EXECUTIVE SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

Schedule Sl. No. 1 (a) (i): Mining Project

"B1" CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND

CLUSTER EXTENT = 26.03.7 hectares

ROUGHSTONE AND GRAVEL QUARRY

At

Anjur Village, Pugalur Taluk, Karur District,

Tamil Nadu State

ToR Letter No. SEIAA-TN/F.No.9906/SEAC/ToR-1464/2023 Dated:31.05.2023.

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.
Mr.P. Sampathkumar S/o. Palanisamy, Door.No.98, Saliankattupallam, Muthur, Kangeyam Taluk, Tiruppur – 638 105.	4.81.5 ha & S.F.No.759/2(Part), 761/2(Part), 761/3(Part), 762/2, 762/3, 763/2 & 763/3

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

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Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.
E-mail: info.gtmsdpi@gmail.com,
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NABET ACC. NO: NABET/EIA/2124/SA 0184
Valid till: Dec 31, 2023

ENVIRONMENTAL LAB

ACCURACY ANALABS AND

ENVIRO FARMERS LABS & TECHNOLOGIES

Baseline Study Period – March through May 2023

CHAPTER I

INTRODUCTION

As the proposed rough stone and gravel mining project, known as P1 falls within the 500 m radius cluster of quarries with the total extent of >5 ha (**i.e., 26.03.7 ha**), it is classified under category "B1" and requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The cluster contains three proposed projects, known as P1, P2 and P3, four expired projects known as EX1, EX2, EX3 and EX4. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016, as shown in Figure 1.1.

This EIA draft discusses the cumulative impacts of three proposed project in a cluster on the environment and provides a detailed Environmental Management Plan (EMP) to minimize the adverse impacts of those projects situated in the cluster falling in Anjur Village, Pugalur Taluk, Karur District and Tamil Nadu. In compliance with ToR obtained vide Lr.No.SEIAA-TN/F.No.9906/SEAC/ToR-1464/2023 Dated:31.05.2023, this EIA report has been prepared for the project proponent, applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No. 759/2(Part), 761/2(Part), 761/3(Part), 762/2, 762/3, 763/2 & 763/3 over an extent of 4.81.5 ha in Anjur Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains three proposed projects, known as P1, P2, P3 and four Expired projects, known as EX1. EX2, EX3 and EX4. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016. The total extent of all the quarries is 26.03.7 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

Table 1.1 Details of Project Proponent

Name of the Project Proponent	**Mr.P.Sampathkumar**
Address	S/o. Palanisamy, Door.No.98, Saliankattupallam, Muthur, Kangeyam Taluk, Tiruppur-638 105.
Status	Proprietor

Table 1.2 Details of Quarries within the cluster area of 500 m radius

Proposed Quarries				
Code	**Name of the Owner**	**S.F. No/ Village**	**Extent (ha)**	**Status**
P1	Thiru.P.Sampathkumar	759/2(P), 761/2(P), 761/3(P), 762/2, 762/3, 763/2, 763/3 Anjur	4.81.50	Proposed Area
P2	Thiru.V. Arunprashath	767/3 Anjur	1.24.0	Applied Area
P3	Thiru.S.Kuppusamy	764/3, 765/3, 766/1, 766/2, 766/3A, 767/1, 767/2A Anjur	4.82.70	Applied Area
Expired Quarries				
EX1	Thiru.P.Duraisamy	762/4, 763/4, 764/1, 765/1 Anjur	1.59.5	07.08.2017 to 06.08.2022
EX2	Tvl.Kowsick & Co. Blue Metals	770/2B(P), 778/3B2, 778/3B1(P) Anjur	4.98.0	07.08.2017 to 06.08.2022
EX3	Thiru.P.Ravi	759/3, 759/4, 763/5, 764/2, 765/2 Anjur	4.18.0	07.08.2017 to 06.08.2022
EX4	Thiru.P.Ravi	775/1E(P), 776/3, 777/1, 778/1A, 807/2B, 807/2C2 Anjur	4.40.0	21.02.2018 to 20.02.2023
	Total Cluster Extent		**26.03.7**	---

Source:

DD Letter - Rc.No.300/Mines/2022, Dated:09.03.2023.

Note: Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016**.**

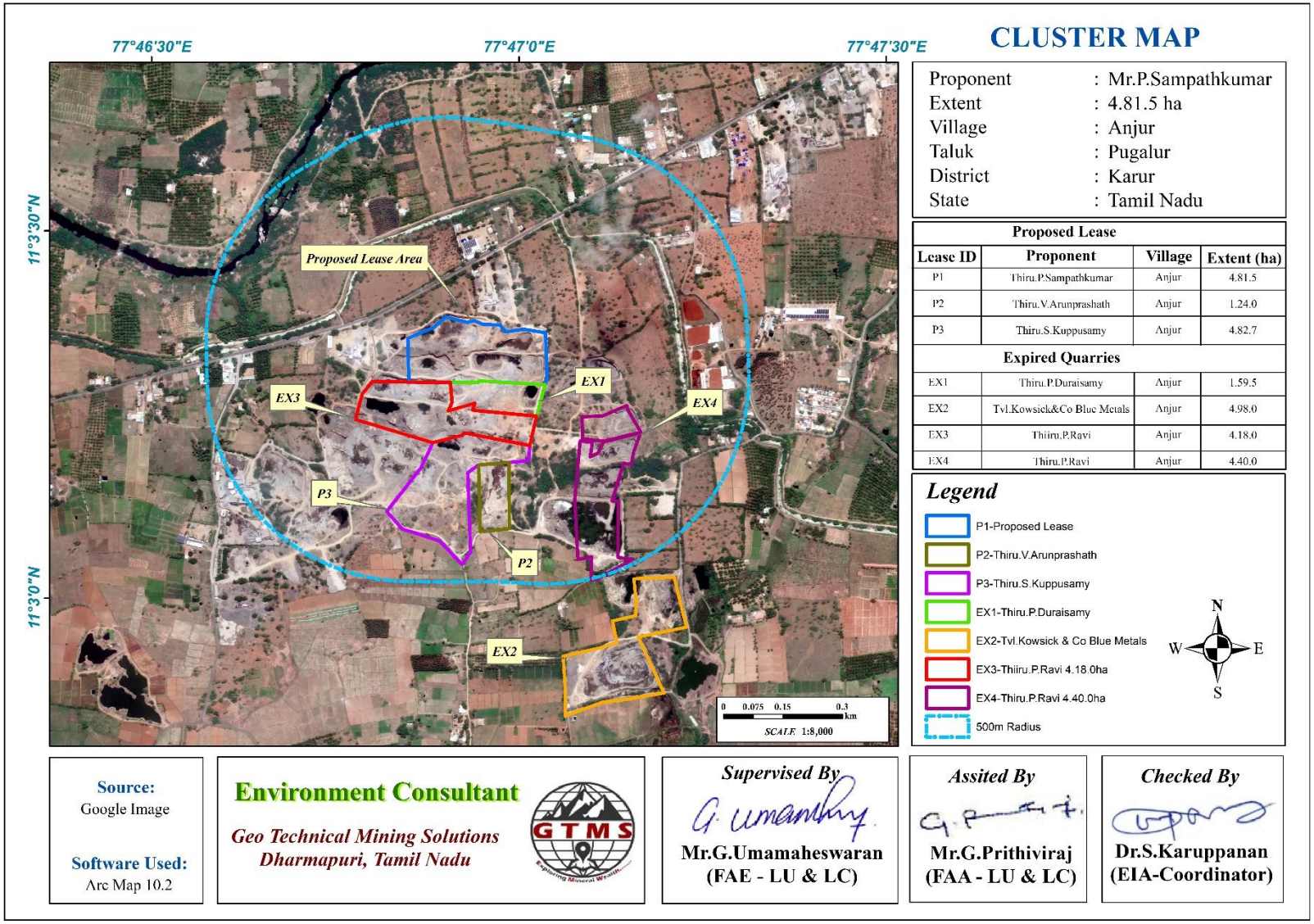


Figure 1.1 Location of the Proposed and Existing Rough Stone and Gravel Quarries in the Cluster of 500m Radius

CHAPTER II

PROJECT DESCRIPTION

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel excavation is an open cast semi-mechanized mining method involving drilling, blasting and formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 11°3'17.44"N to 11°3'23.00"N and Longitudes from 77°46'50.94"E to 77°47'2.32"E in Anjur Village, Pugalur Taluk, Karur District, and Tamilnadu. The project site is a Patta land with the extent of 4.81.5 ha owned by the project proponent.

The proponent had applied for quarry lease on 15.07.2022 to extract rough stone and gravel and obtained the precise area communication letter issued by Department of Geology and Mining, Karur vide Rc.No.333/Mines/2022, dated:14.02.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur Rc.No.333/Mines/2022, dated:03.03.2023.

According to the approved mining plan, about 514162 m^3 of rough stone and about 2880 m^3 of gravel will be mined up to the depth of 45 m BGL in the first five years. To achieve the estimated production, 3 jack hammers, 1 compressor, 1 excavator with bucket/rock breaker, and 7 tippers will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 19 persons will be employed. At Present about 4.45.0 ha of land is used for quarrying, 0.34.5 ha of land is unutilized, Whereas, at the end of the mine life, about 0.2.12.0 ha of land is unutilized; about 0.15.0 ha of land is used for green belt and 0.05.0 will be used for roads and 0.02.0 is used for infrastructure. The final mine closure plan shows that about **Rs.16,37,100** with the annual recurring cost of **Rs.1,44,450** will be spent towards mine closure.

Table 2.1 Corner Geographic Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	11°3’21.69’’N	77°47’2.17’’E	10	11°3’21.22’’N	77°46’50.94’’E
2	11°3’18.03’’N	77°47’2.32’’E	11	11°3’22.12’’N	77°46’53.09’’E
3	11°3’17.44’’N	77°47’2.14’’E	12	11°3’23.00’’N	77°46’54.00’’E
4	11°3’17.75’’N	77°46’56.71’’E	13	11°3’22.52’’N	77°46’55.78’’E
5	11°3’17.62’’N	77°46’56.70’’E	14	11°3’22.68’’N	77°46’56.35’’E
6	11°3’17.63’’N	77°46’54.62’’E	15	11°3’22.37’’N	77°46’57.04’’E

7	11°3’17.60’’N	77°46’54.37’’E	16	11°3’22.30’’N	77°46’58.49’’E
8	11°3’17.65’’N	77°46’51.02’’E	17	11°3’21.75’’N	77°46’58.91’’E
9	11°3’18.27’’N	77°46’50.95’’E	18	11°3’21.97’’N	77°47’0.35’’E

Table 2.2 Site Connectivity to the Project Area

Nearest Roadways	SH – 189 (Kangayam – Kodumudi)	0.07 km N
	NH – 381 A (Kangayam – Kodumudi)	4.57 km W
Nearest Town	Muthur	4.75 km W
Nearest Railway Station	Kodumudi	11.3 km NE
Nearest Airport	Coimbatore	84.45 km W
Nearest Seaport	Tuticorin	255.0 km S
Nearest Villages	Kolantapalayam	0.68 km E
	Pillapalaiyam	1.35 km SE
	Thottipalaiyam	1.36 km W
	Karattan kattupudur	1.4 km N

2.1 DETAILS OF RESERVES

Reserves were calculated using cross-section method after leaving the safety distance as shown in Figure 2.2. Details of resources and reserves of the project are given in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	**Rough Stone in m^3**	**Gravel in m^3**
Geological Resource in m^3	1784581	3888
Mineable Reserves in m^3	554542	2880
Proposed production for 5 years m^3	514164	2880

Table 2.4 Year-Wise Production Details

Year	**Rough Stone in (m^3)**	**Gravel in (m^3)/ 3 years**
I	121959	2880
II	112913	--
III	116590	--
IV	102120	--
V	60582	--
Total	**514164**	**2880**

2.2 LAND USE PATTERN

Land use and land cover information for the proposed project site has been given in Table 2.5.

Table 2.5 Land use data at present, during scheme of mining, and at the end of mine life

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	4.45.0	2.47.5
Infrastructure	Nil	0.02.0
Road	0.02.0	0.05.0
Green Belt & Dump	Nil	0.15.0
Drainage & Settling Tank	Nil	Nil
Unutilized area	0.34.5	2.12.0
Total	**4.81.5**	**4.81.5**

Source: Approved mining plan

2.3 METHOD OF MINING

The quarrying operation is proposed to be carried out by opencast semi mechanized mining method involving drilling, blasting, and formation of benches. Machineries proposed for this project have been given in Table 2.6.

2.4 PROPOSED MACHINERY DEPLOYMENT

List of machineries proposed for the quarrying operation is given in Table 2.6.

Table 2.6 Proposed Machinery Deployments

S. No.	Type	No of Unit	Size /Capacity	Make	Motive Power
1	Jack Hammers	3	Hand held	--	Diesel Drive
2	Compressor	1	Air	--	Diesel Drive
3	Hydraulic Excavator	1	2.9-4.5 m^3	--	Diesel Drive
4	Tipper	7	--	--	Diesel Drive

Table 2.7 Conceptual Blasting Design

Blasthole Diameter (D) in mm	32
Burden (B) in m	1.5
Spacing (S) in m	1.30
Subdrill in m	0.45
Charge length (C) in m	0.64
Stemming	1.5
Hole Length (L) in m	2.6
Bench Height (BH) in m	2.1

Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.43
Blast volume/hole in m3	4.16
Production of rough stone/day in m3	381
Number of blastholes/day	92
Blasthole pattern	Staggered / Rectangular
Mass of explosive /day in kg	36.65
Powder factor in kg/m3	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	19

Table 2.8 Fuel Requirement Details

Fuel Requirement for Excavator			
Details	**Rough Stone ($514164m^3$)**	**Gravel ($2880m^3$)**	**Total Diesel (litre)**
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m^3/hr)	20	60	---
Time Required (hours)	25708	48	---
Total Diesel Consumption for 5 years (litre)	411331	480	**411811**
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	92	---	---
Total Diesel Consumption for 5 years (litre)	49680	---	**49680**
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m^3	6	6	---

Number of Trips / days	63	0	---
Number of Trips / 5 years	85694	480	---
Total Diesel Consumption for 5 years (litre)	1713880	9600	**1723480**
Total Diesel Consumption by Excavator, Compressor and Tipper			**2184971**

** Number of truck loads for gravel has been normalized for 5 years.*

Table 2.9 Capital Requirement Details

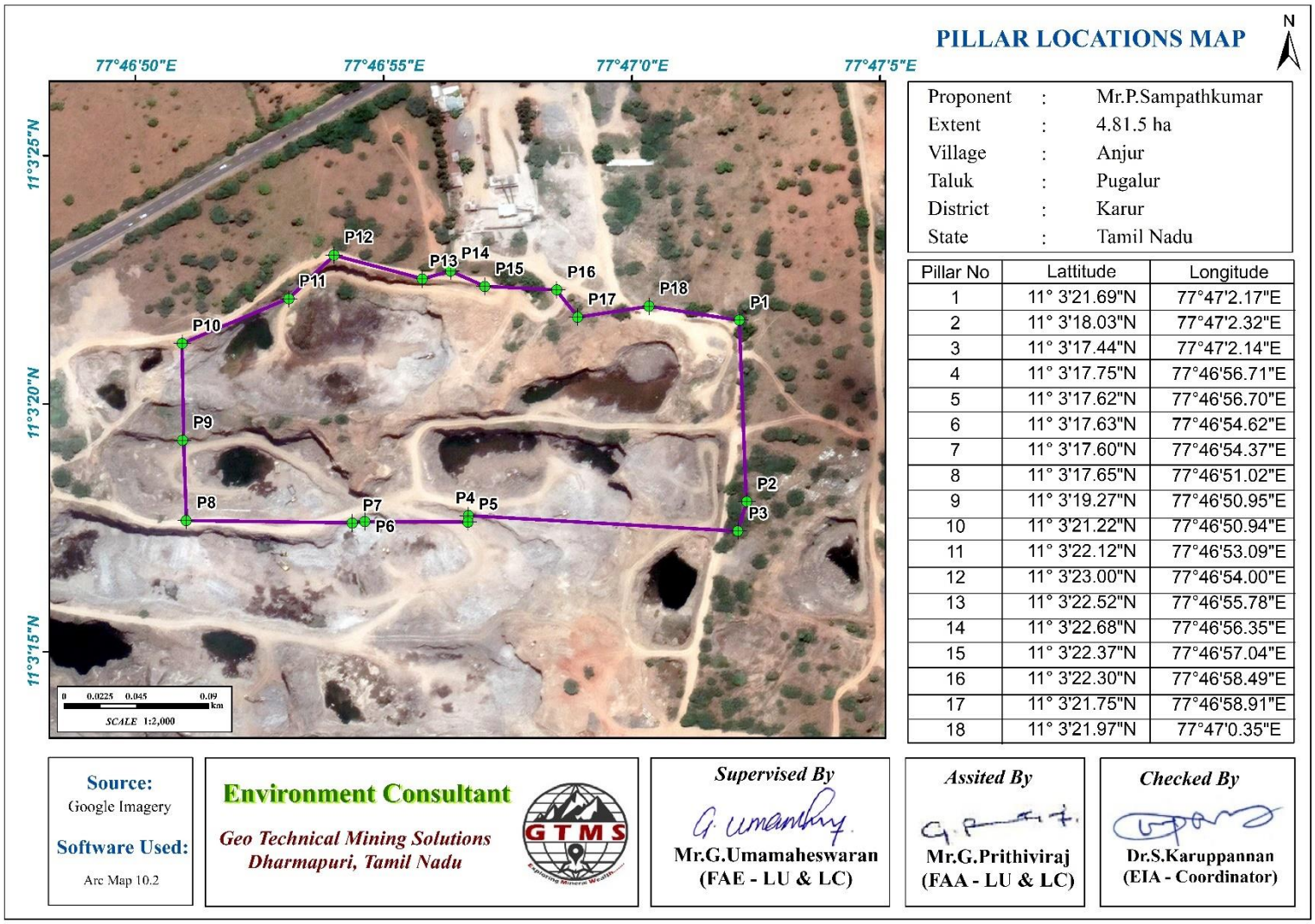
S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	14,00,000/-
2	Machinery cost	30,00,000/-
3	EMP Cost	30,96,500/-
Total Project Cost		**74,96,500/-**

2.5 CONCEPTUAL MINE CLOSURE PLAN

- Mine closure is a process of returning a disturbed site to its natural state for other productive uses to minimize adverse effects on the environment or threats to humans' health and safety.
- The objective of the mine closure plan is to transform quarries to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting, and non-contaminating.
- At the end of mining life, the mine pit will act as an artificial reservoir for collecting rain water and will help to meet the water demand during drought season.
- After mine closure, the greenbelt will be developed along the safety barrier and over top benches. Water from the pit will be used to the greenbelt development and maintenance. Budgetary provision for mine closure is provided in Table 2.10.

Table 2.10 Mine Closure Budget

Activity	Capital Cost	Recurring Cost/Annum
963 plants inside the lease area	192600	28890
1445 plants outside the lease area	433350	43335
Wire Fencing (4.81.5 ha)	963000	48150
Renovation of Garland Drain (4.81.5 ha)	48150	24075
Total	**1637100**	**144450**



Pillar No	Lattitude	Longitude
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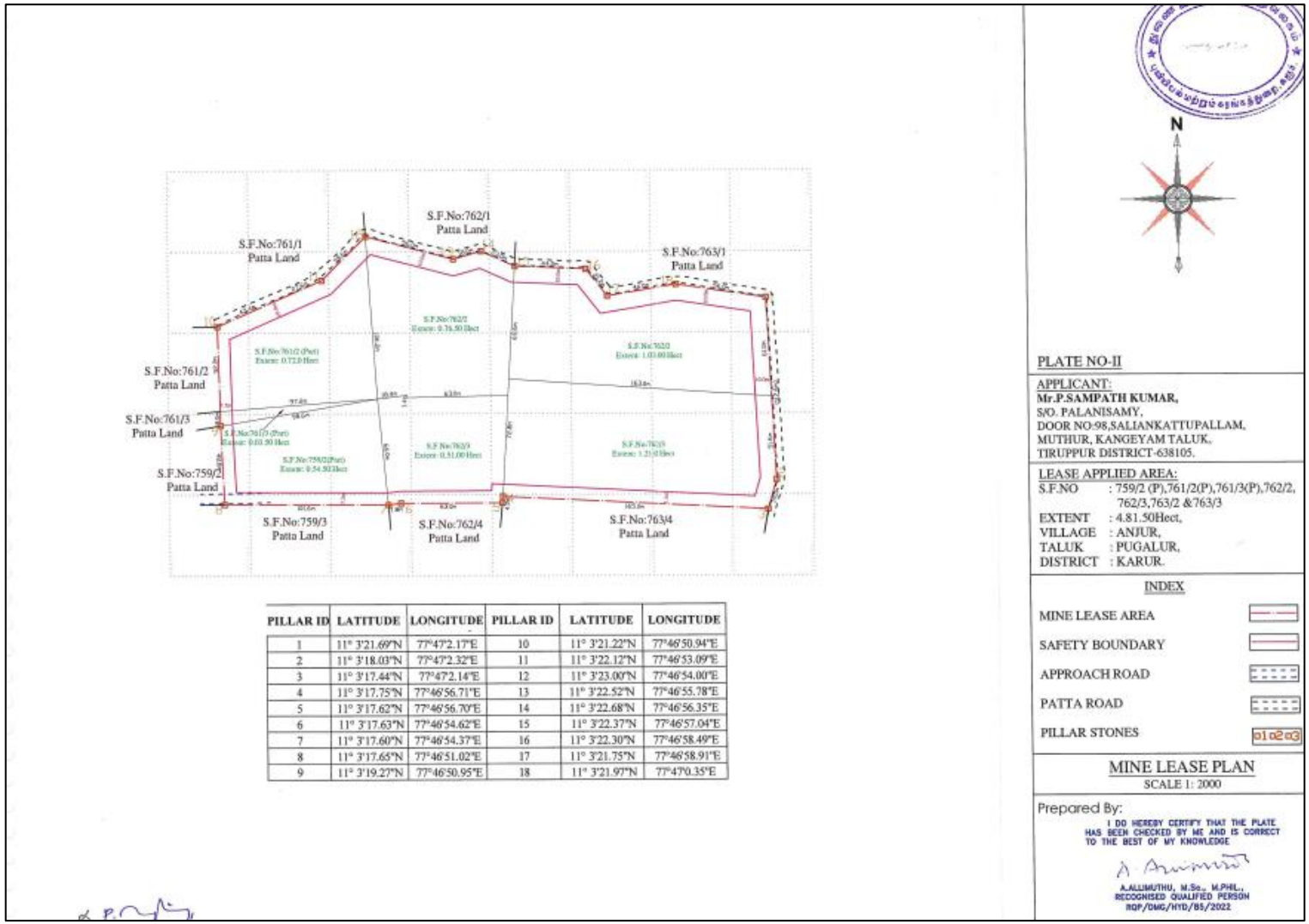
6	11° 3'17.63"N	77°46'54.62"E
7	11° 3'17.60"N	77°46'54.37"E
8	11° 3'17.65"N	77°46'51.02"E
9	11° 3'19.27"N	77°46'50.95"E
10	11° 3'21.22"N	77°46'50.94"E
11	11° 3'22.12"N	77°46'53.09"E
12	11° 3'23.00"N	77°46'54.00"E
13	11° 3'22.52"N	77°46'55.78"E
14	11° 3'22.68"N	77°46'56.35"E
15	11° 3'22.37"N	77°46'57.04"E
16	11° 3'22.30"N	77°46'58.49"E
17	11° 3'21.75"N	77°46'58.91"E
18	11° 3'21.97"N	77°47'0.35"E

Figure 2.1 Google Earth Image Showing Lease Area with Pillars



PILLAR ID	LATITUDE	LONGITUDE	PILLAR ID	LATITUDE	LONGITUDE
1	11° 3'21.69"N	77°47'2.17"E	10	11° 3'21.22"N	77°46'50.94"E
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Figure 2.2 Mine Lease Plan

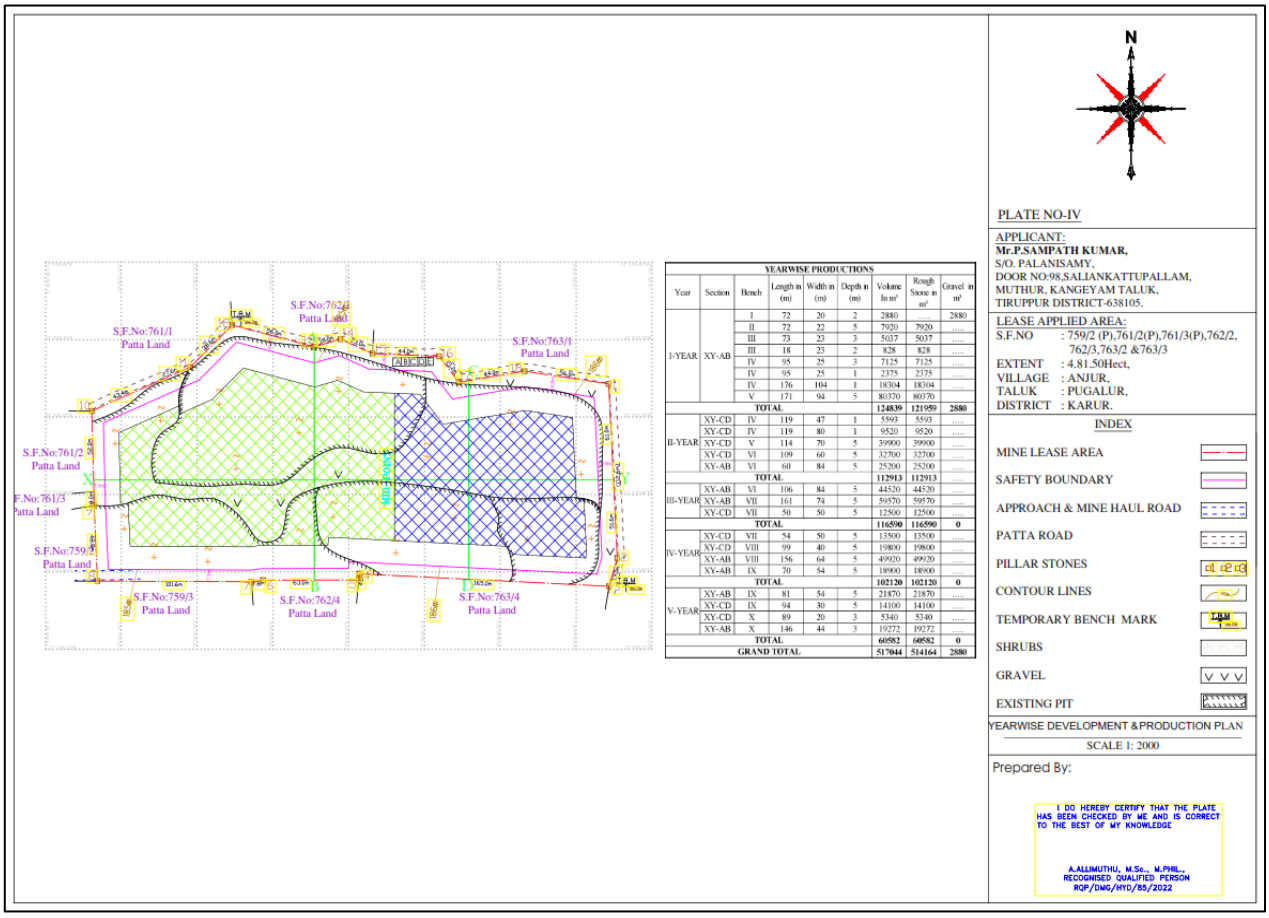


Figure 2.3 Yearwise Development and Production Plan

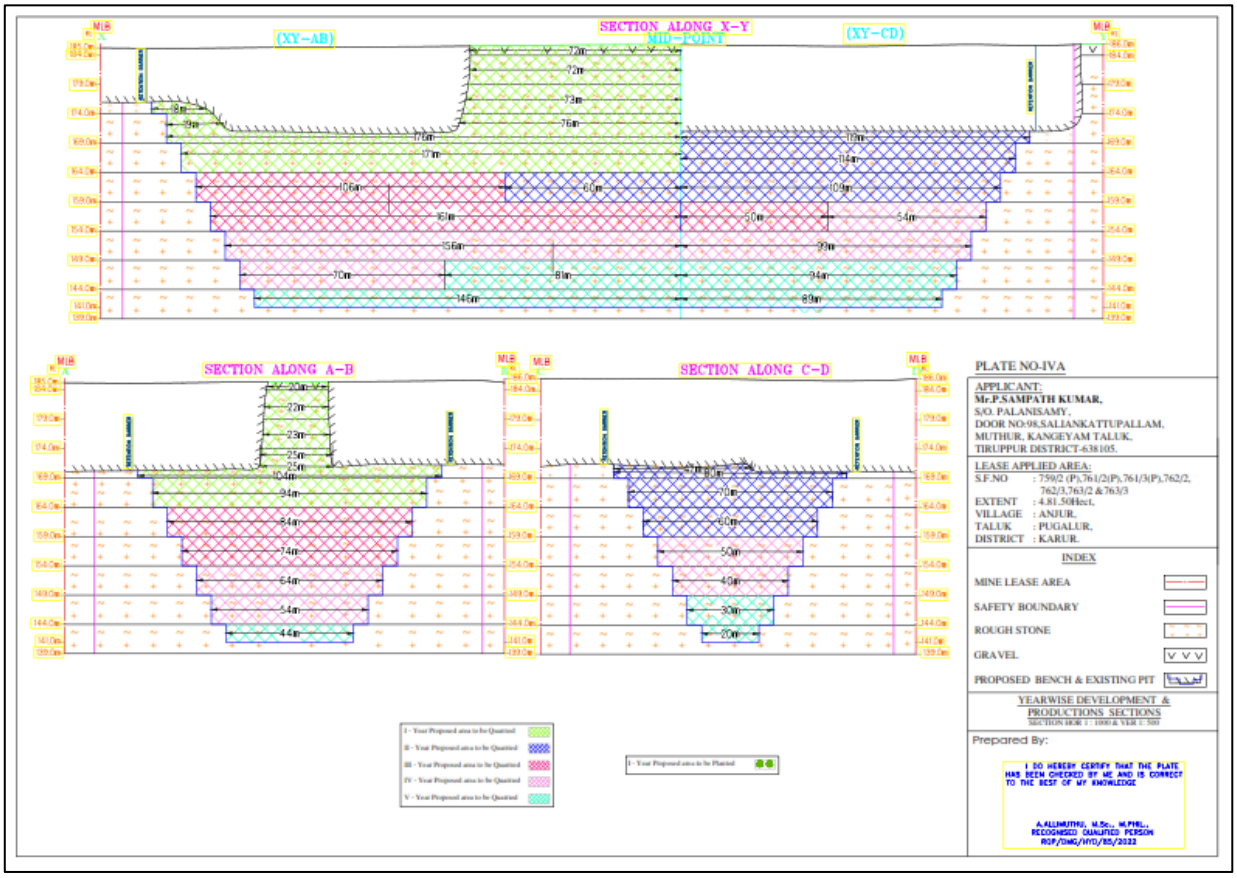


Figure 2.3a Yearwise Development and Production Sections

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 INTRODUCTION

Field monitoring studies were carried out to evaluate the existing environmental condition of the project site during **March through May 2023** as per CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Accuracy Analabs and Enviro Farms & Technology Laboratory for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

3.1 LAND ENVIRONMENT

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 3.1.

Table 3.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Barren Rocky / stony waste	17.89	0.23
2	Crop land	4684.90	59.86
3	Fallow land	771.59	9.86
4	Mining/Industrial Area	82.95	1.06
5	Plantations	2037.14	26.03
6	Settlement	46.94	0.60
7	Water bodies	185.01	2.36
Total		**7826.42**	**100**

Source: Sentinel II Satellite Imagery

3.2 SOIL ENVIRONMENT

Seven locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. The physical and chemical characteristic results of soil samples are provided below.

Physical Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.94 to 8.2 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 3.91 to 4.8 dsm-1. Bulk density ranges between 0.79 and 0.95 g/cm^3.

Chemical Characteristics

Nitrogen ranges between 0.96 and 2.4 %. Potassium ranges between 1.69 and 5.22 %. Calcium ranges between 2351 and 3956 mg/kg. Organic matter content ranges between 20. and 30.2 %. Manganese ranges between 1665 and 2653 mg/kg.

3.3 WATER ENVIRONMENT

Surface Water

Noyyal River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 0.58 km NW of Noyyal River, as shown in Table 3.5 and Figure 3.7. Four surface water sample, known as SW01 were collected from the Noyyal River (Anjur, 0.58 km NW), SW02 were collected from the Noyyal River (Korakkattupudur, 3.76 NE), SW03 were collected from the Noyyal River (Muthur, 4.34NW), to assess the baseline water quality. Table 3.6a summarizes surface water quality data of the collected sample.

Result for surface water sample in the Table 3.6a indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

Ground Water Resources

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Six groundwater samples, known as OW01, OW02, OW03, BW01, BW02 and BW03, collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.4. Table 3.6 summarizes ground water quality data of the 6 samples.

Results for ground water samples in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500: 2012.

Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed

project sites for the period from March through May 2022 (Pre-Monsoon Season) and from October through December, 2022 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 20.6 to 23.5 m BGL in pre monsoon and 11.5 to 16.3 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2022 (Post-Monsoon Season) vary from 63.8 to 67.6 m and from 62.3 to 65.8 m for the period of March through May, 2022 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines

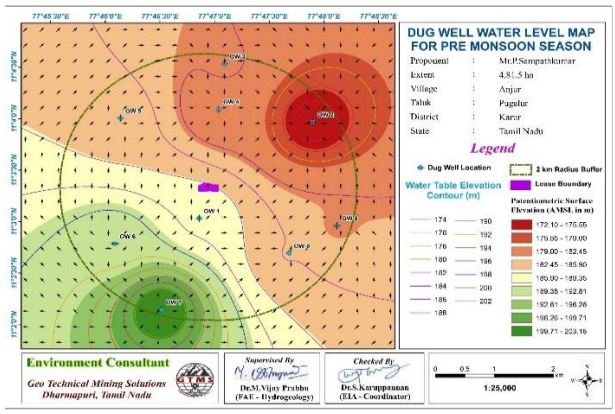


Figure 3.1 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season

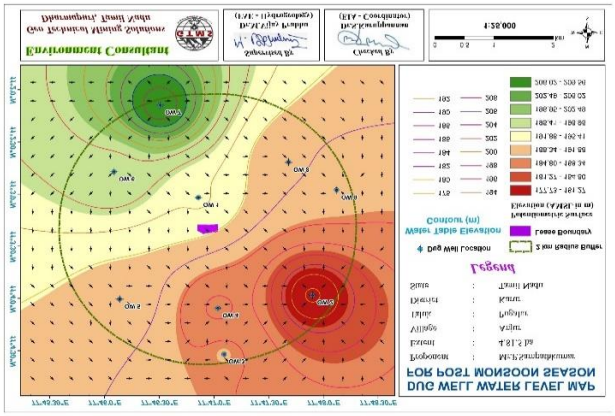


Figure 3.2 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

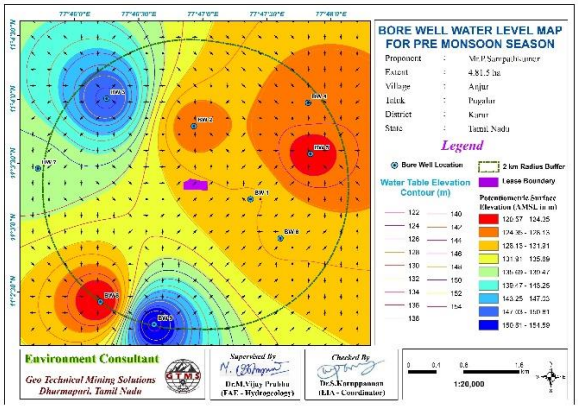


Figure 3.3 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season

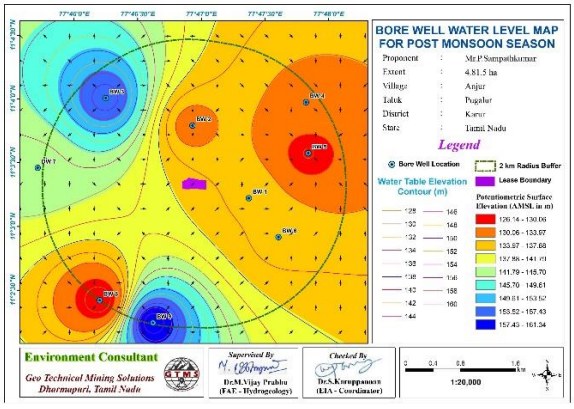


Figure 3.4 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

3.4 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality. The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The ambient air quality in the study area of 5 km radius around the proposed quarry sites provides the baseline ambient air quality information.

Ambient Air Quality

As per the monitoring data, PM2.5 ranges from 18.1 µg/m3 to 22.7 µg/m3; PM10 from 36.7 µg/m3 to 41.6 µg/m3; SO2 from 6.0 µg/m3 to 8.9µg/m3; NOx from 17.8µg/m3 to 23.2g/m3. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

3.5 NOISE ENVIRONMENT

42.8 dB (A) Leq during day time and 33.8 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.9 to 45.6dB (A) Leq and during night time from 28.0 to 35.6dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.6 BIOLOGICAL ENVIRONMENT

The main objective of biological study is to collect the baseline data regarding flora and fauna in the study area and identify ecologically sensitive areas and whether there are any rare, endangered, endemic or threatened (REET) species of flora and fauna in the core zone as well as buffer zone. From the study of biological environment, it is concluded that there was no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species were found in vulnerable, endangered or threatened category as per IUCN and that there is no endangered red list species found in the study area.

3.7 SOCIO ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It is a measure of an individual's or family's or group of people's economic and social position based on education, income, health, and occupation. Socio-economic most important determinant of livelihoods as levels of knowledge, skill and income conditions which mean for their living. People from one income group to another consumption power is also differ among income groups of population This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project It is expected that the socio-economic status of the area will

substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of their standard of living.

3.8 TRAFFIC DENSITY

Table 3.2 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Kangeyam to Kodumudi (SH-189)	0.07 Km-N	Kangeyam to Kodumudi (SH-189)
TS2	Vellakovil to Erode (SH-381A)	4.9 Km-W	Vellakovil to Erode (SH-381A)

Source: On-site monitoring by GTMS FAE & TM

Table 3.3 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	110	330	48	48	89	45	423
TS2	127	381	52	52	94	47	480

Source: On-site monitoring by GTMS FAE & TM

3.9 SITE SPECIFIC FEATURES

Table 3.4 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
		None	Nil within 10 km radius
2	Reserve Forest	Arachalur Reserve Forest	14.90 km NW
		Chennimalai R.F	22.92. Km NW
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Noyyal River	0.44 km NW
		River	5.0 km NE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius

5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Centrally Protected Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	TNPL	23.0 km SE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 INTRODUCTION

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans for sustainable resource extraction.

4.1 LAND ENVIRONMENT

Anticipated Impact

- Permanent or temporary change on land use and land cover.
- Change in topography of the mine lease area will change at the end of the life of the mine.
- Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- Degradation of the aesthetic environment of the core zone due to quarrying
- Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- Siltation of water course due to wash off from the exposed working area

Mitigation Measures

The mining activity will be progressively implemented along with other mitigative measures as discussed below:

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.

- ❖ Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- ❖ Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- ❖ Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- ❖ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimize dust emissions.
- ❖ Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

Anticipated Impact

Following impacts are anticipated due to mining operations:

- Removal of protective vegetation cover
- Exposure of subsurface materials which are unsuitable for vegetation establishment.

Mitigation Measures

- ❖ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- ❖ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ❖ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

Anticipated Impact

- Generation of waste water from vehicle washing
- Washouts from surface exposure or working areas.
- Domestic sewage
- Disturbance to drainage course in the project area
- Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of oil & grease, suspended solids
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining.
- As the proposed project acquires 6.0KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not deplete acquifer beneath the lease area.

Mitigation Measures

- Garland drainage system and settling tank will be constructed along the proposed mining lease area. The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage.
- Rainwater from the mining pits will be collected in sump and will be allowed to store and pumped out to surface settling tank of 15 m x 10 m x 3 m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system
- Benches will be provided with inner slopes and through a system of drains and channels, rain water will be allowed to descent into surrounding drains to minimize the effects of erosion and water logging arising out of uncontrolled descent of water
- The water collected will be reused during storm for dust suppression and greenbelt development within the mines

- ❖ Interceptor traps/oil separators will be installed to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- ❖ Flocculating or coagulating agents will be used to assist in the settling of suspended solids during monsoon seasons
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted.
- ❖ Domestic sewage from site office and urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- ❖ Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- ❖ De-silting will be carried out before and immediately after the monsoon season
- ❖ Regular monitoring (once every 6 months) and analysing the quality of water in open well, bore wells and surface water.

4.4 AIR ENVIRONMENT

Anticipated Impact

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software and the results shown in Tables 4.1 to 4.4 will be used in providing mitigation measures.

Table 4.1 Incremental and Resultant $PM_{2.5}$

Station ID	Distance to core area (km)	Direction	$PM_{2.5}$ concentrations(µg/m³)			Comparison against air quality standard (60 µg/m³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	25.0	7.69	32.69	Below standard	30.76	Not significant
AAQ2	0.17	S	21.6	5	26.6		23.15	
AAQ3	0.84	S	18.8	5	23.8		26.60	
AAQ4	0.42	W	16.9	1	17.9		5.92	
AAQ5	1.37	NNW	19.3	1	20.3		5.18	
AAQ6	1.25	SE	21.0	0.5	21.5		2.38	

AAQ7	3.92	NW	23.0	0	23		0.00	
AAQ8	3.72	NE	17.9	1	18.9		5.59	
AAQ9	1.49	W	18.5	1	19.5		5.41	

Table 4.2 Incremental and Resultant PM_{10}

Station ID	Distance to core area (km)	Direction	PM_{10} concentrations(µg/m^3)			Comparison against air quality standard (100 µg/m^3)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	45.2	13.2	58.4	Below standard	29.20	Not significant
AAQ2	0.17	S	37.5	5	42.5		13.33	
AAQ3	0.84	S	33.1	5	38.1		15.11	
AAQ4	0.42	W	33.4	1	34.4		2.99	
AAQ5	1.37	NNW	37.4	1	38.4		2.67	
AAQ6	1.25	SE	42.2	0.5	42.7		1.18	
AAQ7	3.92	NW	45.1	0	45.1		0.00	
AAQ8	3.72	NE	38.3	0.5	38.8		1.31	
AAQ9	1.49	W	39.6	5	44.6		12.63	

Table 4.3 Incremental & Resultant SO_2

Station ID	Distance to core area (km)	Direction	SO_2 concentrations(µg/m^3)			Comparison against air quality standard (80 µg/m^3)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	8.6	5.07	13.67	Below standard	58.95	Not significant
AAQ2	0.17	S	8.4	5	13.4		59.52	
AAQ3	0.84	S	8.2	5	13.2		60.98	
AAQ4	0.42	W	6.6	0.5	7.1		7.58	
AAQ5	1.37	NNW	6.5	0.5	7		7.69	
AAQ6	1.25	SE	6.6	0.5	7.1		7.58	
AAQ7	3.92	NW	9.2	0	9.2		0.00	
AAQ8	3.72	NE	5.9	1	6.9		16.95	
AAQ9	1.49	W	6.4	1	7.4		15.63	

Table 4.4 Incremental & Resultant NOx

Station ID	Distance to core area (km)	Direction	NOx concentrations(µg/m^3)			Comparison against air quality standard (80 µg/m^3)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	25.9	7.67	33.57	Below standard	29.61	Not significant
AAQ2	0.17	S	17.8	5	22.8		28.09	
AAQ3	0.84	S	15.4	5	20.4		32.47	
AAQ4	0.42	W	13.9	1	14.9		7.19	
AAQ5	1.37	NNW	21.2	1	22.2		4.72	
AAQ6	1.25	SE	23.2	0.5	23.7		2.16	
AAQ7	3.92	NW	24.7	0	24.7		0.00	
AAQ8	3.72	NE	19.1	1	20.1		5.24	
AAQ9	1.49	W	23.5	1	24.5		4.26	

The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further.

Mitigation Measures

Drilling

To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar.

Advantages of Wet Drilling

- In this system dust gets suppressed close to its formation. Dust suppression becomes very effective and the work environment will be improved from the point of view of occupational comfort and health
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased
- The life of drill bit will be increased
- The rate of penetration of drill will be increased. Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting

- ❖ Suitable time of blasting will be chosen according to the local conditions and water will be sprinkled on blasting face.
- ❖ Blasting will be avoided when temperature inversion is likely to occur and strong wind blows towards residential areas.
- ❖ Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone.
- ❖ Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours.
- ❖ Before loading of material water will be sprayed on blasted material.
- ❖ Dust mask will be provided to the workers and their use will be strictly monitored.

Haul Road and Transportation

- ❖ Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- ❖ Water sprinkling on haul roads and loading points will be carried out twice a day
- ❖ Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process and reduces pollution
- ❖ The un-metaled haul roads will be compacted weekly before being put into use
- ❖ Overloading of tippers will be avoided to prevent spillage
- ❖ It will be ensured that all transportation vehicles carry a valid PUC certificate
- ❖ Haul roads and service roads will be graded to clear accumulation of loose materials

Green Belt

- ❖ Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of tractors/tippers
- ❖ Green belt of adequate width will be developed around the project site

Occupational Health

- ❖ Dust mask will be provided to the workers and their use will be strictly monitored
- ❖ Annual medical checkups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers and tipper drivers

- ❖ Ambient air quality monitoring will be conducted every six months to assess effectiveness of mitigation measures proposed

4.5 NOISE ENVIRONMENT

Anticipated Impact

Table 4.5 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level (dBA)	Total (dBA)
Core	100	42.8	57.16	57.32
Kuppusamy Lease	170	43.4	52.55	53.05
Nagappalayam	840	41.2	38.67	43.13
Vellaiyankattu pudur	420	44.2	44.69	47.46
Ramanathapuram	1370	37.9	34.43	39.51
Pillapalayam	1250	39.2	35.22	40.66
Poolavalasu	3920	39.8	25.29	39.95
Nallasellipalayam	3720	39.2	25.75	39.39
Thottiyapalayam	1490	42.2	33.70	42.77
Muthur	4490	45.6	24.11	45.63
Oodayam	3120	36.9	27.28	37.35
Nadupalayam	2560	37.5	28.99	38.07
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. By adopting suitable mitigation measures, the noise levels due to the project can be controlled further.

Table 4.6 Predicted PPV Values due to Blasting

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	36.6	420	0.571	19	0.18	139

Table 4.7 Predicted PPV Values due to Blasting at 100-500 m radius

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	36.6	100	5.669	19	0.99	154
		200	1.87		0.43	147
		300	0.978		0.26	142
		400	0.617		0.19	139
		500	0.432		0.14	137

The peak particle velocity produced by the charge of 36.6 kg is well below that of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

Mitigation Measures

- The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators which reduce the ground vibrations.
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting
- Adequate safe distance from blasting will be maintained as per DGMS guidelines
- Blasting shelter will be provided as per DGMS guidelines
- Blasting operations will be carried out only during day time
- The charge per delay will be minimized and preferably a greater number of delays will be used per blasts
- During blasting, other activities in the immediate vicinity will be temporarily stopped
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire

- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- ❖ Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 BIOLOGICAL ENVIRONMENT

Anticipated Impact

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- Carbon released from quarrying machineries and tippers during quarrying would be 4338 kg per day, 1171145 kg per year and 5855723 kg over five years, as provided in Table 4.8.

Table 4.8 Carbon Released During Five Years of Rough Stone and Gravel Production

	Per day	**Per year**	**Per five years**
Fuel consumption of excavator	305	82362	411811
Fuel consumption of compressor	36.8	9936	49680
Fuel consumption of tipper	1277	344696	1723480
Total fuel consumption in liters	1618	436994	2184971
Co_2 emission in kg	4338	1171145	5855723

Mitigation Measures

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Carbon Sequestration

- To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 75597 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 2408 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 214 kg of the total carbon, as provided in Table 4.9.

Table 4.9 CO_2 Sequestration

CO_2 sequestration in kg	214	57722	288611
Remaining CO_2 not sequestered in kg	4124	1113422	5567112
Trees required for environmental compensation	46393		
Area required for environmental compensation in hectares	93		

4.7 SOCIO ECONOMIC ENVIRONMENT

Anticipated Impact

- Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- Approach roads can be damaged by the movement of tippers.
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

Mitigation Measures

- Good maintenance practices will be adopted for all 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.
- Air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc.., from this project directly and indirectly.

- From above details, the quarry operations will have highly beneficial positive impact in the area.

4.8 OCCUPATIONAL HEALTH MEASURES

All the persons will undergo pre-employment and periodic medical examination. Employees will be monitored for occupational diseases by conducting the following tests

- General physical tests
- Audiometric tests
- Full chest, X-ray, Lung function tests, Spiro metric tests
- Periodic medical examination – yearly
- Lung function test – yearly, those who are exposed to dust
- Eye test

Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost. The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

CHAPTER V
ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The mineral deposits are site specific in nature; hence question of seeking alternate sites do not arise for the projects.

CHAPTER VI
ENVIRONMENT MONITORING PROGRAM

Regular monitoring program of environmental components is essential to take into account the changes in the environmental components as shown in Table 6.1. The Objectives of monitoring is:

- To check or assess the efficiency of the controlling measures;
- To establish a data base for future impact assessment studies.

Table 6.1 Post Environmental Clearance Monitoring Schedule

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Peak particle velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	--	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

Source: Guidance of manual for mining of minerals, February 2010

6.1 BUDGETARY PROVISION FOR EMP

The cost in respect of monitoring of environmental components has been shown in Table 6.2.

Table 6.2 Environment Monitoring Budget

S. No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	-	Rs. 60,000/-
2	Meteorology	-	Rs. 15,000/-
3	Water Quality	-	Rs. 20,000/-
4	Water Level Monitoring	-	Rs. 10,000/-
5	Soil Quality	-	Rs.20,000/-
6	Noise Quality	-	Rs.10,000/-
7	Vibration Study	-	Rs.1,50,000/-
8	Greenbelt	-	Rs.10,000/-
Total		-	**Rs.2,95,000 /-**

Source: Field Data

CHAPTER VII

ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. The methodology for the risk assessment is based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

7.2 DISASTER MANAGEMENT PLAN

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

- ❖ Rescue and treat casualties;
- ❖ Safeguard other people;
- ❖ Minimize damage to property and the environment;
- ❖ Initially contain and ultimately bring the incident under control;
- ❖ Secure the safe rehabilitation of affected area; and

❖ Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

7.3 CUMULATIVE IMPACT STUDY

- The results on the cumulative impact of the three proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from proposed project is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- The proposed three projects will allocate Rs. 15,00,000/- towards CER as recommended by SEAC.
- The proposed three projects will directly provide jobs to 60 local people, in addition to indirect jobs.
- The proposed three projects will plant 5442 about trees in and around the lease area.
- The proposed three projects will add 693 PCU per day to the nearby roads.

7.4 PLASTIC WASTE MANAGEMENT PLAN

The Project Proponent shall comply with Tamil Nadu Government Order (Ms) No. 84 Environment and Forest (EC.2) Department Dated: 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986.

Objective

❖ To investigate the actual supply chain network of plastic waste.

❖ To identify and propose a sustainable plastic waste management by installing bins for collection of recyclables with all the plastic waste

❖ Preparation of a system design layout, and necessary modalities for implementation and monitoring.

S. No.	Activity	Responsibility
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste	Mines Manager

3	Collection of plastic waste	Mines Foreman
4	Setting up of Material Recovery Facilities	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance	Mine Owner

CHAPTER VIII

PROJECT BENEFITS

Various benefits are envisaged due to the proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- Direct employment to 19 local people.
- Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge.
- Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- Strengthening of existing community facilities through the Community Development Program.
- Skill development & capacity building like vocational training.
- Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,
- CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Anjur Village. CSR budget is allocated as 2.5% of the profit.
- Rs. 5,00,000 will be allocated for CER.

CHAPTER IX

ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs.6135072** as capital cost and recurring cost as **Rs.2802219** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs. 21782812.**

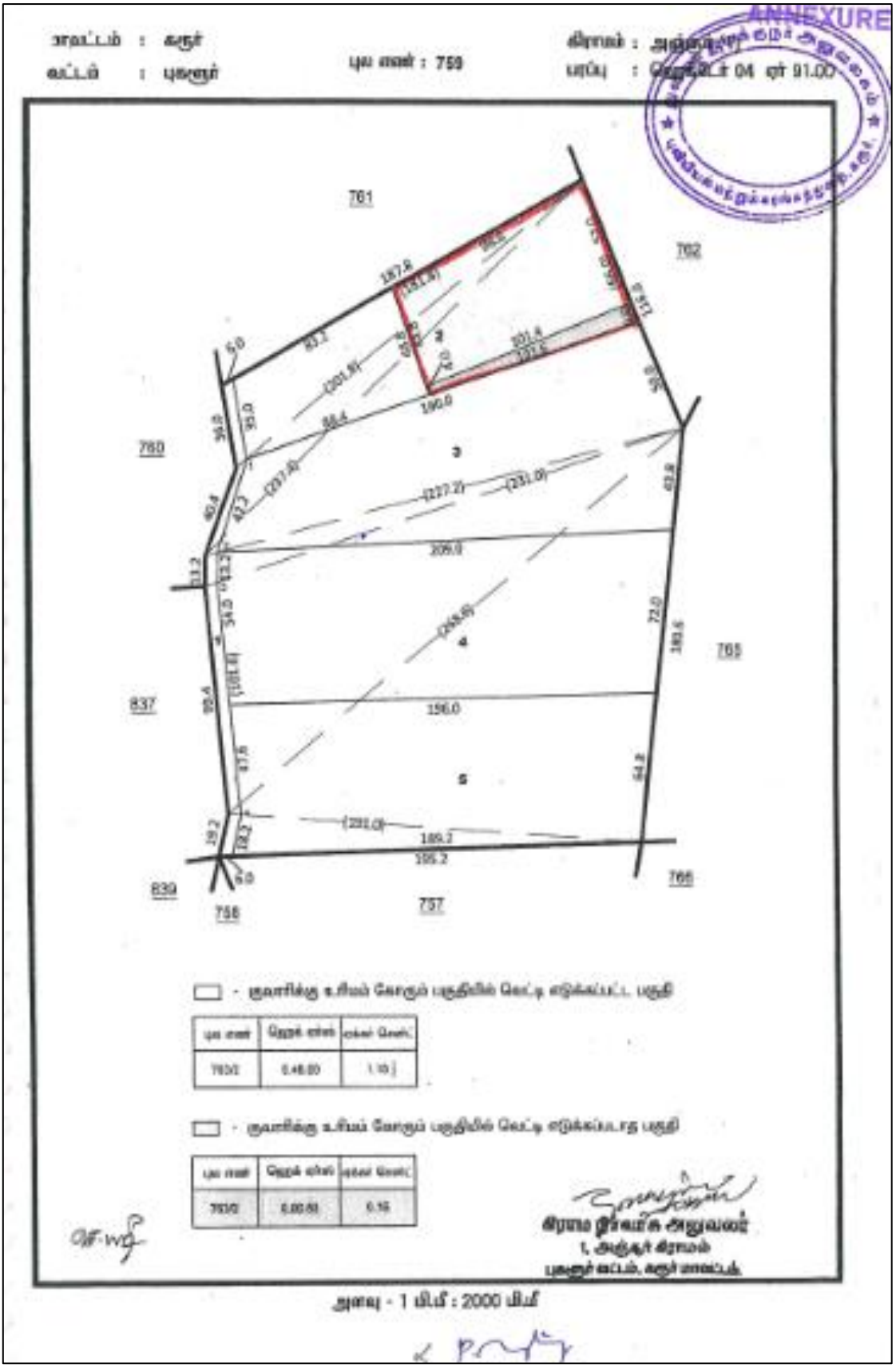
CHAPTER X

CONCLUSION

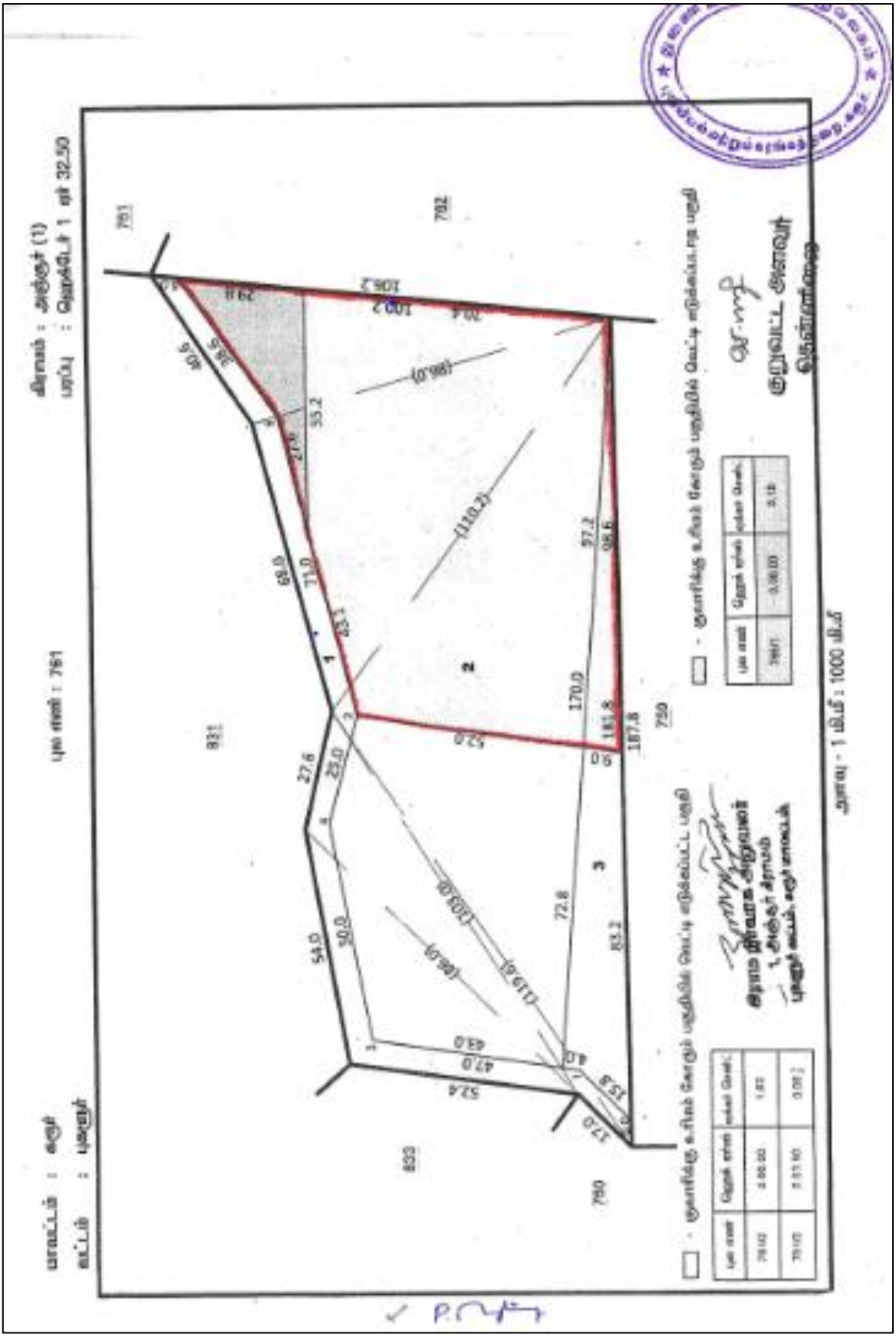
Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental issues, environmental management plan (EMP) was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

LAND DOCUMENTS

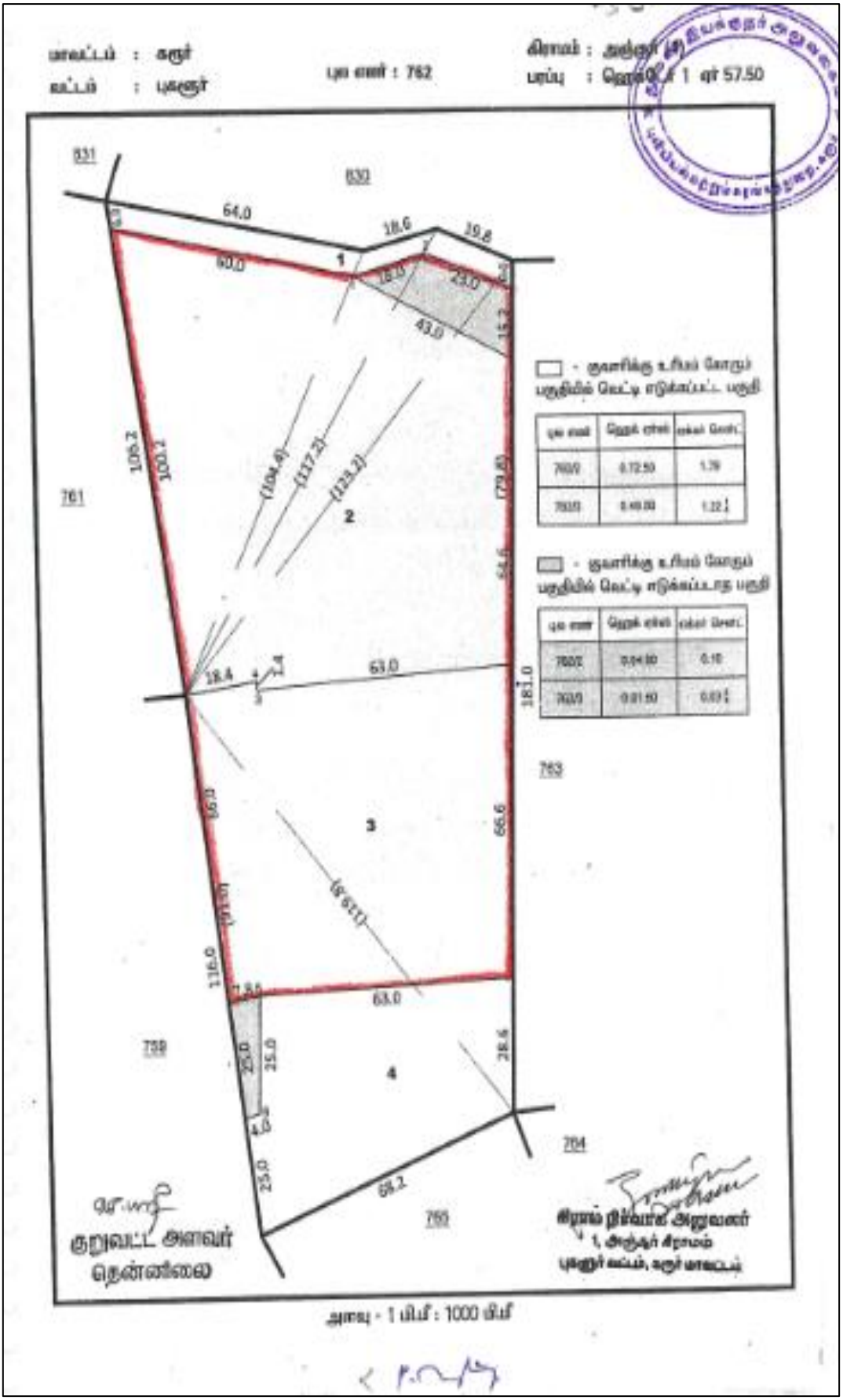
Some of the important land related documents are shown in below:



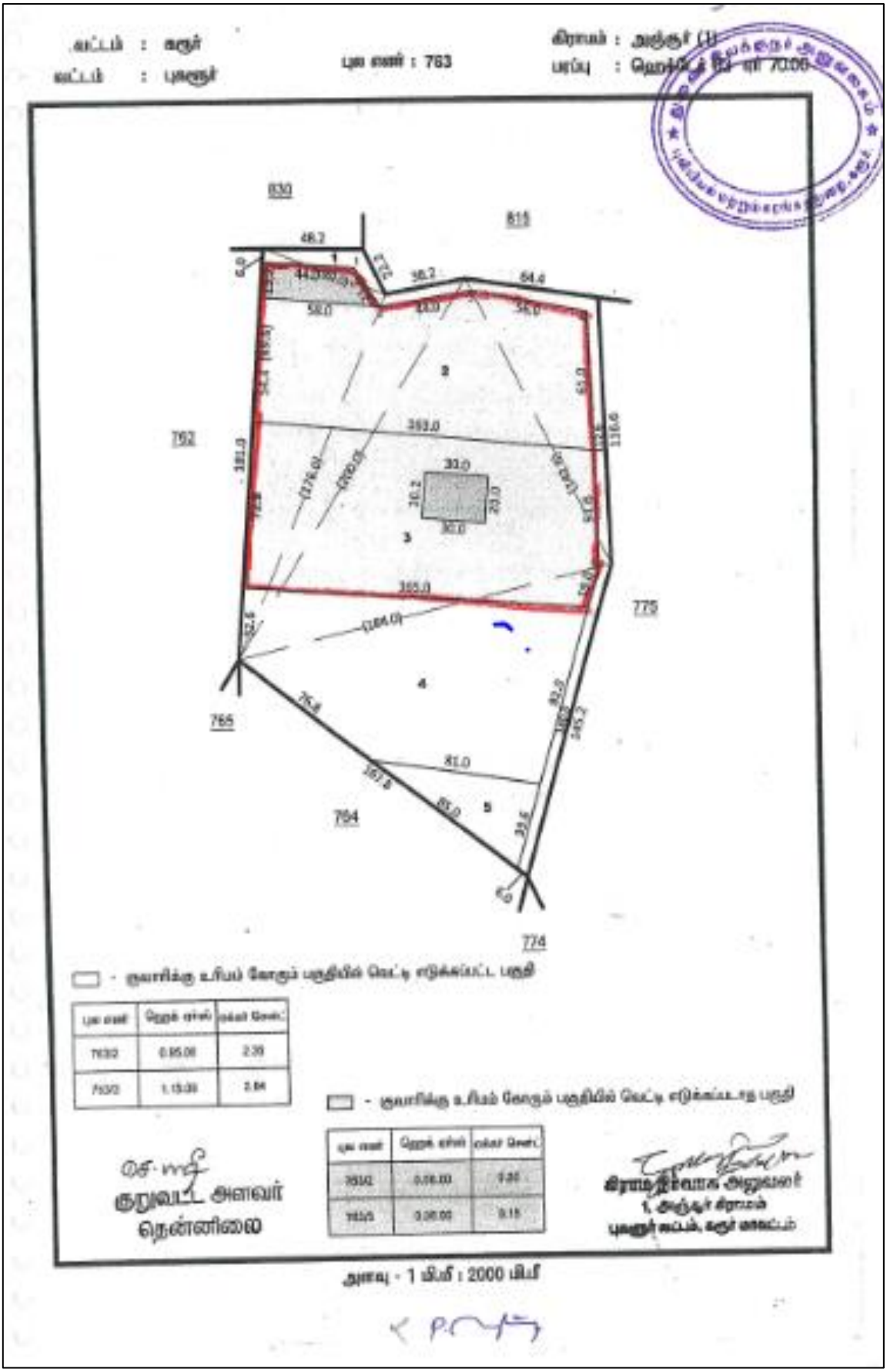
An FMP Sketch Showing Proposed Lease Area in Red Colour



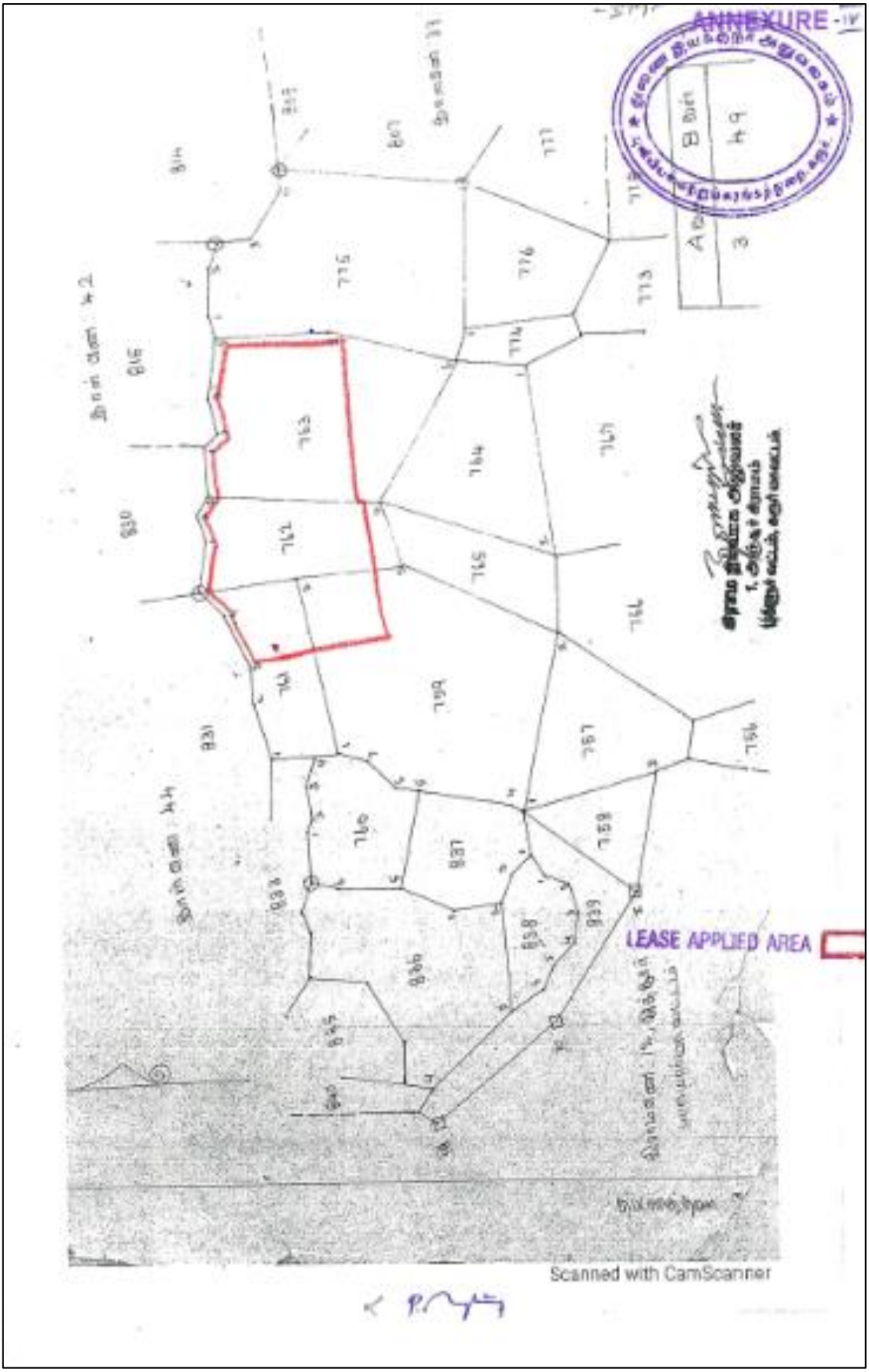
An FMP Sketch Showing Proposed Lease Area in Red Colour



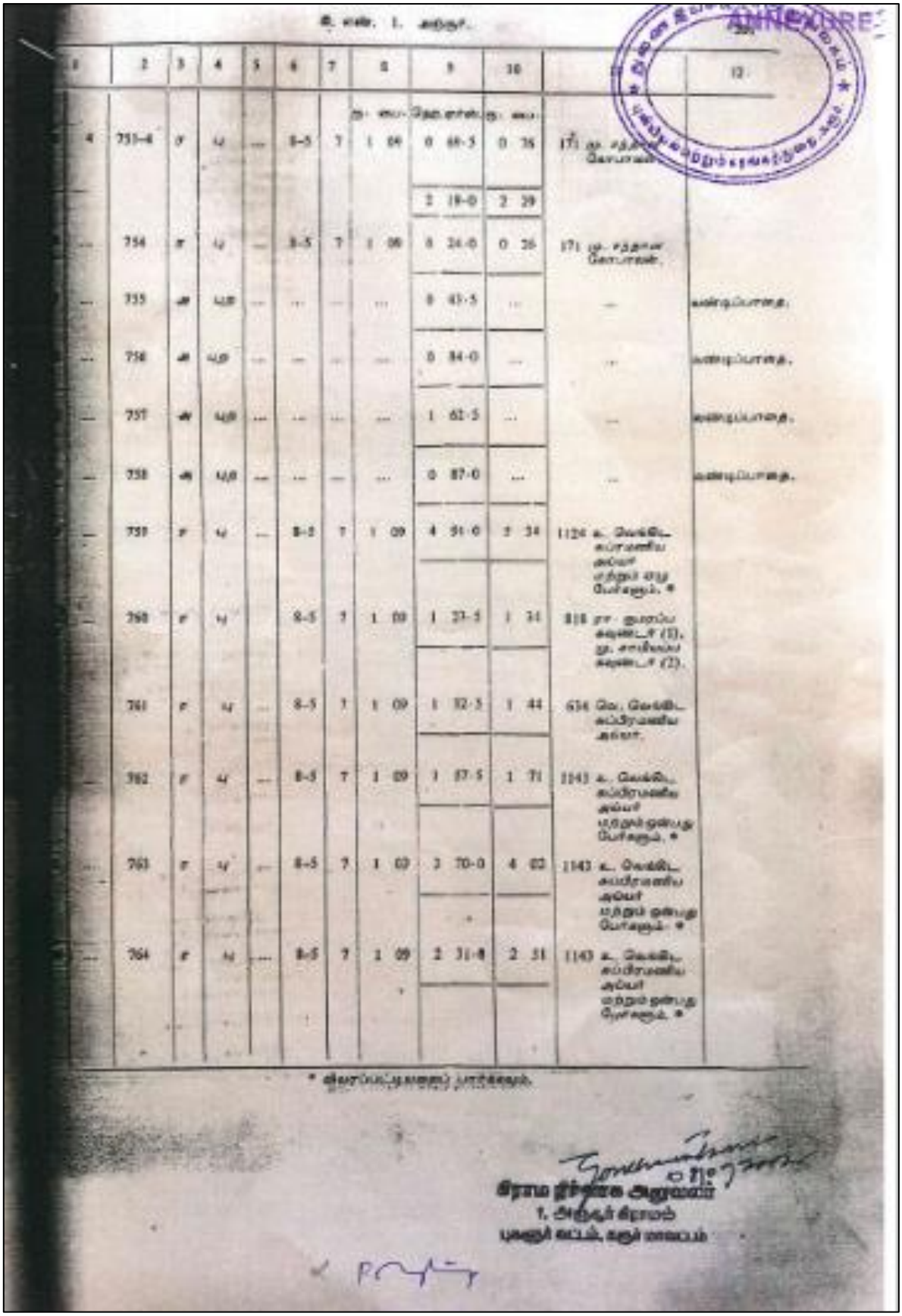
An FMP Sketch Showing Proposed Lease Area in Red Colour



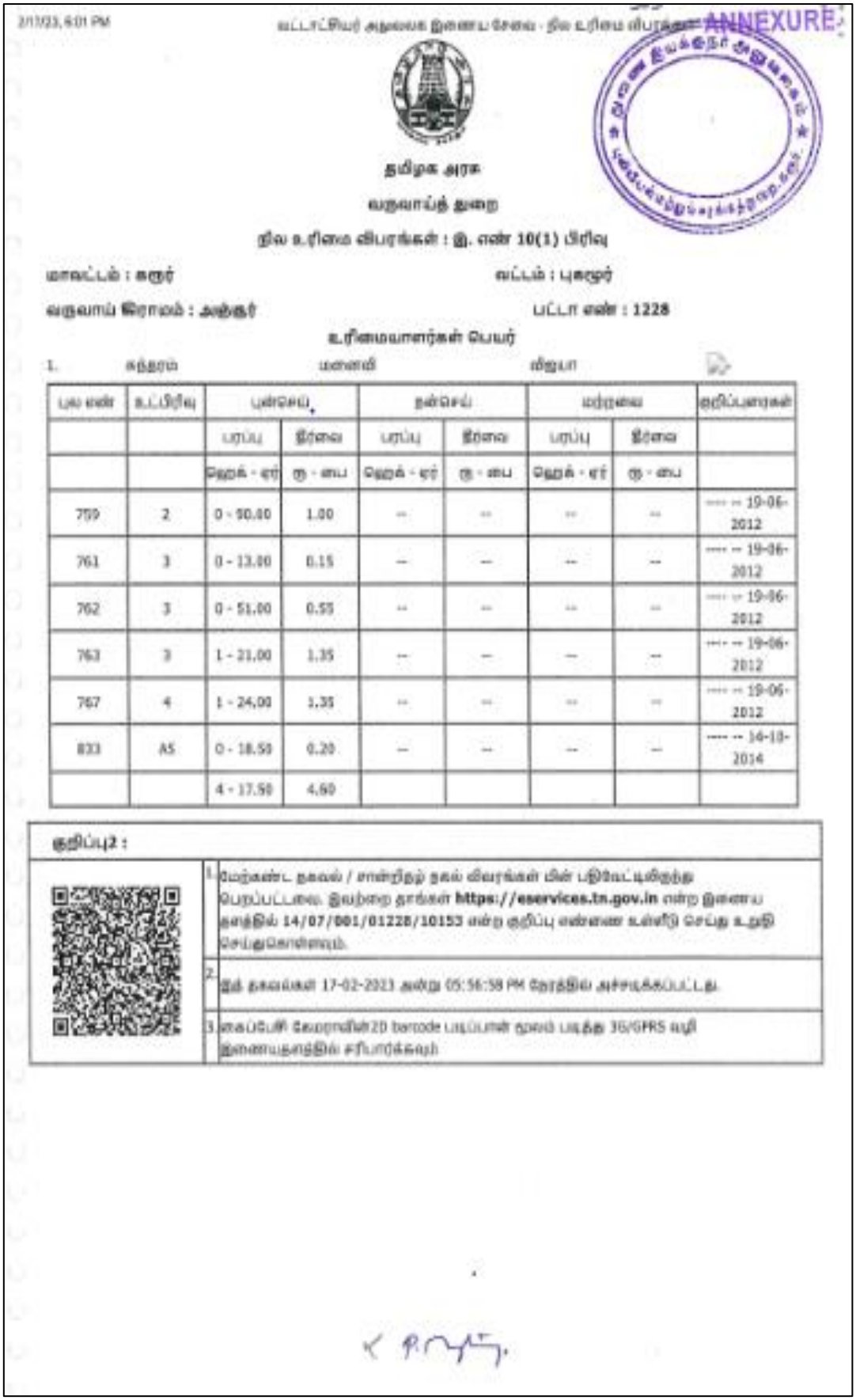
An FMP Sketch Showing Proposed Lease Area in Red Colour



An FMP Sketch Showing Proposed Lease Area in Red Colour



A Register Document



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வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

ANNEXURE

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : அத்தூர்

பட்டா எண் : 1228

உரிமையாளர்கள் பெயர்

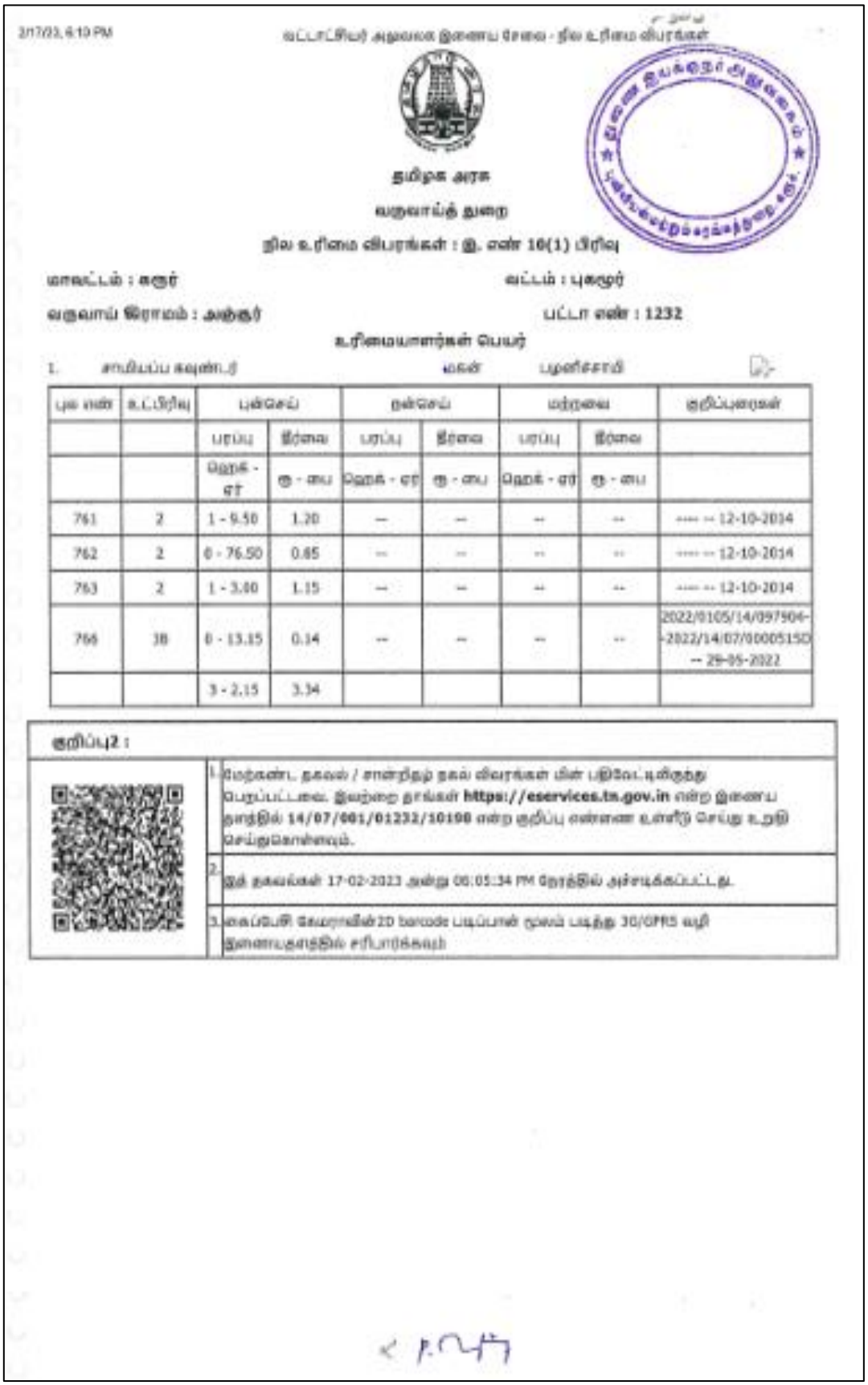
1. கந்தராம மனைவி மீனா

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
759	2	0 - 50.00	1.00	--	--	--	--	---- -- 19-06-2012
761	3	0 - 13.00	0.15	--	--	--	--	---- -- 19-06-2012
762	3	0 - 51.00	0.55	--	--	--	--	---- -- 19-06-2012
763	3	1 - 21.00	1.35	--	--	--	--	---- -- 19-06-2012
767	4	1 - 24.00	1.35	--	--	--	--	---- -- 19-06-2012
833	A5	0 - 18.50	0.20	--	--	--	--	---- -- 16-10-2014
		4 - 17.50	4.60					

குறிப்பு2 :

1. மேற்கண்ட நகல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **14/07/001/01228/10153** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இச் நகல்கள் 17-02-2023 அன்று 05:56:58 PM நேரத்தில் அச்சுக்கப்பட்டது.
3. கைப்பேசி வேறாவின் 2D barcode படிப்பான் மூலம் படித்த 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

Copy of patta chitta documents



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வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 16(1) பிரிவு

மாவட்டம் : கரூர்

வட்டம் : புகழூர்

வருவாய் கிராமம் : அத்தூர்

பட்டா எண் : 1232

உரிமையாளர்கள் பெயர்

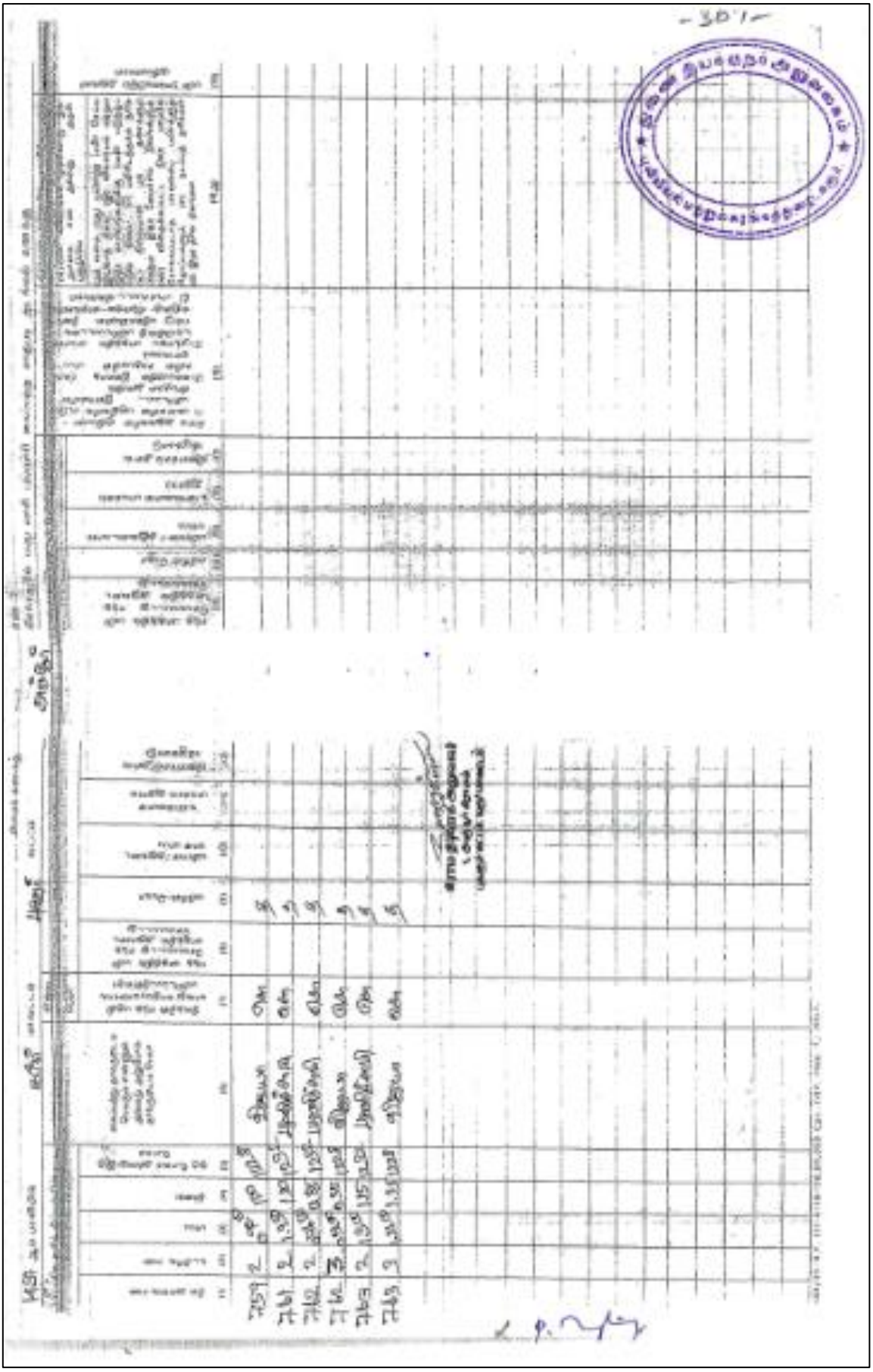
1. சாமியப்ப கவுண்டர் மகன் பழனிசாமி

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
761	2	1 - 9.50	1.20	--	--	--	--	---- -- 12-10-2014
762	2	0 - 76.50	0.85	--	--	--	--	---- -- 12-10-2014
763	2	1 - 3.80	1.15	--	--	--	--	---- -- 12-10-2014
766	3B	0 - 13.15	0.14	--	--	--	--	2022/0105/14/097904-2022/14/07/0000515D -- 29-05-2022
		3 - 2.15	3.34					

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் தகவ் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **14/07/001/01232/10190** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இச் தகவல்கள் 17-02-2023 அன்று 06:05:34 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைபேசி வேலாவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

Copy of patta chitta documents



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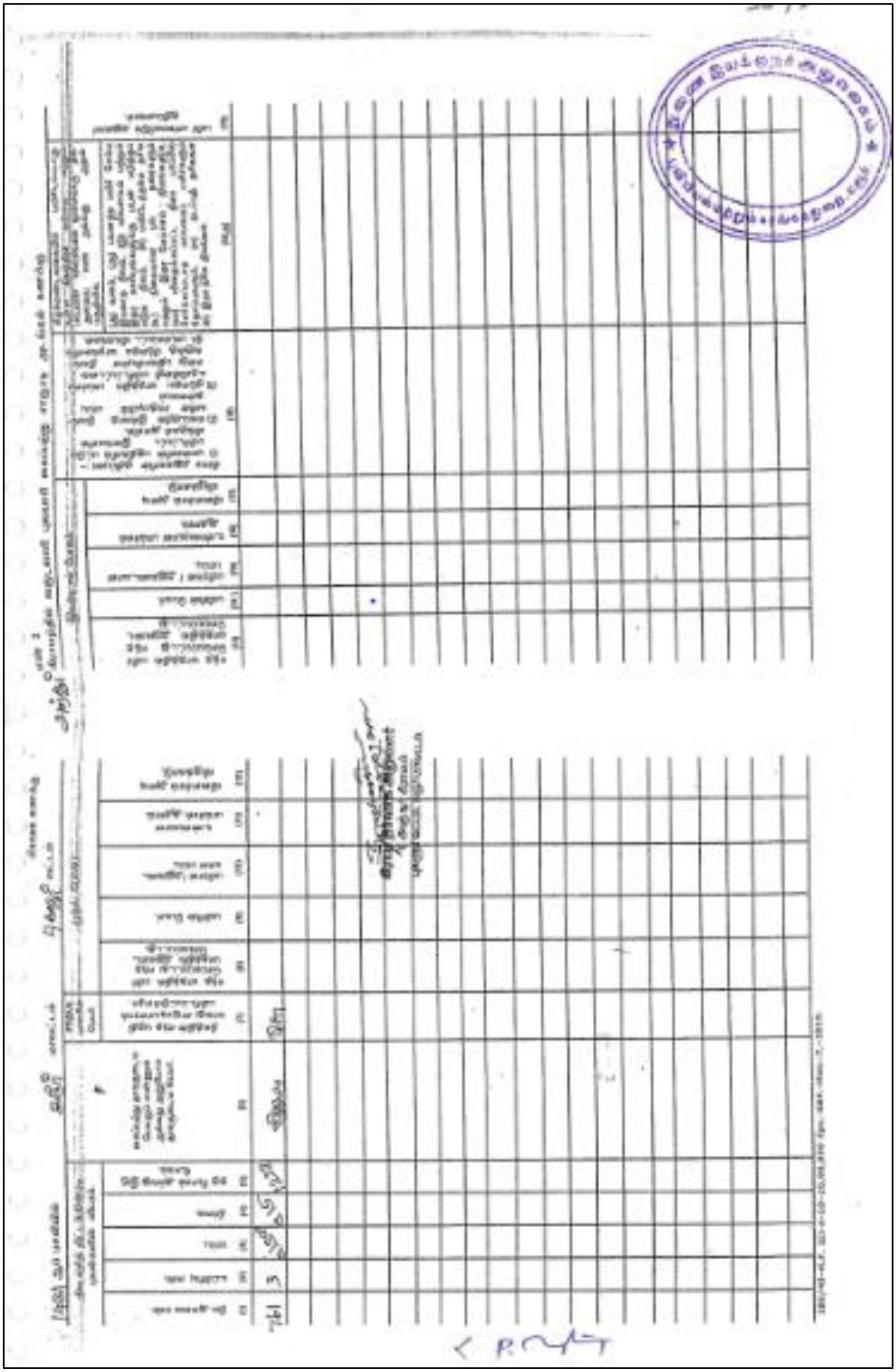

A Register Document