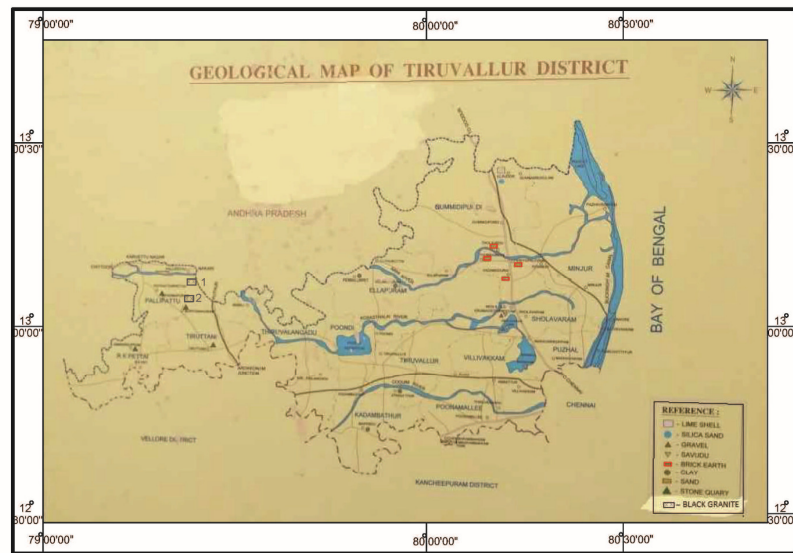


GOVERNMENT OF TAMIL NADU

DISTRICT SURVEY REPORT OF MINOR MINERAL – BLACK GRANITE

(TIRUVALLUR DISTRICT)



Prepared as per

Ministry of Environment, Forest and Climate Change (MoEF&CC)

Notification 25th July 2018

By

DEPARTMENT OF GEOLOGY AND MINING

TIRUVALLUR DISTRICT

May - 2019

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DISTRICT SURVEY REPORT FOR MINOR MINERAL – BLACK GRANITE

TIRUVALLUR DISTRICT

1. INTRODUCTION

With reference to the Gazette Notification dated 25th July 2018 by the Ministry of Environment, Forest and Climate Change, the District Survey Report has been prepared by Department of Geology and Mining, Thiruvallur.

Thiruvallur district is located in the North eastern part of Tamil Nadu between 12 ° 15' and 13° 15' North and 79° 15' and 80 ° 20 ' East. The district is bounded by the Bay of Bengal in the East. Vellore district of Tamil Nadu and Chittoor district of Andhra Pradesh on the West, Nellore district of Andhra Pradesh on the North and on the South by Kancheepuram district. The district spreads over an area of about 3422 Sq.km. The district comprising of 9 taluks, 14 blocks, 5 Municipalities and 10 Panchayat unions. Tiruvallur coast extends north of Toppalayam and to the south of Sattangudu. Marine land forms include beach terraces, lagoons, salt marshes estuaries and mangrove swamps.

2. OVER VIEW OF THE MINING ACTIVITIES IN THE DISTRICT

The mineral deposit in the district is very meager. The area is mainly consists of savadu /gravel clay with sand , rough stone and black granite. The river sand occupies laterally along the banks of rivers of Araniar, Kortaliyar, Adayar and Coovum. The rock formations in the district are Sedimentary rocks of about 80% and Hard rock is about 20 % . Also Alluvium and Marine deposits are existing.

Most of the savudu/ gravel mining leases are given for short span of time viz for a month or six weeks or for three months. Most of the clays are brick quality. Two black granite quarries are operational as on 15.03.2019.

Savudu/Gravel

Earthy material compositionally sand mixed with clay (clay >>sand) and it is locally termed as Savudu. Savudu is locally used as filling material for constructional purposes.

Rough stone

Rough stone quarries are located in Tiruthani and Pallipattu taluk. In Pallipattutaluk, the quarries are operated manually with the conventional method of Hand drilling, blasting with gun powder producing fencing pillars, large size slabs (6'x 3' with thickness 6" to 8"), survey stones.

Black Granites

Black granite Mining is operated by TAMIN located in Pallipattu, producing dimensional stone. Black granite is basically dolerite with commercial name Bengal block or G-15.

3. GENERAL PROFILE OF THE DISTRICT

Thiruvallur district is bounded by Andhra Pradesh in the north, Bay of Bengal in the east, Chennai district in the southeast, Kanchipuram district is in the south. In the District, except for rugged terrain in the western marginal border of the District, the other parts of the district are almost flat. The Tiruthani and R.K. Pet hills form part of the important structural hills. In the Tiruthani taluk, there are existing number of hillocks. The hillocks are not very high but are moderately high from the base level. The Araniar, Kortaliyar, Adayar, and Coovum are important rivers draining the district. The Araniar originating in Andhra Pradesh flows between Ponneri and Thiruvallur taluks and joins the Bay of Bengal near Pulicat. The Poondi reservoir and Red hill reservoirs are important tanks. The Pulicat tank is considered to be an important lagoon. The soil of the district is mostly sandy, mixed with soda or other alkalis or stony. As the rocks are near the surface or detached masses, the soil is less fertile. The Mineral profile of the district is inferior. The Forest Cap of the area is less and most are converted into social forest.

4. GEOLOGY OF THE DISTRICT

Geomorphology the prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Alluvial Plain, 2) Old River Courses 3) Coastal plains 4) Shallow & deep buried Pediments, 5) Pediments and 6) Structural Hills. The elevation of the area ranges from 183 m amsl in the west to sea level in the east. Four cycles of erosion gave rise to a complex assemblage of fluvial, estuarine and marine deposits. The major part of the area is characterised by an undulating topography with innumerable depressions which are used as irrigation tanks. The coastal tract is marked by three beach terraces with broad inter-terrace depressions.

The coastal plains display a fairly lower level or gently rolling surface and only slightly elevated above the local water surfaces or rivers. The straight trend of the coastal tract is resultant of development of vast alluvial plains. There are a number of dunes in the coastal tract.

Soils in the area have been classified into; i) Red soil ii) Black soil iii) Alluvial soil iv) colluvial soil. The major part is covered by Red soil of red sandy/clay loam type. Ferruginous red soils are also seen at places. Black soils are deep to very deep and generally occurs in the depressions adjacent to hilly areas, in the western part. Alluvial soils occur along the river courses and eastern part of the coastal areas. Sandy coastal alluvium (arenaceous soil) are seen all along the sea coast as a narrow belt. The Thiruvallur district is predominantly occupied by the sedimentary formations. Archaean and Proterozoic formations are also present. The hard rock exposure is mostly observed along the western, south eastern and north eastern border of the district.

Stratigraphy of the area (Source : DRM by GSI) is as follows.

LITHOLOGY	FORMATION	ERA
Sandy silt (level)	Swarnamukhi / Korttalaiyar Formation	Quaternary
Grey brown to black sandy clay (Flood basin)		
Medium to coarse sand with clay (Palaeochannel)		
Quartz gravel		
Laterite Lateritic gravel		Cenozoic
Sandstone	Cuddalore Formation	Miocene
Purple conglomerate	Satyavedu Formation	Miocene
Sandstone, Shale	Sriperumbudur formation	
Epidote – hornblend gneiss Basic dykes		Upper Proterozoic
Tiruthani granite	Bhavani Group	Archaean

Granite gneiss	(Peninsular gneiss) Younger gneiss	Archaean
Charnockite	Charnockite Group	
Pyroxene granulite		
Amphibolite	Satyamangalm Group	

5. DRAINAGE OF IRRIGATION PATTERN

Araniyar, Korattalayar, Cooum, Nagari and Nandhi are the important rivers. The drainage pattern, in general, is dendritic. All the rivers are seasonal and carry substantial flows during monsoon period. Korattaliar river water is supplied to Cholavaram and Red Hill tanks by constructing an Anicut at Vellore Tambarambakkam. After filling a number of tanks on its further course, the river empties into the Ennore creek a few kilometres north of Chennai. The Cooum river, flowing across the southern part of the district, has its origin in the surplus waters of the Cooum tank in Tiruvallur taluk and also receives the surplus waters of a number of tanks. It feeds the Chembarambakkam tank through a channel. It finally drains into the Bay of Bengal.

Irrigation Practices

The nine-fold lands use classification for the district is given below.

Sl.No	Classification	Area (Ha)
1	Forests	19736
2	Barren & Uncultivable Lands	13638
3	Land put to non agricultural uses	102580
4	Cultivable Waste	8326
5	Permanent Pastures & other grazing lands	8164
6	Groves not included in the area sown	7779
7	Current Fallows	19931
8	Other fallow Lands	46365

9	Net Area sown	115724
	Total	342243

The chief irrigation sources in the area are the tanks, wells and tube wells. Canal irrigation is highest in Minjur block followed by Sholavaram, Pallipattu, R.k.Pet, Poondi, Gummidipoondi and Ellapuram blocks.

6. LAND UTILIZATION PATTERN IN THE DISTRICT

(Forest, Agriculture, Horticulture, mining etc.)

The total area of the district is 3423 sq.km. Except for the Tiruthani and Pallipattu taluks most of the areas in the district are flat or low lying gently undulated or hilly areas are in the western or south western periphery of the district. Most of the flat or plain areas are brought under cultivation. Total cultivable area is 184198 (h) and net sown area is 136648 (h) and total cropping intensity is 34.8%. Forest land accounts for about 5.8% of the total area. Reserve Forest and reserve land has a total extent of 19.791 ha.

Forest are mainly dry thorny and dry ever green type with tropical nature. Areas adjoining the forest area are barren with little or no cultivation. However isolated agricultural patches are seen intermittently. In addition trees like *Mangifera Indica*, *Psidium guajava*, *Cocunucifera* are also common. Vegetables were cultivated with the Well support water system. Nearly half of the population is engaged in agriculture of which more than 85% in the rural area and the main source of Income is from agriculture.

Land use pattern Statistics (Source : Department of Agriculture)

Details	Area (HA)	Percentage
Forest	19736.01.0	5.8%
Barren and uncultivable land	13636.12.5	4.0%
Lands put to non-agricultural uses	108401.29.9	31.7 %
Cultivable waste land	7734.88.3	2.3 %
Permanent pastures & grazing lands	8120.90.5	2.4 %
Misc tree crops & groves not included	7568.96.0	2.2 %

in the net sown area		
Current fallow lands	32017.03.5	9.3 %
Other fallow lands	38885.79.5	11.4 %
Net sown area	106137.81.8	30.8 %
Geographical area	342243.00.0	100 %

7. SURFACE AND GROUND WATER SCENARIO OF THE DISTRICT

Hydrogeology The district is underlain by both porous and fissured formations. . The important aquifer systems in the district are constituted by i) unconsolidated & semi-consolidated formations and ii) weathered, fissured and fractured crystalline rocks. The porous formations in the district include sandstones and clays of Jurassic age (Upper Gondwana), marine sediments of Cretaceous age, Sandstones of Tertiary age and Recent alluvial formations. As the Gondwana formations are well-compacted and poorly jointed, the movement of ground water in these formations is mostly restricted to shallow levels. Ground water occurs under phreatic to semi-confined conditions in the inter-granular pore spaces in sands and sandstones and the bedding planes and thin fractures in shales. In the area underlain by Cretaceous sediments, ground water development is rather poor due to the rugged nature of the terrain and the poor quality of the formation water. Quaternary formations comprising mainly sands, clays and gravels are confined to major drainage courses in the district. The maximum thickness of alluvium is 30.0 m. whereas the average thickness is about 15.0 m.

Ground water occurs under phreatic to semi-confined conditions in these formations and is being developed by means of dug wells and filter points. Alluvium, which forms a good aquifer system along the Araniyar and Korattalaiyar river bed which is one of the major sources of water supply to urban areas of Chennai city and also to the industrial units. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels. The thickness of weathered zone in the district is in the range of 2 to 12 m. The depth of the wells ranged from 8.00 to 15.00 m bgl.

The yield of large diameter wells tapping the weathered mantle of crystalline rocks ranges from 100 to 500 lpm and are able to sustain pumping for 2 to 6 hours per day. The yield of bore wells drilled down to a depth of 50 to 60 m ranges from 20 to 400 lpm. The yield of successful bore wells drilled down to a depth of 150 m bgl during the ground water exploration programme of Central Ground Water Board ranged from 1.2 to 7.6 lpm. The depth to water level in the district varied between 2.38 – 7.36 m bgl during pre-monsoon (May 2006) and 0.79 – 5.30 m bgl during post monsoon (Jan 2007). The seasonal fluctuation shows a rise between 0.28 and 4.80 m bgl. The piezometric head varied between 2.20 to 10.30 m bgl (May 2006) during premonsoon and 2.72 to 8.55 m bgl during post monsoon. 4.1.1 Long Term Fluctuation (1998-2007) The long term water level fluctuation for the period 1998-2007 indicates rise in water level in the area 0.0564 - 0.0984 m/year.

The fall in water level ranging between 0.0277 - 0.2748 m.year. 4.1.2 Aquifer Parameters The specific capacity in the fissured formation ranges from 27.73 to 979 lpm/m/dd. Transmissivity values in weathered, partly weathered and jointed rocks vary from 14 to 750 m²/day and specific yield in these formations is less than 2%. In the porous formation the specific capacity values vary from 23.5 to 509.9 lpm/m.dd and the Transmissivity values ranged from 40 to 625 m²/day. The specific yield varied from less than 1 to 12%. High specific yields are noticed in the river alluvium 4.2 Ground Water Resources The ground water resources have been computed jointly by Central Ground Water Board and State Ground & Surface Water Resources and Development Centre (PWD, WRO, Government of Tamil Nadu) as on 31 st March 2004. The salient features of the computations are furnished below.

In Tiruvallur district, in general, is colourless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in MicroSeimens at 25o C) during May 2006 was in the range of 480 to 2360 in the district. It is between 750 and 2250µS/cm at 25oC in the major part of the district. Conductance below 750 µS/cm have been observed in ground water in parts of Gummidipundi, Minjur, Sholavaram and Puzhal blocks, whereas conductance exceeding 2250 µS/cm have been observed in part of Tiruvelangadu block. It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness and Nitrate in more than 90 percent of samples analyzed. Total Hardness as CaCO₃ is observed to be in excess of permissible limits in about 36

percent of samples analysed whereas Nitrate is found in excess of 45 mg/l in about 32 percent samples. The incidence of high total hardness is attributed to the composition of lithounits constituting the aquifers in the district, whereas the Nitrate pollution is most likely due to the use of pesticides and fertilisers for agriculture. With regard to irrigation suitability based on specific electrical conductance and Sodium Adsorption Ratio (SAR), it is observed that ground water in the phreatic zone may cause high to very high salinity hazard and medium to high alkali hazard when used for irrigation. Proper soil management strategies are to be adopted in the major part of the district while using ground water for irrigation.

8. RAINFALL OF THE DISTRICT AND CLIMATIC CONDITION

Rainfall details of the district for the last three years as detailed below;

9. DETAILS OF THE MINING LEASES IN THE DISTRICT

Details of the mining leases in the district as detailed below;

10. DETAILS OF ROYALTY OR REVENUE RECEIVED IN THE LAST THREE YEARS

Details of the Royalty or Revenue received in last three years as detailed below;

11. DETAILS OF PRODUCTION OF MINOR MINERAL IN LAST THREE YEARS

Details of Production of Minor Mineral in last three years as detailed below;

12. MINERAL MAP OF THE DISTRICT

Refer Annexure

13. LETTER OF INTENT (LOI) HOLDERS IN THE DISTRICT ALONG WITH ITS VALIDITY

Sl.No.	Name of the Mineral	Name of the lessee	Address & contact no. of letter of Intent holder	Letter of Intent Grant order No. & date	Area of mining lease to be allotted (Ha)	Validity of LOI	Use (Captive/ Non-captive)	Location of the Mining lease (Latitude & Longitude)
1.	Balck Granite	Tvl. TAMIN	Mylarvada Village, Pallipattu Taluk, Tiruvallur District,	G.O.3D No.6 Indus (MME-1) Dept. Dt. 07.02.2012	16.95.0	30	Non Capitive	13 04'02"N 79 21'38"E
2.	Balck Granite	N. Marudavanan	No.15, Bhavani Nagar, Lakshmipuram, Koratur, Chennai-99	G.O.3D.No.9 Indus(MMB-1) Dept. Dt. 01.04.2015	1.59.0	20	Non Capitive	13 06'37"N 79 27'59"E

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

i) River Sand

Rich and thick deposit of sand is occurring along the banks and adjoining areas of the rivers like Araniar, Coovum, Kosasthaliar, Nandhiyar. These sands are mostly golden yellow with less clay content. Silty sand are also the variety broadly falling under the sand category. Based on the varying proportion of clay content, local term like "Savudu" is given where the proportion of clay is relatively more. Savudu is basically sandy clay. Sand is deposited as a point bar deposit by the river meander. Most of the river banks has thick deposit of sand. Lateral extension is pretty good. The river channels are dried up and has good and rich sand deposits. The stream beds are dried most of the time except during the rainy season.

ii) Gravel /Savudu

Compositionally sand mixed with clay (clay >>sand) is locally termed as Savudu. Savudu is locally used as filling material for constructional purposes. Clay proportion varies and there is no fixed standard categorization available. Mostly Eri-lands are given for Savudu lease. The colour is generally varies from buff color to grayish black. Savudu is generally sticky material based on the proportion of the clay.

iii) Brick Earth

Clay mixed with savudu deposits are of brick clay grade and is widely used for the manufacture of bricks. A total reserve of 12.42 MT is estimated up to depth of 5 m. The clay mixed with savudu is locally used for the manufacture of bricks and tiles. Many brick factories are concentrated near the brick clay mines.

iv) Black Granite

The district is famous for the black granite dimensional stone. Black granite quarry at Mylarvada village of Pallipattu taluk is quarried by TAMIN. The total area is 16.95 hectares. Current depth of the quarry is 30 m as on 15.06.2017. The host rock is hornblende biotite gneiss with a general trend of 280° / 38 NE. Fe staining is quite conspicuous in the granite gneiss with subordinate of magnetite grains. Granite gneiss is highly weathered and well foliated.

Black granite is basically Dolerite with commercial name Bengal black or G-15. It is an inferior black variety in terms of commercial aspect. Grain size variation is observed along the margin as well as at core of the exposure. Margins are slightly coarser than the core. Very fine grained dolerite intrusion were also seen in haphazard pattern. Garnet grains are present in the dolerite rubbles which is probably Fe rich variety imparting reddish brown color. Weathered Fe rich patch also seen within the granite. Secondary cavity filling is observed in the fine grained part of the dolerite. Trend of the dolerite is E-W. Blocks of smaller dimension is not marketable as per needs. The commercial granite body occurring in the area shows more or less uniform color and texture and other physical properties, which determines the granite body as a commercial granite deposit.

The slopes of the hillock are occupied with in-situ boulders and floats of black granite. The maximum exposed height is on the eastern slope where the slope is maximum and the western side has the minimum slope. Benches were proposed with a maximum height of 6 m. The benches shall be sloped at an angle of more than 60 ° from the horizontal.

15. QUALITY/GRADE OF MINERAL AVAILABLE IN THE DISTRICT

Black granite is basically Dolerite with commercial name Bengal black or G-15. It is an inferior black variety in terms of commercial aspect.

16. USE OF MINERAL

Black granite dimensional blocks are used for constructional and ornamental purposes.

17. DEMAND AND SUPPLY OF THE MINERAL IN THE LAST THREE YEARS

Refer Mineral Production details above.

18. MINING LEASES MARKED ON THE MAP OF THE DISTRICT

Refer Annexure.

**19. Details of the area of where there is a cluster of mining leases Viz.
Number of mining leases, location (Latitude and Longitude)**

Sl.No.	Name of the Mineral	Letter of Intent Grant order No. & date	Area of mining lease to be allotted (Ha)	Village	Taluk	District	Location of the Mining lease (Latitude & Longitude)
NIL							

20. DETAILS OF ECO-SENSITIVE AREAS IN THE DISTRICT

Pulicat Lake Bird Sanctuary is extended 481 km² and located in Nellore district of Andhra Pradesh and Protected area in Thiruvallur District of Tamil Nadu, India. Pulicat Lake is the second largest brackish-water eco-system in India. Central location is: 13°34'N 80°12'E. 327.33 km² is managed by the Andhra Pradesh Forest Department and 153.67 km² is managed by the Tamil Nadu Forest Department. 108 km² is National Park area. Rainfall ranges from 800 - 2000mm. Temperature varies from 14 °C to 33 °C. Altitude ranges from 100' MSL to 1200' MSL. The sanctuary is most noted for the many greater flamingos seen here. It also attracts many migratory birds and also is a feeding and nesting ground for aquatic and terrestrial birds such as pelicans, storks, etc.

21. IMPACT ON THE ENVIRONMENT (Air, Water, Noise, Soil, Flora & Fauna, Land Use, Agriculture, Forest, Etc.) DUE TO MINING ACTIVITY

Mining and allied operations may affect the existing environmental setup in the area unless proper mitigation measures are not taken. Hence it is essential to assess the impacts of mining on various environmental parameters so that abatement measures could be planned in advance for systematic, sustainable and eco-friendly mining in the area.

21.1 Air Environment

The mining and allied operations may cause deterioration of air quality due to pollution if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be the dust generation in the mine due to:

- Excavation of **Black Granite**, overburden.
- Movement of HEMM such as excavators, tippers etc.,
- Loading and unloading operation
- Overburden & **Black Granite** transportation

21.2 Water Environment

The major sources of water pollution normally associated due to mining and allied operations are:

- Generation of Industrial effluent water from workshop, service building.
- Disturbance to drainage course or water bodies in the project area, if any.
- Washouts from waste dumps/embankment, if any.
- Domestic effluent
- Mine discharge water pumped out from opencast mines, if any and effect on ground water table.

Direct impact on human beings due to poor water quality consequent to mining operation can lead to various water borne diseases like diarrhoea, jaundice, dysentery, typhoid etc. Besides, the polluted water may not be useful for animal or human consumption, vegetation and may affect aquatic life, if effluents are not properly treated to remove the harmful pollutants.

21.3 Noise & Vibration

The impact prediction and control measure for noise environment due to mining and allied activities are described below:

Noise is one of the inevitable causes of pollution in mining operations largely due to the extensive mechanization adopted. Since the **Black Granite** in the District is excavated by means of drilling and blasting. Hence, the major source of noise will be from the equipment's such as Excavation, loading & unloading & movement of

vehicles etc., will produce noise of considerable magnitude in mining operations. Prolonged exposure to a high noise level is harmful to the human auditory system and can create mental fatigue, rebellious attitude, annoyance and carelessness, which may lead to neglect of work and also results in accidents.

21.4 Impact on Land Environment:

Due to mining and its allied activities there will be some changes to the pre-mining land status due to the following activities:

- Excavation of Overburden
- Temporary side casting / Backfilling of waste / overburden.
- Construction of Infrastructure facilities such as office, road, site services etc.,

21.5 Impact on Biological Environment

The major possible impact on biological environment due to mining is given below:

- Clearance of vegetation due to mining and allied activities
- Retardation of tree growth, tip burning etc., due to deposition of dust and the particulate matter generated from the mining operation.
- Presence of Schedule-I fauna in the mining area.
- Proposed impact on surface water quality that also provides water to wildlife
- Risk of fall/slip or cause death to wild animals due to project activities
- The project releases effluents into water bodies that also supplies water to wildlife
- Diversion of Agricultural and forest lands for mining

22. REMEDIAL MEASURES 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.

23. RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATION,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. RISK ASSESSMENT AND DISASTER MANAGEMENT PALN

Risk Assessment and Disaster Management plan in connection with mining and allied operations 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.

1) Outline of Disaster management plan :-

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormality in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

2) System of communication:-

An internal communication system should be provided. Telephone nos. and addresses of adjoining mines, rescue station, police station, Fire service station, local hospital, electricity supply agency and standing consultative committee members should be properly updated and displayed.

3) Consultative committee:-

A standing consultative committee will be formed under the head of Mines. The members consists of Mines manager /safety officer / medical officer / public relation officer/Foreman/ and environmental engineer.

4) Facilities & Accommodation:-

Accommodation and facilities for medical centre, rescue room and for various working groups shall be provided. Regular checking of these facilities shall be undertaken.

5) First Aid & medical facilities:-

The mine management should be having first aid / medical centre for use in emergency situation. All casualties should be registered and should be given first aid. The centre should have facilities for first aid & minor treatment, resuscitation, ambulance and transport. Proper telephone / wireless should be provided for quick communication with hospitals where the complicated cases are to be referred. Regular checking of these facilities shall be undertaken by the doctor and the in charge of the first aid room.

6) Stores and equipment :-

A detailed list of equipment available, its type & capacity and items reserved for emergency should be maintained.

7) Transport services:-

A well defined transport control system should be provided to deal with the situation.

8) Functions of public relations group:-

Liaison with representatives of the mine workers is required to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. Management is required to ameliorate the injured, survivors and family members of affected persons by providing material, finance, moral support and establishing contact with relatives of victims. The consultative committee formed, especially the nominated public relation officer shall look into these aspects.

9) Security :-

Manning of security posts is very essential during the disaster management.

10) Catering & Refreshment :-

Arrangement will be made for the victims, rescue teams and others.

25. DETAILS OF THE OCCUPATIONAL HEALTH ISSUES IN THE DISTRICT (LAST FIVE YEARS 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:

Sl.No.	Year	Number of patients treated for silicosis	Number of patients treated for Tuberculosis
1.	2018	Nil	Nil
2.	2017	Nil	Nil
3.	2016	Nil	Nil
4.	2015	Nil	Nil
5.	2014	Nil	Nil

26. PLANTAION AND GREEN BELT DEVELOPMENT IN RESPECT OF LEAESES 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 conducive.

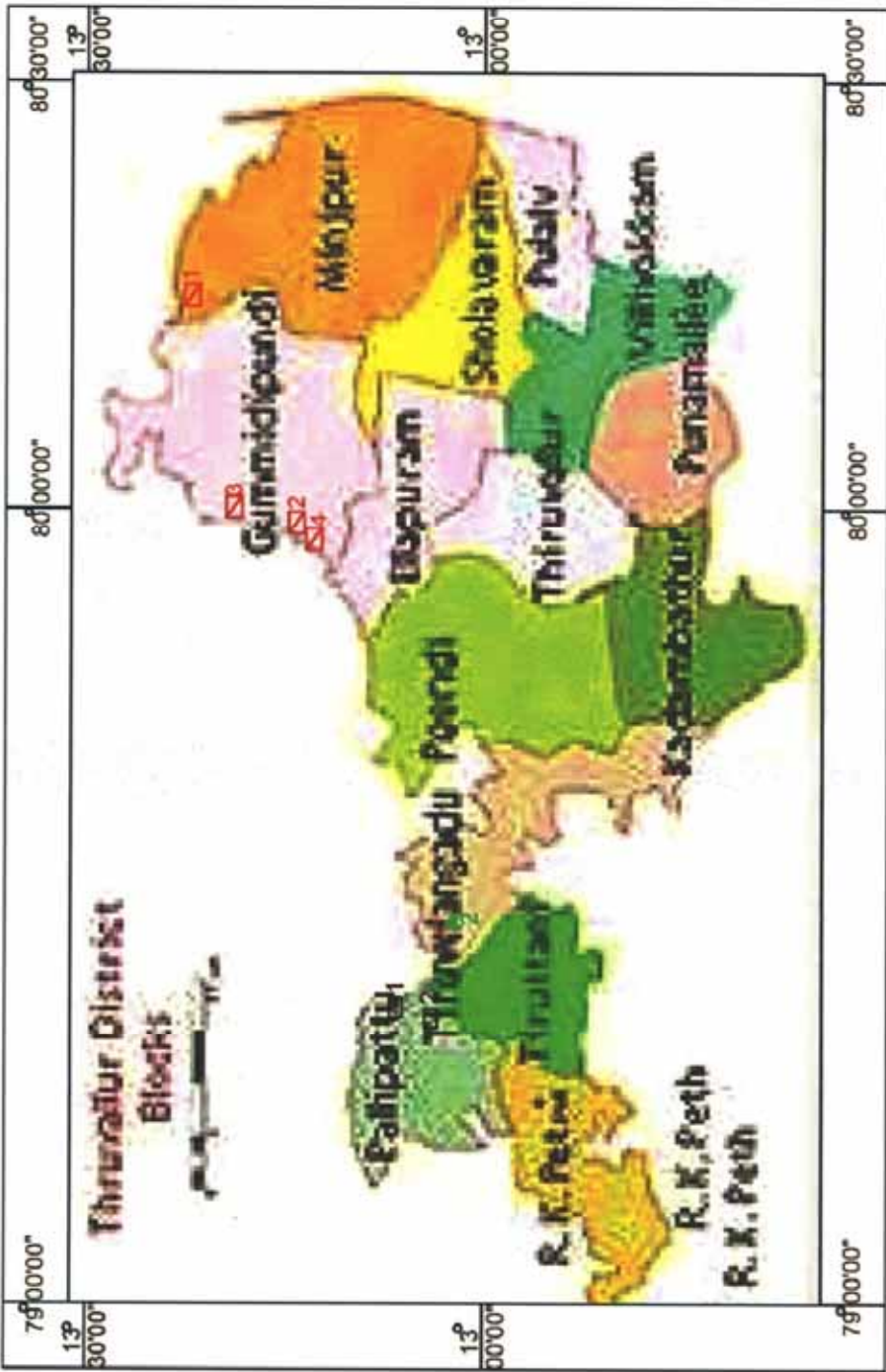
Mining and backfilling method simultaneously will be followed in most of the mining areas. During the operations, the plantation will be proposed and will be carried out on the safety barrier areas and also on the mined out and backfilling areas.

27. ANY OTHER INFORMATION

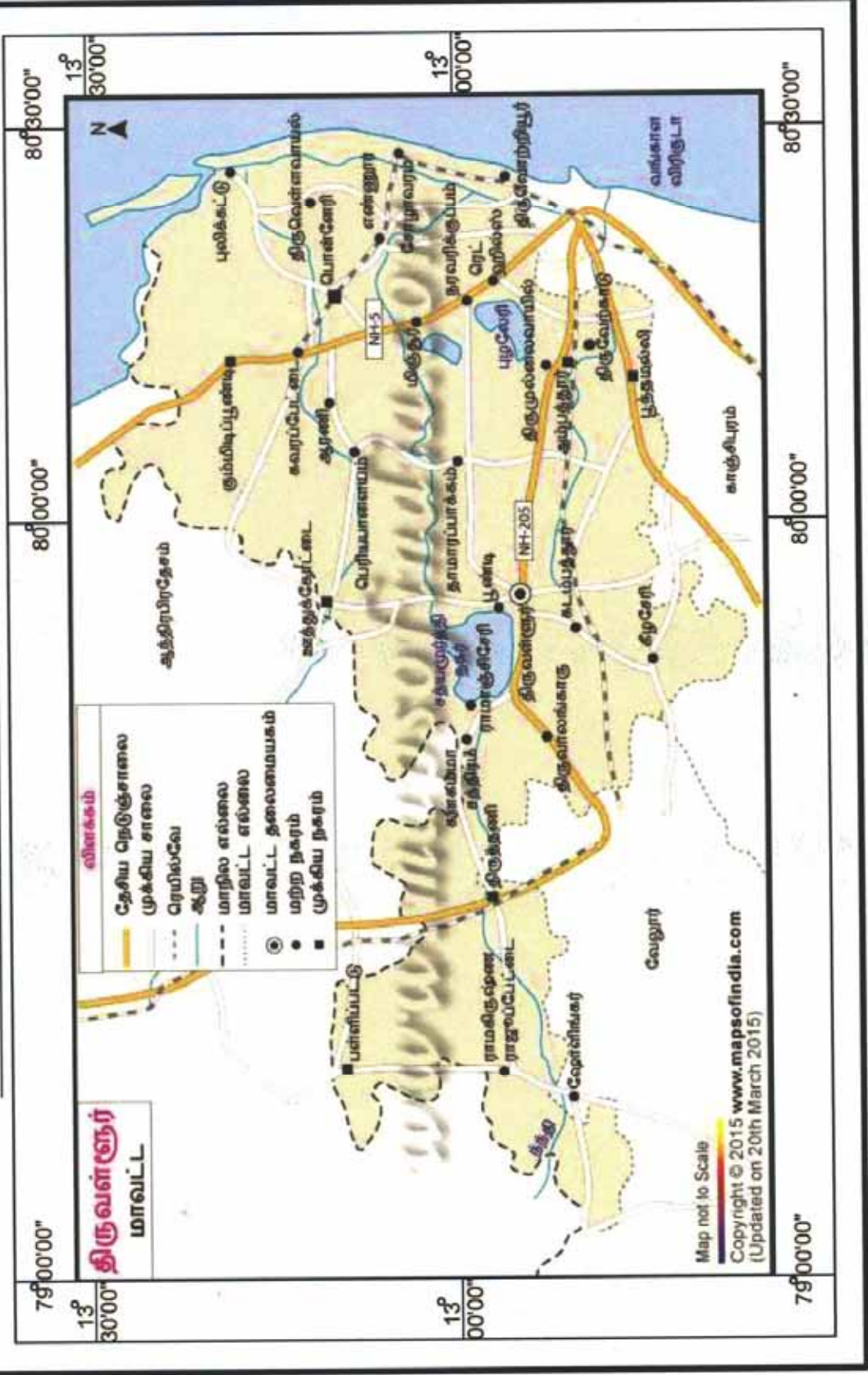
Nil

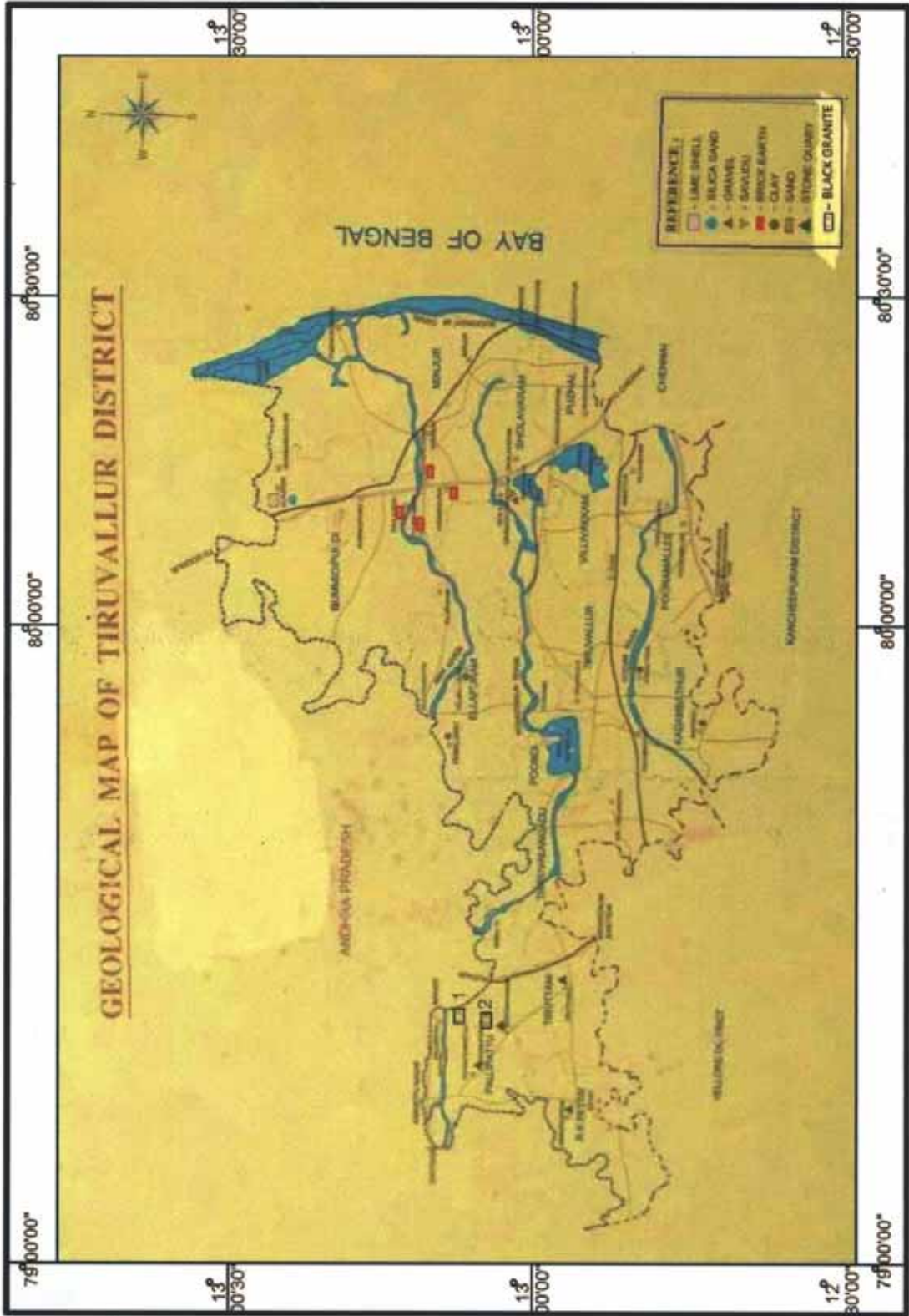
ANNEXURES

LOCATION OF MINING LEASES



PHYSIOGRAPHY OF THE THIRUVALLUR DISTRICT





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24.5.19