

ENVIRONMENT MANAGEMENT PLAN

Executive Summary

The Applicant, The Executive Engineer, having registered office at Mining and Monitoring Division, Public Works Department, Water Resources Department, Thanjavur, Tamil Nadu, has applied for grant of Sand quarry in S.F.No. 1(P), over an Extent of 2.25.0 Hectares in Kothangudi Village of Kumbakonam Taluk, Thanjavur District, Tamil Nadu.

The District collector, Thanjavur vide letter No. Rc.No.352/Mines/2018 dated 17.06.2019 has directed the applicant The Executive Engineer, Mining and Monitoring Division, Public Works Department, Water Resources Department, Thanjavur 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: 1(P), over an extent of 2.25.0Hectares, Kothangudi Village of Kumbakonam Taluk, Thanjavur District, Tamil Nadu. The mining plan is approved by Assistant Director, Geology and Mining, Vide Rc. No.352/Mines/2018 Dated 12.09.2019.

Geological resources and Mineable reserves: The Estimated Geological resources of Sand are 93962 m³ and The estimated mineable reserves are 48962 m³(Total Depth of 1m) Production Schedule: Production of Sand per annum shall be 48962m³.

TABLE NO:1 SALIENT FEATURE

FEATURE	DETAILS
Name of the Proponent and address	THE EXECUTIVE ENGINEER, Mining and Monitoring Division, Public Works Department, Water Resources Department, Thanjavur, Tamil Nadu.
Existing/New Quarry	New
Survey number	1(P)
Geographical features	Latitude: 11°01'02.94"N to 11°01'9.27"N Longitude: 79°19'06.62"E to 79°19'13.09"E. The area applied for fresh quarry lease is flat terrain with 50m above MSL. No. 58-M/8

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Site Location	Kothangudi Village of Kumbakonam Taluk, Thanjavur District, Tamil Nadu.
Type of Project	Sand quarry
Mining lease area	2.25.0 Hectares
Geological Resources	93962m ³
Mineable Reserves	48962m ³
Production	48962m ³ per annum
Depth of Mining	1 m
Water Table	4-5 bgl
Method of Mining	Open cast , Manual mining
Blasting Pattern	NA
Types of Explosives	
Measures proposed to minimize ground vibrations due to blasting	
Storage of Explosive	
Category	B2
Mining plan approval	Assistant Director, Geology and Mining, vide Rc.No. 352/Mines/2018 Dated 12.09.2019.
Period of Lease	3 years.
Does it attract any general conditions specified in the EIA notification, 2006?	Not applicable
Man Power	28 persons
Water requirement	Total water requirement –6.0 KLD Drinking water and utilities -2KLD Dust suppression and Green Belt -4.0KLD. Source: Mineral water supply
EMP Cost	Rs3.67 Lakhs
Project Cost	Rs.70.17 Lakhs
Nearest habitation	Kothangudi – 910m - Northeast (120)
PMHC	Thirupurambiyam– 1.5km South easternside
Nearest Town	Kumbakonam– 9.3km- Southeast
Nearest Railway station	Kumbakonam– 9.3km- Southeast
Nearest Airport	Tiruchirappalli Airport-70.5 km (South western Side)
Water bodies	This project located at Coleroon river. There is no major river or water body, nallah and ponds are situated around 500m radius.

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	I. Sripuranthan lake – 3.41 km – North side A.Natham Lake – 4.9km Northwest																								
Interstate Boundary	Interstate boundary Kerala-Tamil Nadu is located at 265kms from the site on the Western side. B2 Project it is exempted under General Conditions of EIA Notification 2006																								
Coastal Zone	Bay of Bengal – 58km - East																								
Reserve Forest	1. Sathambadi R. forest is located about 4.6 km on western side of the project site. 2. Alvoiy Extension R. forest is located about 6.3km on North western side of the project site. 3. Parukkal R. forest is located about 8.7 km on North western side of the project site. 4. Nayaganaipriyal R. forest is located about 9 km on North North-eastern side of the project site. 5. Madanathur R. Forest is located about 8.6km on North eastern side																								
Park	There is no wild animal sanctuary within 10 km radius from the project site																								
Land use pattern	<table border="1"> <thead> <tr> <th>S. No</th> <th>Description</th> <th>Present Area (Hec)</th> <th>At the end of six months(Hec)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Mining area</td> <td>0.00.0</td> <td>2.25.0</td> </tr> <tr> <td>2</td> <td>O/B or Waste Dump</td> <td>0.00.0</td> <td>0.00.0</td> </tr> <tr> <td>3</td> <td>Safety zone and Plantation</td> <td>Nil</td> <td>Nil</td> </tr> <tr> <td>4</td> <td>Undisturbed area</td> <td>2.25.0</td> <td>0.00.0</td> </tr> <tr> <td colspan="2">Total</td> <td>2.25.0</td> <td>2.25.0</td> </tr> </tbody> </table>	S. No	Description	Present Area (Hec)	At the end of six months(Hec)	1	Mining area	0.00.0	2.25.0	2	O/B or Waste Dump	0.00.0	0.00.0	3	Safety zone and Plantation	Nil	Nil	4	Undisturbed area	2.25.0	0.00.0	Total		2.25.0	2.25.0
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ENVIRONMENT MANAGEMENT PLAN

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 Kothangudi 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. Hydraulic 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 quarrying of sand from this silted bed can

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		<p>be deepened and it will enable to increase the water holding capacity of the tank.</p> <ul style="list-style-type: none">▪ Greenbelt will be developed around the mine lease 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">▪ There is no wastage is encountered during the quarrying operation 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 48,000.

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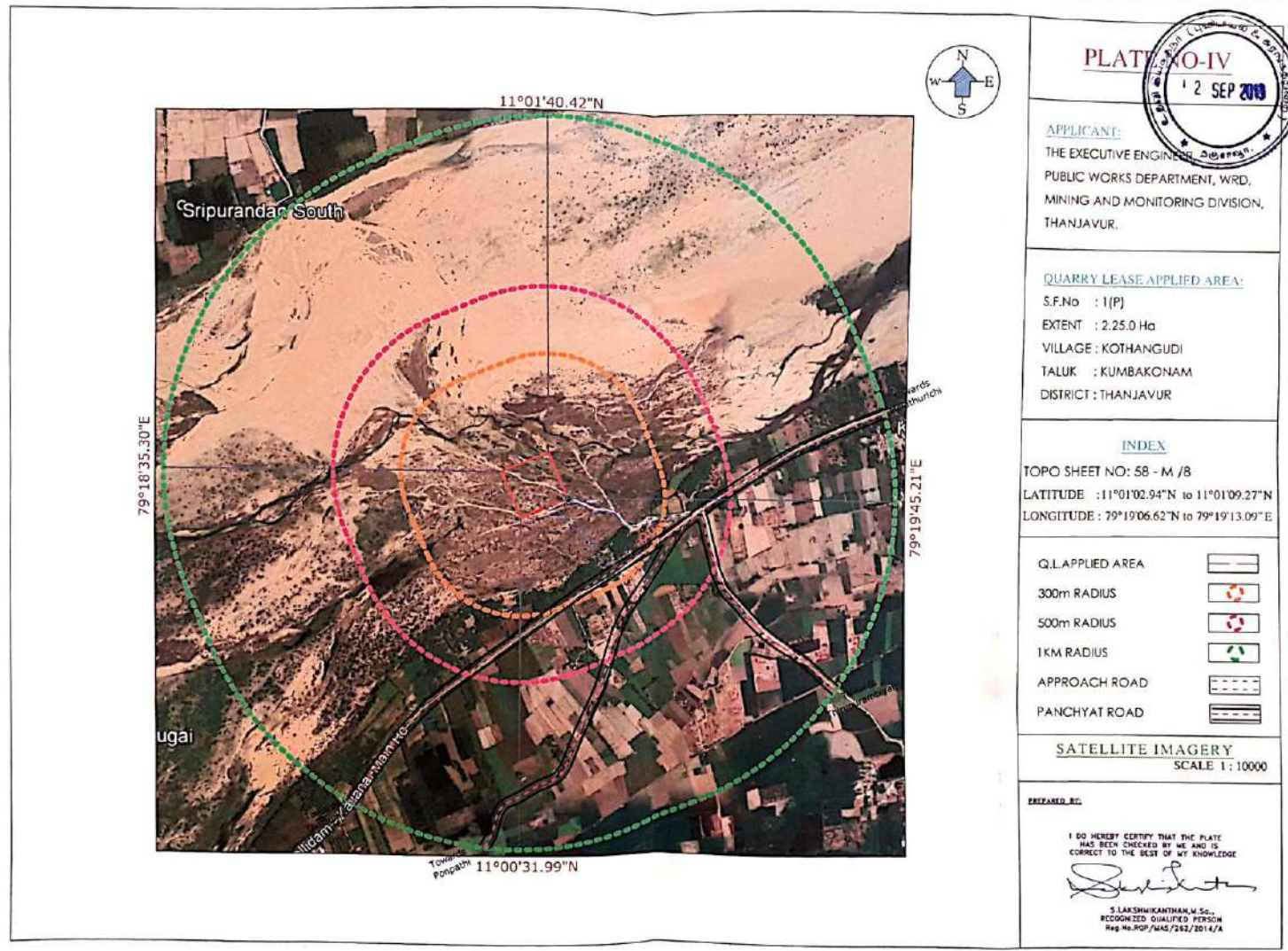


Fig No: 1. 300/500m radius over Google Earth image

S. Lakshwikanthan 14/2/2022
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SOIL CLASSIFICATION

The thanjavur district is occupied by different geological formation. The different types of soils are derived from the formations are;

Quaternary: sand, silt and clay super imposed sand, natural levee complexes

Pliocene: Clay heavily weathered super imposed old drainage morphology

Miocene: Sands, clay bound, clays gravels,

Cretaceous: redish and yellowish calcareous sand stones, clays and lime stone.

(source- CGWB report of Thanjavur district)

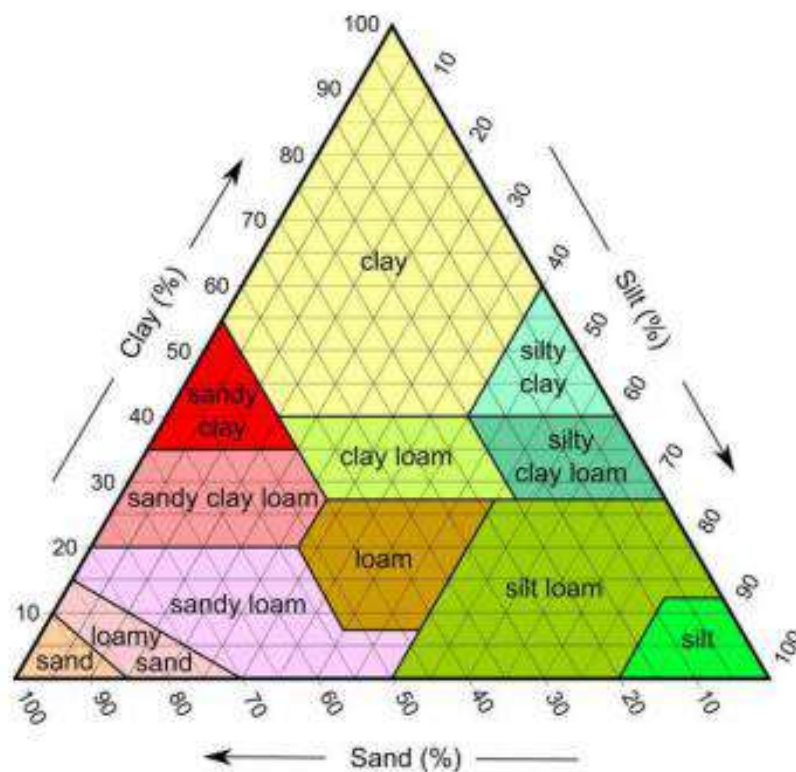


Fig.no.2a- Textural triangle of Soil

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Fig No2.b-Collection soil sample

TABLE NO: 3: SOIL TEXTURE ANALYSIS

PARAMETERS	RESULTS
pH value (10% solution)	7.38
EC@ 25°C (Micromhos/cm) (10% solution)	64.2
moisture	12.62%
Bulk density	1.32 g/cc
texture	Sand = 94.96% : Silt = 0.32%: Clay = 4.72%
	Sand

CHEMICAL PARAMETERS

PARAMETERS	RESULTS
Alkalinity	0.036%
Calcium	0.129%
Magnesium	0.018%
Sodium	0.0024%

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Potassium	0.0018%
Iron	1.68%
Copper	0.0009%
Chlorides	0.0019%
Organic Matter	0.102%
Water Holding Capacity	48.0%

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.



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	-	7.72	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	0.7	1	5
3	Electrical conductivity at 25°C	Micro mhos/ cm	642	-	-
4	Total Suspended Solids	mg/l	18.0	-	-
5	Total Dissolved Solids	mg/l	368	500	2000
6	Total Hardness as CaCO ₃	mg/l	186	200	600
7	Chlorides as Cl	mg/l	56.0	250	1000
8	Sulphates as SO ₄	mg/l	23.0	200	400
9	Total Iron as Fe	mg/l	0.27	0.3	0.3
10	Silica (Reactive) as SiO ₂	mg/l	16.0	-	-

MICROBIOLOGICAL EXAMINATION

S.NO	Parameters (MPN / 100 ml)	Results Bore water	Requirement as per IS 10500: 2012 Second revision (Acceptable Limit)
1	Total Coliforms	90	Shall not be detectable in any 100

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 10/2/2022

			ml
2	E.Coli	17	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

- **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: 5 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	37.4	Residential – 55 dB (A)
2	At Pillars lease boundary	38.5	
		37.0	
		37.2	
		41.5	

- 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.

K. Prasad
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14/12/2022



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: 6 AMBIENT AIR QUALITY MONITORING

S. No	Parameters ($\mu\text{g}/\text{m}^3$)	Measured Value	NAAQS
1	Particulate Matter ($\text{PM}_{2.5}$)	23	60
2	Respirable Particulate Matter (PM_{10})	42	100
3	Sulphur Dioxide (SO_2)	6	80
4	Nitrogen Dioxide (NO_2)	10	80
5	Ozone (O_3)	28	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)	27	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.

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EIA General Conditions

Table No: 7: General conditions

Interstate Boundary	Interstate boundary Kerala-Tamil Nadu is located at 265kms from the site on the Western side. B2 Project it is exempted under General Conditions of EIA Notification 2006.
Coastal Zone	Bay of Bengal – 58km - East
Reserve Forest	<ol style="list-style-type: none"> 1. Sathambadi R. forest is located about 4.6 km on western side of the project site. 2. Alvoy Extension R. forest is located about 6.3km on North western side of the project site. 3. Parukkal R. forest is located about 8.7 km on North western side of the project site. 4. Nayaganaipriyal R. forest is located about 9 km on North North-eastern side of the project site. 5. Madanathur R. Forest is located about 8.6km on North eastern side
Park	No within 10km radius

1. Power Lines (HT / LT)

There is no HT or LT lines are found in 50m radius.

2. Water bodies

This project site it's self located at Coleroon river. Sripuranthan lake is located about 3.4km on northern side of the lease applied area. The groundwater table is reported as 4-5m 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.

4. Road (NH, SH others).

- The nearest National highway is NH 45C which is connecting Thanjavur-Kumbakonam located about 6.5 km on the southern side of the lease area.

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- The nearest State highway is SH 140 which is connecting Kumbakonam-Karaikurichi located about 5 km on the eastern side of the lease area.
- The Major district road is connecting Thattamal- Melathurichi situated about 270m on the South Eastern side of the lease area.

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 300m.

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. 24.0Lakhs and EMP cost is Rs. 4.0 Lakhs.


Executive Engineer, WRD.,

The Executive Engineer
Project Proponent
Public Works Department,
Water Resources Organization,
Mining and Monitoring Division,
Thanjavur District

For Aadhi Boomi Mining &
Enviro Tech (P) Ltd.


Director

(Mr.S.Suriyakumar)
M.Sc., M.Phil, F.C.C. (Min)
PGDBA, DIPC
EIA Co-ordinator (Mining)

Place : Salem

Date : 21.02.2022


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