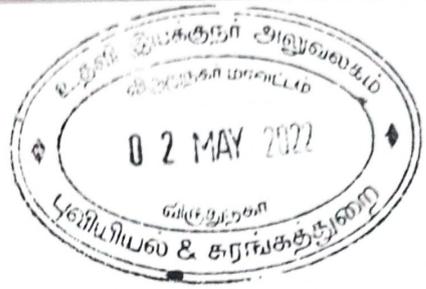


Cross Section along X5-Y5

Fig.No.14: Cross section of River bed showing shoal/Silt portion and obstacles



**Slope Analysis:** In the above Longitudinal section the river water flow follows at gradient of 1:3464 whereas gradient of lease applied area shows 1:578, the slope is very less due to accumulation of sand along the flow direction. Similarly the width wise a section X1-Y1 and X6-Y6 also shows undulated terrain nature.

#### **Cross-Section Gradient along width of River**

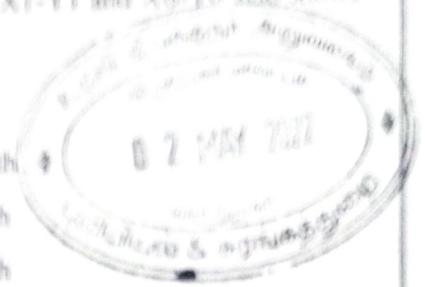
Slope from X1-Y1 : 1 : 62 Slope towards North

Slope from X2-Y2 : 1 : 45 Slope towards North

Slope from X3-Y3 : 1 : 96 Slope towards North

Slope from X4-Y4 : 1 : 440 Slope towards North

Slope from X5-Y5 : 1 : 414 Slope towards North



Deposition of sand mostly is on northern side of the lease area. Sand is not perfectly washed out by river flow. Coarse sand is found below this fine poor quality assorted sand. Removal of this sand on crescent shape of meander may improve the flow of water on downstream. Aerial survey points at 10m x 10m interval as XYZ data are given as soft copy in CD separately for core Zone (Lease area) 100m buffer Zone on all directions from the boundary of lease area as well as 1km upstream and 1km downstream for slope analysis.

### **b) GEOLOGY**

#### **3.1. GEOLOGY OF THE DISTRICT**

The most of the area in Virudhunagar District is covered by a vast tract of black soil with residual hills and knolls. Since the area is covered by thick pediments, the geology of the area is studied in available exposure and quarry section opened up for limestone, dimension stone and blue metals for various purposes. The area exposes Khondalite Group of rocks and migmatite gneisses of Precambrian (V.R.Sowmi Narayanan, et al.). The Khondalite Group of rocks comprises Charnockite, crystalline limestone/calc gneiss, garnetiferous quartzofeldspathic gneiss (leptynite), all these litho units probably represent a sequence of metamorphosed sedimentary units of arenaceous, calcareous and argillaceous composition with various intermixtures of different proportions (V.R.Sowmi Narayanan, et al.). Granite and quartz veins form the younger intrusive.

#### **Charnockite:**

Generally, the Charnockite is grey to greenish colored, coarse to medium grained, greasy nature with or without garnet. Because of the limited outcrops, the quarry sections are studied to infer the various interrelationships between the litho units. Charnockite is interbanded nature with crystalline carbonate rocks are observed in most of the limestone quarry in Pandalgudi, Lakshmipuram, Gopalapuram villages (Field photograph. 1), suggested a metasedimentary origin for the charnockite (V.R.Sowmi Narayanan, et al.). Weathering of the Charnockite on the surface gives a

deceptive look of gneiss and in the quarry sections at depth the fresh charnockite is exposed, which are well exemplified in almost all the Charnockite quarry sections. The specks of quartz within the charnockite are seen in the Duraisampuram village. Hardly charnockite is observed in Gopalapuram rough stone quarry.

#### Migmatite:

The Charnockite shows migmatization is noticed in hill locating ~~near~~ <sup>at</sup> Katalalingam university, where the rock exposes segregation of mafic and felsic layers with pygmatic folds showing conversion of Charnockite in to hornblende biotite gneiss, the occurrences of garnet parallel to the foliation is also observed (Field photograph. 3).

#### Calc Gneiss:

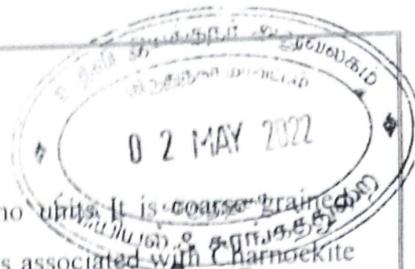
Calc gneiss are characterized by alternating layer of carbonate rich and diopside rich layers are noticed in outcrop in association with garnetiferous quartzofeldspathic gneiss, is medium to coarse grained and is made up of calcite, diopside, biotite and garnet. The exposers are seen in quarry section in Nadikudi, Erichanatham, Kanjanpatti, Sundakottai, Aladipatti, Kadambankulam villages. Kanker is forming as a weathering product of calcgneissic, containing CaO content more than 30% is mined by RAMCO cements in Maravarperungudi village and in many local quarries for various purposes.

#### Garnetiferous Quartzofeldspathic Gneiss:

White coarse to medium grained garnetiferous quartzofeldspathic gneiss occurs as bands along the foliation in the charnockite, also as enclaves engulfed by charnockite. It consists of quartz, feldspar and garnet with subordinate biotite. The garnets at places are rounded simulating snowball garnets, as observed in Motamalai hill (Field photograph. 4). Quartz and feldspar show stretching and alignment, imparting a crude gneissosity and garnets are unevenly distributed (Field photograph. 5). The rock is exposed in association with calc gneiss and Charnockite as observed in quarries in Pandalgudi, Duraisampuram, Thiruthangal villages.

#### Crystalline carbonate rock:

The rock is white, pale grey and pink in color, medium to coarse grained and consists essentially of calcite with mafic minerals (diopside) unevenly distributed within it. The crystalline limestone is associated with calc gneissic in Pandalgudi, K.Pudhur villages and it associated with Charnockite in Gopalapuram, Cholapuram villages (Field photograph. 6). At places the limestone show compositional variation to dolomitisation due to presence of mineral sapphire (Field photograph. 7) as observed in Tamilnadu Cements Corporation mining in Alangulam village. The presence of quartz vein within the limestone degrades the quality of cement grade purposes. In Cholapuram area, the remobilization of carbonate rock is noticed within the Charnockite.



### **Pink Granite:**

The pink granite occurs as veins intruding into the above all litho units. It is coarse grained and consists of quartz, pink feldspar, with biotite in lesser proportion. It is associated with Charnockite is observed in Kothankulam and Aladipatti villages.

### **Quartz Vein:**

Quartz veins are cutting across into the litho units like charnockite, crystalline limestone, calc gneissic are observed in the field and the presence of garnet in the quartz vein are noticed in the village Kothankulam is associated with Charnockite (Field photograph. 9). The quartz vein in limestone makes unsuitable for cement grade purposes.

### **Lime kankar**

The Lime kankar is found to be occurring in a vast stretch of area on the South of Aruppukottai Taluk, Virudhunagar District to Vilathikulam Taluk in Thoothukudi District. The deposits are all superficial, limited to depth of 1 to 2 meters. The Limekankar in this region is generally overlain by Clay. Lime kankar is widely used for manufacturing burned lime and also being used for Cement Manufacturing. Lime kankar deposit around Maravarperungudi village is currently being mined by Tvl. The Ramco Cements Limited, which is having around 38% CaO content. The estimated limekankar reserves of about 8 lakhs tons for the average lime kankar thickness of 1.5 m. Potential deposits of Limekankar is also occurring in Kallurani, Muthuramalingapuram, Narttampatti, Sudhamadam, Vadakkunatham, Sallukuvarpatti, Velayuthapuram and T.Koppuchittampatti Villages of Aruppukottai Taluk. The average thickness of Limekankar deposit in these regions is 1.0 meters and the estimated Resources for ROM Kankar (Kankar plus intercalated clay) for each Square Kilometer is about 2 million Tonnes.

### **Soil:**

The area is mostly covered by black soil for 0-6m thickness, at places reddish in color where laterite formation are prominent as observed in gravel quarry in Kariapatti village. Moreover the black and red soil formations in the District are being quarried for manufacture of bricks and few good quality of black soil is using in cement industries.

### **Clay (Others)**

A fine to silty clayey nature black soil (commonly known as black cotton soil) occurrence is identified in various parts of the District. The Clay layer is of 0 — 5m thickness and generally underlined by Lime kankar or basement gneissic formation. This Clay deposit in the form of black cotton soil has a wide spread occurrence in the District. The clay is rich in Alumina and occurring in Kallurani, Muthuramalingapuram, Narttampatti, Sudhamadam, Vadakkunatham & T.Koppuchittampatti Villages of Aruppukottai Taluk.

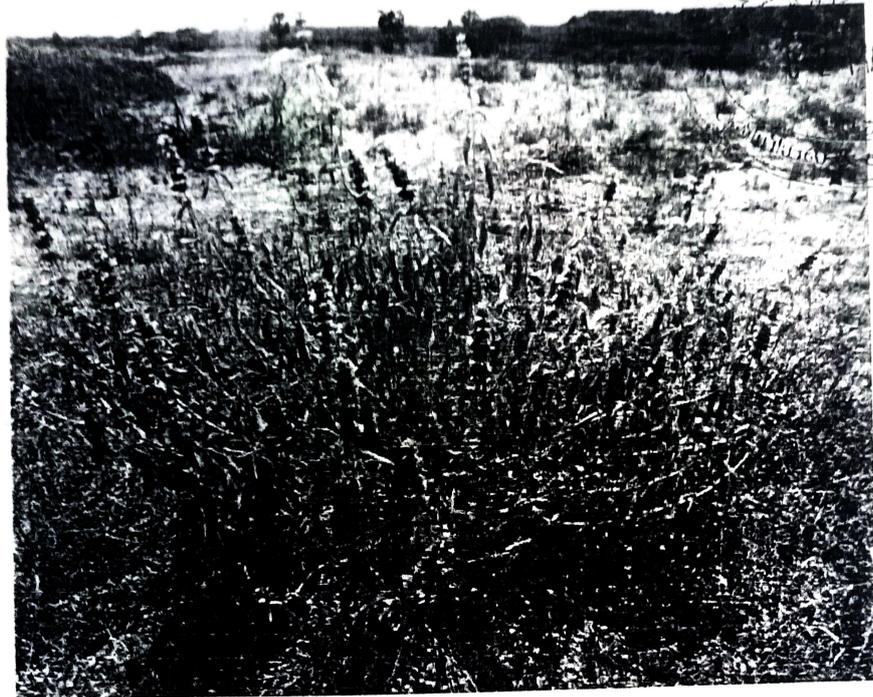


Fig.No.15: Photo showing general view of the Lease area



Fig.No.16: Close view of the River Sand

3.1.(a) Geology of the proposes Area

The proposed area is a river bed and the above photograph illustrates that sand is composed of mixture of fine and coarse sand along with some amount of clay and black accessory minerals. All are product of erosion, transportation and river basin deposition. The Sand is overlying by 2 feet silt (clay mixed with fine sand particles)



a) Slope Analysis

Overall River water flow gradient = 1 : 3464

Over all River sand bed Gradient = 1 : 578

Gradient on stream Direction from Upstream side of Lease area to Downstream side of Lease area:

Highest Elevation - 47.29m

Lowest Elevation - 46.6m

$$\begin{aligned} \text{Gradient} &= \text{Length of River/ Elevation Difference} \\ &= 2421/0.699\text{m} = 1: 3464 \text{ (Low slope)} \end{aligned}$$

Gradient on Down Stream Direction from Lease area:

Highest Elevation - 47.40m

Lowest Elevation - 46.83m

$$\begin{aligned} \text{Gradient} &= \text{Length of River/ Elevation} \\ &= 325.6/0.563\text{m} = 1: 578 \text{ (Low slope)} \end{aligned}$$

Over all slope in lease area is medium - Gentle slope due to sand accumulation.

Specific gravity and Sand textural analysis are given as under table No Table No.5A- 5C

a) Physical Properties

Table No.5A

Grain Size	Size Distribution (%)
Sand	93%
Silt	7%
Bulk Density	1.35 gms/cc
Colour	White to grey
Shape of grain	Rounded to subangular

b) Chemical Analysis

Table No.5B

Constituents	Percentage (%)
SiO <sub>2</sub>	98
Al <sub>2</sub> O <sub>3</sub>	0.60
Fe <sub>2</sub> O <sub>3</sub>	0.30
CaO	1.10

c) Petrographic Analysis Table No.5C

Quartz	98
Feldspar	0.5
Clay\Lime	1.0
Accessory black minerals	0.5

### 3.2 Details of Exploration already carried out if any

#### Already carried out:

The PWD department under water resources management has conducted study on this river basin and maintains the basin from encroachments. The sand in the area has about overlying by silt with 0.0.647m (Avg.) and more than 3m depth of sand as proved in the test pit. However the quarrying is proposed to a depth of 1m below the shoal level. The sand formation is clearly visible right from the surface.

### 3.3 Estimation of Reserves

#### a) Geological Reserves with geological Sections on a scale of 1: 1000

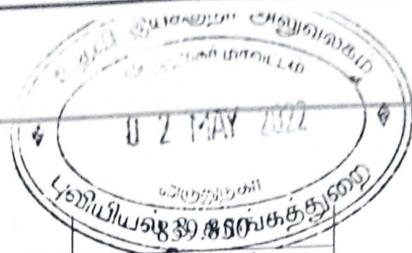
The geological resource is estimated as  $180734\text{m}^3$  up to a depth of 3m below River bed level including Silt within the permissible area for quarrying. Reserve is calculated by Cross Sectional method. The reserve is exposed on all sides for direct loading. Please refer Plate -III for details of calculation.

Table No. 6A. Geological Resources of Silt

S.NO	Existing Level (m)	Theoretical Bed level	Difference (m)	Mean Difference	CS Length (m)	CS-Area $\text{m}^2$
X1-X1'	46.000	46.594	-0.594			
	46.500	46.594	-0.094	-0.344	131.5	-45.236
X2-X2'	46.500	46.541	-0.041			
	46.250	46.541	-0.291	-0.166	138	-22.908
X3-X3'	46.500	46.488	0.012			
	47.250	46.488	0.762	0.387	146	56.502
X4-X4'	46.750	46.435	0.315			
	47.250	46.435	0.815	0.565	148	83.620
X5-X5'	47.250	46.382	0.868			
	47.500	46.382	1.118	0.993	150	148.950
X6-X6'	47.250	46.329	0.921			
	48.000	46.329	1.671	1.296	156	202.176
X7-X7'	47.000	46.276	0.724			
	47.750	46.276	1.474	1.099	164	180.236
X8-X8'	47.000	46.223	0.777			
	47.500	46.223	1.277	1.027	168	172.536

Table No. 6B. Geological Resources of Silt

S.No	Area ( $\text{m}^2$ )	Mean Area ( $\text{m}^2$ )	CS Interver(m)	Quantity in $\text{m}^3$
1	-45.236			
2	-22.908	-34.072	50	-1703.600



3	56.502	16.797	50	
4	83.620	70.061	50	3503.050
5	148.950	116.285	50	5814.250
6	202.176	175.563	50	8778.150
7	180.236	191.206	50	9560.300
8	172.536	176.386	30	5291.580
<b>TOTAL</b>				<b>32084</b>

Average height of Silt =  $32084\text{m}^3/49550\text{m}^3 = 0.0647\text{m}$

**Table No. 6C. Geological Resources Sand**

Details	Volume in m <sup>3</sup>
Geological resource of Silt above TBL(Avg height 0.647m)	32084
Geological resource of sand (3m Below River bed Level )	148650
<b>Geological reserves of Sand including shoals</b>	<b>180734</b>

**b) Mineable Reserves :**

The mineable reserve is estimated as **81634m<sup>3</sup>** up to **1m** below the Theoretical bed level including Silt with an Average thickness of 0.647m.

**Table No.7. Mineable/Production reserves of silt**

S.NO	Existing Level (m)	Theoretical Bed level	Difference (m)	Mean Difference	CS Length (m)	CS-Area M2
X1-X1'	46.000	46.594	-0.594			
	46.500	46.594	-0.094	-0.344	131.5	<b>-45.236</b>
X2-X2'	46.500	46.541	-0.041			
	46.250	46.541	-0.291	-0.166	138	<b>-22.908</b>
X3-X3'	46.500	46.488	0.012			
	47.250	46.488	0.762	0.387	146	<b>56.502</b>
X4-X4'	46.750	46.435	0.315			
	47.250	46.435	0.815	0.565	148	<b>83.620</b>
X5-X5'	47.250	46.382	0.868			
	47.500	46.382	1.118	0.993	150	<b>148.950</b>
X6-X6'	47.250	46.329	0.921			
	48.000	46.329	1.671	1.296	156	<b>202.176</b>
X7-X7'	47.000	46.276	0.724			
	47.750	46.276	1.474	1.099	164	<b>180.236</b>
X8-X8'	47.000	46.223	0.777			
	47.500	46.223	1.277	1.027	168	<b>172.536</b>

Table No.8. Mineable/Production reserves of Silt

S.No	Area (m <sup>2</sup> )	Mean Area (m <sup>2</sup> )	CS Interval (m)	Quantity in m <sup>3</sup>
1	-45.236			-1703.600
2	-22.908	-34.072	50	839.850
3	56.502	16.797	50	3503.050
4	83.620	70.061	50	5814.250
5	148.950	116.285	50	8778.150
6	202.176	175.563	50	9560.300
7	180.236	191.206	50	5291.580
8	172.536	176.386	30	32084
<b>TOTAL</b>				

Table No.9. Mineable/Production reserves sand (Including Silt)

Details	Volume in m <sup>3</sup>
Silt above TBL(Avg height 0.647m)	32084
Mineable reserves of sand (1m Below River bed Level)	49550
<b>Geological reserves of Sand including silt</b>	<b>81634</b>

#### 4. MINING

##### 4.1 Method of Mining:

Mining would be carried out by opencast method by mechanized means Poclair/Excavators and tippers.

##### 4.2 Mode of Working:

Being loose and soft material, it is proposed to remove the materials by a system of hydraulic excavator and tipper combination. No separate top soil or any overburden shall be removed. The Excavated sand shall be loaded into the PWD stock yard.

##### 4.3 Proposed Bench Height & Width

It is a shallow quarrying to a depth of 1m and there is no benches shall be formed. The excavated area shall be replenished during the next rainy season naturally.

##### 4.4. Indicate the overburden / mineral production expected pit wise as detailed below

The following are the production and developmental works to be carried out for six months in the table below,

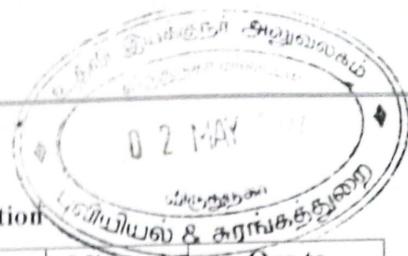


Table No.10. Year wise production

Year	Silt (m <sup>3</sup> )	ROM of sand (m <sup>3</sup> )	Saleable sand (m <sup>3</sup> )	Sub grade ore / mineral	Mineral Rejects	Ore to overburden ratio
Six Months	32084	49550	49550	0	32084	1:0.64

Total production for Six Months = 49550m<sup>3</sup>

#### 4.5 Machineries used

##### a) Mining

Mining would be carried out by opencast method by mechanized means Poclairn and tippers. As the sand is loose granular material it does not require any drilling.

##### b) Loading equipment

Loading of sand shall be done by Poclairn/ Excavator into Tippers.

Table No.11. Details of loading equipment

Type	No	Size/ Capacity	Make	Motive Power	H.P
Hydraulic Excavator	2	0.9 m <sup>3</sup>	L&T	Diesel	180

##### c) Transportation

Haulage of minerals will be done by Tipper directly carry from mining site to the government Sand stack yard.

Table No.12. Details of Transportations

Type	No	Size/ Capacity	Make	Motive Power	H.P
Tipper	20	15M.T	AMW	Diesel	110

#### 4.6 Disposal of overburden / waste

No over burden is anticipated however shoal containing more debris and clay sand shall be dumped over the bank of river to increase the bank height and protect the neighbor area from inundation.

#### 4.7 Brief note on conceptual mining plan:

##### The ultimate extent and size of the pit:

The anticipated life of the mine shall be Six Month. The size of the ultimate pit boundary shall be as follows:

Table No.13 Ultimate pit dimension

LENGTH(m)	WIDTH(m)	DEPTH(m)
330	150	1



**5. BLASTING:** No blasting shall be practiced.

#### **6. MINE DRAINAGE**

**6.1 Depth of water table:** The water table in the adjacent area is 6m depth as observed in the nearby bore wells.

**6.2 Arrangements and places where the mine water is finally proposed to be discharged**

There is no such type of activities anticipated in this quarrying operation.

#### **7. OTHER PERMANENT STRUCTURES**

**7.1 Habitations / Village:**

Population of Nenmeni Village is 10425, it is a small Village in Sattur Taluk and Virudhunagar District. Other Village hamlets were given in the following table,

Table No.14. Human settlement

Direction	Name of Village	Distance from Mines in km (Approx)	Population
NW	Nenmeni	1	10425
N	Sattur	1.5	1825
NE	N. Mettuppatti	2	7184
E	M.Nagalapuram	2	911

**7.2 Power Lines (HT / LT):** There is no HT or LT lines is found nearby.

**7.3 Water Bodies:** The site itself is a river bed

**7.4 Archaeological / historical monuments:** There is no archaeological monument.

**7.5 Road (NH, SH others):**

- The NH-44 Connecting Madurai – Tirunelveli situated at Western side, about 16km away from the area.
- SH-28 Connecting Aruppukkottai - Tuticorin– situated at Eastern side, about 17km away from the area.
- Irukkankudi Village road is available in 1.5km North.  
A village road situated nearby the site on the Southern side for transportation of materials.

**7.6 Places of worship:** Nil

**7.7 Reserved forest / Forest / Social forest / wild life sanctuary etc.:**

1. Kothankulam reserve forest -95km - Northwestern
2. Kurumalai Reserve forest - 55km -S direction.
3. Srivalliputtur wild animal sanctuary - 86km -Northwestern Side.

7.8 Any other structures: Nil

## 8. EMPLOYMENT POTENTIAL & WELFARE MEASURES

### 8.1 Employment Potential

#### Management and supervisory personal

For the purpose of Mines safety under the provisions of MMR, 1961 under the Mines Act, 1952 the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision.

A mines clerk shall also be appointed to keep the registers and record of the mine and make necessary entries for the persons employed in the mines.

#### Labour skilled, semi-skilled and un-skilled.

Table No.15. Labour Details

Supervisory & Skilled Persons			
S.No	Designation	Nos	
1	PWD Assistant Engineer	1	
2	Technical Assistant	1	
3	Poclain Operator	2	
4	Poclain Co-Operator	2	
<b>Total</b>		<b>6</b>	
Unskilled			
S.No	Designation	Nos	
5	Permit Slip issuer	3	
6	Traffic Regulator	Entrance	2
		Exist	2
		Quarrying Site	3
7	Bucket Watcher	3	
8	Office Helper	1	
9	Track Maintainer	6	
10	Watchman(Two Shift)	4	
<b>Total</b>		<b>24</b>	
<b>Grand Total</b>		<b>30</b>	

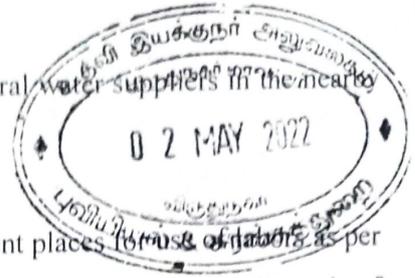
49550m<sup>3</sup> of materials would be handled for Six Months. Considering 150 working days in a Year, about 330m<sup>3</sup>/per day for period of Six Months.

### 8.2 Welfare Measures

#### a) Drinking Water:

Whole some drinking water shall be provided as per the Mines Rules, 1955. Quantity for Drinking and utilities is 2 KLD. Dust suppression and Green belt of water is 3KLD. Total 5 KLD

water required per Day. The drinking water is obtained from Mineral Water suppliers in the nearby areas.



b) Sanitary facilities:

Surface latrines and urinals shall be constructed at convenient places for use of labourers as per the provisions of Rule (33) of the Mines Rules, 1955 separately for males and female. The scale of latrine shall be one for every 50 employees for the purpose of calculating the number of latrines. Washing facilities shall also be arranged as per the Rule (36) of the Mines Rules, 1955.

c) First Aid facility:

Being a small mine First Aid station as per provisions under Rule (44) of the Mines Rules 1955 will be provided with facilities as prescribed in third schedule. Qualified First Aid personnel should be appointed or nominated to attend emergency first aid treatment.

d) Labour Health:

Periodic medical examination has to be arranged for occupational health once in a year in addition to attending medical treatment of occupational injuries under the Rule 45 (A) of MR, 1955.

e) Precautionary safety measures to the Labourers

Safety provisions like helmet, goggles, safety shoes etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS.

f) Child Labour Employment:

As per the Mines Act, 1952, no child labour below 18 years of old shall be engaged for any work in the quarry.

**PART - B****9.0 ENVIRONMENT MANAGEMENT PLAN****9.1 Existing Land Use Pattern**

The land applied for sand mining is Government river poramboke land (PWD), completely covered with sand and sand shoal with little amount clay and debris.

**Table No.16.Land use pattern**

S. No.	Description	Area of Land Use (In Hec.)	
		As at Present	At the end of One Year
1.	Mining	0.0	4.90.0
2.	Waste Dump	0.0	0.00.0
3	Safety zone & Plantation	Nil	Nil
4	Undisturbed area	4.90.0	0.00
<b>Total</b>		<b>4.95.50</b>	<b>4.95.50</b>

**9.2 Water Regime**

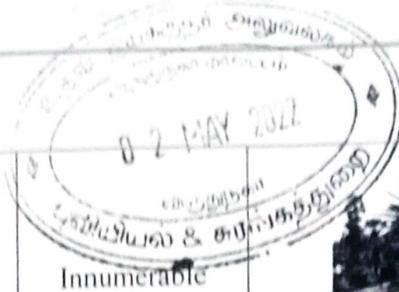
The site is a part of river basin. The mining will not affect the ground water table both in the River basin and adjacent open wells. The water table is noticed at a depth of 6m in the adjacent bore well. Quantity for Drinking and utilities is 2KLD. Dust suppression and Green belt of water is 3 KLD. Total 5 KLD water required per Day. The drinking water is obtained from Mineral water suppliers in the nearby areas.

**9.3 Flora and Fauna**

There are no trees found within the lease area some herbs and shrubs are found in the lease area because the lease is situated within the river bed, so there is no need to cut the trees for this project. The Fauna and flora observed in the regional level is given below,

**A. Flora****Table No.17A List of Flora of the lease area**

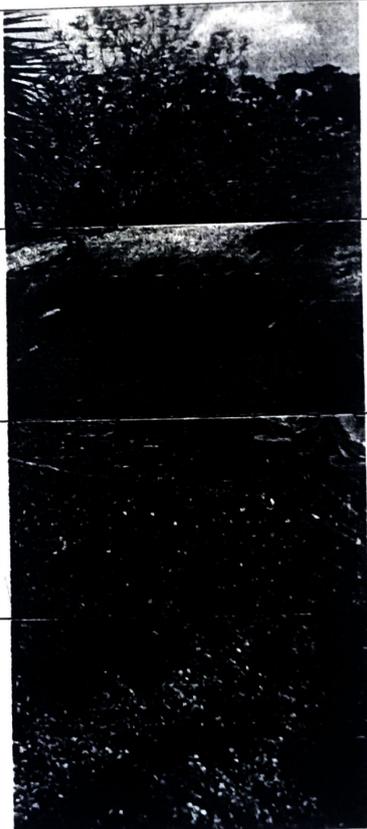
S. No.	Tamil /English Name	Botanical Name	Number of Trees	Photograph
1.	Vivasaaya mullu Maram	<i>Acasia bushes</i>	Innumerable	



2.	Panai/ Palmyra tree	<i>Borassus flabellifer</i>	Innumerable	
3.	Veppamaram/ Margosa tree	<i>Azadirachta Indica</i>	Innumerable	

d) HERBS:

Table No.17B List of Herbs of the lease area

12	Tamil Name	Botanical Name	Number of Plants	Photograph
1.	Erukku Chedi	<i>Calotropis Gigantea</i>	Innumerable	
2.	koraipull	(coco-grass, <i>Cyperus rotundus</i> )	innumerable	
3.	Thumpai / Leucas	<i>Leucas aspera spreng</i>	Innumerable	
4.	Unnichedi	<i>Lantana Camara</i>	innumerable	



## 2. Fauna:

The fauna species may be found around the project site is given below

### a) Mammals:

**Table No.17C List of Mammals of the lease area**

S.No.	Tamil & English Name	Zoological Name
1.	Keeri ( <i>Common Mongoose</i> )	<i>Herpestes edwardsii</i>
2.	Anil ( <i>Three Striped Squirrel</i> )	<i>Funambulus palmarum</i>
3.	Thavalai (Frog)	Cane toad

### b) Avian Fauna:

**Table No.17D List of Avian Fauna of the lease area**

S.No.	Tamil & English Name	Zoological Name
1.	Kalugu ( <i>Black kite</i> )	<i>Milvis migrans</i>
2.	Myna ( <i>Black drogue</i> )	<i>Dicurus macrocerus</i>
3.	Kakka ( <i>House crow</i> )	<i>Corvus splendens</i>
4.	Chittukuruvi ( <i>Indian Robin</i> )	<i>Saxicoloides fulicatus</i>
5.	Parunthu ( <i>Brahminy Kite</i> )	<i>Haliastur indus</i>

### c) Butterfly/Insects:

**Table No.17E List of Butterfly/Insects of the lease area**

S.No.	Tamil & English Name	Zoological Name
1.	Theil ( <i>Scorpion</i> )	Scorpiones
2.	Vannthupoochi ( <i>Millipedes</i> )	Diplopoda

## 9.4 Climatic Conditions

The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The southwest monsoon rainfall is highly erratic and summer rains are negligible. Rainfall data from seven stations over the period 1901-2000 were utilized for analysis and a perusal of the data shows that the normal annual rainfall over the district varies from about 724 to 913 mm. Average rain fall is reported as 812mm per annum. It is minimum around Sathur in the south eastern part of the district. The district enjoys a subtropical climate. The period from April to June is generally hot and dry. The weather is pleasant during the period from November to January. Usually mornings are more humid than afternoons. The relative humidity is on an average between 65 and 85% in the mornings. Humidity in the afternoon is generally between 40 and 70%. The annual mean minimum and maximum temperatures are 23.78 and 33.95° C respectively. The daytime heat is oppressive

and the temperature is as high as 40.2°C. The lowest temperature recorded is of the order of 19.3°C.

#### Summers

The sun is at its glory and shines very brightly during the summers. During the summer months, i.e. from May to June, the temperature varies between 27 deg C and 40 deg C. Therefore, the climate is quite hot. May is the hottest month. Cottons are recommended during this time.

#### Winters

In winters, which starts from December and lasts till February, the temperature ranges between 20° C and 30° C. The climate remains pleasant during this time, as the temperature rarely falls below 20° C.

#### Monsoon

Though the rainfall is very frequent and uniform throughout the year, just like the flow of pilgrims and tourists, the city receives the major share of rainfall between the months of July and October. The average rainfall is 85 cm.

#### Temperature

The annual maximum and minimum temperature normal (1970-2000) of the district are 33.1°C and 24.9°C respectively. 4 Projections of maximum temperature over Virudhunagar for the periods 2010-2040 (2020s), 2040-2070 (2050s) and 2070- 2100 (2080s) with reference to the baseline (1970- 2000) indicate an increase of 1.1°C, 2.2°C and 3.2°C respectively. Similarly, the projections of minimum temperature for the same periods indicate an increase of 1.1°C, 2.3°C and 3.4°C respectively

**9.5 Plan for air, dust suppression:** Base line information on ambient air quality, noise and water has to be collected test SPM, SO<sub>2</sub>, NO<sub>x</sub> and CO both in core and Buffer Zones.



**Fig.No.17: Image showing ambient air quality Measure- PM-10 & PM-2.5 in Nenmeni Sand quarry**

**9.6 Plan for noise level control:** Noise level has to be studied prior to mining and after opening the quarry for production. Ambient noise level on threshold is 35.8dB.

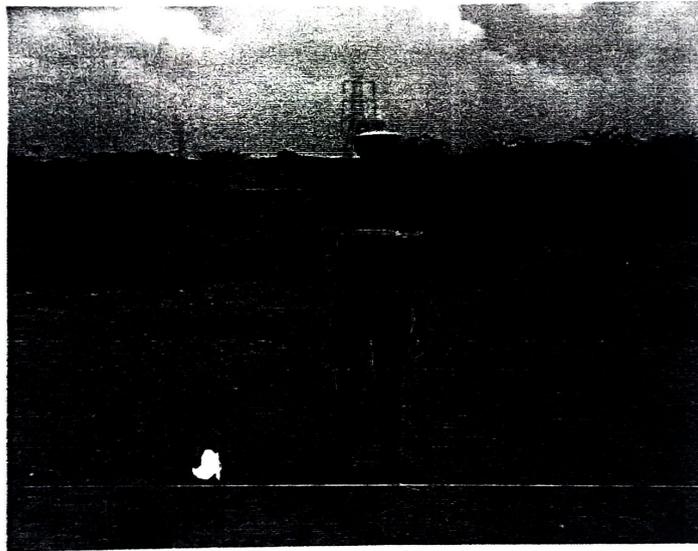
### 9.7 Environmental Impact Assessment Statement (EIA)

Impact of mining on environment will be

- i) Dust generation,
- ii) Temporary storage and utilization of top soil
- iii) Land degradation
- iv) Stabilization and vegetation of dumps
- v) Adverse effect on water regime
- vi) Socio-economic benefits arising out of Mining
- vii) Noise and Vibration



There would not be any adverse impact in the existing environment arising from the mining activities. To protect the environment, the Applicant would do adequate a forestation program along bank of the river for stability and strengthening of earth bund.



**Fig.No.18: Image showing Noise level study along the lease boundary**

i) **Dust:** Dust expected to be generated from hauling roads, place of excavation etc. will be suppressed by periodical wetting of land by spraying. labours those exposed directly to such conditions will be provide such protective equipments like mask, ear plug, helmet, glozes etc. as per the Mines Act.

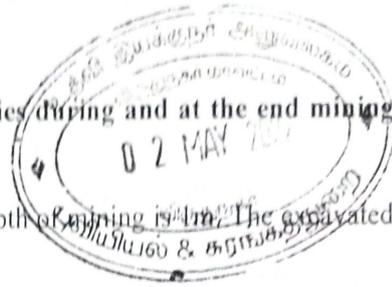
ii) **Noise and Vibration:** Noise level has to be studied prior to mining and after opening the quarry for production.

iii) **Temporary storage and Utilization of Top Soil:**

Storage is not applicable, because of No reject minerals and No Top soil.

iv) **Proposal for reclamation land affected by mining activities during and at the end mining lease period.**

It is a small mining project less than below 5 ha area, depth of mining is 1m. The excavated area shall be replenished during the next rainy season.



v) **Stabilization and Vegetation of Dumps:**

Muddy sludge shall be removed prior to removal of Sand and keep along the bank of the tank for growing trees.

vi) **Cutting of Trees:** There is no much chance for cutting of trees. On the other hand the applicant proposes to plant more trees as per the mining plan, to plant at least 100 trees per annum.

vii) **Measures for minimizing adverse effect on water regime:** The Study area itself a river. Water table is located at a depth of 6m bgl. The Mining depth is 1m only so it doesn't affect the water table.

viii) **Population Characteristics – Nenmeni Village**

**SOCIO-ECONOMIC ENVIRONMENT**

*Introduction*

Major developmental activities in industrial sector are required for economical development as well as creation of employment opportunities (direct and indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of quality of life through upliftment of social, economical, health, education, nutrition status in project region. In this manner all developmental projects have direct as well as indirect relationship with socioeconomic aspect, which also include public acceptability for new developmental projects. Thus the study of socioeconomic component incorporating various facets related to prevailing social and cultural conditions and economic status of the project region is an important part of EIA study. The study of these parameters helps in identification, prediction and evaluation of likely impacts on socioeconomics and Parameters of human interest due to proposed project.

*The objectives of the socio-economic impact assessment are as follows:*

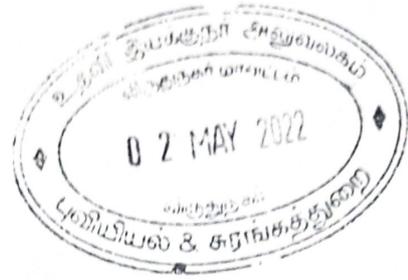
- a) To study the socio-economic status of the people living in the study area of the proposed mining project.
- b) To assess the impact on socio-economic environment due to proposed mining project.
- c) To study the socio economic environment like Noise, water due to impact of mining project.

**Baseline information:**

Baseline Status Baseline information is collected in order to delineate apply the socio-economic profile of the study area. The process related database thus generated includes:

- Demographic structure

- Infrastructure base in the area
- Economic structure
- Health status
- Cultural attributes
- Public awareness and their concern about the project



#### Methodology

The methodology adopted for impact assessment is as follows:

- The details of the activities and population structure have been obtained from Census 2001 and 2011 and analyzed.
- Based on the above data, impacts due to mining operation on the community have been assessed and recommendations for further improvement have been made.

#### Population Characteristics-Nenmeni Village

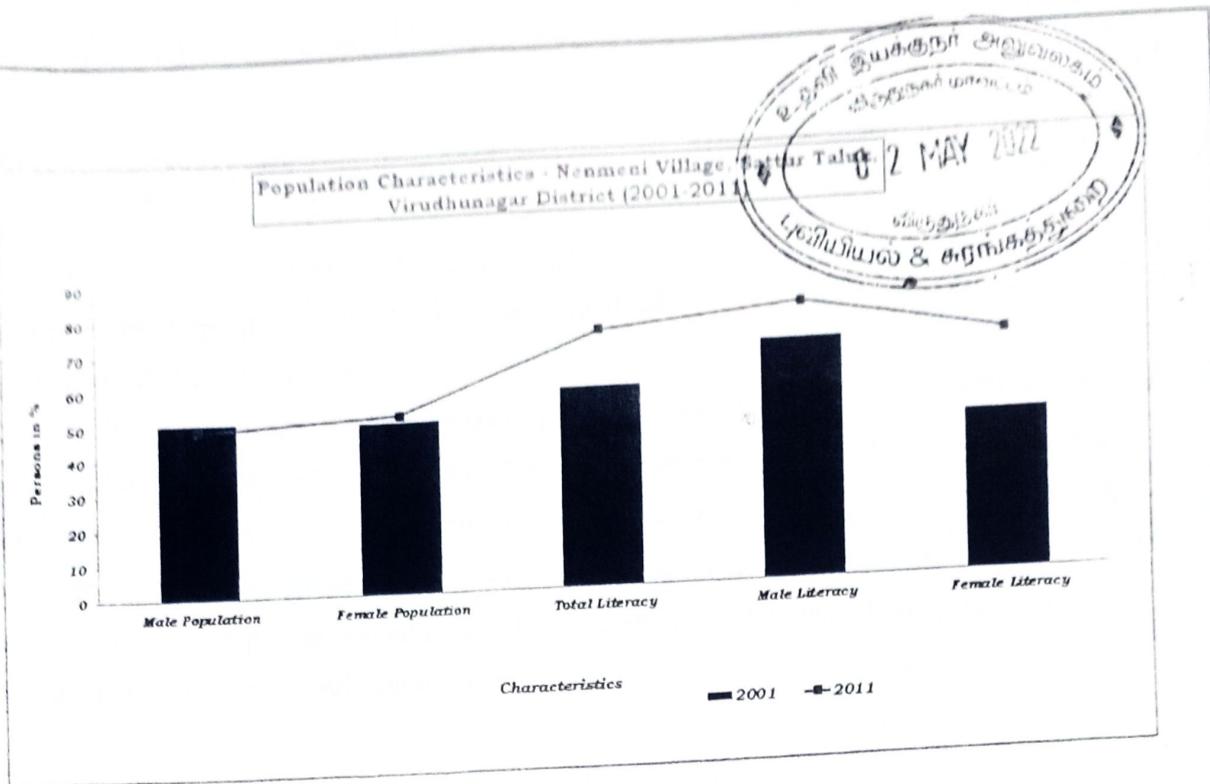
In Sattur taluk, Nenmeni village had a total household 557 in 2001 which is increase to 698 in according to census 2011. Village had a total person of 2425 in 2011 census previous census had about 2274 persons in 2001. There were about 1176 men according to 2011 census and 1149 men in 2001 census marking decreased 27 men over the previous census. During 2001 there were about 1125 women (49%), which is an increased to 1249 (51 %) in 2011 census.

Sex composition is the most important demographic characteristic that affects the incidence of birth and death. The average sex ratio in Sattur taluk, Nenmeni village was 979 during 2001 and increased to 1062 in the year of 2011. The highest sex ratio may be either due to the migrants for educational purpose and employment opportunities and due to infant birth of female high in this village.

#### Population Characteristics-Nenmeni Village, Sattur Taluk, Virudhunagar District (2001-2011)

S.No	Characteristics	2001	%	2011	%
1	Total Household	557		698	
2	Total Population	2274		2425	
3	Male Population	1149	50.53	1176	48.49
4	Female Population	1125	49.47	1249	51.51
5	Total Literacy	1312	57.70	1793	73.94
6	Male Literacy	794	69.10	933	79.34
7	Female Literacy	518	46.04	860	68.86
8	Sex Ratio		979.1		1062

Source: Census 2001, 2011, Virudhunagar District, Tamilnadu



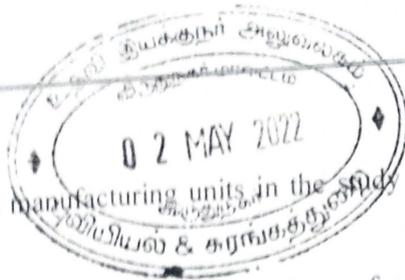
#### *Literacy Rate -Nenmeni Village*

Nenmeni village had a literate accounted for 1312 persons (57%) in 2001 and increased to 1793 persons in 2011. There were about 69 percent male literacy in 2001 census. Decrease to 79 percent male literacy in 2011 census. But female literacy has an increase to 69% compare previous census had decreased about 46%. It is shows that male literacy well educated in this village. Female literacy rate is low because most of female's working in secondary of Household industries had involved. Like matchbox, Crackers, etc. It depends on make money. In addition to that female to improve the knowledge to educate go for employment opportunity.

#### *Occupational Characteristics- Nenmeni Village*

The term **workers** denote the population engaged in primary, secondary and tertiary activities classified in the census reports of Indian government. During the year 2001 Nenmeni village had 1035 workers accounting for 45 percent of the total population of the Village. During 2011 there were about 1205 (49.6%) according to the census. There were about 578 men (50%) during 2001 which has an increase to 674 persons (57%) according to census 2011. There were about 457 female according to 2001 and 2011 census has marking of increase to 531 women as per census.

This group includes the employment of workers in manufacturing activities. Agro based industries, located in the study area engages a sizeable amount of workers. The distribution of secondary workers in the study area is calculated as percent to the total workers. The proportion of secondary workers to total workers has experienced decreasing trend in the Nenmeni village area between 2001 and 2011. Secondary workers during 2001 and 2011 it could be stated that this may



be due to the opening of a number of industries and household manufacturing units in the study area.

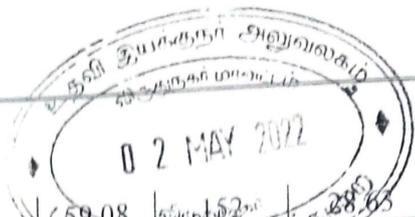
The study area has experienced a change in the occupational structure in the form of a decline in the proportion of cultivators, agricultural laborers are increase in the proportion of secondary workers and tertiary workers.

In Nenmeni village the non-workers population accounted for 1220 (50% of the total population) according to census 2011, which had about previous census 2001 with a population of 1239 (54%). There were about male non workers of 571(49% of the male population) during the census 2001, which had decreased to 502 (42% of the male population) according to census 2011. As more number of people are educated, most of the people living in the villages have own household industries and mostly small shoppers, and business and mining industries earn money in daily life.

The study area has experienced a change in the occupational structure in the form of a decline in the proportion of cultivators, agricultural laborers are increase in the proportion of secondary workers and tertiary workers.

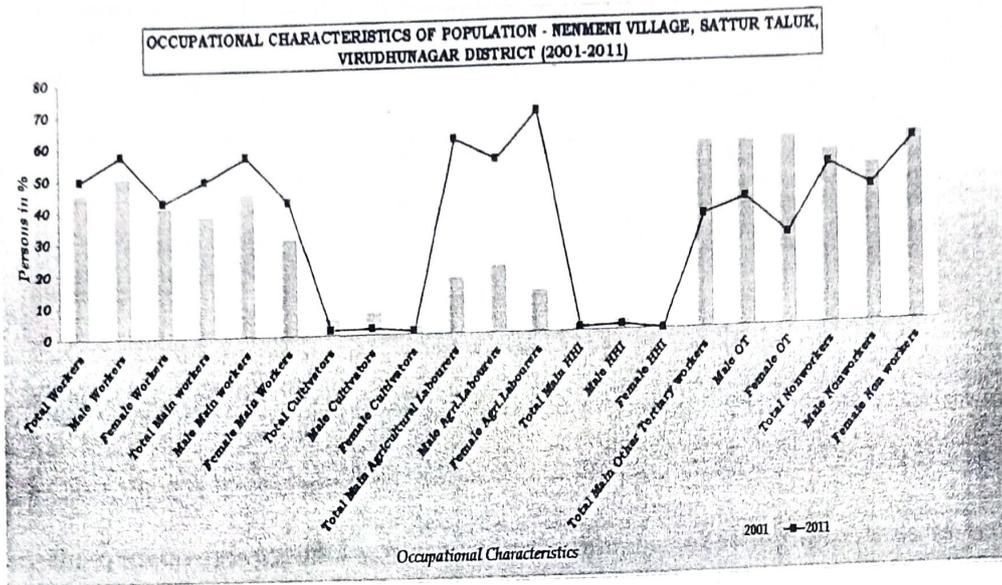
**Occupational Characteristics of Population -Nenmeni Village, Sattur  
Taluk, Virudhunagar District (2001-2011)**

S.No	Characteristics	2001	%	2011	%
1	Total Population	2274		2425	
2	Male Population	1149	50.53	1176	48.49
3	Female Population	1125	49.47	1249	51.51
4	Total Workers	1035	45.51	1205	49.69
5	Male Workers	578	50.30	674	57.31
6	Female Workers	457	40.62	531	42.51
7	Total Main workers	860	37.82	1185	48.87
8	Male Main workers	516	44.91	661	56.21
9	Female Main Workers	344	30.58	524	41.95
10	Total Cultivators	54	5.22	18	1.49
11	Male Cultivators	42	7.27	13	1.93
12	Female Cultivators	12	2.63	5	0.94
13	Total Main Agricultural Labourers	180	17.39	731	60.66
14	Male Agri.Labourers	121	20.93	365	54.15
15	Female Agri.Labourers	59	12.91	366	68.93
16	Total Main HHI	21	2.03	12	1.00
17	Male HHI	18	3.11	11	1.63
18	Female HHI	3	0.66	1	0.19
19	Total Main Other Tertiary workers	605	58.45	424	35.19
20	Male OTe	335	57.96	272	40.36



21	Female OT	270	59.08	152	55.63
22	Total Nonworkers	1239	54.49	818	50.31
23	Male Nonworkers	571	49.70	502	42.69
24	Female Non workers	668	59.38	718	57.49

Source: Census2001, 2011, Virudhunagar District, Tamilnadu



**Impacts on Socio Economy and Mitigation Measures**

Mostly **positive impacts** result from the long-term quarry unit. In this case, provision of job opportunities, business, transport, communication, laborers etc. are the major outcome due to this project. Thus, this unit highly favours the poor and landless people. Employment generation due to the project has generated direct and indirect employment for 15 persons, out of which 3 people are on company role and remaining are contract employees. Preference will be to the local population for employment in all categories including semi-skilled and unskilled.

The skilled employees are recruited through open recruitment process to meet competency required to operate the quarry. The villages and their inhabitants in the buffer zone will not be disturbed in their settlements due to the quarry operations.

**Economic Impacts**

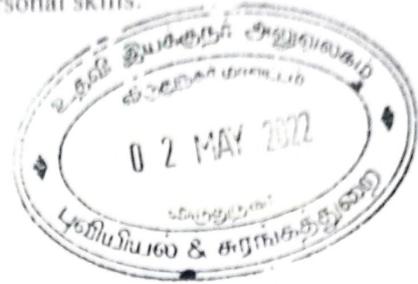
Agricultural yield is positively benefitted due to the halt on quarrying. To ascertain the extent of the financial crisis and improvement in agriculture, horticulture, dairy, fishery, handicraft and tourism if any; the following parameters emerged:

There are some people who are engaged in trading of sand, stone and Bajri. Therefore due to quarrying, the per capita income of local people has been improved. The local people have been provided with either direct employment or indirect employment such as business, contract works

and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. The job/ business opportunities have improved the economic conditions of the persons. They are in a position to utilize this money for purchase of tractors, trucks, jeeps, etc. which may be invested into use for business purposes. Part of money has been utilized in starting of some business as per personal skills.

**Present economic scenario**

1. Loss of income
2. Employees
3. Truck owners/ drivers
4. Trading sector
5. Service sector
6. Mine/Lease owners
7. The State
8. Other sectors

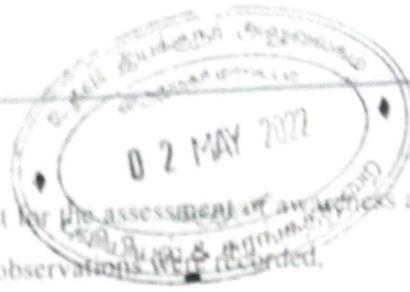


**However, the quarry operations can be managed with the following measures to reduce the negative impacts:**

- Blasting, drilling activities would be used while running quarry in high noise area. During operations time, the noise generating equipment will be provided with acoustic enclosures to control the noise levels within the prescribed limit.
- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems. Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Drilling, bomb blasting etc are carried out at specified location with proper chain and shed. The emergency kit, hood and suction system are to be followed by scrubbers. Sufficient treatment will be provided to wastewater generated and appropriate air pollution control measures will be installed so as to minimize the adverse impacts on water and air quality in surrounding areas.
- Upgradation of the quarry project and quarry workers has created some community development programs in the project.

**Benefits:**

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.



Awareness and opinion of the people about the project for the assessment of awareness about the project activities and opinion about it, following salient observations were recorded.

- during survey it was observed that only nearby villagers are aware and other villagers are not aware about the proposed project.
- People in the region expect job opportunities and improvement in educational, transportation and sanitation facility from project authority.

#### 9.8 Programme of Afforestation

There would not be any adverse impact in the existing environment arising from the mining activities. To protect the environment, the Applicant Company would do adequate a forestation program with 100 trees per annum along the bank of the side.

The phased programmed of afforestation for the whole lease period of Six Month is given below

**TABLE NO.18. PROGRAMME OF AFFORESTATION**

Year	Trees	Area
Six Months	150	Along the river bund and village road

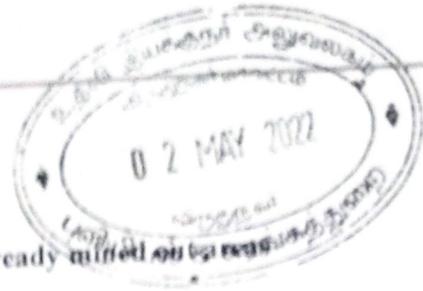
#### 9.12 Proposed financial estimate / budget for (EMP) Environment Management

##### a) Project cost / investment

i) Land Cost	:	Nil
ii) Machinery (Hire)	:	Rs 20,00,000
iii) Construction of Bank of river	:	Rs 2,00,000
iv) Laboures Shed	:	Rs 1,00,000
v) Sanitary facility	:	Rs 1,00,000
vi) Other items	:	Rs 1,00,000
<b>Total</b>	:	<b>Rs 25.0 lakhs</b>

##### b) EMP

i. Environmental Monitoring	=	Rs100,000
ii. Sanitary arrangements	=	Rs 50,000
iii. Safety kits,	=	Rs 50,000
iv. Internal road & Maintenance	=	Rs 100,000
v. Afforestation etc.	=	Rs100,000
<b>Total</b>	=	<b>Rs 4.0 lakhs</b>



## 10. MINE CLOSURE PLAN

### 10.1 Steps proposed for phased restoration, reclamation of already mined out area

The excavated area shall be replenished during the next rainy season

### 10.2 Measures to be under taken on mine closure as per Act & Rules

The excavated area shall be replenished during the next rainy season

### 10.3 Mitigation measures to be undertaken for safety and restoration / reclamation of the already mined out area

Shallow mining with a depth of 1m from the existing River bed level. No major damage of land. The land shall be replenished during the next rainy season with proper maintenance of river bank.

## 11. Any other details intend to furnish by the applicant:

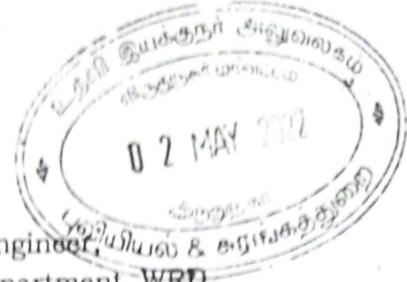
Break up details of land use of the area at end of mine life is given in Chapter.9.1. Adequate steps shall be taken to protect the eco system and environment.

*S. Suriyakumar*  
S. SURIYAKUMAR

EIA coordinator (mining)  
NABET accredited consultant  
Reg. No. NABET/EIA/2124/RA 0228

*Mining Plan Approval*

*[Signature]*  
ASSISTANT DIRECTOR  
GEOLOGY AND MINING  
VIRUDHUNAGAR DISTRICT  
VIRUDHUNAGAR



From  
Thiru.J.Meghanatha Reddy, I.A.S.,  
District Collector,  
Virudhunagar.

To  
The Executive Engineer,  
Public Works Department, WRD,  
Mining and Monitoring Division,  
Madurai.

Rc.No.KV1/347/2022, Dated: 23.03.2022.

Sir,

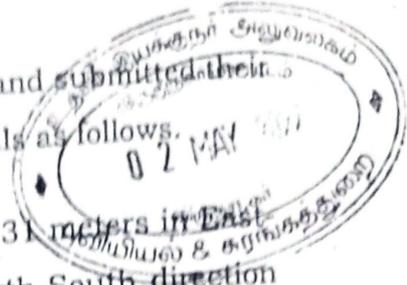
**Sub:** Mines and Minerals - Minor Mineral - Sand quarry -  
Virudhunagar District - Sattur Taluk - Nenmeni Village  
- River Vaipparu - S.F.No:1095 - Over an extent of  
4.95.50 Hectares - Proposal sent by the Executive  
Engineer, PWD, WRD, Mining and Monitoring Division,  
Madurai for grant of lease - Joint Inspection  
conducted - Recommended - Precise Area  
Communicated - Reg.

- Ref:**
1. Rule 38-A of Tamil Nadu Minor Mineral Concession Rules, 1959.
  2. The Executive Engineer, Public Works Department, WRD, Mining and Monitoring Division, Madurai letter letter No. 26M/சே.12-29/Nenmeni/2022 Dated.07.03.2022
  3. Joint Inspection Report dated: 18.03.2022.
  4. Other connected records.

The Executive Engineer, Public Works Department, WRD, Mining and Monitoring Division, Madurai has submitted a proposal requesting sand quarry lease in S.F.No.1095 over an extent of 4.95.50 Hects in Vaipparu River in length of 331 m (average), breadth of 150 m (average) and depth of 1.2 m of Nenmeni Village, Sattur Taluk, Virudhunagar District vide reference 2<sup>st</sup> cited.

2) In connection with the above, a Joint Inspection was carried out on 18.03.2022 by the team consisting of the Revenue Divisional Officer, Sattur along with the Tahsildar Sattur, the Executive Engineer TWAD Board Virudhunagar, Deputy Hydrogeologist TWAD Board Kovilpatti, the Executive Engineer, PWD, WRD Vaipparu basin division, Assistant Engineer PWD Mining and Monitoring, Sub Division Virudhunagar, the Assistant Director (Mines) Virudhunagar along with Special Deputy Thasildar (Mines) Virudhunagar. The Revenue Inspector and the Village Administrative Officer of

Nenmeni Village were also present at the time of inspection and submitted their joint inspection report vide reference 3<sup>rd</sup> cited. The report reveals as follows.



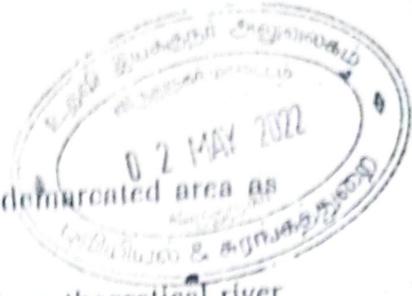
The proposed quarry is having an average length of 331 meters in East West direction and an average width of 150 meters in North-South direction with 1.2 meters depth. The area is located in upstream river side covered by deposit of clayey sand having 2 feet depth followed by thick deposit of River Sand. The sand is medium to coarse in size and it may be used for construction activities. No objection was received from the public of local Villages for the granting of sand quarry in the proposed area.

No water supply systems, infiltration wells or pumping installations of local bodies or the Tamilnadu Water Supply and Drainage Board, head works or areas identified for locating water supply schemes and bridges are noticed within a radial distance of 500 meters. High Tension Electrical Towers are seen on east and northern side of the area situated 50 meters away from the proposed site.

There is no existing sand quarry within a radial distance of 1 km from the area. Under the circumstances stated above, the area proposed for sand quarrying satisfied the restrictions made in Rule 36 of Tamil Nadu Minor Mineral Concession Rules 1959.

In view of the above, the above said sand quarry over an extent of 4.95.50 Hectares of Government pamba land in River Vaipparu in S.F.No.1035 in length of 331 m (average), breadth of 150 m (average) and depth of 1.2 m of Nenmeni Village, Sattur Taluk, Virudhunagar District is considered for grant under rule 38A of Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the following conditions:-

- i) No quarrying operation shall be carried out within 500 meters from the drinking water well of the local bodies of the proposed area.
- ii) Quarrying of sand should be carried out 50m away from the bank of the river.
- iii) The applicant department should provide permanent bench mark which shows the level of the river bed in the subject survey number.

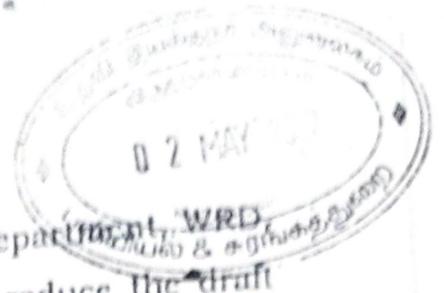


- v) Boundary stones should be laid all along the demarcated area as permitted.
- vi) The ultimate working depth shall be 1 meter from theoretical river bed level.
- vii) Sand Quarrying shall not be carried out below ground water table under any circumstances.
- viii) River course should not be disturbed or changed due to quarrying of sand.
- ix) Sand Quarrying should not cause any hindrance to the public while quarrying of sand in the river bed.
- x) Stream Muting shall not be allowed.
- xi) It shall be ensured that excavation of sand do not disturb or change the underlying soil characteristics of the river bed where quarrying is proposed to be carried out.
- xii) Machineries shall be used for the above said sand quarry as per instructions given by SEMA.
- xiii) The conditions specified in Tamil Nadu Minor Mineral Concession Rules 1959, should be strictly adhered during the course of quarrying of sand.

3) Based on the above recommendations of the Joint Inspection Officials and in order to cater the need of sand for the construction purposes of the public and the Government Organisations, opening of a new sand quarry in the proposed area is an essential one:

4) As per Rules 41 & 42 of TNMMCR 1959 amended vide G.O.(Ms) No.79 Industries (MMC1) Department Dated:06.04.2015, "Mining Plan and Environmental Clearance are pre-requisite to the grant of quarry lease for Minor Minerals like sand.

5) Therefore, in view of the above, the land in S.F.No:1095 over an extent of 4.95.50 hecta in Valpparu River of Nenment Village in Sattur Taluk, Virudhunagar District is considered as "Precise area" for the grant of sand quarry permission for a period of 6 months, on production of the Approved Mining Plan and Environmental Clearance obtain from the State Level Environmental Impact Assessment Authority-TamilNadu, Chennai for grant of sand quarry lease.



6) Hence, the the Executive Engineer, Public Works Department, Mining and Monitoring Division, Madurai is requested to produce the draft Mining Plan before the Assistant Director, Geology and Mining, Virudunagar prepared by a Recognized Qualified Person within a period of 3 months from the date of receipt of this precise area communication for approval and forwarding the same to the State Level Environmental Impact Assessment Authority, TamilNadu, Chennai for getting Environmental Clearance.

*[Signature]*  
District Collector,  
Virudhunagar.

Copy to:-

*[Signature]*  
The Member Secretary,  
State Level Environment Impact  
Assessment Authority, 3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1 Jeenis Road, Saidapet, Chennai - 15

The Director, Dept of Geology and Mining, Guindy, Chennai-32

*[Signature]*  
**S. SURIYAKUMAR**  
EIA coordinator (mining)  
NABET accredited consultant  
Reg. No. NABET/EIA/2124/RA 0228









பி. என். சி. சென்னை.

1	2	3	4	5	6	7	8	9	10	11	12
1093	2A 1093-2A	ஈ	4	1	4-5	5	1 32	1 50.5	2 69	173 சி. ஊதா பச்சா.	
1094	2B -2B	ஈ	4	...	4-5	5	1 32	1 52.0	2 19	1231 சி. பெரிய உமா ராஜகந்தர் மற்றும் மூன்று பெருகும்.	
1094	(1094)	ஈ	4	...	4-5	5	1 32	5 49.0	7 69	1230 ஸா. முத்து சாமி (1), சி. வெஜ சாமி (2).	
1095	1095	சு	4D	...	...	...	...	50 74.5	...	...	வெப்பசூழ்வு படி.
1096	1096	சு	4D	...	...	...	...	22 92.0	...	...	வெப்பசூழ்வு படி.
1097	1 1097-1	ஈ	4	...	4-5	5	1 38	0 73.0	1 00	464 சி. செல்வையா பூசாரி.	
1097	2 -2	சு	4D	...	...	...	...	0 07.5	...	...	வெப்பசூழ்வு பச்சா.
1097	3A -3A	ஈ	4	...	4-5	5	1 38	1 41.0	1 94	1336 செ. செது சிங்க பூசாரி மற்றும் தாங்கு பெருகும்.	
1097	3B -3B	ஈ	4	...	4-5	5	1 38	0 21.0	0 31	771 சி. மாநிமுத்து.	
1097	1A 1092 -1A	ஈ	4	...	4-3	3	2 77	0 20.5	0 56	381 சா. சீலியம் மார்.	
1097	1B -1B	ஈ	4	...	4-3	3	2 77	0 06.5	0 13	467 செ. செது சிங்க பூசாரி.	
1097	2A -2A	ஈ	4	...	4-3	3	2 77	0 25.5	0 75	467 செ. செது சிங்க பூசாரி.	
1097	2B -2B	ஈ	4	...	4-3	3	2 77	0 16.5	0 50	918 செ. சாமர்.	
1097	1A 1099 -1A	ஈ	4	...	4-3	3	2 77	0 16.5	0 50	147 சி. செது சிங்க பூசாரி.	
1097	1B -1B	ஈ	4	...	4-3	3	2 77	0 07.0	0 19	467 செ. செது சிங்க பூசாரி.	

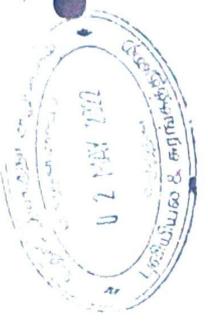
S. SURIYANUM  
EIA coordinator (m...)  
NABET accredited  
Reg. No. NABET/212... 2221



# LEASE PLAN

SCALE 1:2000

PLATE-II



1031850mN  
829100mE

1031850mN  
828400mE

1031800mN

1031750mN

1031700mN

1031650mN

1031600mN

1031550mN

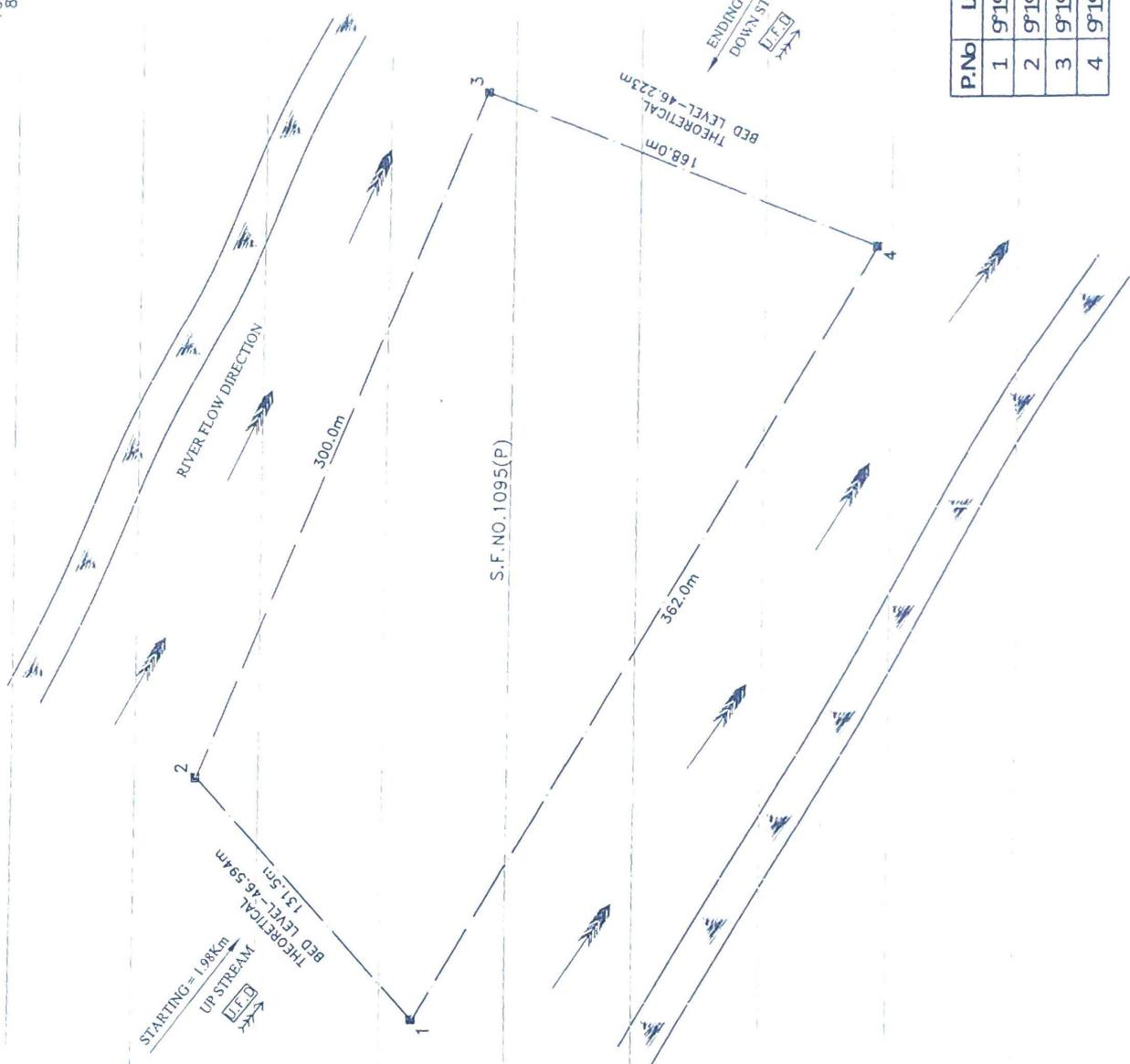
1031500mN

1031450mN

1031400mN  
828650mE

1031400mN  
829100mE

828700mE 828750mE 828800mE 828850mE 828900mE 828950mE 829000mE 829050mE



## INDEX

- LEASE BOUNDARY
- APPROACH ROAD
- FLOW DIRECTION
- FILLER
- RIVER
- RIVER BANK

**LOCATION**  
 S.F.NO : 1095  
 EXTENT : 4.95.50Ha  
 VILLAGE : NENMENT  
 TALUK : SATTUR  
 DISTRICT : VIRUDHUNAGAR

**APPLICANT**  
 THE EXECUTIVE ENGINEER  
 MINING AND MONITORING DIVISION  
 WATER RESOURCE DEPARTMENT  
 MADURAI.

**PREPARED BY:**  
  
 S.SURIYA KUMAR, M.Sc., M.Phil  
 EIA Coordinator (Mining)  
 NABET Accredited Consultant  
 Reg. No. NABET/EIA/1821/RA-0102

P.No	Latitude	Longitude
1	9°19'14.0882"	77°59'30.6180"
2	9°19'16.9688"	77°59'33.7996"
3	9°19'13.1709"	77°59'42.8811"
4	9°19'08.1037"	77°59'40.8007"

# GEOLOGICAL PLAN

PLATE-III

1031850mN  
829100mE

SCALE 1:2000

1031850mN  
828400mE

1031800mN

1031750mN

1031700mN

1031650mN

1031600mN

1031550mN

1031500mN

1031450mN

1031400mN  
828650mE

828700mE

828750mE

828800mE

828850mE

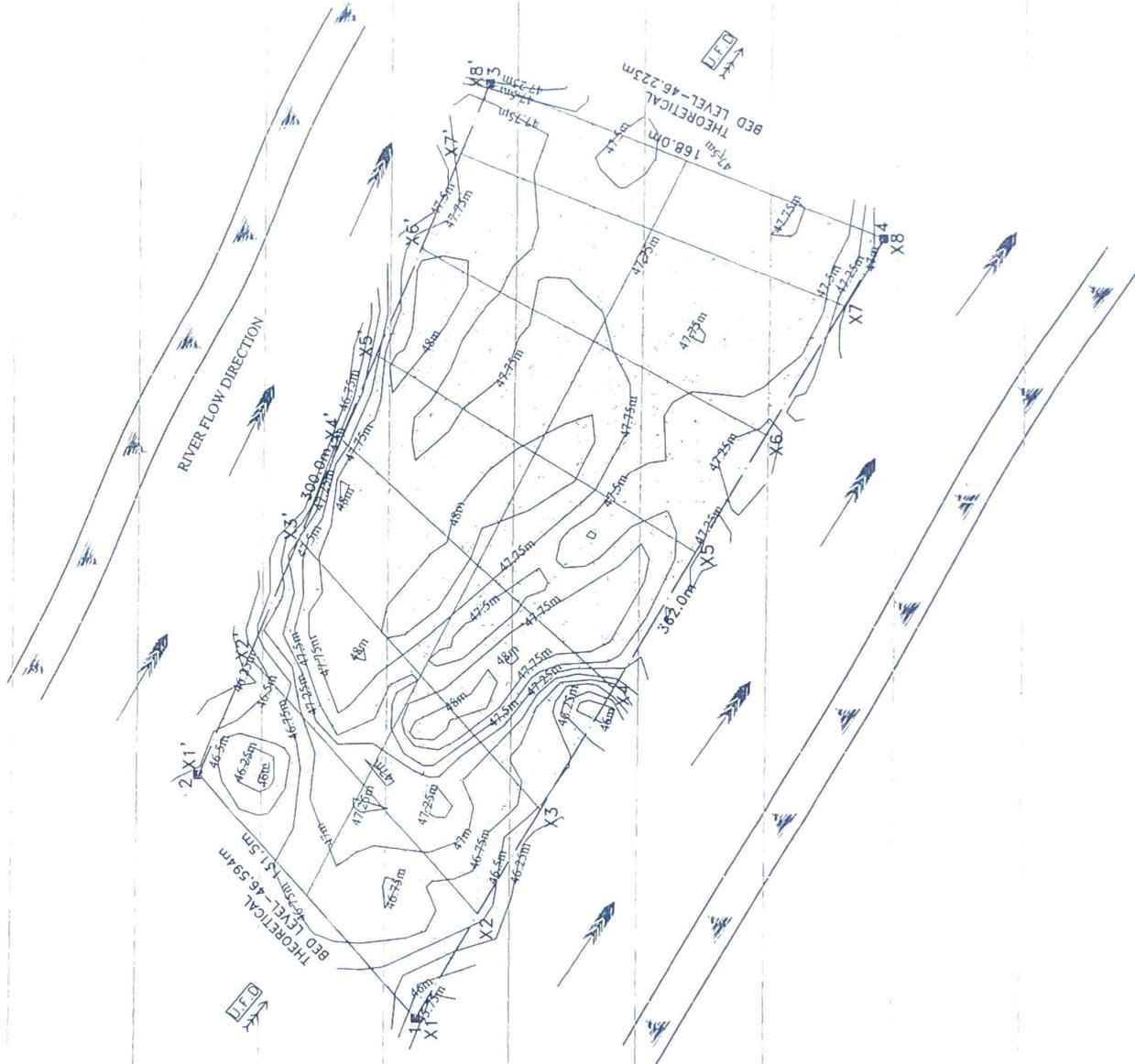
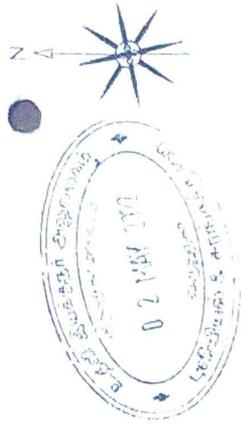
828900mE

828950mE

829000mE

829050mE

1031400mN  
829100mE



## INDEX

- LEASE BOUNDARY
- APPROACH ROAD
- FLOW DIRECTION
- SAND
- EXISTING RIVER BED LEVEL
- RIVER
- RIVER BANK

LOCATION  
S.F.NO : 1095  
EXTENT : 4.95.50Ha  
VILLAGE : NENMENI  
TALUK : SATTUR  
DISTRICT : VIRUDHUNAGAR

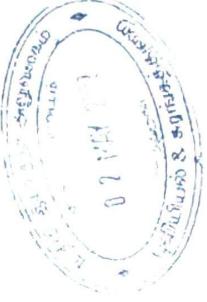
## APPLICANT

THE EXECUTIVE ENGINEER  
MINING AND MONITORING DIVISION  
WATER RESOURCE DEPARTMENT  
MADURAI.

PREPARED BY:

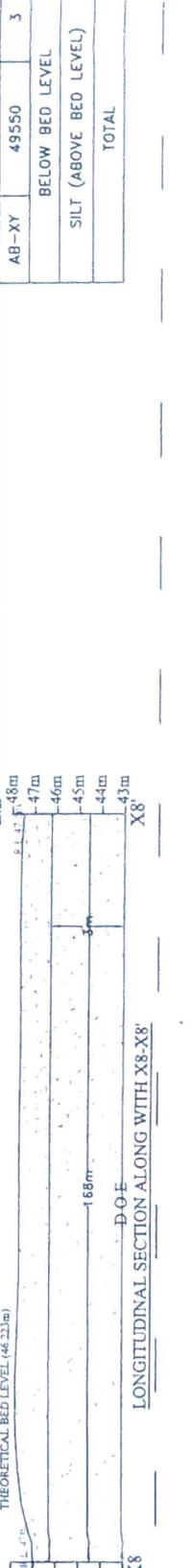
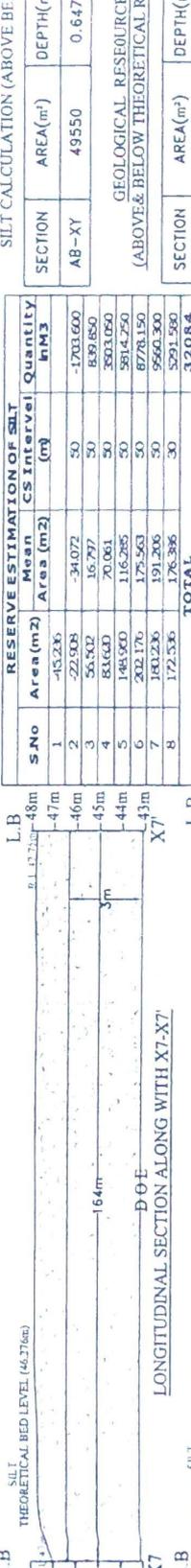
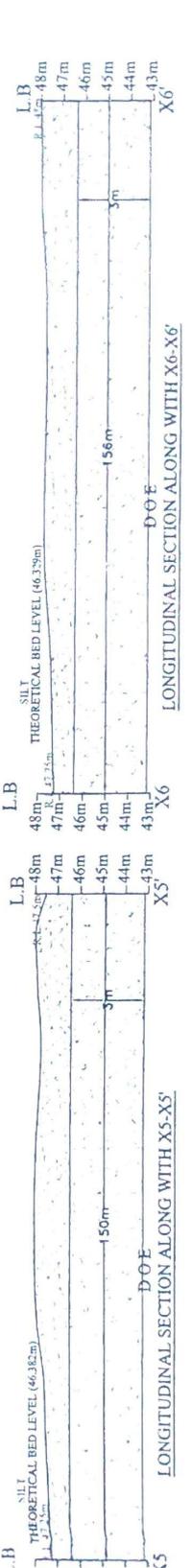
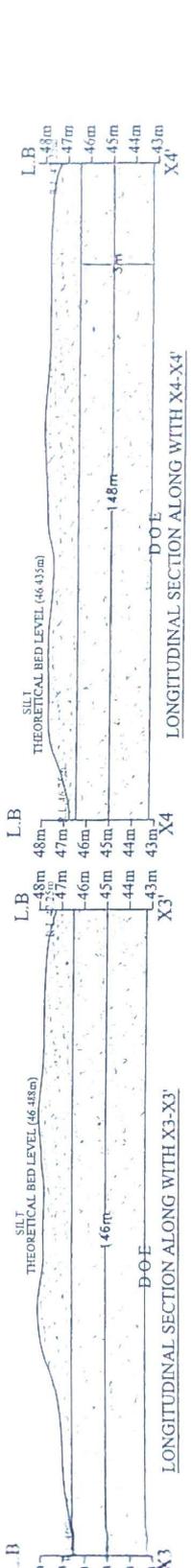
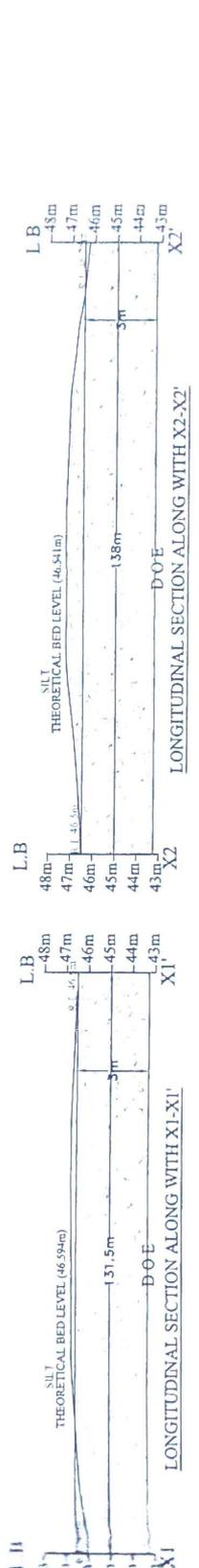
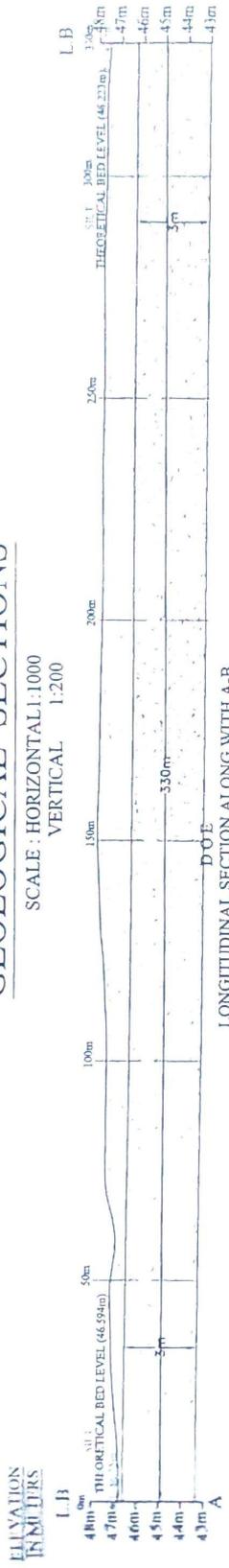
*S. Suriya Kumar*

S. SURIYA KUMAR, M.Sc., M.Phil.  
EIA Coordinator (Mining)  
NABET Accredited Consultant  
Reg. No. NABET/EIA/1821/RA-0103



# GEOLOGICAL SECTIONS

SCALE : HORIZONTAL 1:1000  
VERTICAL 1:200



ELEVATION IN METERS

## INDEX

- LEASE BOUNDARY
- SILT ABOVE BED LEVEL
- SAND BELOW BED LEVEL
- DEPTH OF ESTIMATION

LOCATION  
 SF NO 1095  
 EXTENT 4.95.50H9  
 VILLAGE NENMENI  
 TALUK SATTUR  
 DISTRICT VIRUDHUNAGAR

APPLICANT  
 THE EXECUTIVE ENGINEER  
 MINING AND MONITORING DIVISION  
 WATER RESOURCE DEPARTMENT  
 MADURAI

PREPARED BY:  
  
 S SURIYA KUMAR, M.Sc., M.Phil  
 EIA Coordinator (Nisarg)  
 NABET Accredited Consultant  
 Reg. No. NABETA/IN/21/RA-09/03

SILT CALCULATION (ABOVE BED LEVEL )

SECTION	AREA(m <sup>2</sup> )	DEPTH(m)	VOLUME (m <sup>3</sup> )
AB-XY	49550	0.647	32084

GEOLOGICAL RESOURCES OF  
 (ABOVE & BELOW THEORETICAL RIVER BED LEVEL)

SECTION	AREA(m <sup>2</sup> )	DEPTH(m)	VOLUME (m <sup>3</sup> )
AB-XY	49550	3	148650
BELOW BED LEVEL			
SILT (ABOVE BED LEVEL)			32084
TOTAL			180734

RESERVE ESTIMATION OF SILT

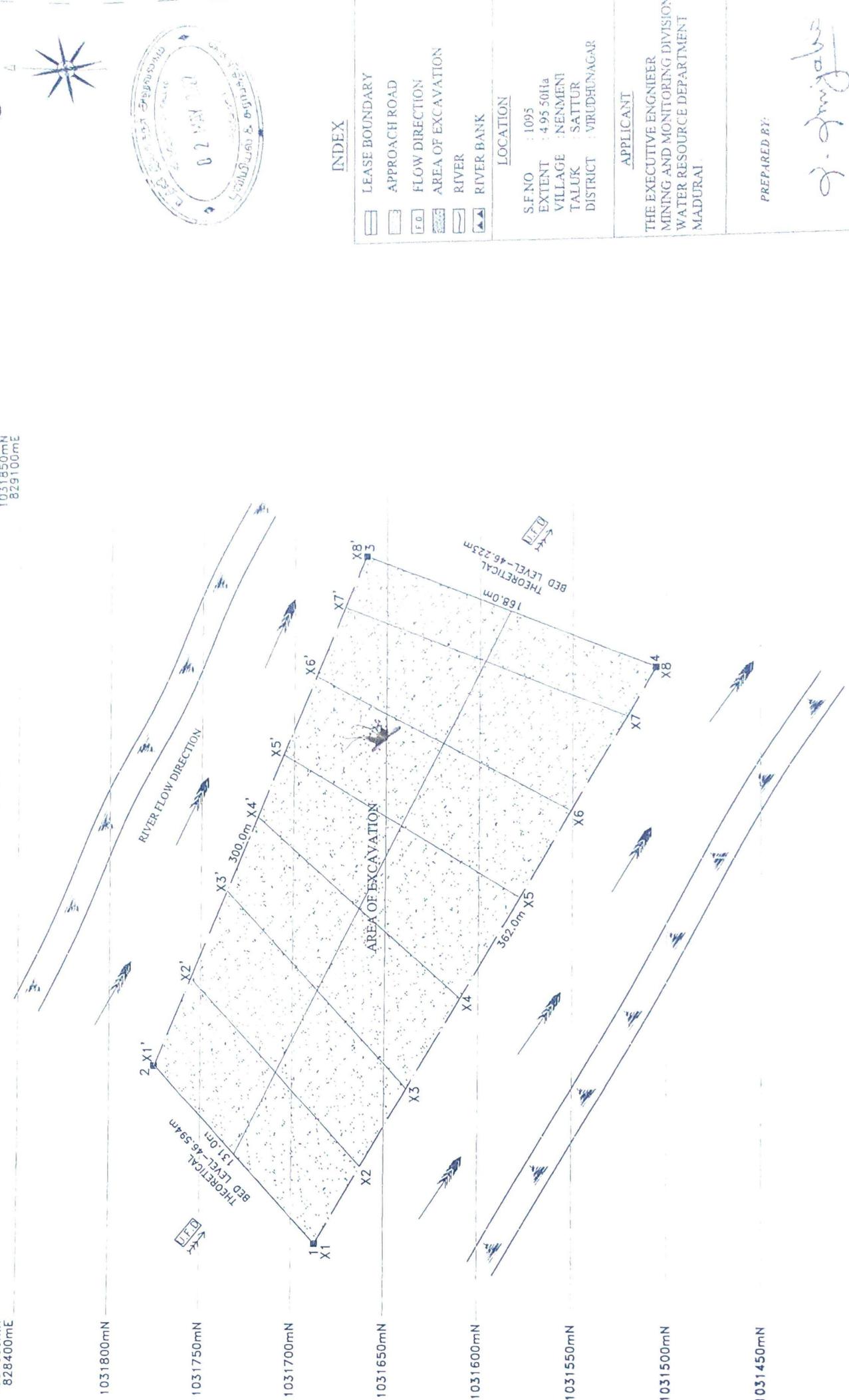
S.No	Area (m <sup>2</sup> )	Mean CS Interval	Quantity m <sup>3</sup>
1	15,236	50	-1703,600
2	22,908	50	1145,400
3	56,832	50	2841,600
4	83,630	50	4181,500
5	148,900	50	7445,000
6	202,176	50	10108,800
7	180,236	50	9011,800
8	172,336	30	5169,000
TOTAL			32084

# PRODUCTION AND DEVELOPMENT PLAN

PLATE-V

1031850mN  
829100mE

SCALE 1:2000



1031850mN  
828400mE

1031800mN

1031750mN

1031700mN

1031650mN

1031600mN

1031550mN

1031500mN

1031450mN

1031400mN  
828650mE

1031400mN  
829100mE

828700mE 828750mE 828800mE 828850mE 828900mE 828950mE 829000mE 829050mE

## INDEX

- LEASE BOUNDARY
- APPROACH ROAD
- FLOW DIRECTION
- AREA OF EXCAVATION
- RIVER
- RIVER BANK

## LOCATION

S.F.NO : 1095  
EXTENT : 4.95 50Ha  
VILLAGE : NENMENI  
TALUK : SATTUR  
DISTRICT : VIRUDHUNAGAR

## APPLICANT

THE EXECUTIVE ENGINEER  
MINING AND MONITORING DIVISION  
WATER RESOURCE DEPARTMENT  
MADURAI

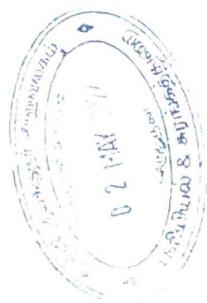
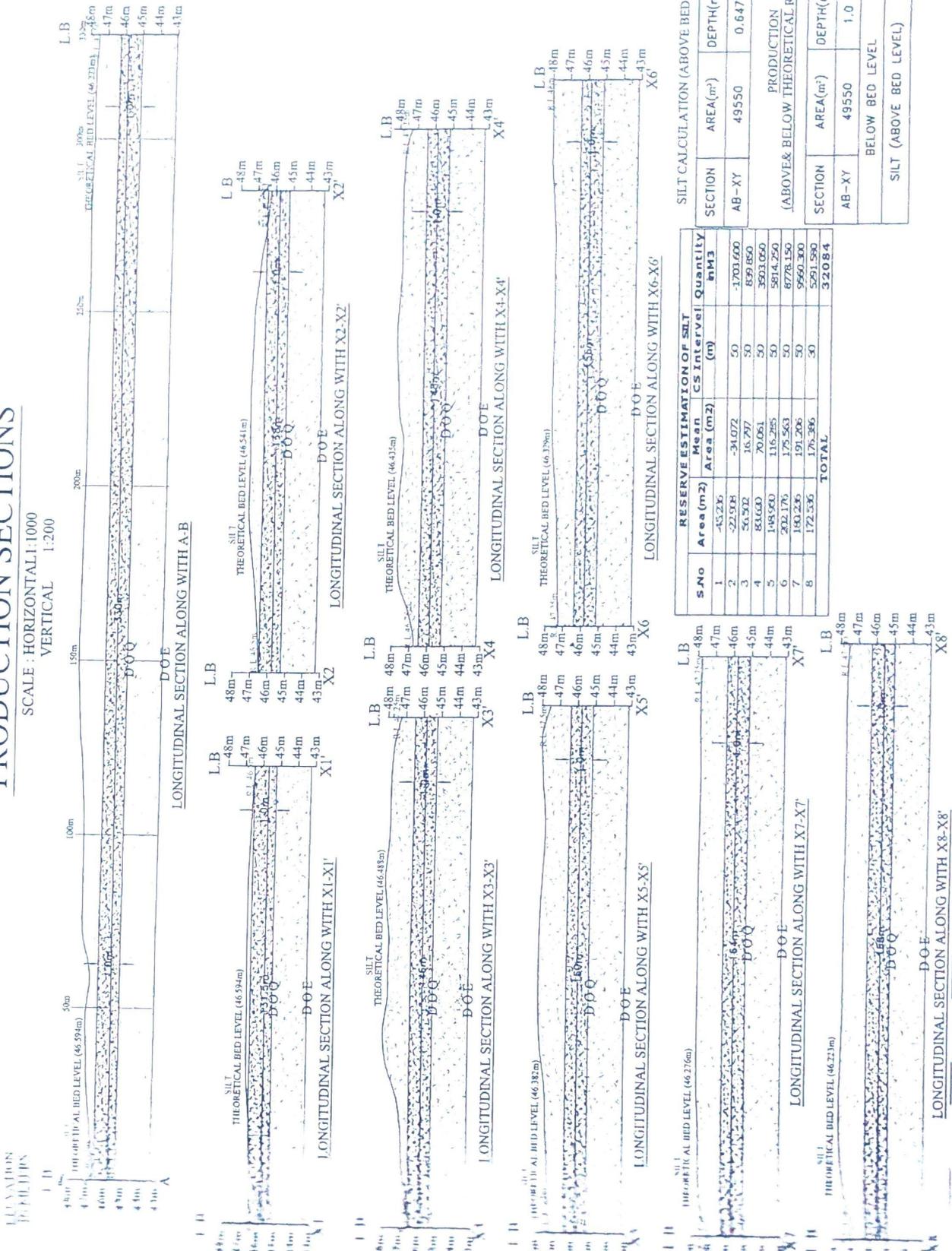
PREPARED BY:

*J. Prinjaba*

S SURIYA KUMAR, M.S., M.Phil  
EIA Coordinator (Mining)  
NABET Accredited Consultant  
Reg. No. NABET/LLA/14218/2010

# PRODUCTION SECTIONS

SCALE : HORIZONTAL: 1:1000  
VERTICAL 1:200



## INDEX

- (LB) LEASE BOUNDARY
- (S) SILT ABOVE BED LEVEL
- (SB) SAND BELOW BED LEVEL
- (A) AREA OF EXCAVATION
- (DOE) DEPTH OF QUARRYING

## LOCATION

SF NO 1095  
EXTENT 4.95.50Ha  
VILLAGE NENMENT  
TALUK SATTUR  
DISTRICT VIRUDHUNAGAR

## APPLICANT

THE EXECUTIVE ENGINEER  
MINING AND MONITORING DIVISION  
WATER RESOURCE DEPARTMENT  
MADURAI

PREPARED BY:

*S. Srinivas*

S SURYA KUMAR, M.Sc. M.Phil  
FIA, Coordinator (Mining)  
NABET Accredited Consultant  
Reg. No. NABET/TEMA/181/PRA/01/03

## SILT CALCULATION (ABOVE BED LEVEL)

SECTION	AREA(m <sup>2</sup> )	DEPTH(m)	VOLUME (m <sup>3</sup> )
AB-XY	49550	0.647	32084

## PRODUCTION (ABOVE & BELOW THEORETICAL RIVER BED LEVEL)

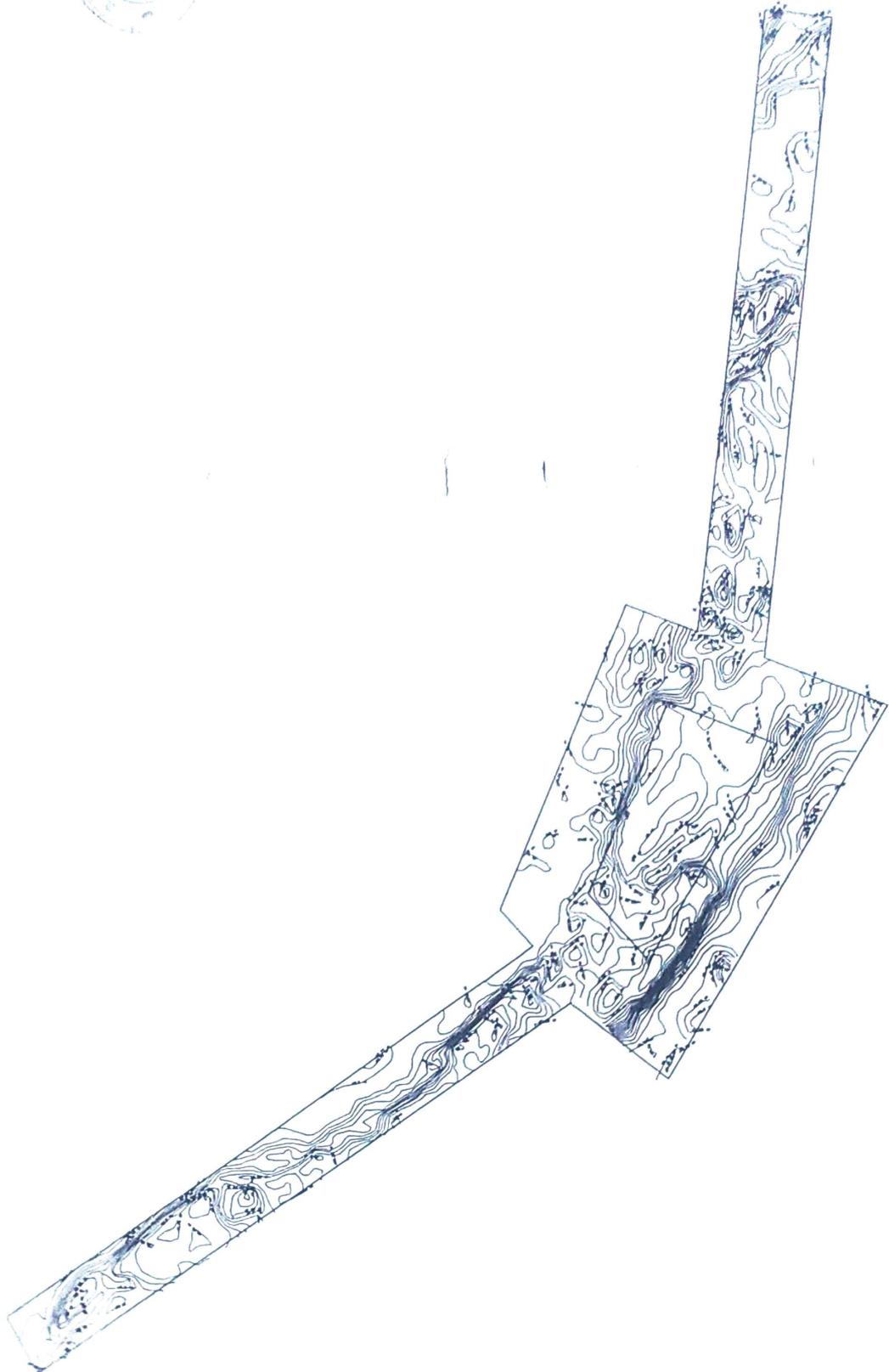
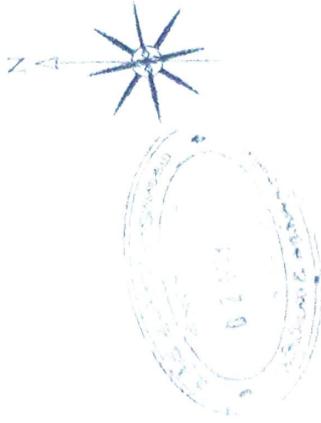
SECTION	AREA(m <sup>2</sup> )	DEPTH(m)	VOLUME (m <sup>3</sup> )
AB-XY	49550	1.0	49550
BELOW BED LEVEL			
SILT (ABOVE BED LEVEL)			32084

S No	RESERVE ESTIMATION OF SILT		Quantity m <sup>3</sup>
	Area (m <sup>2</sup> )	CS Interval (m)	
1	45.236	50	1703.600
2	22.038	50	859.850
3	56.502	50	3503.050
4	83.600	50	5814.250
5	145.000	50	9660.300
6	202.176	50	13108.800
7	190.236	50	9511.800
8	172.536	50	8626.800
<b>TOTAL</b>			<b>32084</b>

RIVER GRADIENT 1KM UPSTREAM AND 1KM DOWNSTREAM FROM LEASE AREA PLAN

SCALE 1:5000

PLATE-VII



INDEX

-  LEASE BOUNDARY
-  BUFFER LINE(1 KM RADIUS)
-  CONTUR LINE

LOCATION

S.F NO : 1095  
 EXTENT : 4.85 50Ha  
 VILLAGE : NENMENT  
 TALUK : SATTUR  
 DISTRICT : VERTHEGANGAR

APPLICANT

THE EXECUTIVE ENGINEER  
 MINING AND MONITORING DIVISION  
 WATER RESOURCE DEPARTMENT  
 MADURAI.

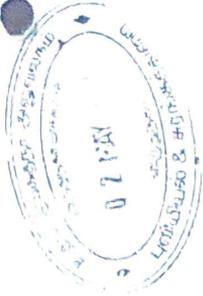
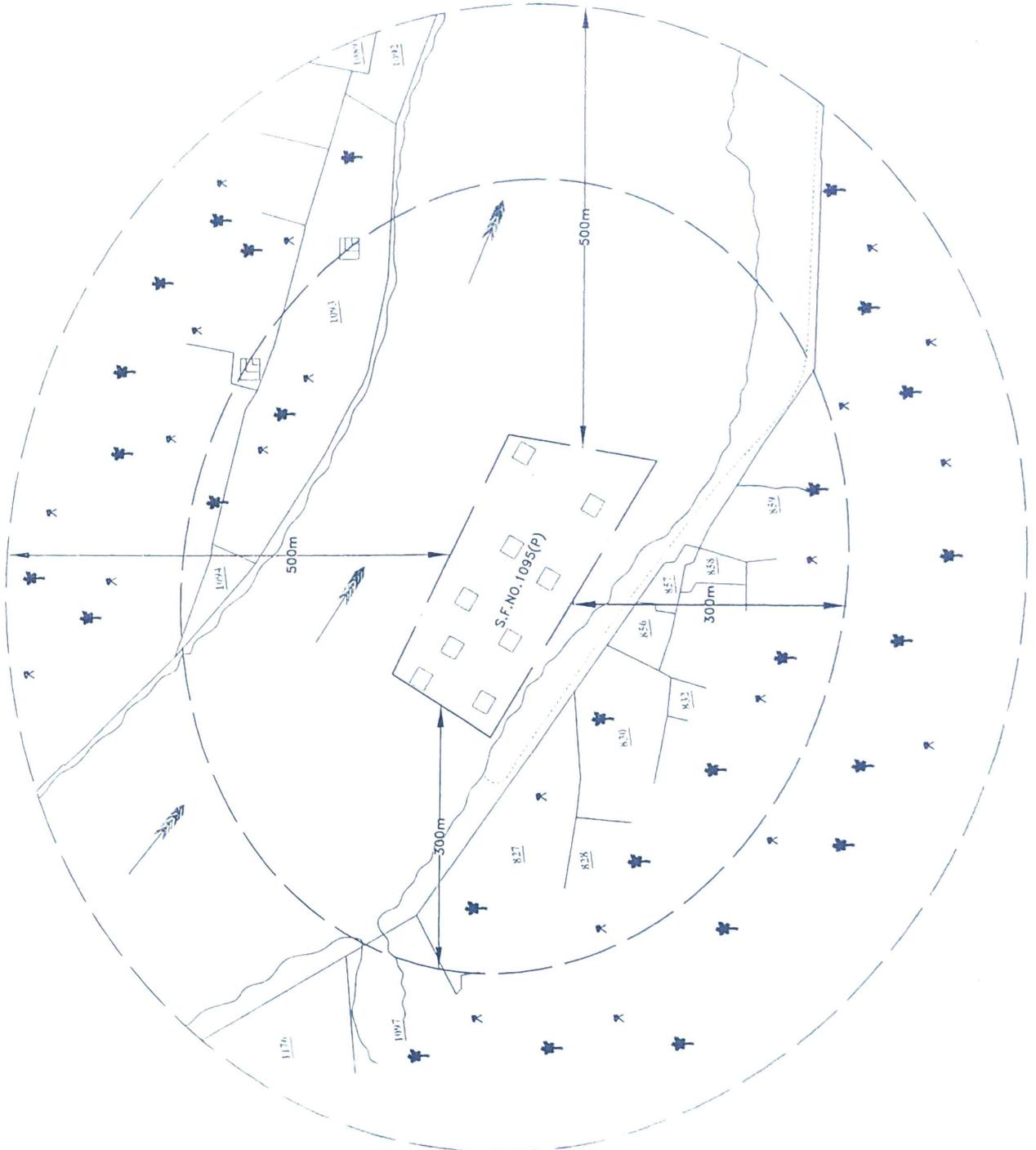
PREPARED BY:

*S. Suriya Kumar*

S. SURIYA KUMAR, M.Sc., M.Phil  
 EIA Coordinator (Mining)  
 NABET Accredited Consultant  
 Reg. No NABET/EIA/1134/RA-9234

(SHOWING LOCATIONS OF HABITATION, WATER BODIES, RESERVE FOREST, AROUND 500M)

Scale - 1:5000



DESCRIPTION	NEAREST DISTANCE (m)	DIRECTION
LEASE BOUNDARY	-	CENTRE
HABITATIONS	-	-
WATER BODIES	-	-
WELLS	-	-
ROAD	-	-
QUARRIES	-	-
E.B LINE	-	-
300m BUFFER ZONE	-	-
500m BUFFER ZONE	-	-
WIND DIRECTION	-	-
TREES	-	-
DRY LAND	-	-
ODD	-	-
ACASIA BUSHES	-	-
LOCATION	APPLICANT	
S.F. NO : 1095	THE EXECUTIVE ENGINEER	
EXTENT : 4.95.50Ha	MINING AND MONITORING DIVISION	
VILLAGE : ENNEMENI	WATER RESOURCE DEPARTMENT	
TALUK : SATTUR	MADURAI.	
DISTRICT : VIRUDHUNAGAR		
PREPARED BY:		
		
S. SURIYA KUMAR, M.Sc., M.Phil EIA Coordinator (Mining) NABET Accredited Consultant Reg. No. NABET/EIA/1821/RA-0103		

## APPLICATION FOR PRIOR ENVIRONMENTAL CLEARANCE

(As per SAND MINING GUIDELINES, 2020)

SAND QUARRY -CATEGORY – "B2"

ONLINE PROPOSAL NO: SIA/TN/MIN/27/1159/2022 dated 13.05.2022



### LOCATION DETAILS

Extent : 4.95.5 Hectares  
 S.F. No : 1095 (P)  
 Village : Nenmeni  
 Taluk : Sattur  
 District : Virudhunagar  
 State : Tamil Nadu



**Aerial Surveying**

**PROJECT PROPONENT**  
**THE EXECUTIVE ENGINEER,**  
**WRO,**  
**Mining and Monitoring Division,**  
**Madurai.**

CONSULTANT

**AADHI BOOMI MINING AND ENVIRO TECH (P) LTD.,**

(NABET Accredited EIA Consultant "A" Category)

CERTIFICATE NO. NABET/EIA/2124/RA-0228

No. 3/216, K.S.V. Nagar, Narasothipatti,

Alagapuram post, Salem – 636 004. Tamil Nadu.

Email: [suriyakumarsemban@gmail.com](mailto:suriyakumarsemban@gmail.com), [abmenvirotech@gmail.com](mailto:abmenvirotech@gmail.com)

Mobile: 98427 29655, Website: [www.abmenvirotec.com](http://www.abmenvirotec.com)





**QUALITY COUNCIL  
OF INDIA**  
Creating an Ecosystem for Quality



# National Accreditation Board for Education and Training



## Certificate of Accreditation

**Aadhi Boomi Mining and Enviro Tech P Ltd, Salem**

**3/216, K.S.V.Nagar, Narasothipatti, Alagapuram Post, Salem - 636004, Tamil Nadu**

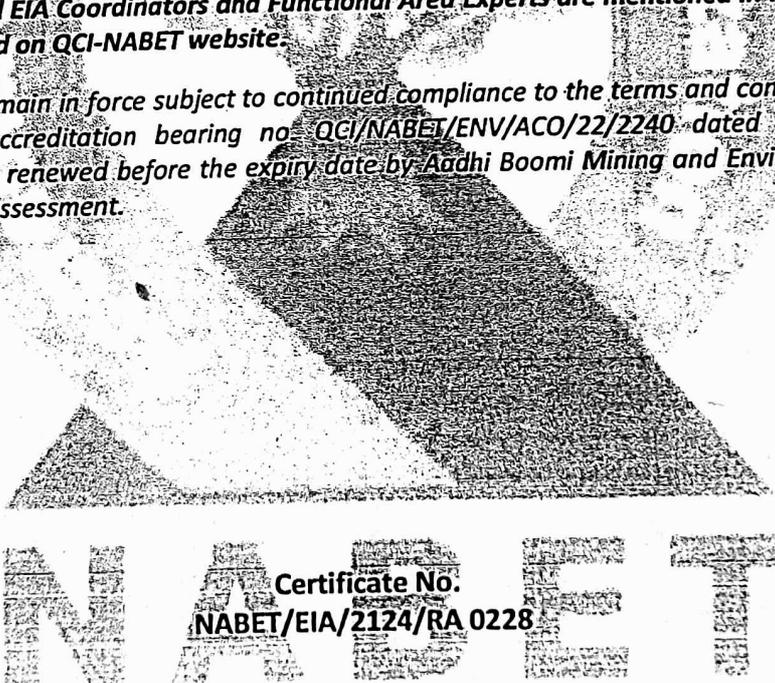
The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors -

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals - opencast only	1	1 (a) (i)	A
2	River Valley projects	3	1 (c)	A
3	Mineral beneficiation	7	2 (b)	A
4	Cement plants	9	3 (b)	A
5	Highways	34	7 (f)	B
6	Building and construction projects	38	8 (a)	B
7	Glass and Ceramic Industry	40 (iv)	-	A

**Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated December 17, 2021 posted on QCI-NABET website.**

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2240 dated Feb 10, 2022. The accreditation needs to be renewed before the expiry date by Aadhi Boomi Mining and Enviro Tech P Ltd, Salem following due process of assessment.

Sr. Director, NABET  
Dated: Feb 10, 2022



Certificate No.  
NABET/EIA/2124/RA 0228

Valid up to  
October 22, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.



## CONTENTS

Sno	Description	Page No
1	NABET certificate	I
2	Covering Letter	II
3	Online Report Copy	III
4	Brief Summary of the Project	1
5	Form1	5
6	Form1M	20
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8	Pre-Feasibility Report	41
9	Risk Assessment Report	68
10	Approved Mining Plan	69
11	District Survey Report	
12	Additional Documents	POUCH
	I.Approved Letter	
	II.500m radius letter from AD	
	III.General View of the Lease area signed by VAO	
	IV.V.A.O Certificate	
	V.Affidavit to SEIAA, Tamil Nadu	

PUBLIC WORKS DEPARTMENT/  
WATER RESOURCE DEPARTMENT

From  
The Executive Engineer,  
PWD/WRO,  
Mining and Monitoring Division,  
Madurai- 625 002

To  
The Member Secretary,  
SEIAA, 3<sup>rd</sup> Floor,  
Panagal Maaligai,  
No.1, Jeeeni Road,  
Saidapet, Chennai-15.

Dt. 11.05.2022.

Dear sir,

**Sub :** Seeking Environmental Clearance for Category B2 project - Nenmeni Sand Quarry in Vaipparu river over an extent of 4.95.5 hectares in S.F.No. 1095(P), Nenmeni Village in Sattur Taluk, Virudhunagar District, Tamil Nadu.

Ref. 1) District collector Letter Rc No: . **KV1/347 /2022, dated 23.03.2022**

2) Approved Mining Plan Letter : Rc No: . **KV1/347 /2022, dated 02.05.2022**

With reference to the above letter from Dept. of Geology and Mining, Virudhunagar, We are submitting the following documents for obtaining Environmental Clearance from your office along with Demand Draft for Rs 20000 on your favor,

DD No:

- 1) Check List
- 2) Form-I & Form-1M duly filled
- 3) Environmental Management Plan (EMP)
- 4) Prefeasibility Report, Risk assessment
- 5) Approved Mining Plan
- 6) District Survey Report
- 7) Photo of site attested by VAO
- 8) Affidavit of SEIAA-TN
- 9) Soft copy of item (2) to (7)

All the above reports and documents are submitted along with soft copy. Email also sent to SEIAA-TN and therefore, I request you to grant EC as early as possible.

Thanking You,

Yours faithfully,

*[Signature]*  
Assistant Engineer, PWD/WRD  
Section - II  
Mining and Monitoring Sub Division,  
Virudhunagar.

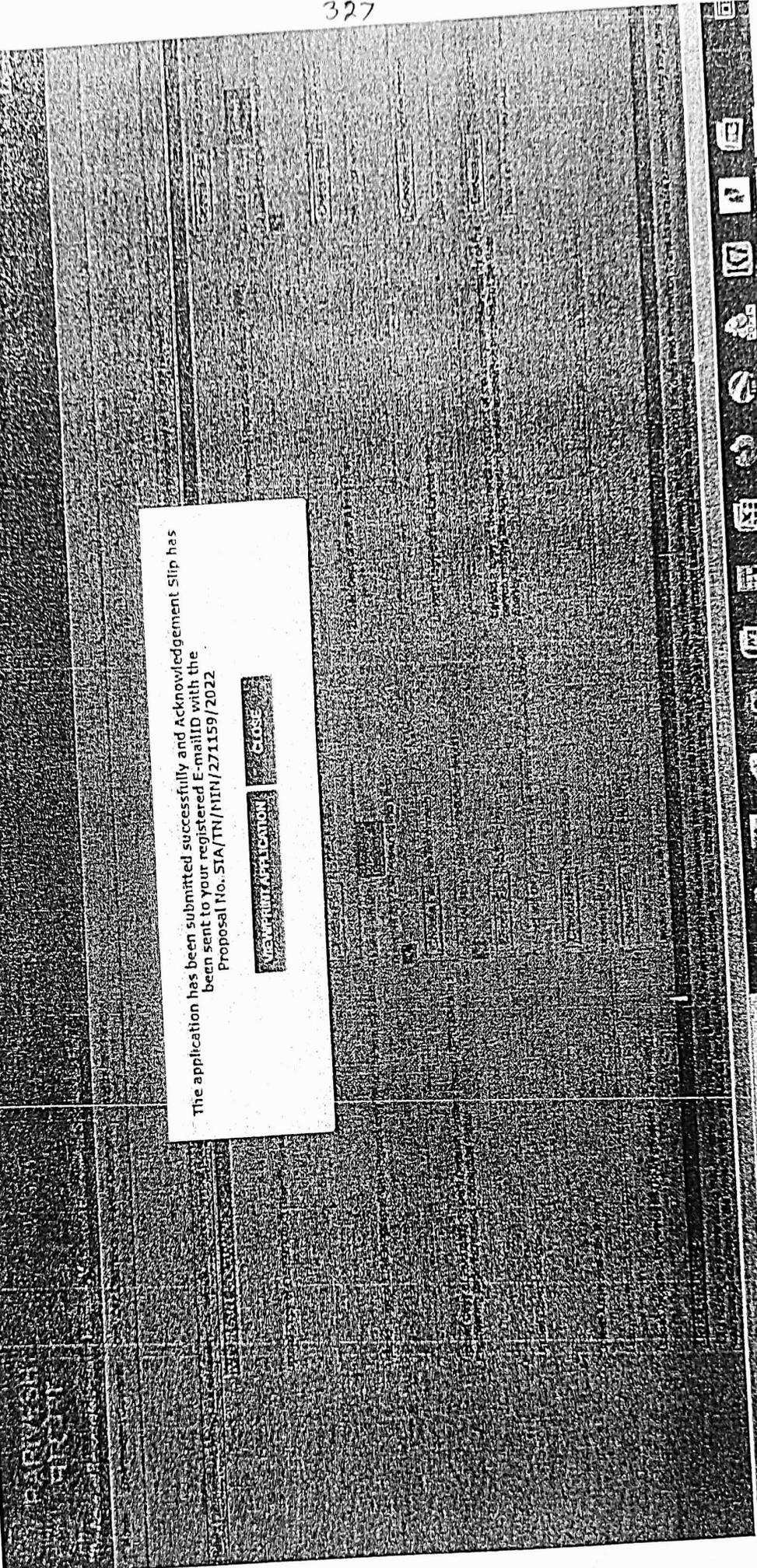
*[Signature]*  
Assistant Executive Engineer, PWD/WRD  
Mining and Monitoring Subdivision,  
Virudhunagar

*[Signature]*  
Executive Engineer,  
PWD, WRD, MMD  
Madurai.

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The application has been submitted successfully and Acknowledgement Slip has been sent to your registered E-mailID with the Proposal No. SIA/TRI/NIN/271159/2022

Close

Type here to search



111

**Acknowledgement Sllp for EC application**

This is to acknowledge that the proposal has been successfully uploaded on the portal of the Ministry. The proposal shall be examined in the Ministry to ensure that required information has been submitted. An email will be sent seeking additional information, if any, within 20 working days. Once verified, an acceptance letter shall be issued to the project proponent.

Following should be mentioned in further correspondence

1. Proposal No. : SI/TN/MIN/271159/2022
2. Category of the Proposal : Non-Coal Mining
3. Name of the proposal : The Executive Engineer MMD WRD Nenmeni sand quarry
4. Date of Receipt of Proposal : 13 May 2022
5. Name of the Project proponent along with contact details
  - a) Name of the proponent : THE EXECUTIVE ENGINEER, MADURAI
  - b) State : Tamil Nadu
  - c) District : Virudhunagar
  - d) Pincode : 625002

**Form-2**  
**APPLICATION FOR PRIOR ENVIRONMENTAL CLEARANCE**

S. No.	Item	Details		
1.	Whether it is a violation case and application is being submitted under Notification No. S.O.804(E) dated 14.03.2017 ? <b>Details of Project:</b> (a) Name of the project(s) (b) Name of the Company / Organisation (c) Registered Address (d) Legal Status of the Company	No  The Executive Engineer MMD WRD Nenmeni sand quarry THE EXECUTIVE ENGINEER, MADURAI PWD,WRD, MMD, Thallakulam, Madurai,,Madurai,Tamil Nadu-625002 State Government		
2.	<b>Address for the correspondence:</b> (a) Name of the Applicant (b) Designation (Owner/ Partner/ CEO) (c) Address (d) Pin code (e) E-mail (f) Telephone No. (g) Fax No. (h) Copy of documents in support of the competence/authority of the person making this application to make application on behalf of the User Agency .	Executive Engineer Executive Engineer PWD,WRD, MMD, Thallakulam, Madurai,Madurai,Tamil Nadu-625002 625002 eemmdmdu@gmail.com 0-  Annexure-Uploaded Copy of documents in support of the competence/authority		
3.	<b>Category of the Project/Activity as per Schedule of EIA Notification,2006:</b> (a) Major Project/Activity (b) Minor Project/Activity (c) Category (d) Proposal Number (e) Master Proposal Number(Single Window) (f) EAC concerned (for category A Projects only) (g) Project Type	1(a) Mining of minerals 1(a) Mining of minerals B2 SIA/TN/MIN/271159/2022 SW/271158/2022 Non-Coal Mining Fresh EC		
4.	<b>Location of the Project:</b> (a) Plot/Survey/Khasra No. (b) Pincode (c) Bounded Latitudes (North) From Degree Minutes Second From Degree Minutes Second (d) Bounded Longitudes (East) From Degree Minutes Second From Degree Minutes Second (e) Survey of India Topo Sheet No. (f) Uploaded Topo Sheet File (g) Maximum Elevation Above Means Sea Level(AMSL) (h) Uploaded (kml) File (i) Distance of Nearest HFL from the project boundary within the study area (j) Seismic Zone	S.F.No 1095(P) 626202  9 19 8  9 19 18  77 59 31  77 59 43 58G/15 Copy of Topo Sheet File 47.4 Copy of Kml File  0 2		
5.	(a) Number of States in which Project will be Executed (b) Main State of the project	1 Tamil Nadu		
<b>Details of State(s) of the project</b>				
S. No.	State Name	District Name	Tehsil Name	Village Name
(1.)	Tamil Nadu	Virudhunagar	Sattur	Nenmeni
6.	<b>Details of Terms of Reference (ToR):</b>			

13/03/2022 2:30 PM

**Details of Public Consultation:**  
 (a) Whether the Project Exempted from Public Hearing? | Yes  
 (b) Reason | Below 5ha  
 (c) Supporting Document | Copy of Supporting Document

**h Details of Project Configuration/Product:**

**h.1 Project Configuration**

S. No.	Plant/Equipment/Facility	Configuration	Remarks
(1.)	Hydraulic excavator	2 Nos - 0.9 cbm	
(2.)	Tipper	20 Nos- 15MT	

**h.2 Product**

S. No.	Product/Activity (Capacity/Area)	Quantity	Unit	Other Unit	Mode of Transport / Transmission of Product	Other Mode of Transport / Transmission of Product
(1.)	Sand	49550	Others	cubic meter	Road	

**9. In case of Expansion / Modernisation / One Time Capacity Expansion (only for Coal Mining) / Expansion under Clause 7(ii) / Modernisation under Clause 7(ii) / Change of Product Mix under Clause 7(ii):**  
 Details Not Applicable

**9.1. Details of Consent to Operate**

(i) Whether Consent to operate obtained ?	NA
(ii) Copies of all Consent to operate obtained since inception	NA
(iii) Date of Issue	N/A
(iv) Valid Upto	N/A
(v) File No.	NA
(vi) Application No.	NA
(vii) Copy of Consent to operate valid as on date	NA

**10. Project Cost:**

(a) Total Cost of the Project at current price level (in crores)	0.25
(b) Funds Allocated for Environment Management (Capital) (in crores)	0.005
(c) Funds Allocated Towards ESC (Entrepreneur Social Responsibility) (in crores)	0.005
(d) Funds Allocated for Environment Management Plan (EMP) (Recurring per Annum) (in crores)	0.4
(e) Funds Allocated for Environment Management Capital (%)	2.00

**11. Whether project attracts the General Condition specified in the Schedule of EIA Notification ?** | No

**12. Whether project attract the Specific Condition specified in the Schedule of EIA Notification ?** | No

**13. Raw Material / Fuel Requirement:**

(a) Proposed quantity of raw material/fuel	49550
(b) Existing quantity of raw material/fuel	N/A
(c) Total quantity of raw material/fuel	49550

**13.1. Raw Material / Fuel Profile**

S. No.	Raw Material / Fuel	Quantity	Unit	Other Unit	Source (in case of Import, please specify country and Name of the port from which Raw Material / Fuel is received)	Mode of Transport	Other Mode of Transport	Distance of Source from Project Site (In Kilometres) (In case of Import, distance from the port from which the raw material / fuel is received)	Type of Linkage	Other Type of Linkage	Uploaded Copy of Linkage
(1.)	HSD	0.1	Kilo Litre per Day		Open market	Road		5	Fuel Supply Agreement		Copy of Linkage

**14. Baseline Data:**

(a) Period of Base Line Data Collection	FROM 29 Mar 2022 To 29 Mar 2022
(b) Season	Summer

VI