DISTRICT SURVEY REPORT

OF

THIRUVARUR DISTRICT

DEPARTMENT OF GEOLOGY AND MINING

THIRUVARUR DISTRICT

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DISTRICT SURVEY REPORT FOR EARTH/ SAVUDU THIRUVARUR

PERMEABLE

In conjunction to the Ministry of Environment, Forest and Climate Change, the Government of India Notification No.SO 141 (E) dated 15.01.2016 and SO 190 (E) dated 20.01.2016 the District Level Environment Impact Assessment Authority (DEIAA) and District Environment Appraisal Committee (DEAC) were constituted in Thiruvarur District for the grant of Environmental Clearance for category "B2" projects for quarrying of Minor Minerals.

The main purpose of preparation of District Survey Report is to identify the mineral resources and develop the mining activities along with relevant current geological data of the District. The DEAC will scrutinize and screen scope of the category "B2" projects and the DEIAA will grant Environmental Clearance based on the recommendations of the DEAC for the Minor Minerals on the basis of District Survey Report. This District Mineral Survey Report is prepared on the basis of field work carried out in Thiruvarur district by the official from Geological Survey of India and Directorate of Geology and Mining, (ThiruvarurDistrict), Govt. of Tamilnadu. The District Survey Report (DSR) report prepared based on the guidelines by MOEF S.O. 3611(E). dt 25.07.2018.

1.0 INTRODUCTION:

Tiruvarur District, which was once part of theerstwhile Thanjavur District, the "Rice Bowl of Tamil Nadu." The District wasformed on 01.01.1997. It is called, the granary of the south, with the Cauverybrimming with flowing water and the enchanting green fields. Tiruvarur is an ancient town with a historical background. According tothe myths, the main Thiyagaraja temple was installed by Muchukanda Chola.Tiruvarur is also associated with another legendary king Manu Neethi Chola,who gave death punishment to his own son, for the death of a calf by hiscareless driving of his chariot. Tiruvarur has been mentioned in the Thevaramand Thiruvasagam sung by revered Nayanmars. The granite structure of thetemple was first constructed by Aditya Chola in the 9th Century and remodelledby Rajaraja Chola.

Rajendra Chola, however has given the present structure tothe temple. The Kamalalayam is the biggest tank in this district and the annualfloating festival is still an attraction. The royal patronage continued and thetown flourished as a cultural centre during the rule of the Nayaks, VijayanagarKings and the Marathas.

LOCATION

Thiruvarur district is bounded on the north by Nagapattinam district, on the south by Palk strait, on the east by Pondicherry (Karaikkal part) and Nagapattinam district and on the west and north-west by Thanjavur district. Geographically, the Thiruvarur District of Tamil Nadu State is bounded on the north by Nagapattinam District, on south by Palk Strait, on the east by Puducherry (Karaikal part) and Nagapattinam District(Fig No.1) and on the west and north-west by Tanjavur Disrict with the Coordinates 10020'00" N to 11007'00" N latitude and 79015'00" E to 79045'00" E longitude and the Mean Sea Level is varying from 10 m at Southern side and 30 m at western part of the district. The area of Thiruvarur District is 2,374 Sq. Km. The area falls under the toposheets 58 M/12, 58 N/05, 58 N/06, 58 N/07, 58 N/09, 58 N/10 and 58 N/11 of Survey of India.

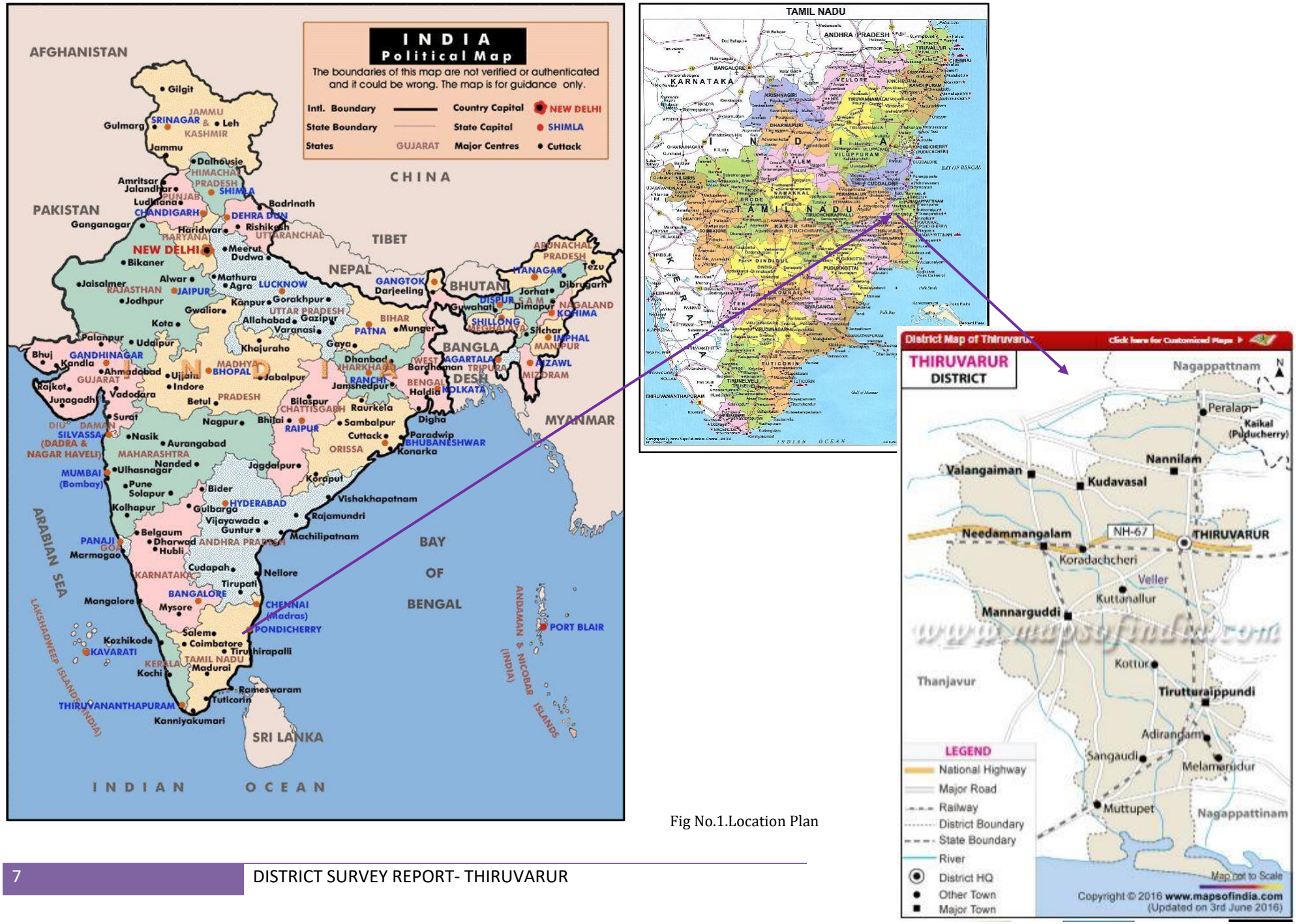


Fig No.1.Location Plan

2.0 OVERVIEW OF MINING ACTIVITY IN THE DISTRICT:

Thiruvarur District of Tamil Nadu State has less importance in concern with the mineral wealth. The important minerals are Alluvial sand and clay and Crude Oil and Natural Gas in the Cauvery Basin. The alluvial sand and clay is being used as earth filling material. The exploration and exploitation of Crude Oil and Natural Gas is carried out by the ONGC and the alluvial sand and clay mine lease is being granted by the Department of State Geology and Mines. The alluvial sand and clay mining falls under the category 'B' and sub category 'B2' and Sl. No. 1 (a) in the schedule under the Ministry of Environment and Forest notification EIA-2006 and notification EIA-2009 and should follow the Minor Mineral Conservation and Development Rules, 2010.

3.0 GENERAL PROFILE OF THE DISTRICT:

Fig No.2 Thiruvarur District Map

The old integrated Thanjavur district was trifurcated into three districts, namely,Thanjavur, Thiruvarur and Nagapattinam districts. There are 2 revenue divisions, 7taluks, 10 community development blocks,3 municipalties, 7 town panchayats and 573 villages in Thiruvarur district.

Fig No.3 Taluk Map

Tab.No.1 District Glance

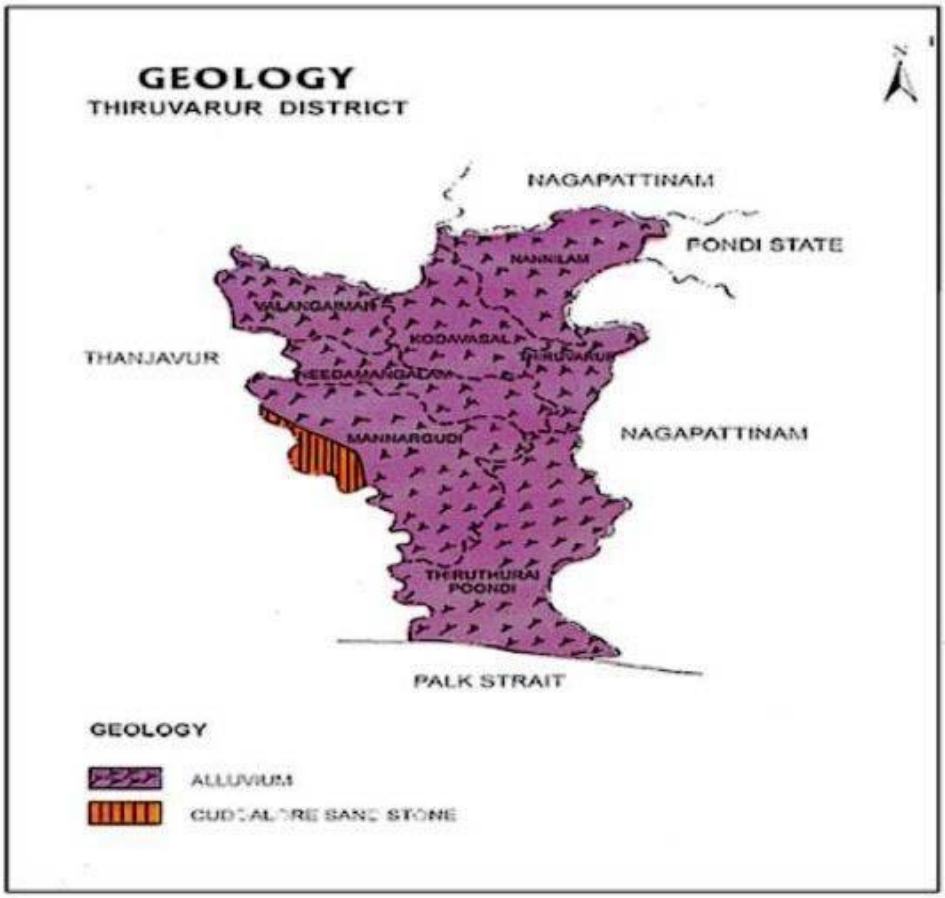
SL. NO	DETAILS	THIRUVARUR DISTRICT
1	GEOGRAPHICAL POSITION	
	East Longitude Between North Latitude Between Sea Level	**Between 79 15'and 79 45' Between 10 20'and 11 07' 10 meters**
2	AREA AND POPULATION	**2011 CENSUS**
	a) Area in Square Km.,	**2374**
	b) Population	**12,64,277**
	Male	**6,26,693**
	Female	**6,37,584**
	Rural	**10,06,482**
	Urban	**2,57,795**
	c) Density / Sq.km.,	**556**
	d) Literates Literacy Rate	**9,46,471 82.86%**
	MAIN WORKERS	**2011 CENSUS**
	a) Total Workers	**540168**
	b) Male Workers	**369853**
	c) Female Workers	**170315**
	d) Rural Workers	**451099**
	e) Urban Workers	**89069**
	f) Cultivators	**60508**
	g) Agricultural Labors	**200126**
	h) Household Industry	**7264**
	i) Other Workers	**144527**
	j) Marginal Workers	**127743**
	k) Non Workers	**724109**
	l) Languages Spoken	**Tamil,Telugu,Malayalam,Urud**
		Kannada, and Sowrashtra
3.	VITAL STATISTICS	
	a) Births	**17048**
	b) Deaths	**6417**
	c) Infant Deaths	**168**
	BIRTH RATE (PER 1000 POPULATION)	
	a) Rural	**13**
	b) Urban	**13**
	c) Combined	**13**
	DEATH RATE (PER 1000 POPULATION)	
	a) Rural	**5.6**
	b) Urban	**3.3**
	c) Combined	**5.4**

SL.NO	DETAILS			THIRUVARUR 2015-2016
	INFANT MORTALITY RATE(PER 1000			
	LIVE BIRTHS)			**10.4**
	a)	Rural		**12.2**
	b)	Urban		**0.6**
	c)	Combined		**11.1**
	EXPECTATION OF LIFE AT BIRTH			
	a)	Male		**61.7**
	b)	Female		**63.5**
4	TEMPERATURE (IN CELSIUS)			**THIRUVARUR 2015-2016**
	PLAINS			
	i) Maximum			**35.19**
	ii) Minimum			**26.39**
	HILL STATION			
	i) Maximum			**NIL**
	ii) Minimum			**NIL**
5	RAINFALL (in m.m.,)			**THIRUVARUR 2015-2016**
	a)	Normal		
		i) North	East Monsoon	**719.1**
		ii) South	West Monsoon	**296.4**
	b)	Actual		
		i) North	East Monsoon	**1022.2**
		ii) South	West Monsoon	**218.4**
6	AGRICULTURE (IN HECT)			**THIRUVARUR 2015-2016**
	a) Total Cultivated Area			**328869**
	b) Net Area sown			**154740**
	c) Area sown more than once			**174128**
	Area & Production of Principal crops			**Area**
	1.	Paddy		**194743**
	2. Millets and other cereals			**----**
	3.	Pulses		**120579**
	4.	Sugarcane		**375**
	5.	Ground nut		**2122**
	6.	Gingelly		**241**
	7.	Cotton (lint)		**4799**
	Agricultural Land Holdings (2010-11)			
	a) Holdings (Nos)			**152127**
	b) Area (in Hec)			**140613**
	c) Average size of holdings (in hec)			**0.924**
	d) Name of the Important Food Crops			**Rice, Black Gram, Green gram Cotton, Groundnut, Coconut, Gingelly, Palmolin, Flowers**
	e) Important Non food crops			

SL.NO	DETAILS	THIRUVARUR 2015-2016
7	IRRIGATION	
	a) NET AREA IRRIGATED BY (IN HEC)	
	i) Government Canals ii) Private Canals iii) Tanks iv) Tube wells v) Open wells vi) Other Sources Total Net area Irrigated	149546 Nil Nil Nil Nil Nil 149546
	b) GROSS AREA IRRIGATED	218793
	Name of the river	Vennar, Vettar, Koraiyar Odampokki, Mudikondan Kattar, Nandalar, Mulliyar, Thirumalairajanar,Valavaikal, Adapparpandavaiyar,Paminiyar uHarichandranathi,Ayyanar, Vellaiyar, Marakka Koraiyar,Vaduvur Extn(CMP)
	Name of the Lake	Vaduvur Lake, Thirumeni Lake, Moovanallur Lake, Udayamarthandapuram Lake
8	ANIMAL HUSBANDRY	THIRUVARUR 2015-2016
	I. VETERINARY INSTITUTIONS	
	a) Veterinary Hospitals b) Dispensary c) Clinicians Centre d) Sub Centre	7 66 1 33
	II. POULTRY DEVELOPMENT	THIRUVARUR 2015-2016
	a) Chicks Produced in hatcheries b) Birds sold for breeding (Rupees) c) Birds sold for food (lakhs)	Nil Nil Nil
	III. LIVESTOCK CENSUS(2004 CENSUS) a) Cattle b) Buffaloes c) Sheep d) Goat e) Poultry	 195743 2070 4591 225143 -
9	DAIRY DEVELOPMENT	THIRUVARUR 2015-2016
	a) Dairies b) Milk Chilling Plants c) No.of Milk Co-op Societies d) Milk production liters Flush season (Lakh liters) Lean Season	NIL NIL 145 14599385 -- --

4. GEOLOGY OF THE DISTRICT

Thiruvarur District comprises of Tertiary and Alluvial Deposits. The Cuddalore Sand stones of Tertiary Age are well developed as seen near Mannargudi. These sand stones are covered by laterites and lateritic soil over the Cuddalore Formations of Miopliocene age. The rest of the area is represented by the Quaternary deposits. The alluvial deposits of River Cauvery and its tributaries lie over the Tertiary sandstone. The fluvial deposits comprise flood plain, flood basin, point bar, channel bar and palaeo channels with admixtures of sand, silt, clay and gravel. The deltaic plain includes palaeo tidal flats with clays and sands and sand ridges of grey brown sand. The marine coastal plains include beach, tidal flats, salt marsh, mangrove swamps, deposits of sand and clay. The thickness of these Formations ranges from 30 m to 400 m (Fig: 3). Reserve forest of Muttupet on either side of the Mullipalam Creek represent marshy area. Mullipallam Creek represents estuaries in the area, connected to sea by narrow tidal creeks and rivers such as Koraiyar and Pamaniyar. A NW- SE rending deep seated fault is located to the east of Tiruttaraipoondi.



5. DRAINAGE OF IRRIGATTION PATTERN

BASIN AND SUB-BASIN

The district falls in Cauvery sub-basin. The tributaries of the river Cauvery are: Vennar,Vettar and Bamini rivers

DRAINAGE

The Vennar and Vettar rivers play an important role in draining the district. There are 13irrigation canals branching from these rivers. There are 34 irrigation tanks, which serveas major source of irrigation the district. Out of 34 tanks in the district Mannargudi talukaccounts for 22, followed by Thiruthuraipoondii. Surface water canals are the majorsources of irrigation water accounting for about 89 percentage of the area irrigated in thedistrict, whereas dug wells and tube wells accounts for 11 percentages.Table No.2 Irrigation Pattern

The nine-fold land use classification (2005-06) for the district is given below

S. No.	Classification	Area (Ha)
1	Forest	2452
2	Barren and uncultivable land	113
3	Non-agriculture uses	37059
4	Cultivable waste	1896
5	Pastures and grassing land	768
6	Miscellaneous trees and grasses	2132
7	Current Fallows	5709
8	Other Fallow lands	6353
9	Net area sown	153227
	Total	**209709**

(Source: Department of Economics and Statistics, Govt. of Tamil Nadu)

6. LAND UTILIZATION PATTERN IN THE DRAINAGE OF RRIGATTION PATTERN: FOREST, AGRICULTURAL, HORTICULTURE, MINING ETC.,

AGRICULTURAL

SOILS

The district has mainly alluvial soil consisting of sand, silt and clay.

FOREST

The forests in the Thanjavur ForestDivision which comprise Thiruvarur canbe divided into three regions from thetopography, and flora point of view. Theyare the alluvial regions or riverine landareas; The areas on the banks of rivers andcanal in the form of narrow strips. Teakplantations mostly cover these areas andwherever the soil is unsuitable forCamellia sinensis, Dalbergia

sisso,Terminalia arjuna and Eucalyptus havebeen planted. The lateritic region: This regioncontains mostly throny scrub jungles,tropical thorn forests and tropical dryevergreen forests.

The coastal regions: This zonecontains causurina plantations, mangrovescrub, mangrove forest and southern thornscrub jungle. The entire stretch of coastalmangroves with lagoons and back waterslying along the coast fall in this category.

AGRICULTURAL

Thiruvarur lies in the Cauvery River basin and the main occupation of the inhabitants of the town and surrounding regions is agriculture. More than 70% of the workforce is involved in agriculture; 14% being cultivators and rest are agricultural labourers. Paddy is cultivated in three seasons namely Kuruvai (June – August) Samba (August – January) and Thaladi (January – March). Other cereal crops of the district are Cumbu, Ragi, Maize, Korra and Varagu. The pulses grown in the district are red gram green gram and black gram. Other food crops are condiments and species, sugarcane, fruits and vegetables.

HORTICULTURE

Major horticulture crops cultivated in this district are fruits crops like mango, banana and acid lime, vegetables like Bhendi, Brinjal, Greens and Tapioca, spices like turmeric, flower crops like jasmine, and rose, plantation crops like betel vine.

7.0 SURFACE WATER AND GROUND WATER SCENRIO OF THE DISTRICT

The district falls in Cauvery sub-basin. The tributaries of the river Cauvery are; Vennar,Vettar and Bamini rivers.The Vennar and Vettar rivers play an important role in draining thedistrict. There are 13 irrigation canals branching from these rivers. There are 34 irrigation tanks, which serve as major source of irrigation the district. Out of 34 tanks in the district Mannargudi taluk accounts for 22, followed by Thiruthuraipoondii. Surface water canals are the major sources of irrigation water accounting for about 89 percentage of the area irrigated in the district, whereas dug wells and tube wells accounts for 11 percentages.

8.0 RAINFALL OF THE DISTRICT AND CLIMATE CONDITION:

The district has a hot tropical climate in summer season, which is very oppressive and it isfrom March to about the end of May. The humidity is generally high in the coastalregion throughout the year and exceeds 70 percentages during period from August toMay. It is much drier towards the interior of the district.Tiruvarur district experiences a hot and tropical monsoonal climate with humid weather. The district experiences moderate rainfall during the southwest monsoon and heavy rains duringnortheast monsoon. However during January and February winter season prevails while March toMay will experience hot weather.The Maximum temperature is 35.190C and Minimum of 26.390C. The average rainfall during North East Monsoon is 719.1 mm and 296.4 mm of rainfall

YEAR	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEPT		OCT		NOV		DEC	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2013	14.3	-65	24.8	29	75.2	337	7.8	-77	49.3	5	37.7	13	20.5	-68	162.4	73	138.0	31	68.3	-66	169.4	-44	150.7	-30
2014	6.3	-85	13.2	-31	0.0	-100	0.3	-99	180.7	286	2.0	-94	119.8	87	94.8	1	30.7	-71	333.2	66	251.8	-17	167.6	-22
2016	0.0	-100	0.0	-100	0.0	-100	0.0	-100	187.4	301	33.5	0	38.9	-39	78.9	-16	56.7	-46	68.6	-66	89.5	-71	91.9	-57
2017	123.1	201	2.0	-90	11.2	-35	0.0	-100	19.3	-59	61.0	83	60.0	-6	149.6	59	120.0	14	128.6	-36	363.9	20	209.3	-3

during South West Monsoon.Source:http://hydro.imd.gov.in

District : THIRUVARUR

Note :(1) The District Rainfall in millimeters (R/F) shown below are the arithmatic averages of Rainfall of Stations under the District.

(2) % Dep. are the Departures of rainfall from the long period averages of rainfall for the District.

(3) Blank Spaces show non-availability of Data

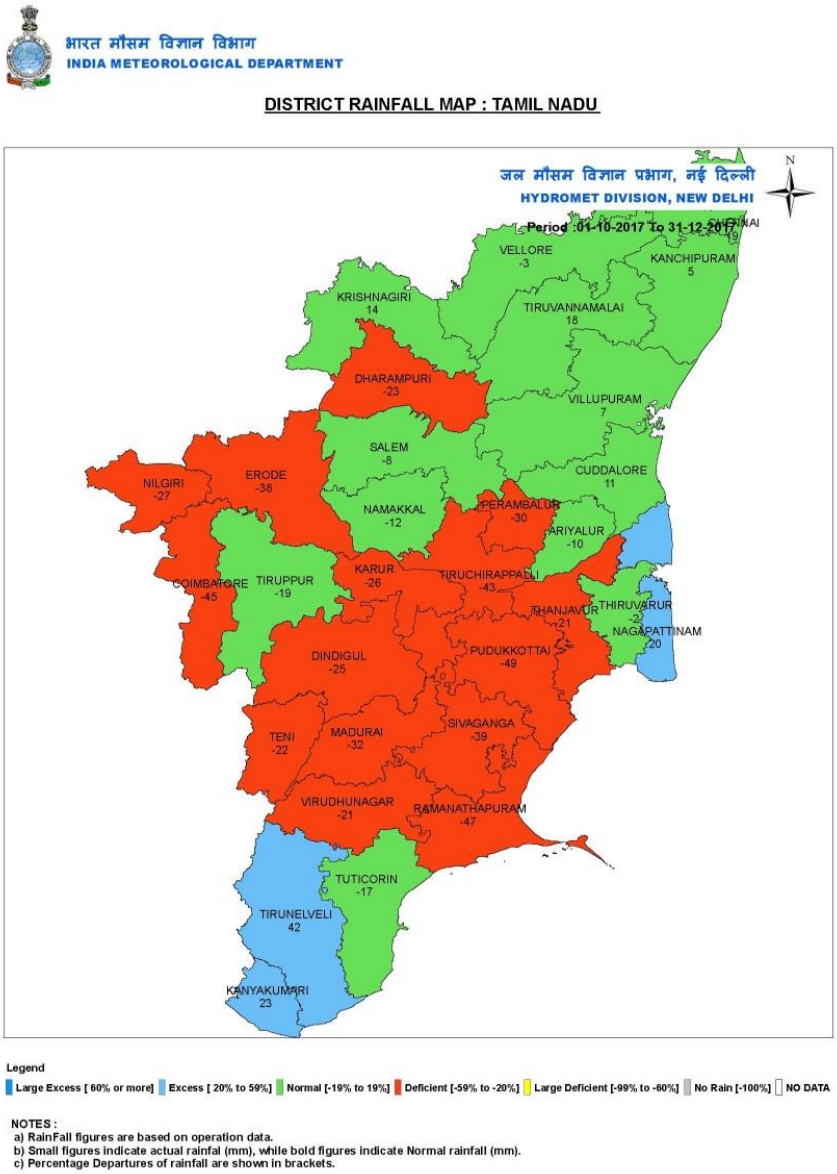


Fig No.4 Rainfall data of Tamilnadu

9.0 EARTH / SAVUDU

In Thiruvarur District a total No.of 15 leases have been granted for quarry earth/ savudu in 10 villages of 6taluk during the year 2015-2016 and 5 villages of 4 taluk during the year 2016-2017 and one village of one taluk during the year 2017-2018.

Table No.3 9.0 Details of the mining lease in the district as per following format

Sl. No	Name of the mineral	Name of the lessee	Address & Contact No. of lessee	Mining lease grant order No. and date	Area of mining lease (Ha)	Period of mining lease (Initial)		Period of mining lease (1st & 2nd renewal)		Date of commencement of Mining Operation	Status (Working / Non-Working / Temp. Working for dispatch etc.)	Captive / Non-Captive	Obtained Environmental Clearance (Yes / No)	Location of the Mining Lease (Latitude & Longitude)	Method of Mining (Open cast / Underground)
						From	To	From	To						
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
LEASES GRANTED ON MINOR MINERALS (SAVUDU) DURING THE YEAR 2015 – 2016															
1.	Savudu	R. Chandrasekaran	S/o. Ramanathan Pillai, No.5/73, Main Road, Poonthottam Post, Nannilam Taluk, Thiruvarur District	R.C.No.625 / (G&M) / 2014 Dated 15-04-2015	2.84.0	22-04-2015	21-04-2018	Nil	Nil	22-04-2015	Non-working	Non-Captive	Yes	08°10'20" - 8°12'00" to 77°13'00" - 77°14'45"	Open-cast
2.	Savudu	R. Mahesh	S/o. Rajendran, 20, Pillai Street, Thiruvarur	R.C.No. 82 / (G&M) / 2015Dated : 21-12-2015	4.21.5	31-12-2015	30-12-2018	Nil	Nil	31-12-2015	Non-working	Non-Captive	Yes	10°24'13''N to 10°24'21'' N 79°32'38'' E to 79°32'46''E	Open-cast
3.0	Savudu	Rajendran	S/o. Venkatachalam, 92/B1, Agraharam Street, Chithiraiyur Post, Needamangalam Taluk, Thiruvarur District	R.C.No. 376 / (G&M) / 2014 Dated 21-12-2015	1.08.0	31-12-2015	30-12-2017	Nil	Nil	31-12-2015	Non-working	Non-Captive	Yes	10°41'15.54''N to 10°51'0.48'' N 79°37'54.18'' E to 79°47'45.6'' E	Open-cast
4.0	Savudu	R. Chitra,	W/o. K. Suresh, 663, Savadi Street, Nedungulam, Nannilam Taluk, Thiruvarur District	R.C.No. 785 / (G&M) / 2014 Dated : 08-01-2016	2.44.0	08-01-2016	07-01-2019	Nil	Nil	08-01-2016	Non-working	Non-Captive	Yes	10°59'19.08''N to 10°59'20.54''N 79°42'49.32''E to 79°42'57.48	Open-cast

														’E	
5.0	Savudu	C. Mangaikarasi ,	W/o. Chandrasekaran, No.5/73, Main Road, Poonthottam, Nannilam Taluk, Thiruvarur District	R.C.No. 663 / (G&M) / 2015 Dated : 26 -02-2016	0.55.5	26-02-2016	25-02-2019	Nil	Nil	26-02-2016	Non-working	Non-Captive	Yes	10°50’29’’N to 10°50’50’’N 79°37’02’’E to 79°37’18E’’ E	Open-cast
6.0	Savudu	G.Subramaniyan,	S/o. Govindarajan, No.1/77, Kudiyana Street, Mananthakudi Post, Ayyampettai, Nannilam Taluk, Thiruvarur District	R.C.No. 664 / (G&M) / 2015 Dated : 26-02-2016	2.25.0	26-02-2016	25-02-2019	Nil	Nil	26-02-2016	Non-working	Non-Captive	Yes	11°00’07’’N to 11°00’15’’N 79°42’06’’E to 79°42’13’’E	Open-cast
7.0	Savudu	B. Kumaran,	S/o. Balasubramanian, No.51, Periyar Street, Mettupalayam, Thiruvarur District	R.C.No. 662 / (G&M) / 2015 Dated : 02-03-2016	1.83.0	02-03-2016	01-03-2019	Nil	Nil	02-03-2016	Non-working	Non-Captive	Yes	10°44’48.7’’ N to 10°44’48.9’’ N 79°39’22.4’’ to 79°39’25.9’’ E	Open-cast
8.0	Savudu	Thiru D. Packirisamy,	S/o. Duraisamy, No.11, Chinna Alathur, Peralam Post, Kodavasal Taluk, Thiruvarur District	R.C.No.311 / G&M / 2015 dated 02-03-2016	1.65.0	02-03-2016	01-03-2019	Nil	Nil	02-03-2016	Non-working	Non-Captive	Yes	11°00’21.1N to 11°00’26.7’’ N 79°42’18.2’’ to 79°42’22.2’’ E	Open-cast
9.0	Savudu	Thiru A. Jayakumar,	S/o. Ayyadurai, No.30, South Sozhiyar Street, Kodavasal Taluk, Thiruvarur District	R.C.No. 592 / (G&M) / 2013 Dated : 02-03-2016	1.85.0	02-03-2016	01-03-2019	Nil	Nil	02-03-2016	Non-working	Non-Captive	Yes	10°49’20.1’’ N to 10°49’24.7’’ N 79°31’30.7’’ E to 79°31’10.8’’	Open-cast

													E	
10.0	Savudu	Thiru N. Udayakumar,	S/o. Nagarajan, No.44, Chithanallur, Semangalam Post, Thiruvarur Taluk, Thiruvarur District	R.C.No. 397 / (G&M) / 2014 Dated : 03-03-2016	0.92.5	03-03-2016	02-03-2018	Nil	Nil	03-03-2016	Non-working	Non-Captive	Yes	10°48'48.24''N to 10°48'49.08''N 79°31'42.3'' E to 79°31'44.7'' E	Open-cast
11.0	Savudu	Thiru Gnanasekar,	S/o. Subramanian, No.2/72, North Street, Vaippur Post, Thiruvarur Taluk and District	R.C.No. 179 / (G&M) / 2015 Dated : 07-03-2016	2.08.0	07-03-2016	06-03-2019			07-03-2016	Non-working	Non-Captive	Yes	10°48'39''N to 10°48'51''N 79°41'11''E to 79°41'29''E	Open-cast
LEASE GRANTED ON MINOR MINERAL (SAVUDU) 2016-2017															
12.0	Savudu	Thiru Sundarapandiyan,	S/o. Singaravelu, 47/A, Perumal Kovil Keezha Veedhi, Pulivalam, Thiruvarur Taluk	R.C.No. 623 / (G&M) / 2011 dated 10-06-2016	2.60.0	15-06-2016	29-03-2018	Nil	Nil	29-03-2018	Non-working	Non-Captive	Yes	10°44'16"N 79°40'55''E	Open-cast
	Savudu	Tmt. C. Amutha,	W/o. Chandrasekaran, 73/2, Pillai Street, Koradachery, Kodavasal Taluk, Thiruvarur District	R.C.No.147/G &M/2014 dated 07-07-2016.	1.33.5	15-07-2016	14-07-2018	Nil	Nil	14-07-2018	Non-working	Non-Captive	Yes	10°46'13.84''N to 10°46'17.81''N 79°28'49.94''E to 79°28'53.60''E	Open-cast
13.0	Savudu	Thiru. R. Selvam	S/o. Rethinam No.3/10/6 Meppalam, Kulikarai post, Kodavasal Taluk Thiruvarur-613 704	RC.No.70/G&M/2016 dated 17-07-2017.	0.62.0	31-07-2017	30.07.2019	Nil	Nil	30.07.2019	Non-working	Non-Captive	Yes	10°41'53.9'' N 79°43'52.41 E	Open-cast
14.0	Savudu	C.Murugandham	S/o. Singaravel 2/99 Pillaiyar Kovil Theru, Perunattanthoppu, Thirukannapuram	RC.No.70/G&M/2016 dated 17-07-2017	0.72.5	31-07-2017	30.07.2019	Nil	Nil	30.07.2019	Non-working	Non-Captive	Yes	10°48'38.70''N to 10°48'40.00''' N 79°32'08.10	Open-cast

			Nagapattinam											”E to 79°32’11.19 ”E	
15.0	Savudu	Thiru R. Manisekaran,	S/o. Ramanathan, 347, Railadi Theru, Poonthottam, Nannilam Taluk, Thiruvarur.	RC.No.319/G&M/ 2016 dated 14.11.2017.	1.99.0	11-12-2017	10-02-2020	Nil	Nil	10-02-2020	Non-working	Non-Captive	Yes	10°50’47.96 ”N to 10°50’49.57 ”N 79°37’02.99 ” E to 79°37’12.65 ”E	Open-cast

Sl. No	Name of the mineral	Name of the lessee	Address & Contact No. of lessee	Mining lease grant order No. and date	Area of mining lease (Ha)	Period of mining lease (Initial)		Period of mining lease (1st & 2nd renewal)		Date of commencement of Mining Operation	Status (Wor-king / Non-Wor-king / Temp. Wor-king for dispatch etc.)	Captive / Non-Captive	Obtained Environmental Clearance (Yes / No)	Location of the Mining Lease (Latitude & Longitude)	Method of Mining (Open cast / Underground)
						From	To	From	To						
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
LEASES GRANTED ON MINOR MINERALS (SAVUDU) DURING THE YEAR 2017 – 2018															
1.	Savudu	V. Ramalingam	S/o. Vadivelu, 23, Sivam Nagar, Thiruvarur.	R.C.No.806/ (G&M) / 2015 Dated 12-04-2017	2.53.5	25.05.2017	24.05.2020	Nil	Nil	23.06.2017	Non-working	Non-Captive	Yes	10°59'36.0'' N to 10°59'46.7'' N 79°43'51.9'' E to 79°43'55.9'' E	Open-cast

10.0 DETAILS OF SEIGNIORAGE FEE / REVENUE RECEIVED IN LAST THREE YEARS:

The volume of the minable sand / clay depends up on the total extent of the lease area and other environmental parameters. The total volume of alluvial sand / clay has been given for mining/ quarrying is about 5,49,148 m3 with a tonnage of 7,13,892 metric tons (Consider the density of the clay is 1.3 kg/m3). The Seigniorage fee per 1 m3 is Rs. 26/- Basing on these statistics, the O/o DGM, Thiruvarur Disrtict, Tamil Nadu is supposed to be received the Revenue in last three years is about Rs. 1,09,82,960/-. But, the mining / quarrying details and seigniorage fee paid by the mine lease owners is yet to be received from the DGM Office, Thiruvarur because of all the leased mines / quarries have been abandoned due to expiry of the lease period or local issues. The market value of the clay of one cubic meter is Rs. 500/- (Source: from local people of Thiruvarur).

Sl. No.	Year	Seigniorage Fee Collected (in Rs.)
1	2015-16	749625539
2	2016-17	681421307
3	2017-18	729433020
	Total	2160479866

Tab.No.5MINERAL WISE / LEVY WISE / MONTH WISE MINERAL REVENUE COLLECTION FOR THE YEAR 2015 – 2016

Sl. No.	Month & Year	Major Minerals					Minor Minerals								Any Other Amount (int.)	Total (Minor Mineral) Revenue	Grand Total (Reconciled Figure) Revenue
		Royalty		A.F/S.R.	etc.,	Total (Major Mineral) Revenue	Seignior age fee	Brick		Applicati on Fee	Area Asses sment	Dea d Ren t	Penalty				
		Crude Oil	Natural Gas				Redsoil / Savudu	Registration Fee	Annual Brick Mineral Fee	(Savudu)	Savudu	Savudu	Sand	Others (Savudu)			
1	April 2015	56405063	15841573	0	0	72246636	375000	0	0	3000	1800	0	213919	0	0	593719	72840355
2	May 2015	52595545	10398704	0	0	62994249	50000	0	0	1500	0	0	86734	76220	0	214454	63208703
3	June 2015	62067408	15579633	0	0	77647041	185000	100	6000	3000	0	0	190920	76155	0	461175	78108216
4	July 2015	53417082	14834221	0	0	68251303	85000	700	12000	10500	0	0	62510	0	0	170710	68422013

5	August 2015	48868039	15626158	0	0	64494197	320000	0	0	1500	0	0	31928	100770	0	454198	64948395
6	September 2015	43740410	23622599	4315	0	67367324	100000	0	0	6000	0	0	25586	101540	0	233126	67600450
7	October 2015	42473444	23466295	0	0	65939739	60000	0	0	4500	0	0	15482	0	0	79982	66019721
8	November 2015	42661826	20131351	0	0	62793177	0	0	0	0	0	0	0	0	0	0	62793177
9	December 2015	37431783	18893107	0	0	56324890	192240	0	0	0	800	0	51164	50770	0	294974	56619864
10	January 2016	34237085	17283357	0	0	51520442	151000	0	0	1500	1800	0	61734	25385	0	241419	51761861
11	February 2016	28265783	18877682	0	0	47143465	280000	0	0	1500	3600	0	0	0	0	285100	47428565
12	March 2016	29942094	18135280	0	0	48077374	1764160	0	0	1500	5800	0	0	25385	0	1796845	49874219
	Total	532105562	212689960	4315	0	744799837	3562400	800	18000	34500	13800	0	739977	456225	0	4825702	749625539
Deduct apportionment amount adjusted on 07-03-2016																	485000
Net Receipt																	749140539

Tab.No.6MINERAL WISE / LEVY WISE / MONTH WISE MINERAL REVENUE COLLECTION FOR THE YEAR 2016 – 2017

Sl. No.	Month & Year	Major Minerals					Minor Minerals										Total (Minor Mineral) Revenue	Grand Total (Reconciled Figure) Revenue
		Royalty		A.F/S.R.	Annual Compensation PEL etc.,	Total (Major Mineral) Revenue	Seignior age fee	Brick		Application Fee	Area Assessment	Dead Rent	Penalty					
		Crude Oil	Natural Gas				Redsoil / Savudu	Registration Fee	Annual Brick Mineral Fee	(Savudu)	Savudu	Savudu	Sand		Others (Savudu)	Gravel		
1	April 2016	34842024	19138500	0	0	53980524	0	300	18000	4500	0	0	53126	0	0	75926		54056450
2	May 2016	34948945	14656476	0	0	49605421	75582	0	0	0	0	0	76155	0	0	151737		49757158
3	June 2016	38798926	14641014	0	0	53439940	100000	200	12000	4500	1800	0	27885	50770	0	197155		53637095
4	July	37364137	1413182	0	0	51495961	220000	100	6000	3000	800	0	25466	0	0	484564		51980525

	2016		4										4				
5	August 2016	34661082	14161947	4415	0	48827444	0	0	0	0	0	0	47892	20308	0	250972	49078416
6	September 2016	35785722	14141821	0	0	49927543	20000	500	35000	1500	0	0	237946	0	0	294946	50222489
7	October 2016	34084351	11980568	0	0	46064919	40000	0	0	1500	0	0	109763	25582	0	176845	46241764
8	November 2016	37271508	9769859	0	0	47041367	25000	0	0	0	0	0	51550	25385	0	101935	47143302
9	December 2016	35377122	10668868	0	0	46045990	25000	0	0	1500	0	0	0	12689	0	153395	46199385
10	January 2017	46984485	10673640	0	0	57658125	40000	0	0	0	0	0	135318	25450	26155	226923	57885048
11	February 2017	0	0	0	0	0	165760	0	0	0	0	0	81790	78465	0	326015	326015
12	March 2017	48155927 46139776	10985995 1019345	0	0	174075151	572100	3000	105000	6000	0	0	0	13240	0	818509	174893660

		58600000	3														
Total		523014005	155143965	4415	0	678162385	1283442	4100	176000	22500	2600	0	1076089	66803	26155	3258922	681421307

Tab.No.7 MINERAL WISE / LEVY WISE / MONTH WISE MINERAL REVENUE COLLECTION FOR THE YEAR 2017 – 2018

Sl. No.	Month & Year	Major Minerals					Minor Minerals									Total (Minor Mineral) Revenue	Grand Total (Reconciled Figure) Revenue
		Royalty		A.F/S.R.	GravelD.R./Penalty / Interest / Annual Compensation PEL etc	Total (Major Mineral) Revenue	Seigniorage fee	Brick		Application Fee	Area Assessment	Dead Rent	Penalty				
		Crude Oil	Natural Gas				Gravel / Earth / Clay / Redsoil / Savudu	Registration Fee	Annual Brick Mineral Fee	Earth (Savudu)	Savudu	Savudu	Sand	Others (Savudu)	Gravel / Pebbles / Silica		
1	Apr 2017	1778711	0	0	0	1778711	230000	100	6000	3000	1550	0	160102	226065	0	626817	2405
2	May 2017	43233336	11489777	14972986	0	69696099	120000	0	0	3000	0	0	274332	329760	0	727092	7042
3	Jun 2017	42174642	9937075	0	0	52111717	220000	300	1200	7500	0	0	71155	821865	0	1132820	5324
4	Jul 2017	43313560	11800688	17361	0	55131609	4454100	0	0	6000	1200	0	369434	280330	18450	5129514	6026

5	Aug 2017	46307768	12162855	320000	0	58790623	50000	0	0	0	200	0	364819	75990	0	491009	5928
6	Sep 2017	48077600	11939168	0	0	60016768	20000	0	0	0	0	0	688460	233280	0	941740	6095
7	Oct 2017	49934469	11390522	0	0	61324991	62000	0	0	0	0	0	1268415	334407	52310	1717132	6304
8	Nov 2017	53617928	13117824	0	0	66735752	0	0	7000	9000	1000	0	361613	0	0	441613	6717
9	Dec 2017	52396744	14014024	0	0	66410768	0	0	0	3000	0	0	1069881	0	0	1072881	6748
10	Jan 2018	57323373	14187091	0	0	71510464	60000	0	0	0	0	0	290207	410019	0	760226	7227
11	Feb 2018	66183999	13723486	0	0	79907485	275000	300	1200	1500	0	0	236060	152220	0	677080	8058

12	Mar 2018	59170947	11368491	0		70539438	243000	1500	6000	12000	0	0	1444171	0	0	1760671	7230
Total		563513077	135131001	15310347	0	713954425	5734100	2200	1600	45000	3950	0	6598649	2863936	70760	15478595	7294

11.0 *DETAILS OF PRODUCTION OF MINOR IN THE LAST THREE YEARS*

Table No.6 details of production of minor in the last three years

DETAILS OF PRODUCTION OF MINOR MINERAL IN LAST THREE YEARS					
S No	Name of the Mineral	Year			Production
		2015-16	2016-17	2017-18	
1	Savudu	74969	75555	78297	228821

12. MINERAL MAP OF THE DISTRICT:

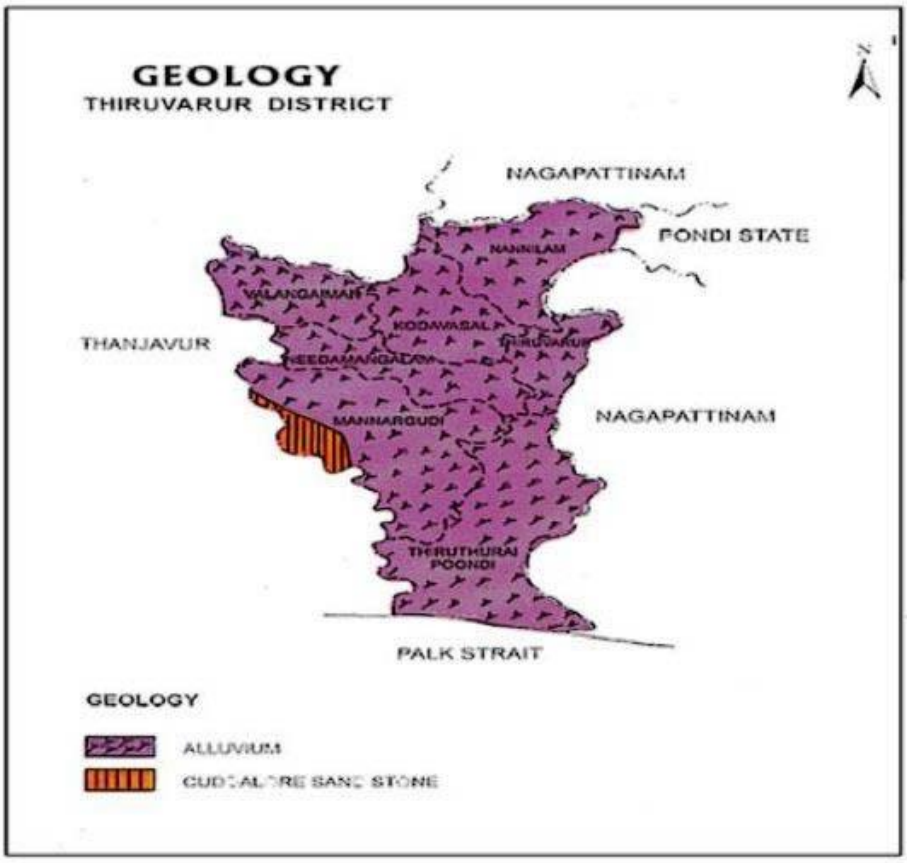


Fig No. 5 MINERAL MAP OF THE DISTRICT

13.0 LIST OF INTENT (LOI) HOLDERS IN THE DISTRICT ALONG WITH ITS VALIDITY AS PER THE FOLLOWING FORMAT

LIST OF LETTER OF INTENT (LOI) HOLDERS IN THE DISTRICT									
S No	Name of the Mineral	Name of the Lessee	Address & Contact No. of Lessee	Letter of Intent Grant Order No & Date	Area of Mining lease (ha)	Validity of LOI	Use (Capitive /Non Capitive	Location of the Mining lease (Latitude & Longitude)	
								Latitude	Longitude
1	Savudu	Sivanantham	S/o. Poovalingam	District Collector, Thiruvarur letter in Rc.No. 706/Mines/2017 dated: 03.04.2018.	1 Year	2.16.0	Non Capitive	10°59'07.67''N to 10°59'12.67''N	79°45'03.80''E to 79°45'09.15''E

Table No.7 details of list of intent (LOI) holders in the district

14.0TOTAL MINERAL AVAILABLE IN THE DISTRICT

TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT				
S No	Name of the Lessee/LOI Holder	Village	Taluk	Geological Reserve (Cum)
1	V. Ramalingam	Nedungulam	Nannilam	36740
2	R. Selvam	Kiliyanur	Needamangalam	12741
3	R. Manisekaran	Anaikuppam	Nannilam	39800
4	S. Murugandham	Engan	Kudavasal	14500
5	N. Vijayakumar	Manaparavai	Kudavasal	46250
6	T. Manoharan	Segal	Thiruthuraipoondi	91950

CRUDE OIL AND NATURAL GAS:

ONGC, Cauvery Asset, Karaikal, Puducherry is the Mine lease owner of the Crude Oil & Natural gas (Major mineral) of Cauvery Basin. Mining lease has been granted for a total of 11 nos. of crude oil and natural gas blocks which are located in different parts of Thiruvarur Taluk, Nannilam Taluk, Kamalapuram Block area, Koothanallur area, Greater Kovil Kalappal area and Needamangalam areas since the year 1999.

ALLUVIAL SAND AND CLAY (SAVUDU):

A total of 19 nos. of Mining lease have been granted for Alluvial sand and clay quarrying in different parts of Mannargudi Taluk, Nannilam Taluk, Thiruthuraipoondi Taluk, Needamangalam Taluk, Thiruvarur Taluk and Kodavasal Taluk since the year 2014.

15.QUALITY / GRADE OF MINERAL AVAILABLE IN THE DISTRICT

A total of 19 nos. of Mining lease have been granted for Alluvial sand and clay quarrying in different parts of Mannargudi Taluk, Nannilam Taluk, Thiruthuraipoondi Taluk, Needamangalam Taluk, Thiruvarur Taluk and Kodavasal Taluk since the year 2014. All the quarries present in the Appendix–I have been inspected and photographs have been taken (Plate-I).of the minable sand / clay depends up on the total extent of the lease area and other environmental parameters. The total volume of alluvial sand / clay has

been given for mining/ quarrying is about 5,49,148 m3 with a tonnage of 7,13,892 metric tons (Consider the density of the clay is 1.3 kg/m3). The Seigniorage fee per 1 m3 is Rs. 20/- [As per the Order G.O. (Ms) No. 6 Dated 11.01.2011 by Industries (MMB.1) Department in the Tamil Nadu Government Gazette Extra-ordinary]. Basing on these statistics, the O/o DGM, Thiruvarur Disrtict, Tamil Nadu is supposed to be received the Revenue in last three years is about Rs. 1,09,82,960/-. But, the mining / quarrying details and seigniorage fee paid by the mine lease owners is yet to be received from the DGM Office, Thiruvarur because of all the leased mines / quarries have been abandoned due to expiry of the lease period or local issues. The market value of the clay of one cubic meter is Rs. 500/- (Source: from local people of Thiruvarur).

CRUDE OIL AND NATURAL GAS:

ONGC, Cauvery Asset, Karaikal, Puducherry is the Mine lease owner of the Crude Oil & Natural gas (Major mineral) of Cauvery Basin. Mining lease has been granted for a total of 11 nos. of crude oil and natural gas blocks which are located in different parts of Thiruvarur Taluk, Nannilam Taluk, Kamalapuram Block area, Koothanallur area, Greater Kovil Kalappal area and Needamangalam areas since the year 1999. After getting prior permission from the Deputy General Manager (G), SSM, Cauvery Asset, Karaikal, Puducherry (Annexure–III); various Early Production Units (EPS) like Kamalapuram EPS and Kuthanallur EPS, Group Gathering Stations (GGS) like Adiyakamangalam GGS and various crude oil and natural gas well sites and a rig site at Pallivaramaiylem near Kamalapuram have been visited and all possible environmental parameters have been recorded. All the crude oil and natural gas wells are being maintained by ONGC and there is no environmental impact like spillage and leakage of crude oil and natural gas. The entire crude oil and natural gas wells have been dug in the agricultural lands. The well site is leased from the land owner.

The source rock for crude oil and natural gas is sand stone. Two types of crude oil wells like flowing wells and mechanized oil wells operated by using sucking rod pump motors are present in the survey area. Some of the oil wells have been abandoned due to no production or no average production of crude oil or natural gas. The depth of the oil wells is varying from 1,350 m to 2,500 m. The production of the crude oil with natural gas

16.USE OF MINERAL

The alluvial sand and clay is being used as earth filling material.Savudu is used for filling and levelling purpose.

17.0 DEMAND AND SUPPLY OF THE MINERAL IN THE LASE THREE YEARS

In respect of Thiruvarur District, there is a drastic increase in the production of Savudu, due to the on-goingfilling works in and around the District

DEMAND AND SUPPLY OF THE MINERAL				
S No	Name of the Mineral	Year		
		2015-16	2016-17	2017-18
1	Savudu	74969	75555	78297

18.0 MINING LEASES MARKED ON THE MAP OF THE DISTRICT

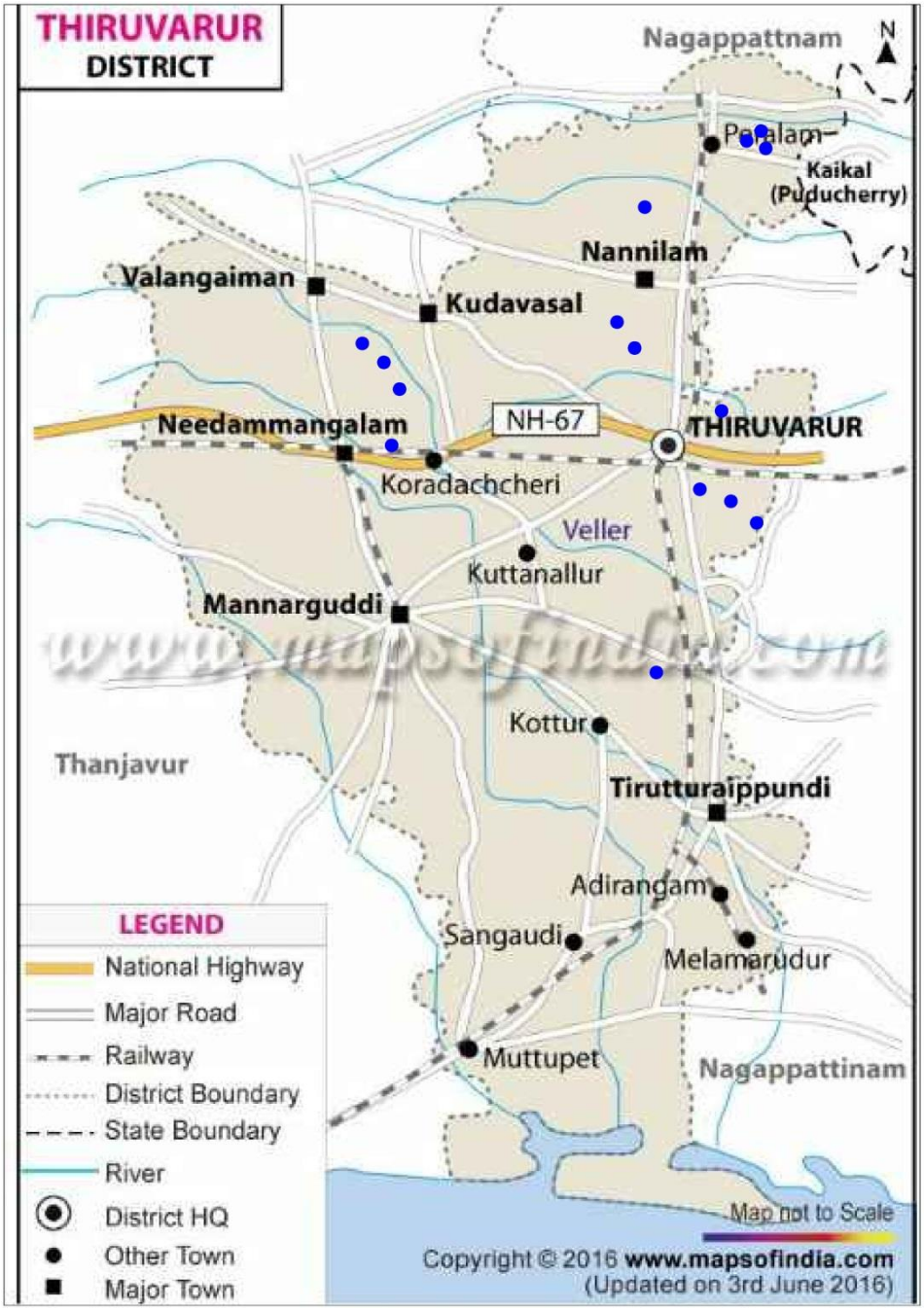
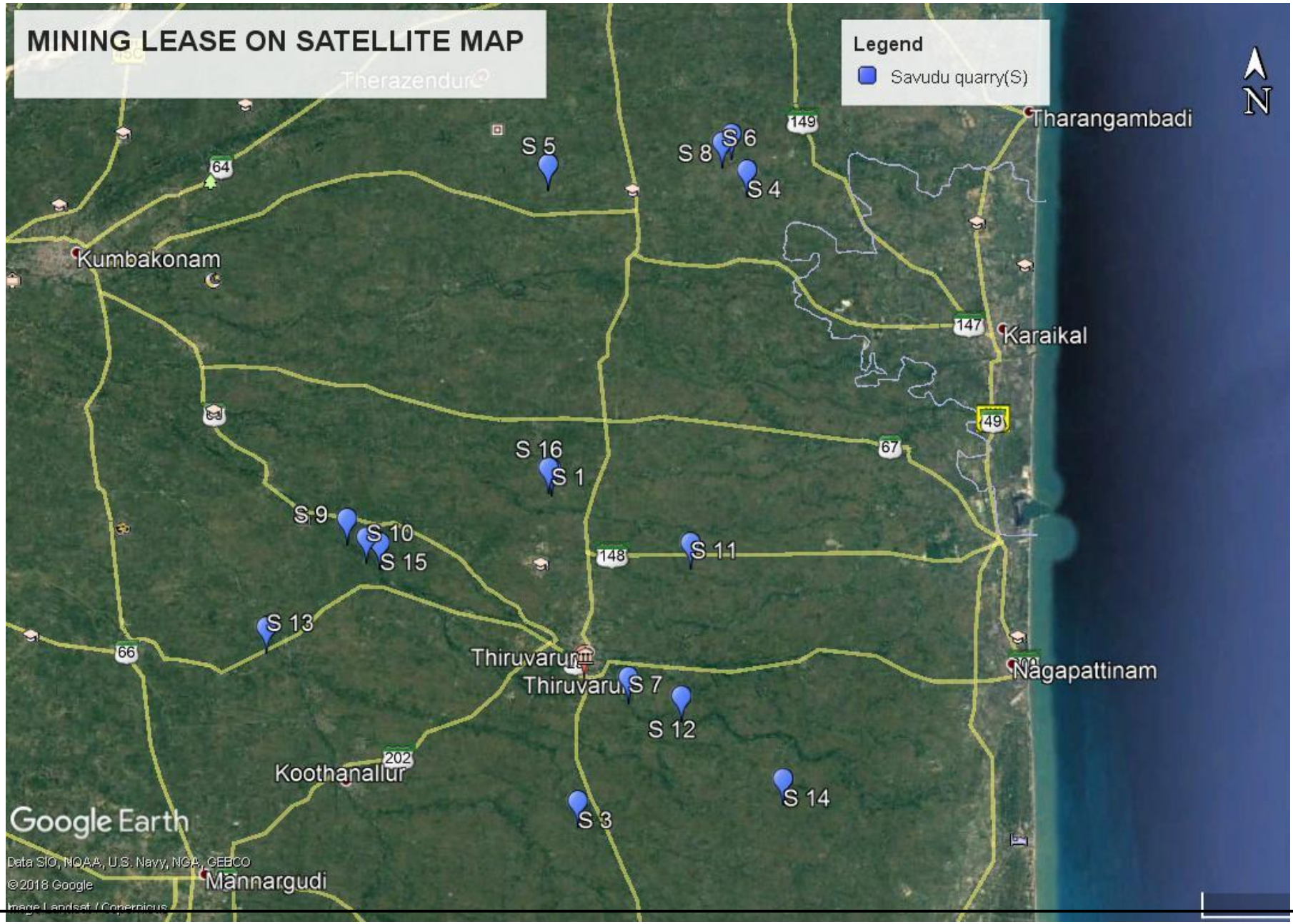


Fig No .6 MINING LEASES MARKED ON THE MAP OF THE DISTRICT


MINING LEASE ON SATELLITE MAP
Legend
Savudu quarry(S)
N
Therazendur
Tharangambadi
Kumbakonam
Karaikal
Nagapattinam
Thiruvarur
Thiruvarur
Koothanallur
Mannargudi
S 1
S 3
S 4
S 5
S 6
S 7
S 8
S 9
S 10
S 11
S 12
S 13
S 14
S 15
S 16
64
149
147
49
67
148
66
202
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2018 Google
Image Landsat / Copernicus

19.0 DETAILS OF THE AREA WHERE THERE IS A CLUSTER OF MINING LEASES VIZ., NUMBER OF MINING LEASES, LOCATION (latitude & longitude)

CLUSTER OF MINING DETAILS IN THE DISTRICT									
S No	Name of the Mineral	Name of the Lessee	Address & Contact No. of Lessee	Letter of Intent Grant Order No & Date	Area of Mining lease (ha)	Validity of LOI	Use (Capitive /Non Capitive	Location of the Mining lease (Latitude & Longitude)	
								Latitude	Longitude
1	-- NIL –								

Table No.8 details of Details of the area where there is a cluster of mining lease

20.0 DETAILS OF ECO-SENSITIVE AREA

Udhayamarthandapuram Birds sanctuary is spread over an area of 0.453 Sq Km (45.28 ha)and situated in Thiruthuraipoondi Taluk of Thiruvarur District in the State of Tamil Nadu. An irrigation tank maintained by Public Works Department was declared as Bird

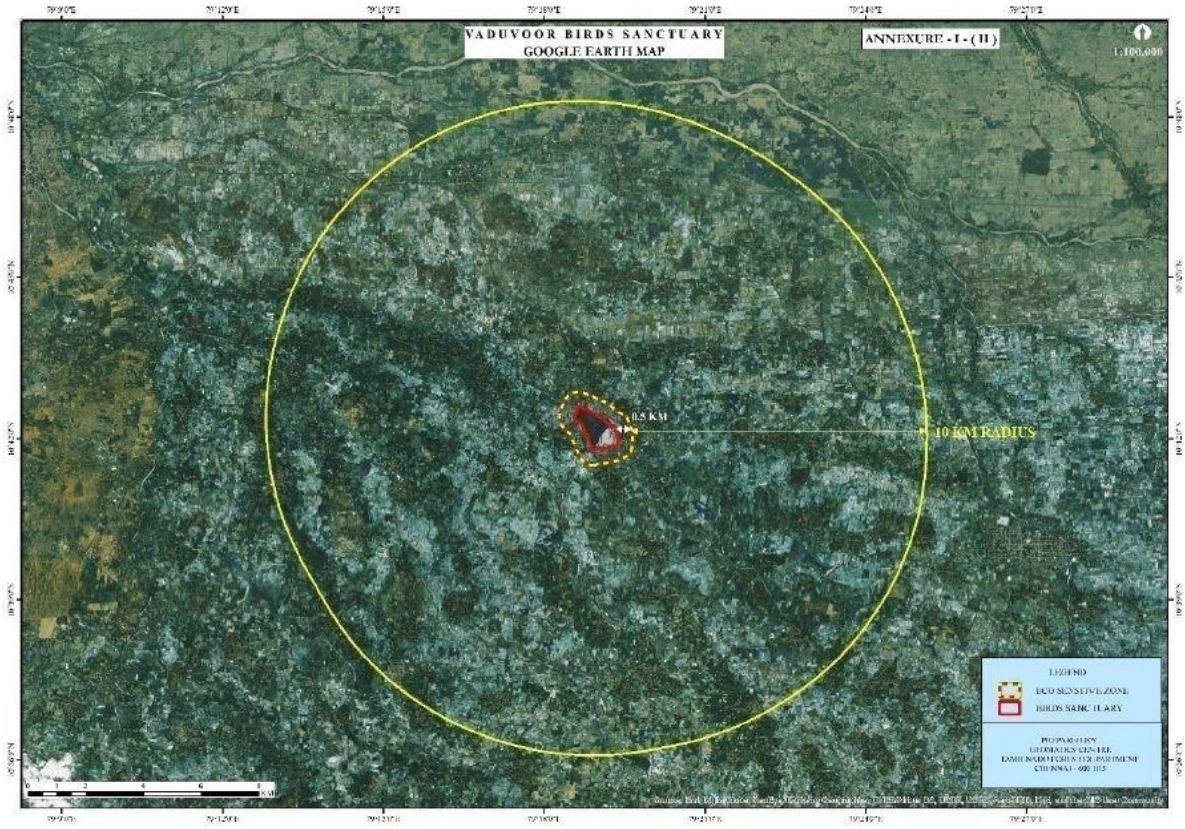
GOOGLE MAP OF ECO-SENSITIVE ZONE OF UDHAYAMARTHANDAPURAM BIRD SANCTUARY

Sanctuary in 1998 (G.O. Ms.No.379 Environment and Forests Department dt. 31.12.1998) for the conservation of avian fauna that inhabit the water body.the sanctuary is basically an irrigation tank that is used for storing water for agriculture. Itreceives water from Mettur dam from August onwards which is further supplemented by the northeastmonsoons from October till January. The tank remains completely dry from March to August. As thesanctuary is basically an irrigation tank, there is no natural forest within the sanctuary.The sanctuary has 55 species

of avian fauna visiting and residing in this small tank spreadover 45.285 ha. The common generalists are Black-crowned Night Heron (Nycticorax nycticoras), LittleCormorant (Phalacrocorax niger) etc.

Vaduvoor Birds Sanctuary is spread over an area of 1.281 Square Kilometers (128.10 ha) andsituated in Needamangalam Taluk of Thiruvarur District in the State of Tamil Nadu. An irrigation tank maintained byPublic Works Department was declared as Bird Sanctuary in 1999 (G.O. Ms.No.169 Environment and ForestsDepartment dated: 22-07-1999) for the conservation of avian fauna that inhabit the water body.the sanctuary is basically an irrigation tank, there is no natural forest within the sanctuary.The Acacia nilotica plantations were raised during 1986

GOOGLE MAP OF ECO-SENSITIVE ZONE OF VADUVOOR BIRDS SANCTUARY



and 1988, and apart from Acacia Plantation native species likeInca dulce, Ziziphus indica, Pongamia pinnata are also available. These trees and earthen bund attracts large numbers ofheronry birds to nest and roost;the sanctuary has recorded 54 species of avian fauna, including rare migratory birds thatvisiting and roosts in this sanctuary and certain species are hatching eggs. About 40,000 birds are visiting this birdsanctuary annually.the sanctuary also has some species of butterflies, insects, reptiles, amphibians, mammals.Examples of butterflies are Blue Pansy (Junonia orithya), common rose (Colotis danae), gram blue (Euchrysops cnejus),Tiny Grass Blue (Zizula hylax) etc.

21.0 IMPACT ON THE ENVIRONMENT DUE TO MINING ACTIVITY

Environmental impact on quarrying can be broadly classified in to two categories:

1. Environmentaldegradation
2. Environmental pollution

ENVIRONMENTAL DEGRADATION: Degradation of topography, fauna and flora invariablytakesplaceonquarrying.Whiledevelopinginfrastructure,vegetationcover is destroyed, topography degraded and fauna and flora affected. If it is rubber plantation in Kerala, it is mango grooves in Tamil Nadu that is destroyed. Natural lakes, nalla beds have becometheconvenientlocitodumptheoverburden.Fillingupofthenaturaldrainagechannels creates problem in the water way system. Degradating the topography leads to destruction of vegetative cover, dry air circulation, non precipitation, choking of natural drainage and finally toextremedrought.Thisishappensatpresentinexcessivelyquarriedareasforwhich the reason attributed is failure ofmonsoon.

ENVIRONMENTAL POLLUTION: Air, water and noise pollution, are some of the impacts of quarrying on environment which have extreme destructive consequences. Silicosis is the prevalent disease thataffectsmajorityofthequarryworkersandtheadjoiningvillages.Inadditiontothenatural water sources getting contaminated with particulates, deepening of quarry depth intercepts groundwatertable.Naturaltopographicgradientisupsetwithconcomitantchangeindrainage pattern. Deepened out quarries have become overnight perched aquifers draining away water from all the surrounding highlands. Noise pollution, over and above those from quarrying equipmentgetaccentuatedfromincreaseduseofjetburners(flamescutters). Solid waste is non-biodegradable and slow mechanical disintegration of which leads to environment of silica, sodium, potassium and calcium in soils. Soils become unproductive. Inadequate space for dumping solid wastes near quarries leads to dumping of them on either side of the road.

22.0 REMEDIAL MEASURE TO MITIGATE THE IMPACT OF MINING ON THE ENVIRONMENT

The following remedial measures to be taken during mining

22.1 Remedial Measures to mitigate Air Pollution

- Water sprinkling on mineral transport road from the mines to the main road
- Black topping of the main transportation roads to the possible extent.
- Avoiding crowding of trucks by properly spacing them to avoid the concentration of dust emission at any time
- Covering the trucks by tarpaulin sheets during ore transportation
- Proper maintenance of HEMM to minimize gaseous emission
- Imparting sufficient training to operators on safety and environmental parameters
- Development of green belt / plantation around mine, along the roads, backfilled area in various undisturbed areas within the mine lease areas etc.,

22.2 Remedial Measures to mitigate water Pollution

- Industrial effluent treatment systems wherever necessary to be introduced and maintained properly.
- Safety barriers to be provided for all water bodies and no mining activities should be carried out in the safety barrier area.
- Mitigative measures like construction of garland drains formation of earth bunds to be followed in the waste dumping areas to avoid wash off.
- Domestic effluents to be treated in scientific manner
- Required statutory clearances to be obtained and all precautionary measures to be adopted wherever pumping of ground water is involved.

22.3 Remedial Measures to reduce Noise & Vibration

- Planting rows of native trees around mine, along the roads, other noise generating centres to act as acoustic barriers.
- Sound proof operator's cabin for equipment may lead to less noise generation.
- Proper and regular maintenance of equipment may lead to less noise generation
- Air silencers of suitable type that can modulate the noise of the engines of machinery to be utilized and will be maintained effectively.
- Providing in-built mechanism for reducing sound emissions.
- Providing ear muff's to workers exposed to higher noise level and to those persons operating or working close to any machine.
- Conducting regular health check-up of workers including Audiometric test for the workers engaged in noise prone area.

22.4 Remedial measures to reduce Impact on Land Environment:

Scientific reclamation measures to be adopted to reduce the impact of land environment due to mining.

22.5 Remedial measures to reduce Impact on Biological environment

- Necessary mitigative measures like dust suppression, proper maintenance of equipments, black topping of roads etc., to be carried out to prevent dust generation & any further impact on the vegetation.
- Conservation plan for schedule –I species if any to be prepared in consultation with the Forest Department and the proposals given in the conservation plan to be strictly implemented.
- Effluents generated in the mining areas to be treated properly.

23.0 RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATIONS, PROPOSED RECLAMATION PLAN

The reclamation of mined out lands by simultaneous backfilling and development of plantation in the backfilled areas will be the best practice of reclamation.

24.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

Any mines have dangers or risk like fires, inundation, failure of machinery, which need to be investigated,addressed and mitigated. Disaster management is formulated with an aim of taking precautionary steps toavert disaster and also to take such action after the disaster which limits the damage to the minimum.Miningoperations may be carried to the utmost safety but there is always some element of danger or risk in it. Nomajor disaster is envisaged. Only minor accidents may take place. The mining operations will be carried outunder supervision of statutory personnel's & strictly following safety aspects as per MMR 1961.The following natural/industrial hazards may occur during normal operation.

Risk Assessment and Disaster Management plan in connection with mining and alliedoperations should be spelt out in detail to cover possible dangers /risks/explosions/accidents etc., likely to arise from the project operations including onsite and off-site emergency plans to meet the disastrous situations if any.

The management is able to deal with the situation efficiently to reduce confusion keeping in view of the likely sources of danger in the mine.

25.0 DETAILS OF OCCUPATIONAL HEALTH ISSUE IN THE DISTRICT (LAST FIVE – YEAR DATA OF NUMBER OF PATIENTS OF SILICOSIS & TUBERCULOSIS IS ALSO NEEDS TO BE SUBMITTED)

The details of number of patients treated for silicosis and Tuberculosis for the last five years in the district is given below:

OCCUPATIONAL HEALTH ISSUE IN THE DISTRICT (LAST FIVE –YEARs)			
S No	Year	Number of patients treated for silicosis	Number of patients treated for Tuberculosis
1	2014-15	--	1580
2	2015-16	--	1560
3	2016-17	--	1780
4	2017-18	--	1610
5	2018-19	--	1548

Table No.9 Details of occupational health issue in the district

26.0 PLANTATION AND GREEN BELT DEVELOPMENT IN RESPECT OF LEASES ALREADY GRANTED IN THE DISTRICT

It is necessary to develop Green belt in and around the polluted site with suitable species to reduce the air pollution effectively. Implementation of afforestation program is of paramount importance. In addition to augmenting existing vegetation, it also checks soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conductive.

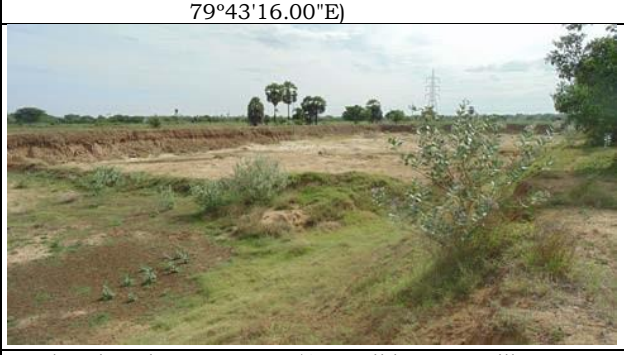
Simultaneous backfilling method will be followed in most of the mining areas. During the operations, the plantation will be proposed and will be carried out on the safety barrier areas and also on the mined out and backfilling areas.

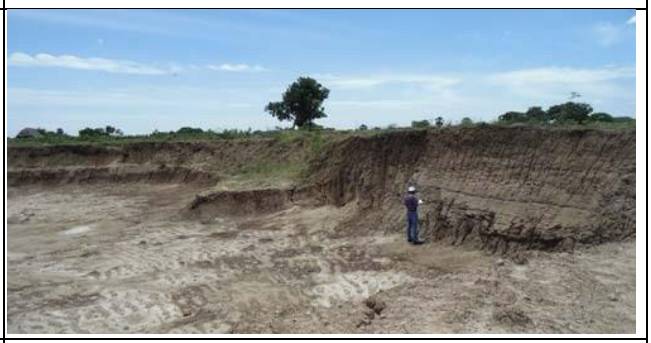
27.0 ANY OTHER INFORMATION

Nil

Fig. No.8 Field Photographs

Plate-1: Field Photographs of Mining / Quarrying. Commodity: Sand / Clay

	
Abandoned Sand Quarry within Tirumeni River near Thirumakkottai-I village, Mannargudi Taluk (Location: 10°33'34.25"N 79°26'55.97"E)	Abandoned sand quarry near Annadhanapuram Village, nannilam Taluk (Location: 11°00'21.42"N 79°42'20.97"E)
	
Abandoned quarry near Kooppachikkottai Village, Mannargudi Taluk (10°35'39.28"N 79°25'44.41"E)	Abandoned quarry near Ubayavedanthapuram Village, Nannilam Taluk (10°56'40.86"N 79°43'16.00"E)
	
Abandoned quarry near Kaliyakudi village and pavattakudi village, Nannilam Taluk (Location: 10°59'44.55"N 79°41'35.41"E)	Abandoned quarry near 58, Anaikkuppam village, Nannilam Taluk (Location: 10°50'45.09"N 79°37'00.57"E)
	
Mine Lease area near Thillaivilagam Village, Thiruthuraipoondi Taluk (Location: 10°24'14.19"N 79°32'43.42"E)	Abandoned quarry near 49, CHithiraiyur Village, Needamangalam Taluk (Location: 10°41'15.84"N 79°37'55.66"E)

	
Abandoned quarry near 5, kaliyakudi Village, Nannilam Taluk (Location: 10°59'19.11"N 79°42'54.39"E)	Abandoned quarry near Anaikuppam Village and Kuvalaikkal Village, Nannilam Taluk (Location: 10°50'49.08"N 79°37'03.21"E)
	
Abandoned Quarry near Annathanapuram Village, Nannilam Taluk (Location: 11°00'21.66"N 79°42'19.49"E)	Abandoned Quarry near Alivalam Vilalge, Thiruvarur Taluk (Location: 10°44'45.61"N 79°39'26.22"E)
	
Abandoned sand quarry near Annathanapuram, Nannilam Taluk (Location: 11°00'21.41"N 79°42'20.10"E)	Abandoned sand quarry near 71, Neikuppai Village, Kodavasal Taluk (Location: 10°49'19.34"N 79°31'09.06"E)
	
Abandoned sand quarry near 70, Karayapalaiyur village, Kodavasal Taluk (Location: 10°48'50.20"N 79°31'39.53"E)	Abandoned clay quarry near 3, Vaippur village, Thiruvarur Taluk (Location: 10°48'29.25"N 79°40'53.11"E)

Abandoned sand quarry near Thappalampuliyur village, Thiruvarur Taluk (Location: 10°44'08.63"N 79°40'58.73"E)

Abandoned clay quarry near 82, Viswanathapuram village, Kodavasal Taluk (Location: 10°46'10.31"N 79°28'36.84"E)

Abandoned sand quarry near Thirukottaram village, Nannilam Taluk (Location: 10°58'16.34"N 79°45'15.24"E)

Plate-2: Field Photographs of Mining. Commodity: Crude Oil and Natural Gas

	
Automatic flow Oil Well near Addiyakamangalam, Tiurvarur (Location: 10°45'27.50"N 79°40'09.09"E)	Automatic flow Oil well near Nannilam, Thiruvarur (Location: 10°46'48.78"N 79°31'49.16"E)
	
Automatic flow Oil well near Nannilam, Thiruvarur (Location: 10°46'56.48"N 79°31'42.19"E)	Sucken Rod Pump Mechanized Oil well near Kamalapuram (Location: 10°45'09.87"N 79°36'20.77"E)
	
Sucken Rod Pump Mechanized Oil well near Kamalapuram (Location: 10°44'18.46"N 79°33'39.67"E)	Sucken Rod Pump Mechanized Oil well near Kamalapuram (Location: 10°45'06.98"N 79°35'54.52"E)
	
Sucken Rod Pump mechanized oil well near Koothanallur, Thiruvarur (Location: 10°44'08.67"N 79°29'44.71"E)	Sucken Rod Pump mechanized oil well near Greater Kovil Kalappal, Thiruvarur District (Location: 10°34'03.21"N 79°31'50.18"E)

	
Sucken Rod Pump mechanized flow well near Vijayapuram # 13 area, Thiruvarur (Location: 10°45'43.32"N 79°38'30.32"E)	Abandoned oil well near Adhichapuram, Thiruvarur District (Location: 10°35'50.96"N 79°32'05.83"E)
	
Abandoned oil well near Mattur, Needamangalam, Thiruvarur (Location: 10°50'40.70"N 79°26'28.14"E)	Oil well Rig site near Pallivaramangalam, Kamalapuram, Thiruvarur (Location: 10°48'29.20"N 79°40'37.98:E)

CONCLUSION:

- This District Survey Report has been prepared by doing field work in a short span of ten working days. The details related to the occurrence of mineral resources and other data of the district are subject to updation of district mineral inventory from time to time. It may be periodically done every five (05) years with the help of GSI and other govt/non-govt geoscience exploration organisations.
- Thiruvarur District of Tamil Nadu State has less importance in concern with the mineral wealth.
- The important minerals are Alluvial sand and clay and Crude Oil and Natural Gas in the Cauvery Basin.
- The exploration and exploitation of Crude Oil and Natural Gas is carried out by the ONGC and the alluvial sand and clay mine lease is being granted by the Department of State Geology and Mines.
- The alluvial sand and clay is being used as earth filling material
- Alluvial sand and clay quarrying in different parts of Mannargudi Taluk, Nannilam Taluk, Thiruthuraipoondi Taluk, Needamangalam Taluk, Thiruvarur Taluk and Kodavasal Taluk.
- ONGC, Cauvery Asset, Karaikal, Puducherry is the Mine lease owner of the Crude Oil & Natural gas (Major mineral) of Cauvery Basin.
- The district falls in Cauvery sub-basin. The tributaries of the river Cauvery are; Vennar,Vettar and Bamini rivers.
- The Vennar and Vettar rivers play an important role in draining the district.
- GPS/Auto Tags installed tracking of mined out mineral vehicles will fetch more revenue to the state exchequer and over exploitation.
- The introduction of e-permit system and implementation of Mineral Dealers Rule and thedispatchslips/transitpermitswithtamperedproofsecurityfeaturesandtracki ngofmined out minerals will fetch more revenue to the State Exchequer as well as sustainable development.