.5} , SO ₂ , and NO ₂
3.	Noise	8 (1 within site	Once every	Ambient Equivalent continuous

		premises and 7 outside site premises)	season	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	8 (1 within site premises and 7 outside site premises)	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	8 samples within the 10km buffer from the Project Site	Yearly Once	As per ISO 10500 Standard parameters

➤ **Disposal of Waste:**

The Mine waste in the mine includes the over burden, side burden, rock fragments and rubbles generated as mineral rejects during production works and the country rock fragments generated during development works as approach road formation, formation of dumping yard sites etc., During the five years of Mining Plan period, such waste material are proposed to be dumped along the sidest of the lease area where it comprises of country rock terrain.

➤ **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**

The green belt plantation programme will be continued till the end of the mining operation in the area. In framing out this programme on a sustainable and scientific base, due consultation and coordination with the forest department will be sought. The plantation

will be developed around the mining lease about 0.10.0 Ha, out of 1.29.0 Ha. Plants are chosen to provide aesthetic, ecological and economical value. Trees will help to arrest propagation of noise and help to lessen dust pollution due to dust arresting action.

➤ **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**

- A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per Tamil Nadu State Pollution Control Board (TNPCB), shall be maintained.

➤ **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 Ariyur 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.

➤ **Benefits of the Proposed Project**

- The quarrying activities in this belt will benefit to the local people 19 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.
