

ENVIRONMENT MANAGEMENT PLAN

Executive Summary

The Applicant, The Executive Engineer, Public Works Department, Water Resources Organization, Mining and Monitoring Division, Villupuram has applied for sand quarry in S.F.No. 262(P), over an Extent of 4.80.0 Hectares in Kamatchipettai Village of Panruti Taluk, Cuddalore District, Tamil Nadu.

The District collector, Cuddalore vide letter Rc. No. 160/Mines/2018 Dated 24.10.2019 has directed the applicant The Executive Engineer to get approved mining plan and Environmental clearance certificate from the State Environment Impact Assessment Authority (SEIAA/DEIAA) for grant of quarrying the Sand quarry lease in S.F.No: 262(P), over an extent of 4.80.0 Hectares, Kamatchipettai Village of Panruti Taluk, Cuddalore District, Tamil Nadu. The mining plan is approved by Assistant Director, Geology and Mining, Vide Rc. No. 160/Mines/2018 Dated 25.11.2019.

Geological Resources: Geological resource is estimated as 175200m³ and recoverable reserve is estimated as 48000m³. The approved production is 48000 Cum for a period of 1year to a depth of 1m only.

TABLE NO:1 SALIENT FEATURE

FEATURE	DETAILS
Name of the Proponent and address	THE EXECUTIVE ENGINEER, Public Works Department, Water Resources Organization, Mining and Monitoring Division, Villupuram
Existing/New Quarry	New
Survey number	262(P)
Geographical features	Latitude: 11°44'46.24"N to 11°44'58.57"N Longitude: 79°28'6.42"E to 79°28'16.76"E Toposheet No. 58M/6
Site Location	Kamatchipettai Village of Panruti Taluk, Cuddalore District, Tamil Nadu.
Type of Project	Sand



Mining lease area	4.80.0 Hectares
Geological Resources	175200m ³
Mineable Reserves	79200m ³
Production	48000m ³ per annum
Depth of Mining	1m
Water Table	10m bgl
Method of Mining	Open cast semi mechanized mining
Blasting Pattern	As the sand is loose granular material it does not require any drilling and blasting pattern.
Types of Explosives	
Measures proposed to minimize ground vibrations due to blasting	
Storage of Explosive	
Category	B ₂
Mining plan approval	Assistant Director, Geology and Mining, vide Rc.No.160/Mines/2018, dated 25.11.2019
Period of Lease	1 year.
Does it attract any general conditions specified in the EIA notification, 2006?	Not applicable
Man Power	9 persons
Water requirement	Total water requirement –6.0 KLD Drinking and Utilities – 2.0 KLD Dust Suppression and Green Belt - 4.0 KLD. Source: Mineral water supply
EMP Cost	Rs. 4.0 Lakhs
Project Cost	Rs. 22.5Lakhs
Nearest habitation	Kamatchipettai – 2km
PMHC	Elanthampattu – 4km
Nearest Town	Panruti – 10km
Nearest Railway station	Panruti – 10km
Nearest Airport	Chennai Airport –190km
Water bodies	
Interstate Boundary	Tamil nadu –Andhra Pradesh Interstate Boundary – 145kms (NE)
Coastal Zone	Bay of Bengal – 34km - East
Reserve Forest	Aranya Forest and Sanctuary – 40km – North East Mangrove Forest – 48km – South East
Park	Vedanthangal Bird Sanctuary – 98km – North East



		Karaivetti Bird Sanctuary – 96 – South West		
Land use pattern	S. No	Description	Present Area (Hec)	At the end of One Year
	1	Mining area	0.0	4.80.0
	2	Waste Dump	0.0	0.00.0
	3	Infrastructure	0.0	0.00.0
	4	Safety Zone & Plantation	Nil	Nil
	5	Mine Roads	0.0	0.00
	6	Undisturbed area	4.80.0	0.00
	Total		4.80.0	4.80.0Ha

ENVIRONMENT MANAGEMENT PLAN

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There would not be any adverse impact in the existing environment arising from this mining activity. To protect the environment, the proponent would do adequate afforestation program and spend CER @ 2% of the project cost and CSR at a rate of 2.5% of the profit through local Panchayat for the welfare of Kamatchipettai Village.

TABLE NO: 2: ENVIRONMENT MANAGEMENT PLAN

S.No	Parameters	Mitigation measures
1	Water Environment	<ul style="list-style-type: none"> ▪ Mining activity will be above the ground water level and hence ground water table will not be affected. ▪ Drinking water utilized from Mineral water industries ▪ Total Water requirement will be 6.0 KLD
2	Air Environment	<ul style="list-style-type: none"> ▪ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ▪ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF&CC to control fly of dust, noise etc. ▪ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS.
3	Noise Environment	<ul style="list-style-type: none"> ▪ This eco-friendly quarrying operation does not involves any blasting and drilling methods. JCB excavator is less than 80db. ▪ Hence noise will be minimal and this is only due to the movement of Excavator and trucks. ▪ Plantation will help in arresting noise at source ▪ Periodical monitoring of noise and vibration to ensure safety environment for workers.
4	Soil Environment	<ul style="list-style-type: none"> ▪ Humus top soil shall be preserved for reuse in afforestation and agriculture.
5	Land Environment	<ul style="list-style-type: none"> ▪ By permitting the quarrying of Sand from river bed will remove the shoals and increase the water carrying capacity of the river. ▪ Greenbelt will be developed around the mine lease

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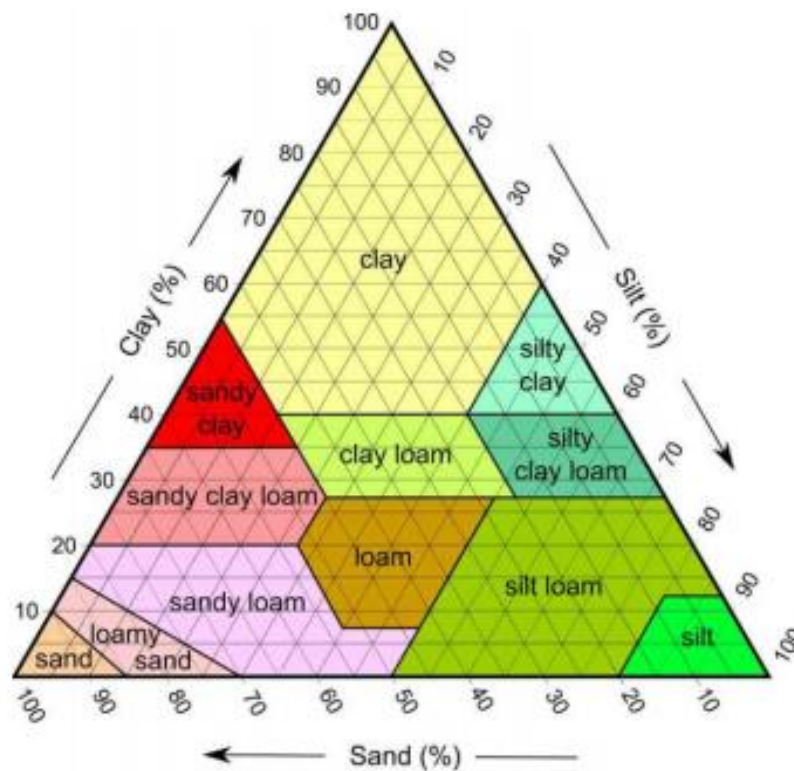
		boundary
6	Ecology and Biodiversity	<ul style="list-style-type: none"> ▪ No rare species of flora and fauna identified except regional common species.
7	Waste Management	<ul style="list-style-type: none"> ▪ No wastage is encountered during the quarrying operation and the entire quarry is utilized.
8	Occupational Health and Safety	<ul style="list-style-type: none"> ▪ Workers involved in quarrying work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc... ▪ First Aid station as per provision under Rule (44) – schedule III of the Mines Rules 1955 to be provided. ▪ Qualified First Aid personnel should be appointed /nominated to attend emergency first aid treatment. ▪ Periodic medical examination has to be made for occupational health once in six months in addition to attending medical treatment of occupational injuries under Rule 45 (A).
9	CSR Activities	<ul style="list-style-type: none"> ▪ The proponent is proposed to spend CSR @ 2.5% of profit as per the Companies Act, 2013 and CSR Rules, 2014 through local Panchayat for maintenance of road, street light, school sanitation etc., The CER will be @ 2% of the project cost which is about Rs 45,000.

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SOIL CLASSIFICATION

The soils of the district are classified as the black, red, ferruginous and arenaceous. They are again subdivided into clays, loam and sands. Black soils are observed in the Cuddalore and Chidhambaram taluks. The sandy soils are seen along the coast in Cuddalore and Chidhambaram taluks. The younger alluvial soils are found as small patches along the stream and river coursed in the cuddalore district. Red sandy soil is seen covering the cuddalore sandstone , laterite and lateritic gravels occur in parts of Viruddhachalam, Panruti taluk of cuddalore district.

(source- CGWB report of cuddalore district)



Textural triangle of Soil

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Fig No.2 Collection soil sample

Table No. 3 Soil Texture Analysis

PARAMETERS	RESULTS
pH value (10% solution)	7.16
EC@ 25°C (Micromhos/cm) (10% solution)	19.4
moisture	1.38%
Bulk density	1.29 g/cc
texture	Sand = 90.54% ; silt = 1.84% ; clay = 7.62 % sandy loam

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CHEMICAL PARAMETERS

PARAMETERS	RESULTS
Alkalinity	0.020%
Calcium	0.219%
Magnesium	0.102%
Sodium	0.0019%
Pottasium	0.0013%
Iron	1.96%
Copper	0.0012%
Chlorides	0.0010%
Organic Matter	0.179%
Water Holding Capacity	40.0%

Water Quality

Quarrying does not have any significant impact on the water quality, as the neither quarrying nor intercept with the ground water level neither there is any surface water body near the site.



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Fig: No: 3: Collection of Water sample

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TABLE: NO: 4 WATER QUALITY ANALYSIS- SAMPLE -1**Physical and Chemical Properties**

S.no	Parameters	Unit	Results (Surface water)	As per IS 10500: 2012	
				Requirement (Acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	7.15	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	36.0	1	5
3	Electrical conductivity at 25°C	Micro mhos/ cm	353	-	-
4	Total Suspended Solids	mg/l	69.0	-	-
5	Total Dissolved Solids	mg/l	220	500	2000
6	Total Hardness as CaCO ₃	mg/l	68	200	600
7	Chlorides as Cl	mg/l	40.0	250	1000
8	Sulphates as SO ₄	mg/l	23	200	400
9	Total Iron as Fe	mg/l	6.80	0.3	0.3
10	Silica (Reactive) as SiO ₂	mg/l	18.0	-	-



MICROBIOLOGICAL EXAMINATION

S.NO	Parameters (MPN / 100 ml)	Results (Bore water)	Requirement as per IS 10500:2012 Second revision (Acceptable Limit)
1	Total Coliforms	80	Shall not be detectable in any 100 ml
2	E.Coli	13	Shall not be detectable in any 100 ml

TABLE: NO: 5 WATER QUALITY ANALYSIS- SAMPLE -2

Physical and Chemical Properties

S. no	Parameters	Unit	Results (Bore water)	As per IS 10500: 2012	
				Requirement (Acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	6.87	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	0.20	1	5
3	Electrical conductivity at 25°C	Micromhos/cm	1201	-	-
4	Total Suspended Solids	mg/l	1.0	-	-

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5	Total Dissolved Solids	mg/l	680	500	2000
6	Total Hardness as CaCO ₃	mg/l	438	200	600
7	Chlorides as Cl	mg/l	115	250	1000
8	Sulphates as SO ₄	mg/l	38.0	200	400
9	Total Iron as Fe	mg/l	0.11	0.3	0.3
10	Silica (Reactive) as SiO ₂	mg/l	25	-	-

MICROBIOLOGICAL EXAMINATION

S.NO	Parameters (MPN / 100 ml)	Results (Bore water)	Requirement as per IS 10500:2012 Second revision (Acceptable Limit)
1	Total Coliforms	23	Shall not be detectable in any 100 ml
2	E.Coli	Absent	Shall not be detectable in any 100 ml

i). Mitigation measures

- The quality of ground water is fairly good. There is no liquid waste discharge from quarrying activity, which is likely to pollute water.
- People already consuming this water for drinking purposes and no health implications reported.
- Total water requirement will be 6.0 KLD

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NOISE AND VIBRATION

Major noise generating sources may be considered as excavation, drilling blasting, loading and vehicle movement during transportation of minerals. With the starting of quarrying operations, it is imperative that noise levels shall increase. In order to assess the impact baseline ambient noise level, noise monitoring has been carried out at different points using Sound level meter



Fig: No: 4: Measuring Noise Level

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TABLE: NO: 6 AMBIENT NOISE LEVELS

S. No	Location	Noise levels dB (A)	Limits as per TNPCB dB(A)
			(Day Time: 6:00 AM – 10:00PM)
1	Core zone	46.8	Residential – 55 dB (A)
2	At Pillars lease boundary	39.0	
		42.4	
		35.7	
		38.2	

The noise level found to be within the limits as per TNPCB Standards.

i).Mitigation Measures

- Greenbelt will be developed around the mine lease as well as safety zones which will help in arresting noise at source
- Safety devices provided to workers, where noise is more than 80dB (A)
- Limiting time exposure of workers to excessive noise
- Proper and regular maintenance of vehicles, machinery and other equipments
- Periodic inspection of all equipments and risk prone areas
- Regular lubrication & replacement of worn out parts etc...

Air Quality

Drilling and blasting operations are source of fugitive dust emission but its effect is more or less localized. Ambient Air monitoring has been carried out in the core zone.





Fig: No: 5: Ambient Air monitoring

The major part of the dust generated during such operations usually gets settle down and thus the effect of such operation will be localized phenomenon.

TABLE: NO: 7 AMBIENT AIR QUALITY MONITORING

S. No	Parameters ($\mu\text{g}/\text{m}^3$)	Measured Value	NAAQS
1	Particulate Matter (PM _{2.5})	22.7	60
2	Respirable Particulate Matter (PM ₁₀)	44.9	100
3	Sulphur Dioxide (SO ₂)	7.3	80
4	Nitrogen Dioxide (NO ₂)	11.8	80
5	Ozone (O ₃)	28.5	180
6	Lead (Pb)	BDL (DL=0.1)	1
7	Carbon Monoxide (CO) 1 hour	BDL (DL=1.15)	4

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8	Ammonia (NH ₃)	22.4	400
9	Arsenic (As)	BDL (DL=1.0)	6
10	Nickel (Ni)	BDL (DL=0.1)	20
11	Benzene (C ₆ H ₆)	BDL (DL=0.1)	5
12	Benzo (a) Pyrene	BDL (DL=0.1)	1
BDL = Below Detectable Limit, DL = Detection Limit			
NAAQS = National Ambient Air Quality Standards			

The above results comply with NAAQS. The generation of dust is controlled and suppressed at source by sprinkling of water on haul roads, loading points at regular intervals as shown below.

i) Mitigation Measures

- Dust extractor or wet drilling to be followed to control dust at source of emission
- Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste
- Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF&CC to control fly of dust, noise etc...
- Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, and goggles as per the MMR, 1961 amendments and circulars of DGMS.



EIA General Condition

Table No 8: General conditions

Interstate Boundary	Tamil Nadu –Andhra Pradesh Interstate Boundary – 145km (NE)
Coastal Zone	Bay of Bengal – 34km - East
Reserve Forest	<p>Aranya Forest and Sanctuary – 40km – NorthEast</p> <p>Mangrove Forest – 48km – SouthEast</p> <p>1.Karukkal Reserve forest about 3.7 km on South Eastern side of the project site.</p> <p>2.Visur Reserve forest about 4.5 km on Southern side of the project site.</p> <p>3. Mrelippu Reserve forest about 5.3 km on Southeastern side of the project site.</p> <p>4. Kallamedu Reserve forest about 7.6 km on Southwestern side of the project site.</p> <p>5.Melkangeyankuppam Reserve forest about 6.6 km on Southern side of the project site.</p> <p>6. Vallam Reserve forest about 7.4 km on Southeastern side of the project site.</p> <p>7. Nadukuppam Reserve forest about 8.2 km on South eastern side of the project site.</p>
Park	<p>Vedanthangal Bird Sanctuary – 98 – NorthEast</p> <p>Karaivetti Bird Sanctuary – 96 – South West</p>

1. Power Lines (HT / LT)

There is no HT or LT lines found nearby.

2. Water bodies

The groundwater table is reported as 10m depth in nearby bore wells on this area. The de silting of the tank will facilitate rain water harvesting and recharging of the water table in the surrounding area. For quarry operation water is not required.

3. Archaeological / historical monuments

There is no Archeological /Historical Monuments within a radius of 10 km.

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4. Road (NH, SH others).

The nearest National highway (NH-45) Villupuram-Ulundurpettai at 10km distance on the West side of the lease applied area. The nearest roads following below.

SH-9 – Panruti – Madapattu – 3 km – North

MDR – Sendanadu – Sadampuliyar Road – 3.30km – South

Village Road – Panruti – Kizhakku Marudhur Road – 500m - NorthWest

5. Places of worship (Temple, Church, Mosque etc.,)

No infrastructures like residential building, places of special interest like temples, Sanctuaries etc., are found in the radius of 500m. No quarry is found around 500m radius. The quarry lease area does not attract the general conditions as per EIA Notification, 2006. The project cost is about Rs. 22.5 Lakhs and EMP cost is Rs. 4 Lakhs.



The Executive Engineer

Project Proponent

Public Works Department,
Water Resources Organization,
Mining and Monitoring Division,
Villupuram District

For Aadhi Boomi Mining &
Enviro Tech (P) Ltd


Director

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