

**DRAFT 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 = 13.27.5hectares**

**At**

**Kuppam Village, Pugalur Taluk,**

**Karur District, Tamil Nadu State**

**ToR letter No. Lr. No. SEIAA-TN/F.No.10158/ToR-1531/2023 Dated:07.08.2023**

**NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT**

<b>Name and Address</b>	<b>Extent &amp; S.F.No.</b>	<b>Mineral Production</b>
<b>Mr. T.Manoj Prabakar S/o. Thirunavukkarasu Door.No.450-A, College Road, 3<sup>rd</sup> Cross, Paramathivelur, Namakkal District – 638 182</b>	<b>4.11.5 Ha &amp; 683/2 (Part) &amp; 686/1 (Part)</b>	<b>Rough Stone-821400 m<sup>3</sup> Gravel – 173850 m<sup>3</sup></b>

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**



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NABET ACC. NO: NABET/EIA/2124/SA 0184

Valid till: April 02, 2024



**ENVIRONMENTAL LAB**

**EXCELLENCE LABORATORY**

**No.23/93, 5<sup>th</sup> Street Ram Nagar, S.S.Colony,**

**Madurai, Tamil Nadu**

**NABL Certificate Number: TC-6932, Valid Until : 19.03.2024  
Baseline Study Period – October 2023 through December 2023**

## TERMS OF REFERENCE (ToR) COMPLIANCE

ToR issued vide Letter No. SEIAA-TN/F.No.10158/ToR-1531 Dated 07.08.2023 for

### T. Manoj Prabakar Rough Stone & Gravel Quarry

Annexure - I		
1	The PP shall submit the 'Action Plan' on the issues raised during the Public Hearing with budgetary provisions for the same.	The details regarding the public hearing will be given in the final EIA report.
2	The PP shall study the Traffic Volume of the proposed quarry site considering the cluster situation involving the Division of Transportation Engineering of Department of Civil Engineering, Anna University, Chennai and the report shall stipulate the plan indicating the transportation of the minerals by road not passing through adjacent villages without increasing the carrying capacity of such village roads.	The traffic volume report will be obtained from the Division of Transportation Engineering of Department of Civil Engineering, Anna University, Chennai and included in the final EIA report.
3	The PP shall submit a controlled blasting measures for reducing the impacts due to the blasting operation in the proposed quarries within 1 km of the proposed quarry.	Details regarding blasting measures for reducing the impacts is given in the Section 2.6 under Chapter II, pp.16-22.
4	The proponent shall carry out Bio Diversity study through reputed Institution and the same shall be included in the EIA Report.	The Bio Diversity study through reputed Institution will be included in the final EIA report.
5	The PP shall submit a 'Conceptual Mining Plan' indicating the accessible ramp from the surface to the pit bottom keeping the benches intact for the dimensions as stipulated in the Approved Mining Plan.	The details of Conceptual Mining Plan are attached in the Annexure III.

**Annexure - I**

1	In the case of existing / operating mines, a letter obtained from the concerned Ad (Mines) shall be submitted and it shall include the following:																			
	<table border="1"> <tr> <td>i</td> <td>Original pit dimension</td> </tr> <tr> <td>ii</td> <td>Quantity achieved Vs EC Approved Quantity</td> </tr> <tr> <td>iii</td> <td>Balance Quantity as per Mineable Reserve calculated</td> </tr> <tr> <td>iv</td> <td>Mined out Depth as on date Vs EC Permitted depth</td> </tr> <tr> <td>v</td> <td>Details of illegal / illicit mining</td> </tr> <tr> <td>vi</td> <td>Violation in the quarry during the past working</td> </tr> <tr> <td>vii</td> <td>Quantity of material mined out outside the mine lease area</td> </tr> <tr> <td>viii</td> <td>Condition of Safety zone / benches</td> </tr> <tr> <td>ix</td> <td>Revised / Modified mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</td> </tr> </table>	i	Original pit dimension	ii	Quantity achieved Vs EC Approved Quantity	iii	Balance Quantity as per Mineable Reserve calculated	iv	Mined out Depth as on date Vs EC Permitted depth	v	Details of illegal / illicit mining	vi	Violation in the quarry during the past working	vii	Quantity of material mined out outside the mine lease area	viii	Condition of Safety zone / benches	ix	Revised / Modified mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	As it is a fresh lease area, the conditions are not applicable.
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2	Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.	The VAO certificate has been submitted in the Annexure IV.																		
3	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 100m, (ii) 100m, (iii) 200m and (iv) 300m (v) 500m shall be enumerated with the details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds,	The details about the structure within the radius of 100m, 200m, 300m, 500m is discussed in the Annexure V.																		

	etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	
4	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1km of the proposed quarry.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.34-45.
5	The proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	Details regarding Bio diversity is given in the Section 3.5 under Chapter III, pp.59-72.
6	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	The document will be submitted along with the final EIA report.
7	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining plan, the project proponent (PP) shall prepare and submit an 'Slope Stability Action plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director and mining during the time of appraisal for obtaining the EC.	The Slope Stability report is not required as it is a new lease area.
8	However, in case of the fresh/virgin quarries, the proponent shall submit a conceptual 'Slope Stability plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30m below ground level.	The condition is not applicable, it is a fresh lease quarry



9	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.		The affidavit for blasting has been enclosed in the approved mining plan report in Annexure III.
10	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.		A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.16-22.
11	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.		The condition is not applicable as the proposed quarry project is the only project in the name of project proponent Mr.T. Manoj Prabakar.
12	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.		
13	a.	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	As it is a fresh lease area, the conditions are not applicable.
14	b.	Quantity of minerals mined out.	
	c.	Highest production achieved in any one year	
	d.	Detail of approved depth of mining.	
	e.	Actual depth of the mining achieved earlier.	
	f.	Name of the person already mined in	

	that leases area.	
	g. If EC and CTO already obtained, the copy of the same shall be submitted.	
	h. Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
15	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3, under Chapter II, p.12.
16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	Drone video showing fencing and greenbelt development will be submitted in the final EIA report.
17	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs showing fencing, green belt have been included in Annexure V.
18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	The mineral reserves of the project have been discussed in Section 2.5 under Chapter II, pp.14-15. The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.82 - 100.

19	<p>The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.</p>	<p>Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.22.</p>
20	<p>The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping &amp; open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly – be shown whether working will intersect groundwater, Necessary data and documentation in this regard may be provided.</p>	<p>Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.34-45.</p>
21	<p>The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality &amp; flora/fauna including traffic/vehicular movement study.</p>	<p>The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III, pp. 23-81.</p>
22	<p>The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry</p>	<p>Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.111-115.</p>

	specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	
23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
24	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.24-33. The details of surrounding sensitive ecological features have been provided in Table 3.39 under Chapter III, p.80. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.18 & 19.
25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects	This condition is not applicable to this project because no dumps have been

	outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&R issues. If any, should be provided.	proposed outside the lease area.
26	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required' clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	This condition is not applicable to this project because this project is not located in proximity to the areas of areas declared as 'Critically Polluted' (or) the project areas which attracts the court restrictions for mining operations.
27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
28	Impact on local transport infrastructure due to the Project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III, pp.77-79.
29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III, pp.59-72.
30	A detailed mine closure plan for the proposed project shall be included in	A progressive mine closure plan has been attached with the approved mining plan

	EIA/EMP report which should be site-specific.	report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.19.
31	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.
32	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics A wide range of indigenous plant species should be planted as given in the <b>appendix-I</b> in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV, pp.95-96.
33	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities, botanist/Horticulture with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.

	project site with at least 3 meters wide and in between blocks in an organized manner.	
34	A Disaster management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII, pp.109-110.
35	A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII, pp.107.
36	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.97 & 98.
37	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.117 & 118.
38	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 24 people directly as discussed in Section 8.1 under

	indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Chapter VIII, p.116.
39	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.116-119.
41	If any quarrying operation were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	As it is new lease area, the condition is not applicable.
42	The PP Shall prepare the EMP for the entire life/lease period of mine and also Furnish the sworn affidavit starting to Abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X, pp.120-125. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted in the final EIA report.
43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal



	Environment (Protection) Act' 1986.	of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.
	<p>The subject was placed in the 644<sup>th</sup> Authority meeting held on 07.08.2023. The authority noted that the subject was appraised in the 394<sup>th</sup> SEAC meeting held on 21.07.2023.</p> <p>Based on the presentation and documents furnished by the project proponent, SEAC after detailed deliberations, detailed to recommend the proposal for the grant of Terms of Reference (ToR).</p> <p>After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions recommended by SEAC &amp; normal conditions in addition to the following conditions mentioned in 'Annexure B' of this minute.</p>	
	<b>Annexure 'B'</b>	
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.

4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 & 2.7 under Chapter II, pp.16-22.
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	The committee shall furnish an action plan	A proper action plan with reference to

	to achieve sustainable development goals with reference to water, sanitation & safety.	water, sanitation & safety will be devised and submitted by the committee to the respective authority.
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The committee will submit the fire safety and evacuation plan as discussed in Section 7.3 under Chapter VII, pp.109-110.
<b>Impact study of Mining</b>		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following	
	a) Soil health & soil biological, physical land chemical features.	Soil health and biodiversity have been discussed in Sections 3.1 and 3.5 respectively under Chapter III, pp.24-33 & pp.59-72.
	b) Climate change leading to Droughts, Floods etc.	Climatic condition of the proposed project area has been discussed in Section 3.3 under Chapter III, pp.45-55.
	c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local People.	The information about CO <sub>2</sub> emission has been added to Section 4.6 under Chapter IV, pp.95-96.
	d) Possibilities of water contamination and impact on aquatic ecosystem health.	Possibilities of both surface and ground water contamination have been discussed in Section 4.3 under Chapter IV, pp.83. The impact on aquatic species has been discussed in Section 4.6 under Chapter IV, pp.95 & 96.
	e) Agriculture, Forestry, & Traditional practices.	Sorgum, millet, groundnut, and coconut are the primary crops that are cultivated in the study area.

	f)	Hydrothermal/Geothermal effect due to destruction in the Environment.	The average geothermal gradient of earth is 25 <sup>0</sup> C/km. As the proposed depth of mining is 45 m below the local ground level, the temperature will increase by 1.125 <sup>0</sup> C at the depth of mining.
	g)	Bio-geochemical processes and its foot prints including environmental stress.	Data is not included.
	h)	Sediment geochemistry in the surface streams.	There is no river within 5km radius. The condition is not applicable.
<b>Agriculture &amp; Agro-Biodiversity</b>			
13		Impact on surrounding agricultural fields around the proposed mining area.	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, as shown in Section 4.6 under Chapter IV, pp.95 & 96.
14		Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III, pp.59-72. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
15		Details of type of vegetations including no. of trees & shrubs within the proposed mining area shall be given and if so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Details of vegetation in the lease area have been provided in Section 3.5 under Chapter III, pp.59-72. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.95-96.

16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III, pp.59-72 and measures have been provided in Section 4.6 under Chapter IV, pp.95-96.
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV, pp.82-100.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV, p.82.
<b>Forests</b>		
19	The project proponent shall study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV, pp.95-96.
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV, pp.95-96.
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site.	There are no protected areas, National Parks, Corridors and Wildlife pathways near project site. The list of environmentally sensitive areas within 10 km radius has been provided in Table 3.39 under Chapter III, p.80.

<b>Water Environment</b>		
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.34-45.
24	Erosion control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV, pp.83.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.82-100.
26	The project proponent shall study impact on fish habitats and the food WEB/food chain in the water body and Reservoir.	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.5.1 under Chapter 3, pp.60-67.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp.82-100.
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6

	on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	under Chapter IV, pp.95-96.
29.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, pp.82 -83.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV, pp.83.
<b>Energy</b>		
31	The measures taken to control Noise, Air, water, Dust control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures taken to control noise, air, water, and dust have been given under Chapter IV, pp. 82-100.
<b>Climate Change</b>		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV, pp.95-96.
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The matter has been discussed in Chapter IV, pp. 82-100.
<b>Mine Closure Plan</b>		
34	Detailed Mine closure plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget

		details for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.19.
<b>EMP</b>		
35	Detailed Environment Management plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X, pp.120-125.
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X, pp.120-125.
<b>Risk Assessment</b>		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII, pp.107-109.
<b>Disaster Management Plan</b>		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.109-110.
<b>Others</b>		
39.	The project proponent shall furnish VAO certificate with reference to 300 m radius	The VAO certificate has been submitted in the Annexure IV.



	regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc.	
40	As per the MoEF & CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management plan.	The concerns raised during public consultation will be submitted in the final EIA report.
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management will be included in the final EIA report
<b>STANDARD TERMS OF REFERENCE</b>		
1.	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable. This is not a violation category project. This proposal falls under B1 category.
2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	The proposed site for quarrying is a private land. A copy of the document showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure III.

3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents are in the name of the lessee.
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3, under Chapter II, p.12.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III, pp.23-81.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the	The Environmental Policy will be included in the final EIA report.

	<p>prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.</p>	
8.	<p>Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.</p>	<p>It is an opencast quarrying operation proposed to operate in Manual method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90<sup>0</sup> bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.</p>
9.	<p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.</p>	<p>The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste</p>

		generation etc., is for the life of the mine / lease period.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1, under Chapter III, pp.24-33. The details of surrounding sensitive ecological features have been provided in Table 3.39 under Chapter III, p.80. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, pp.18-19.
11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers.
12.	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for	It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.39 under Chapter III, p.80.

	representative of the State Forest Department to assist the Expert Appraisal Committees.	
13.	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	It is not applicable as the proposed project area does not involve any forest land.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable.  The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Reserve Forest is found within the study area. The matter has been discussed Section 3.5.1, under Chapter III, pp.60-67.
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.39 under Chapter III, p.80.

17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.39 under Chapter III, p.80.
18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under Chapter III, pp.59-72.
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court	Not Applicable.  Project area / Study area is not declared

	restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	in ‘Critically Polluted’ Area and does not come under ‘Aravalli Range.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable The project doesn't attract the C.R.Z. Notification, 2018.
21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R	Not Applicable. There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project Affected People (PAP) are not provided.

	and socio-economic aspects should be discussed in the Report.	
22.	One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	Baseline data were collected for the period of October – December 2023 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.8 under Chapter III, pp. 24-80.
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.84-90.



	the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	
24.	The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II, p.21.
25.	Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.	Not Applicable.  Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter

		IV, p.83.
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Not Applicable.  The ground water table is found at the depth of 65-70 m below ground level. The ultimate depth of quarry is 45 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2 under Chapter III, pp.34-45.
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable.  There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 200 m AMSL. Ultimate depth of the mine is 45 m BGL. Depth to the water level in the area is 65-70 m BGL.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up	Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.95-96.

	<p>front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.</p>	
32.	<p>Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.</p>	<p>Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III, pp.77 &amp; 79.</p>
33.	<p>Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.</p>	<p>Infrastructure &amp; other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.6 under Chapter II, pp.19-20.</p>
34.	<p>Conceptual post mining land use and Reclamation and Restoration of mined out</p>	<p>Progressive mine closure plan has been prepared for this project and is given in</p>

	areas (with plans and with adequate number of sections) should be given in the EIA report.	Section 2.6.4 under Chapter II, p.19.
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.97 - 98.
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.116 & 118.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 24 people directly as discussed in Section 8.1 under Chapter VIII, p.116.
38.	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.120-125.

39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be submitted during the final EIA report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs. 1,27,00,500/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs. 11228160 as capital cost and recurring cost as Rs. 3624430 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 31395334, as shown in Tables 10.1 & 10.2 under Chapter X, pp.120-125.
42	A disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.109-110.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.116-118.

44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project	Original Baseline monitoring reports will be submitted in the final EIA report.
e)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.
f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be submitted in the final EIA report.
g)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009 have been followed while preparing the EIA report.
h)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I	No changes are made in the basic scope and the project parameters.

	and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	
i)	As per the circular no. J-11011/618/2010-IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	As it is a new lease area, the condition is not applicable.
j)	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III.

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# CHAPTER I

## INTRODUCTION

### 1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> August 2018, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided in to B1 and B2 on the basis of the guidelines issued of the Ministry of Environment and Forests. All mining projects included in category B1 require an EIA report for obtaining environmental clearance from the State Environment Impact Assessment Authority (SEIAA). As the proposed project falls within the cluster of quarries of overall extent of greater than 5 ha and less than 50 ha in the case of non-coal mine lease, the proposed project falls under the category B1 and the project requires preparation and submission of an EIA report after public consultation to SEIAA for obtaining environmental clearance as per the order dated 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.

In compliance with ToR obtained vide Lr.No. SEIAA-TN/F.No.10158/ToR-1531/2023 Dated:07.08.2023, this EIA report has been prepared for the project proponent, Mr.T.Manoj Prabakar applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.683/2(Part) & 686/1(Part) over an extent of 4.11.5 ha in Kuppam 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 one Existing project E1 and one Expired project EX1. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1<sup>st</sup> July 2016. The total extent of all the quarries is 13.27.5 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 Quarries within the cluster area of 500 m radius**

<b>Proposed Quarries</b>					
<b>Code</b>	<b>Name of the Owner</b>	<b>S.F. No</b>	<b>Village</b>	<b>Extent (ha)</b>	<b>Status</b>
<b>P1</b>	Thiru.T.Manoj Prabakar	683/2 (Part), 686/1(Part)	Kuppam	4.11.50	Proposed Area
<b>P2</b>	Mr.M.Gunasekaran	710/3, 712/2	Kuppam	1.92.5	Applied Area
<b>P3</b>	M/s.Annai Blue Metals	682(Part)	Kuppam	1.92.0	Applied Area
<b>Existing Quarry</b>					
<b>E1</b>	Thiru.S.Krishnamurthy	679, 680/1 (Part)	Kuppam	01.95.5	04.07.2018 to 03.07.2023 Last permit obtained on 24.03.2022
<b>Expired Quarries</b>					
<b>EX1</b>	Tmt.S.Tamilselvi	706 Part	Kuppam	3.36.0	18.08.2017 to 17.08.2022 Last permit obtained on 21.07.2022
<b>Total Cluster Extent</b>				<b>13.27.5</b>	

**Source:**

*DD Letter - Rc.No.97/Mines/2023, Dated:19.06.2023.*

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

### **1.1 PURPOSE OF THE REPORT**

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **October-December2023** according to the provisions of

MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015, to analyse impacts and provide mitigation measures.

## **1.2 ENVIRONMENTAL CLEARANCE**

The Environmental Clearance process for the project will comprise of four stages. These stages are screening, scoping, public consultation & appraisal.

### ***Screening***

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/MIN/ 433804/2023, dated 19.06.2023) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 23.06.2023.

### ***Scoping***

The proposal was placed in the 394<sup>th</sup> meeting of SEAC on 21.07.2023. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

### ***Public Consultation***

In this stage, an application along with the draft of EIA and EMP report will be made to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing ensuring public participation at the project site or in its close proximity in the district. During public hearing, an opportunity will be given to the people living nearby the project site to express their opinions about the impact of the proposed project on the environment. The outcome of the public hearing meeting will be updated in the final EIA report for appraisal.

### ***Appraisal***

In this stage, an application along with final EIA report including the outcome of the public consultations will be made to the SEIAA. The application thus made will be scrutinized by the SEAC. Then, the SEAC will make recommendations to grant EC or reject the application to the SEIAA.

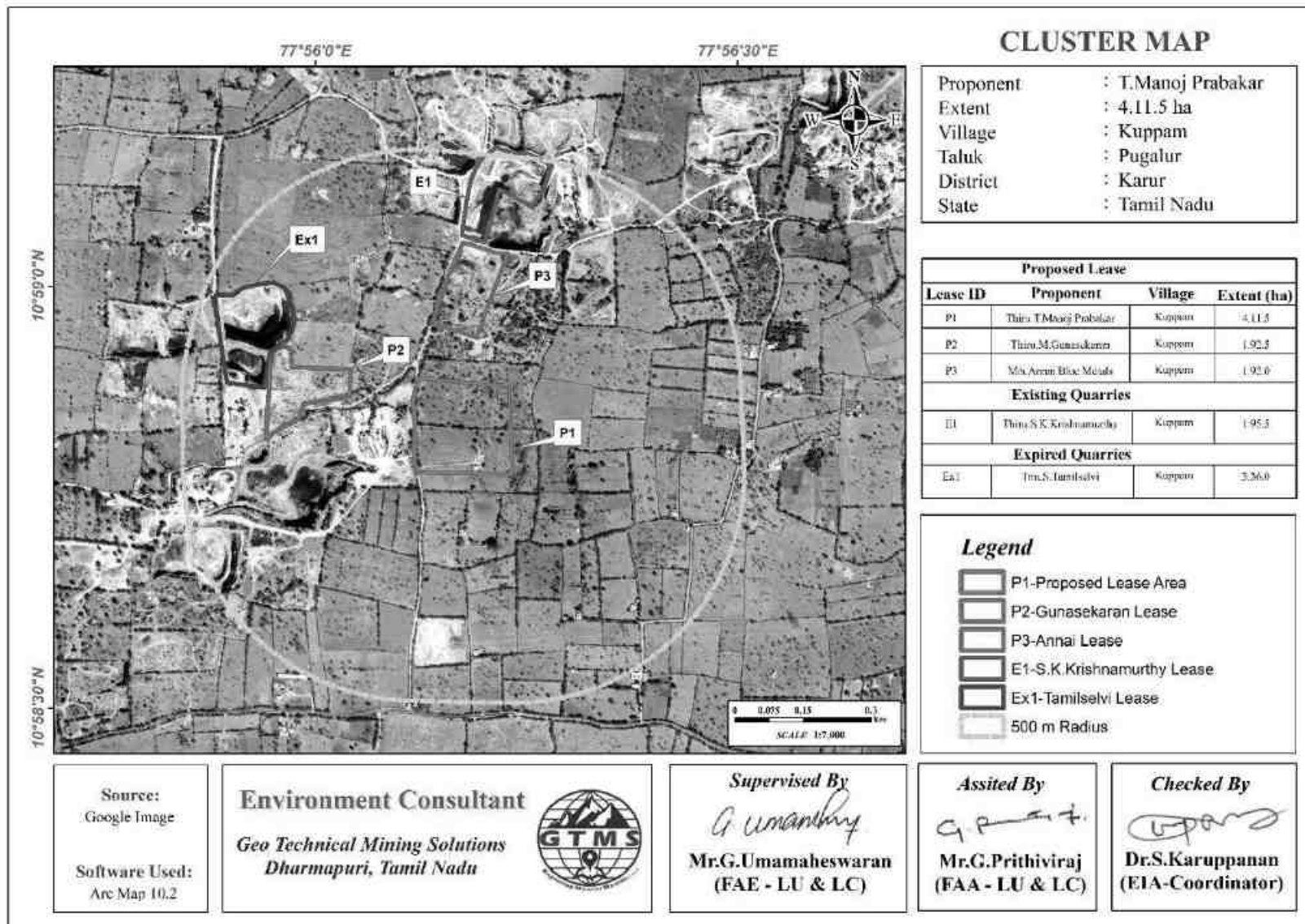


Figure 1.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

### 1.3 TERMS OF REFERENCE (ToR)

The SEAC framed a comprehensive Terms of Reference (TOR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued TOR to the proponent vide **Lr.No.SEIAA-TN/F.No.10158/ToR-1531/2023 Dated:07.08.2023.**

### 1.4 POST ENVIRONMENT CLEARANCE MONITORING

For category B projects, irrespective of its clearance by MoEF/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF website where it is displayed.

After obtaining EC, the project proponent will submit a half-yearly compliance report of stipulated environmental clearance terms and conditions to MoEF & CC Regional Office & SEIAA on 1<sup>st</sup> June and 1<sup>st</sup> December of every year.

### 1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written “no objection” by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period (EIA Guidance Manual for Mining of Minerals, 20).

### 1.6 IDENTIFICATION OF THE PROJECT PROPONENT

The profile of the project proponent who has involved in this quarrying project has been given in Table 1.2.

**Table 1.2 Details of Project Proponent**

<b>Name of the Project Proponent</b>	<b>Mr. T.Manoj Prabakar</b>
Address	S/o. Thirunavukkarasu Door.No.450-A, College Road, 3 <sup>rd</sup> Cross, Paramathivelur, Namakkal District – 638 182
Status	Proprietor

### 1.7 BRIEF DESCRIPTION OF THE PROJECT

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 Open Cast Semi Mechanized mining method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Kuppam Village, Pugalur



Taluk, Karur District, and Tamilnadu State. Some of the important features of the proposed project have been provided in Table 1.3.

**Table 1.3 Salient Features of the Proposed Project**

Name of the Quarry	Mr.T.Manoj Prabakar Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	4.11.5 Ha	
S.F. No	683/2 (Part) & 686/1 (Part)	
Toposheet No	58-F/13	
Location of Project Site	10° 58'46.65"N to 10° 58'53.45"N 77°56'6.93"E to 77°56'14.02"E	
Highest Elevation	200 m AMSL	
Proposed depth of Mining	45 m BGL	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
	1844370	204930
Mineable Reserves	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
	867900	173850
Proposed reserves for five years	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup> /1 year
	821400	173850
Method of Mining	Open-Cast Semi Mechanized mining	
Topography	Flat Topography	
Machinery proposed	Jack Hammer	4
	Compressor	1
	Tipper	8
	Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.	
Proposed Manpower Deployment	24 Nos	
Project Cost	Rs.1,27,00,500	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	4.0 KLD	

## **1.8 SCOPE OF THE STUDY**

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **October – December 2023** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

## **1.9 Legislation Applicable to Mining of Mineral Sector**

A few important legislations are given below:

- ❖ The Mines Act, 1952
- ❖ The Mines and Mineral (Development and Regulation) Act, 1957
- ❖ Mines Rules, 1955
- ❖ Mineral Concession Rules, 1960
- ❖ Mineral Conservation and Development Rules, 1988
- ❖ State Minor Mineral Concession Rules, 1960
- ❖ Granite Conservation and Development Rule, 1999
- ❖ The Water (Prevention and Control of pollution) Act, 1974
- ❖ The Air (Prevention and Control of pollution) Act, 1981
- ❖ The Environment (Protection) Act, 1986
- ❖ The Forest (Conservation) Act, 1988
- ❖ The Wildlife (Protection) Act, 1972.

## **CHAPTER II**

### **PROJECT DESCRIPTION**

#### **2.0 GENERAL INTRODUCTION**

The open cast mining method, also known as open-pit mining has been proposed to extract the mineral deposit. It is the most commonly used surface mining method all over the world and is generally suitable for mining low-grade mineral deposits that are found close to the surface of the earth and distributed uniformly over a large area. Open pits are also termed quarries when the pits are used for the extraction of building materials and dimension stones.

Opencast mining starts with the development of benches, the widths of which will be determined in such a way to accommodate the use of heavy machinery. The walls of open pits will be dug at an angle that will be decided based on well-established industry standards to provide safety. In some cases where the walls are composed of weak material such as soil and highly weathered rocks, dewatering holes will be drilled horizontally to relieve the water pressure to avoid wall collapse inside the mine site.

The required mine-related infrastructures will be established close to the open pit. The mining infrastructures may include an administration building, a maintenance garage, and a warehouse. The materials mined from open pits will be brought to the surface using trucks. The waste rocks will be piled up in a suitable location, usually close to the open pit. The structure produced by the waste rock pile is known as a waste dump. The dimension of the waste dump will be determined based on industrial safety standards to prevent the rocks from falling into the surrounding area.

#### **2.1 DESCRIPTION OF THE PROJECT**

The proponent, **Mr.T.Manoj Prabakar** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone and gravel. Therefore, the proponent had applied for quarry lease on 16.03.2023 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.97/Mines/2023 Dated:08.06.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Karur Rc.No.97/Mines/2023 Dated:30.05.2023. The overall view of the project site is shown in Figure 2.1.



**Figure 2.1 Overall View of Proposed Project Site**

## **2.2 LOCATION AND ACCESSIBILITY**

The proposed quarry project is located in Kuppam Village, Pugalur Taluk, Karur District as shown in Figure 2.2. The area lies between Latitudes from  $10^{\circ}58'46.65''\text{N}$  to  $10^{\circ}58'53.45''\text{N}$  and Longitudes from  $77^{\circ}56'6.93''\text{E}$  to  $77^{\circ}56'14.02''\text{E}$ . The maximum altitude of the project area is 200 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

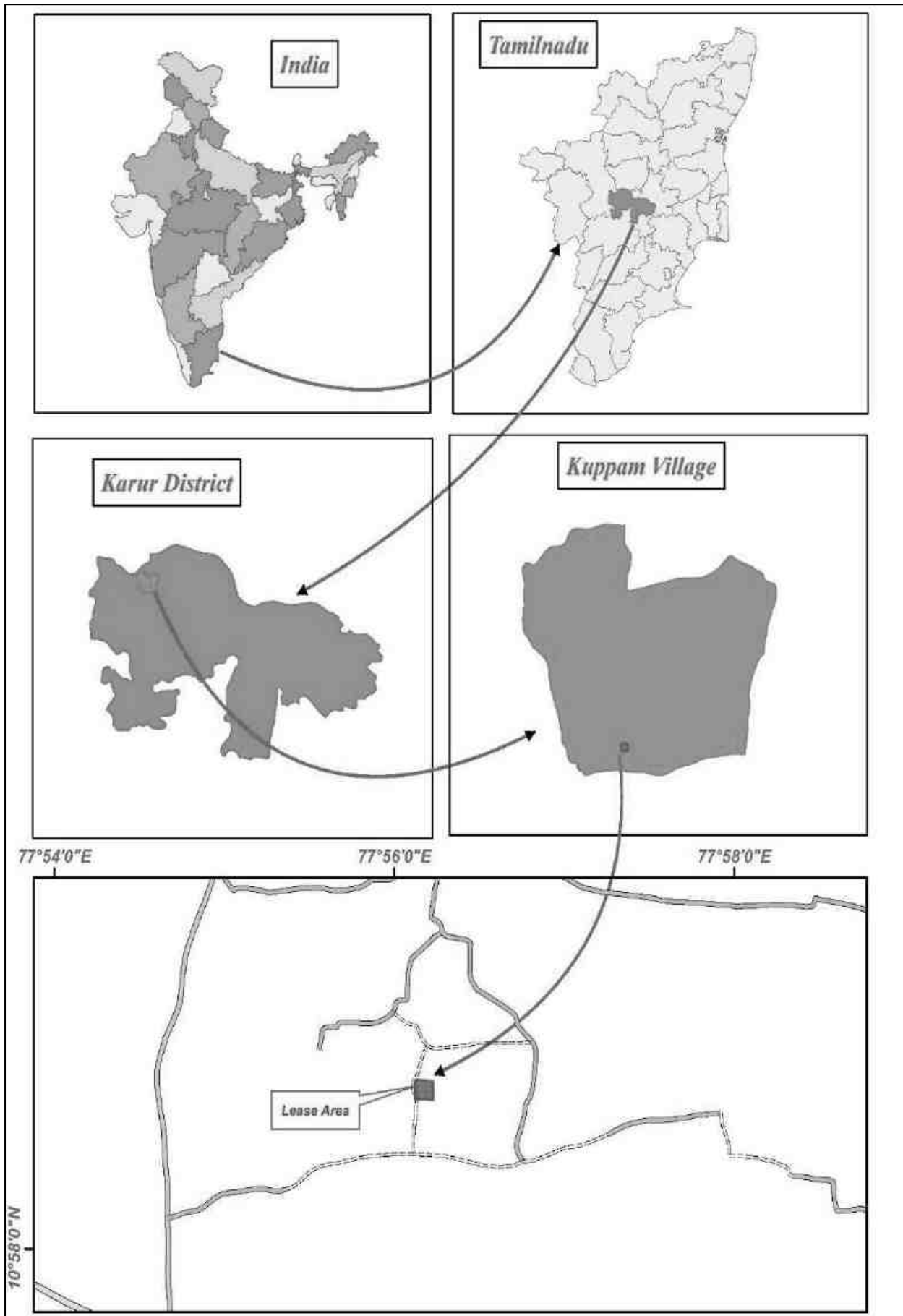


Figure 2.2 Key Map Showing Location of the Project Site

**Table 2.1 Site Connectivity to the Project Area**

Nearest Roadways	SH – 84 Noyal – Karur	5.30 km N
	NH – 81 Thennilai - Karur	2.25 km S
Nearest Town	Karudaiyampalayam	2.20 km SE
Nearest Railway Station	Noyal	8.56 km N
Nearest Airport	Trichy	96.7 km E
Nearest Seaport	Tuticorin	246 km S
Nearest Villages	Munnur	2.93 km NW
	Salipalayam	1.52 km N
	Thalaiyeethupatti	2.28 km NE
	Karudayampalayam	2.23 km SE

**2.3 LEASEHOLD AREA**

- ❖ The extent of the proposed project site is 4.11.5 ha.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

**2.3.1 Corner Coordinates**

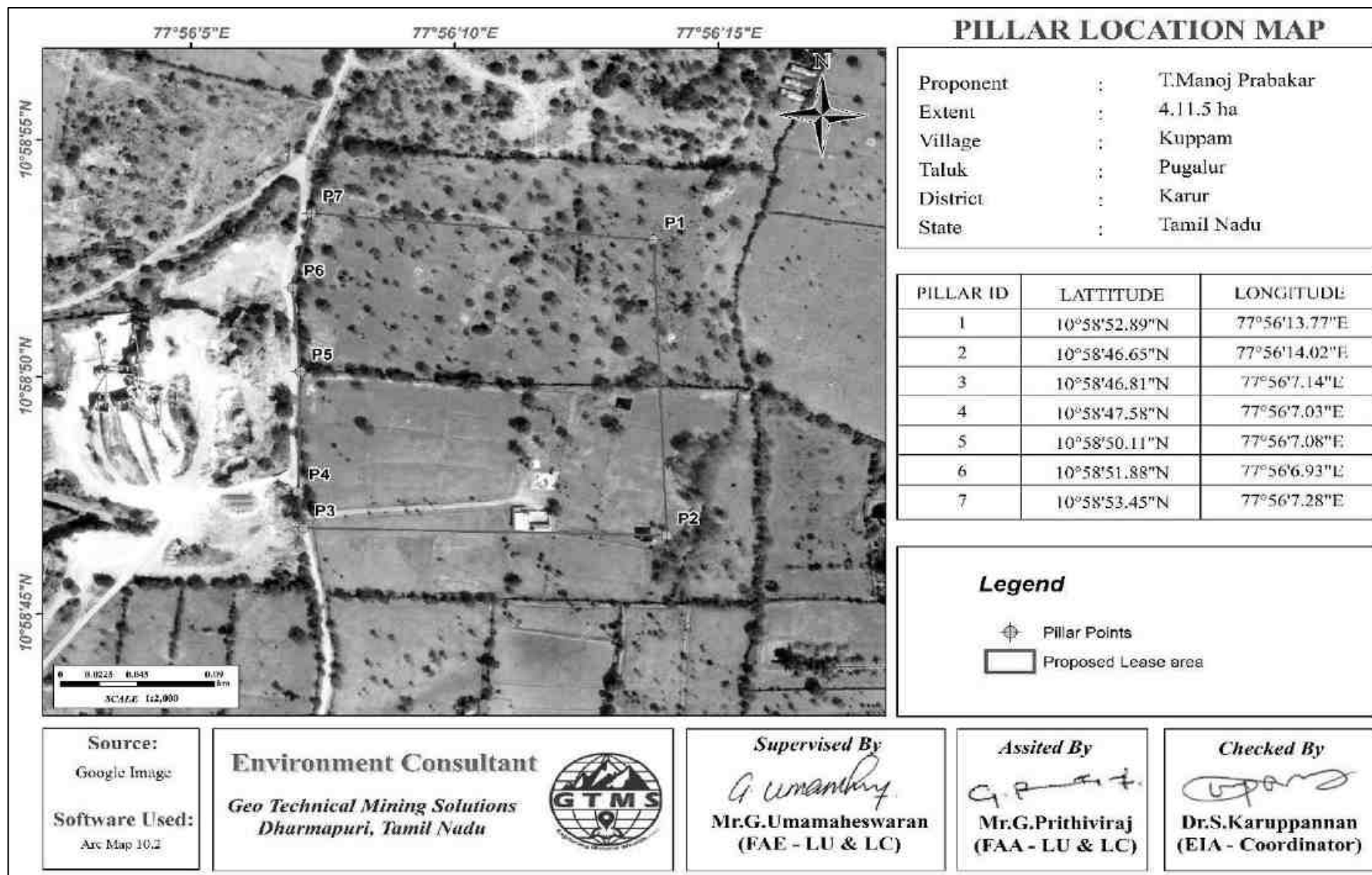
The boundary corner geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.3.

**Table 2.2 Corner Coordinates of Proposed Project**

Pillar ID	Latitude	Longitude
1	10°58'52.89''N	77°56'13.77''E
2	10°58'46.65''N	77°56'14.02''E
3	10°58'46.81''N	77°56'07.14''E
4	10°58'47.58''N	77°56'07.03''E
5	10°58'50.11''N	77°56'07.08''E
6	10°58'51.88''N	77°56'06.93''E
7	10°58'53.45''N	77°56'07.28''E

**2.4 GEOLOGY**

The lease area geologically occurs Hornblende–Biotite Gneiss. The Charnockite, commercially called as Roughstone occurs within the migmatite rock. Also, the lease area geomorphologically occurs pediment pediplain complex.



**Figure 2.3 Google Earth Image Showing Lease Area with Pillars**

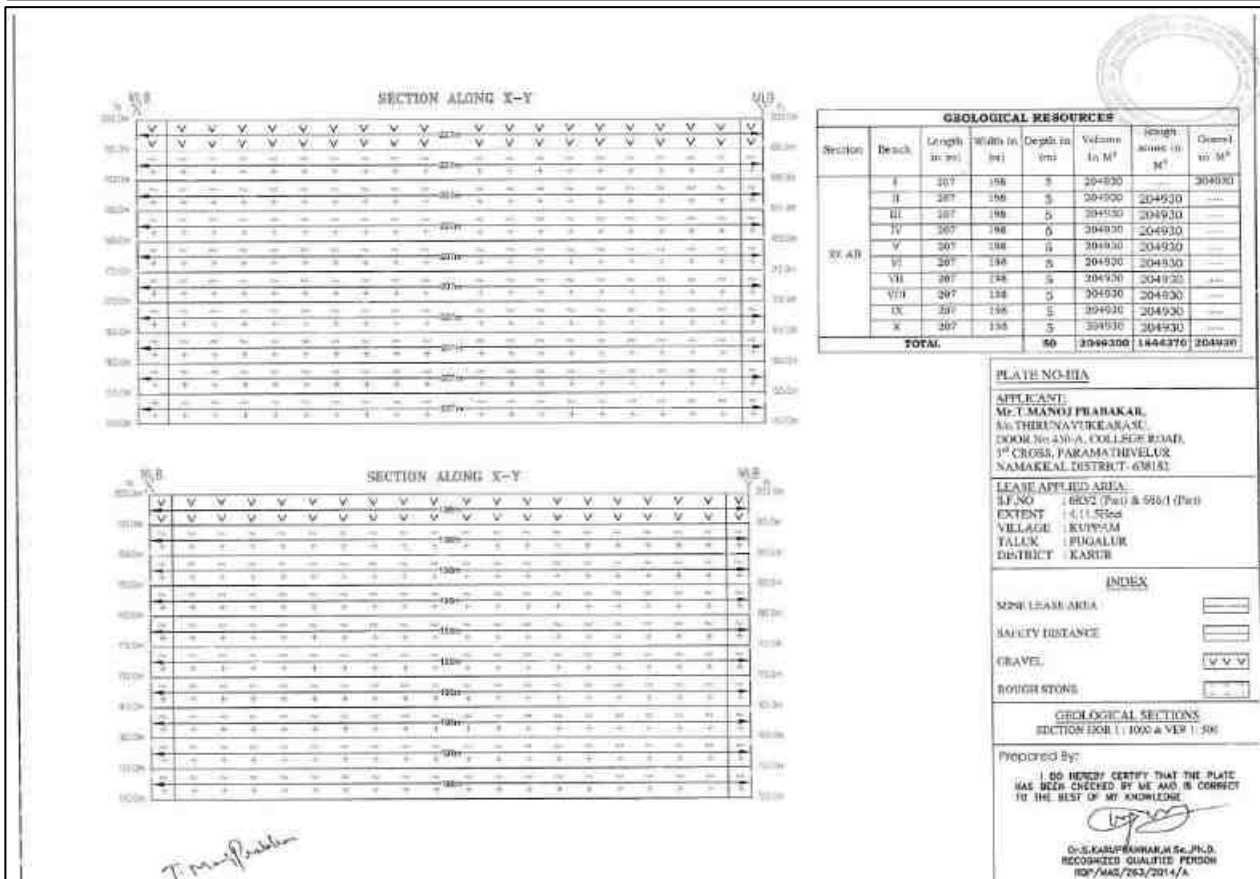
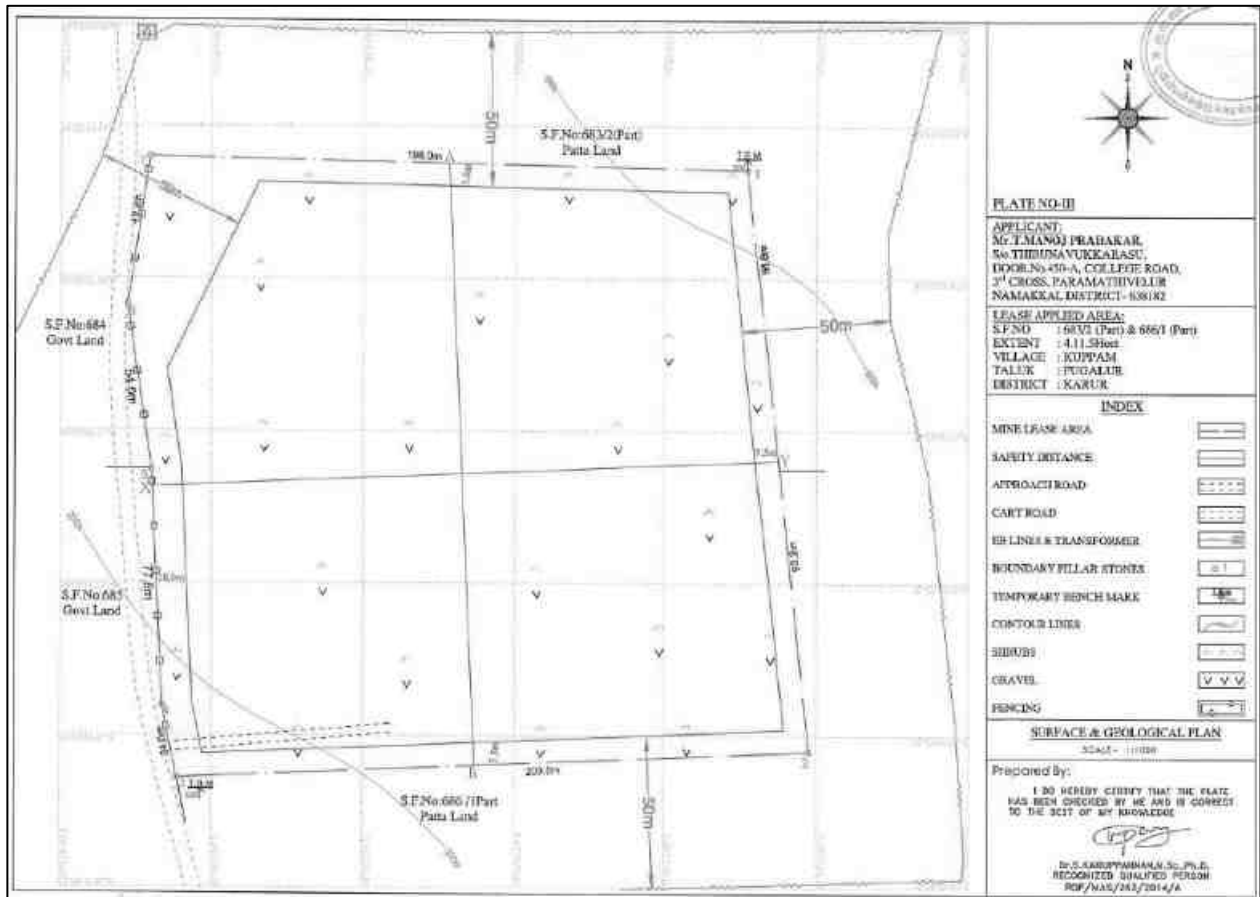


Figure 2.4 Surface, Geological Plan and Sections



## 2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5m and 10m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 45m considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.4 results of geological resources and reserves have been shown in Table 2.3.

**Table 2.3 Estimated Resources and Reserves of the Project**

<b>Resource Type</b>	<b>Rough Stone in m<sup>3</sup></b>	<b>Gravel in m<sup>3</sup></b>
Geological Resource in m <sup>3</sup>	1844370	204930
Mineable Reserves in m <sup>3</sup>	867900	173850
Proposed production for 5 years m <sup>3</sup>	821400	173850

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.5.

**Table 2.4 Year-Wise Production Details**

<b>Year</b>	<b>Rough Stone in (m<sup>3</sup>)</b>	<b>Gravel in (m<sup>3</sup>) / 1 year</b>
I	123250	64050
II	146700	54900
III	146700	54900
IV	200350	---
V	204400	---
<b>Total</b>	<b>821400</b>	<b>173850</b>

*Source: Approved Mining Plan & Tord*

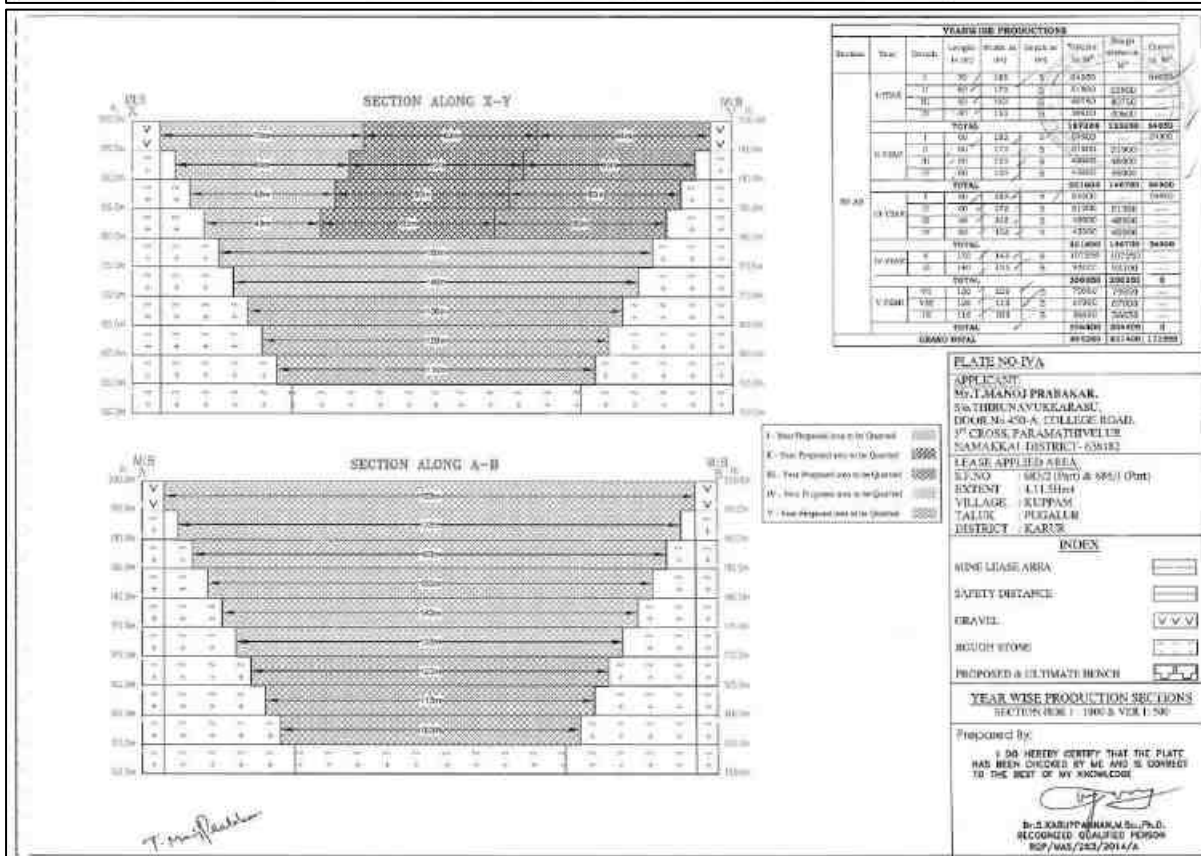
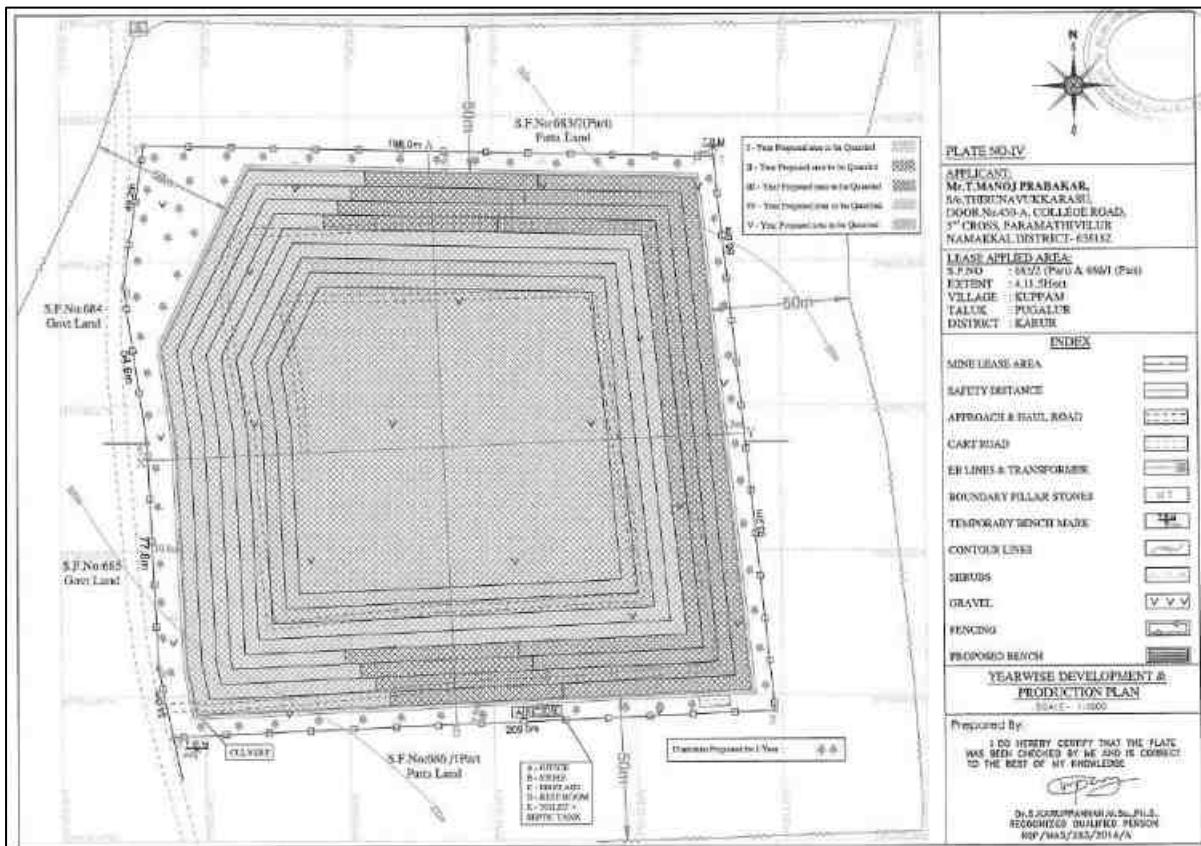


Figure 2.5 Year wise Development, Production Plan & Sections

## 2.6 MINING METHOD

The Quarrying operation is proposed to be carried out by open cast semi-mechanized mining method with the bench height and width of 5 m each. The open cast semi-mechanized method involving drilling and blasting is proposed to extract rough stone and gravel. The extracted rough stone will be loaded manually to the trucks for dispatch to the customers. In this project, NONEL blasting will be adopted to extract rough stone.

### Conceptual Blasting Design

In this project, NONEL blasting will be employed to win rough stone. This method will involve closed spaced perimeter holes to reduce the overbreak/backbreak on a blast. The objective of the blasting design is to prevent fly rocks from damaging the nearby structures.

### Rules of Thumb for Blast Design

Based on practical experience and technical information, a set of rules for blasting have been provided as below ([Chapter8 \(nps.gov\)](#)). These rules will be applied to blast rocks in the proposed project.

**Rule 1: The detonation velocity (VOD) of the explosive should be close to the same value of the sonic velocity (VSO) of the rock to be blasted.**

The sonic velocity of a rock is considered to be a reliable indicator of its structural integrity and resistance to fragmentation. As the VOD of the explosive approaches close to the VSO of the rock, the blasting would result in relatively smaller size of fragmentation with uniformity. There is no value in using an explosive that has a VOD greatly in excess of the VSO of the rock, since there is little or no improvement in fragmentation above the VSO. When selecting an explosive to match up the VSO of a rock mass, variance of <10% in the velocities is acceptable.

**Rule 2: Generally, select the densest explosive possible.**

When the density of explosives is higher, the potential energy of the explosives can be greater and the more of it can be placed within a borehole of a given size.

**Rule 3: Select explosives according to the characteristics of the rock formation to be blasted.**

When planes of separation in the rock are smaller than the degree of fragmentation required, the rock can often be blasted by using lower density and lower detonation velocity explosives.

**Rule 4: When using slurry or water gel explosives, always determine the critical temperature below which the explosive will fail to reliably detonate.**

Almost all slurry explosives have a critical temperature below which they may not detonate, or may not sustain detonation in elongated columns. The explosives should not be used when the temperature of the explosive at time of loading is below that critical temperature.

**Rule 5: The distance between holes (spacing) should not be greater than one-half the depth of the borehole.**

When the distance between holes in a row is greater than one-half the depth of the hole, the angles of breakage intersect above the bottom of the holes. This causes both a great deal of vertical throw and a very uneven bottom.

**Rule 6: Stemming should be equal to the burden.**

Stemming is useful to confine and maximize efficient use of the explosive's energy. It also reduces noise as much as possible. If the stemming is greater than the burden, the rock at the top of the borehole will have less cracking from reflection and refraction of compressive and tensile waves. Therefore, stemming should be equal to burden. Drill fines can be used for loading the borehole.

**Rule 7: Subdrill (if necessary) should be between 0.3 and 0.5 of spacing/burden.**

Subdrill should be equal to 0.3 of burden. It will work when there is row-for-row delay. In blasts where the delay system is both row-for-row and hole-for-hole, the subdrill should be determined by the largest dimension, which can be the spacing or the burden. An average subdrill of 0.4 of spacing is best to use for planning purposes. Based on the above-mentioned rules, blasting design has been conceptualized and has been provided in Table 2.5.

**Table 2.5 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 m <sup>3</sup>	4.16
Production of rough stone/day in m <sup>3</sup>	608
Number of blastholes/day	146

Blasthole pattern	Staggered / Rectangular
Mass of explosive /day in kg	58.55
Powder factor in kg/m <sup>3</sup>	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

### 2.6.1 Magnitude of Operation

Based on the results of estimated production for the 5 years, details about the size of operation have been provided in Table 2.6.

**Table 2.6 Operational Details for Proposed Project**

	<b>Rough Stone in m<sup>3</sup> 5 years</b>	<b>Gravel in m<sup>3</sup> 3 years</b>
Proposed production for 5 years	821400	173850
Number of Working Days /Annum	270	270
Production of /Day (m <sup>3</sup> )	608	215
No. of Lorry Loads	101	36

### 2.6.2 Extent of Mechanization

List of machineries proposed for the quarrying operation is given in Table 2.7.

**Table 2.7 Machinery Details**

S. No.	Type	No of Unit	Size /Capacity	Make	Motive Power
1	Jack Hammers	4	Hand held	--	Diesel Drive
2	Compressor	1	Air	--	Diesel Drive
3	Hydraulic Excavator	1	2.9-4.5 m <sup>3</sup>	--	Diesel Drive
4	Tipper	8	--	--	Diesel Drive

### 2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan (Figure 2.6) of the proposed project shows past, present, and future land use statistics. According to the land use results, as shown in Table 2.8 At Present about 4.11.5 ha of land is unutilized, Whereas, at the end of the mine life, about 0.51.7 ha of land is used for green belt and 0.11.0 will be used for roads and 0.02.0 is used for infrastructure and 3.38.8 ha of land is used for area under mining.

**Table 2.8 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 mining	Nil	3.38.8
Infrastructure	Nil	0.02.0

Road	Nil	0.11.0
Green Belt	Nil	0.51.7
Drainage & Settling Tank	Nil	0.08.0
Unutilized area	4.11.5	Nil
<b>Total</b>	<b>4.11.5</b>	<b>4.11.5</b>

#### 2.6.4 Progressive Quarry Closure Budget

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, mine closure plan is not proposed for now. Based on the progressive mine closure plan for the scheme period, the mine closure cost is given in Table 2.9.

**Table 2.9 Mine Closure Budget**

Activity	Capital Cost
823 plants inside the lease area	164600
1235 plants outside the lease area	370350
Wire Fencing	823000
Renovation of Garland Drain	41150
<b>Total</b>	<b>13,99,100</b>

*Source: Environment Management Plan*

#### 2.6.5 Conceptual Mining Plan

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc. Details of ultimate pit dimensions have been derived from given in Table 2.10.

**Table 2.10 Ultimate Pit Dimension**

Pit	Length (m)	Width (m) (Max)	Depth (m)
I	190	183	50

*Source: Approved Mining Plan & ToR*

#### 2.6.6 Infrastructures

Infrastructures like mines office, temporary rest shelters for workers, latrine and urinal facilities have been proposed as per the mine rule and will be established after the grant of quarry lease. There is no proposal for the mineral processing or ore beneficiation plants in this project.

##### 2.6.6.1 Other Infrastructure Requirement

No workshops are proposed inside the project area. Hence, there will not be any process effluent generation from the proposed lease area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. As there is no toxic effluent expected to generate in the form of solid, liquid or gaseous form, there is no requirement of waste treatment plant.

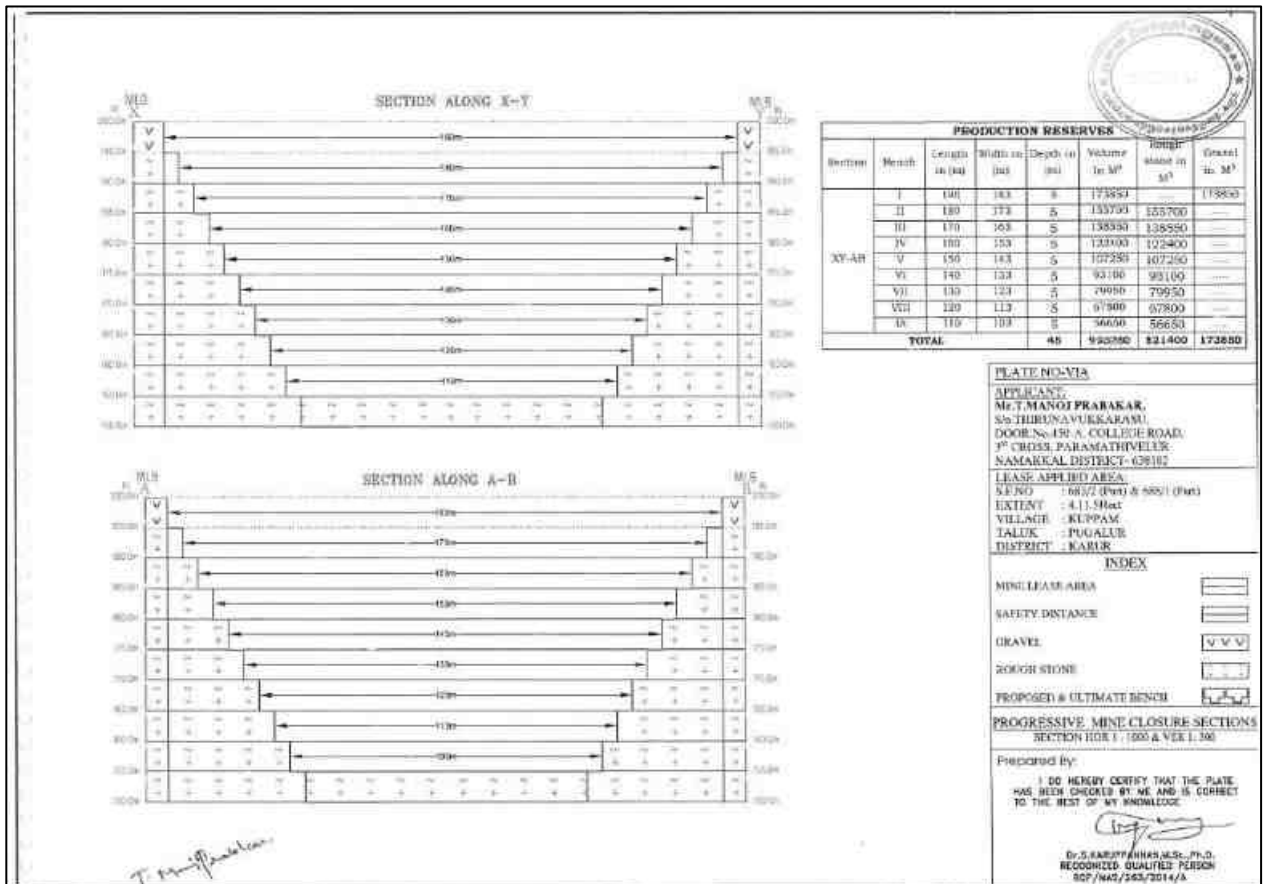
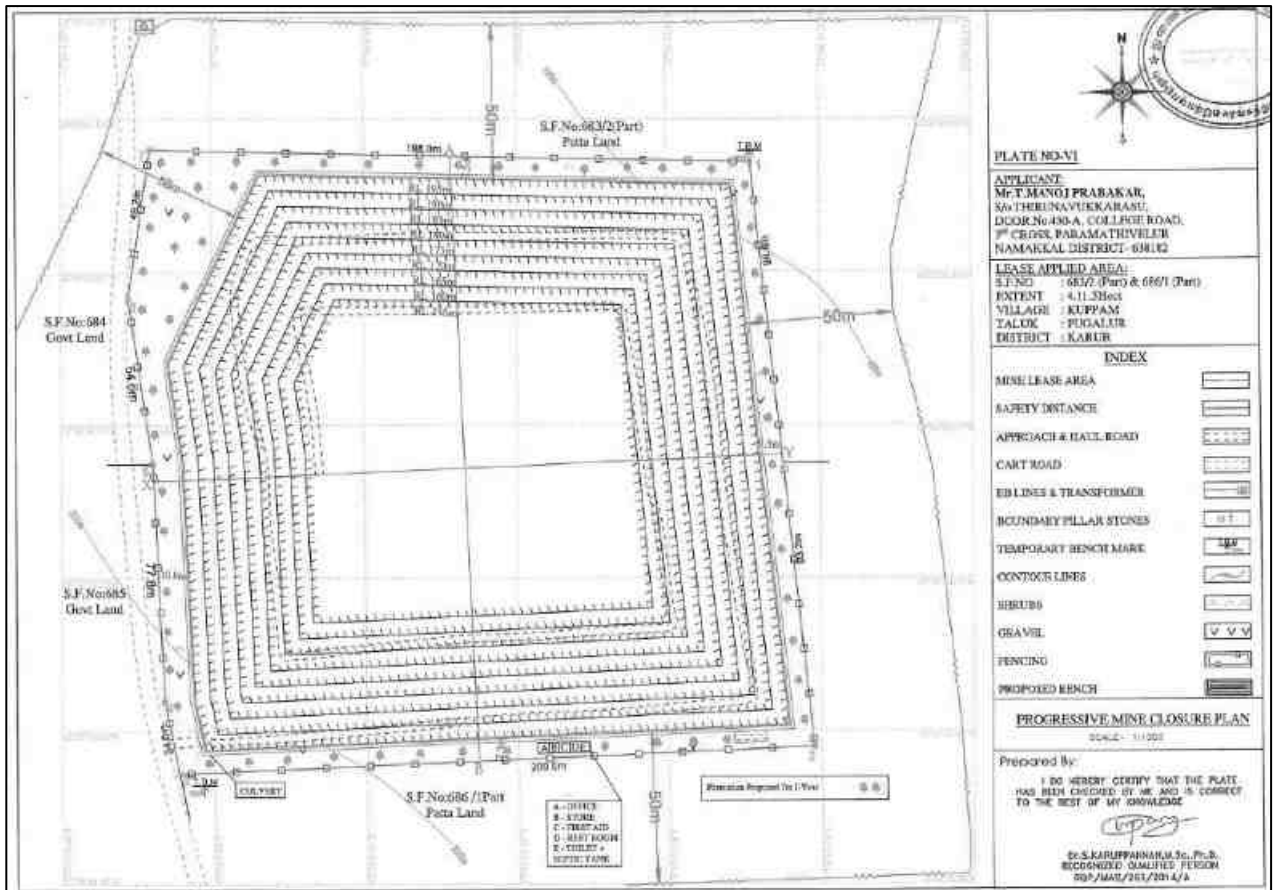


Figure 2.6 Progressive Mine Closer Plan and Sections

## 2.6.7 Water Requirement

Detail of water requirement in KLD is given in Table 2.11.

**Table 2.11 Water Requirement for the Project**

Purpose	Quantity	Source
Dust Suppression	1.5 KLD	Existing bore wells nearby the lease area
Green Belt development	1.5 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.0 KLD	Existing bore wells and approved water vendors
<b>Total</b>	<b>4.0 KLD</b>	

*Source: Prefeasibility Report*

## 2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 40,82,435 litres of HSD will be used for rough stone and gravel extraction during this 5 years plan period. The diesel will be brought to the site from nearby diesel pumps.

**Table 2.12 Fuel Requirement Details**

<b>Fuel Requirement for Excavator</b>			
Details	Rough Stone (821400 m <sup>3</sup> )	Gravel (173850 m <sup>3</sup> )	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m <sup>3</sup> /hr)	20	60	---
Time Required (hours)	41070	2898	---
Total Diesel Consumption for 5 years (litre)	657120	28975	<b>686095</b>
<b>Fuel Requirement for Compressor</b>			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	146	---	---
Total Diesel Consumption for 5 years (litre)	78840	---	<b>78840</b>
<b>Fuel Requirement for Tipper</b>			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m <sup>3</sup>	6	6	---
Number of Trips / days	101	21*	---
Number of Trips / 5 years	136900	28975	---
Total Diesel Consumption for 5 years (litre)	2738000	579500	<b>3317500</b>
<b>Total Diesel Consumption by Excavator, Compressor and Tipper</b>			<b>40,82,435</b>

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



## 2.6.9 Capital Requirement

The project proponent will invest **Rs.1,27,00,500/-** to the project. The breakup summary of the investment has been given in Table 2.13.

**Table 2.13 Capital Requirement Details**

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	63,38,000/-
2	Machinery cost	30,00,000/-
3	EMP Cost	33,62,500/-
<b>Total Project Cost</b>		<b>1,27,00,500/-</b>

*Source: Approved Mining Plan*

## 2.7 MANPOWER REQUIREMENT

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community. Number of employees required for this project have been provided in Table 2.14.

**Table 2.14 Employment Potential for the proposed project**

S. No.	Category	Role	Nos.
1.	Highly Skilled	Mine manager	1
		Mine Engineer	1
		Mine Geologist	1
		Blaster	1
2.	Unskilled	Musdoor/ Labours	20
<b>Total</b>			<b>24</b>

*Source: Feasibility Report*

## 2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the Tamil Nadu State Pollution Control Board. The conditions imposed during the environmental clearance will be compiled before the start of mining operation. Expected time schedule for the quarrying operation is given Table 2.15.

**Table 2.15 Expected Time Schedule**

S. No.	Particulars	Time Schedule (in Months)					Remarks if any
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
1	Environmental Clearance						
2	Consent to Establish						Project Establishment Period
3	Consent to operate						Production starting period.
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

*Source: Anticipated based on Timelines framed in EIA Notification & CPCB Guidelines*

**CHAPTER III**  
**DESCRIPTION OF THE ENVIRONMENT**

**3.0 GENERAL**

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **October through December 2023** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Excellence Laboratory for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

***Study Area***

The study area has been divided into two zones: core zone and buffer zone. Core zone is considered as lease area and buffer zone as 5 km radius from the periphery of the cluster, except for ecological study, which considers 10 km as buffer zone. Both core and buffer zones are taken as the study area. The data was collected from the study area to understand the existing environment conditions of the above-mentioned environmental components. Sampling methodologies for the various environmental parameters, including frequency of sampling, method of sample analysis, etc., are briefly given in Table 3.1.

**Table 3.1 Monitoring Attributes and Frequency of Monitoring**

<b>Attribute</b>	<b>Parameters</b>	<b>Frequency of Monitoring</b>	<b>No. of Locations</b>	<b>Protocol</b>
Land Use/ Land Cover	Land-use Pattern within 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico- Chemical characteristics	Once during the study period	7 (1 in core & 6 in buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and	Once during the study period	6 (6 ground water)	IS 10500& CPCB Standards

	Bacteriological Parameters			
Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/automatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub>	24 hours, twice a week	8 (1 core & 7 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	8 (1 core & 7 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, Population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

*\*All monitoring and testing have been carried out as per the Guidelines of CPCB and MoEF & CC.*

### 3.1 LAND ENVIRONMENT

#### 3.1.1 Geology and Geomorphology

Study area is mainly composed of hornblende-biotite genesis and phroxene granulite, as shown in Figure 3.1. The lease area occurs in migmatite terrain.

Among the geomorphic units, shallow weathered/buried pediment and pediplain dominate the study area, as shown in Figure 3.2. The lease area occurs in shallow weathered/buried pediplain terrain.

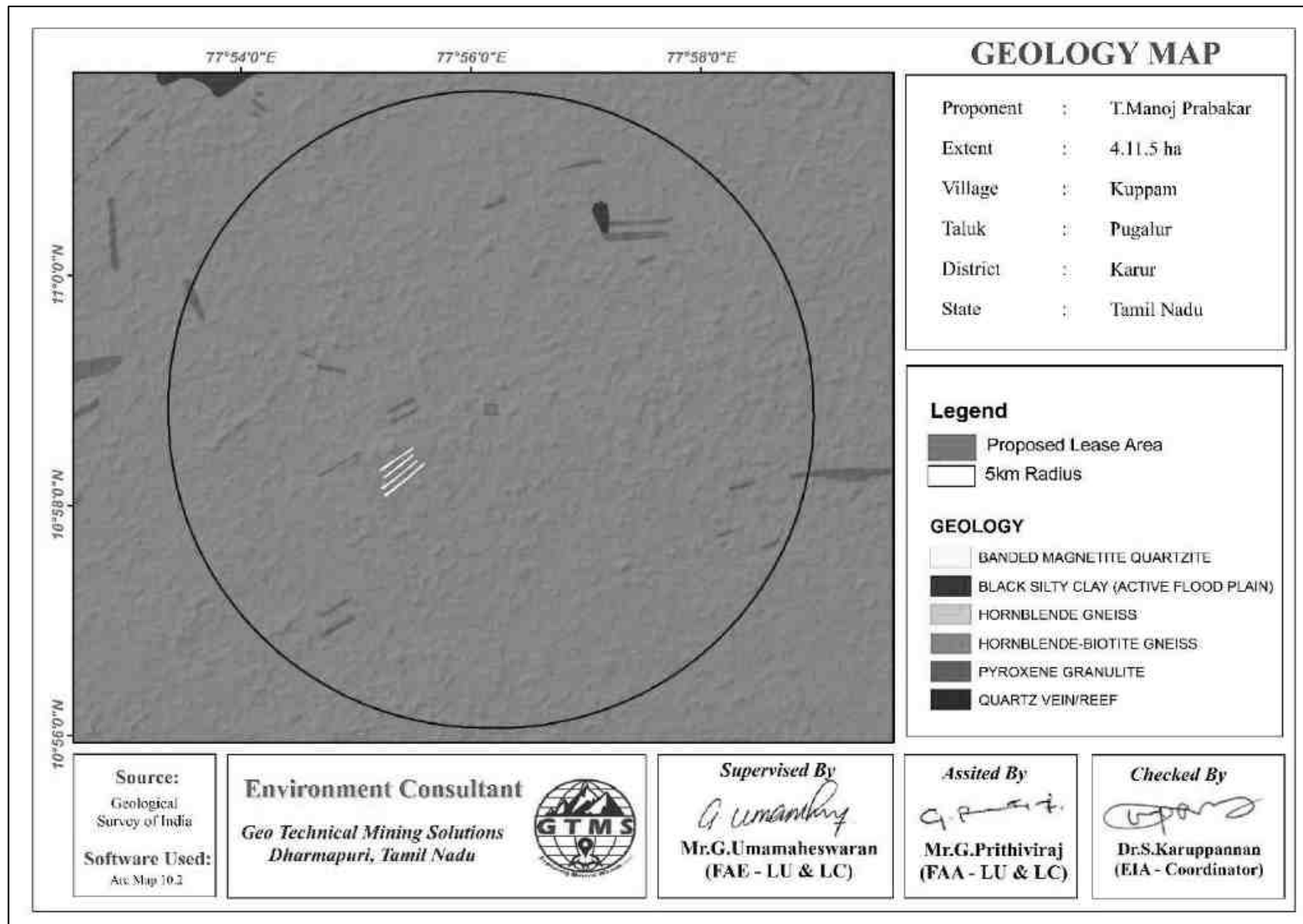


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

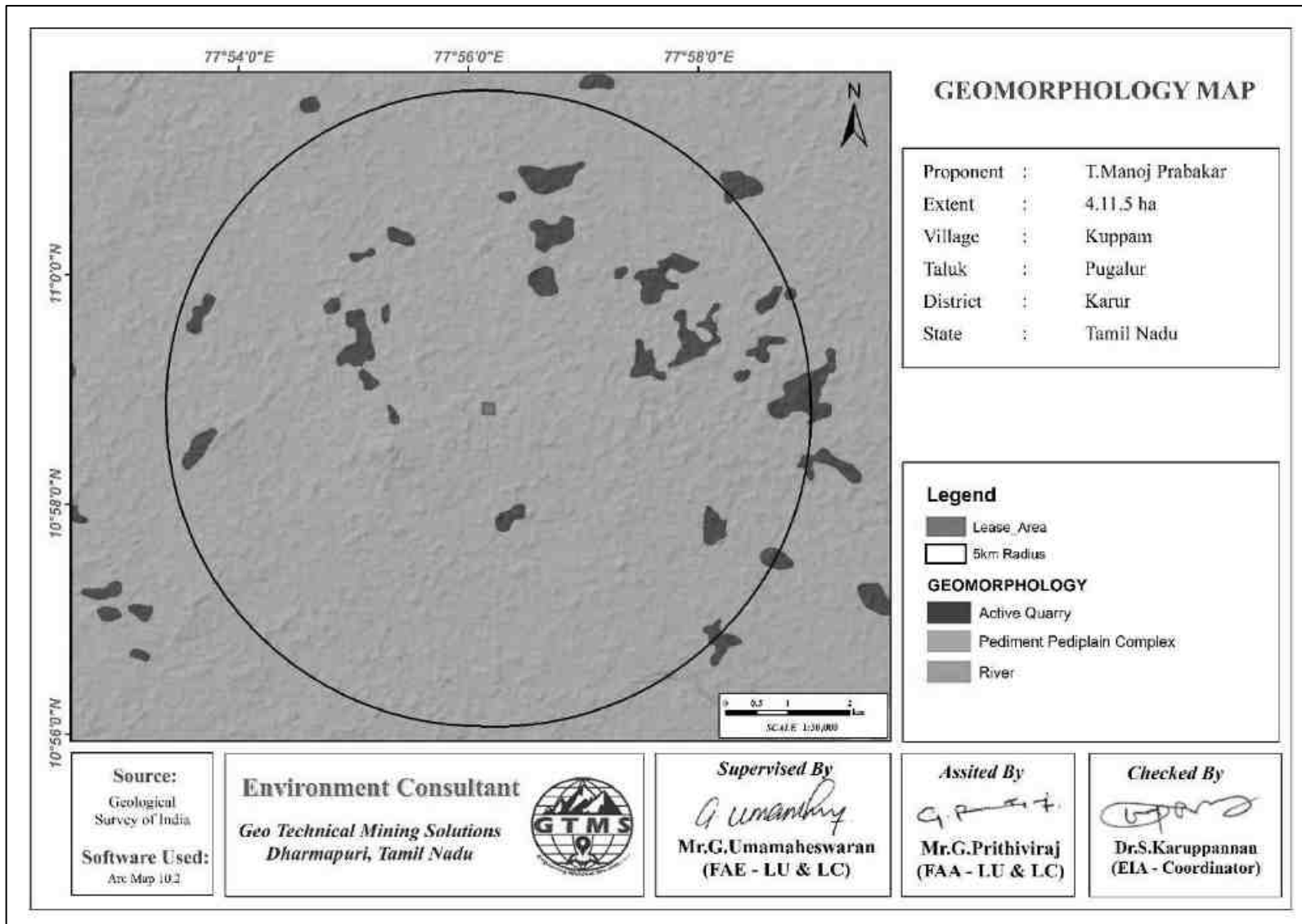


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site

### 3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 5 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 182.57 ha accounting for 2.35 %, of which lease area of 4.11.5 ha contributes only about 0.052 %. This small percentage of mining activities shall not have any significant impact on the land environment.

**Table 3.2 LULC Statistics of the Study Area**

S. No.	LU/LC Type	Extend (ha)	Percentage
1	Crop Land	6957.50	89.59
2	Dense Forest	85.47	1.10
3	Land with/without scrub	52.74	0.68
4	Mining/Industrial lands	182.57	2.35
5	Plantations	488.03	6.28
<b>Total</b>		<b>7766.31</b>	<b>100.0</b>

Source: Sentinel II Satellite Imagery

### 3.1.3 Topography

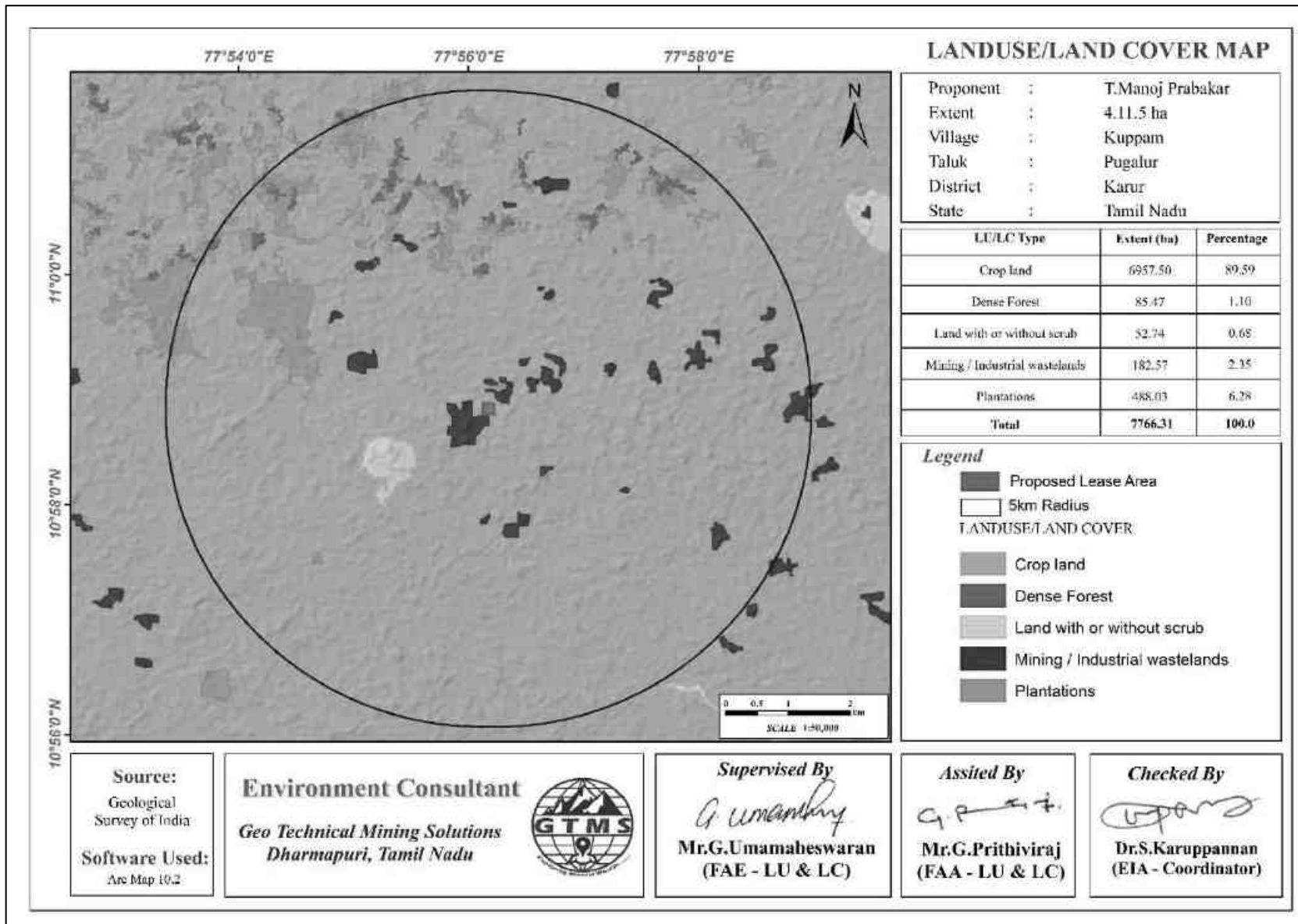
The proposed lease area is located in a flat terrain with an altitude range of 200 m AMSL.

### 3.1.4 Drainage Pattern

Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin over time that reveals characteristics of the kind of rocks and geological structures in a landscape. The proposed area shows dendritic drainage pattern indicating uniform lithology beneath the surface, as shown in Figure 3.4.

### 3.1.5 Seismic Sensitivity

The proposed lease area is situated in a Seismic Zone II, as defined by National Center for Seismology ([Official Website of National Centre of Seismology](#)). The Zone II is defined as the region where only minor damage is expected from seismic events. In this respect, the proposed lease area is located in a low earthquake hazard area.



**Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site**

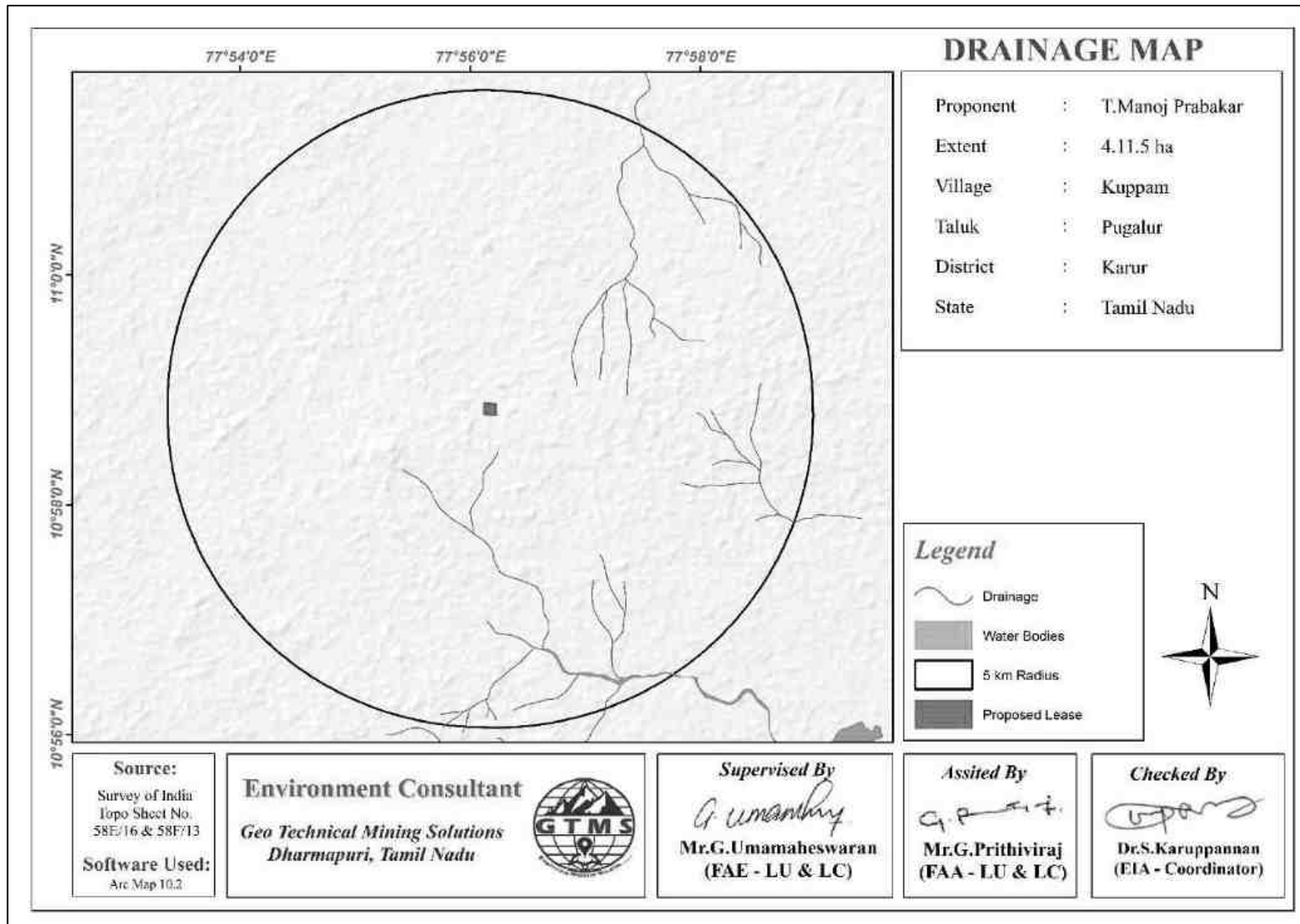


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site



### 3.1.6 Soil

Composite soil samples were collected from 7 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

**Table 3.3 Soil Sampling Locations**

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	S01	Core	--	--	10°58'48.28"N 77°56'9.36"E
2	S02	Munnur	3.17	NW	10°59'13.87"N77°54'25.10"E
3	S03	Kuppam	3.70	NW	11° 0'45.84"N 77°55'23.83"E
4	S04	Uppupalayam	4.47	NE	11° 0'40.39"N 77°57'52.96"E
5	S05	Vairapuram	3.09	E	10°58'56.01"N77°57'55.53"E
6	S06	Nedungur	3.80	S	10°56'44.79"N77°56'34.36"E
7	S07	K Paramathy	3.65	SW	10°57'17.75"N77°54'47.69"E

Source: On-site monitoring/sampling Excellence Laboratory, in association with GTMS.

#### **Physical Characteristics**

The soil samples in the study area sandy loam textures varying between, silty loam and sandy loam. pH of the soil varies from 6.7 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 155 to 232  $\mu\text{S}/\text{Cm}$ . Bulk density ranges between 1.6 and 3.2  $\text{g}/\text{cm}^3$ .

#### **Chemical Characteristics**

Nitrogen ranges between 1.01 and 2.45 %. Potassium ranges between 1.4 and 2.4 %. Calcium ranges between 245 and 326 mg/kg. Organic matter content ranges between 1.2. and 2.3 %. Manganese ranges between 1.62 and 2.45 mg/kg.

#### **Soil erosion**

The soil erosion map shows in Figure 3.6 that there is no soil erosion in the mining lease area and moderate soil erosion in the southwest part of the lease area.

#### **Soil Quality Assessment**

Soil quality is the foundation of sustainable crop production. Soil quality assessment helps to understand soil conditions and adopt suitable production practices. It can be done using physical, chemical, and biological properties of soil. For this assessment, four soil quality parameters including PH, EC, OM, CEC and BD were taken into account. The soil quality score for each sample has been provided in Table 3.4a.

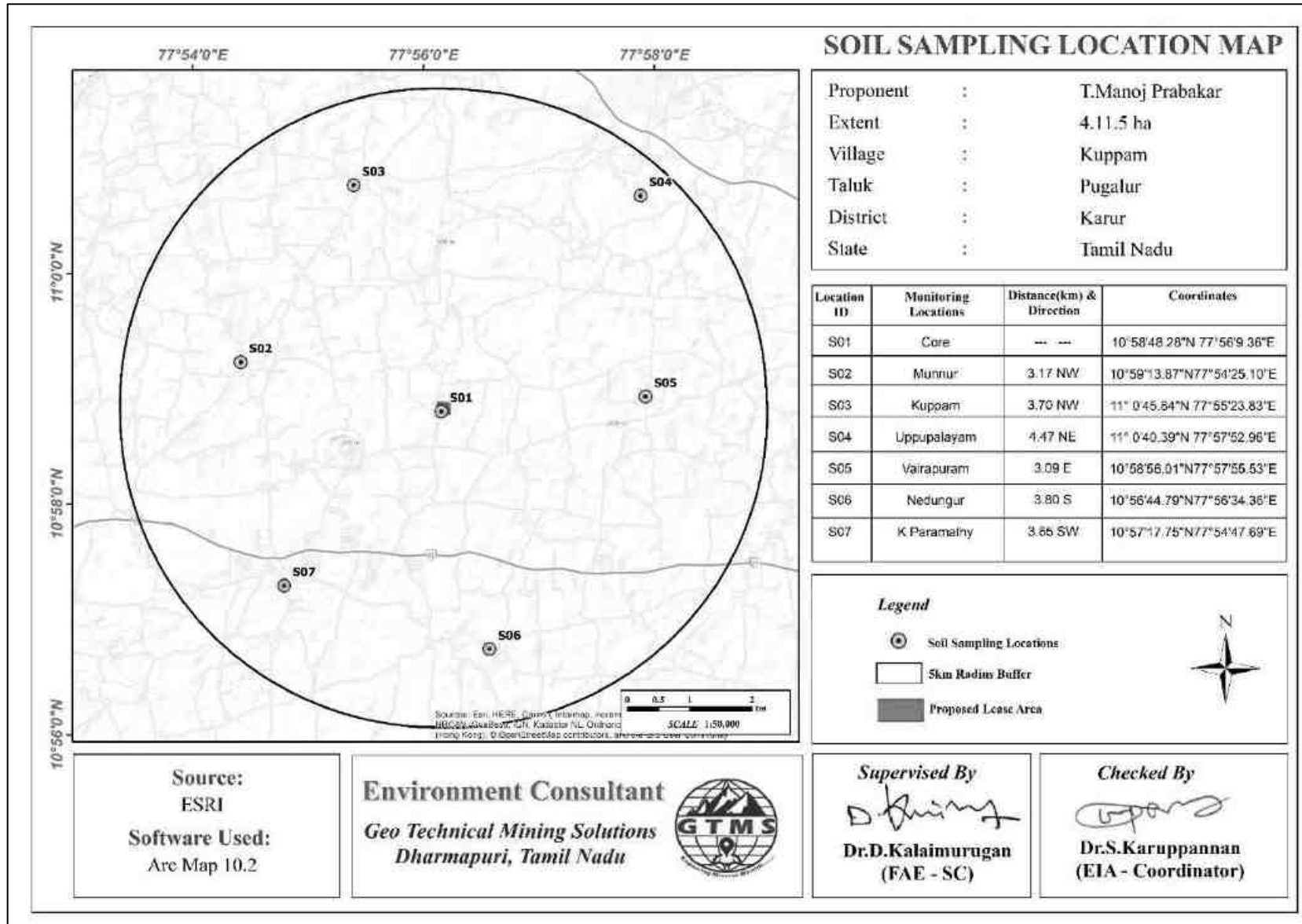
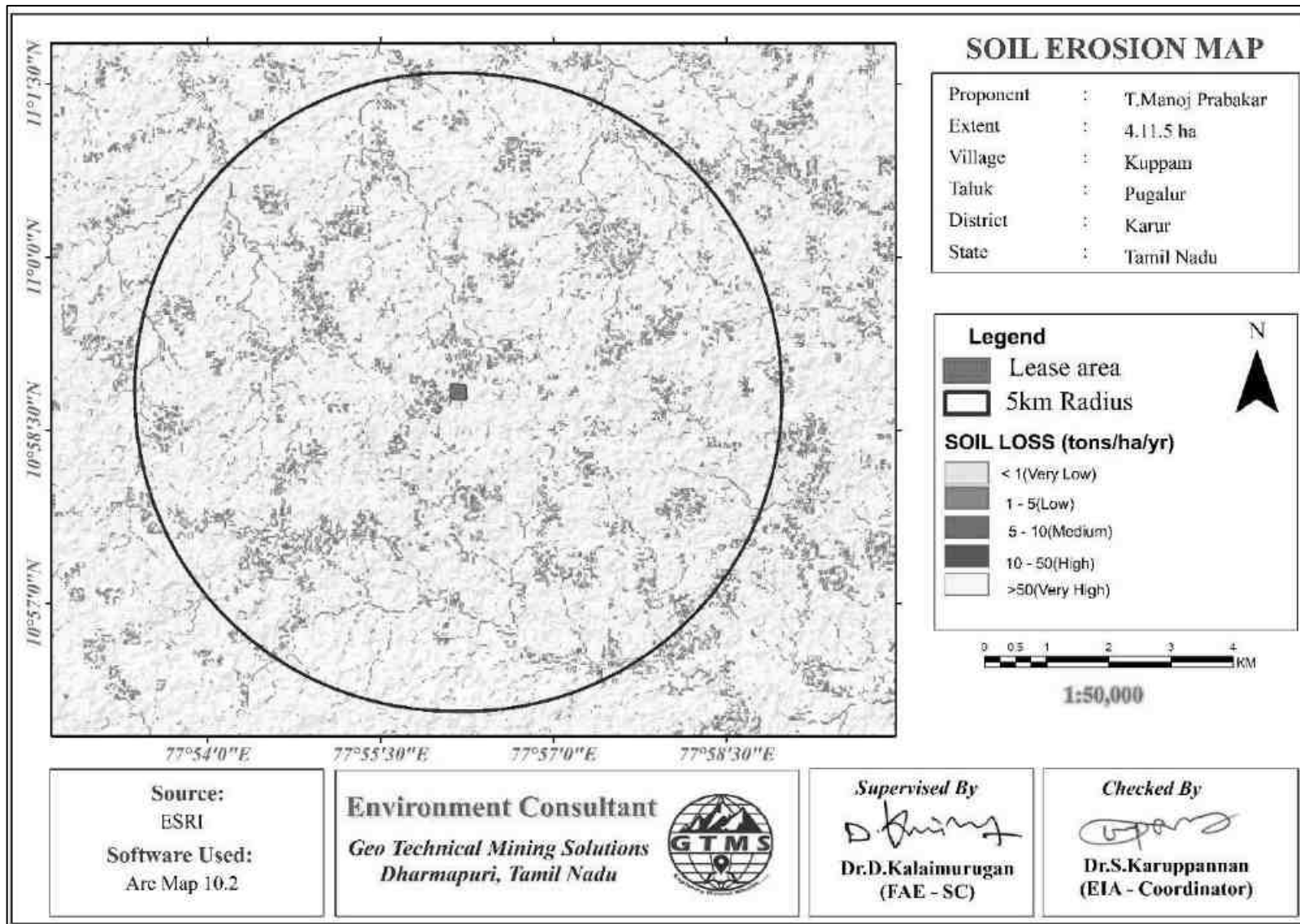


Figure 3.5 Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site



**Figure 3.6 Soil Erosion map within 5 km Radius around the Proposed Project Site**

**Table 3.4 Soil Quality of the Study Area**

S. No	Parameters	Unit	S01 Core	Minimum	Maximum	Average
1	Bulk Density	g/cm <sup>3</sup>	1.4	1.6	3.2	2.33
2	Cadmium (Cd)	mg/kg	<1.0	<1.0	<1.0	<1.0
3	CEC	Meq/kg	18.2	15.3	25.6	21.17
4	Chromium (Cr)	mg/kg	<1.0	<1.0	<1.0	<1.0
5	Copper (Cu)	mg/kg	1.8	1.5	2.8	2.28
6	Iron (Fe)	mg/kg	15250	15978	36397	21474.50
7	Lead (Pb)	mg/kg	<1.0	<1.0	<1.0	<1.0
8	Manganese (Mn)	mg/kg	2.63	1.62	2.45	1.97
9	Nitrogen (N)	%	1.05	1.01	1.08	1.04
10	Organic Matter @ 155°C	%	0.62	1.2	2.3	1.61
11	pH value @ 25°C	--	7.4	6.7	7.7	7.10
12	Phosphate (P)	%	2.3	1.4	2.4	1.87
13	Potassium (K)	%	0.36	0.14	0.27	0.21
14	EC @ 25°C	µS/Cm	172	155	232	182.83
15	Total Carbon	%	2.2	2.3	3.9	2.98
16	Sulphates (SO <sub>4</sub> )	%	0.16	0.17	0.25	0.20
17	Zinc (Zn)	mg/kg	16	17	31	23.50
18	Boron (B)	mg/kg	0.67	0.32	0.81	0.61
29	Calcium (Ca)	mg/kg	268	245	326	293.33
20	Chlorides (Cl)	mg/kg	169	236	320	274.17
21	Magnesium (Mg)	mg/kg	172	115	187	138.33
22	Texture	-	Sandy Clay Loam	Sandy Loam		
23	Sand	%	29.5	67.5	55.35	29.5
24	Clay	%	11.2	15.2	12.43	11.2
25	Silt	%	21.3	55.3	32.22	21.3

Source: Sampling Results by Excellence Laboratory, in association with GTMS.

**Table 3.4a Assigning Scores to Soil Quality Indicators**

Soil Quality Score							Recommendation
S. No.	OM	BD	pH	CEC	EC	Total Score	
S01	30	12	12	6	10	70	The Soil Requires Major and Immediate Treatment
S02	30	2	12	2	10	56	
S03	30	2	18	6	10	66	
S04	30	2	18	6	10	66	
S05	30	2	12	6	10	60	
S06	30	6	18	6	10	70	
S07	30	2	18	2	10	62	

OM (Organic Matter) BD (Bulk Density) pH (Potential of Hydrogen) EC (Electrical Conductivity)

Source: [PSS-2262 Soil Quality Monitoring.pdf \(okstate.edu\)](#)

## 3.2 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the baseline quality of surface and ground water.

**Table 3.5 Water Sampling Locations**

S. No	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	BW01	MGR Nagar	0.41	S	10°58'50.44"N,77°55'53.77"E
2	BW02	Arasampalaiyam	3.59	NE	11°0'42.51"N, 77°56'45.26"E
3	BW03	Vallipuram	3.14	NE	10°58'51.89"N,77°57'56.01"E
4	BW04	Munnur	4.24	NW	10°59'59.60"N, 77°54'8.30"E
5	BW05	Nedungur	3.81	S	10°56'44.24"N, 77°56'2.51"E
6	OW01	K.Paramathi	4.05	SW	10°57'14.79"N,77°54'35.21"E

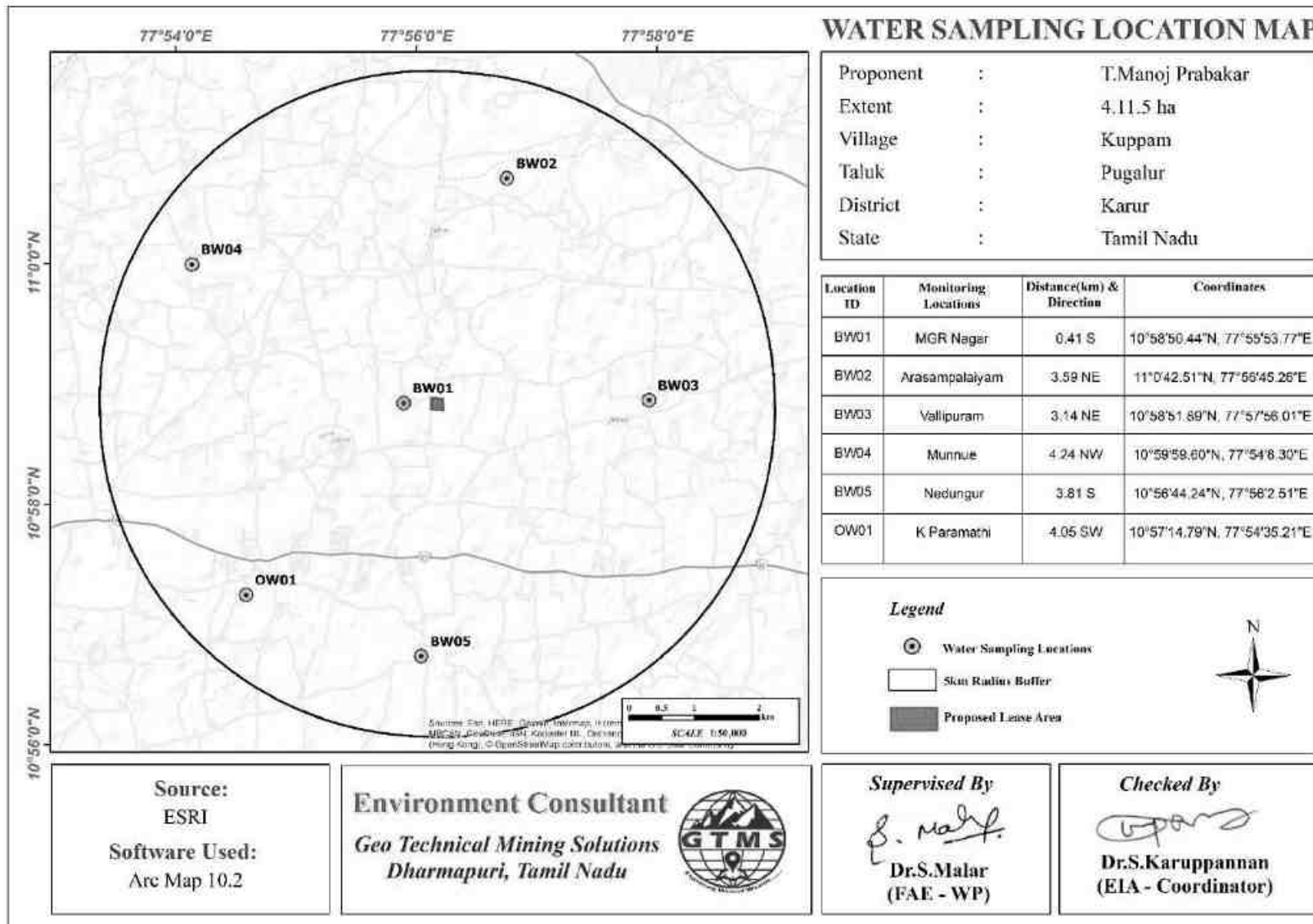
*Source: On-site monitoring/sampling Excellence Laboratory, in association with GTMS.*

### 3.2.1 Ground Water Resources and Quality

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 BW01, BW02, BW03, BW04, BW05 and OW01 were 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 3.7. Table 3.6 summarizes ground water quality data of the six samples.

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



**Figure 3.7 Toposheet Showing Water Sampling Locations within 5 km Radius around Proposed Project Site**

**Table 3.6 Ground Water Quality Result**

S.No.	Parameters	Units	Ground Water Samples			10500:2012 (Acceptable)	10500:2012 (Permissible)
			Minimum	Maximum	Average		
1	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	0.5	0.7
2	Boron (B)	mg /l	<0.1	<0.1	<0.1	0.5	1.0
3	Calcium (Ca)	mg /l	79	97	87.25	75	200
4	Chloride (Cl)	mg /l	251	297	274.75	250	1000
5	Colour	CU	<1.0	<1.0	<1.0	5	15
6	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	0.05	1.5
7	Fluoride (F)	mg/l	0.31	0.92	0.6175	1.0	1.5
8	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	0.2	1.0
9	Iron (Fe)	mg/l	<0.05	<0.05	<0.05	0.3	No relaxation
10	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	0.01	No relaxation
11	Magnesium (Mg)	mg/l	34	81	56	30	100
12	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	No relaxation
13	Nitrate (NO <sub>3</sub> )	mg/l	16	25	19.625	45	No relaxation
14	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
15	pH value @ 25°C	--	6.9	7.6	7.275	6.5-8.5	No relaxation
16	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	0.001	0.002
17	EC @ 25°C	µs/cm	756	1452	1140	-	-
18	Sulphates (SO <sub>4</sub> )	mg/l	79	134	108.125	200	400
19	Total Alkalinity	mg/l	181	345	260.875	200	600
20	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	0.01	0.05
21	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	0.05	No relaxation
22	TDS	mg/l	459	890	693.25	500	2000
23	TH (CaCO <sub>3</sub> )	mg/l	93	204	156.625	200	600
24	Total Silica (SiO <sub>2</sub> )	mg/l	1.8	4.5	2.975	-	1
25	Turbidity	NTU	<0.1	<0.1	<0.1	5	15
26	Zinc (Zn)	mg/l	<0.05	<0.05	<0.05	0.1	0.3
27	<i>Coliforms Bacteria</i>	MPN	Present	Present	Present	Shall not be detectable in any 100 ml sample	
28	<i>E. Coli</i>	MPN	Absent	Absent	Absent		

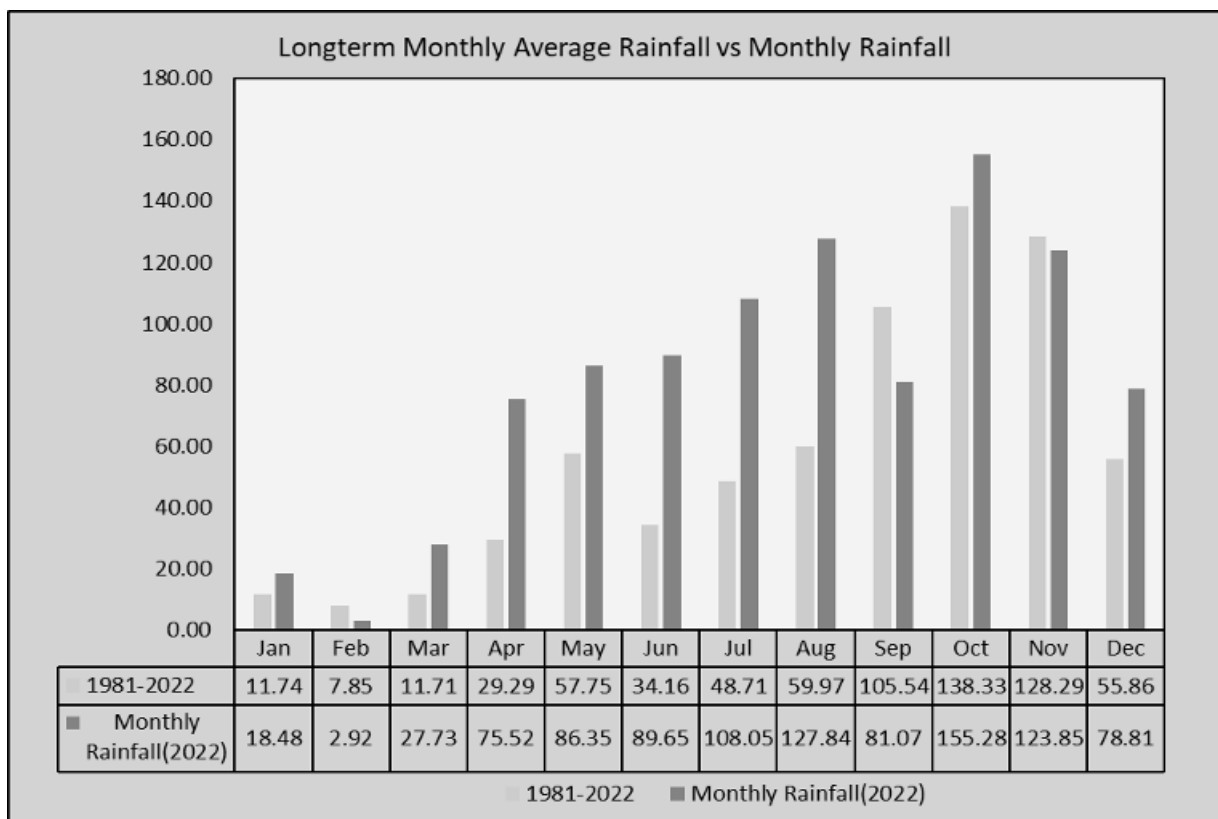
Source: On-site monitoring/sampling Excellence Laboratory, in association with GTMS.

### 3.2.2 Hydrogeological Studies

The area within 2 km radius consists of numerous open wells and deep wells. Groundwater level data were collected both from open wells and bore wells for two monsoon seasons as discussed in the following section.

#### 3.2.2.1 Rainfall

Rainfall data for the study area were collected for the period of 1981-2022([POWER | Data Access Viewer \(nasa.gov\)](#)). Long term monthly average rainfall was estimated from the data of 1981-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.8. The Figure 3.13 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in April through August and October of 2022 is higher than the previous years.



**Figure 3.8 Long-Term Monthly Average Rainfall Vs Monthly Rainfall**

#### 3.2.2.2 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 8 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2023, (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 18.96 to 21.00 m BGL in pre monsoon and 14.33 to 16.00 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 (Post-Monsoon Season) vary from 62.3 to 65.8 m and from 72.7 to 75.5 m for the period of March through May, (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.

**Table 3.7 Pre-Monsoon Water Level of Open Wells within 2 km Radius**

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2023	Apr-2023	May-2023	Average		
DW01	21.5	22.7	23	20.00	0°58'46.65"N	77°56'13.64"E
DW02	22	23.5	24.6	21.00	0°58'27.20"N	77°56'2.85"E
DW03	21	22.5	23.5	19.00	10°58'5.98"N	77°55'33.63"E
DW04	20.5	21	22.5	18.00	0°57'57.21"N	77°56'35.65"E
DW05	22.5	23.7	24.5	21.00	10°59'18.69"N	77°55'19.28"E
DW06	20.5	21.7	22.5	17.00	10°59'38.00"N	77°56'11.84"E
DW07	22	23.5	24.7	19.00	10°59'11.49"N	77°56'52.98"E
DW08	19.5	20.5	22.8	18.00	10°58'32.25"N	77°56'53.33"E
DW09	19.20	20.9	21.8	17.68	10°58'55.92"N	77°55'13.44"E

*Source: Onsite monitoring data*

**Table 3.8 Post-Monsoon Water Level of Open Wells within 2 km Radius**

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2023	Nov- 2023	Dec-2023	Average		
DW01	12.5	11.9	10.4	16.00	10°58'46.65"N	77°56'13.64"E
DW02	13.4	12.5	11	14.00	10°58'27.20"N	77°56'2.85"E
DW03	12.7	11.5	10.5	17.00	10°58'5.98"N	77°55'33.63"E
DW04	14.5	13.5	12	14.00	10°57'57.21"N	77°56'35.65"E
DW05	13.7	12.4	11.5	13.00	10°59'18.69"N	77°55'19.28"E
DW06	15.5	13.9	13	15.00	10°59'38.00"N	77°56'11.84"E
DW07	16.5	14.2	13.5	14.00	10°59'11.49"N	77°56'52.98"E
DW08	16.6	14.5	13.4	13.00	10°58'32.25"N	77°56'53.33"E
DW09	16.20	13.9	12.8	13.00	10°58'55.92"N	77°55'13.44"E

*Source: Onsite monitoring data*

**Table 3.9 Pre-Monsoon Water Level of Bore Wells within 2 km Radius**

Station ID	Depth to Static Potentiometric Surface				Latitude	Longitude
	BGL(m)					
	Mar-2023	Apr-2023	May- 2023	Average		
BW01	70	72.2	75.5	58.00	10°58'18.99"N	77°55'57.19"E
BW02	69	73.2	74.6	59.00	10°59'4.90"N	77°55'33.92"E
BW03	71.2	72.3	75.5	60.00	10°58'57.16"N	77°56'33.96"E
BW04	72.3	73.2	74.7	59.00	10°59'42.57"N	77°56'16.91"E
BW05	71.4	73.5	76.6	58.00	10°59'22.57"N	77°55'38.22"E
BW06	71.3	72.4	75.5	57.00	10°59'6.97"N	77°56'36.46"E
BW07	71.3	72.3	76.5	59.00	10°57'57.26"N	77°56'52.03"E
BW08	71.2	72.5	75.5	60.00	10°58'0.47"N	77°55'33.87"E

Source: Onsite monitoring data

**Table 3.10 Post-Monsoon Water Level of Bore Wells within 2 km Radius**

Station ID	Depth to Static Potentiometric Surface				Latitude	Longitude
	BGL(m)					
	Oct-2023	Nov-2023	Dec-2023	Average		
BW01	64.5	63.5	62	48	0°58'18.99"N	77°55'57.19"E
BW02	63.5	62.5	61	49	10°59'4.90"N	77°55'33.92"E
BW03	65.5	64	63	51	0°58'57.16"N	77°56'33.96"E
BW04	67	66	64.5	53	0°59'42.57"N	77°56'16.91"E
BW05	66.5	64.5	64	52	10°59'22.57"N	77°55'38.22"E
BW06	66	64.5	63	51	10°59'6.97"N	77°56'36.46"E
BW07	63.5	62.5	61	53	10°57'57.26"N	77°56'52.03"E
BW08	66	63.5	62	50	10°58'0.47"N	77°55'33.87"E

Source: Onsite monitoring data

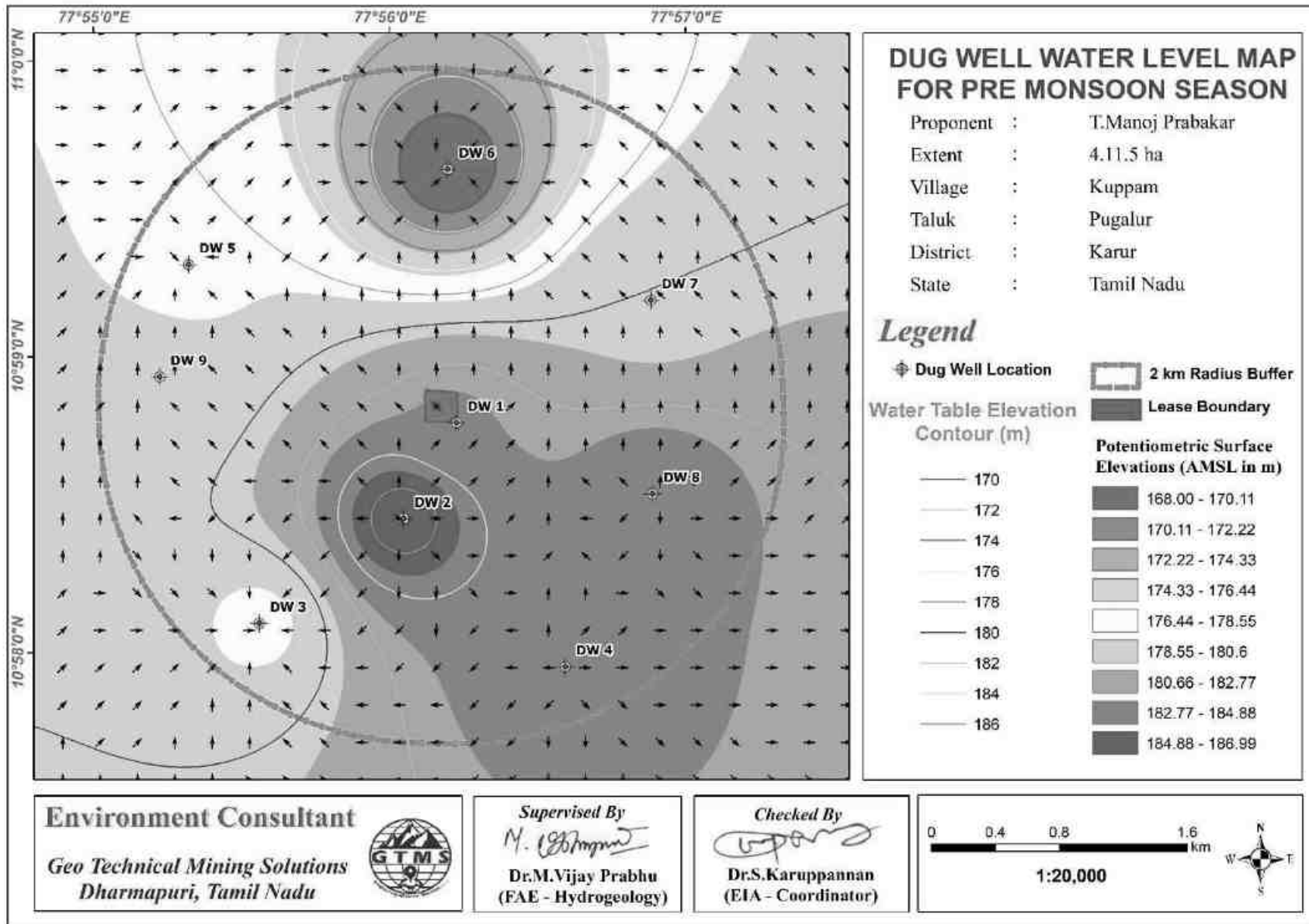


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

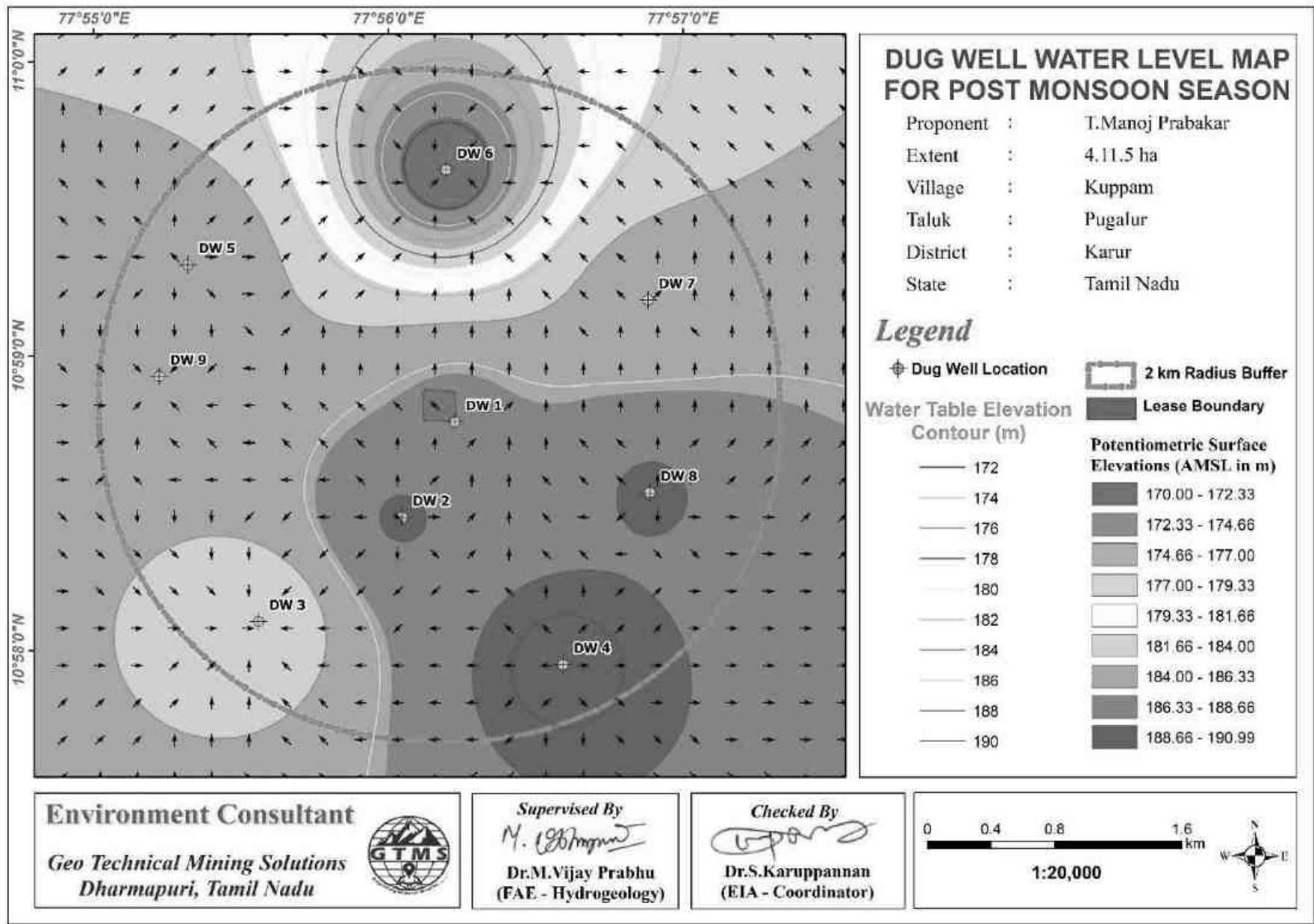


Figure 3.10 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

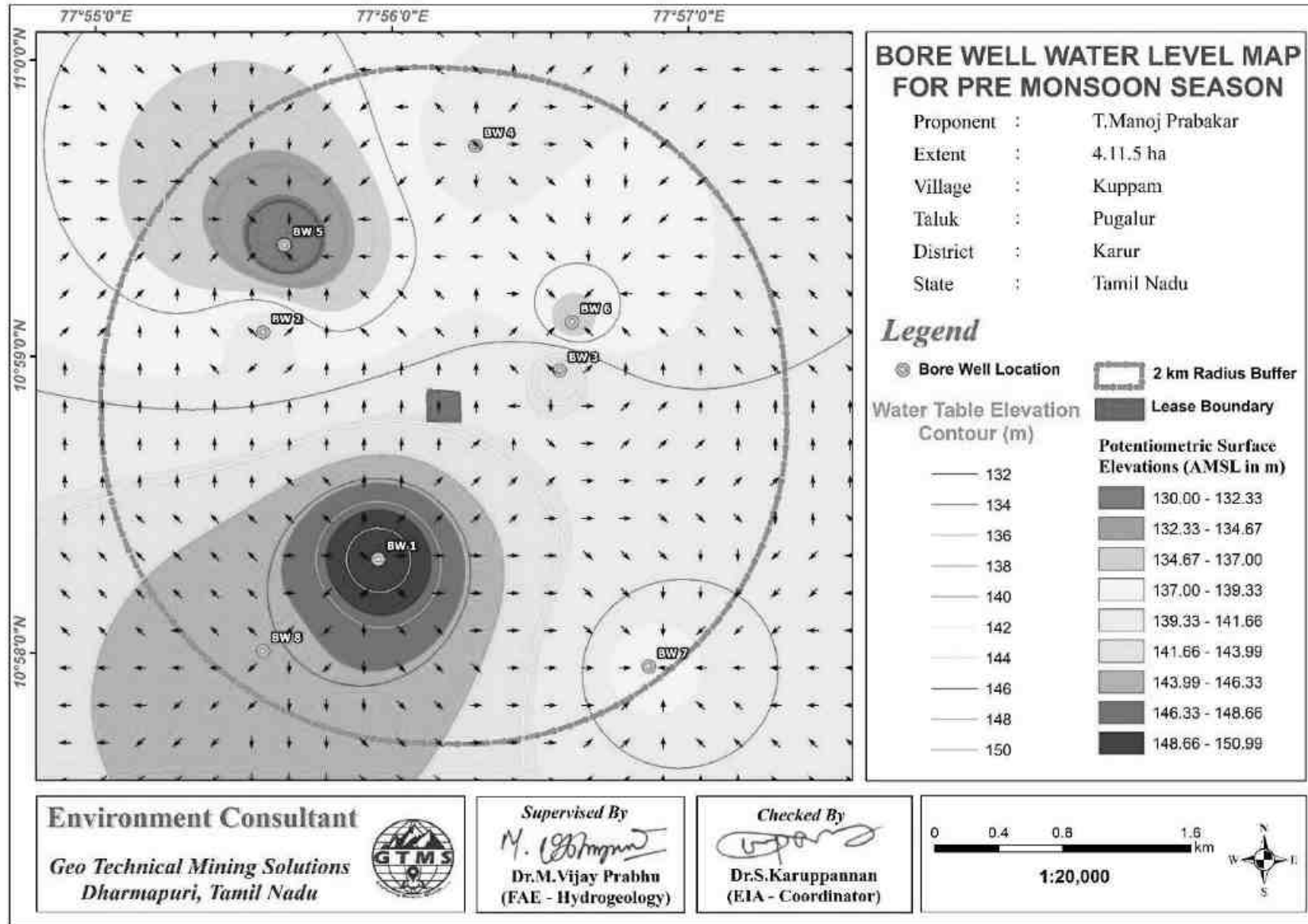


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

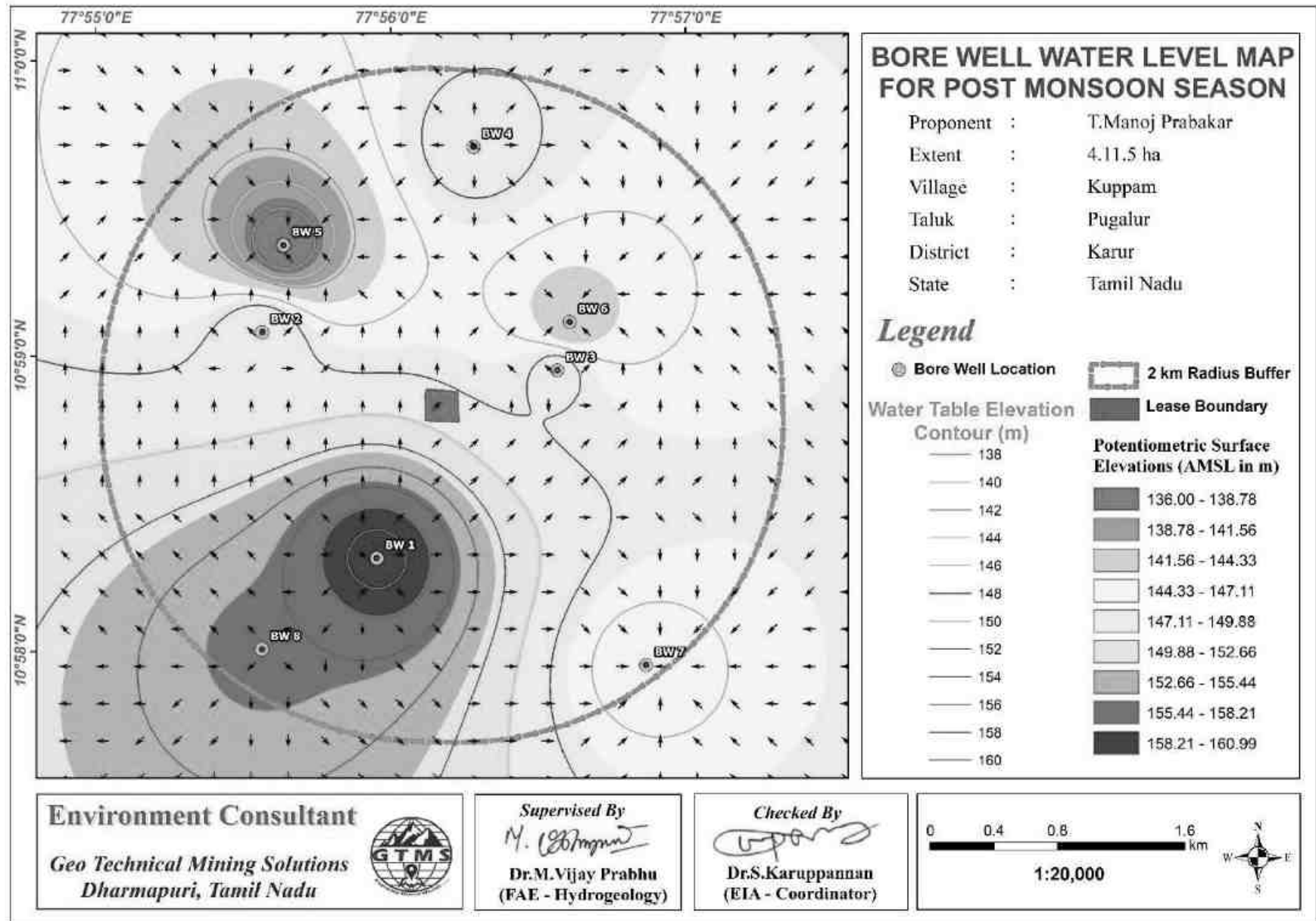


Figure 3.12 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

### 3.2.2.3 Electrical Resistivity Investigation

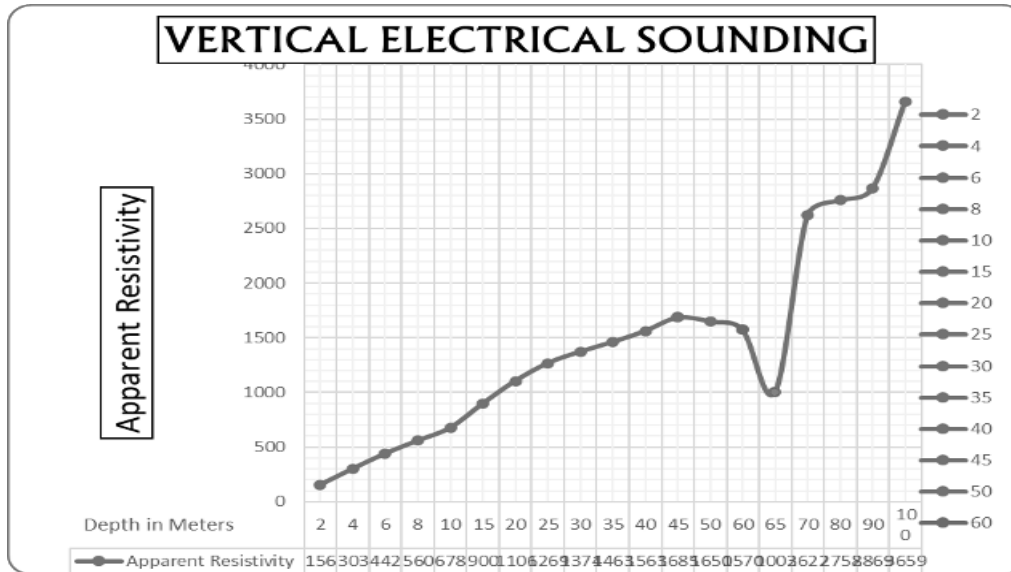
Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses four electrodes set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference.

#### **Result**

The Geophysical VES data obtained from the project site have been shown in Table 3.11. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.13.

**Table 3.11 Vertical Electrical Sounding Data**

Location Coordinates - 10°58'50.14"N 77°56'10.61"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega\text{m}$
1	2	2	11.78	13.248	156.06
2	4	2	49.46	6.127	303.04
3	6	5	112.26	3.937	441.97
4	8	5	200.18	2.798	560.10
5	10	5	75.36	8.997	678.01
6	15	10	173.49	5.188	900.07
7	20	10	310.86	3.558	1106.04
8	25	10	487.49	2.603	1268.94
9	30	10	274.75	5.001	1374.02
10	35	10	376.8	3.883	1463.11
11	40	10	494.55	3.16	1562.78
12	45	10	628	2.683	1684.92
13	50	10	777.15	1.943	1510.00
14	65	20	453.6	2.213	1003.82
15	70	20	989.1	2.651	2622.10
16	80	20	1256	2.196	2758.18
17	90	20	1554.3	1.846	2869.24
18	100	20	1653.6	2.213	3659.42



**Figure 3.13 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 65 m Below Ground Level in Proposed Project**

The rock formation of low resistivity values indicates occurrence of water at the depth of about 65 m below ground level. The maximum depth proposed for the proposed project is 45 m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

### 3.3 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities.

#### 3.3.1 Meteorology

##### 3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.12.

According to the onsite data, the temperature in October, 2023 varied from 21.01 to 37.13°C with the average of 27.98°C; in November, 2023 from 20.08 to 32.82°C with the average of 26.06°C; and in December, 2023 from 17.73 to 32.26°C with the average of 24.67°C. In October, 2023, relative humidity ranged from 26.06 to 99.62% with the average of 70.38%; in November, 2023, from 46.12 to 100 % with the average of 82.75%; and in December, 2023,



from 40.19 to 100% with the average of 80.15%. The wind speed in October,2023 varied from 0.04 to 9.41 m/s with the average of 2.31 m/s; in November, 2023 from 0.50 to 6.92 m/s with the average of 2.63 m/s; and in December,2023 from 0.80 to 7.37m/s with the average of 3.18m/s. In October,2023, wind direction varied from 0.00 to 359.75<sup>0</sup> with the average of 158.80<sup>0</sup>; in November, 2023, from 0.00 to 359.23<sup>0</sup> with the average of 81.51<sup>0</sup>; and in December,2023, 0.12 to 359.22<sup>0</sup> with the average of 111.69 <sup>0</sup>. In October,2023, surface pressure varied 98.03 to 98.98 kPa with the average of 98.59kPa; in November, 2023, from 98.24 to 99.07 kPa with the average of 98.66kPa; and in December,2023, from 97.98 to 99.42 kPa with the average of 98.64kPa

**Table 3.12 Onsite Meteorological Data**

S. No.	Parameters		OCT,2023	NOV,2023	DEC,2023
1	Temperature (°C)	Min	21.01	20.08	17.73
		Max	37.13	32.82	32.26
		Avg	27.98	26.06	24.67
2	Relative Humidity (%)	Min	26.06	46.12	40.19
		Max	99.62	100.00	100.00
		Avg	70.38	82.75	80.15
3	Wind Speed (m/s)	Min	0.04	0.50	0.80
		Max	9.41	6.92	7.37
		Avg	2.31	2.63	3.18
4	Wind Direction (degree)	Min	0.00	0.00	0.12
		Max	359.75	359.23	359.22
		Avg	158.80	81.51	111.69
5	Surface Pressure(kPa)	Min	98.03	98.24	97.98
		Max	98.98	99.07	99.42
		Avg	98.59	98.66	98.64

Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

### 3.3.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of October through December of the years from 2019 to 2022 and the seasonal wind rose for the study period of October through December 2023. The wind rose diagrams thus produced are shown in Figures 3.14-3.14a. Figure 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 2.71m/s.
- ❖ Predominant wind was dominant in the directions ranging from Northeast to Southeast.

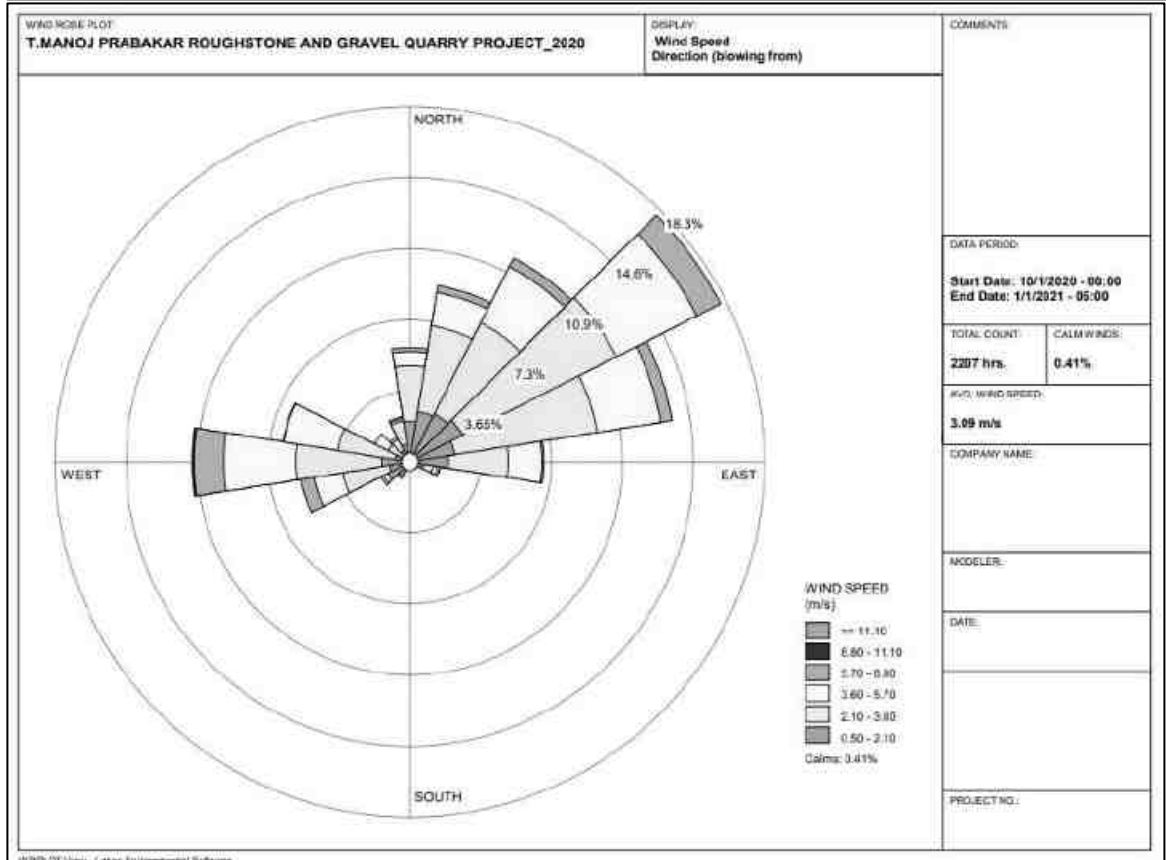
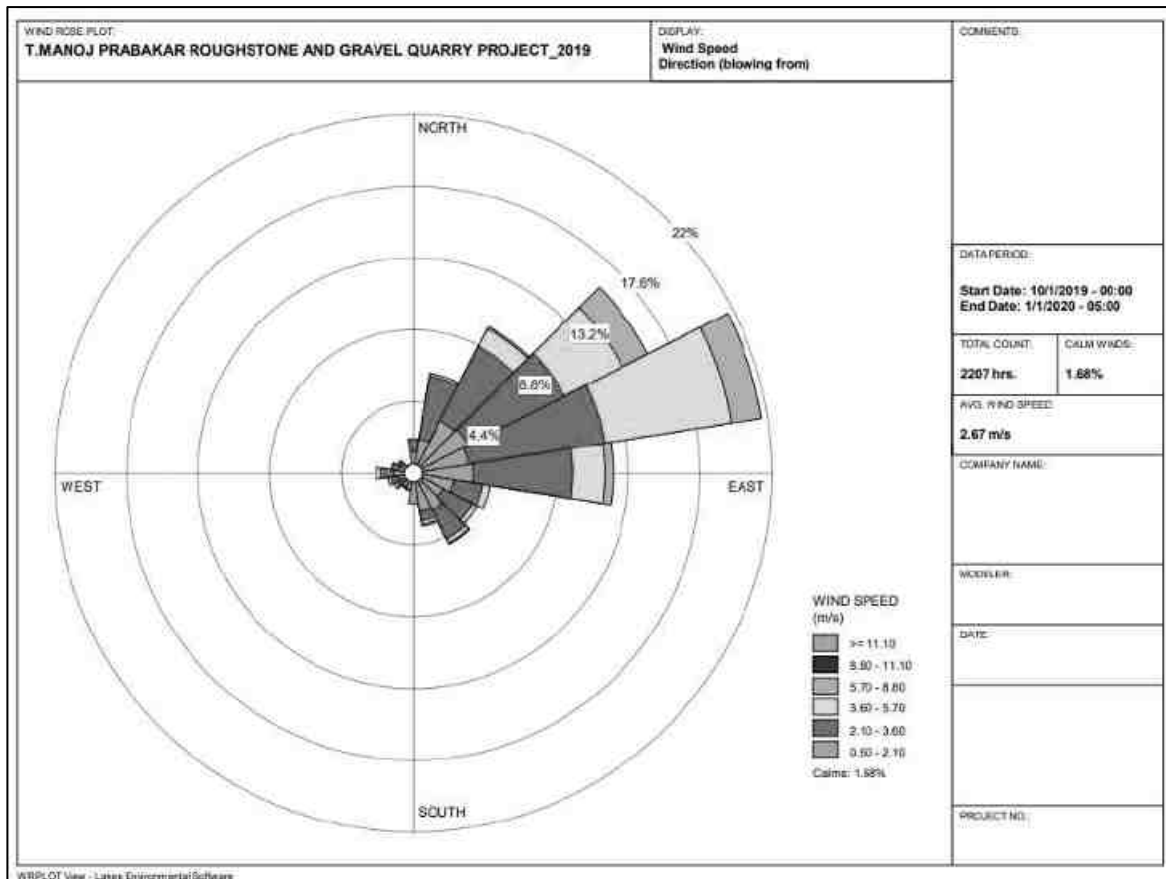


Figure 3.14 Windrose Diagram for 2019 and 2020 (October to December)

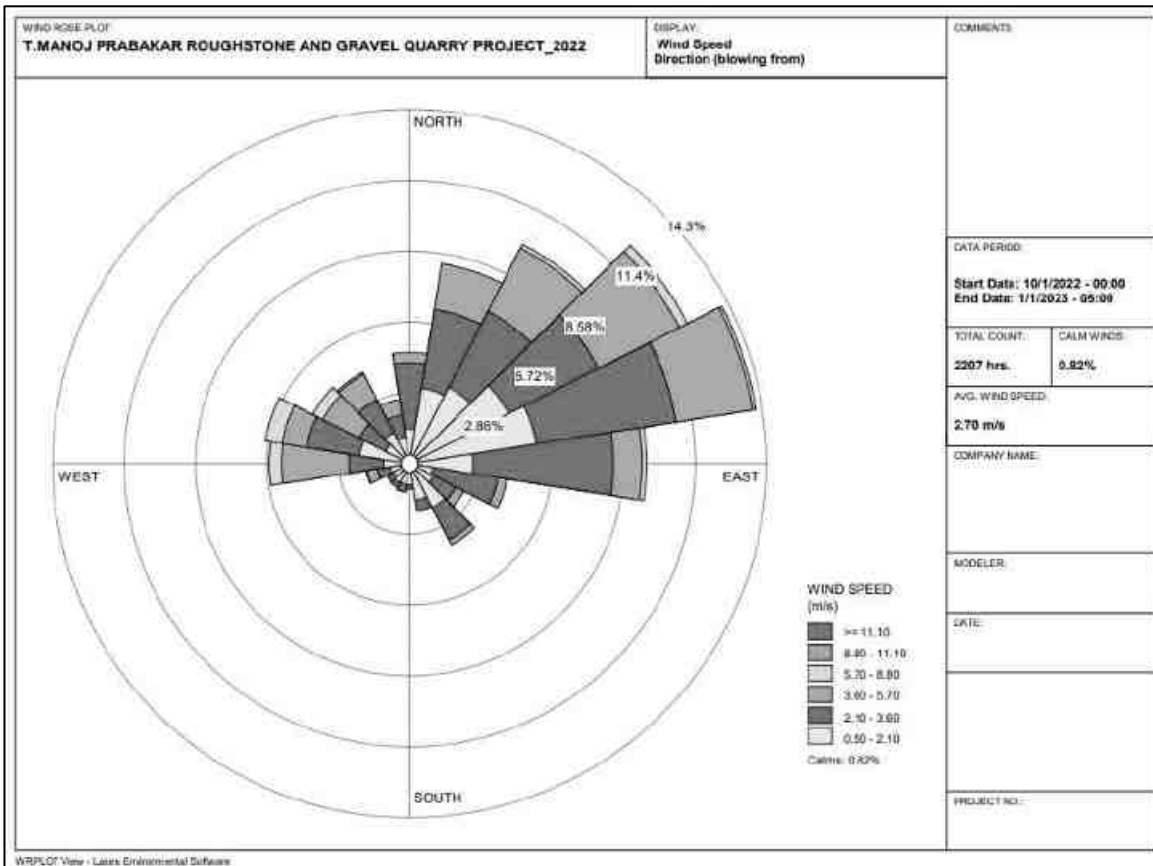
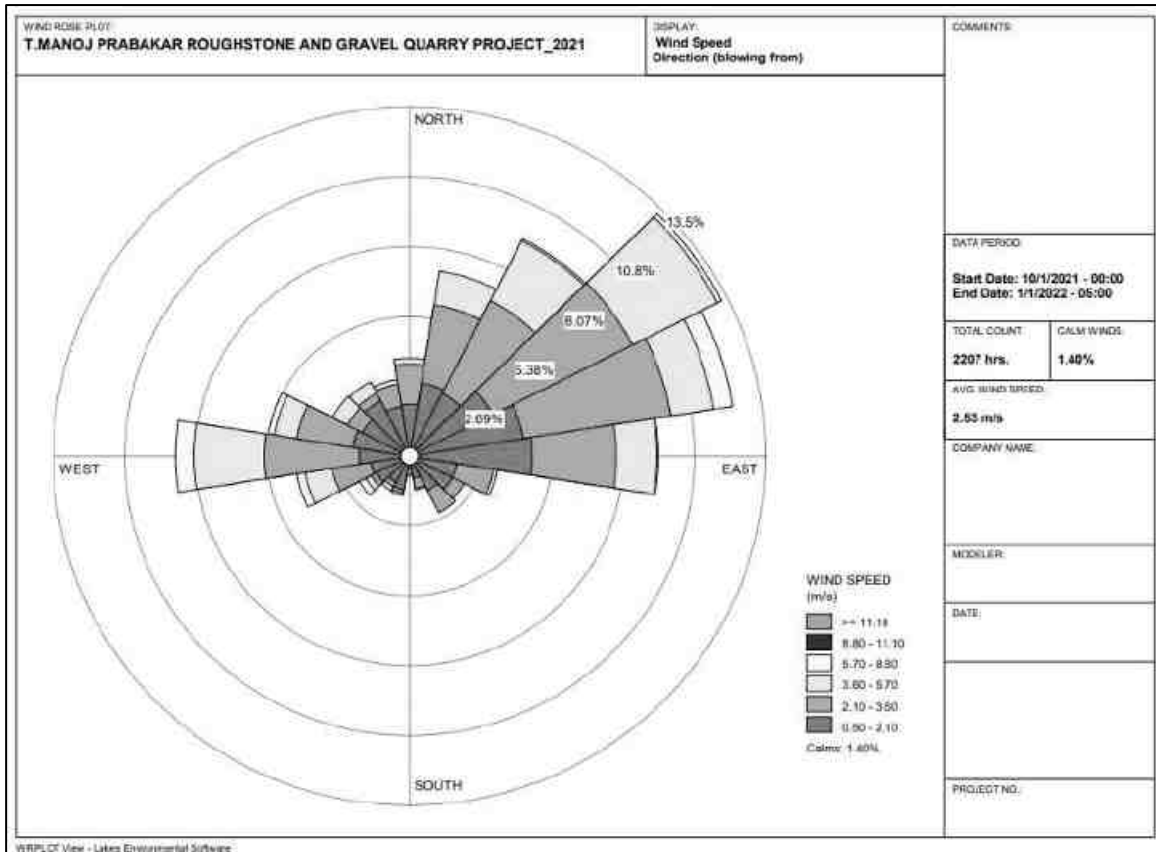
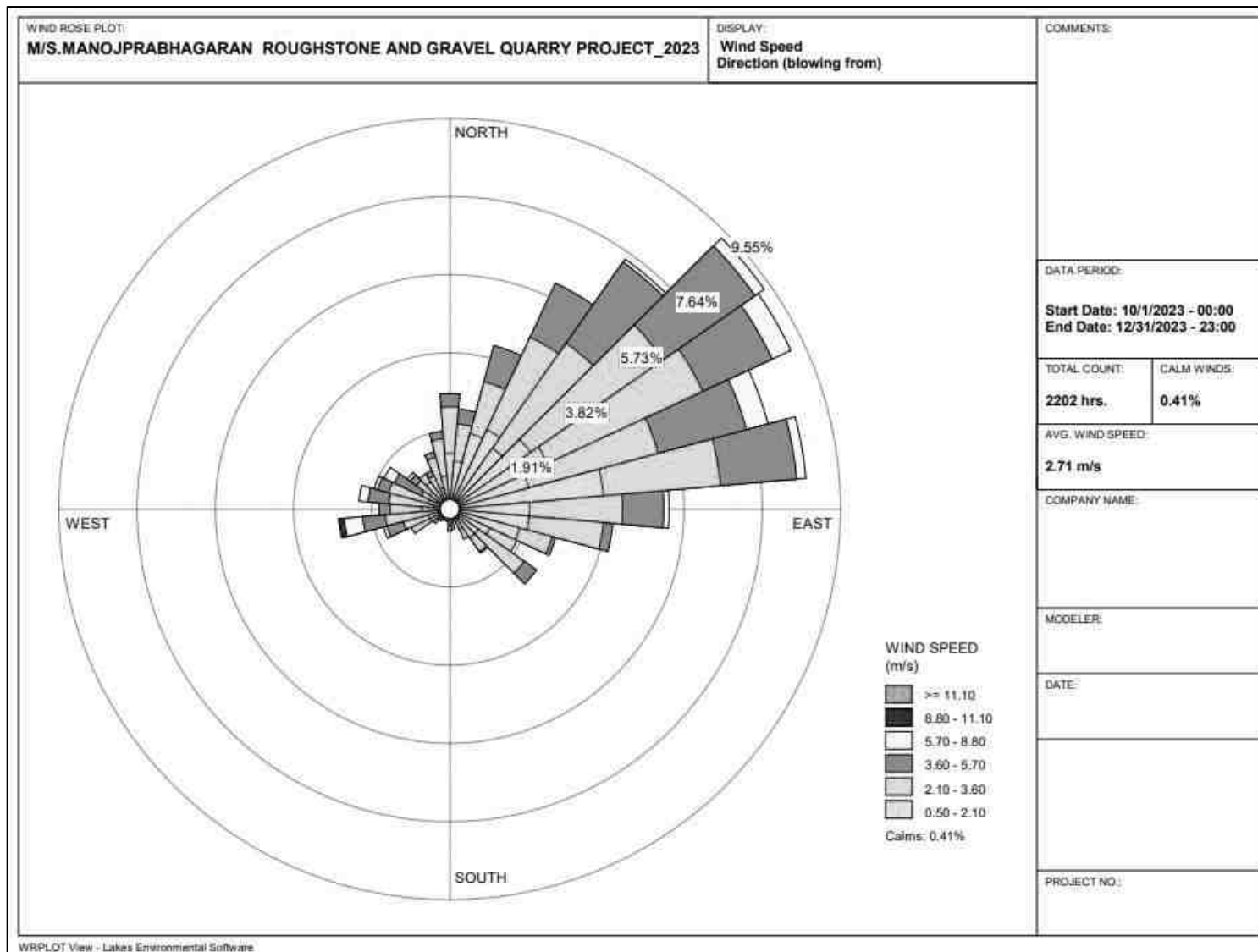


Figure 3.14a Windrose Diagram for 2021 and 2022 (October to December)



**Figure 3.15 Onsite Wind Rose Diagram**

### 3.3.2 Ambient Air Quality Study

The baseline ambient air quality is studied through a scientifically designed ambient air quality monitoring network considering the followings

- ❖ Meteorological condition on synoptic scale
- ❖ Topography of the study area
- ❖ Representatives of regional background air quality for obtaining baseline status
- ❖ Location of residential areas representing different activities
- ❖ Accessibility and power availability

**Table 3.13 Methodology and Instrument Used for AAQ Analysis**

Parameter	Method	Instrument
PM <sub>2.5</sub>	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM <sub>10</sub>	Gravimetric method Beta attenuation method	Respirable Dust Sampler
SO <sub>2</sub>	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO <sub>x</sub>	IS-5182 Part II (Jacob & Hoch heiser modified method)	Respirable Dust Sampler with gaseous attachment
Free Silica	NIOSH – 7601	Visible Spectrophotometry

Source: Sampling Methodology based *Excellence Laboratory* & CPCB Notification

**Table 3.14 National Ambient Air Quality Standards**

S. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO <sub>2</sub> (µg/m <sup>3</sup> )	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO <sub>x</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM <sub>10</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

Source: NAAQS CPCB Notification No. B-29016/20/90/PCI-I Dated: 18<sup>th</sup> Nov 2009

## Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at nine (08) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October to December, 2023 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5\text{m}$  above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The baseline data of ambient air were generated for  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$ , sulphur dioxide ( $\text{SO}_2$ ) and nitrogen dioxide ( $\text{NO}_x$ ). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.15 and are shown in Figures 3.16-3.20.

**Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations**

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	AAQ1	Core	--	--	10°58'47.37"N	77°56'11.25"E
2	AAQ2	Salipalayam	0.76	N	10°59'18.06"N	77°56'4.04"E
3	AAQ3	K. Paramathi	3.30	SW	10°57'32.03"N	77°54'49.24"E
4	AAQ4	Puthurpatti	3.23	NE	11° 0'16.30"N	77°57'18.38"E
5	AAQ5	Kuppam	3.61	NNW	11° 0'45.56"N	77°55'31.42"E
6	AAQ6	Malapalayampudur	4.65	SSE	10°56'34.66"N	77°57'29.31"E
7	AAQ7	Kurumpapatti	3.99	ESE	10°58'22.31"N	77°58'22.95"E
8	AAQ8	Munnur	2.93	WNW	10°59'10.03"N	77°54'32.19"E

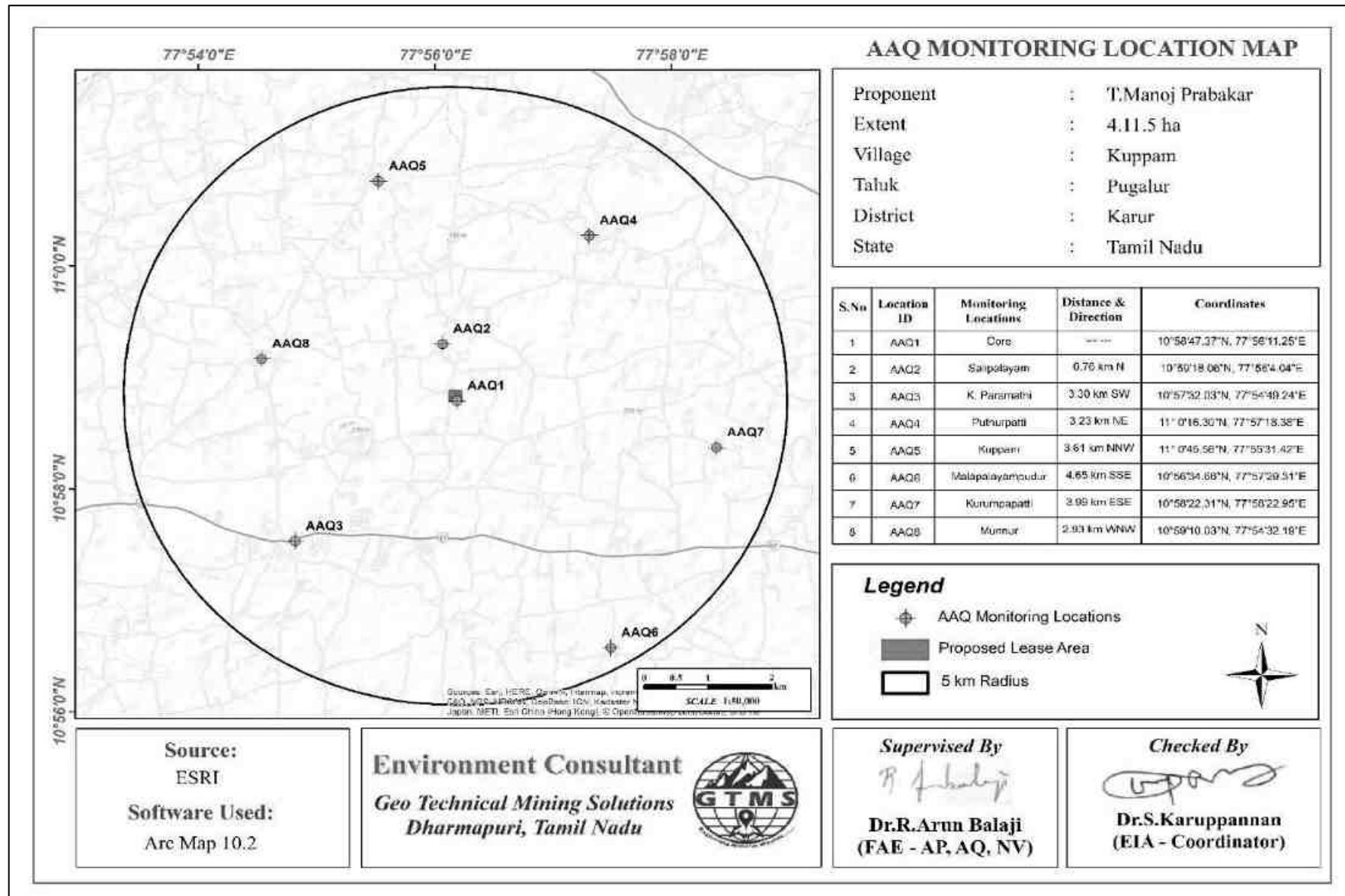
Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

## Results

As per the monitoring data,  $\text{PM}_{2.5}$  ranges from  $14.3\mu\text{g}/\text{m}^3$  to  $16.7\mu\text{g}/\text{m}^3$ ;  $\text{PM}_{10}$  from  $35.8\mu\text{g}/\text{m}^3$  to  $41.5\mu\text{g}/\text{m}^3$ ;  $\text{SO}_2$  from  $5.3\mu\text{g}/\text{m}^3$  to  $7.1\mu\text{g}/\text{m}^3$ ;  $\text{NO}_x$  from  $11.7\mu\text{g}/\text{m}^3$  to  $15.7\mu\text{g}/\text{m}^3$ . The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

## Air quality Index (AQI)

The AQI shows that the air quality of the study area falls within good category 39 causing minimal impact to human health.



**Figure 3.16 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site**

**Table 3.16 Summary of AAQ Result**

PM <sub>2.5</sub>					PM <sub>10</sub>			
Station ID	Max	Min	Mean	98 <sup>th</sup> Percentile	Max	Min	Mean	98 <sup>th</sup> Percentile
AAQ1	17.6	15.5	16.7	17.6	44.0	38.8	41.8	44.0
AAQ2	15.6	13.0	14.5	15.6	38.9	32.4	36.2	38.9
AAQ3	17.6	16.5	17.0	17.4	44.1	41.3	42.6	43.9
AAQ4	15.8	13.7	14.8	15.8	39.5	34.3	37.0	39.5
AAQ5	17.5	14.4	15.7	17.5	43.8	36.0	39.3	43.8
AAQ6	15.6	11.9	13.7	15.6	38.9	29.7	34.3	38.9
AAQ7	16.2	14.6	15.5	16.2	40.6	36.5	38.8	40.6
AAQ8	17.3	15.2	16.3	17.3	42.2	37.0	39.7	42.2
SO <sub>2</sub>					NO <sub>x</sub>			
AAQ1	6.9	5.2	6.2	6.9	14.5	10.9	12.9	14.5
AAQ2	7.7	6.2	6.8	7.6	16.6	13.3	14.6	16.4
AAQ3	10.9	7.9	9.4	10.4	22.9	16.6	19.8	22.7
AAQ4	7.1	5.2	6.1	7.1	14.9	10.9	12.7	14.9
AAQ5	8.1	6.2	7.1	8.0	17.0	13.0	14.9	16.8
AAQ6	5.5	4.1	4.7	5.4	11.6	8.6	9.8	11.4
AAQ7	4.3	2.6	3.5	4.3	10.8	6.5	8.7	9.8
AAQ8	6.5	5.2	5.7	6.5	17.4	13.9	15.3	17.3



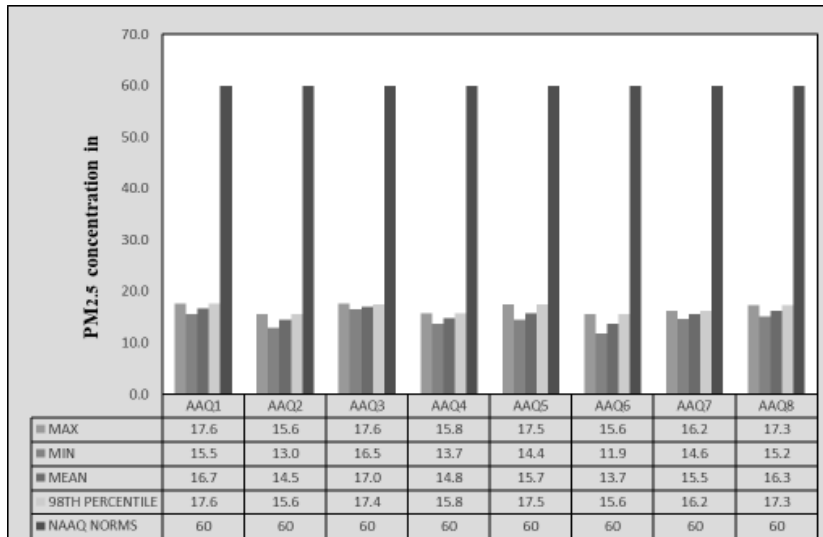


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM2.5 Measured from 8 Air Quality Monitoring Stations within 5 km Radius

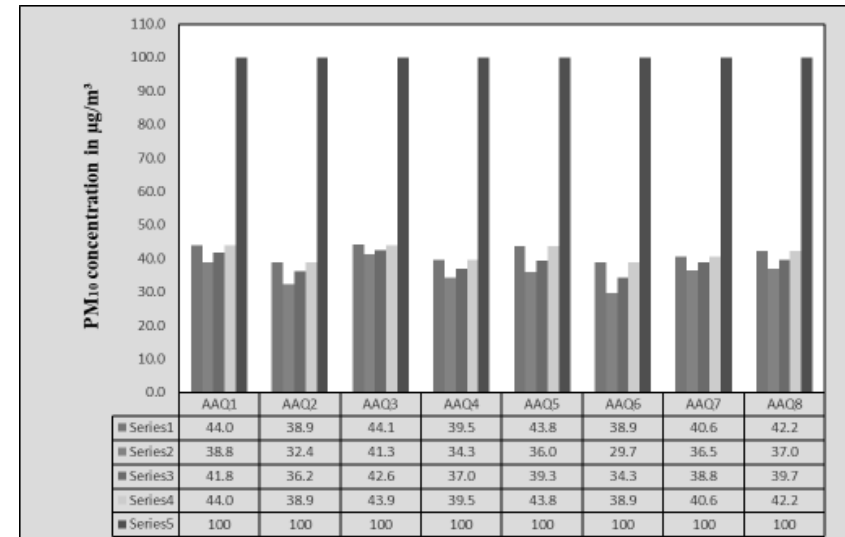


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM10 Measured from 8 Air Quality Monitoring Stations within 5 km Radius

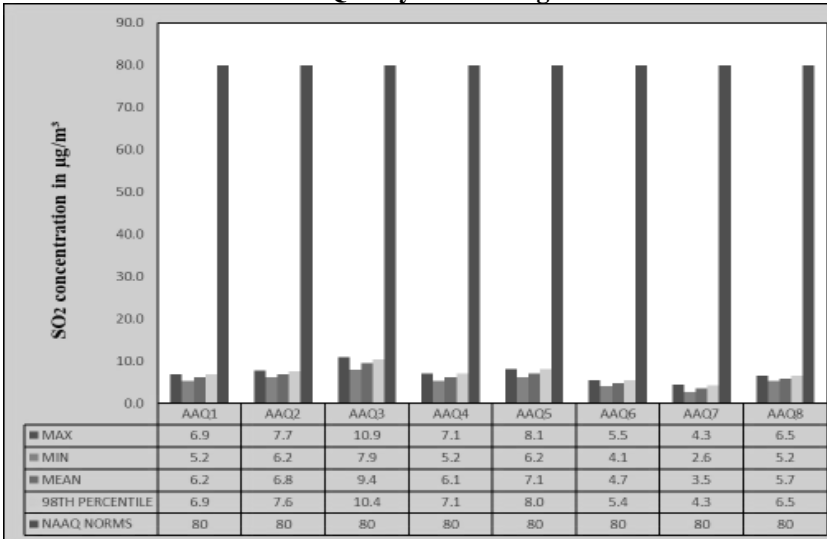


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO2 Measured from 8 Air Quality Monitoring Stations within 5 km Radius

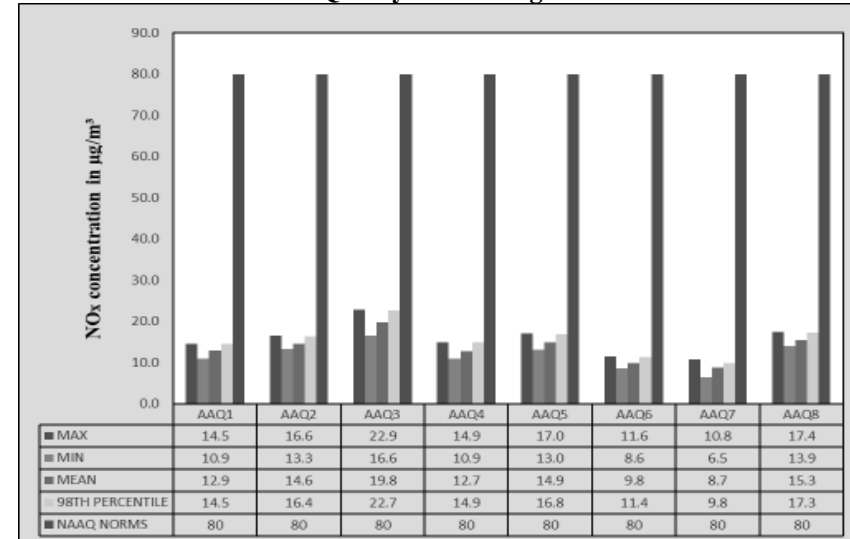
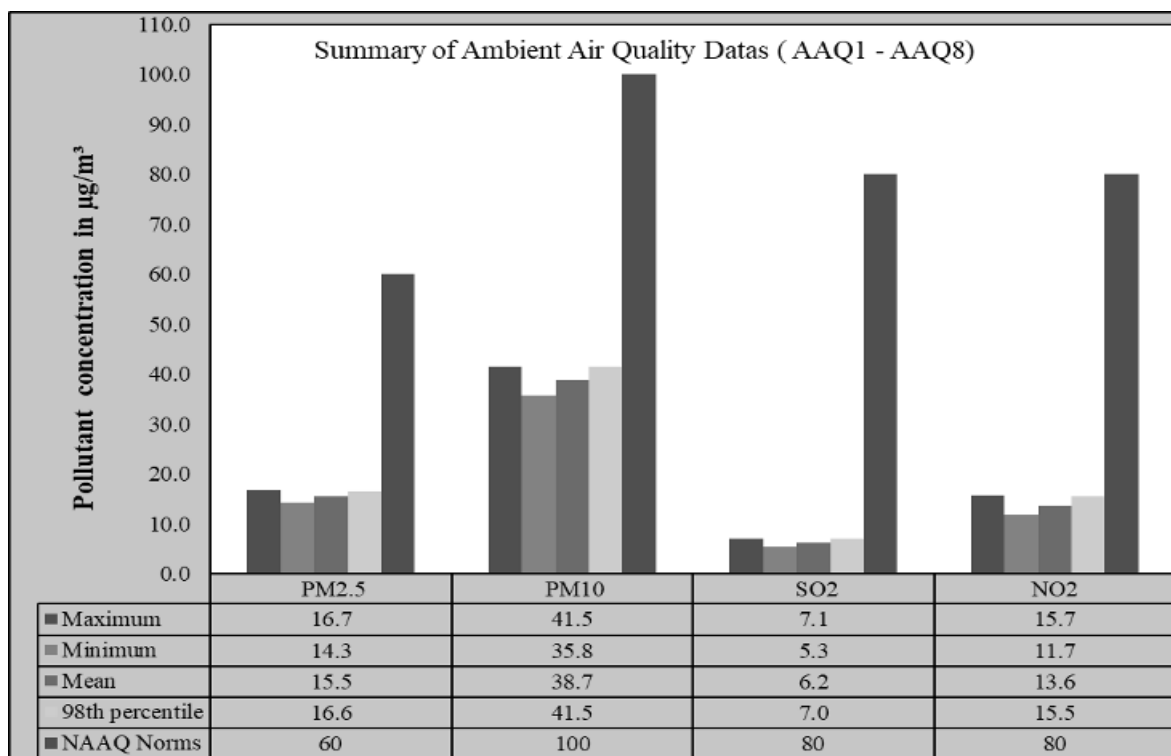


Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NOx Measured from 8 Air Quality Monitoring Stations within 5 km Radius



**Figure 3.21 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius**

### 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Eight (08) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.22.

**Table 3.17 Noise Monitoring Locations**

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	N1	Core	---	---	10°58'50.47"N	77°56'7.73"E
2	N2	Salipalayam	0.79	N	10°59'18.87"N	77°56'4.69"E
3	N3	K. Paramathi	3.51	NW	10°57'31.64"N	77°54'40.12"E
4	N4	Puthurpatti	3.16	NE	11° 0'15.33"N	77°57'16.04"E

5	N5	Kuppam	3.64	NNW	11° 0'46.24"N	77°55'30.89"E
6	N6	Malapalayampudur	4.62	SSE	10°56'36.88"N	77°57'30.73"E
7	N7	Kurumpapatti	3.94	ESE	10°58'22.52"N	77°58'21.67"E
8	N8	Munnur	2.99	WNW	10°59'9.37"N	77°54'30.29"E

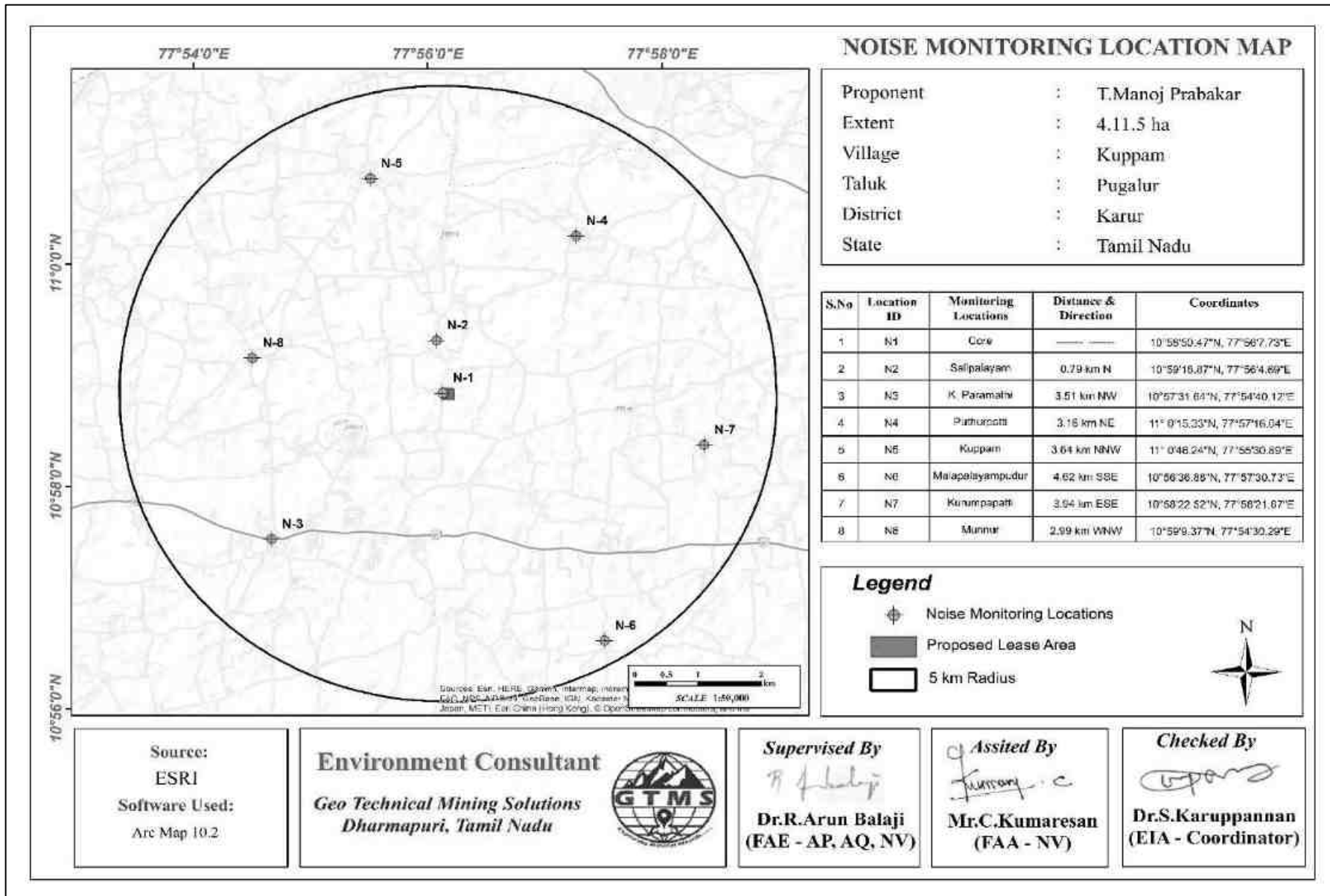
Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

**Table 3.18 Ambient Noise Quality Result**

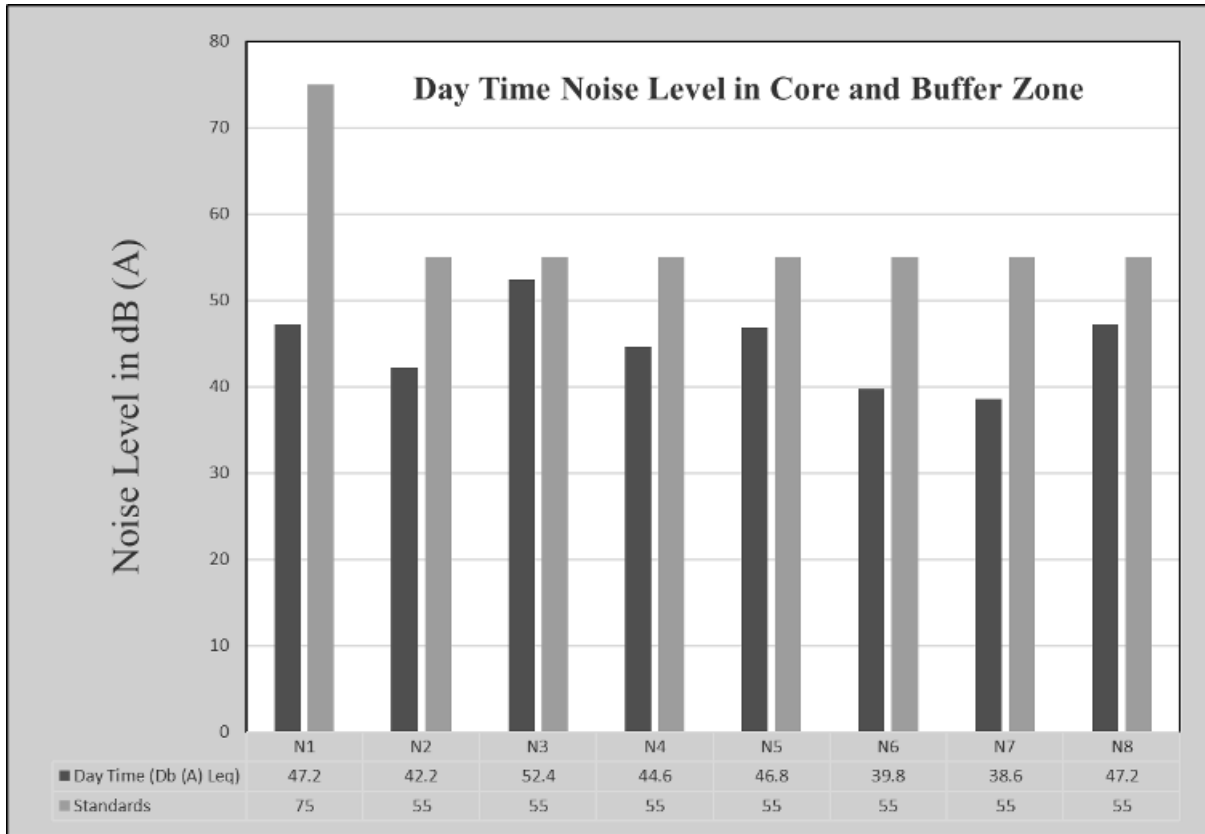
Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard ( $L_{eq}$ in dB (A))	
N1	Core	Industrial Area	47.2	35.4	75	70
N2	Salipalayam	Residential Area	42.2	32.6	55	45
N3	K. Paramathi		52.4	42.2	55	45
N4	Puthurpatti		44.6	34.4	55	45
N5	Kuppam		46.8	39.8	55	45
N6	Malapalayampudur		39.8	30.6	55	45
N7	Kurumpapatti		38.6	32.2	55	45
N8	Munnur		47.2	39.4	55	45

Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

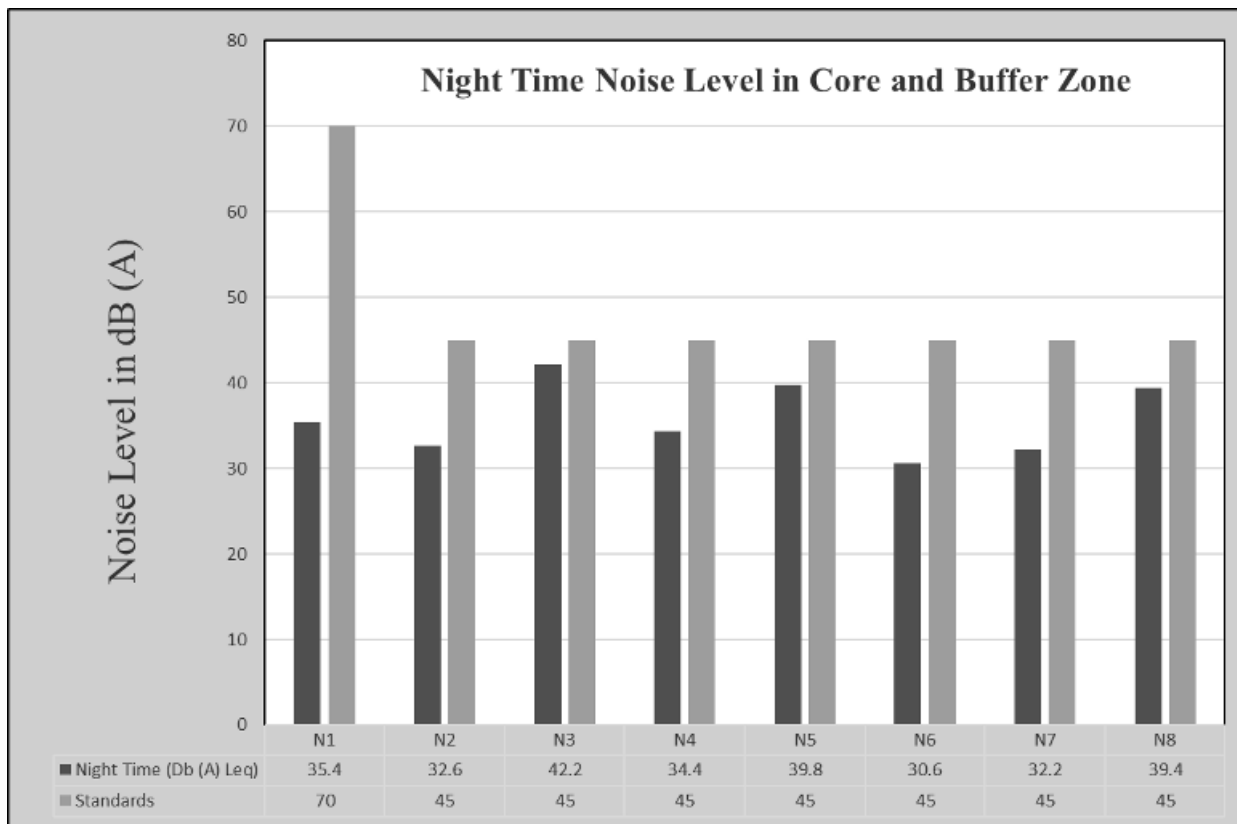
The Table 3.18 shows that noise level in core zone was 47.2 dB (A) Leq during day time and 35.4 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.6 to 52.4dB (A) Leq and during night time from 30.6 to 42.2dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.23 and 3.24.



**Figure 3.22 Toposheet Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site**



**Figure 3.23 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones**



**Figure 3.24 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones**

### 3.5 BIOLOGICAL ENVIRONMENT

An ecological survey was conducted to collect the baseline data regarding flora and fauna in the study area of 10 km radius. Data were collected from different sources, i.e., government departments such as District Forest Office and Government of Tamil Nadu. On the basis of onsite observations as well as forest department records the checklist of flora and fauna was prepared.

#### **Methodology**

Sampling locations were selected with reference to topography, land use, vegetation pattern, etc. In this study, quadrats of 25 m × 25 m were laid down to assess trees and quadrats of 10 m × 10 m were laid down for shrubs, as shown in Figure 3.25.



**Figure 3.25** Quadrates Sampling Methods of Flora

#### **Phyto-Sociological Studies**

Phyto sociological parameters, such as *Density, Frequency, Abundance and Importance Value Index* of individual species were determined in randomly placed quadrat of different sizes in the study area, as shown in Table 3.19. Relative frequency, and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, *Density, Frequency, Relative Density & Relative Frequency were found*. Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 10 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

**Table 3.19 Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index**

Parameters	Formula
Density	Total No. of individuals of species/ Total No. of Quadrats used in sampling
Frequency (%)	(Total No. of Quadrats in which species occur/ Total No. of Quadrats studied)100
Abundance	Total No. of individuals of species/ No. of Quadrats in which they occur
Relative Density	(Total No. of individuals of species/Sum of all individuals of all species) * 100
Relative Frequency	(Total No. of Quadrats in which species occur/ Total No. of Quadrats occupied by all species) * 100
Important Value Index	Relative Density + Relative Frequency

***Shannon – Wiener Index, Evenness and Richness***

Biodiversity index is a quantitative measure that reflects how many different types of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species is equally abundant. The corresponding formulas are given in Table 3.20.

**Table 3.20 Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness**

Description	Formula
Species diversity – Shannon – Wien Index	$H = \sum [(p_i) * \ln(p_i)]$ Where $p_i$ : Proportion of total sample represented by species i: number of individuals of species i/ total number samples
Evenness	$H/H_{max}$ $H_{max} = \ln(s) =$ maximum diversity possible $S =$ No. of species
Species Richness by Margalef	$RI = S - 1/\ln N$ Where $S =$ Total Number of species in the community $N =$ Total Number of individuals of all species in the Community

**3.5.1 Flora**

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections.

### **Flora in mine lease area (core zone)**

The mine lease area contains total of 17 species belonging to 9 families have been recorded from the mine lease area. 5 Trees, 4 shrubs, 8 herbs were identified. It is a grassy land. There are no endangered species in mine lease area. Details of vegetation with scientific name indicated in Table 3.21.

**Table 3.21 Flora in mine lease area**

S.no	Local name	Scientific name	Family name	No of plants
<b>Trees</b>				
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	7
2	Unjai maram	<i>Albizia amara</i>	Fabaceae	9
3	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	6
4	Vealli vealan	<i>Vachellia leucophloea</i>	Fabaceae	6
5	Panai maram	<i>Borassus flabellifer</i>	Fabaceae	3
<b>Shrubs</b>				
1	Avaram chadi	<i>Senna auriculata</i>	Fabaceae	3
2	Earuku	<i>Calotropis gigantea</i>	Apocynaceae	7
3	communist pacha	<i>Chromolaena odorata</i>	Asteraceae	6
4	Unnichadi	<i>Lantana camara</i>	Verbenaceae	5
<b>Herbs /Climber</b>				
1	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	2
2	Thathapondu	<i>Tridax procumbens</i>	Asteraceae	12
3	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	8
4	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	5
5	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	12
6	Pill	<i>Cenchrus ciliaris</i>	Poaceae	10
7	Pulapoo	<i>Aerva lanata</i>	Amaranthaceae	3
8	American mint	<i>Hyptis suaveolens</i>	Lamiaceae	5

### **The Flora in lease area and 300 m radius (buffer zone)**

There is no agricultural land nearby lease area. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 5 Shrubs (17%) and 22 Herbs and Climbers, Creeper, Grass & Cactus 20 (64%) were identified. Details of flora with the scientific name details and of diversity species Richness index were mentioned in Table 3.22-3.24 and Figure 3.26. There is no threatened species in 300 m radius.

### **Flora in 10 km radius (buffer zone)**

Similar type of environment occurs in both core and buffer zone but more floral diversity noticed in buffer zone compared with core zone area. Buffer area contains a total species belonging to 38 families have been recorded. The floral (75) varieties among them 35 Trees (46%), 15 Shrubs (15%) Herbs and Climbers, Creeper, Grass & Cactus, 25 (33%) were identified. Details of flora with the scientific name mentioned in Table 3.24.



**Table 3.22 Flora in 300 m Radius**

S.No.	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>Trees</b>													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
2	Panai maram	<i>Borassus flabellifer</i>	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
3	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
4	Vealli vealan	<i>Vachellia leucophloea</i>	Babesiae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
5	Unjai maram	<i>Albizia amara</i>	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
6	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
<b>Shrubs</b>													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	10	0.8	70.0	1.1	21.6	21.9	43.5	Not Listed
2	Uumaththai	<i>Datura metel</i>	Solanaceae	6	5	10	0.6	50.0	1.2	16.2	15.6	31.8	Not Listed
3	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7	6	10	0.7	60.0	1.2	18.9	18.8	37.7	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	10	0.9	80.0	1.1	24.3	25.0	49.3	Not Listed
5	Unichadi	<i>Lantana camara</i>	Verbenaceae	7	6	10	0.7	60.0	1.2	18.9	18.8	37.7	Not Listed

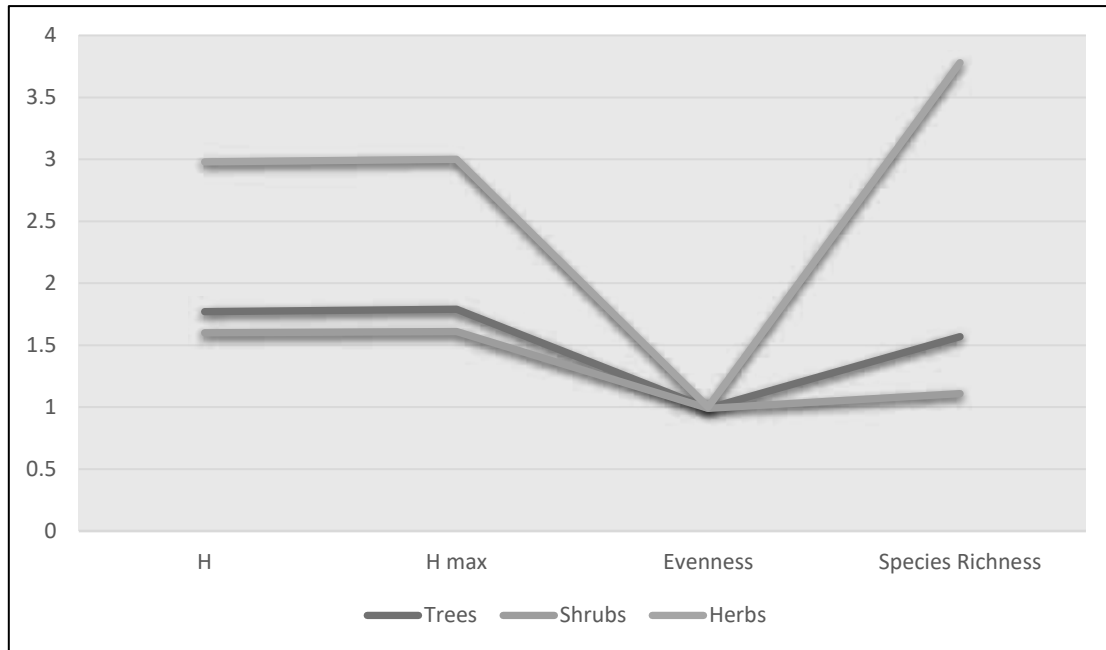
Herbs													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	
3	pill	<i>Cenchrus ciliaris</i>	Poaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
5	kapok bush	<i>Aerva javani</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
6	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
7	Yanai neariji	<i>pedalium murex</i>	Pedaliaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
8	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	10	9	15	0.7	60.0	1.1	6.6	6.8	13.4	Not Listed
9	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
10	Umathai	<i>Datura metel</i>	Solanaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
11	Sethamutti	<i>Sida cordata</i>	Malvaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
12	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
13	Ishappukol Vitai	<i>Plantago coronopus</i>	Plantaginaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
14	Vealiparuthi	<i>Pergularia daemia</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
15	Seppu nerinji	<i>Indigofera linnaei</i> Ali	Fabaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
16	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
17	Pal kodi	<i>Cynanchum viminalis</i>	Apocynaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
18	Ilia perandai	<i>Cissus rotundifolia</i>	Vitaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
19	Katralai	<i>Aloe vera</i>	Asphodelaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
20	Seammulli	<i>Barleria prionitis</i>	Acanthaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed

**Table 3.23 Calculation of Species Diversity in 300 m Radius**

S.No.	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Trees</b>						
1	Karuvealan	<i>Prosopis juliflora</i>	4	0.17	-1.79	-0.30
2	Palm tree	<i>Borassus flabellifer</i>	3	0.13	-2.08	-0.26
3	Vembu	<i>Azadirachta indica</i>	5	0.21	-1.57	-0.33
4	Vealli vealan	<i>Vachellia leucophloea</i>	4	0.17	-1.79	-0.30
5	Unjai maram	<i>Albizia amara</i>	3	0.13	-2.08	-0.26
6	Vetpalai	<i>Wrightia tinctoria</i>	5	0.21	-1.57	-0.33
H (Shannon Diversity Index) =1.77						
<b>Shrubs</b>						
1	Erukku	<i>Calotropis gigantea</i>	8	0.22	-1.53	-0.33
2	Uumaththai	<i>Datura metel</i>	6	0.16	-1.82	-0.29
3	Thuthi	<i>Abutilon indicum</i>	7	0.19	-1.67	-0.32
4	Avarai	<i>Senna auriculata</i>	9	0.24	-1.41	-0.34
5	Unichadi	<i>Lantana camara</i>	7	0.19	-1.67	-0.32
H (Shannon Diversity Index) =1.60						
<b>Herbs</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.04	-3.23	-0.13
2	Nearunji mull	<i>Tribulus zeyheri Sond</i>	7	0.05	-3.08	-0.14
3	Pill	<i>Cenchrus ciliaris</i>	9	0.06	-2.83	-0.17
4	Pulapoo	<i>Aerva lanata</i>	8	0.05	-2.94	-0.15
5	Kapok bush	<i>Aerva javani</i>	6	0.04	-3.23	-0.13
6	Rail poondu	<i>Croton bonplandianus</i>	8	0.05	-2.94	-0.15
7	Mookuthi poondu	<i>pedalium murex</i>	7	0.05	-3.08	-0.14
8	Perandai	<i>Cissus quadrangularis</i>	10	0.07	-2.72	-0.18
9	Thumbai chadi	<i>Leucas aspera</i>	6	0.04	-3.23	-0.13
10	Umathai	<i>Datura metel</i>	7	0.05	-3.08	-0.14
11	Sethamutti	<i>Sida cordata</i>	8	0.05	-2.94	-0.15
12	Kolunji	<i>Tephrosia purpurea</i>	9	0.06	-2.83	-0.17
13	Ishappukol Vitai	<i>Plantago coronopus</i>	6	0.04	-3.23	-0.13
14	Vealiparuthi	<i>Pergularia daemia</i>	7	0.05	-3.08	-0.14
15	Seppu nerinji	<i>Indigofera linnaei Ali</i>	8	0.05	-2.94	-0.15
16	Sapathikalli	<i>Opuntia ficus-indica</i>	9	0.06	-2.83	-0.17
17	Pal kodi	<i>Cynanchum viminale</i>	6	0.04	-3.23	-0.13
18	Ila perandai	<i>Cissus rotundifolia</i>	8	0.05	-2.94	-0.15
19	Katralai	<i>Aloe vera</i>	9	0.06	-2.83	-0.17
20	Seammulli	<i>Barleria prionitis</i>	8	0.05	-2.94	-0.15
H (Shannon Diversity Index) =2.98						

**Table 3.24 Species Richness (Index) in 300 m radius**

Details	H	H max	Evenness	Species Richness
<b>Trees</b>	1.77	1.79	0.99	1.57
<b>Shrubs</b>	1.60	1.61	0.99	1.11
<b>Herbs</b>	2.98	3.00	1.00	3.78



**Figure 2.26 Bar Chart Showing in Species Richness**

**Table 3.25 Flora in Buffer Zone**

S. No	Local Name	Scientific name	Family name	IUCN Conservation Status
<b>Trees</b>				
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	Not Listed
2	Thekku	<i>Tectona grandis</i>	Verbenaceae	Not Listed
3	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	Not Listed
5	Manga	<i>Mangifera indica</i>	Anacardiaceae	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	Not Listed
7	Vadanarayani	<i>Delonix elata</i>	Fabaceae	Not Listed
8	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae	Not Listed
9	Punnai	<i>Calophyllu inophyllum</i>	Calophyllaceae	Not Listed
10	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae	Not Listed
11	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	Not Listed
12	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	Not Listed
13	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae	Not Listed
14	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	Not Listed
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae	Not Listed
16	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	Not Listed
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae	Not Listed
18	Vazhaimaram	<i>Musa</i>	Musaceae	Not Listed
19	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae	Not Listed
20	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae	Not Listed
21	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	Not Listed

22	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae	Not Listed
23	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae	Not Listed
24	Karungali	<i>Acacia sundra</i>	Legumes	Not Listed
25	Nochi	<i>Vitex negundo</i>	Lamiaceae	Not Listed
26	Karimurungai	<i>Moringa olefera</i>	Moraginaceae	Not Listed
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae	Not Listed
28	Poovarasu	<i>Thespesia populnea</i>	Malvaceae	Not Listed
29	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	Not Listed
30	Vilvam	<i>Aegle marmelos</i>	Rutaceae	Not Listed
31	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	Not Listed
32	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae	Not Listed
33	Koyya	<i>Psidium guajava</i>	Myrtaceae	Not Listed
34	Seethapazham	<i>Annona reticulata</i>	Annonaceae	Not Listed
35	Savukku	<i>Casuarina L.</i>	Casuarinaceae	Not Listed
<b>Shrubs</b>				
1	Avarai	<i>Senna auriculata</i>	Fabaceae	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	Not Listed
3	Puramuttai	<i>Chrozophora rottleri</i>	Euphorbiaceae	Not Listed
4	Arali	<i>Nerium indicum</i>	Apocynaceae	Not Listed
5	Seemaiagaththi	<i>Cassia alata</i>	Caesalpinaceae	Not Listed
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	Not Listed
7	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	Not Listed
8	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	Not Listed
9	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae	Not Listed
10	Thuthi	<i>Abutilon indicum</i>	Meliaceae	Not Listed
11	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae	Not Listed
12	Uumaththai	<i>Datura metel</i>	Solanaceae	Not Listed
13	Kundumani	<i>Abrus precatorius</i>	Fabaceae	Not Listed
14	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	Not Listed
15	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	Not Listed
<b>Herbs, Climber, Creeper &amp; Grasses</b>				
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	Not Listed
2	Veetukaayapoond	<i>Tridax procumbens</i>	Asteraceae	Not Listed
3	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	Not Listed
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	Not Listed
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	Not Listed
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae	Not Listed
7	Thumbai	<i>Leucas aspera</i>	Lamiaceae	Not Listed
8	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	Not Listed
9	Parttiniyam	<i>Parthenium hysterothorus</i>	Asteraceae	Not Listed
10	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	Not Listed

11	Arugampul	<i>Cynodon dactylon</i>	Poaceae	Not Listed
12	Thoiya keerai	<i>Digeria muricata</i>	Amarantheceae	Not Listed
13	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	Not Listed
14	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	Not Listed
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	Not Listed
16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	Not Listed
17	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae	Not Listed
18	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae	Not Listed
19	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	Not Listed
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	Not Listed
21	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae	Not Listed
22	Mookuthi poondu	<i>Wedelia trilobata</i>	Asteraceae	Not Listed
23	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae	Not Listed
24	Musthakasu	<i>Kyllinga brevifolia</i>	Cyperaceae	Not Listed
25	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	Not Listed

#### **Aquatic Vegetation**

There are no water bodies in 1km radius of mine lease area. So, no aquatic flora and fauna in 1km radius.

#### **Forest Vegetation**

There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Thathampalayam R.F. located on 7.82 km South-eastern side of the lease area. There are few plants and no endangered species in Thampalayam reserve forest. the *Azadirachta indica*, *Vachellia leucophloea*, *albizia amara* these three types of plants are abundant in Thampalayam reserve forest. the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive.

#### **Endangered and endemic species as per the IUCN Red List**

There are no rare, endangered and endemic species found in the study area. There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), ecologically sensitive zone.

### **3.5.2 Fauna**

The faunal survey was carried out for Mammals, Birds, Reptiles, Amphibians and Butterflies. There are no rare, endangered, threatened (RET) and endemic species present in core area.

**Table 3.26 Methodology applied during survey of fauna**

S. No.	Taxa	Method of Sampling	References
1	Insects	Random walk, Opportunistic observations	Pollard (1977); Kunte (2000)
2	Reptiles	Visual encounter survey (Direct Search)	Daniel J.C (2002)

3	Amphibians	Visual encounter survey (Direct Search)	
4	Mammals	Tracks and Signs	Menon V (2014)
5	Avian	Random walk, Opportunistic observations.	Grimmett R (2011); Ali S (1941)

### ***Fauna in Core Zone***

The 25 varieties of species observed in the core zone. Among them numbers of Insects 8 (32%), Reptiles 3 (12%), Mammals 5 (20%) and Avian 9 (36%). A total of 25 species belonging to 22 families have been recorded from the core mining lease area. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and eight species are under schedule IV according to Indian wild life Act 1972. A total eight species of birds were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table. 3.27.

**Table 3.27 Fauna in Core Zone**

S. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
<b>INSECTS</b>					
1	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	NL	NL
2	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
3	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
4	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
5	Stick insect	Lonchodidae	<i>carausius morosus</i>	NL	LC
6	Mottled emigrant	Peridae	<i>Catopsilia pyranthe</i>	NL	LC
7	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	<i>Acraea violae</i>	Nymphalidae	<i>Acraea violae</i>	NL	LC
<b>REPTILES</b>					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
<b>MAMMALS</b>					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
2	Cow	Bovidae	<i>Bos taurus</i>	NL	NL
3	Common dog	Canidae	<i>Canis lupus familiaris</i>	NL	NL

4	Common cat	Felidae	<i>Felis silvestris catus</i>	NL	NL
5	Squirrel	Sciuridae	<i>Funambulus palmarum</i>	NL	NL
<b>AVES</b>					
1	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
2	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
3	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
4	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
5	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
6	Koel	Cucalidae	<i>Eudynamys scolopaceus</i>	Schedule IV	LC
7	Crow Pheasant	Cucalidae	<i>Centropus sinensis</i>	Schedule IV	LC
8	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
9	Grey drongo	Dicruridae	<i>Dicrurus leucophaeus</i>	Schedule IV	LC

\*NE- Not Evaluated; LC- Least Concern, NT –Near Threatened, T-Threatened

### ***Fauna in Buffer Zone***

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (40%), followed by Insects 15 (31%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed. List of fauna in the buffer zone is provided in Table 3.28.

**Table 3.28 Fauna in Buffer Zone**

<b>S. No.</b>	<b>Common Name/English Name</b>	<b>Family Name</b>	<b>Scientific Name</b>	<b>Schedule List Wildlife Protection Act 1972</b>	<b>IUCN Red List Data</b>
<b>INSECTS</b>					
1	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
4	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
7	Lime butterfly	Papilionidae	<i>Papilio demoleus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC



10	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
11	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
12	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
13	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
14	Lesser grass blue	Lycaenidae	<i>Zizina otis indica</i>	Schedule IV	LC
15	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA
<b>REPTILES</b>					
16	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
17	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
18	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
19	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
20	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
21	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
22	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
<b>MAMMALS</b>					
23	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
24	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
25	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
26	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
<b>AVES</b>					
27	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
28	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
29	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
30	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
31	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
32	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
33	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
34	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
35	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
36	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
37	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
38	Indian golden oriole	Oriolidae	<i>Oriolus kundoo</i>	Schedule IV	LC

39	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameria</i>	NL	LC
40	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
41	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
42	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocerus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
<b>AMPHIBIANS</b>					
45	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
46	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
47	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

\*NL-Not listed, LC-Least concern, NT-Near threatened.

### 3.5.3 Agriculture & Horticulture in Karur district:

The principal crops of the district are paddy, millets, pulses, oilseeds, sugarcane and banana. The major paddy area is in Kulithalai and Krishnarayapuram taluks. Pulses are grown in rice fallow areas. In uplands millets like sorghum, pearl millet pulses such as red gram, horse gram oilseeds such as groundnut, gingelly and sunflower are grown both under irrigated and rain fed conditions.

#### Major Agricultural Crops

Major horticulture crops cultivated in this district are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.29.

**Table 3.29 Major Crops in 1km radius**

S. No	Major crops	Scientific name	Families
1	Sorghum	<i>Sorghum bicolor</i>	Poaceae
2	Gingelly	<i>Sesamum indicum</i>	Pedaliaceae
3	Groundnut	<i>Arachis hypogaea</i>	Legumes
4	Sugarcane	<i>Saccharum officinarum</i>	Poaceae
5	Millets	<i>Panicum miliaceum L</i>	Poaceae
6	Sesame	<i>Sesamum indicum</i>	Pedaliaceae
7	Cotton	<i>Gossypium herbaceum</i>	Malvaceae

#### Major Horticulture Crops

Horticulture includes cultivation of fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees

and plants. It also includes plant conservation, landscape restoration, landscape and garden design.

### **Horticulture**

Major horticulture crops cultivated in Karur district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, Veandai, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.30.

**Table 3.30 Major Field Crops & Horticulture cultivation in 1km radius.**

S. No	Common Name	Scientific Name	Family
<b>Major Horticultural Crops</b>			
1	Guava	<i>Psidium guajava</i>	Myrtaceae
2	Sapota	<i>Manilkara zapota</i>	Sapotaceae
3	Lemon	<i>Citrus × limon</i>	Rutaceae
4	Papaya	<i>Carica papaya</i>	Caricaceae
<b>Vegetables</b>			
8	Onion	<i>Allium cepa</i>	Amaryllidaceae
9	Tapioca	<i>Manihot esculenta</i>	Spurges
10	Brinjal	<i>Solanum melongena</i>	Nightshade
11	Tomato	<i>Solanum lycopersicum</i>	Nightshade
12	Bottle Gourd	<i>Lagenaria siceraria</i>	Cucurbits
13	Veandai kai	<i>Abelmoschus esculentus</i>	Mallows
14	Moringa	<i>Moringa oleifera</i>	Moringaceae

### **Results**

Biological assessment of the site was done to identify ecologically sensitive areas and whether there are any rare, endangered, endemic or threatened (REET) species of flora & fauna in the core area as well its buffer zone to be impacted. The study has also been designed to suggest suitable mitigation measures, if necessary, for protection of wildlife habitats and conservation of REET species if any. The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

## **3.6 SOCIO ECONOMICS ENVIRONMENT**

### **3.6.1 Introduction**

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services,

occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. Socio-economic study of an area provides a good opportunity to assess the socio-economic condition and possibly makes a change in living and social standards of the particular area benefitted due to the project.

### 3.6.2 Objectives of the Study

The main objectives of the study are as follows:

- ❖ To know the current socio-economic condition in the region to cover the sub sectors education, health, sanitation, and water & food security.
- ❖ To recommend practical strategic interventions in the sector.
- ❖ To help in providing better living standards.
- ❖ To understand skill sets and plan for employment opportunities which shall be created.

### 3.6.3 Scope of Work

- ❖ To study the socio-economic environment of the area from the secondary sources
- ❖ Data collection & Analysis
- ❖ Prediction of project impact
- ❖ Mitigation Measures

### 3.6.4 Socio-Economic Status of Study area

The study area covers 10 villages including Ariyur, Athipalayam, K.Paramathi, Karudayampalayam, Kuppam, Munnur, Nedungur, Pavithiram, Punnam, Vettamangalam(East) , Vettamangalam (West) is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.31 and for other 10 villages in Tables 3.32 - 3.34

**Table 3.31 Kuppam Village Population Facts**

<b>Kuppam Village</b>	
Number of Households	1120
Population	3503
Male Population	1697
Female Population	1806
Children Population	264
Sex-ratio	1064
Literacy	60.11%
Male Literacy	72.80%
Female Literacy	48.17%
Scheduled Tribes (ST)	0
Scheduled Caste (SC)	600
Total Workers	2246
Main Worker	1941
Marginal Worker	305

**Table 3.32 Population and Literacy Data of Study Area**

<b>Village</b>	<b>No of Households</b>	<b>Total Population Person</b>	<b>Total Population Male</b>	<b>Total Population Female</b>	<b>Literates Population Person</b>	<b>Literates Population Male</b>	<b>Literates Population Female</b>	<b>Illiterate Persons</b>	<b>Illiterate Male</b>	<b>Illiterate Female</b>
Ariyur	443	1378	694	684	887	512	375	491	182	309
Athipalayam	730	2062	1014	1048	1271	757	514	791	257	534
K.Paramathi	25475	82268	40825	41443	53384	30733	22651	28884	10092	18792
Karudayampalayam	577	2347	1211	1136	1614	977	637	733	234	499
Munnur	826	2582	1289	1293	1649	980	669	933	309	624
Nedungur	403	1190	586	604	800	469	331	390	117	273
Pavithiram	1799	5881	2862	3019	3738	2165	1573	2143	697	1446
Punnam	1452	5446	2839	2607	3679	2208	1471	1767	631	1136
Vettamangalam (East)	807	2657	1310	1347	1521	900	621	1136	410	726
Vettamangalam (west)	1827	5882	2887	2995	3953	2225	1728	1929	662	1267

**Table 3.33 Details on Educational Facilities, Water, and Drainage & Health Facilities**

<b>Village</b>	<b>Private Primary School (Numbers)</b>	<b>Govt. Vocational Training School/ITI (Numbers)</b>	<b>Primary Health Centre (Numbers)</b>	<b>Tap Water Untreated</b>	<b>River/Canal</b>	<b>Is the Area Covered under Total Sanitation Campaign (TSC)?</b>	<b>Telephone (landlines)</b>	<b>Public Bus Service</b>	<b>Gravel (kutch) Roads</b>	<b>Commercial Bank</b>	<b>Agricultural Credit Societies</b>	<b>Self - Help Group (SHG)</b>	<b>Nutritional Centres- Anganwadi Centre</b>	<b>Community Centre with/without TV</b>	<b>Power Supply For Domestic Use</b>
Ariyur	0	0	0	1	2	2	1	1	1	2	2	1	1	1	1
Athipalayam	0	0	0	1	2	1	1	2	1	2	2	1	1	1	1
K.Paramathi	0	0	1	1	2	2	1	1	1	1	1	1	1	2	1
Karudayampalayam	0	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Munnur	0	0	0	1	2	1	1	1	1	2	2	1	1	2	1
Nedungur	0	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Pavithiram	1	0	0	1	1	2	1	1	1	2	2	1	1	1	1
Punnam	1	0	1	1	1	2	1	1	1	2	1	1	1	1	1
Vettamangalam (East)	0	0	1	1	1	1	1	1	1	2	1	1	1	1	1
Vettamangalam (west)	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1

**Table 3.34 Workers' Profile of Study Area**

<b>Village</b>	<b>Total Worker Population Person</b>	<b>Total Worker Population Male</b>	<b>Total Worker Population Female</b>	<b>Main Working Population Person</b>	<b>Main Working Population Male</b>	<b>Main Working Population Female</b>	<b>Main Cultivator Population Person</b>	<b>Main Agricultural Labourers Population Person</b>	<b>Main Other Workers Population Person</b>	<b>Non-Working Population Person</b>
Ariyur	790	493	297	790	493	297	337	309	130	588
Athipalayam	1372	713	659	1309	701	608	442	551	281	690
K.Paramathi	49254	27760	21494	46414	26489	19925	14265	17270	13726	33014
Karudayampalayam	1176	646	530	847	501	346	301	265	251	1171
Munnur	1577	882	695	1434	805	629	420	638	355	1005
Nedungur	753	432	321	734	418	316	409	241	81	437
Pavithiram	3293	1875	1418	2879	1682	1197	747	829	1242	2588
Punnam	2718	1531	1187	2665	1504	1161	731	632	1269	2728
Vettamangalam (East)	1609	894	715	1593	886	707	419	940	210	1048
Vettamangalam (west)	3541	1966	1575	3455	1920	1535	1268	1410	729	2341

### **3.6.5 Recommendation and Suggestion**

- ❖ Awareness program should be conducted to make the population aware of education and to get a better livelihood.
- ❖ Vocational training programme should be organized to make the people self - employed, particularly for women and unemployed youth.
- ❖ On the basis of qualification and skills local community may be preferred. Long term and short-term employments should be generated.
- ❖ Health care centre and ambulance facility should be provided to the population to get easy access to medical facilities. Apart from that, as these areas are prone to various diseases a hospital with modern facilities should be opened on a priority basis in a central place to provide better health facilities to the villagers around the project.
- ❖ While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

### **3.6.6 Summary & Conclusion**

The socio-economic study in the study area gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from a lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis. The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

### **3.7 TRAFFIC DENSITY**

The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Karur to Vellaikovil (NH-81) as shown in Table 3.35-3.38 and in Figure 3.27. Traffic density measurements were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station. During each shift one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.



**Table 3.35 Traffic Survey Locations**

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.53 Km-South	Village Road
TS2	Karur to Vellaikovil (NH-81)	2.25 Km-South	Karur to Vellaikovil (NH 81)

Source: On-site monitoring by GTMS FAE & TM

**Table 3.36 Existing Traffic Volume**

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	28	84	33	33	58	29	146
TS2	130	390	188	188	220	110	688

Source: On-site monitoring by GTMS FAE & TM

\* PCU conversion factor: HMV (Trucks and Bus) = 3, LMV (Car, Jeep and Auto) = 1 and 2/3 Wheelers = 0.5

**Table 3.37 Rough Stone Transportation Requirement**

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	101	303

Source: Approved Mining Plan

**Table 3.38 Summary of Traffic Volume**

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Village Road	146	303	449	1200
Karur to Vellaikovil (NH-81)	668	303	971	1200

Source: On-site monitoring analysis summary by GTMS FAE & TM

- Due to these projects the existing traffic volume will not exceed the traffic limit. As per the IRC 1960 this existing village road can handle 1,200 PCU in hour and Major district road can handle 1500 PCU in hour. Hence there will not be any conjunction due to this proposed transportation

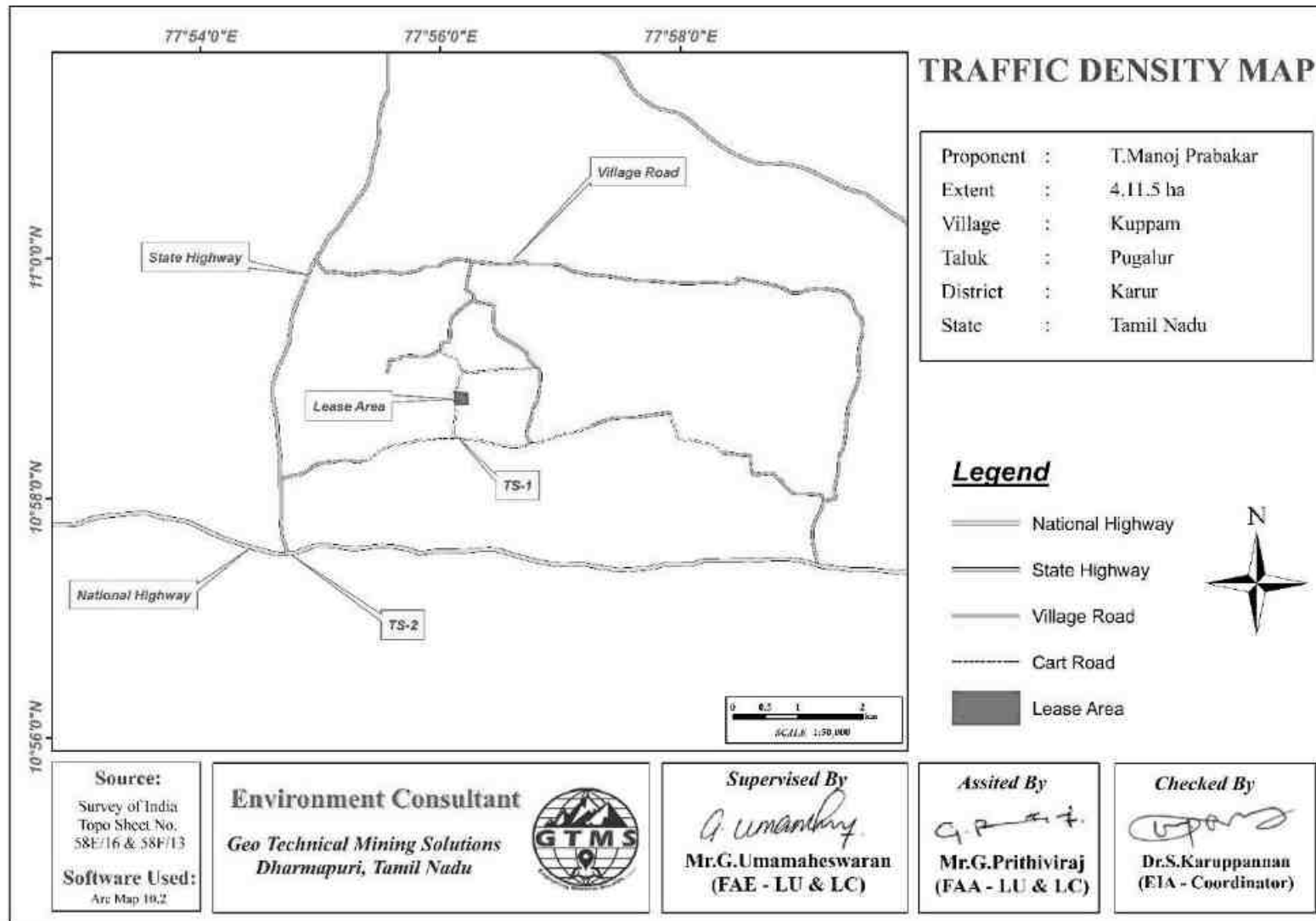


Figure 3.27 Traffic Density Map

### 3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, Reserve Forest and National Park within 10 km radius. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitive areas around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.39.

**Table 3.39 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	Thathampalayam R. F	7.82 km SE
		Amaravathi River	9.72 km SE
		Cauvery River	8.98 km North
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Densely 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 Tamilnadu Newsprint and Papers Limited	9.95 km NE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet





**Figure 3.28 Field Study Photographs**

## CHAPTER IV

### ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 4.0 GENERAL

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 sustainable resource extraction. This chapter discusses the anticipated impacts on soil, land, water, air, noise, biological, and socioeconomic environments.

#### 4.1 LAND ENVIRONMENT

##### 4.1.1 Anticipated Impact

- ❖ Permanent change on land use and land cover.
- ❖ Change in topography of the mine lease area.
- ❖ 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 agricultural fields during the rainy season
- ❖ Increase in agricultural productivity of land when mine water is discharged to the surrounding lands for irrigation

##### 4.1.2 Common Mitigation Measures from Proposed Project

- ❖ 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
- ❖ 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

##### 4.2.1 Anticipated Impact on Soil Environment

- ❖ Deterioration of soil quality in the surrounding area due to runoff from the project area

- ❖ Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

#### **4.2.2 Common Mitigation Measures from proposed project**

- ❖ Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- ❖ 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 the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site.
- ❖ Retain existing or re-plant the vegetation will be retained 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**

#### **4.3.1 Anticipated Impact**

- ❖ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ❖ As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

#### **4.3.2 Common Mitigation Measures for the Proposed Project**

- ❖ Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- ❖ Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- ❖ Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- ❖ 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
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- ❖ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program

## 4.4 AIR ENVIRONMENT

### 4.4.1 Anticipated Impact from proposed project

- ❖ During mining at various stages of activities such as excavation, drilling and transportation of materials, particular matter (PM), gases such as sulphur dioxide, oxides of nitrogen from vehicular exhaust are the main air pollutants.
- ❖ Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- ❖ The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- ❖ Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

### 4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauhya et al.,2001. The equations used for SPM, SO<sub>2</sub>, and NO<sub>x</sub> emission estimation have been given in Table 4.1.

**Table 4.1 Empirical Formula for Emission Rate from Overall Mine**

	<b>Pollutant</b>	<b>Source Type</b>	<b>Empirical Equation</b>	<b>Parameters</b>
Overall Mine	SPM	Area	$E = [u0.4a0.2\{9.7 + 0.01p + b/(4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	SO <sub>2</sub>	Area	$E = a0.14\{u/(1.83 + 0.93u)\} [\{p/(0.48 + 0.57p)\} + \{b/(14.37 + 1.15b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	NO <sub>x</sub>	Area	$E = a0.25\{u/(4.3 + 32.5u)\} [1.5p + \{b/(0.06 + 0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> emission results have been given in Table 4.2.

**Table 4.2 Estimated Emission Rate**

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m <sup>2</sup>	Calculated Value (g/s/m <sup>2</sup> )
Overall Mine	PM <sub>2.5</sub>	0.198418716	41150	4.82184E-06
Overall Mine	PM <sub>10</sub>	1.322791440	41150	3.21456E-05
Overall Mine	SO <sub>2</sub>	0.250381701	41150	6.08461E-06
Overall Mine	NO <sub>x</sub>	0.015985869	41150	3.88478E-07

**4.4.2.1 Modelling of Incremental Concentration**

Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500 m around the project area is predicted by open pit source modelling using AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants, as shown in Tables 4.3-4.6.

**4.4.2.2 Model Results**

The post project resultant concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> & NO<sub>x</sub> (GLC) is given in Tables 4.3-4.6.

**Table 4.3 Incremental & Resultant GLC of PM<sub>2.5</sub>**

Station ID	Distance to core	Direction	PM <sub>2.5</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (60 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	16.7	5	21.7	Below standard	29.9	Not significant
AAQ2	0.76	N	14.5	1	15.5		6.9	
AAQ3	3.30	SW	17.0	0	17		0.0	
AAQ4	3.23	NE	14.8	0.1	14.9		0.7	
AAQ5	3.61	NNW	15.7	0.1	15.8		0.6	
AAQ6	4.65	SSE	13.7	0.1	13.8		0.7	
AAQ7	3.99	ESE	15.5	0.1	15.6		0.6	
AAQ8	2.93	WNW	16.3	1	17.3		6.1	

**Table 4.4 Incremental & Resultant GLC of PM<sub>10</sub>**

Station ID	Distance to core area (km)	Direction	PM <sub>10</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (100 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	41.8	10	51.8		23.9	



AAQ2	0.76	N	36.2	1	37.2	Below standard	2.8	Not significant
AAQ3	3.30	SW	42.6	0	42.6		0.0	
AAQ4	3.23	NE	37.0	0.5	37.5		1.4	
AAQ5	3.61	NNW	39.3	0.5	39.8		1.3	
AAQ6	4.65	SSE	34.3	0	34.3		0.0	
AAQ7	3.99	ESE	38.8	0	38.8		0.0	
AAQ8	2.93	WNW	39.7	0.5	40.2		1.3	

**Table 4.5 Incremental & Resultant GLC of SO<sub>2</sub>**

Station ID	Distance to core area (km)	Direction	SO <sub>2</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	6.2	1	7.2	Below standard	16.1	Not significant
AAQ2	0.76	N	6.8	0.5	7.3		7.4	
AAQ3	3.30	SW	9.4	0	9.4		0.0	
AAQ4	3.23	NE	6.1	0	6.1		0.0	
AAQ5	3.61	NNW	7.1	0	7.1		0.0	
AAQ6	4.65	SSE	4.7	0.1	4.8		2.1	
AAQ7	3.99	ESE	3.5	0	3.5		0.0	
AAQ8	2.93	WNW	5.7	0.1	5.8		1.8	

**Table 4.6 Incremental & Resultant GLC of NO<sub>x</sub>**

Station ID	Distance to core area (km)	Direction	NO <sub>x</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	12.9	5	17.9	Below standard	38.8	Not significant
AAQ2	0.76	N	14.6	1	15.6		6.8	
AAQ3	3.30	SW	19.8	0	19.8		0.0	
AAQ4	3.23	NE	12.7	0	12.7		0.0	
AAQ5	3.61	NNW	14.9	0	14.9		0.0	
AAQ6	4.65	SSE	9.8	0	9.8		0.0	
AAQ7	3.99	ESE	8.7	0	8.7		0.0	
AAQ8	2.93	WNW	15.3	1	16.3		6.5	

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.

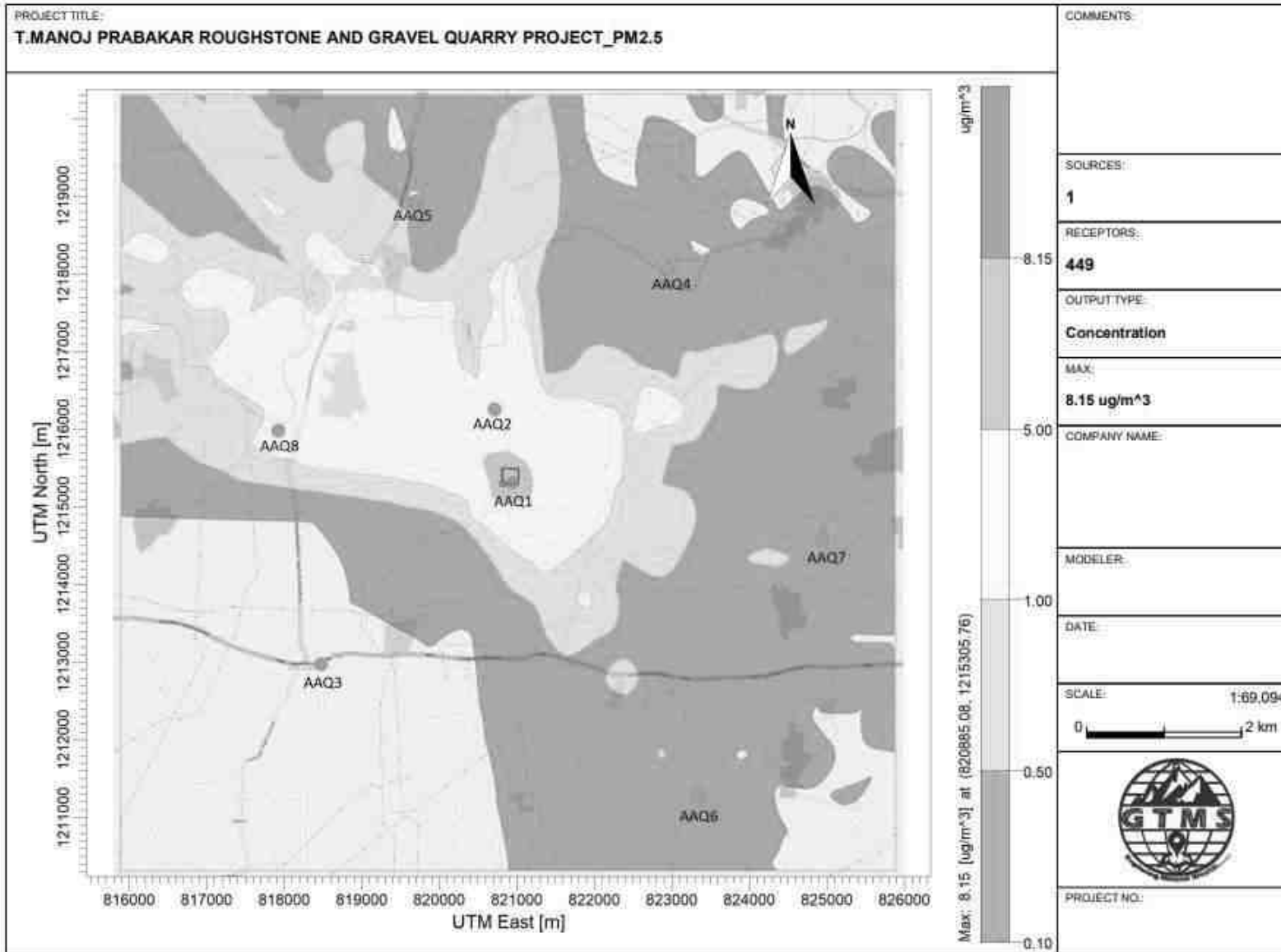
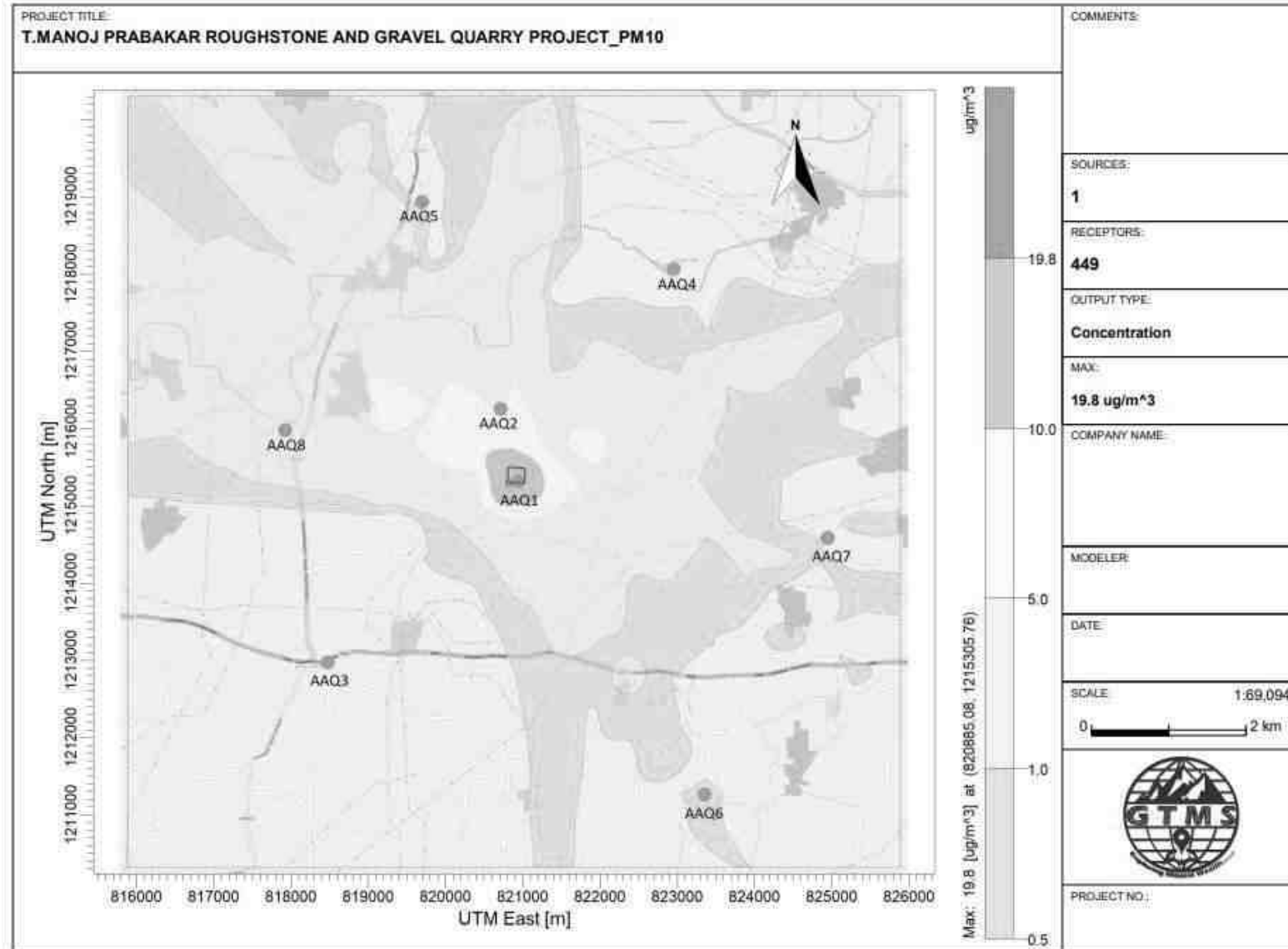


Figure 4.1 Predicted Incremental Concentration of PM<sub>2.5</sub>



**Figure 4.2 Predicted Incremental Concentration of PM<sub>10</sub>**

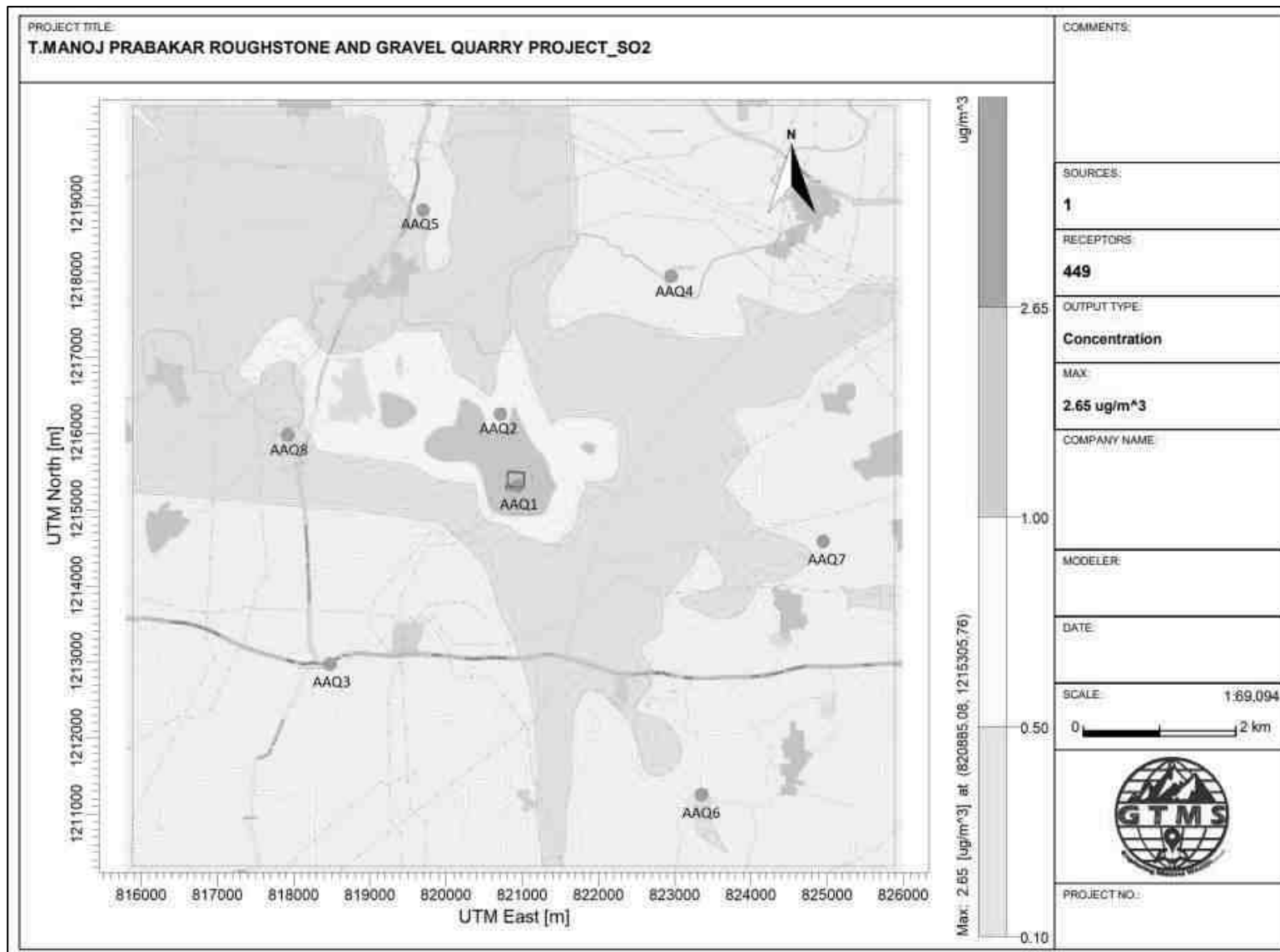


Figure 4.3 Predicted Incremental Concentration of SO<sub>2</sub>

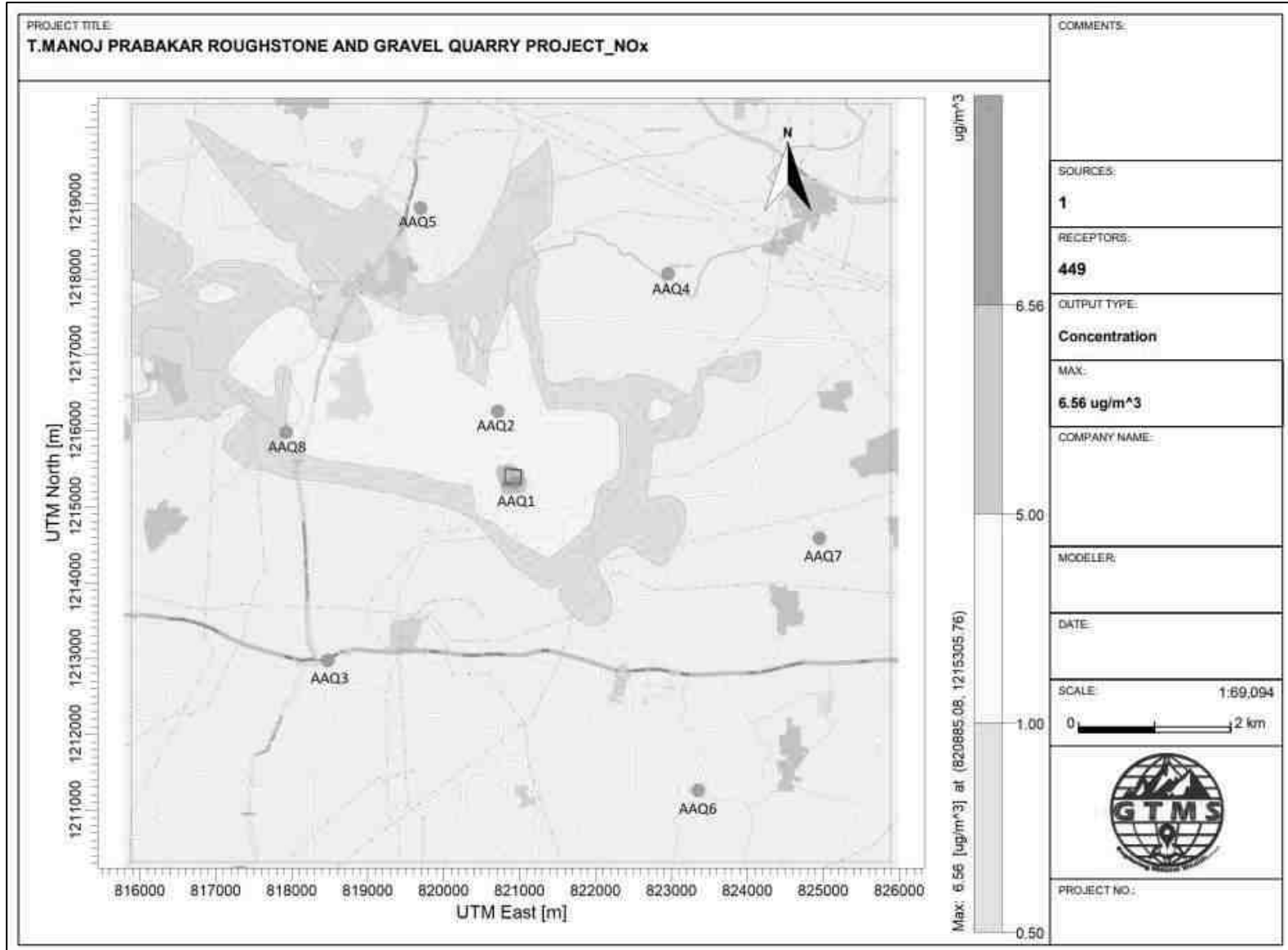


Figure 4.4 Predicted Incremental Concentration of NOx

## 4.5 NOISE ENVIRONMENT

Noise modelling has been carried out to assess the impact on surrounding ambient noise levels. Basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves which are propagated outwards from the source through the air at a speed of 1,100 ft/sec with the first wave making an ever-increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of the sphere. The assumption of the model is based on point source relationship i.e., for every doubling of the distance the noise levels are decreased by 6 dB (A). For hemispherical sound wave propagation through homogeneous loss free medium, one can estimate noise levels at various locations at different sources using a mathematical model based on first principle.

$$Lp_2 = Lp_1 - 20 \log (r_2/r_1) - Ae_{1,2}$$

Where,  $Lp_1$  &  $Lp_2$  are sound levels at points located at distances  $r_1$  and  $r_2$  from the source;  $Ae_{1,2}$  is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

$$Lp_{total} = 10 \log \{10^{(Lp1/10)} + 10^{(Lp2/10)} + 10^{(Lp3/10)} + \dots\}$$

### 4.5.1 Anticipated Impact

The attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are: source data, receptor data, and attenuation factor. Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.7.

**Table 4.7 Activity and Noise Level Produced by Machinery**

S. No.	Machinery / activity	Impact on environment?	Noise produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
<b>Total</b>			<b>95.8</b>

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). We have considered the total noise to be produced by mining activity to be 95.8 dB (A) for noise prediction modelling.

**Table 4.8 Predicted Noise Incremental Values**

<b>Noise Monitoring Location</b>	<b>Distance From Project Site(m)</b>	<b>Baseline Noise Level (dBA)m During Day Time</b>	<b>Predicted Noise Level (dBA)</b>	<b>Total (dBA)</b>
Core	100	47.2	43.96	48.89
Salipalayam	790	42.2	26.01	42.30
K. Paramathi	3510	52.4	13.05	52.40
Puthurpatti	3160	44.6	13.97	44.60
Kuppam	3640	46.8	12.74	46.80
Malapalayampudur	4620	39.8	10.67	39.81
Kurumpapatti	3940	38.6	12.05	38.61
Munnur	2990	47.2	14.45	47.20
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000. Therefore, no impact is anticipated on the noise environment due to the project.

#### **4.5.2 Common Mitigation Measures**

The following noise mitigation measures are proposed for control of noise:

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise
- ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders
- ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained
- ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system
- ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise
- ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise
- ❖ Silencers / mufflers will be installed in all machineries
- ❖ Greenbelt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise

- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness
- ❖ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

#### 4.5.3 Ground Vibrations

The major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kutcha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation. The empirical equation for assessment of peak particle velocity (PPV) is given below:

$$V = K [R/Q^{0.5}]^{-B}$$

Where,

V = peak particle velocity (mm/s), K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

B = constant related to the rock and site (usually 1.6), R = distance from charge (m)

**Table 4.9 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	58.55	790	0.3	19	0.15	137

**Table 4.10 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	58.55	100	8.18	19	1.73	159
		200	2.70		0.75	152
		300	1.41		0.46	147
		400	0.89		0.33	144
		500	0.62		0.25	142



The PPV results shows that the ground vibration is well below the permissible limits set by DGMS through circular 7,1997 for domestic houses near by the lease area at the dominant frequency of <8 Hz.

#### **4.5.3.1 Common 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> 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
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

## 4.6 ECOLOGY AND BIODIVERSITY

### 4.6.1 Impact on Ecology and Biodiversity

- ❖ During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- ❖ The Number of plants in the mining lease area is given in chapter 3 table 3.21 which vegetation in the lease area may be removed during mining.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 8104 kg per day, 2188185 kg per year and 10940926 kg over five years, as provided in Table 4.11.

**Table 4.11 Carbon Released During Five Years of Rough Stone and Gravel Production**

	Per day	Per year	Per five years
Fuel consumption of excavator	508	137219	686095
Fuel consumption of compressor	58.4	15768	78840
Fuel consumption of tipper	2457	663500	3317500
Total fuel consumption in liters	3024	816487	4082435
CO <sub>2</sub> emission in kg	8104	2188185	10940926

### 4.6.2 Mitigation Measures on Flora

- ❖ 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.
- ❖ None of the plants in the lease area will be cut during operational phase of the mine. we recommend uprooting and planting of the 10 trees along the 7.5 m safety zone to prevent environmental pollution during quarrying. As the survival rate due to uprooting was only 30%, 100 seedlings will be procured at the rate of 10 seedlings per tree and planted in 7.5 m safety zone.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ❖ To mitigate carbon emission due to mining activities, 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 4.12), about 2058 trees (Table 4.13) will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 89119 kg of the total carbon, as provided in Table 4.12.

**Table 4.12 CO<sub>2</sub> Sequestration**

CO <sub>2</sub> sequestration in kg	183	49331	246653
Remaining CO <sub>2</sub> not sequestered in kg	7922	2138855	10694273
Trees required for environmental compensation	89119		

**Table 4.13 Recommended Species for Greenbelt Development Plan**

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer Palisade & Spongy parenchyma. Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	Tree	
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	
6	<i>Bauhinia racemose</i>	Fabaceae	Aathi	Tree	
7	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Tree	
8	<i>Aegle marmelos</i>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	

**Table 4.14 Greenbelt Development Plan**

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m <sup>2</sup> )
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	823	658	7407
	Number of plants outside the mine lease area		
	1235	988	11111
<b>Total</b>	<b>2058</b>	<b>1646</b>	<b>18518</b>

**4.6.3. Anticipated Impact on Fauna**

- ❖ Direct impact is anticipated on fauna of core zone
- ❖ Insignificant impact is anticipated on fauna in the buffer area due to air emissions, noise, vibration, transportation, waste water discharges, and changes in land use

**Mitigation Measures on Flora**

- ❖ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ❖ The workers shall be trained not to harm any wildlife near the project site

**Aquatic Biodiversity**

Mining activities will not disturb the existing aquatic ecology as there is no effluent discharge proposed from the rough stone and gravel quarry. There is no natural perennial surface water body within the mine lease area. Hence, aquatic biodiversity is not observed in the mine lease area.

## **4.7 SOCIO ECONOMIC ENVIRONMENT**

### **4.7.1 Anticipated Impact from Proposed and Existing Projects**

- ❖ 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.

### **4.7.2 Common Mitigation Measures for Proposed Project**

- ❖ 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 AND SAFETY**

Occupational health and safety hazards occur during the operational phase of mining and primarily include the following:

- ❖ Respiratory hazards
- ❖ Noise
- ❖ Physical hazards
- ❖ Explosive storage and handling

### **4.8.1 Respiratory Hazards**

Long-term exposure to silica dust may cause silicosis the following measures are proposed:

- ❖ Cabins of excavators and tippers will be enclosed with AC and sound proof
- ❖ Use of personal dust masks will be made compulsory

#### **4.8.2 Noise**

Workers are likely to get exposed to excessive noise levels during mining activities. The following measures are proposed for implementation

- ❖ No employee will be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection
- ❖ The use of hearing protection will be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110 dB(A)
- ❖ Ear muffs provided will be capable of reducing sound levels at the ear to at least 85 dB(A)
- ❖ Periodic medical hearing checks will be performed on workers exposed to high noise levels.

#### **4.8.3 Physical Hazards**

The following measures are proposed for control of physical hazards

- ❖ Specific personnel training on work-site safety management will be taken up;
- ❖ Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level;
- ❖ Maintenance of yards, roads and footpaths, providing sufficient water drainage and preventing slippery surfaces with an all-weather surface, such as coarse gravel will be taken up.

#### **4.8.4 Occupational Health Survey**

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, spirometry tests, periodic medical examination – yearly, lung function test – yearly, those who are exposed to dust, and 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.

### **4.9 MINE WASTE MANAGEMENT**

No waste is anticipated from any of the proposed quarries.

### **4.10 MINE CLOSURE**

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities

starting from the decommissioning of the project. Therefore, progressive mine closure plan should be specifically dealt with in the mining plan and is to be reviewed along with mining plan. As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

- ❖ To create a productive and sustainable after-use for the site, acceptable to mine owners, regulatory agencies, and the public
- ❖ To protect public health and safety of the surrounding habitation
- ❖ To minimize environmental damage
- ❖ To conserve valuable attributes and aesthetics
- ❖ To overcome adverse socio-economic impacts.

#### **4.10.1 Mine Closure Criteria**

The criteria involved in mine closure are discussed below:

##### **4.10.1.1 Physical Stability**

All anthropogenic structures, which include mine workings, buildings, rest shelters etc., remaining after mine decommissioning should be physically stable. They should present no hazard to public health and safety as a result of failure or physical deterioration and they should continue to perform the functions for which they were designed. The design periods and factors of safety proposed should take full account of extreme events such as floods, hurricane, winds or earthquakes, etc. and other natural perpetual forces like erosion, etc.,

##### **4.10.1.2 Chemical Stability**

The solid wastes on the mine site should be chemically stable. This means that the consequences of chemical changes or conditions leading to leaching of metals, salts or organic compounds should not endanger public health and safety nor result in the deterioration of environmental attributes. If the pollutant discharges likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

#### 4.10.1.3 Biological Stability

The stability of the surrounding environment is primarily dependent upon the physical and chemical characteristics of the site, whereas the biological stability of the mine site itself is closely related to rehabilitation and final land use. Nevertheless, biological stability can significantly influence physical or chemical stability by stabilizing soil cover, prevention of erosion/wash off, leaching, etc.,

A vegetation cover over the disturbed site is usually one of the main objectives of the rehabilitation programme, as vegetation cover is the best long-term method of stabilizing the site. When the major earthwork components of the rehabilitation programme have been completed, the process of establishing a stable vegetation community begins. For re-vegetation, management of soil nutrient levels is an important consideration. Additions of nutrients are useful under three situations.

- ❖ Where the nutrient level of spread topsoil is lower than material in-situ e.g., for development of social forestry
- ❖ Where it is intended to grow plants with a higher nutrient requirement than those occurring naturally.
- ❖ Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor. For example, development of green barriers

The Mine closure plan should be as per the approved mining plan. The mine closure is a part of approved mine plan and activities of closure shall be carried out as per the process described in mine closure plan.

## **CHAPTER V**

### **ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

#### **5.0 INTRODUCTION**

Consideration of alternatives to a proposed project is a requirement of EIA process. During the scoping process, alternatives to a proposed project can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost-effective options.

#### **5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE**

The proposed project is site specific and has the following advantages:

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the project area; hence no R & R issues exist.
- ❖ There is no river, stream, nallah and water bodies in the applied mine lease area.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are well connected and accessible.
- ❖ The mining operations will not intersect the ground water level. Hence, no impact on ground water environment.
- ❖ As the proposed project area falls in seismic zone II, there is no major history of landslides, earthquake, subsidence etc., recorded in the past history.

#### **5.2 ANALYSIS OF ALTERNATIVE SITE**

No alternatives are suggested as the mine site is mineral specific.

#### **5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY**

Manual open cast mining method with secondary blasting will be applied to extract rough stone and gravel in the area. The proposed mining lease areas have following advantages:

- ❖ As the mineral deposition is homogeneous and batholith formation, opencast method of working is preferred over underground method.
- ❖ The material will be loaded with the help of excavators into tractors/tippers and transported to the need by customers.
- ❖ Semi-skilled labours fit for quarrying operations are easily available around the nearby villages.

#### **5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY**

Open cast mechanized method has been selected for this project. This technology is having least gestation period, economically viable, safest and less labour intensive. The method has inbuilt flexibility for increasing or decreasing the production as per market condition.



## **CHAPTER VI**

### **ENVIRONMENTAL MONITORING PROGRAMME**

#### **6.0 GENERAL**

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections. The main objective of environmental monitoring is to ensure that the obtained results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results, this forms as base data to identify the cause and suggest remedial measures. Environmental monitoring is mandatory to meet compliance of statutory provisions under the Environment (Protection) Act, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA-TN as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTE/CTO.

#### **6.1 METHODOLOGY OF MONITORING MECHANISM**

Implementation of EMP and periodic monitoring will be carried out by respective project proponents. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project; Environmental protection measures like dust suppression, control of noise and blast vibrations, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of Environmental Management Plan and environmental clearance conditions will be monitored by the respective mine management. On the other hand, implementation of area level protection measures like green belt development, environmental quality monitoring etc., are taken up by a senior executive who reports to their Mine Management.

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in the proposed quarry. The responsibilities of this cell will be:

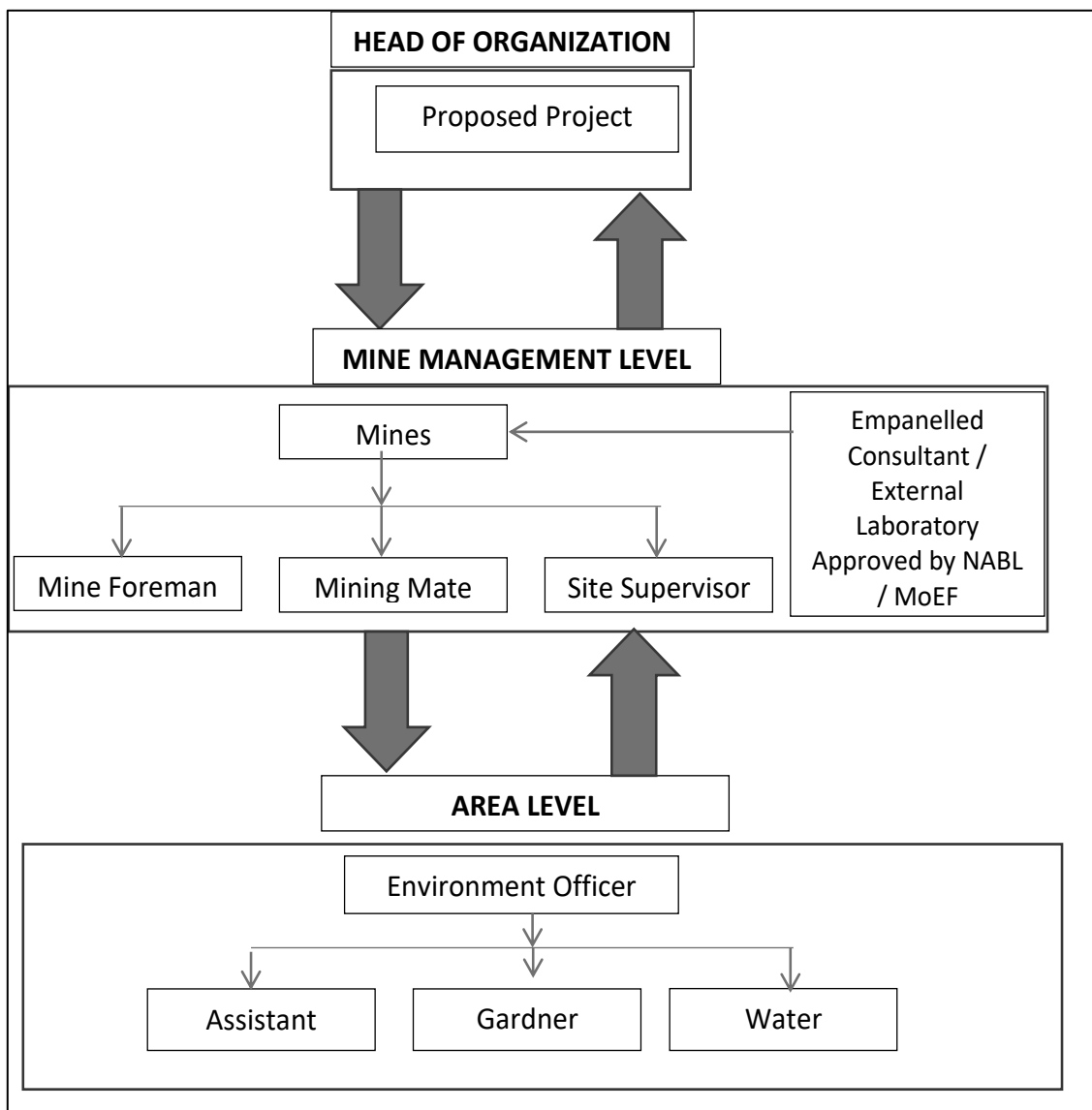
- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment

- ❖ Seeking expert's advice when needed.

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies as compliance status reports.

The sampling and analysis report of the monitored environmental attributes will be submitted to the Tamil Nadu Pollution Control Board (TNPCB) at a frequency of half-yearly and yearly by the proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA-TN as well.

The sampling and analysis of the environmental attributes will be as per the guidelines of Central Pollution Control Board (CPCB)/Ministry of Environment, Forest and Climate Change (MoEF & CC). The Environmental Monitoring Cell will be formed for the proposed project. The structure of the cell will be as shown in Figure 6.1.



**Figure 6.1 Proposed environmental monitoring chart**

## 6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in chapter IV will be implemented so as to reduce the impact on the environment due to the operations of the proposed project. Implementation schedule of mitigation measures is given in Table 6.1.

**Table 6.1 Implementation Schedule for Proposed Project**

S. No.	Recommendations	Time Period	Schedule
1	Land Environment Control Measures	Before commissioning of the project	Immediately after the commencement of project
2	Soil Quality Control Measures	Before commissioning of the project	Immediately after the commencement of project
3	Water Pollution Control Measures	Before commissioning of the project and along with mining operation	Immediately and as project progress
4	Air Pollution Control Measures	Before commissioning of the project and along with mining operation	Immediately and as project progress
5	Noise Pollution Control measures	Before commissioning of the project and along with mining operation	Immediately and as project progress
6	Ecological Environment	Phase wise implementation every year along with mine operations	Immediately and as project progress

## 6.3 MONITORING SCHEDULE AND FREQUENCY

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against statutory standards. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The environmental monitoring will be conducted in the mine operations as follows:

- ❖ Air quality
- ❖ Water and wastewater quality
- ❖ Noise levels
- ❖ Soil quality and
- ❖ Greenbelt development

The details of proposed monitoring schedule have been provided in Table 6.2.

**Table 6.2 Proposed Monitoring Schedule Post EC for the Proposed Quarry**

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 <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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*

#### **6.4 BUDGETARY PROVISION FOR ENVIRONMENT MONITORING PROGRAM**

The cost in respect of monitoring of environmental attributes, parameter to be monitored, sampling/monitoring locations with frequency and cost provision against each

proposal is shown in Table 6.3. Monitoring work will be outsourced to external laboratory approved by NABL / MoEF. The proposed recurring cost for Environmental Monitoring Programme is Rs **2,95,000** /- per annum for the proposed project site.

**Table 6.3 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/-
<b>Total</b>		-	<b>Rs 2,95,000 /-</b>

Source: Field Data

## 6.5 REPORTING SCHEDULES OF MONITORED DATA

The monitored data on air quality, water quality, noise levels and other environmental attributes will be periodically examined by the Cluster Mine Management Coordinator and Respective Head of Organization for taking necessary corrective measures. The monitoring data will be submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO Conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

Periodical reports to be submitted to:

- ❖ MoEF & CC – Half yearly status report
- ❖ TNPCB - Half yearly status report
- ❖ Department of Geology and Mining: quarterly, half yearly annual reports

Besides the Mines Manager/Agent of respective project will submit the periodical reports to:

- ❖ Director of mines safety
- ❖ Labour enforcement officer
- ❖ Controller of explosives as per the norms stipulated by the department.

## **CHAPTER VII**

### **ADDITIONAL STUDIES**

#### **7.0 GENERAL**

Additional studies deal with:

- ❖ Public Consultation for Proposed Project
- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Cumulative Impact Study

#### **7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT**

Application to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district was made and the public opinions on the proposed project will be updated in the final EIA/EMP report.

#### **7.2 RISK ASSESSMENT FOR PROPOSED PROJECT**

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 31<sup>st</sup> 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.

Factors of risks involved due to human induced activities in connection with these proposed mining & allied activities with detailed analysis of causes and control measures for the mine is given in Table 7.1.

**Table 7.1 Risk Assessment & Control Measures for Proposed Project**

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries.	Improper handling and unsafe working practice	<ul style="list-style-type: none"> <li>✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations.</li> <li>✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited.</li> <li>✓ Fire-fighting and first-aid provisions in the mine office complex and mining area.</li> <li>✓ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use.</li> <li>✓ Working of quarry, as per approved plans and regularly updating the mine plans.</li> <li>✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut.</li> <li>✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager.</li> <li>✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.</li> </ul>
2	Drilling	Improper and unsafe practices; Due to high pressure of compressed air, hoses may burst; Drill Rod may break;	<ul style="list-style-type: none"> <li>✓ Safe operating procedure established for drilling (SOP) will be strictly followed.</li> <li>✓ Only trained operators will be deployed.</li> <li>✓ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places,</li> <li>✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</li> <li>✓ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</li> <li>✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</li> <li>✓ Operator shall regularly use all the personal protective equipment.</li> </ul>

3	Transportation	Potential hazards and unsafe workings contributing to accident and injuries  Overloading of material  While reversal & overtaking of vehicle  Operator of truck leaving his cabin when it is loaded.	<ul style="list-style-type: none"> <li>✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul>
4	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> <li>✓ Escape Routes will be provided to prevent inundation of storm water</li> <li>✓ Fire Extinguishers &amp; Sand buckets</li> </ul>
5	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	<ul style="list-style-type: none"> <li>✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.</li> </ul>

*Source: Analysed and Proposed by FAE & EC*

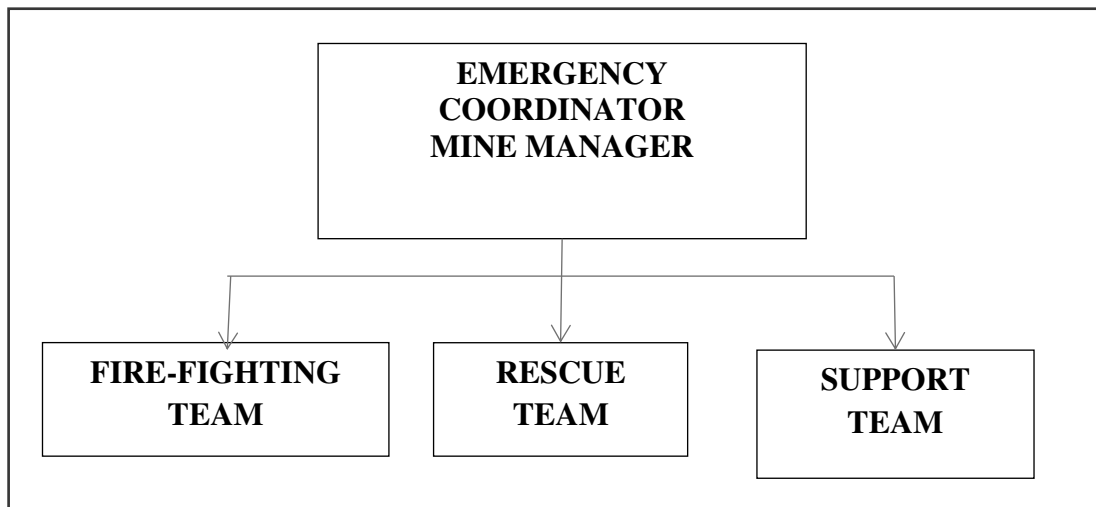
### **7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT**

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone II. The area is far away from the sea. Hence, the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- ❖ Rescue and medical treatment of 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.



In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency situations. Structure of the team has been shown in Figure 7.1.



**Figure 7.1 Disaster management team layout for proposed project**

### 7.3.1 Emergency Control Procedure

The onset of emergency, will in all probability, commence with a major fire or explosion or collapse of wall along excavation and shall be detected by various safety devices and also by members of operational staff on duty. If located by a staff member on duty, he (as per site emergency procedure of which he is adequately briefed) will go to nearest alarm call point, break glass and trigger off the alarms. He will also try his best to inform about location and nature of accident to the emergency control room. In accordance with work emergency procedure the following key activities will immediately take place to interpret and take control of emergency.

- ❖ On site fire crew led by a fireman will arrive at the site of incident with fire foam tenders and necessary equipment.
- ❖ Emergency security controller will commence his role from main gate office
- ❖ Incident controller shall rush to the site of emergency and with the help of rescue team and will start handling the emergency.
- ❖ Site main controller will arrive at MECR with members of his advisory and communication team and will assume absolute control of the site.
- ❖ He will receive information continuously from incident controller and give decisions and directions to:
  - ❖ Incident controller
  - ❖ Mine control rooms
  - ❖ Emergency security controller

## 7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, 3 proposed projects, known as P1, P2, P3 are taken into consideration. The details of P1 have been given in Table 1.2 and the details of P2 and P3 are given in the Table 7.2 and 7.3

**Table 7.2 Salient Features of the Proposed Project P2**

Name of the Quarry	Mr.M.Gunasekaran Rough Stone and Gravel Quarry		
Type of Land	Patta Land		
Extent	1.92.5		
S.F.No	710/3, 712/2		
Toposheet No	58 – F/13		
Location of Project Site (Centre Point)	10°58'49.04"N to 10°58'55.76"N 77°55'56.49"E to 77°56'02.53"E		
Highest Elevation	179 m AMSL		
Ultimate Pit Dimensions	Length (m)	Width (m)	Depth (m)
	170	114	37
depth of Mining	37 m BGL		
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>	
	7,24,430	29,112	
Mineable Reserves	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>	
	1,60,982	11,446	
Proposed reserves for five years	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup> /1 year	
	1,40,607	11,446	
Method of Mining	Open-Cast Semi Mechanized mining		
Topography	Flat Topography		
Machinery proposed	Jack Hammer	4	
	Compressor	1	
	Tipper	2	
	Excavator	1	

Blasting Method	The quarrying operation is proposed to be carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.
Proposed Manpower Deployment	20 Nos
Project Cost	Rs.47,30,000
CER Cost	Rs. 5,00,000
Proposed Water Requirement	1.5 KLD

**Table 7.3 Salient Features of the Proposed Project P3**

Name of the Quarry	M/s. Annai Blue Metals Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	1.92.0	
S.F.No	682(Part)	
Toposheet No	58-F/13	
Location of Project Site (Centre Point)	10° 59'2.28"N to 10°58'57.34"N 77°56'13.64"E 77°56'8.30"E	
Highest Elevation	174 AMSL	
Ultimate depth of Mining	47 m BGL	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
	784728	20592
Mineable Reserves	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
	227340	15256
Proposed reserves for five years	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup> /1 year
	227340	15256
Method of Mining	Open-Cast Semi Mechanized mining	
Machinery proposed	Jack Hammer	1
	Compressor	1
	Tipper	2
	Excavator	1

Blasting Method	The quarrying operation is proposed to be carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.
Proposed Manpower Deployment	15 Nos
Project Cost	Rs.92,80,000
CER Cost	Rs. 5,00,000
Proposed Water Requirement	1.675 KLD

#### 7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from the 3 proposed projects have been given in Tables 7.4 and 7.5.

**Table 7.4 Cumulative Production Load of Rough Stone**

Proposed Production Details				
Quarry	5 Years in m <sup>3</sup>	Per Year in m <sup>3</sup>	Per Day in m <sup>3</sup>	Number of Lorry Load Per Day
P1	821400	164280	608	101
P2	140607	28121	104	17
P3	227340	45468	168	28
<b>Grand Total</b>	<b>1189347</b>	<b>237869</b>	<b>880</b>	<b>146</b>

**Table 7.5 Cumulative Production Load of Gravel**

Quarry	Production for 1 Year (m <sup>3</sup> )	Yearly Production (m <sup>3</sup> )	Daily Production (m <sup>3</sup> )	Number of Lorry Loads Per Day
P1	173850	34770	129	21
P2	11446	2289	8	1
P3	15256	3051	11	2
<b>Grand Total</b>	<b>200552</b>	<b>40110</b>	<b>148</b>	<b>24</b>

The cumulative study shows that the overall production of rough stone from the quarry is 880 m<sup>3</sup> per day with a capacity of 146 trips of rough stone per day and that production of gravel from the 3 proposed quarry is 148 m<sup>3</sup> per day accounting for 24 trips/day.

##### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 3 proposed projects on air environment of the cluster have been provided in Table 7.6. The cumulative values resulting from the 3 projects for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.6 Cumulative Impact Results from the 3 proposed projects**

Pollutants	Baseline Data ( $\mu\text{g}/\text{m}^3$ )	Incremental Values ( $\mu\text{g}/\text{m}^3$ )			Cumulative Value ( $\mu\text{g}/\text{m}^3$ )
		P1	P2	P3	
PM <sub>2.5</sub>	15.5	5	1.80	2.60	24.9
PM <sub>10</sub>	38.7	10	2.75	3.90	55.35
SO <sub>2</sub>	6.2	1	1	1.25	9.45
NO <sub>x</sub>	13.6	5	2	2.5	23.1

#### 7.4.2 Noise Environment

Noise pollution is mainly due to operation like drilling & blasting and plying of trucks & HEMM. Cumulative Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities. Predictions have been carried out to compute the noise level at various distances around the different quarries within the 500 m radius.

**Table.7.7 Cumulative Impact of Noise from 3 Proposed Quarries on Salipalayam Habitation**

Location ID	Distance (m)	Direction	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	790	N	42.2	21.4	43.2	<b>55</b>
Habitation Near P2	740	N	42.2	22.0	43.2	
Habitation Near P3	520	N	42.2	25.0	42.3	
<b>Cumulative Noise (dB (A))</b>					47.7	

Source: Lab Monitoring Data

The cumulative analysis of noise due to 3 proposed projects shows that habitation of **Salipalayam** will receive about 47.7dB (A) respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

#### Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the all the 3 mines have been shown in Table 7.8.

**Table 7.8 Cumulative Effect of Ground Vibrations Resulting from 3 Mines on Habitation of Salipalayam**

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	58.55	790	0.30

P2	11.50	740	0.09
P3	16.20	520	0.20
<b>Total</b>			<b>0.59</b>

Results from the above tables 7.8 indicate that the cumulative PPV value of each habitation is well below the peak particle velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

#### 7.4.3 Socio Economic Environment

Socio Economic benefits of the proposed project were calculated and the results have been shown in Table 7.9 the project together will contribute Rs. 15,00,000/-towards CER fund.

**Table 7.9 Socio Economic Benefits from 3 Mines**

Location ID	Project Cost	CER Cost
P1	Rs.1,27,00,500	Rs. 5,00,000
P2	Rs.47,30,000	Rs. 5,00,000
P3	Rs.92,80,000	Rs. 5,00,000
<b>Grand Total</b>	<b>Rs.2,67,10,500</b>	<b>Rs. 15,00,000</b>

**Table 7.10 Employment Benefits from 3 Mines**

Location ID	Employment
P1	24
P2	20
P3	15
<b>Grand Total</b>	<b>59</b>

A total of 59 people will get employment due to 3 proposed mines in cluster

#### 7.4.4 Ecological Environment

**Table 7.11 Greenbelt Development Benefits from Mine**

Code	Number of Trees proposed	Area to be covered (m <sup>2</sup> )	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	2058	18518	1646	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Techtona grandis, etc.,</i>
P2	963	8662	770	
P3	960	8640	768	
<b>Total</b>	<b>3981</b>	<b>35820</b>	<b>3184</b>	

Cumulative studies show that the proposed project will plant about 3981 native tree species like *Azadirachta indica, Albizia lebbeck, Delonix regia, Techtona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 3184 trees will survive in this green belt development program.

## **CHAPTER VIII**

### **PROJECT BENEFITS**

#### **8.0 GENERAL**

The proposed project at Kuppam Village aims to produce **821400 m<sup>3</sup>** of rough stone and **173850 m<sup>3</sup>** of gravel over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

- ❖ Increase in Employment Potential
- ❖ Improvement in Socio-Economic Welfare
- ❖ Improvement in Physical Infrastructure
- ❖ Improvement in Social infrastructure

#### **8.1 EMPLOYMENT POTENTIAL**

It is proposed to provide employment to about 24 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

#### **8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED**

The impact of mining activity in the area will be more positive on the socio-economic environment in the immediate project impact area. The employment opportunities both direct and indirect will contribute to enhanced money incomes to job seekers with minimal skill sets especially among the local communities.

#### **8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE**

The proposed quarry project is located in Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu. The area has already well-established communications roads and other facilities. The following physical infrastructure facilities will further improve due to proposed project.

- ❖ Road transport facilities
- ❖ Communications
- ❖ Medical, Educational and social benefits will be made available to the nearby civilian population in addition to the workmen employed in the mine.

## **8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE**

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

## **8.5 OTHER TANGIBLE BENEFITS**

The proposed mine is likely to have other tangible benefits as given below

- ❖ Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation, sanitation for supply of goods and services to the mine and other community services
- ❖ Additional housing demand for rental accommodation will increase
- ❖ Cultural, recreation and aesthetic facilities will also improve
- ❖ Improvement in communication, transport, education, community development and medical facilities and overall change in employment and income opportunity
- ❖ The State Government will also benefit directly from the proposed mine, through increased revenue from royalties, cess, DMF, GST etc.,

## **8.6 CORPORATE SOCIAL RESPONSIBILITY**

Individual project proponents will take responsibility to develop awareness among all levels of their staff about CSR activities and the integration of social processes with business processes. Those involved with the undertaking of CSR activities will be provided with adequate training and re-orientation.

Under this programme, the project proponents will take-up following programmes for social and economic development of villages within 5 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation



- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Kuppam Village. CSR budget is allocated.

## 8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & capital investment is  $\leq$  100 crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, Rs. 5,00,000 is allocated for CER. The proposed utilization of the budget of CER activities is given in Table 8.1.

**Table 8.1 CER Action Plan**

S. No.	Activity	Budget (Rs.in Lakh)
1	The applicant Indents to involve in corporate environment responsibilities (CER) activities such as renovation of existing toilet, plantation within the school premises, donating environment related books to the nearby school library, etc.	Rs.5,00,000
	<b>Total</b>	<b>Rs.5,00,000</b>

*Source: Field survey conducted by FAE in consultation with project proponent*

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs.10,08,93,920** to the state government through various ways, as provided in Table 8.2.

**Table 8.2 Project Benefits to the State Government**

Particulars	Budget for Rough Stone (Rs.)	Budget for Gravel (Rs.)
CER	5,00,000	---
Seigniorage @ Rs.90/m <sup>3</sup> of rough stone/ Rs.56/m <sup>3</sup> of gravel	7,39,26,000	97,35,600
District Mineral Foundation Tax @ 10% of Seigniorage	73,92,600	9,73,560
Green Tax @ 10% of Seigniorage	73,92,600	9,73,560
<b>Total</b>	<b>8,92,11,200</b>	<b>1,16,82,720</b>

**CHAPTER IX**  
**ENVIRONMENTAL COST BENEFIT ANALYSIS**

Not Applicable, Since Environmental Cost Benefit Analysis not recommended at the Scoping stage.

**CHAPTER X**  
**ENVIRONMENTAL MANAGEMENT PLAN**

**10.0 GENERAL**

Environment Management Plan (EMP) aims at the preservation of ecological system by considering in-built pollution abatement facilities at the proposed site. Good practices of environmental management plan will ensure to keep all the environmental parameters of the project in respect of ambient air quality, water quality, socio economic improvement standards. Mitigation measures at the source level and an overall environment management plan at the study area are elicited so as to improve the supportive capacity of the receiving bodies. The EMP presented in this chapter discusses the administrative aspects ensuring that mitigative measures are implemented and their effectiveness monitored after approval of the EIA.

**10.1 Budgetary Provision for Environmental Management**

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.1 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

**Table 10.1 EMP Budget for Proposed Project**

Attribute	Mitigation measures	Provision for Implementation	Capital Cost	Recurring Cost/annu m
			(Rs.)	(Rs.)
<b>Air Environment</b>	Compaction, gradation and drainage on both sides	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare	41150	41150
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000

	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	100000	10000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	40000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	10000
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare	0	82300
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Total Air Environment</b>			<b>1031150</b>	<b>283450</b>
<b>Noise Environment</b>	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation	Provision made in Operating Cost	0	0

	vehicles carry a fitness certificate.			
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	2299920
<b>Total Noise Environment</b>			<b>50000</b>	<b>2301920</b>
<b>Water Environment</b>	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum (4.82.7 ha X 10000)	41150	20575
<b>Total Water Environment</b>			<b>41150</b>	<b>20575</b>
<b>Waste Management</b>	Waste management (Spent Oil, Grease etc.)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal).	25000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine	Provision made in Operating Cost	0	0

	lease on the land of owner itself			
<b>Total Waste Management</b>			<b>30000</b>	<b>22000</b>
<b>Implementation of EC, Mining Plan &amp; DGMS Condition</b>	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
<b>Total Implementation of EC, Mining Plan</b>			<b>10000</b>	<b>1000</b>
<b>Occupational Health and Safety</b>	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	96000	24000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	24000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	16460
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum (4.82.7 hectare)	823000	41150
	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	205750	41150
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000

	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR, 1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
<b>Total Occupational Health and Safety</b>			<b>1164750</b>	<b>933760</b>
<b>Development of Green Belt</b>	Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	164600	24690
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	370350	37035
<b>Total Development of Green Belt</b>			<b>534950</b>	<b>61725</b>
<b>Mine Closure</b>	Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs)		0	0
	G.O.(Ms)No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@ 10% of Seigniorage Fee) (Seigniorage Fee for Roughstone = Rs.90 and for Gravel= Rs.56)	8366160	0
<b>Total Seigniorage Fee</b>			<b>8366160</b>	<b>0</b>
<b>TOTAL</b>			<b>11228160</b>	<b>3624430 (Excl. Mine Closure)</b>

**Table 10.2 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation**

<b>I<sup>st</sup> Year</b>	<b>II<sup>nd</sup> Year</b>	<b>III<sup>rd</sup> Year</b>	<b>IV<sup>th</sup> Year</b>	<b>V<sup>th</sup> Year (including Mine Closure Cost)</b>	<b>Total Recurring Cost</b>	<b>Total EMP Cost</b>
3624430	3805652	3995934	4195731	4545427	20167174	31395334

In order to implement the environmental protection measures, an amount of **Rs. 11228160** as capital cost and recurring cost as **Rs. 3624430** 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.31395334** as shown in Table 10.2.

#### **10.10 CONCLUSION**

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan 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.



## **CHAPTER XI SUMMARY AND CONCLUSION**

### **11.1 INTRODUCTION**

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 13.27.5 ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 683/2(Part) & 686/1(Part) over the extent of 4.11.5 ha is situated in the cluster falling in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. The quarries involved in the calculation of cluster extent are three proposed quarries, one existing quarries, and the one expired quarry.

### **11.2 PROJECT DESCRIPTION**

The proposed project area is located between latitudes from 10° 58'46.65"N to 10°58'53.45"N and Longitudes from 77°56'6.93"E to 77°56'14.02"E in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. According to the approved mining plan, about 821400 m<sup>3</sup> of rough stone will be mined up to the ultimate depth of 45 m BGL in the five years. The quarrying operation is proposed to be carried out by opencast semi mechanized mining method involving drilling, blasting, and formation of benches of the prescribed dimensions.

### **11.3 DESCRIPTION OF THE ENVIRONMENT**

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during October to December, 2023 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified Excellence Laboratory for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

#### **11.3.1 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 1.

**Table.1 LULC Statistics of the Study Area**

<b>S. No.</b>	<b>LU/LC Type</b>	<b>Extend (ha)</b>	<b>Percentage</b>
1	Crop Land	6957.50	89.59
2	Dense Forest	85.47	1.10
3	Land with/without scrub	52.74	0.68
4	Mining/Industrial lands	182.57	2.35
5	Plantations	488.03	6.28
<b>Total</b>		<b>7766.31</b>	<b>100.0</b>

*Source: Sentinel II Satellite Imagery*

### **11.3.2 Soil Environment**

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 6.7 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 155 to 232  $\mu\text{s}/\text{cm}$ . Organic Matter ranges between 1.2 to 2.3  $\text{g}/\text{cm}^3$ . Nitrogen ranges between 1.01 to 2.45 %. Phosphate ranges between 1.4 to 2.4 %. Potassium ranges between 1.4 to 2.4 %.

### **11.3.3 Water Environment**

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. 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 were 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. The results of all the ground water samples fall within the permissible limits of IS10500:2012.

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Therefore, data regarding groundwater elevations were collected from 9 open wells and 8 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2023, (Post Monsoon Season). According to the data, average depths to the static water table in open wells range from 18.96 to 21.00 m BGL in pre monsoon and 14.33 to 16.00 m BGL in post monsoon. The average depths to static potentiometric surface in bore wells vary from 72.7 to 75.5 m in pre monsoon and from 62.3 to 65.8 m in post monsoon.

### **11.3.4 Air Environment**

As per the monitoring data, PM<sub>2.5</sub> ranges from 14.3µg/m<sup>3</sup> to 16.7µg/m<sup>3</sup>; PM<sub>10</sub> from 35.8µg/m<sup>3</sup> to 41.5 µg/m<sup>3</sup>; SO<sub>2</sub> from 5.3 µg/m<sup>3</sup> to 7.1µg/m<sup>3</sup>; NO<sub>x</sub> from 11.7µg/m<sup>3</sup> to 15.7g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

### **11.3.5 Noise Environment**

Noise levels recorded in core zone was 47.2 dB (A) Leq during day time and 35.4 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.6 to 52.4dB (A) Leq and during night time from 30.6 to 42.2dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

### **11.3.6 Biological Environment**

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

### **11.3.7 Socio Economic Environment**

The proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of people's standard of living.

## **11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **11.4.1 Land Environment**

#### **Anticipated Impact**

- Change in land use and land cover and topography of the mine lease area
- Problems to human habitations due to dust and noise caused by movement of heavy vehicles
- Soil erosion and sediment deposition in the nearby water bodies during the rainy season
- Siltation of water course due to wash off from the exposed working area
- Deterioration of soil quality in the surrounding area due to runoff from the project area
- Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

## **Mitigation Measures**

- Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- Runoff water will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site
- The vegetation will be retained at the site wherever possible
- Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

### **11.4.2 Water Environment**

#### **Anticipated Impact**

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

#### **Mitigation Measures**

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- 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
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program

### **11.4.3 AIR ENVIRONMENT**

#### **Anticipated Impact**

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software. 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**

- 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
- 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
- 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
- The un-metalled haul roads will be compacted weekly before being put into use
- 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
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

### **11.4.4 Noise Environment**

#### ***Anticipated Impact***

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. The peak particle velocity produced by the charge of 58.55kg is well below that of 0.3 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 will use shallow holes and delay detonators to reduce the ground vibrations

- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during 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
- 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> 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
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

#### **11.4.5 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 8104 kg per day, 2188185 kg per year and 10940926 kg over five years.

### ***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
- Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled
- Existing roads will be used; new roads will not be constructed to reduce impact on flora
- 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 49331 kg of carbon per year. Therefore, we recommend 2056 planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc
- About 2056 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 246653 kg of the total carbon

### **11.4.6 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

### 11.4.7 Occupational Health

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spirometric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and 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.

### 11.5 Environment Monitoring Program

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 <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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



## **11.6 ADDITIONAL STUDIES**

### **11.6.1 Risk Assessment**

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. 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.

### **11.6.2 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.

### **11.6.3 Cumulative Impact Study**

The results on the cumulative impact of the four 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 three proposed project is well below the permissible limit of Peak Particle Velocity of 5 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 59 local people, in addition to indirect jobs
- The proposed three projects will plant 3981 about trees in and around the lease area
- The proposed three projects will add 1437 PCU per day to the nearby roads.

## **11.7 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 24 local people
- 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.
- Rs. 5,00,000 will be allocated for CER

## **11.8 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of Rs.11228160 as capital cost and recurring cost as Rs.3624430 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.31395334.

## CHAPTER XII

### DISCLOSURES OF CONSULTANT

The Project Proponent, **Mr.T. Manoj Prabakar** has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

**Address of the consultancy:**

No: 1/213B Natesan Complex,  
Oddapatti, Dharmapuri – 636705,  
Tamil Nadu, India.  
Email:[info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)  
Web: [www.gtmsind.com](http://www.gtmsind.com)  
Phone: 04342 232777.

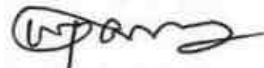
The accredited experts and associated members who were engaged in this EIA study are given below:

S.No	Name of the expert	In house/ Empanelled	Sector	Functional Area	Category
<b>Approved Functional Area Experts &amp; EC</b>					
1.	Dr. S. Karuppanan	EIA Coordinator (EC) In-house	1(a)(i)	Mining	B
2.	Dr. M. Vijayprabhu	In-house FAE	1(a)(i)	HG	B
3.	Dr. J. Rajarajeswari	In-house, FAE	1(a)(i)	EB	B
4.	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
5.	Dr. R. Arunbalaji	In-house, FAE	1(a)(i)	AQ, NV	B
6.	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SH, AP	B
7.	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
8.	G. Umamaheswaran	In-house, FAE	1(a)(i)	LU	B
9.	S. Gopalakrishnan	In-house, FAE	1(a)(i)	GEO	B
10.	P. Venkatesh	In-house, FAE	1(a)(i)	AP	B
11.	Dr. D.Kalaimurugan	In-house, FAE	1(a)(i)	SC	B
<b>Approved Functional Area Associates</b>					
12.	G. Prithiviraj	FAA	1(a)(i)	LU, HG	B
13.	C. Kumaresan	FAA	1(a)(i)	NV	B
14.	P. Vellaiyan	FAA	1(a)(i)	GEO	B
15.	P. Dhatchayini	FAA	1(a)(i)	AQ	B
16.	V. Malavika	FAA	1(a)(i)	NV, SHW	B
<b>Abbreviations</b>					

EC	EIA Coordinator	NV	Noise and Vibration
FAE	Functional Area Expert	SE	Socio Economics
FAA	Functional Area Associates	HG	Hydrology, ground water and water conservation
TM	Team Member	SC	Soil conservation
GEO	Geology	RH	Risk assessment and hazard management
WP	Water pollution monitoring, prevention and control	SHW	Solid and hazardous wastes
AP	Air pollution monitoring, prevention and control	MSW	Municipal Solid Wastes
LU	Land Use	ISW	Industrial Solid Wastes
AQ	Meteorology, air quality modelling, and prediction	HW	Hazardous Wastes
EB	Ecology and bio-diversity	GIS	Geographical Information System

**DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP**

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the EIA & EMP report.

Signature : 

Date :

Name : **Dr. S. Karuppannan**



Designation : EIA Coordinator

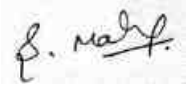





Name of the EIA Consultant Organization : Geo Technical Mining Solutions






Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **Mr.T. Manoj Prabakar** rough stone and gravel quarry project with the extent of 4.11.5 ha situated in the cluster with the extent of 13.27.5 ha in Kuppam Village, Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our knowledge.



**List of Functional Area Experts Engaged in this Project**




S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity	J.N. Manikandan	
		○ Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	

2	WP	<ul style="list-style-type: none"> <li>○ Suggesting water treatment systems, drainage facilities</li> <li>○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.</li> </ul>	Dr.S. Malar	
3	HG	<ul style="list-style-type: none"> <li>○ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>○ Analysis and description of aquifer Characteristics</li> </ul>	Dr.M. VijayPrabhu	
4	GEO	<ul style="list-style-type: none"> <li>○ Field Survey for assessing the regional and local geology of the area.</li> <li>○ Preparation of mineral and geological maps.</li> <li>○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.</li> </ul>	G.Gopala Krishnan	
5	SE	<ul style="list-style-type: none"> <li>○ Revision in secondary data as per Census of India, 2011.</li> <li>○ Impact Assessment &amp; Preventive Management Plan</li> <li>○ Corporate Environment Responsibility.</li> </ul>	Dr. G. Prabhakaran	
6	EB	<ul style="list-style-type: none"> <li>○ Collection of Baseline data of Flora and Fauna.</li> <li>○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> <li>○ Impact of the project on flora and fauna.</li> <li>○ Suggesting species for greenbelt development.</li> </ul>	Dr.J.Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> </ul>	J.N. Manikandan	

		<ul style="list-style-type: none"> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul>		
8	LU	<ul style="list-style-type: none"> <li>○ Construction of Land use Map</li> <li>○ Impact of project on surrounding land use</li> <li>○ Suggesting post closure sustainable land use and mitigative measures.</li> </ul>	G.Uma Maheswaran	
9	NV	<ul style="list-style-type: none"> <li>○ Identify impacts due to noise and vibrations</li> <li>○ Suggesting appropriate mitigation measures for EMP.</li> </ul>	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> <li>○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>○ Recommending mitigations measures for EMP</li> </ul>	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> <li>○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>	Dr. D.Kalaimurugan	
12	SHW	<ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>	J.N. Manikandan	

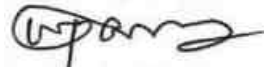
**List of Functional Area Associate Engaged in this Project**

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithiviraj	LU, HG	<ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU and HG</li> </ul>	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	

			○ Assistance in noise prediction modelling	
3	P. Vellaiyan	GEO	○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection	
4	P. Dhatchayini	AQ	○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data	
5	V. Malavika	NV, SHW	○ Site visit along with FAE ○ Assistance in report preparation	

**DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION**

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for Mr.T Manoj Prabakar rough stone and gravel quarry project with the extent of 4.11.5 ha situated in the cluster with the extent of 13.27.5 ha in Kuppam Village, Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date :

Name : **Dr. S. Karuppannan**

Designation : Managing Partner

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : NABET/EIA/2124/SA 0184

Validity : Till 02.04.2024



**THIRU.DEEPAK S. BILGI, I.F.S.  
MEMBER SECRETARY**

**STATE LEVEL ENVIRONMENT IMPACT  
ASSESSMENT AUTHORITY-TAMILNADU**

3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1, Jeenis Road, Saidapet,  
Chennai - 600 015.  
Phone No. 044-24359973  
Fax No. 044-24359975

**TERMS OF REFERENCE (ToR)**

**Lr.No.SEIAA-TN/F.No.10158/ToR- 1531/2023 Dated: 07.08.2023.**

**To**

T. Manoj Prabakar,  
S/o. Thirunavukkarasu,  
Door.No.450-A, College Road,  
3<sup>rd</sup> Cross, Paramathivelur,  
Namakkal District – 638182.

**Sir / Madam,**

**Sub:** SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough Stone & Gravel quarry lease area over an extent of Extent 4.11.5 Ha at S.F. No. 683/2 (Part) & 686/1 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu by Thiru. T.Manoj Prabakar - under project category – “B1” and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

- Ref:**
1. Online proposal No.SIA/TN/MIN/433804/2023, dated: 19.06.2023.
  2. Your application submitted for Terms of Reference dated: 23.06.2023.
  3. Minutes of the 394<sup>th</sup> SEAC meeting held on 21.07.2023.
  4. Minutes of the 644<sup>th</sup> Authority meeting held on 07.08.2023.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

  
**MEMBER SECRETARY  
SEIAA-TN**



The proponent, Thiru. T.Manoj Prabakar has submitted application for Terms of Reference (ToR), for the proposed Rough Stone & Gravel quarry lease area over an extent of Extent 4.11.5 Ha at S.F. No. 683/2 (Part) & 686/1 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.

**SEAC Remarks: -**

The proposal was placed in 394<sup>th</sup> SEAC meeting held on 21.07.2023. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

**The SEAC noted the following:**

1. The Project Proponent, Thiru. T. Manoj Prabakar has applied for Terms of Reference for the Proposed Rough Stone & Gravel quarry lease area over an extent of Extent 4.11.5 Ha at S.F. No. 683/2 (Part) & 686/1 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. As per mining plan, the lease period is for 10 years. The mining plan is for 10 years & production should not exceed 8,21,400m<sup>3</sup> of Rough Stone & 1,73,850m<sup>3</sup> of Gravel. The annual peak production 2,04,400m<sup>3</sup> of Rough Stone & 64,050m<sup>3</sup> of Gravel. The ultimate depth of mining is 45 m BGL.

Now, the proposal was placed in the 394<sup>th</sup> Meeting of SEAC held on 21.07.2023. Based on the presentation made by the proponent SEAC recommended grant of **Terms of Reference (TOR) with Public Hearing** as per the **annexure I** of this minute, subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP shall submit the 'Action Plan' on the issues raised during the Public Hearing with budgetary provisions for the same.
2. The PP shall study the Traffic Volume of the proposed quarry site considering the cluster situation involving the Division of Transportation Engineering of Department of Civil Engineering, Anna University, Chennai and the report shall stipulate the plan indicating the transportation of the minerals by road not passing through adjacent villages without increasing the carrying capacity of such village roads.
3. The PP shall submit a controlled blasting measures for reducing the impacts due to the

  
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blasting operation in the proposed quarries within 1 km of the proposed quarry.

4. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
5. The PP shall submit a 'Conceptual Mining Plan' **indicating the accessible ramp from the surface to the pit bottom** keeping the benches intact for the dimension as stipulated in the Approved Mining Plan.

#### ANNEXURE-I

1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:
  - (i) Original pit dimension
  - (ii) Quantity achieved Vs EC Approved Quantity
  - (iii) Balance Quantity as per Mineable Reserve calculated.
  - (iv) Mined out Depth as on date Vs EC Permitted depth
  - (v) Details of illegal/illicit mining
  - (vi) Violation in the quarry during the past working.
  - (vii) Quantity of material mined out outside the mine lease area
  - (viii) Condition of Safety zone/benches
  - (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.
2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.
3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.

5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.
8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.
9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.
10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.
11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
14. Quantity of minerals mined out.
  - Highest production achieved in any one year

  
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- Detail of approved depth of mining.
  - Actual depth of the mining achieved earlier.
  - Name of the person already mined in that leases area.
  - If EC and CTO already obtained, the copy of the same shall be submitted.
  - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,
17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.
19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.

21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
28. Impact on local transport infrastructure due to the Project should be indicated.
29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc..) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.



31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

#### Appendix -I

##### List of Native Trees Suggested for Planting

1. *Aeglemarmelos*-Vilvam
2. *Adenaantherapavonina*-Manjadi
3. *Albizialebeck*-Vaagai
4. *Albiziaamara*-Usil
5. *Bauhinia purpurea* - Mantharai
6. *Bauhinia racemosa* - Aathi
7. *Bauhinia tomentosa*-Iruvathi
8. *Buchananiaaillaris*-Kattuma
9. *Borassusflabellifer*- Panai
10. *Buteamonosperma* - Murukkamaram
11. *Bobaxceiba*- Ilavu, Sevvilavu
12. *Calophylluminophyllum* - Punnai
13. *Cassia fistula*- Sarakondrai
14. *Cassia roxburghii*- Sengondrai
15. *Chloroxylonsweitenia* - Purasamaram
16. *Cochlospermumreligiosum*- Kongu, Manjallavu

  
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17. *Cordiadichotoma*– Mookuchalimaram
18. *Cretevaadansonii*–Mavalingum
19. *Dilleniaindica*– Uva, Uzha
20. *Dilleniapentagyna*– SiruUva, Sitruzha
21. *Diospyrosebenum*- Karungali
22. *Diospyroschloroxylon*– Vaganai
23. *Ficusamplissima*– Kalltchi
24. *Hibiscus tiliaceous*–Aatrupoovarasu
25. *Hardwickiabinata*– Aacha
26. *Holopteliaintegrifolia*-Aayili
27. *Lanneacoromandelica* - Odhiam
28. *Lagerstroemia speciosa* - Poo Marudhu
29. *Lepisanthustetraphylla*- Neikottaimaram
30. *Limoniaacidissima* - Vila maram
31. *Litseaaglutinosa*–Pisinpattai
32. *Madhucalongifolia* - Illuppai
33. *Manilkarahexandra*–UlakkaiPaalai
34. *Mimusopselengi* - Magizhamaram
35. *Mitragynapurvifolia* - Kadambu
36. *Morindapubescens*–Nuna
37. *Morindacitrifolia*– VellaiNuna
38. *Phoenix sylvestre*-Eachai
39. *Pongamiapinnata*–Pungam
40. *Premnamollissima*– Munnai
41. *Premnaserratifolia*– Narumunnai
42. *Premnatomentosa*-PurangaiNaari, PudangaNaari
43. *Prosopiscinerea* - Vannimaram
44. *Pterocarpusmarsupium* - Vengai
45. *Pterospermumcanescens*–Vennangu, Tada
46. *Pterospermumxylocarpum* - Polavu
47. *Puthranjivaroxburghii*–Puthranjivi



48. *Salvadorapersica* - UgaaMaram
49. *Sapindusemarginatus*- Manipungan, Soapukai
50. *Saracaasoca* - Asoca
51. *Streblusasper*- Pirayamaram
52. *Strychnosnuxvomica*-Yetti
53. *Strychnopotatorum* - TherthangKottai
54. *Syzygiumcumini* - Naval
55. *Terminaliabellerica*- Thandri
56. *Terminalia arjuna*- Venmarudhu
57. *Toona ciliate* - Sandhanavembu
58. *Thespesiapopulnea*- Puvarasu
59. *Walsuratrifoliata*-valsura
60. *Wrightiatinctoria*- Vep

**SEIAA Remarks: -**

The subject was placed in 644<sup>th</sup> Authority meeting held on 07.08.2023. The authority noted that the subject was appraised in 394<sup>th</sup> SEAC meeting held on 21.07.2023.

Based on the presentation and documents furnished by the project proponent, SEAC after detailed deliberations, decided to **recommend the proposal for the grant of Terms of Reference (ToR).**

After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions and the conditions mentioned in 'Annexure B' of this minute:

**Annexure 'B'**

**Cluster Management Committee**

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,

  
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3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

**Impact study of mining**

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
  - a) Soil health & soil biological, physical land chemical features.
  - b) Climate change leading to Droughts, Floods etc.
  - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
  - d) Possibilities of water contamination and impact on aquatic ecosystem health.
  - e) Agriculture, Forestry & Traditional practices.
  - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
  - g) Bio-geochemical processes and its foot prints including environmental stress.

h) Sediment geochemistry in the surface streams.

#### **Agriculture & Agro-Biodiversity**

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

#### **Forests**

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

#### **Water Environment**

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

#### **Energy**

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

#### **Climate Change**

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

#### **Mine Closure Plan**

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

#### **EMP**

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.

36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

#### **Risk Assessment**

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

#### **Disaster Management Plan**

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

#### **Others**

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

#### **A. STANDARD TERMS OF REFERENCE**

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible

  
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- with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
  - 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
  - 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
  - 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
  - 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
  - 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
  - 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted.



- Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
  - 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
  - 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
  - 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
  - 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
  - 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
  - 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
  - 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along

  
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with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free



silica, should be given.

- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project.

  
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Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed: -
  - a) Executive Summary of the EIA/EMP Report
  - b) All documents to be properly referenced with index and continuous page numbering.
  - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
  - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
  - e) Where the documents provided are in a language other than English, an English translation should be provided.
  - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
  - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA, II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
  - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

- i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

**In addition to the above, the following shall be furnished: -**

**The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:**

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental

  
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- increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
  15. A specific study on agriculture & livelihood shall be carried out and reported.
  16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
  17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
  18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
  19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
  20. Likely impact of the project on air, water, land, flora-fauna and nearby population
  21. Emergency preparedness plan in case of natural or in plant emergencies
  22. Issues raised during public hearing (if applicable) and response given
  23. CER plan with proposed expenditure.
  24. Occupational Health Measures
  25. Post project monitoring plan
  26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
  27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
  28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
  29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
  30. Reserve funds should be earmarked for proper closure plan.
  31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics



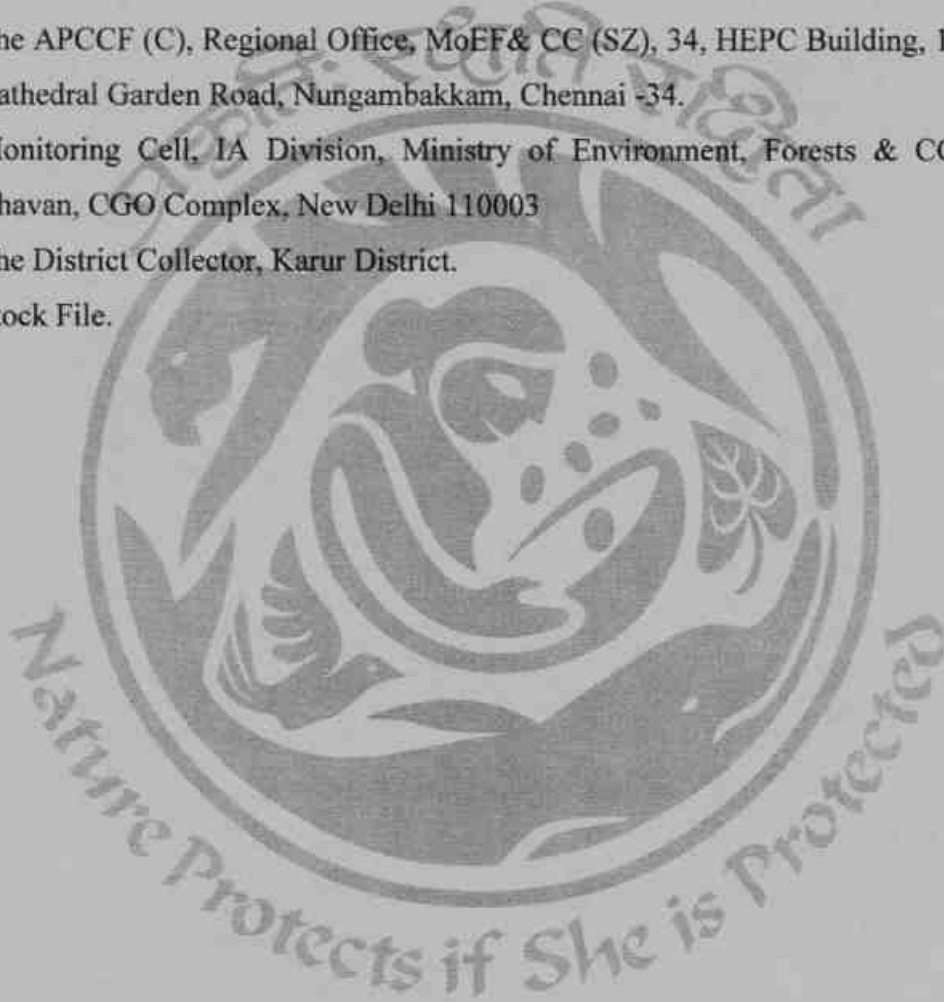
irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

**Besides the above, the below mentioned general points should also be followed: -**

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2<sup>nd</sup> December, 2009, 18<sup>th</sup> March 2010, 28<sup>th</sup> May 2010, 28<sup>th</sup> June 2010, 31<sup>st</sup> December 2010 & 30<sup>th</sup> September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.
  - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
  - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
  - The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29<sup>th</sup> August, 2017.

**Copy to:**

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF& CC (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Karur District.
7. Stock File.



From  
Dr.P.Jayapal M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Karur.

To  
Thiru.T.Manoj Prabakar,  
S/o.Thirunavukkarasu,  
Door No.450-A,  
College Road,  
3<sup>rd</sup> Cross,  
Paramathivelur,  
Namakkal District- 638 182.

Rc.No.97/Mines/2023, Dated:19.06.2023

Sir,

Sub: Mines and Minerals – Minor Mineral - Karur District – Pugalur Taluk – Kuppam Village - S.F.Nos 683/2(Part) (2.07.50 hectares) and 686/1(Part) (2.04.00 hectares) Over an extant 4.11.50 hectares - Quarry lease application for Rough Stone and Gravel – Preferred by Thiru.T.Manoj Prabakar – Mining Plan approved - requested for the details of Existing/ Proposed/Expired and Abandoned quarries situated within 500 mts radial distance - furnished – Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by Thiru.T.Manoj Prabakar, S/o.Thirunavukkarasu, Door No.450-A, College Road, 3<sup>rd</sup> Cross, Paramathivelur, Namakkal District- 638 182, dated:16.03.2023
  2. Precise Area Communication Notice Rc.No. 97/Mines/202, Dated: 30.05.2023.
  3. Mining Plan submitted by Thiru.T.Manoj Prabakar, Letter dated: 01.06.2023.
  4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter Rc.No.97/Mines/2023, Dated: 08.06.2023.
  5. Thiru.T.Manoj Prabakar letter dated:16.06.2023.

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In the reference 1<sup>st</sup> cited, Thiru.T.Manoj Prabakar has applied quarry lease for quarrying Rough stone and Gravel in S.F.Nos 683/2(Part) (2.07.50 hectares) and 686/1(Part) (2.04.00 hectares) Over an extant 4.11.50 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur had issued precise area letter to the proposed lease area vide reference 2<sup>nd</sup> cited.

Accordingly, the applicant has submitted the 3 copies of draft Mining Plan and the same was approved by the Deputy Director, Geology and Mining, Karur vide reference 4<sup>th</sup> cited.

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T. Manoj Prabakar



In the reference 5<sup>th</sup> cited, the applicant has requested the Deputy Director of Geology and Mining, Karur to provide the details of existing, proposed, expired and abandoned quarries situated within 500 meter radial distance from subject area and the same has been furnished as follows:-

I. Existing Quarries: -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	Thiru.S.K.Krishnamurthy, 1/22, Kavadikaranur, Thangayur village, Edapati Taluk, Karur District.	Rough Stone	Pugalur Taluk, Kuppam	679, 680/1(Par)	<b>01.95.5</b>	04.7.2018 to 03.7.2023 Last permit obtained on 24.03.2022

II. Proposed Quarries: -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Total Extent (hect)	Lease Period
1	Thiru.T.Manoj Prabakar, S/o.Thirunavukkarasu, Door No.450-A, College Road, 3 <sup>rd</sup> Cross, Paramathivelur, Namakkal District - 638 182.	Rough Stone and Gravel	Pugalur Taluk, Kuppam	683/2(Part) 686/1(Part)	<b>4.11.50</b>	Proposed Area
2	Thiru.M.Gunasekaran, S/o.Muthusamy, No.3/37, Karaippalayam, Thirukkatuthurai, Pugalur Taluk, Karur District - 639 117	Rough Stone and Gravel	Pugalur Taluk, Kuppam	710/3 712/2	<b>1.92.5</b>	Adjacent applied area
3	M/s.Annai Blue Metals, S.F.No.451, Kaalipalayam, Kuppam Village, Pugalur Taluk, Karur District - 639 111.	Rough Stone and Gravel	Pugalur Taluk, Kuppam	682(Part)	<b>1.92.0</b>	Adjacent applied area

## III. Lease Expired Quarries : -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	Tmt.S.Tamilselvi w/o.Sapapathi Ganesa Nagar 1 <sup>st</sup> Street Enam Karur Karur Taluk & District.	Rough Stone	Pugalur Taluk, Kuppam	706 part	3.36.0	18.08.2017 to 17.08.2022 Last permit obtained on 21.07.2022

## IV. Abandoned Quarries : -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	S.Tamilselvi, W/o.S.Sapabathi, 16B, Ganesa Nagar, K.V.B Nagar, Karur.	Rough Stone	Pugalur Taluk, Kuppam	702	3.35.5	09.09.2010 to 08.09.2015

*[Handwritten Signature]*  
19/06/23

Deputy Director,  
Geology and Mining,  
Karur

*[Handwritten Signature]*  
19/6/23

*T. M. J. Prabakaran*

From  
Dr.P.Jayapal M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Karur.

To  
Thiru.T.Manoj Prabakar,  
S/o.Thirunavukkarasu,  
Door No.450-A,  
College Road,  
3<sup>rd</sup> Cross,  
Paramathivelur,  
Namakkal District- 638 182.

**Rc.No.97/Mines/2023, Dated:08.06.2023**

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Kuppam Village - S.F.Nos 683/2(Part) (2.07.50 hectares) and 686/1(Part) (2.04.00 hectares) Over an extant 4.11.50 hectares - Quarry lease application for Rough Stone and Gravel – Preferred by Thiru.T.Manoj Prabakar - Precise area communicated - mining plan submitted for approval – Approved – Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel preferred by Thiru.T.Manoj Prabakar, S/o.Thirunavukkarasu, Door No.450-A, College Road, 3<sup>rd</sup> Cross, Paramathivelur, Namakkal District- 638 182, dated:16.03.2023.
2. Order of the Hon'ble Supreme Court of India in I.A.Nos.12-13/2011 in SLP (C) No.19628-19629/2009, dt: 27.02.2012.
3. Government of India, Ministry of Environment and Forest Office Memorandum, Dated:18.05.2012.
4. The Chairman, State Level Environment Impact Assessment Authority, Tamil Nadu D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated: 17.09.2012.
5. The Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dt: 19.11.2012.
6. Deputy Director, Geology and Mining, Karur Notice Rc.No.97/Mines/2023, Dated:30.05.2023
7. Mining Plan submitted by Thiru.T.Manoj Prabakar letter Dated: 01.06.2023.

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Thiru.T.Manoj Prabakar applied for quarry lease to quarry Rough Stone and Gravel vide in the reference 1<sup>st</sup> cited and Precise area

T. M. Manoj Prabakar

communicated to the applicant regarding to submit the mining plan for approval as per rule 41 and also submit the Environmental Clearance as per Rule 42 of Tamil Nadu Minor Mineral Concession Rules

Accordingly Thiru.T.Manoj Prabakar have submitted three copies of draft mining plan for approval in respect of Rough stone and Gravel quarry lease applied areas, over an extent of 4.11.50 hectares of patta lands in S.F.Nos 683/2(Part) (2.07.50 hectares) and 686/1(Part) (2.04.00 hectares) of Kuppam Village, Pugalur Taluk, Karur District in the reference 7<sup>th</sup> cited.

The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.Nos 683/2(Part) (2.07.50 hectares) and 686/1(Part) (2.04.00 hectares) Over an extant 4.11.50 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District has been examined in detail.

As per the guidelines/ instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, date: 19.11.2012., the mining plan submitted by the applicant is hereby approved, subject to the following conditions:

- (i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (ii) This approval of the mining plan does not in any way imply the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

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T. Manoj Prabakar


- (III) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (IV) The approval is valid up to five years from the date of execution of lease deed and the applicant should submit scheme of mining at lease 180 days before the expiry of the mining plan period.
- (V) As per the Deputy Director, Geology and Mining, Karur notice in Rc.No.97/Mines/2023, Dated.30.05.2023 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப புல எண்.683/2-க்கு வட மேற்கில் சுமார் 35 தொலைவில் தொலைவில் அமைந்துள்ள மின்மாற்றி மற்றும் 15 மீட்டர் தொலைவில் அமைந்துள்ள உயரழுத்த மின்பாதை ஆகியவற்றிற்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு மேற்கில் புல எண்கள். 684 மற்றும் 685-இல் தென் வடலாக செல்லும் அரசு புறம்போக்கு நடைபாதைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
3. விண்ணப்ப புலங்களுக்கு வடக்கு, தெற்கு மற்றும் கிழக்கில் செல்லும் உயரழுத்த மின்பாதைகளுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
4. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
5. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
6. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Metalliferous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
7. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்ற மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.

T. M. - i. Pealokar


- (VI) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (VII) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

Encl: Two copies of Approved Mining Plan.

  
08/06/23  
Deputy Director,  
Geology and Mining,  
Karur.

**Copy to:**

Dr.S.Karuppannan, M.Sc., Ph.D,  
RQP/MAS/263/2014/A,  
GEO Technical Mining Solutions,  
No.1/213-B Ground Floor,  
Natesan Complex,  
Oddapatti, Collectorate Post Office,  
Dharmapuri - 636 705.

  
08/06/2023

# MINING PLAN



## FOR KUPPAM VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/Opencast-Semi Mechanized mining/ Non- Forest/Non - Captive Use – “B2” Category

Lease period 10 Years from the date of lease execution  
(Mine plan prepared for first five years)

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

### LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
 DISTRICT : KARUR  
 TALUK : PUGALUR  
 VILLAGE : KUPPAM  
 S.F. NO'S : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5 HECTARES

### ADDRESS OF THE APPLICANT

**Mr. T.Manoj Prabakar,**  
 S/o.Thirunavukkarasu,  
 Door.No.450-A, College Road,  
 3<sup>rd</sup> Cross, Paramathivelur,  
 Namakkal District - 638182

*(This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval letter No: 97/Mines/2023 Dated: 08.06.2023)*

### PREPARED BY

**Dr.S.KARUPPANNAN.M.Sc., Ph.D.,**  
 RQP/MAS/263/2014/A

### **GEO TECHNICAL MINING SOLUTIONS**

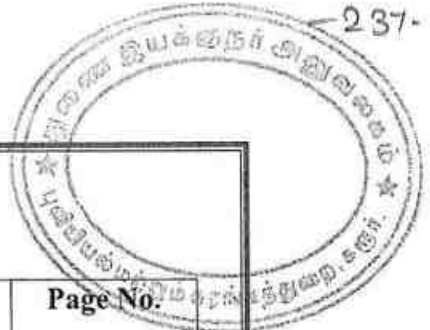
No: 1/213 -B, Ground Floor, Natesan Complex,  
 Oddapatti, Collectorate Post office,  
 Dharmapuri-636705. Tamil Nadu.  
 Mob. : +91 9443937841, +917010076633,  
 E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com) ,  
 Website: [www.gtmsind.com](http://www.gtmsind.com)



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*T. Manoj Prabakar*



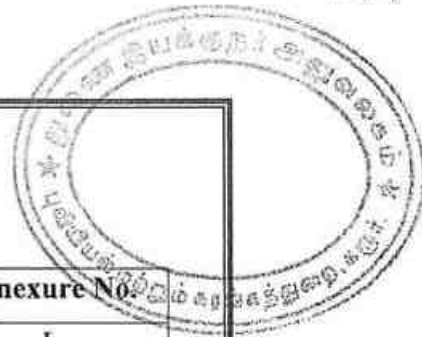


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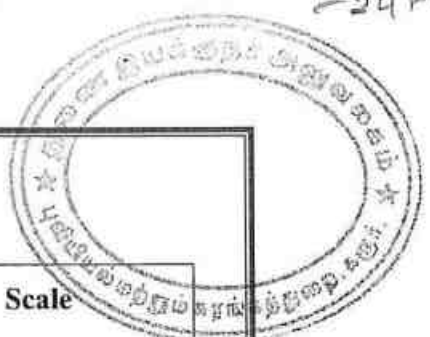
T. N. Prabhakar  
**173**





## ANNEXURES

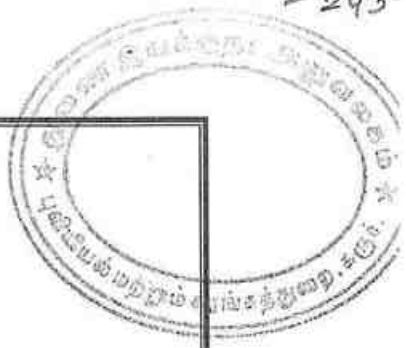
Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of <b>FMB</b> (Field Measurement book)	II
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### LIST OF PLATES

S. No	Description	Plate No.	Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	Scale 1:1,00,000
4	Satellite imagery map	I-C	Scale 1: 5,000
5	Environmental plan	I-D	Scale 1: 5,000
6	Mine lease plan	II	Plan Scale: 1:1000
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14	Conceptual plan	VII	Plan scale: 1:1000
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*T-Mani Pradeepan*



**Mr.T.Manoj Prabakar,**  
S/o.Thirunavukkarasu,  
Door.No.450-A, College Road,  
3<sup>rd</sup> Cross, Paramathivelur,  
Namakkal District - 638182

**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan for rough stone and gravel quarry lease in S.F.No's: 683/2 (Part) (2.07.5Hect) and 686/1 (Part) (2.04.0Hect) over an extent of 4.11.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

**Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Regn. No. RQP/MAS/263/2014/A)**

I request the **Deputy Director, Department of Geology and Mining, Karur District** to make further correspondence regarding modifications of the Mining Plan with the said Recognized Qualified Person on this following address.

**Dr. S. KARUPPANNAN. M.Sc., Ph.D.**  
(Regn. No. RQP/MAS/263/2014/A)  
**GEO TECHNICAL MINING SOLUTIONS**  
(A NABET accredited & ISO certified Company)  
No: 1/213-B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post office, Dharmapuri-636705  
Ph: +91 9443937841, +91 7010076633  
E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
Website: [www.gtmsind.com](http://www.gtmsind.com)

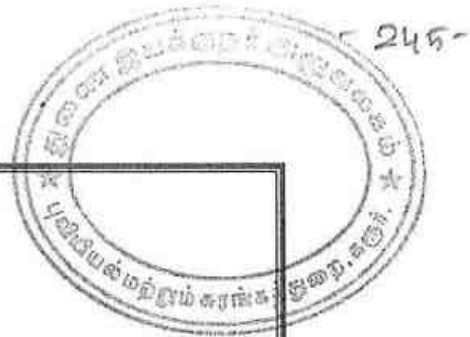
I hereby assure that all modifications so made in the Mining Plan by the Recognized Qualified Person may be deemed to made with my knowledge and consent and shall be acceptable and binding on me in all respects.

Place: Karur, TN

Date:

*T. Manoj Prabakar*  
Signature of the applicant  
(T.Manoj Prabakar)

*T. Manoj Prabakar*



**Mr.T.Manoj Prabakar,**  
S/o.Thirunavukkarasu,  
Door.No.450-A, College Road,  
3<sup>rd</sup> Cross, Paramathivelur  
Namakkal District - 638182

**DECLARATION**

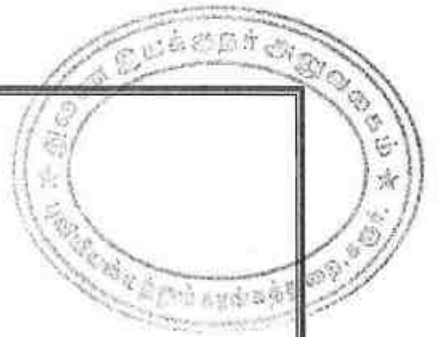
The Mining Plan of rough stone and gravel quarry lease in S.F.No's: 683/2 (Part) (2.07.5Hect) and 686/1 (Part) (2.04.0Hect) over an extent of 4.11.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Karur, TN

Date:

*T. Manoj Prabakar*  
Signature of the applicant  
(T.Manoj Prabakar)

*T. Manoj Prabakar*



**Dr. S. KARUPPANNAN. M.Sc., Ph.D.**  
 (Regn. No. RQP/MAS/263/2014/A)  
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 Ph: +91 9443937841, +91 7010076633  
 E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
 Website: [www.gtmsind.com](http://www.gtmsind.com)

**CERTIFICATE**

This is to certify that the provisions of 19(1), 20 and 22 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the mining plan for the grant of rough stone and gravel quarry lease in S.F.No's: 683/2 (Part) (2.07.5Hect) and 686/1 (Part) (2.04.0Hect) over an extent of 4.11.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamilnadu State applied to **Mr.T.Manoj Prabakar**, Namakkal District, Tamil Nadu.

Wherever specific permission / exemptions / relaxations or approvals are required the applicant will approach the concerned authorities of State and Central governments for granting such permissions etc.

Place: Dharmapuri, TN  
 Date: 31/5/23

Signature of the Recognized Qualified Person

**Dr. S. KARUPPANNAN, M.Sc., Ph.D.,**  
 RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
 1/213-B, Ground Floor, Natesan Complex,  
 Oddapatti, Collectorate Post Office,  
 Dharmapuri - 636 705. Tamil Nadu, India.  
 E-mail : [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)  
 website : [www.gtmsind.com](http://www.gtmsind.com)

*T. Manoj Prabakar*

**Dr. S. KARUPPANNAN. M.Sc., Ph.D.**

(Regn. No. RQP/MAS/263/2014/A)

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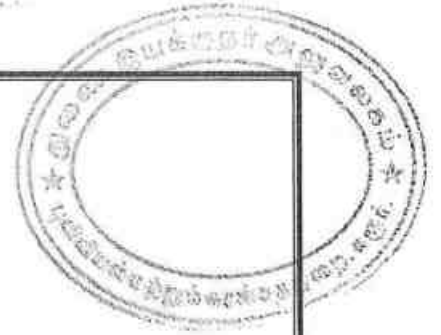
No: 1/213-B, Ground Floor, Natesan Complex,

Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)



**CERTIFICATE**

I certify that the preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 683/2 (Part) (2.07.5Hect) and 686/1 (Part) (2.04.0Hect) over an extent of 4.11.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu prepared to **Mr.T.Manoj Prabakar**, Namakkal District, Tamil Nadu, covers all the provisions of Mines Act, Rules and Regulations etc. made there in and if any specific permission is required the applicant will approach "**The Director General of Mines Safety**", Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date: 31/5/23

Signature of the Recognized Qualified Person

**Dr. S. KARUPPANNAN, M.Sc., Ph.D.,**  
RQP/MAS/263/2014/A

**GEO TECHNICAL MINING SOLUTIONS**

1/213-B, Ground Floor, Natesan Complex,

Oddapatti, Collectorate Post Office,

Dharmapuri - 636 705. Tamil Nadu, India.

E-mail : [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)

website : [www.gtmsind.com](http://www.gtmsind.com)

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T. Manoj Prabakar

# MINING PLAN

FOR KUPPAM VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH  
PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/Opencast-Semi Mechanized mining/ Non- Forest/Non - Captive Use -  
"B2' Category

Lease period 10 Years from the date of lease execution  
(Mine plan prepared for first five years)

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

## INTRODUCTORY NOTES:

- 1) **Introduction:** The applicant Mr.T.Manoj Prabakar S/o. Thirunavukkarasu residing at Door.No. 450-A, College Road, 3<sup>rd</sup> Cross, Paramathivelur, Namakkal District - 638182, Tamil Nadu State. The applicant was submit application on 16.03.2023 for request to the Deputy Director, Department of Geology and Mining, Karur, new proposal has requested to grant the quarry lease for rough stone and gravel at S.F.No's: 683/2 (Part) (2.07.5Hect) and 686/1 (Part) (2.04.0Hect) over an extent of 4.11.5hectares of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State further the period of 10 years.
- 2) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, Karur has directed to the applicant Mr. T.Manoj Prabakar through his precise area communication letter **Rc.No.97/Mines/2023 Dated: 30.05.2023** has recommended quarrying lease for rough stone and gravel quarry lease at Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No's: 683/2 (Part) (2.07.5Hect) and 686/1 (Part) (2.04.0Hect) over an area of 4.11.5 hectares and should be submitted draft mining plan for approval for the period of 90 days the following conditions for a period of Ten (10) years under Rule 19 (1), 20 & 22 of Tamil Nadu Minor Mineral Concession Rules, 1959.
  - i) Excavation should be carried out properly without any damage leaving a safety distance of 50 meters to the transformer located about 35 meters and the HT line located 15 meters away on northwest of the application S.F.No.683/2.
  - ii) Leaving a 10m safety distance which passing Government Cart Road leading to south-north on the western side from the Application S.F.No.684 & 685 and the quarrying should be carried out properly without any damage.

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This Mining Plan is approved subject  
to the conditions/stipulations  
indicated in the Mining Plan approval  
Letter No: 97/Mines/2023  
Dated: 08.06.2023

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T. Manoj Prabakar



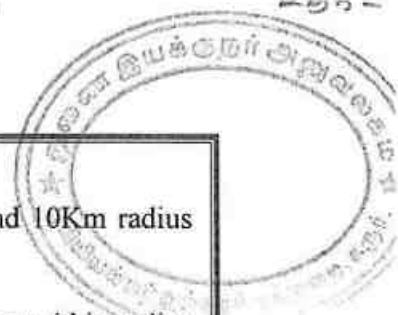


- iii) Excavation should be done properly without any damage leaving a safety distance of 50 meters to the HT line crossing north, south and east of the applied lease area.
- iv) A safety distance should be left out nearby the applied area 7.5m and 10m of Patta and Poramboke lands as respectively while quarrying activities.
- v) Quarrying operation to be carried out with controlled blasting techniques viz, hand-hack-Hammer, Driller for drilling shot holes and use mild explosives substance for blasting the rocks.
- vi) To ensure the safety of quarry workers as per Metalliferous Mines Acts should formed wide, safe benches. Inside the quarry in safe manner vehicles come and go, do the quarry work ensuring the safety of the quarry workers.
- vii) To provide quarrying lease by the Deputy Director, Karur, approved mining plan, obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and should be submitted.

- 3) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, for mining lease as per conditions mentioned in the precise area communication letter **Rc.No.97/Mines/2023 Dated: 30.05.2023.**
- 4) **Geological resources and Mineable reserves:** Geological resource of estimated as **2049300m<sup>3</sup>** including the resources of safety zone, and gravel. Of which, rough stone resources of about **1844370m<sup>3</sup>** and gravel is about **204930m<sup>3</sup>**. The total mineable reserve is estimated to be **1041750m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources. Of which, rough stone is about **867900m<sup>3</sup>** and gravel is about **173850m<sup>3</sup>** up to a depth of 50m below the ground level (R.L.200m-150m) (Refer Plate No. IIIA & VIIA).
- 5) **Proposed production schedule:** Total proposed production of **995250m<sup>3</sup>**. Of which, rough stone is **821400m<sup>3</sup>** and gravel is **173850m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.200m-150m) for first five years plan period. Average production is **164280m<sup>3</sup>** of rough stone per year and gravel is **57950m<sup>3</sup>** Per year (Refer Plate No. IVA).

T. Mani Pradeepan





6) **Environmental Sensitivity of the proposed lease area: -**

- i. **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
- ii. **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.
- iii. **Indian Reserve Forest Act, 1980:** No reserved forest situated within radius of 1Km periphery of the proposed site. The Nearest reserve forest is  
1.Thathampalayam R.F -7.9km - Southeast
- iv. **CRZ Notification, 1991:** There is no sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 1991.

7) **Environmental measures to be adopted during the ongoing activity period,**

- a) Controlled blasting includes adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- b) Usage of sharp drill bits while drilling which will help in reducing noise.
- c) Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.
- d) Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
- e) Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
- f) Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- g) Transportation of material will be carried out during day time and material will be covered with tarpaulin.
- h) The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- i) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

1.0 **GENERAL:**

a.	Name of the Applicant	:	<b>Mr. T.Manoj Prabakar,</b>
	Applicant address	:	S/o.Thirunavukkarasu, Door.No.450-A, College Road, 3rd Cross, Paramathivelur,.
	District	:	Namakkal

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T. Manoj Prabakar



State	:	Tamilnadu
Pin code	:	638182
Phone	:	----
Fax	:	Nil
Gram	:	Nil
Telex	:	Nil
E-mail	:	.....
<b>b. Status of the Applicant</b>		
Private individual	:	Private individual
Cooperative Association	:	---
Private company	:	---
Public Company	:	---
Public Sector Undertaking	:	---
Joint Sector Undertaking	:	---
Other (pl. specify)	:	---
<b>c. Mineral(s) Which are occurring in the area and which the applicant intends to mine</b>		
	:	Rough stone and gravel quarry lease
<b>d. Period for which the mining lease granted /renewed/ proposed to be applied</b>		
	:	The precise area has been communicated to the applicant for quarrying period of ten (10) years.
<b>e. Name of the RQP preparing the Mining Plan</b>		
	:	<b>Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,</b>
Address	:	<b>Geo Technical Mining Solutions</b> (A NABET Accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
Phone	:	+91 9443937841, 7010076633
Fax	:	Nil
e-mail	:	<a href="mailto:info.gtmsdpi@gmail.com">info.gtmsdpi@gmail.com</a>
Telex	:	Nil
Certificate Number	:	RQP/MAS/263/2014/A
Date of grant/renewal	:	16.12.2014
Valid upto	:	15.12.2024
<b>f. Name of the prospecting agency</b>		
	:	<b>Geo Technical Mining Solutions</b> GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.

T. Mani Pradeepan



Address	:	No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
Phone	:	+91 9443937841, 7010076633
g. Reference No. and date of consent letter from the state government	:	The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, District Collectorate, Karur Vide Rc.No.97/Mines/2023 Dated: 30.05.2023

**2.0 LOCATION AND ACCESSIBILITY:**

a. Details of the Area:	:	Refer plate no: IA & IB				
District & State	:	Karur, Tamil Nadu				
Taluk	:	Pugalur				
Village	:	Kuppam				
Khasra No./ Plot No./ Block Range/ Felling Series etc.						
<b>Survey No.</b>	<b>Sub division</b>	<b>Total Extent in Hect</b>	<b>Patta No.</b>	<b>Name of the Land Owner</b>	<b>Mine lease Applied S.F. No.</b>	<b>Mine lease Applied Area out of total area in hect.</b>
683	2	3.43.85	4393	Mr.T.Manoj Prabakar S/o.Thirunavukkarasu	683/2	2.07.5
686	1	3.54.0	4390		686/1	2.04.0
<b>Total Extent</b>		<b>6.97.85</b>	<b>Applied lease area extent</b>		<b>4.11.5</b>	
Lease area (hectares)	:	4.11.5 Hectares				
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	No, forest is involved. This is recorded as patta Land.				
Ownership / Occupancy	:	This is a Patta land S.F.No. 683/2 (Part) and 686/1 (Part) is registered in the name of Mr.T.Manoj Prabakar S/o.Thirunavukkrasu vides Patta No.4393 & 4390. (Ref. Annex. No:V). /				
Existence of Public Road / Railway line if any nearby and approximate distance	:	✓ Excavated materials will be transported through the approach road on the southwest side of the lease applied area.				

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T. Manoj Prabakar.

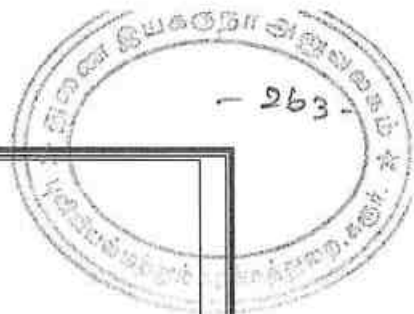


— 261 —

	<p>✓ There is an NH-81 road are situated about 2.25km away from the southern side which is connecting Thennilai- Karur Rd.</p> <p>✓ There is an SH-84 road are situated about 5.30km away from the north side which is connecting Noyal- Karur Rd.</p> <p>✓ There is an MDR-332 road are situated about 2.69km away from the western side which is connecting Noyal- Paramathi Rd.</p> <p>✓ There is no railway line are situated about 5.0km radius.</p>																								
<p>Toposheet No. with latitude and longitude</p>	<p>SOI Toposheet No. <b>58-F/13</b></p> <p>Latitude : From 10°58'46.65"N to 10°58'53.45"N ✓</p> <p>Longitude : From 77°56'6.93"E to 77°56'14.02"E ✓</p>																								
<p>Geo-Coordinates of the lease boundary: ✓</p> <table border="1"> <thead> <tr> <th>Pillar No</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>10°58'52.89"N</td> <td>77°56'13.77"E</td> </tr> <tr> <td>2</td> <td>10°58'46.65"N ✓</td> <td>77°56'14.02"E ✓</td> </tr> <tr> <td>3</td> <td>10°58'46.81"N</td> <td>77°56'7.14"E</td> </tr> <tr> <td>4</td> <td>10°58'47.58"N</td> <td>77°56'7.03"E</td> </tr> <tr> <td>5</td> <td>10°58'50.11"N</td> <td>77°56'7.08"E</td> </tr> <tr> <td>6</td> <td>10°58'51.88"N</td> <td>77°56'6.93"E ✓</td> </tr> <tr> <td>7</td> <td>10°58'53.45"N ✓</td> <td>77°56'7.28"E ✓</td> </tr> </tbody> </table>		Pillar No	Latitude	Longitude	1	10°58'52.89"N	77°56'13.77"E	2	10°58'46.65"N ✓	77°56'14.02"E ✓	3	10°58'46.81"N	77°56'7.14"E	4	10°58'47.58"N	77°56'7.03"E	5	10°58'50.11"N	77°56'7.08"E	6	10°58'51.88"N	77°56'6.93"E ✓	7	10°58'53.45"N ✓	77°56'7.28"E ✓
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7	10°58'53.45"N ✓	77°56'7.28"E ✓																							
<p>Land use pattern (Forest, Agricultural, Grazing, Barren etc.)</p>	<p>It is a fresh quarry lease.</p>																								
<p>b) <i>Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. It is preferred that the area to be marked on a survey of India topographical map or a</i></p>	<p>Refer plate no-IA &amp; IB</p>																								

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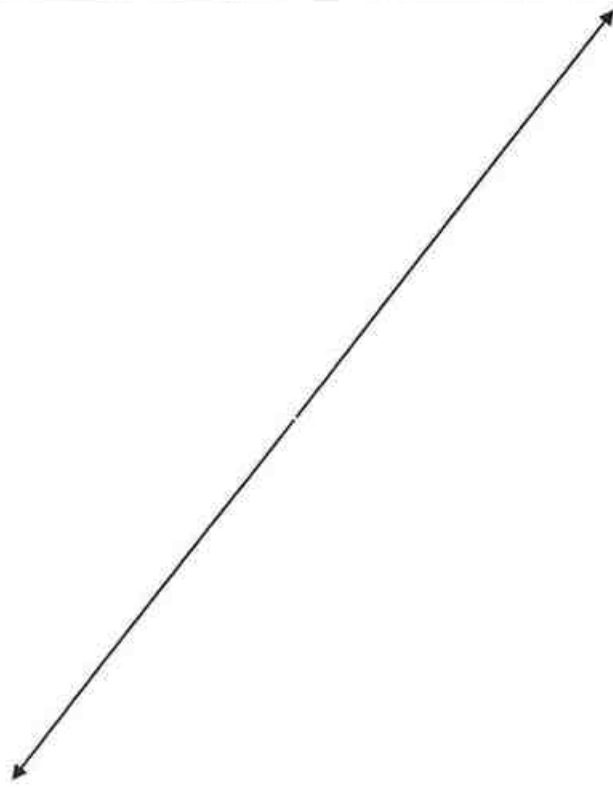
T. Mani Pealakar



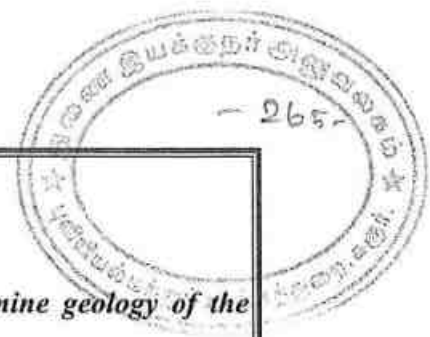
*cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.*

**i) INFRASTRUCTURE AND COMMUNICATION:**

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Karudaiyampalayam	2.20Km	Southeast
b.	Nearest police station	K.Paramathi	3.64km	Southwest
c.	Nearest fire station	Kodumudi	13.05km	Northwest
d.	Nearest medical facility	K.Paramathi	3.49Km	Southwest
e.	Nearest school	Salipalayam	1.45Km	North
f.	Nearest railway station	Noyal	8.56km	North
g.	Nearest port facility	Tuticorin	246km	South
h.	Nearest airport	Trichy	96.7km	East
i.	Nearest DSP office	Karur	12.2m	East
j.	Nearest villages	Munnur	2.93Km	Northwest
		Salipalayam	1.52km	North
		Thalaiyeethupatti	2.28km	Northeast
		Karudayampalayam	2.23km	Southeast



T.M. Pealbar



**PART - A**

**3.0 GEOLOGY AND MINERAL RESERVES:**

***(a) Briefly describe the topography and general geology and local/mine geology of the mineral deposit including drainage pattern:***

(i)	Topography	:	The proposed lease area exhibits flat topography. The maximum elevation (200m) was observed in southwest side of the site. The slope is towards southeast side and falls in Toposheet no. 58 F/13.
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(ii) **a) Geology of the District:**

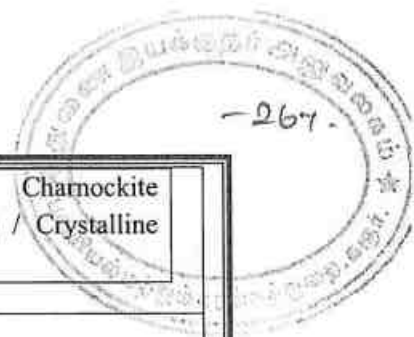
The Karur district forms part of the Archean complex of peninsular gneiss. The general rock types of this area are Biotite gneiss. Karur District is blessed with good reserves of crystalline limestone known as "Palayam belt" in Varavanai, Thennilai, Gudalur etc., villages in Kulithalai Taluk and the occurrences of good quality of pegmatite veins constituting with glassy quartz and potash feldspar in lensoid patches in Nagampalli and Pungambadi areas in Aravakurichi Taluk. The major mineral such as limestone, quartz and feldspar are exploited in Karur district and utilized in the mineral-based industries.

The Granite gneiss rocks are found to occur in K.Paramathi, Athur, Thennilai, Punnam, Godanthur South, Munnur, Punnam, Anjur villages in Karur and Aravakurichi Taluk are exploited to produce building materials and road metal (Jelly) and over burden soil appear as gray to reddish in colour called as gravel. The commercially known "Coloumbo Zubrana" the unique type in the Multi coloured granite / Granite gneiss category is occurring in Thogamalai, Naganur and Kazhugur Villages in Kulithalai Taluk. These rock type belong to minor mineral category. The arrangement of alternate layers of felsic and mafic minerals in linear pattern and exhibits wavy pattern in the rock and giving very good structure for the rock type. The well-developed gneissic pattern with linear arrangement, the rock type have attracted the granite market and found to be suitable for the exploitation of granite blocks. But in this area the banded gneissic rock has many fractures and foliation in it. So, this is not viable for dimensional stone. **Order of superposition of the proposed lease area,**

Age	Group	Rock Formation
Recent to Sub recent	---	Topsoil (1-2m thick),
Proterozoic	Acid intrusive	Pink medium grained granite/ Granite gneiss

*T. Mani Prakashan*





Archaean	Charnockite Group	Pyroxene Granulite, (acid to intermediate) / limestone / Quartzite	Charnockite Crystalline
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(iii) **Local / Mine Geology of the mineral deposit area:**

**a) Topography of the proposed lease area:**  
 The proposed lease area exhibits flat topography. The maximum elevation (200m) was observed in southwest side of the site. The slope is towards southeast side. The applied lease area is fresh quarry with covered gravel and beneath the charnockite rocks found based on existing pit nearby the lease area. Surface plan preparing for contour lines, surface features and Geological mapped the applied lease area.

**b) Mode of origin:**  
 The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by recrystallization at high pressures and moderately high temperatures.

**c) Physiography of the rocks:**  
 General characteristics of the rocks of this series has recorded that the rocks are in general bluish gray or darkish in colour and extremely fresh in appearance with an even grained granular structure.

**d) Chemical composition of rocks:**  
 The compositional characteristics of coexisting orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites–Enderbites such as the granulite’s and gneisses. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks.

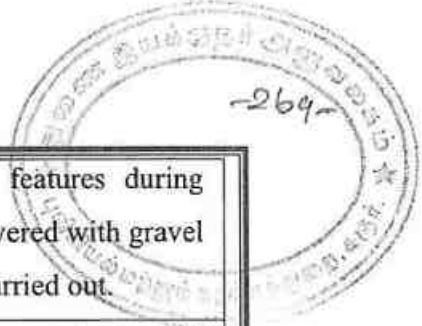
**Order of superposition of rocks in the proposed site:**

Age	Group	Rock Formation
Recent to Sub recent	---	Gravel
Archaean	Charnockite Group	Charnockite.

(iv) **Drainage Pattern** | No major river located within 500m radius. The drainage in the area is dendritic in nature.

(b) *The topographic plan of the lease area prepared on a scale of 1 :1000 or 1: 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan.*

T. Mani Pradeepan



a. Present status	The RQP examined the surface features during survey. It is a fresh quarry lease covered with gravel in this lease area. No exploration carried out.																														
b. Surface Plan	Surface plan showing elevation contour, rock exposure, and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No.III.																														
(c) Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000	Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No.IIIA.																														
<p>(d) <b><i>Broadly indicate the Year wise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below:</i></b></p> <table border="1"> <thead> <tr> <th>Year</th> <th>No.of boreholes</th> <th>Total meterage</th> <th>No.of Pits and Dimensions</th> <th>No.of Trenches and Dimensions</th> </tr> </thead> <tbody> <tr> <td>First</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Second</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Third</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Fourth</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Fifth</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> </tbody> </table> <p>No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.</p>		Year	No.of boreholes	Total meterage	No.of Pits and Dimensions	No.of Trenches and Dimensions	First	N.A	---	---	N.A	Second	N.A	---	---	N.A	Third	N.A	---	---	N.A	Fourth	N.A	---	---	N.A	Fifth	N.A	---	---	N.A
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Fourth	N.A	---	---	N.A																											
Fifth	N.A	---	---	N.A																											
<p>(e) <b><i>Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e., proved, probable, possible). Indicate cut-off grade. Availability of resources should also be indicated for the entire leasehold.</i></b></p> <p>The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one sections (longitudinal and transverse) to calculate the volume of material up to the depth of 50m below ground level. The longitudinal and transverse cross sections were assigned XY-AB as respectively. Using the cross-sectional method, total reserve is estimated to be <b>2049300m<sup>3</sup></b> including the resources of safety zone, and gravel. Of which, rough stone is about <b>1844370m<sup>3</sup></b> and gravel resource of about <b>204930m<sup>3</sup></b>.</p> <p>The gravel is obtained about 5m (R.L.200-195m) from the surface and a rough stone starts from 5 to 50m (R.L.195-150m) below ground level. (Refer plate</p>																															

T. Manj Prakash





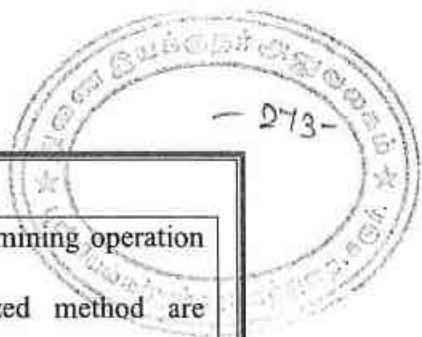
no.IIIA).

GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Rough stone in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	207	198	5	204930	.....	204930
	II	207	198	5	204930	204930	.....
	III	207	198	5	204930	204930	.....
	IV	207	198	5	204930	204930	.....
	V	207	198	5	204930	204930	.....
	VI	207	198	5	204930	204930	.....
	VII	207	198	5	204930	204930	.....
	VIII	207	198	5	204930	204930	.....
	IX	207	198	5	204930	204930	.....
	X	207	198	5	204930	204930	.....
<b>TOTAL</b>				<b>50</b>	<b>2049300</b>	<b>1844370</b>	<b>204930</b>

(f) *Indicate mineable reserves by slice plan / level plan method, as applicable, as per the proposed mining parameters.*

The total mineable reserve is estimated to be **1041750m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 50m (R.L.200-150m) below ground level. Of which, rough stone is about **867900m<sup>3</sup>** and gravel is about **173850m<sup>3</sup>**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no. VIIA).

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Rough stone in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	190	183	5	173850	.....	173850
	II	180	173	5	155700	155700	.....
	III	170	163	5	138550	138550	.....
	IV	160	153	5	122400	122400	.....
	V	150	143	5	107250	107250	.....
	VI	140	133	5	93100	93100	.....
	VII	130	123	5	79950	79950	.....
	VIII	120	113	5	67800	67800	.....
	IX	110	103	5	56650	56650	.....
	X	100	93	5	46500	46500	.....
<b>TOTAL</b>				<b>50</b>	<b>1041750</b>	<b>867900</b>	<b>173850</b>



**4.0 MINING:**

a. Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.  
 (Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)

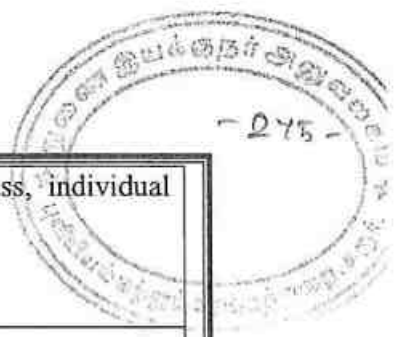
: It is a fresh grant lease. The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal

b. Indicate quantum of development and tonnage and grade of production expected pit wise as in table below.

Total proposed production **995250m<sup>3</sup>**. Of which, rough stone is **821400m<sup>3</sup>** and gravel is **173850m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.200m-155m) for first five years plan period. Average production is **164280m<sup>3</sup>** of rough stone per year and gravel is **57950m<sup>3</sup>** per year. (Refer Plate No. IVA).

Year	Pit No.(s)	Topsoil/Overburden (m <sup>3</sup> )	ROM (m <sup>3</sup> )	Saleable rough stone (m <sup>3</sup> ) @ 100%	Rough stone rejects(m <sup>3</sup> )	Sub grade/Weathered rock in (m <sup>3</sup> )	Saleable Gravel (m <sup>3</sup> )	Rough stone to topsoil ratio
First	I	---	187300	123250	...	...	64050	....
Second	I	---	201600	146700	...	....	54900	....
Third	I	---	201600	146700	...	....	54900	....
Fourth	I	---	200350	200350	...	....	....	....
Fifth	I	---	204400	204400	...	....	....	....
<b>Total</b>	<b>—</b>	<b>...</b>	<b>995250</b>	<b>821400</b>	<b>...</b>	<b>....</b>	<b>173850</b>	<b>....</b>

T. Mangappa



c. **Composite plans and Year wise sections (In case of 'A' class mines):** : Not applicable. It is a "B" class, individual quarry lease.

**Composite plans and year wise sections (In case of 'B' class mines):**

YEARWISE PRODUCTIONS									
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Rough stone in M <sup>3</sup>	Gravel in M <sup>3</sup>	
XY-AB	I- YEAR	I	70	183	5	64050	.....	64050	
		II	60	173	5	51900	51900	.....	
		III	50	163	5	40750	40750	.....	
		IV	40	153	5	30600	30600	.....	
	<b>TOTAL</b>						<b>187300</b>	<b>123250</b>	<b>64050</b>
	II- YEAR	I	60	183	5	54900	.....	54900	
		II	60	173	5	51900	51900	.....	
		III	60	163	5	48900	48900	.....	
		IV	60	153	5	45900	45900	.....	
	<b>TOTAL</b>						<b>201600</b>	<b>146700</b>	<b>54900</b>
	III- YEAR	I	60	183	5	54900	.....	54900	
		II	60	173	5	51900	51900	.....	
		III	60	163	5	48900	48900	.....	
		IV	60	153	5	45900	45900	.....	
	<b>TOTAL</b>						<b>201600</b>	<b>146700</b>	<b>54900</b>
	IV- YEAR	V	150	143	5	107250	107250	.....	
		VI	140	133	5	93100	93100	.....	
	<b>TOTAL</b>						<b>200350</b>	<b>200350</b>	<b>0</b>
	V- YEAR	VII	130	123	5	79950	79950	.....	
		VIII	120	113	5	67800	67800	.....	
		IX	110	103	5	56650	56650	.....	
	<b>TOTAL</b>						<b>204400</b>	<b>204400</b>	<b>0</b>
	<b>GRAND TOTAL</b>						<b>995250</b>	<b>821400</b>	<b>173850</b>

d. **Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.** : Composite plan not prepared in this proposed lease area. It is "B<sub>2</sub>" category of mine.

e. **Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:**

At this rate of production, the expected life of quarry is calculated as given below: -

**Rough stone:**

Mineable reserves of rough stone = 867900m<sup>3</sup>

First Five Year Production of rough stone = 821400m<sup>3</sup>

Yearly production of rough stone = 164280m<sup>3</sup>

Remaining Mineable reserves is = 46500m<sup>3</sup>

T. Mani Prabakaran



**Gravel:**

Mineable reserves of gravel = 173850m<sup>3</sup>

Yearly production = 57950m<sup>3</sup>

The regular working of the quarry and its production depends upon the demand from the market. The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production. The year wise production, anticipated life of quarry etc., are only a tentative figure.

f. *Attach a note furnishing a conceptual mining plan for the entire lease period (for B" category mines) and up to the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:*

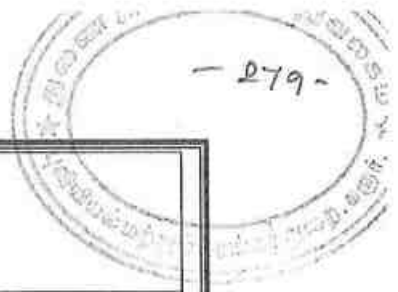
i) Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame: : Considering the indefinite depth persistence of the rough stone and gravel deposit is proved beyond the workable limits about up to a depth of 50m below ground level (R.L.200m-150m) from the petrogenetic character of the rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 10 years.

ii) Whether ultimate pit limit has been determined and demarcated on surface and geological plan:-

The ultimate pit limit has been determined and demarcated in the conceptual plan

ULTIMATE PIT LIMIT-(XY-AB)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.200-195m	First Five years	Gravel	190	183	5
II	R.L.195-190m		Rough stone	180	173	5
III	R.L.190-185m		Rough stone	170	163	5
IV	R.L.185-180m		Rough stone	160	153	5
V	R.L.180-175m		Rough stone	150	143	5
VI	R.L.175-170m		Rough stone	140	133	5
VII	R.L.170-165m		Rough stone	130	123	5
VIII	R.L.165-160m		Rough stone	120	113	5
IX	R.L.160-155m		Rough stone	110	103	5
X	R.L.155-150m	Next Five Years	Rough stone	100	93	5
<b>Total</b>						<b>50m</b>

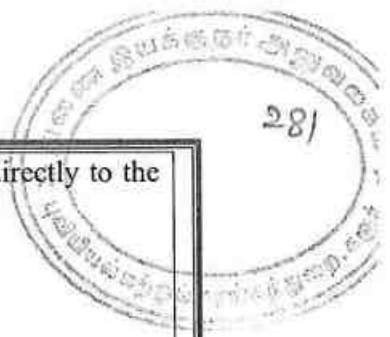
iii) Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long- : The recovery of rough stone in this quarry is 100%. There is no waste rock will be proposed in this lease area.



	term use in the event of continuation of mining activity: -	
iv)	Whether back filling of pits after recovery of mineral up to techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -	: As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.
v)	Whether post mining land use envisaged: -	: At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.
g.	<b>Open cast Mines:</b>	
	i). Describe briefly giving salient features of the mode of working (Mechanized, Semi-mechanized, manual)	: It is a fresh quarry lease. The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.  Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Excavators and tipper combination are adapted.
	ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden /waste. A reference to the plans enclosed under 4(b) and 4(d) will	: The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using drilling with the help of tractor mounted compressor attached with jack hammers, nonel blasting and waste and are removal using

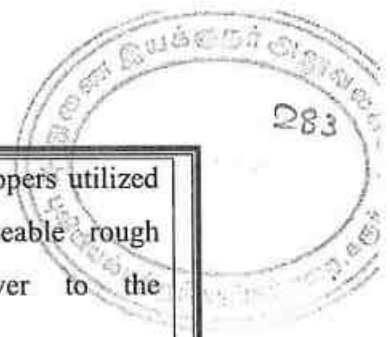
T. M. Prabhu





suffice	Hydraulic excavator and loaded directly to the tippers. Bench height = 5mts. Bench width = 5mts.																																													
a. Details of topsoil/ overburden	: There is no topsoil will be removed.																																													
b. Rough stone waste and side burden waste:-	: The recovery of rough stone in this quarry is 100%. Any other waste or side burden dumps are doesn't proposed.																																													
h. <b>Underground Mines:</b>	: Not applicable																																													
<p>i. <b>Extent of mechanization:</b></p> <p>Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.</p> <p><b>(1) Drilling Machines:</b></p> <p>Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.</p> <p><b>Details of drilling equipment's are given below.</b></p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P</th> </tr> </thead> <tbody> <tr> <td>Jack Hammer</td> <td>4</td> <td>32 mm</td> <td>Hand held</td> <td>---</td> <td>Diesel</td> <td>--</td> </tr> <tr> <td>Compressor</td> <td>1</td> <td>---</td> <td>Air</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> <p><b>(2) Loading Equipment:</b></p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Hydraulic Excavator</td> <td>1</td> <td>2.9-4.5m<sup>3</sup></td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> <p><b>(3) Haulage and Transport Equipment</b></p> <p>(a) Haulage within the mining leasehold:</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>8</td> <td>15MT</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> <p><b>Whether the dumpers are fitted with exhaust conditioner should be indicated:</b></p> <p>The dumpers are not used in this quarry; hence it's a small B2 category quarry.</p> <p>a) Transport from mine head to the destination : Tipper will be used for transport rough stone from the mine head to needy customer.</p>		Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Jack Hammer	4	32 mm	Hand held	---	Diesel	--	Compressor	1	---	Air	--	Diesel	--	Type	Nos	Size / Capacity	Make	Motive power	H.P.	Hydraulic Excavator	1	2.9-4.5m <sup>3</sup>	--	Diesel	--	Type	Nos	Size / Capacity	Make	Motive power	H.P.	Tipper	8	15MT	--	Diesel	--
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T. Mani Pradeep

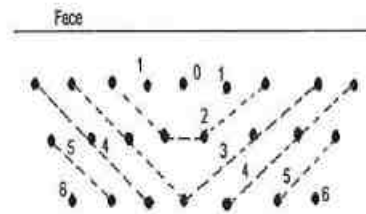


c. Describe briefly the transport system (please specify)	: Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.				
d. Ore transported by : own trucks / hired trucks	: Hired trucks for initially production purposes.				
e. Main destination to which ore is transported (giving to and from distance)	: Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size (i.e 1/4", 1/2", 1/3" and 1") The recovery of rough stone in this quarry is 100%.				
f. Details of hauling / transport equipment:					
Type	Nos	Size / Capacity	Make	Motive power	H.P.
--	--	--	--	--	--
<b>(4). Miscellaneous:</b>					
<b>Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.</b>					
(A) Operations	: The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only.				
(B) Machineries deployed	: Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted. (Refer Part-A-4 (i))				
<p>5. <b>BLASTING:</b></p> <p>a) <i>Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.</i></p> <p><b><u>Blasting pattern:</u></b></p> <p>The quarrying operation is proposed to carried out by opencast, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.</p>					

T. Mani Prabhakar

Drilling and Blasting parameters are as follows,

1	Diameter of the hole	32 mm
2	Spacing between hole	1.2m
3	Burden for hole	1.0m
4	Depth of each hole	1.5m
5	Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8 \times 2.8$	5.04 T
6	Output per hole = $1.8 \times 2.8 = 5 T$	5 T
7	Production per annum $164280m^3 * 2.8 = 459984 T$	459984 T
8	Total handling per day (280 working day)	1643T
9	Nos. of holes per day ( $1643/5.04 = 326$ )	326 holes
10	Meterage required per day ( $326 \times 5.5 = 1793$ )	1793meters
11	Charge per hole	0.375 kg
12	Powder factor ( $326 \text{holes} \times 0.375 \text{kg} = 122$ )	122 kg
13	Sequence of blasting = Cord relay with electric detonators / Nonel	--



Staged method of mining

**b) Type of explosives used / to be used:**

Following explosives are recommended for efficient blasting with safe practice.

Small dia. 25mm slurry explosives are proposed to be used for shattering and heaving effect for removal and winning of rough stone. No deep hole drilling or primary blasting is proposed.

**c) Measures proposed to minimize ground vibration due to blasting:**

The control blasting measures is being adopted for minimizing ground vibration and fly rock. Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock.

**Delay detonators:**

Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:





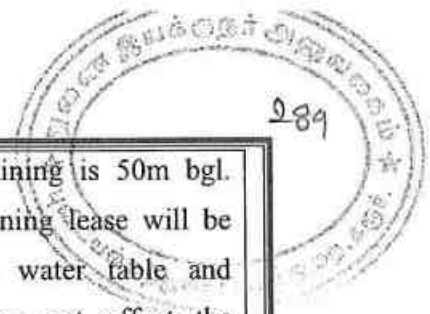
- ❖ Reduction of ground vibration
- ❖ Reduction in air blast
- ❖ Reduction in over break
- ❖ Improved fragmentation
- ❖ Better control of fly rock

Blasting program for the production per day

No of holes	:	326holes
Yield	:	1643 tons
Total explosive required	:	122kg-Slurry explosives
Charge per hole	:	0.375kg
Blasting at day time only	:	12.0p.m-1.0p.m

d) Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.375kg per holes of explosives
e) Whether secondary blasting is needed, if so describe it briefly	:	Irrespective of the method of primary blasting employed, it may be necessary to re-blast a proportion of the rock on the quarry floor so as to reduce it to a size suitable for handling by the excavators and rock breakers.
f) Storage of explosives (like capacity and type of explosive magazine)	:	<ol style="list-style-type: none"> <li>1. The applicant is advised to engage an authorized explosive agency to carry out blasting.</li> <li>2. First Aid Box will be keeping ready at all the time.</li> <li>3. Necessary precautionary announcement will be carried out before the blasting operation.</li> </ol>
<b>6. MINE DRAINAGE</b>		
a) Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 70m in rainy season and 75m in summer from the below ground level in the adjacent bore wells of the area.

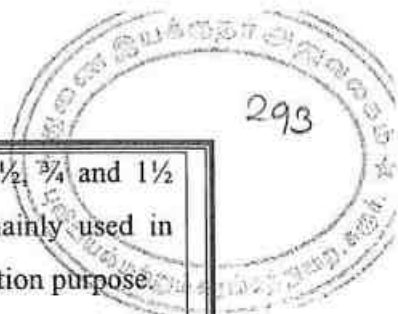
T. Mani Prakash



<p>b) Workings expected to be _____ m. above / reach below water table by the year _____.</p>	<p>: Ultimate depth of mining is 50m bgl. Now, the present Mining lease will be proposed above the water table and hence, quarrying may not affect the ground water.</p>
<p>c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged</p>	<p>: The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage will be less than 300 Lpm and it will be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.</p>
<p><b>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b></p>	
<p>(a) Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years: No separate of topsoil will be removed and any other waste or side burden dumps are doesn't proposed.</p>	
<p>(b) Land chosen for disposal of waste with proposed justification</p>	<p>: There is no waste are proposed.</p>
<p>(c) Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated year wise.</p>	<p>: There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.</p>
<p><b>8. USE OF MINERAL:</b></p>	
<p>(a) Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)</p>	<p>: The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc</p>

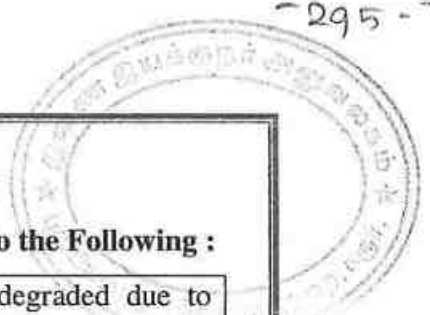
T. Mani Prakash

(b) Indicate physical and chemical specifications stipulated by buyers	: Basically, the materials produced at this quarry are rough stone and the same are used for building stone, sized stone materials only, so there are no chemical specifications are specified. Only physical specifications are involved.																		
(c) Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	: Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.																		
<b>9. OTHERS</b>																			
(a) Describe briefly the following Site services	: Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and booth rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.																		
<p>(b) Employment potential :</p> <p>As per Mines safety under the provisions of Metalliferous Mines Regulations, 1961 and under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified mining mate to keep all the production workers directly under his control and supervision.</p> <p>The following man power is proposed for quarrying stone material during the five years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.</p> <table border="1"> <tr> <td rowspan="4">1.</td> <td rowspan="4">Highly Skilled</td> <td>Mines Manager</td> <td>1No.</td> </tr> <tr> <td>Mine Engineer</td> <td>1No.</td> </tr> <tr> <td>Mine Geologist</td> <td>1No.</td> </tr> <tr> <td>Blaster</td> <td>1No.</td> </tr> <tr> <td>2.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>20 No's</td> </tr> <tr> <td colspan="3" style="text-align: right;"><b>Total =</b></td> <td><b>24 No's</b></td> </tr> </table>		1.	Highly Skilled	Mines Manager	1No.	Mine Engineer	1No.	Mine Geologist	1No.	Blaster	1No.	2.	Unskilled	Musdoor / Labours	20 No's	<b>Total =</b>			<b>24 No's</b>
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<b>10 MINERAL PROCESSING/BENEFICIATIONS:</b>																			
(a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to	: Excavated rough stone minerals directly will be used by the applicant in his own																		



	the extraction area, briefly describe the nature of the processing/beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.	crusher for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose.  The recovery of rough stone in this quarry is 100%.
(b)	Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).	: No water will be used for quarrying or any other processing except drinking water to be drawn from public sources. Some stagnation of rain water in the pit will be used for drilling and spraying haul roads. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the SPM in a pit before passing the water in to natural system.
(c)	A flow sheet or schematic diagram of the processing procedure should be attached.	: Not applicable.
(d)	Specify quantity and type of chemicals to be used in the processing plant.	: Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	: Not applicable
(f)	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	: Drinking is 0.3KLD, utilized water is 0.7KLD, Dust suppression is 1.5KLD and Green Belt is 1.5KLD. Minimum quantity of water 4.0KLD per day. It is proposed to make an own bore well for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.  The sewage water to a tune of 0.8KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.

T.M. Prabha



**PART – B**

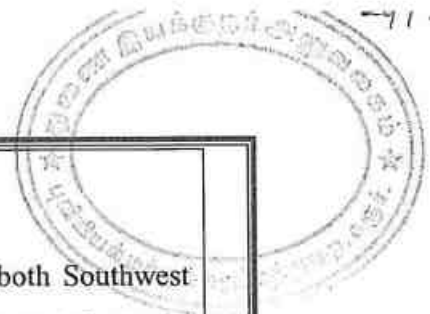
**11.0 ENVIRONMENTAL MANAGEMENT PLAN :**

a) Attach a note on the status of Baseline information with regard to the Following :

11.1	Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below.	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>Nil</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>Nil</td> </tr> <tr> <td>3</td> <td>Road</td> <td>Nil</td> </tr> <tr> <td>4</td> <td>Green belt &amp; Dump</td> <td>Nil</td> </tr> <tr> <td>5</td> <td>Drainage &amp; Settling Tank</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>4.11.5</td> </tr> <tr> <td colspan="2"><b>Grand total</b></td> <td><b>4.11.5</b></td> </tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under mining	Nil	2	Infrastructure	Nil	3	Road	Nil	4	Green belt & Dump	Nil	5	Drainage & Settling Tank	Nil	6	Un-utilized area	4.11.5	<b>Grand total</b>		<b>4.11.5</b>
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<b>Grand total</b>		<b>4.11.5</b>																								
11.2	Water Regime	: Water table in this area is noticed at a depth of 75m in summer and 70m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 50m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except acacia bushes, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																								
11.4	Quality of air, ambient noise level and water	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																								

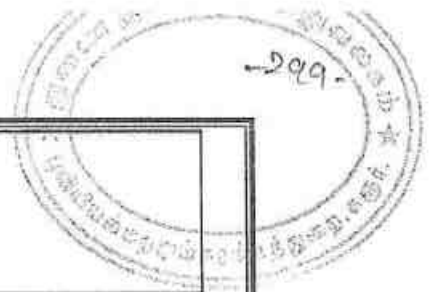
T. M. Rajalakshmi





11.5	<p><b>Climatic conditions:</b></p> <p><b>Climate:</b></p> <p>The district receives the rain under the influence of both Southwest and Northeast monsoons. The Northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The Southwest monsoon rainfall is highly erratic and summer rains are negligible. The average annual rainfall over the district varies from about 620 mm to 745 mm.</p> <p><b>Rainfall:</b></p> <p>The annual rainfall normal (1970-2000) of Karur district is 742 mm.4 Projections of rainfall over Karur for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively.</p>																									
11.6	<p><b>Human Settlement:</b></p> <p>The nearest villages are found in the buffer zone with population as per 2011 census.</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>Village</th> <th>Direction</th> <th>Distance in Kms</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Munnur</td> <td>Northwest</td> <td>2.93Km</td> <td>2582</td> </tr> <tr> <td>2</td> <td>Salipalayam</td> <td>North</td> <td>1.52km</td> <td>788</td> </tr> <tr> <td>3</td> <td>Thalaiyeethupatti</td> <td>Northeast</td> <td>2.28km</td> <td>854</td> </tr> <tr> <td>4</td> <td>Karudayampalayam</td> <td>Southeast</td> <td>2.23km</td> <td>2347</td> </tr> </tbody> </table>	S.N	Village	Direction	Distance in Kms	Population	1	Munnur	Northwest	2.93Km	2582	2	Salipalayam	North	1.52km	788	3	Thalaiyeethupatti	Northeast	2.28km	854	4	Karudayampalayam	Southeast	2.23km	2347
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11.7	<p>Public buildings, places of worship and monuments : No infrastructure like residential building, places of special interest like archeological monuments, sanctuaries etc., are found around 10km radius.</p>																									
11.8	<p>Attach plans showing the locations of sampling stations : The proposed ambient air quality, water quality ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA notification 2006 and also covering DGMS norms.</p>																									
11.9	<p>Does area (partly or fully) fall under notified area : The proposed area not fall under notified area under water (Prevention &amp; Control of</p>																									

T. Mani Prabakaran



under Water (Prevention & Control of Pollution), Act, 1974	Pollution), Act, 1974
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**b) Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)**

i)	<p><b>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</b></p> <p>Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:</p>																									
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 15%;">Sl. No.</th> <th style="width: 55%;">Land Use</th> <th style="width: 30%;">Area in use during the quarrying period (Hect)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.</td> <td>Area under mining</td> <td style="text-align: center;">3.38.8</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Infrastructure</td> <td style="text-align: center;">0.02.0</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Road</td> <td style="text-align: center;">0.11.0</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Green belt</td> <td style="text-align: center;">0.51.7</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Drainage &amp; Settling Tank</td> <td style="text-align: center;">0.08.0</td> </tr> <tr> <td style="text-align: center;">6</td> <td>Un-utilized area</td> <td style="text-align: center;">Nil</td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>Grand total</b></td> <td style="text-align: center;"><b>4.11.5</b></td> </tr> </tbody> </table>	Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Area under mining	3.38.8	2	Infrastructure	0.02.0	3	Road	0.11.0	4	Green belt	0.51.7	5	Drainage & Settling Tank	0.08.0	6	Un-utilized area	Nil	<b>Grand total</b>		<b>4.11.5</b>	
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ii).	Air Quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.																								
iii).	Water quality	A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.																								
iv).	Noise levels	Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																								
v).	Vibration levels (due to blasting)	No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity will be																								

*T.M. Prabhakar*

		recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime	No major water bodies like rivers, pond, lake etc., located within a radius of 500m.
vii).	Socio-economics	1. To provide Employment opportunities of the near by villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km radius.

**c) Attach an Environmental Management Plan (supported by appropriate plans and sections) defining the time bound action proposed to be taken with sequence & timing in the following areas (or diagrams should be used):**

i).	Temporary storage and utilization of topsoil	:	There is no topsoil will be removed.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	:	The present mining is proposed to an average depth of 45m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.



iii) *Programme of afforestation, Yearwise for the initial five years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.*

**Green Belt Development:**

Safety barrier, school and nearest panchayat roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan and other regional trees will be planted in a phased manner as described below.

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	5170	575	80%	@100 Rs Per sapling	57,500/-
Second	Approach road and Nearby Village Road	--	300	80%		30,000/-
Third	Schools	--	300	80%		30,000/-
<b>Total</b>						<b>1,17,500/-</b>

iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and up to conceptual plan period for 'A' category mines).	:	No waste or rejects removed in this lease area.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this quarry area.
vi).	Treatment and disposal of water from mine.	:	It will not be harmful and it does not require any treatment before discharging into the natural courses.
vii).	Measures for minimizing adverse effects on water regime.	:	There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry. The worked-out pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit.  The open pit will be used as rain water storage structure to augment groundwater

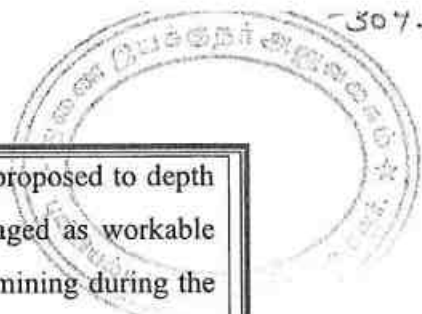
		levels which improve the mine environment.
viii).	Protective measures for ground vibrations / air blast caused by blasting,	: It is a small B2 category opencast, semi mechanized method of mining is adopted and no heavy machinery will be used. The only smooth blasting is proposed, therefore no change for ground vibration or noise from the quarry.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	: No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	: The nearest villages are will get employment benefits.

*d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (for 'A' category mines only)*

Not applicable. It is B2 category quarry

**12.0 PROGRESSIVE QUARRY CLOSURE PLAN:**

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The Ultimate mining is proposed to an average depth of 50m bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	: Measures will be taken as per the Acts and Rules. Green belt development at the rate of 575 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	: The quarry lease is a fresh mining lease. No mitigation measures adopted.



12.4	Mine closure activity	: The present mining plan is proposed to depth of 45m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	: Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	: Open cast semi mechanized method of mining is adopted in this quarry. If the benches are made with proposed height and with no risk will be there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	: A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for

T. Mary Pealton

		security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and manpower entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 24 labors will be improved.
12.9	Reclamation and Rehabilitation	: Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes.

**12.9 Proposed Financial Estimate / Budget for (EMP) Environment Management:**

<b>A</b>	<b>Fixed Asset Cost:</b>	
	1. Land Cost	: Rs. 52,88,000/-
	2. Labour Shed	: Rs. 2,00,000/-
	3. Sanitary Facility	: Rs. 1,50,000/-
	4. Fencing	: Rs. 4,00,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 3,00,000/-
	<b>Total</b>	<b>: Rs. 63,38,000/-</b>
<b>B</b>	<b>B. Machinery cost</b>	<b>: Rs. 30,00,000/- (Hire Basis)</b>
<b>C</b>	<b>Total Expenditure of EMP cost (for five years)</b>	
	1. Drinking Water Facility	: Rs. 1,50,000/-
	2. Sanitary facility & Maintenance	: Rs. 50,000/-
	3. Permanent water sprinkler	: Rs. 1,00,000/-

4. Afforestation and its maintenance	:	Rs. 1,17,500/-
5. Safety Kits	:	Rs. 50,000/-
6. Provision of tyre washing facility	:	Rs. 75,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.08.0Hect or 800Sq.m X 400	:	Rs. 3,20,000/-
8. Blasting materials with blast mat cost	:	Rs. 20,00,000/-
9. Environment monitoring	:	Rs. 5,00,000/-
<b>Total</b>	:	<b>Rs. 33,62,500/-</b>
<b>D</b>	<b>Total Project Cost (A+B+C)</b>	<b>Rs. 1,27,00,500/-</b>

**13.0 FINANCIAL ASSURANCE:**

Not applicable, it is a small B2 rough stone and gravel quarry.

**14.0 CERTIFICATES:**

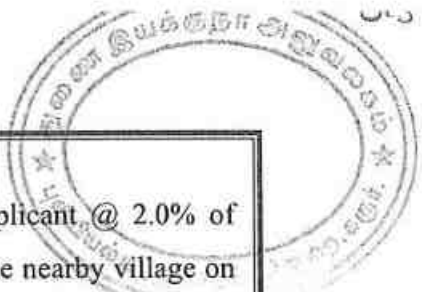
All required certificates are enclosed.

**15.0 PLAN AND SECTIONS, ETC:**

Plan and Sections are submitted along with mining plan.

**16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT:**

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The mining plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Deputy Director of Geology and Mining, Karur vide letter **Rc.No.97/Mines/2022 Dated: 30.05.2023.**
- (iv) Total proposed production of **995250m<sup>3</sup>**. Of which, rough stone is about **821400m<sup>3</sup>** and gravel is about **173850m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.200m-150m) for first five years plan period. Average production is **164280m<sup>3</sup>** of rough stone per year and gravel is **57950m<sup>3</sup>** per year.



**17.0 CSR Expenditure:**

CSR (Corporate Social responsibility) shall provide by the applicant @ 2.0% of average net profit of the company for the last three financial years to the nearby village on the Ministry has notified the amendments in section 135 of the Act as well in the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25th August 2021.

Place: Dharmapuri, TN

Date: 31/5/23

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,  
RQP/MAS/283/2014/A  
GEO TECHNICAL MINING SOLUTIONS  
1/213-B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post Office,  
Dharmapuri - 635 705. Tamil Nadu, India.  
E-mail : info.gtmsdpt@gmail.com  
website : www.gtmsind.com

This Mining Plan is approved based on incorporation of the particulars specified in clause 7 (iv) of the Commissioner of Geology and Mining Chennai Lt No 3588 / LC / 2012 dt 19-11-2012 and Draft Minor Mineral Conservation & Development Rules 2010

08/06/23

Deputy Director of Geology and Mining  
Karur District

This Mining Plan is approved subject to the conditions / stipulations indicated in the Mining Plan approval letter No: 97/Mines/2023  
Dated: 08.06.2023

Q  
08/06/2023

T. Mani Prabhu



ந.க.எண். 97/கனிமம்/2023

மாவட்ட ஆட்சியர் அலுவலகம்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்  
நாள். 30.05.2023.

குறிப்பாணை

**பொருள்:** கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - குப்பம் கிராமம் - பட்டா புல எண்கள்.683/2(பகுதி) (2.07.50 ஹெக்டேர்ஸ்) மற்றும் 686/1(பகுதி) (2.04.00 ஹெக்டேர்ஸ்) ஆகியவற்றின் மொத்தம் 4.11.50 ஹெக்டேர்ஸ் பரப்பில் - சாதாரணகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி திரு.தி.மனோஜ் பிரபாகர் என்பவர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை:**
1. திரு.தி.மனோஜ் பிரபாகர், த/பெ.திருநாவுக்கரசு, கதவு எண்.450-A, காலேஜ் ரோடு, 3-வது கிராஸ், பரமத்திவேலூர், நாமக்கல் மாவட்டம் என்பவரின் விண்ணப்பம், நாள்: 16.03.2023.
  2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் கடிதம் ந.க.எண். அ1/1775/2023, நாள்:03.05.2023
  3. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:10.05.2023.
  4. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்.எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

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கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.683/2(பகுதி) (2.07.50 ஹெக்டேர்ஸ்) மற்றும் 686/1(பகுதி) (2.04.00 ஹெக்டேர்ஸ்) ஆகியவற்றின் மொத்தம் 4.11.50 ஹெக்டேர்ஸ் பரப்பு நிலத்திலிருந்து பத்து ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க குத்தகை உரிமம் வழங்கக்கோரி திரு.தி.மனோஜ் பிரபாகர் என்பவர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளார்.

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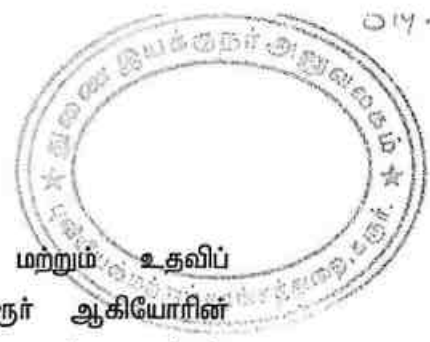
T. Mani Praveen



மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.683/2(பகுதி) (2.07.50 ஹெக்டேர்ஸ்) மற்றும் 686/1(பகுதி) (2.04.00 ஹெக்டேர்ஸ்) ஆகியவற்றின் மொத்தம் 4.11.50 ஹெக்டேர்ஸ் பரப்பில் மட்டும் தமிழ்நாடு சிறு கனிமச்சலுகை விதிகளில் விதி எண்கள்.19-(1), 20 மற்றும் 22-இன் கீழ் திரு.தி.மனோஜ் பிரபாகர் என்பவருக்கு 10(பத்து) ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் முதல் 03 (மூன்று) ஆண்டுகளுக்கு கிராவல் குவாரி உரிமம் வழங்க கீழ்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பார்வை 2 மற்றும் 3-இல் கண்டுள்ளவாறு பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புல எண்.683/2-க்கு வட மேற்கில் சுமார் 35 தொலைவில் தொலைவில் அமைந்துள்ள மின்மாற்றி மற்றும் 15 மீட்டர் தொலைவில் அமைந்துள்ள உயரழுத்த மின்பாதை ஆகியவற்றிற்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு மேற்கில் புல எண்கள். 684 மற்றும் 685-இல் தென் வடலாக செல்லும் அரசு புறம்போக்கு நடைபாதைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
3. விண்ணப்ப புலங்களுக்கு வடக்கு, தெற்கு மற்றும் கிழக்கில் செல்லும் உயரழுத்த மின்பாதைகளுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
4. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
5. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
6. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
7. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.





எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.683/2(பகுதி) (2.07.50 ஹெக்டேர்ஸ்) மற்றும் 686/1(பகுதி) (2.04.00 ஹெக்டேர்ஸ்) ஆகியவற்றின் மொத்தம் 4.11.50 ஹெக்டேர்ஸ் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண். 19(1), 20 மற்றும் 22-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு திரு.தி.மனோஜ் பிரபாகர் என்பவருக்கு 10(பத்து) ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் முதல் 03(மூன்று) ஆண்டுகளுக்கு கிராவல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண்.41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு திரு.தி.மனோஜ் பிரபாகர் என்பவர் கேட்டுக்கொள்ளப்படுகிறார். மேலும், ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ஆம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-இன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

*(Handwritten signature)*  
30/5/23

துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்.

**பெறுநர்**  
திரு.தி.மனோஜ் பிரபாகர்,  
த/பெ.திருநாவுக்கரசு,  
கதவு எண்.450-A,  
காலேஜ் ரோடு,  
3-வது கிராஸ்,  
பரமத்திவேலூர்,  
நாமக்கல் மாவட்டம்.

*(Handwritten signature)*  
30/05/2023

**நகல்:-**

1. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை.

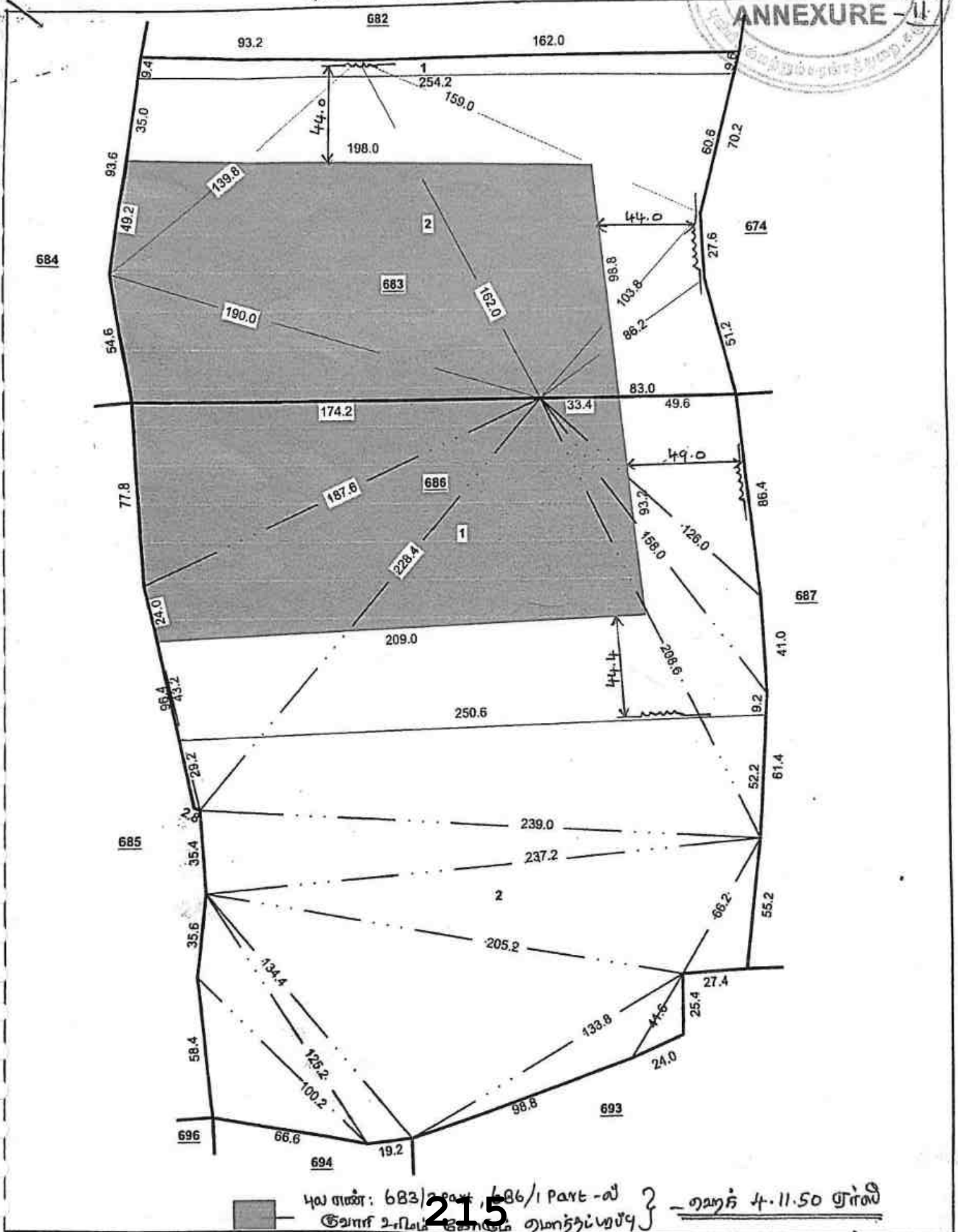
214 *(Handwritten signature)*

மாவட்டம் : கட்டு  
 அட்டை : 486

புல எண் : 683, 686

பக்கம் : 18  
 தரம் : 686

ANNEXURE - II



புல எண் : 683/2 part, 686/1 part - ல் } - ஏற்க 4.11.50 தரலி  
 தரம் 2-ம் பகுதி கட்டுமே ஏற்கத்தியது

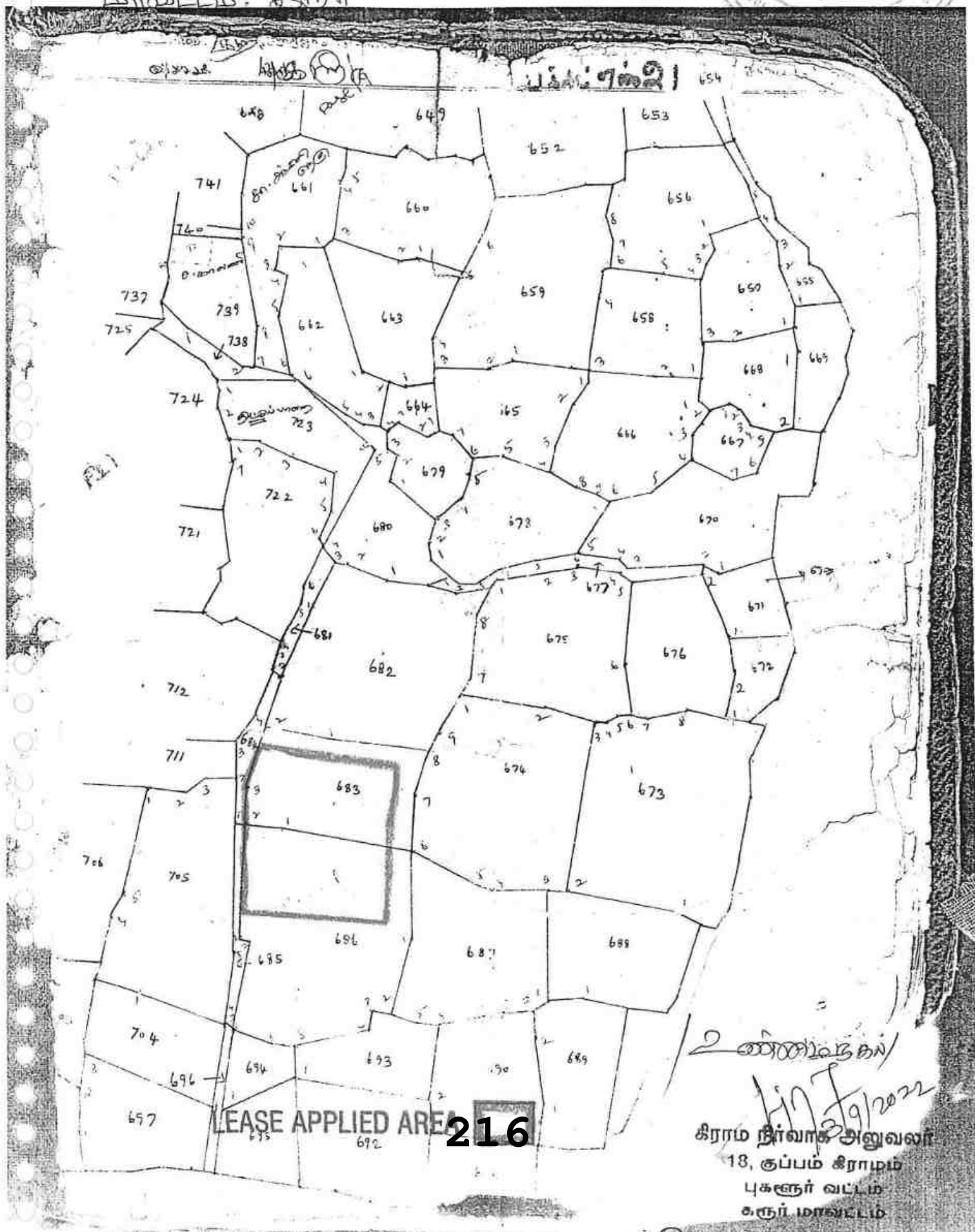
215

திகதி 16.12.2000

செ. ஜெயலக்ஷ்மி  
 சா.ஜ  
 மதுரை (கே.அ.ம.ம.)

T.M. Rajalekshmi

பட்டினம்: 150



LEASE APPLIED AREA **216**

2 கிராம நிர்வாக அலுவலர்  
 18/09/2022  
 கிராம நிர்வாக அலுவலர்  
 18, குப்பம் கிராமம்  
 புகளூர் வட்டம்  
 கரூர் மாவட்டம்

T.M. Pradeep

1	2	3	4	5	6	7	8	9	10	11	12
678	1	678-பா	ர	4	...	8-3	5	2 00	1 96.5	3 93	250 வே. திருமூர்த்தி.
	2	-பா	ர	4	...	8-3	5	2 00	0 02.5	0 06	734 வே. திருமூர்த்தி (1), வே. ராமசாமி (2).
	3	-பா	ர	4	...	8-3	5	2 00	1 18.0	2 06	538 வே. ராமசாமி.
									3 17.0	6 35	
679	...	679	ர	4	...	8-3	5	2 00	1 09.5	2 20	886 ப. சின்ன ராமண கவுண்டர் (1), சி. மொட்டையப்ப கவுண்டர் (2), சி. கருப்பண கவுண்டர் (3).
680	...	680	ர	4	...	8-3	5	2 00	2 29.5	4 59	1009 வே. திருமூர்த்தி மற்றும் மூன்று போர்களும்.
681	...	681	அ	4	...	...	...	...	0 34.5	...	.....
682	...	682	ர	4	...	8-4	6	1 38	6 21.0	8 59	578 கு. வங்கிவர் பப்பன்.
683	...	683	ர	4	...	8-4	6	1 38	3 64.5	5 05	540 மொ. ராமசாமி.
684	...	684	அ	4	...	...	...	...	0 45.5	...	.....
685	...	685	அ	4	...	...	...	...	0 33.0	...	.....
686	...	686	ர	4	...	8-4	6	1 38	7 08.0	9 79	887 வே. முதது சாமி (1), வே. ராமசாமி (2), ரா. செல்லப்பன் (3).
687	1	687-பா	ர	4	...	8-4	6	1 38	2 03.0	2 80	451 மொ. முனியப்பன்.
	2	-பா	ர	4	...	8-4	6	1 38	0 11.0	0 15	567 மொ. வர்கமணன்.
	3	-பா	ர	4	...	8-4	6	1 38	0 11.0	0 15	536 மொ. ராமசாமி.
	4	-பா	ர	4	...	8-4	6	1 38	0 23.5	0 33	280 ப. நாச்சியா கவுண்டர்.
	5	-பா	ர	4	...	8-4	6	1 38	0 08.0	0 11	567 மொ. வர்கமணன்.

சதுரக் கிணறு.

நடைபாதை

நடைபாதை

நடைபாதை

சதுரக் கிணறு.

12 ஸ்ரீமதி நல்லி  
 கிராம நிர்வாக அலுவலர்  
 18, குப்பம் கிராமம்  
 புகளூர் வட்டம்

217

T. Mani Pradeep



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகமூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 4393

உரிமையாளர்கள் பெயர்

1. திருநாவுக்கரசு

மகன்

மனோஜ்பிரபாகர்



புல எண்	உட்பிரிவு	புன்செய்		நுன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
683	2	3 - 43.85	4.75	--	--	--	--	2023/0105/14/127793- -2023/14/07/000146SD -- 11-03-2023
		3 - 43.85	4.75					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/04393/40809 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 30-05-2023 அன்று 04:49:11 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

218

T-M-Prakashan





தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகழூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 4390

உரிமையாளர்கள் பெயர்

1. திருநாவுக்கரசு

மகன்

மனோஜ்பிரபாகர்



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	
686	1	3 - 54.00	4.89	--	--	--	--	2023/0103/14/252551- -2022/14/07/000121SD -- 07-03-2023
		3 - 54.00	4.89					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/04390/40876 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 30-05-2023 அன்று 04:48:26 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

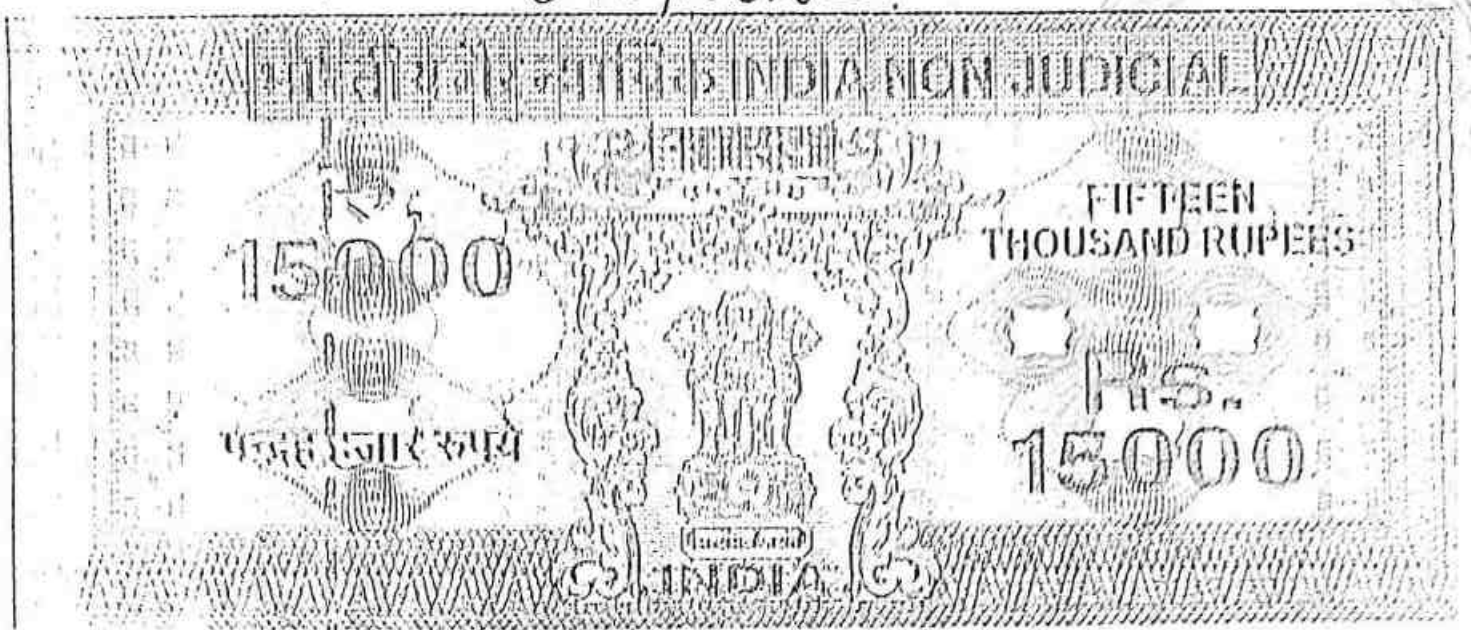
219

T-Mari Pealeban

5/5/2023

TP/144628867/2023

381



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ.15000-

A 688779

T. மனோஜ் பிரபாகர்  
நாமக்கல்.

01.03.2023

K. DIANASEKARAN  
STAMP VENDOR  
KARUR. L.No:15/2003



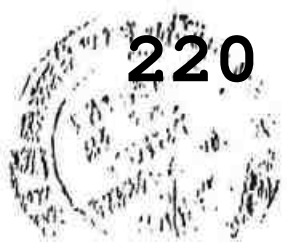
சுத்தக் கிரைய சாசனம்

2023-ம் வருடம் மார்ச் மாதம் 02-ம் தேதி, தமிழ் சுபகிருது வருடம் மாசி மாதம் 18-ம் தேதி,

நாமக்கல் மாவட்டம், பரமத்தி வேலூர் வட்டம், பொத்தனூர், காலேஜ் ரோடு 3-வது கிராஸ், கதவு எண்.450A-ல் வசித்து வரும் திரு.K.திருநாவுக்கரசு அவர்கள் குமாரர் திரு.T.மனோஜ்பிரபாகர் (PAN:BTQPM8247P / ஆதார் அட்டை எண்.7485 9965 5292 / செல்.96886 28888) (கிரையம் பெறுபவர்) ஆகிய தங்களுக்கு,  
எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. Manoj Prabhakar  
மனோஜ் பிரபாகர்  
01.03.2023  
நாமக்கல்



1. S. Thamil Selvi  
2. S. Subal  
T. Manoj Prabhakar



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ15000-

A 688801



T. கணேசன் பிரபாகர்  
நாமச்சேலி, 01.03.2023.

K. DIAMANEKARAN  
STAMP VENDOR  
KARUR. L.No:16/2008

/2/

கருர் மாவட்டம், கருர் வட்டம், கல்பா கருர் டவுன், KVB காலனி, கணேசா நகர், கதவு எண்.2-16-ல் வசித்து வரும் திரு.சபாபதி அவர்கள் மனைவி S.தமிழ்ச்செல்வி (PAN:ADGPT0402Q / ஆதார் அட்டை எண்.2478 7646 4115 / செல்.95004-52462)-1,

கருர் மாவட்டம், கருர் வட்டம், கல்பா கருர் டவுன், KVB காலனி, கணேசா நகர், பழைய கதவு எண்.16/B-க்கு புதிய கதவு எண்.2-ல் வசித்து எழுதி வாங்குபவர்:-  
எழுதிக் கொடுப்பவர்கள்:-

T. M. Prabhakar

1. S. Thamilselvi
2. S. Jagan

1. புத்தியம் 2023-ம்  
வரு.த்தியம் 515-ம்  
அலகைம் 26-ம்  
கொண்டது 2-ம்

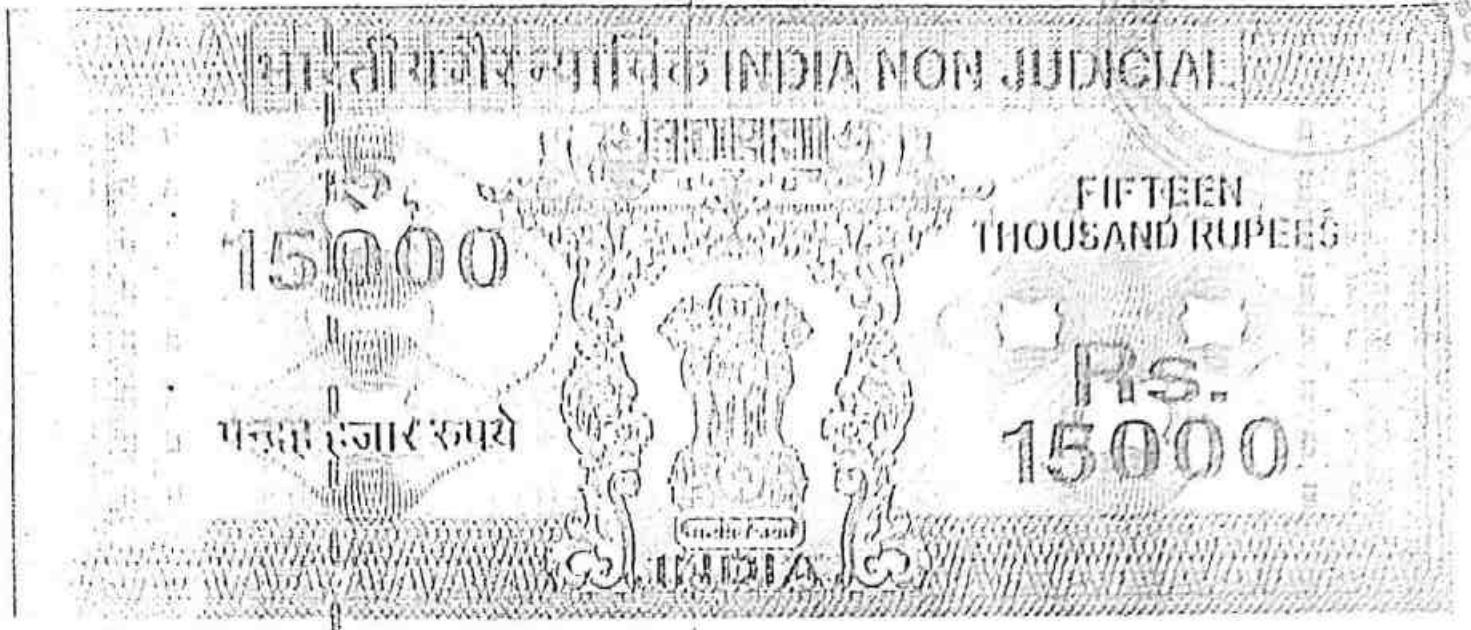
221

புதிது அலுவலர்



T. M. Prabhakar



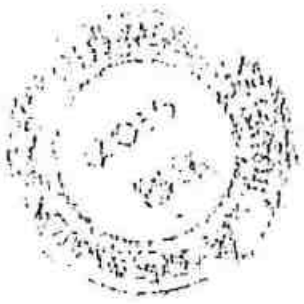


தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ 15000

A 688801

T. மனோஜ் பிரபாகர்  
 இயக்குநர், 01.03.2023.

K. DHANASEKARAN  
 STAMP VENDOR  
 KARUR. L.No:15/2003



131

வந்தும் தற்சமயம் திருச்சிராப்பள்ளி மாவட்டம், திருச்சிராப்பள்ளி வட்டம், உறையூர், நாராயணா நகர், கதவு எண்.5A/1-ல் வசித்து வரும் திரு. சபாபதி அவர்கள் குமாரத்தியும், திரு.குமரேசன் அவர்கள் மனைவியுமான S.யசோதா (PAN:ABUPY5733H / ஆதார் அட்டை எண். 3596 7893 6429 / செல்.94435-36289)-2 (கிரையம் கொடுப்பவர்கள்) ஆகிய நாங்கள் இருவரும் சேர்ந்து எழுதிக் கொடுத்த சுத்தக் கிரைய சாசனம் என்னவென்றால்,

எழுதி வாரங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. M. Pradeepan

- S. Thamil Selvi
- S. Subal

1. பித்தகம் 2022  
 உரிசிய 515  
 மூலம் 26 நாள் கலளம்  
 மலிட்டு 3 நாள் தான்

பதிவு அலுவலர்

222



T. M. Pradeepan



தமிழ்நாடு சமீப-நாடு TAMILNADU ரூ.15000 -

A 688892

T. மகேசுவரன் நிரபாகர்  
புலமேகல், 01.03.2023.

K. DIJANASEKARAN  
STAMP VENDOR  
KARUR. L.No-15/2008



14/

இதனடியில் கண்ட சொத்தானது எங்களில் 1 நபருக்கு சுயார்ஜித வகையில் சென்ற 14.06.2000-ம் தேதியில் ஏற்பட்ட கிரையப் பத்திரப்படி (பத்திர எண்.1-552/2000 2 நெ. இணை சார்பதிவகம், கரூர்) எங்களில் 1 நபருக்கு பாத்தியப்பட்டும் மற்றும் எங்களில் 1 நபர் பெயரில் மட்டா (மட்டா எண்.4212) ஏற்பட்டுள்ள சொத்தினையும்,

எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

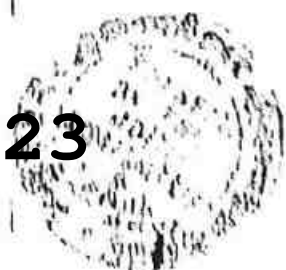
T. M. Pralaban

1. S. Thamilselvi

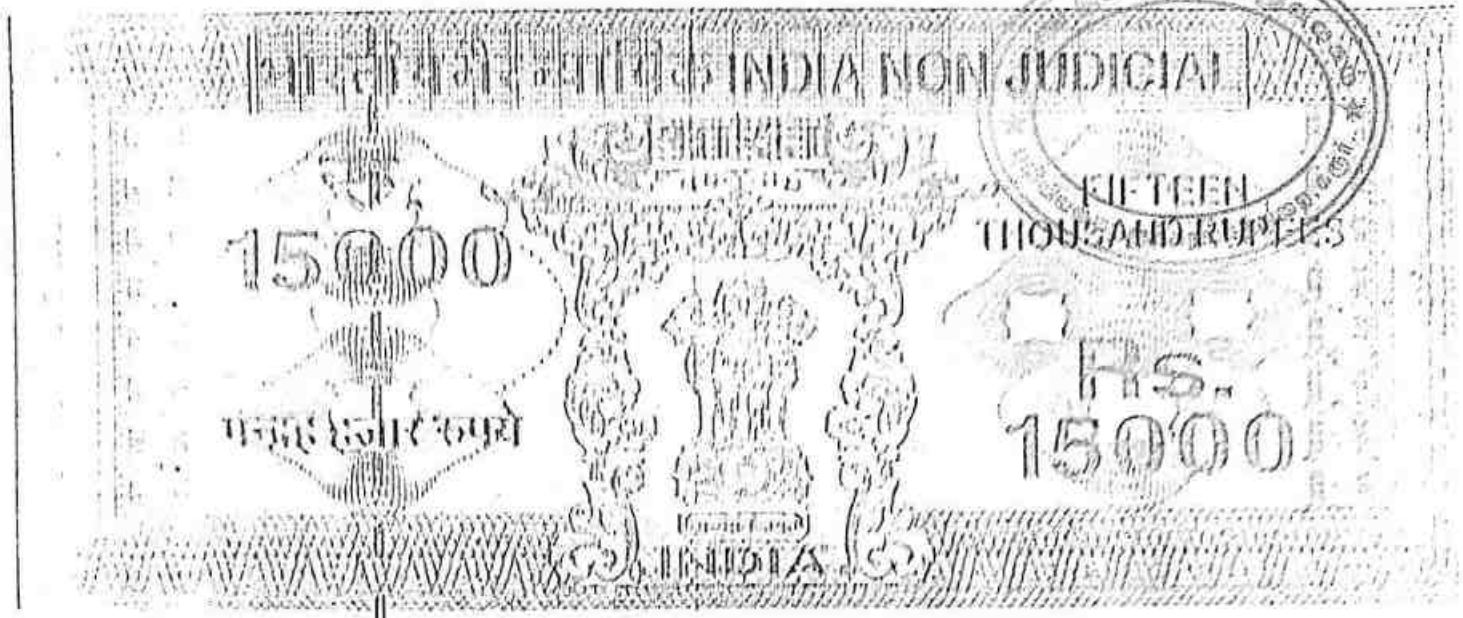
2. S. Y...

...இந்தகம்...  
வருத்திய...  
ஆளமை...  
கொண்டது...

223



T. M. Pralaban



தமிழ்நாடு அமிலாது TAMILNADU ரூ 15000 -

A 231301



T. ஸேனாதிபதி  
நாமக்கல், 01.02.2023.

K. DHANASEKARAN  
STAMP VENDOR  
KARUR. L.No:15/2003

15/

மற்றும் எங்களில் 2 நபருக்கு, எங்களில் 2 நபர் மைனராக இருக்கும் போது எங்களில் 2 நபரின் தகப்பனார் S.சபாபதி அவர்களை கார்டியனாக கோட்கண்டு சுயார்ஜித வகையில் சென்ற 11.02.2002-ம் தேதியில் ஏற்பட்ட கிரையப் பத்திரப்படி (பத்திர எண்.1-119/2002 2நெ. இணை சார்பதிவகம், கருா) எங்களில் 2 நபர் மேஜரான பிறகு எங்களில் 2 நபருக்கு பாத்தியப்பட்டும்,

எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. M - P. Peethan.

1. S. Thanuvelu
2. S. [Signature]

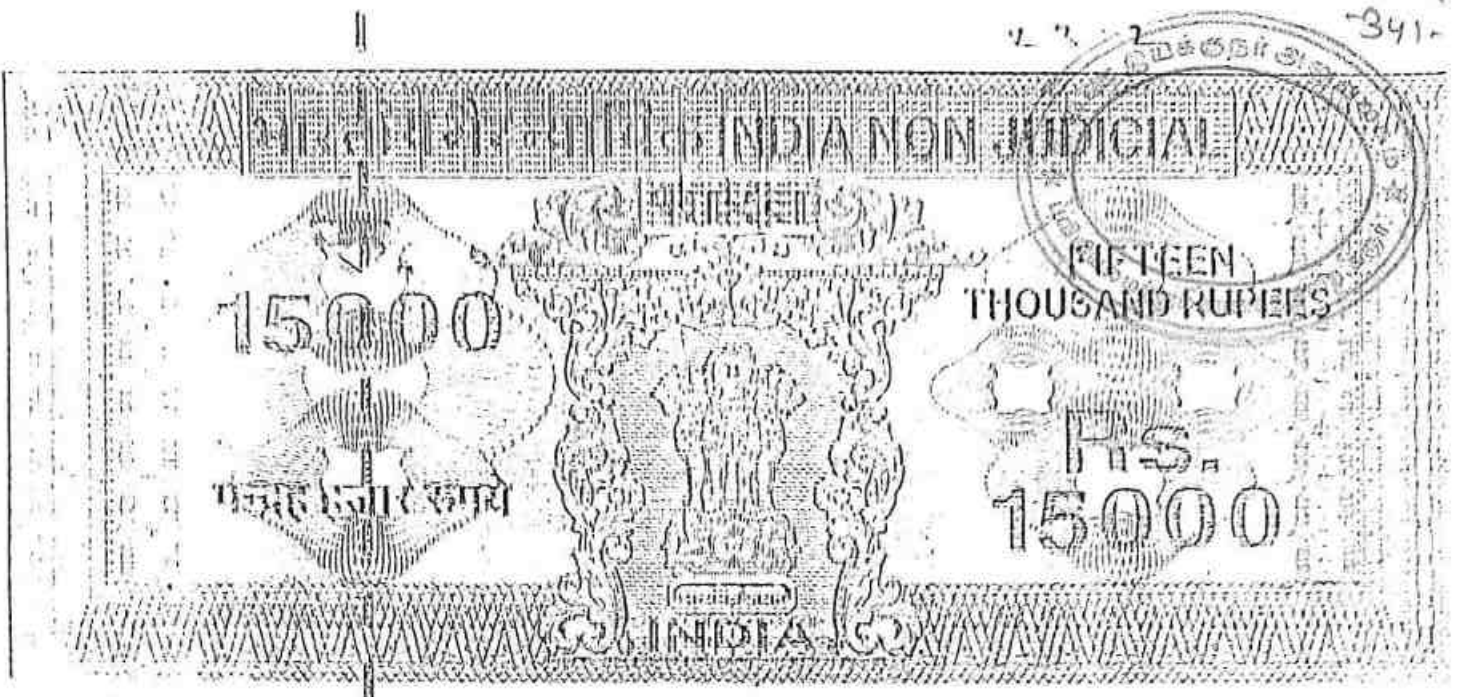
1...புத்தகம்...2023...  
முத்திய...515...  
எனாம்...26...சாங்கலவக்  
காண்த...5...நுதான்

224

பரிவு குலுவலர்



T. M - P. Peethan.



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ.15000 —

A 231302

T. லக்ஷ்மீ நரசிம்மன்  
 இயக்குநர்,  
 01.03.2023.

K. DIHANASEKARAN  
 STAMP VENDOR  
 KARUR. L.No:15/2008



16/

மற்றும் எங்களில் 2 நபருக்கு சென்ற 24.01.2023-ம் தேதியில் ஏற்பட்ட  
 கொண்டாடும் பாகப் பாத்திய விடுதலைப் பத்திரப்படி (பத்திர எண்.1-168/2023  
 2நெ.) இணை சார்பதிவகம், கருர்) எங்களில் 2 நபருக்கு பாத்தியப்பட்டும்  
 மற்றும் எங்களில் 2 நபர் பெயரில் பட்டா (பட்டா எண்.4154) ஏற்பட்டுள்ள  
 சொத்தினையும் ஒன்று சேர்த்து நாங்கள் இருவரும் பொதுவாய் வைத்து  
 ஆண்டனுபவித்து வருகிற சொத்துக்களில் இதனடியில் கண்ட சொத்தினை  
 மட்டும் நாளது தேதியில் தங்களுக்கு நாங்கள் சுத்தக் கிரையமும், சுவாதீனமும்  
 செய்து கொடுத்து பெற்றுக் கொண்டது ரூ.52,88,000/-

எழுதி வாங்குபவர்:-

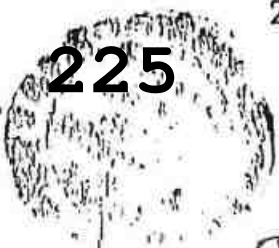
எழுதிக் கொடுப்பவர்கள்:-

T. M. J. Pradeepan

1. S. Thamilselvan

...புத்தகம்... 2023...  
 ...வருடத்திய... 515...  
 ...வணம்... 216...  
 ...கொண்டது... 12...  
 ...தாளர்கள்

2. S. Yashwanth

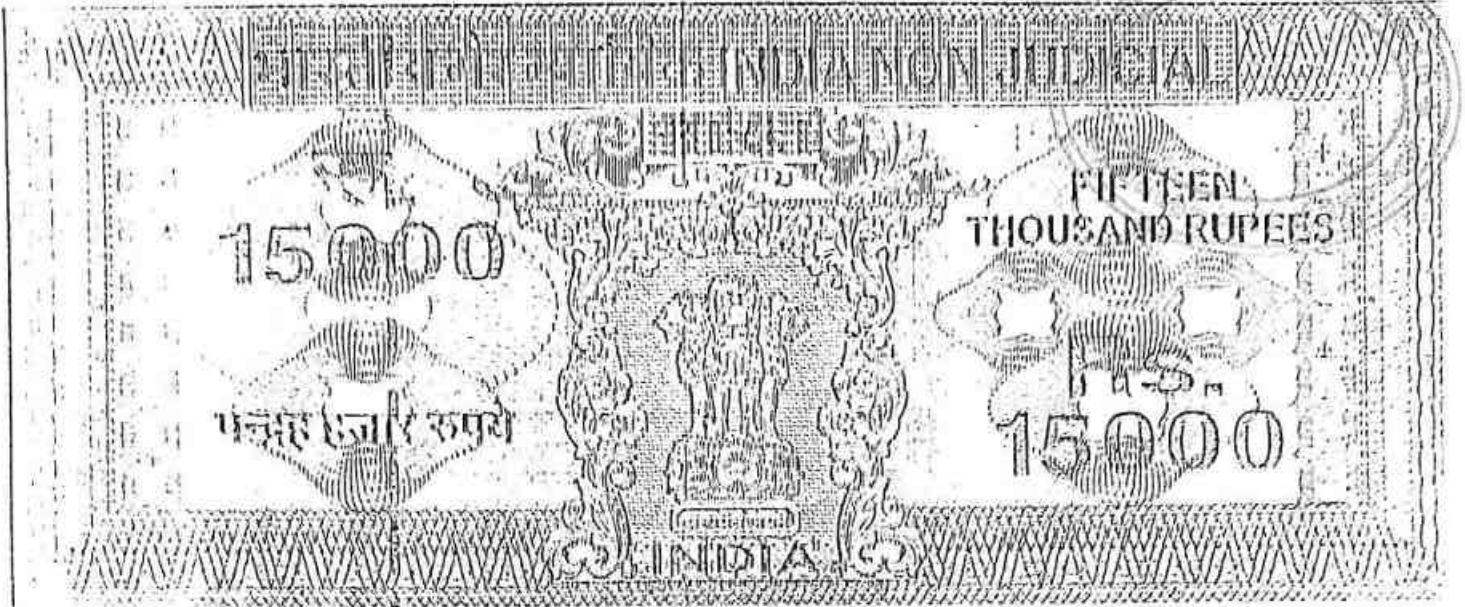


T. M. J. Pradeepan



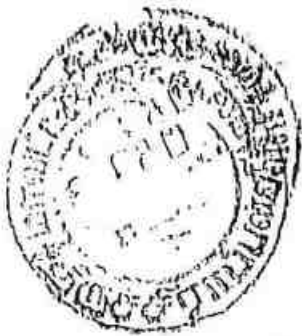
24.2

349



தமிழ்நாடு ரிசர்வ் வங்கி TAMILNADU 15000 -

A 231399



T. லக்ஷ்மீ நிரமலா  
தலைவர்  
01.03.2023

K. DIANASEKARAN  
STAMP VENDOR  
KARUR. L.No: 15/2008

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இந்த ரூபாய் ஐம்பத்தி இரண்டு இலட்சத்தி எண்பத்தி எட்டாயிரமும் எங்களுக்கு செல்லானதற்கு விபரம்:-

1) தங்களால் எங்களில் 1 நபரான தமிழ்ச்செல்வி அவர்கள் பெயருக்கு வழங்கப்பட்ட காசோலையின் வாயிலாக (காசோலை எண்.014349 -SOUTH INDIAN BANK - KARUR BRANCH - நாள்.2.03.2023) பெற்றுக் கொண்ட வகையில் எங்களில் 1 நபருக்கு செல்லானது ரூ.30,08,000/- (ரூபாய் முப்பது இலட்சத்து எட்டாயிரம் மட்டும்)

எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. Mani Pradeepan

1. S. Thaniselvi

புத்தகம் 2022...  
வாங்கிய 515...  
உணர் 26...  
7... து துள்

2. S. Lakshmi

பதிவு அலுவலர்

226

T. Mani Pradeepan



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ.15000 -

A 231400



T. லக்ஷ்மீ பிரபாகர்  
 துணை இயக்குநர்

K. DHANASEKARAN  
 STAMP VENDOR  
 KARUR. L.No:16/2008

01.03.2023

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2) தங்களால் எங்களில் 2 நபரான யசோதா அவர்கள் பெயருக்கு வழங்கப்பட்ட காசோலையின் வாயிலாக (காசோலை எண்.014350 - SOUTH INDIAN BANK- KARUR BRANCH- நாள்.2.03.2023) பெற்றுக் கொண்ட வகையில் எங்களில் 2 நபருக்கு செல்லானது ரூ.22,80,000/- (ரூபாய் இருபத்தி இரண்டு இலட்சத்து எண்பதாயிரம் மட்டும்)

எழுதி வாங்கியவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. Mani Pradeepan

1. S. Thamilselvi
2. S. [Signature]

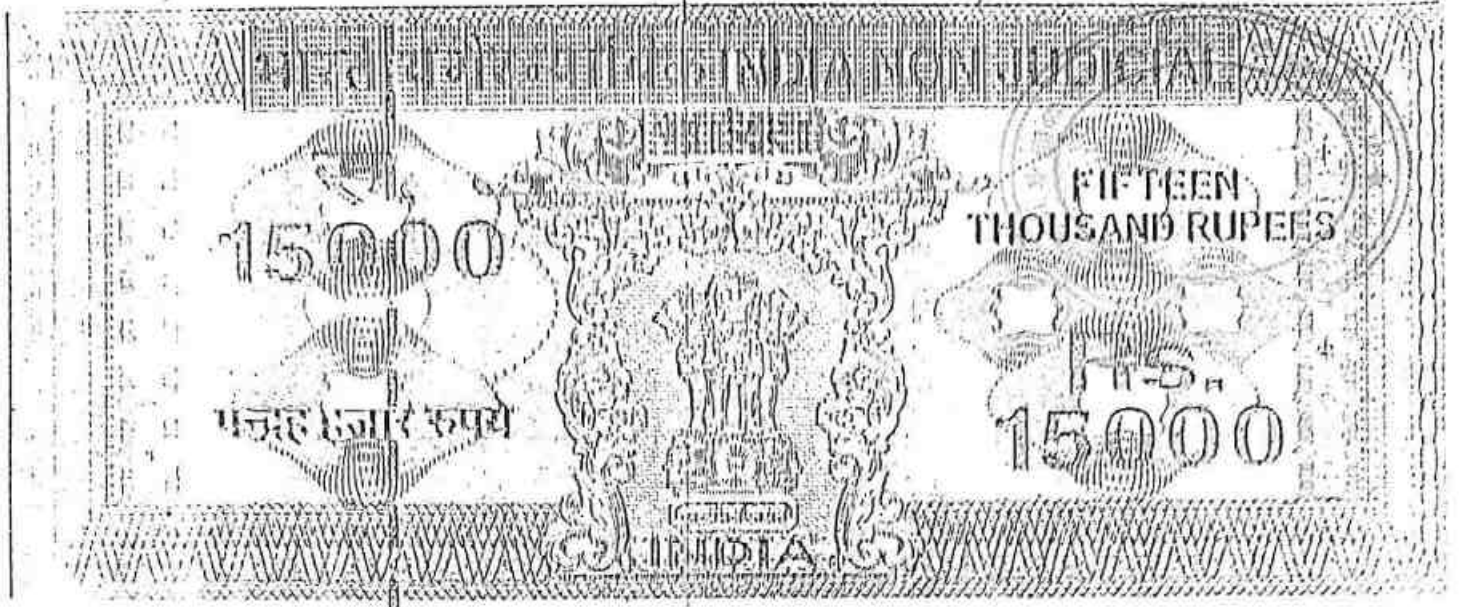
...புத்தகம் 2023...ம்  
 வருடத்திய 515...ம்  
 இவ்வளவு ரூபாய்களைக்  
 கொண்டு 8...வது நாள்

[Signature]  
 பதிவு இலுவலர்

227



T. Mani Pradeepan



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ 15000 —

A 231401



T. லக்ஷ்மீ நிரபாசர்  
சுமக்கல்.

K. DHANASEKARAN  
STAMP VENDOR  
01.03.2023, KARUR. L.No:15/2008

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ஆக மேலேகண்ட விபரப்படி மேற்படி கிரைய தொகை பூராவும் எங்களில் அவர்வர்கள் குடும்ப செலவிற்காகவும், முன்கடன்களை தீர்ப்பதற்காகவும் மற்றும் இதர பிற செலவுகளுக்காகவும் வேண்டி கீழ்க்கண்ட சாட்சிகளின் முன்பு தங்களிடமிருந்து நாங்கள் மேற்படி வீதம் பெற்றுக் கொண்டு விட்டபடியால் இனி நாளது தேதி முதல் இதனடியில் காணும் சொத்தினை தாங்களே புத்திர, பெளத்திர பாரம்பரியமாய் தானாதி வினியோக விற்கிரையங்களுக்கு யோக்கியமாய் சர்வ சுதந்திர பாத்தியங்களுடன் எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. Mani Pradeepa.

1. S. Thamilgeli

2. S. Padal

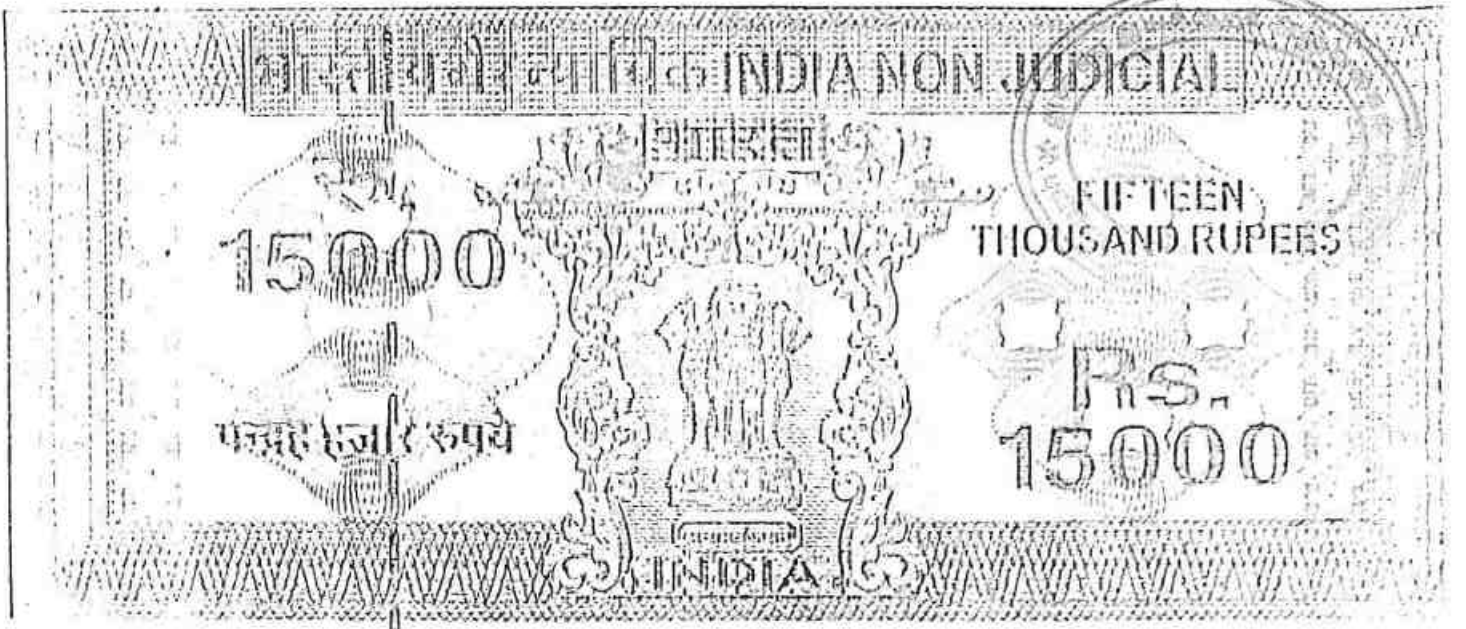
1. பந்தம் 2023ம்  
வருத்திய 515ம்  
உவணம் 211 தாள்கலைக்  
கொண்டது 9 வறு தாள்க

புதிதான அலுவலர்

228

T. Mani Pradeepa.





தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ.15000—

A 231402



T. லக்ஷ்மீ நரசிம்மன்  
தலைவர்,  
01.03.2023.

K. DIHANASEKARAN  
STAMP VENDOR  
KARUR. L.No-15/2003

/10/

ஆண்டனுபவித்துக் கொண்டும், பட்டா முதலியன தங்கள் பெயரில் பெயர் மாற்றம் செய்து கொண்டும், வரி வகையராக்களை தாங்களே செலுத்திக் கொண்டும் நலமுடன் வாழ்ந்து வரவும்.

இதனடியில் காணும் சொத்தின் மீது யாதொரு வில்லங்கம் இல்லை என்று தங்களுக்கு நாங்கள் உறுதி கூறுகிறோம். அப்படி ஏதேனும் நஷ்டமுண்டானால் அவ்விதமான நஷ்டத்தை நாங்கள் எங்களுக்குப் பாத்தியப்பட்ட இதர ஸ்தாவர ஐங்கம சொத்துக்களைக் கொண்டு கட்டுப்படும் நாங்கள் முன்னின்று தீர்த்துக் கொடுப்போமாகவும்.

எழுதி வாங்குபவர்:-

T. Mani Pradeep

.....புத்தியம்.....2023.....  
எழுதி தந்திய .....5.15.....  
ஆவணம்.....தாங்களே  
கொண்டிரு .....ஒது தாள

எழுதிக் கொடுப்பவர்கள்:-

1. S. Thamil Selvi
2. S. Pradeep

229



T. Mani Pradeep





தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ 15000 -

A 231403

T. மனோஜ் பிழாபகர்  
சுமங்கல்,

U. D  
K. DHANASEKARAN  
STAMP VENDOR  
KARUR. L.No-15/2008

01.03.2023



/11/

இதனடியில் காணும் சொத்தினைப் பொறுத்து இனி நாளது தேதி முதல் எங்களுக்கோ, எங்கள் உள்ளிட்ட வாரிசுகளுக்கோ, யாதொரு பாத்தியமும், சம்பந்தமும், பின்தொடர்ச்சியும் கிடையாது.

இதனடியில் காணும் சொத்தினை நாளது தேதியில் நாங்கள் தங்களின் அனுபோக சுவாதீனத்தில் விட்டுவிட்டோம்.

இதன்படி நாளது தேதியில் தங்களுக்கு நாங்கள் எழுதிக் கொடுத்த சுத்தக் கிரைய சாசனமாகும்.

எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. M. Manoj

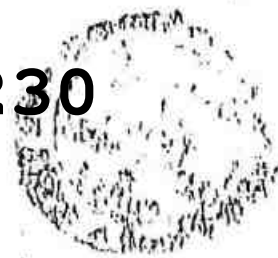
1. S. Thamilselvi

1. நாளது 2023...  
வருடத்திய 5/15...  
26...  
கொண்டது 11...  
பரிசு

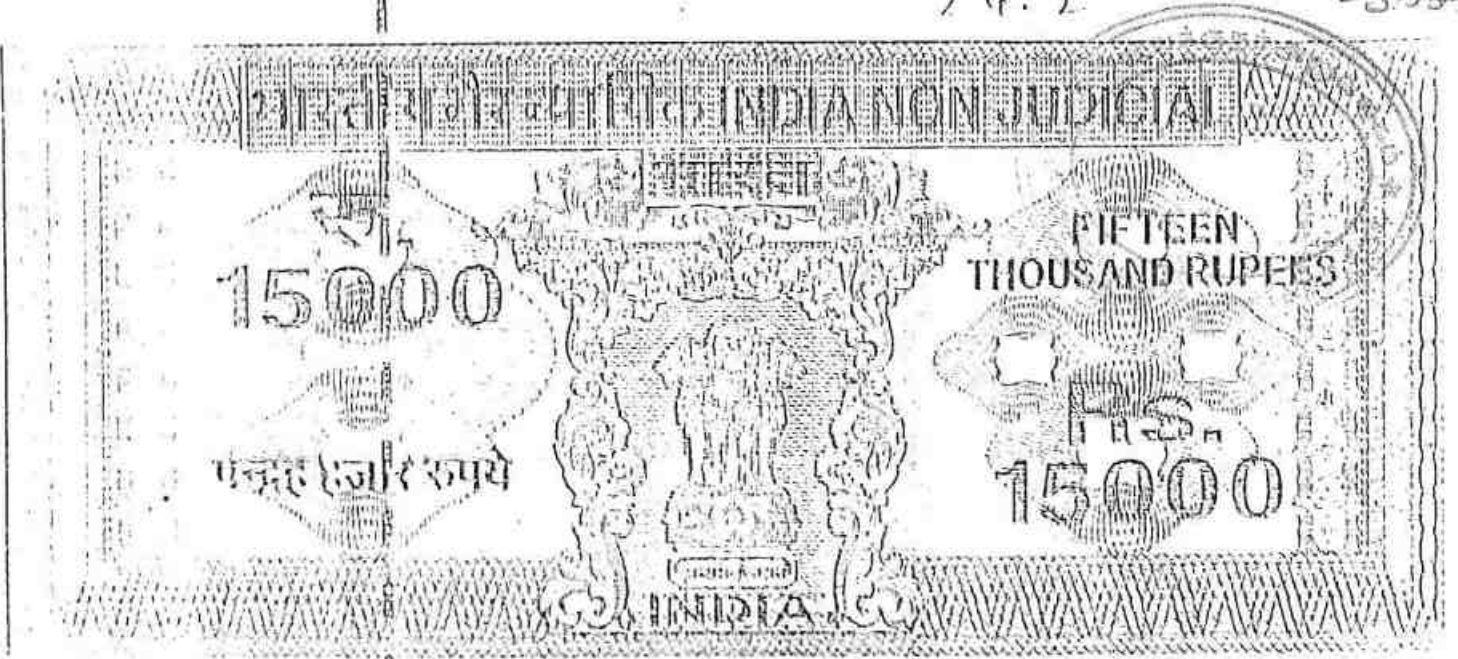
2. S. Yashodha

230

பரிசு



T. M. Manoj



தமிழ்நாடு அபிவிருத்தி தாமதப்படுத்தல் TAMILNADU 15000 -

A 231404

1. கருணாநிதி நகராட்சி  
நகராட்சி  
01.03.2023

K. D  
K. DHANASEKARAN  
STAMP VENDOR  
KARUR. L.No:16/2008



/12/

சொத்து விபரம்

கருநர் பிதிவு மாவட்டம், 2.நெ இணை சார்பதிவகம், புகனூர் வட்டம்,  
குப்பம் கிராமம்,

1-வது தாக்குது

மேற்படி கிராமம், அ.ப.ச.683 நெ.ஹெக.3.64.50 ஏர்ஸ்-க்கு ஏக்.9.01  
செண்ட் இதில் தென்புரம் ஏக்.8.50 செண்ட் இந்தளவுள்ள பூமியும்,  
எழுதி வாங்குபவர்:-  
எழுதிக் கொடுப்பவர்கள்:-

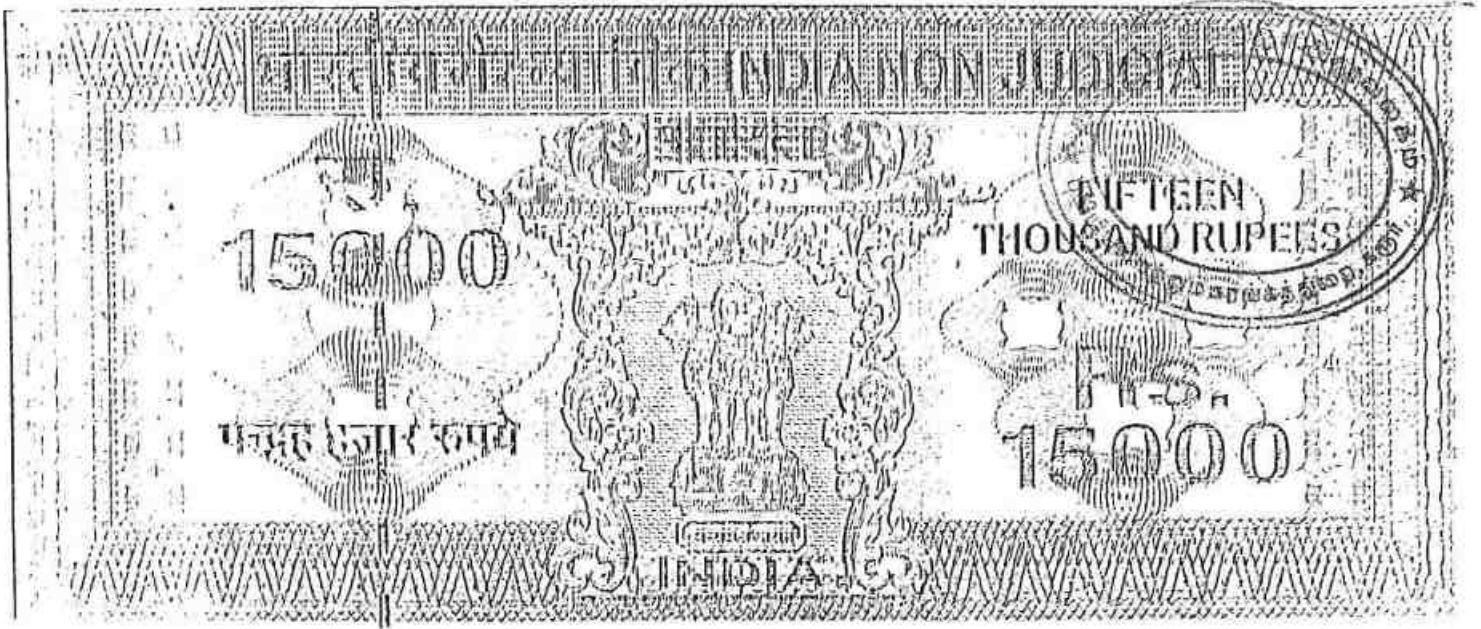
T. Mani Pradeep

1. S. Thamilselvi
2. S. Yashodha

புத்தியம் 2023ம்  
வருத்தியம் 515  
மீட்டர் 26  
கொண்டது 12  
பதிவு  
T. Mani Pradeep

231

T. Mani Pradeep



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ 15000 —

A 231437



T. மனோஜ் பிரபாகர்  
சுயக்கல்!

U. D  
K. DHANASEKARAN  
STAMP VENDOR  
KARUR. L.No:16/2008

01.03.2023

/13/

மேற்படி பூமிக்கு நான்கெல்லை விபரம்:-

சர்வே 674-ம் நெம்பர் பூமிக்கும் மேற்கு, தென்வடல் பாதைக்கும் கிழக்கு, நாளை தேதியில் எங்களில் 2 நபரிடமிருந்து K.திருநாவுக்கரசு அவர்கள் கிரையம் பெறும் ஏக்.0.51 செண்ட் பூமிக்கும் தெற்கு, சர்வே 686-ம் நெம்பர் பூமிக்கும் (கீழேகண்ட 2வது தாக்கு) வடக்கு இதன் மத்தியில் மேற்படி ஏக்.8.50 செண்ட்-க்கு ஹெக்.3.44.13 ஏர்ஸ் இந்தளவுள்ள பூமியும்,

மேற்படி பூமிக்குண்டான மாமூல் வழித்தடம் சகிதம்.

எழுதி வாங்குபவர்:-

எழுதிக் கொடுப்பவர்கள்:-

T. Mani Prakash

1. S. Thamilselvi

2. S. [Signature]

புகளம் 26/23

வருத்திய 5/5

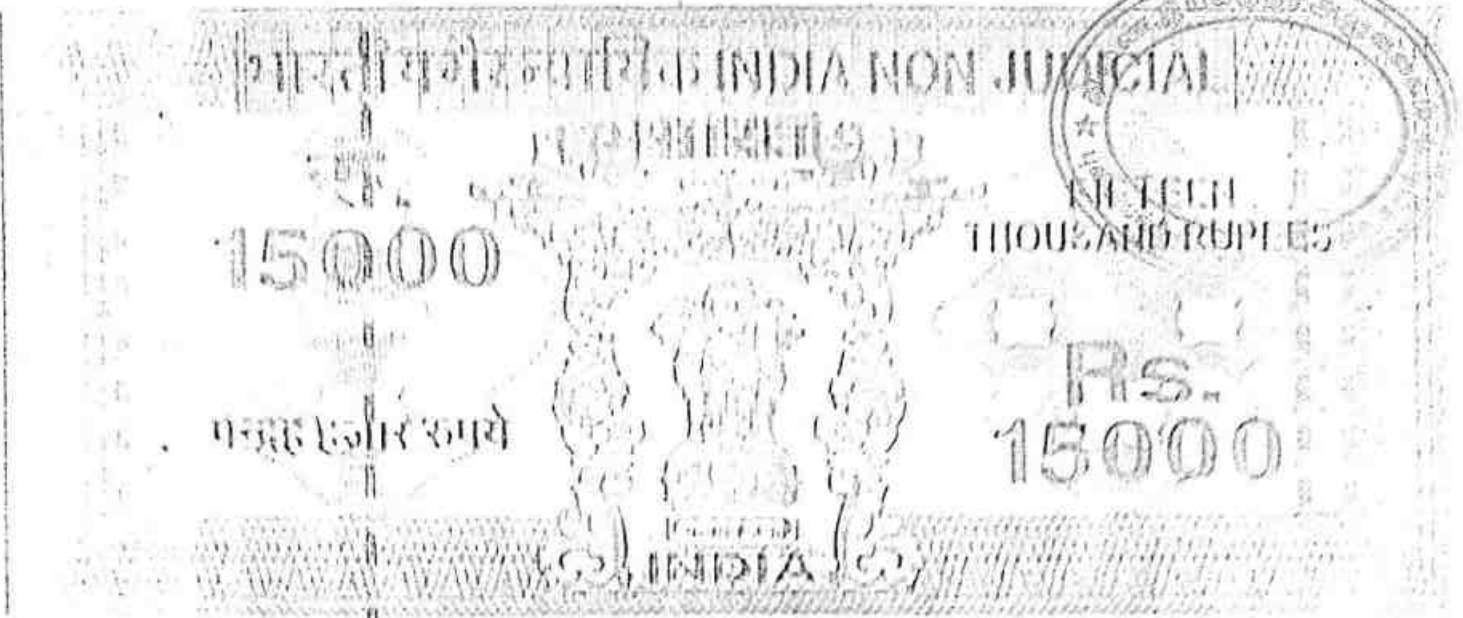
அவணம் 26

வருத்திய 12

புதி அலுவலர்

232

T. Mani Prakash



தமிழ்நாடு சமீப-படி TAMILNADU ரூ.15000

A 231438



T. சேனாபதி நிராயுதன்  
 நாயக்கன்.

K. DHANASEKARAN  
 STAMP VENDOR  
 KARUR. L.No:15/2008

01.02.2023

/14/

2-வது தாக்கு:-

மேற்படி கிராமம், அ.ப.ச.686/1 நெ. ஹெக்.3.54.00 ஏர்ஸ்-க்கு ஏக்.8.74-  
 1/2 செண்ட் இந்தளவுள்ள பூமி பூராவும்.

எழுதி வாங்குபவர்:-

T. M. Pradeep

எழுதிக் கொடுப்பவர்கள்:-

1. S. Thamilselvi
2. S. Yadevalli

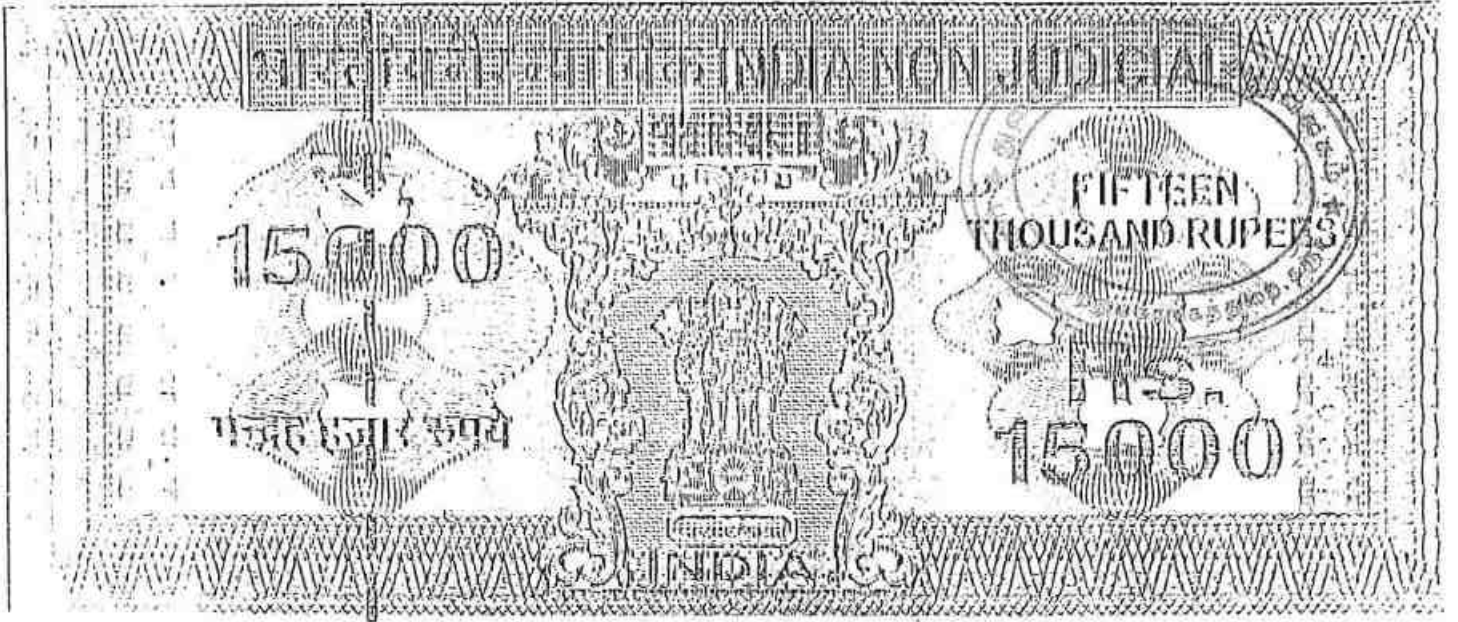
புத்தகம் 2023  
 வருத்திய 1515  
 ஆணை 24 தாக்கவைக்  
 கொண்டு 14 எழுதுவர்  
 பி. சி. ஜெயவரன்

233



T. M. Pradeep





தமிழ்நாடு திருச்சி மாவட்டம் TAMILNADU ரூ 15000 -

A 231439



T. லக்ஷ்மீ பிரபாகர்  
தலைவர்,

K. DHANASEKARAN  
STAMP VENDOR  
KARUR. L.No-15/2008

01.03.2023.

/15/

மேற்படி சர்வே நெம்பரிலுள்ள கிணர் ஒன்றிலும், அதில் வைக்கப்பட்டுள்ள 5 HP மின்சார மோட்டார் (SC.No. 3) மோட்டார் மூலம் கிணற்றிலிருந்து தண்ணீர் இறைத்து, மேற்படி பூமிக்கு பாசனம் செய்து கொள்ளும் பாசன பாத்தியமும், மாமூல் தடம் சகிதமும்.

எழுதி வாங்குபவர்:-

T. Mani Pradeepan

எழுதிக் கொடுப்பவர்கள்:-

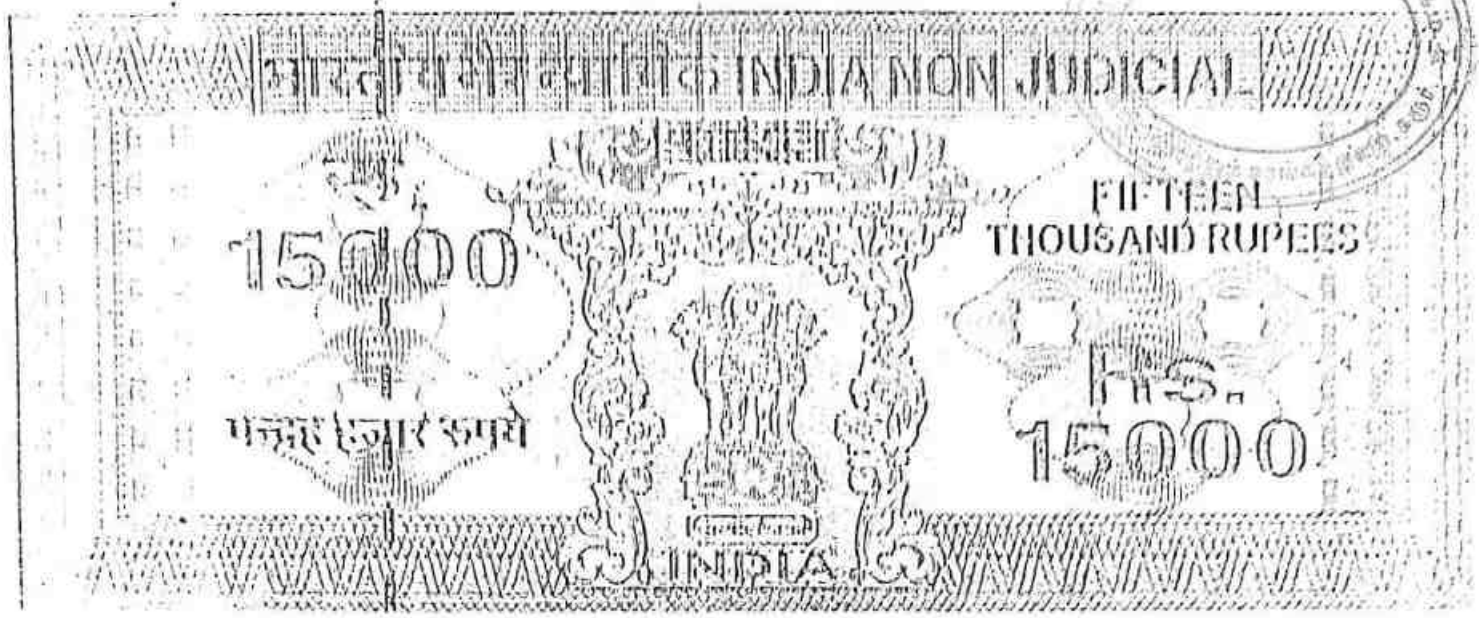
1. S. Thamilselvan
2. S. Lakshmi

1. புக்தகம்... 2023...ம்  
 வருடத்திய... 515...ம்  
 ஆவணம்... 2b... தாள்களம்  
 கொண்டது... 15... வருட துள்

பதிவு  
 234



T. Mani Pradeepan



தமிழ்நாடு சமீனாடு TAMILNADU 15000 -

A 231440



T. மனோஜ் பிரபாகர்  
 துணைத் தலைவர்

K. DHANASEKARAN  
 STAMP VENDOR  
 KARUR. L.No:15/2008

01.03.2023

/16/

மேற்படி மின்மோட்டாருக்கு சாலிபானையம் S.S.1-ல் உள்ள

பிரான்ஸ்பார்மிலிருந்து மேற்படி மின்மோட்டாருக்கு இணைப்பு

கொடுக்கப்பட்டுள்ளது.

எழுதி வாங்குபவர்:-

T. Mani Pradeepan

எழுதிக் கொடுப்பவர்கள்:-

- S. Thamilselvi
- S. Yashika

புத்தகம் 2023...ம்  
 அடக்கம் 515...ம்  
 உடனடி... நாட்களைக்  
 காட்டி... வருவது  
 பதிவு அலுவலர்



235

T. Mani Pradeepan

/17/

மேற்படி இரண்டு தாக்குகளின் கூடுதல் ஏக்.17.24-1/2 சென்ட் ஆகும்.

மேற்படி 1-வது தாக்கு றெக்.3.44.13 ஏர்ஸ்-ன் மதிப்பு	- ரூ.	22,79,861.25
மேற்படி 2-வது தாக்கு றெக்.3.54.00 ஏர்ஸ்-ன் மதிப்பு	- ரூ.	29,31,120.00
சிணம் 1-ன் மதிப்பு	- ரூ.	50,000.00
5 H' ின் மோட்டார் 1-ன் மதிப்பு	- ரூ.	26,100.00
பாலை, பாத்திய மதிப்பு	- ரூ.	918.75
ஆக மொத்த மதிப்பு	- ரூ.	52,88,000.00

எழுதி வாங்குபவர்:-

T. M. Pradeepan.

எழுதிக் கொடுப்பவர்கள்:-

1. S. Thamilselvi
2. S. Yashoda.

சாட்சிகள்:-

1. P. R. Suresh . P.ரவிச்சந்திரன், த/பெ.பழனிசாமி, நெ.4/125, N.பசுபதிபாளையம், நெடுங்கூர், புகளூர் வட்டம், கரூர்.
2. G. L. S. G. இனியவன், த/பெ.குணசேகரன், நெ.51D, புதுத்தெரு, பரமத்தி வேலூர் வட்டம், நாமக்கல்.

ATTESTED BY:-



C. Vasanthi  
C.VASANTHI, BA, LL.B.,  
Advocate, (Enrol. No. MS 1760/2016),  
No.2/59, K.Venkadapuram West Thottam,  
Kodialyur Village, Putthampur Post,  
Aravakurichi Taluk,  
Karur District - 639003

...முத்தம்...  
வருத்திய...  
ஆவணம்...  
கொண்ட...  
பதிவு அலுவலர்

பதிவு அலுவலர்

236

T. M. Pradeepan

R/2 எண் இணை சார்பதிவாளர் கருர்/புத்தகம்-1/515/2023



1898ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சான்று


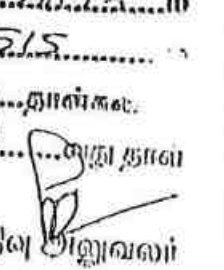
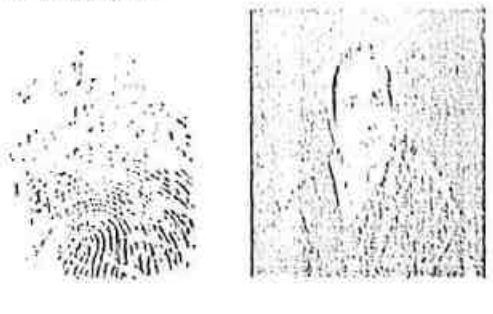

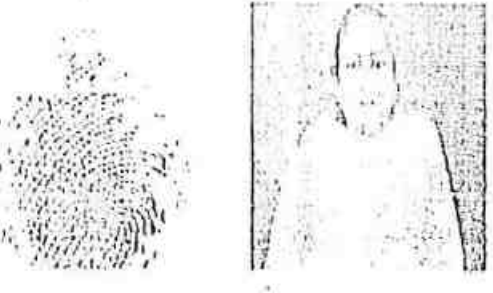

2023 ஆம் ஆண்டு இணை எண் 239

எண் 239 காவேஜ் ரொடு 3-வது கிராஸ், பொத்தனூர், பரமத்தி வேலூர் வட்டம், நாமக்கல், தமிழ்நாடு, இந்தியா, சம்பளம் வசூலும் கிளா மனோஜ் பிரபாகர் என்பவரிடமிருந்து ₹ 1,29,650/- (ரூபாய் ஒரு லட்சத்து மூன்றுபத்தொன்பதாயிரத்து அறுபத்தாறு மட்டும்) இந்த ஆவணத்திற்காக இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் படி குறைவாயிருக்க முக்கியமாக கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றளிக்கிறேன்.

சார்பதிவாளர் : எண் இணை சார்பதிவாளர் கருர்  
 நாள் 02/03/2023

சார்பதிவாளர் மற்றும் இந்திய முத்திரைச் சட்டம் பிரிவு  
 42ன் படி ஆட்சிபர்

2023 ஆம் ஆண்டு மார்ச் மாதம் 02ம் தேதி பி.ப. 04:20 மணியளவில் 2 எண் இணை சார்பதிவாளர் கருர் சார்பதிவாளர் அலுவலகத்தில் நாமக்கல் கொடுத்து கட்டணம் ₹ 2,12,454/- செலுத்தியவர்.


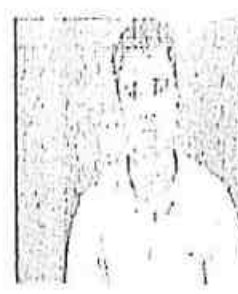

<p>புது சார்பதிவாளர்</p> 	<p>.....புத்தகம்.....2023.....ம்                  வருடத்திய.....215.....                  ஆவணம்.....26.....தாள்.கல்.                  கொண்டு.....18.....புது தாள                  கருதல் விவரங்கள் ஆவண வசூலில்                  உள்ளபடி</p> <p>T.M. Pradeep</p> <p>புது சார்பதிவாளர்</p>	
<p>எழுதின அளவுக்குகளை ஒப்பிட்டு கொண்டவர்                  புது சார்பதிவாளர்</p> 	<p>S. Thamilselvi</p> <p>"சம்மதத்துடன் சௌய ஆதார அங்கீகாரம்" என்று                  வழி இந்த நபரின் அடையாளம் விரல் ரேகை                  மூலம் ஆதார ஆணையத்துடன்                  சரிபார்க்கப்பட்டது. ஒப்பீட்டு எண்                  UKC:224122becdeb2443e04a130d147a11c3e4ec70                  (Details from UIDAI : S Thamilselvi, W/O Sahapathi, 16-07-                  1967, xxxxxxxx4115)</p>	
<p>எழுதின அளவுக்குகளை ஒப்பிட்டு கொண்டவர்                  புது சார்பதிவாளர்</p> 	<p>S. Yasoda</p> <p>"சம்மதத்துடன் சௌய ஆதார அங்கீகாரம்" என்று                  வழி இந்த நபரின் அடையாளம் விரல் ரேகை                  மூலம் ஆதார ஆணையத்துடன்                  சரிபார்க்கப்பட்டது. ஒப்பீட்டு எண்                  UKC:754792dde191b6a99343b7bbd2be5b3e935d12                  (Details from UIDAI : Yasoda Kumaresan W/O</p>	

T.M. Pradeep





1/2 எண் இலாப சார்பதிவாளர் கருர்/புத்தகம்-1/515/2023



	Kumarasu, 28-07-1985, xxxxxxxx0420]	
கருர் கண்ணகரன் ஓயாப் கொண்டவர் 1985-07-28  	<p style="text-align: center;"><i>T. Manoj Prabhakar</i></p> <p>"சம்மதத்தூடன் ஈடுபடி ஆதார அங்கீகாரம்" என்று          வழி இந்த நபரின் அடையாளம் விரல் நேசை          மூலம் ஆதார ஆணையத்தூடன்          சரிபார்க்கப்பட்டது ஒப்பிட்டு எண்          UKC-962150da97ee186574483e81082c40c80c7e15          (Details from UIDAI : T Manoj Prabhakar S/O K          Thirunavukkarsu, 17-09-1990, xxxxxxxx5292)</p>	

1/2 ஆம் ஆணை சார்பதிவாளர் கருர் 28 ஜூன்




  
 கருர் கண்ணகரன்  
 சார்பதிவாளர்  
 2 எண் இலாப சார்பதிவாளர் கருர்

1/2 எண் இலாப சார்பதிவாளர் கருர்/புத்தகம்-1/515/2023 எண்ணைப் பதிவு செய்யப்பட்டது

1985-07-28

2 எண் இலாப சார்பதிவாளர் கருர்

  
 கருர் கண்ணகரன்  
 சார்பதிவாளர்

...1...புத்தகம்...2...2...ம்  
 கருர்/புத்தகம்...515...ம்  
 ஆணை...26...ஜூன்...2023...  
 எண்ணை...19...ஜூன்...  
 பதிவு...  
 இலாபவர்



T. Manoj Prabhakar



சொத்தானது நீர்நிலை பகுதியில் அமைப்பு பெறவில்லை என்பதற்கான சான்று / உறுதிமொழி (Declaration) (நீதிபேரரசவை எண்.22163/2018-ல் ஸ்ரேயஸ்கப்பட்ட தீர்ப்புரையை காண்க)

இந்த ஆவணத்தில் கண்ட சொத்தானது நீர்நிலைகள், நீர்வழிப்பாதைகள், நீர்ப்பிடிப்பு பகுதிகளில் கட்டுப்படவில்லை என சான்றளிக்கிறோம். மேலும் இதனில் தங்களுக்கு தவறான தகவல் அல்லது சான்று அளிக்கப்பட்டதாக பின்னாளில் கண்டுபிடிக்கப்பட்டால் அதனால் நான் / நாங்கள் சட்ட பூர்வ நடவடிக்கைகளுக்கு உட்படுத்தப்படுவோம் என்பதைபயம் அறிவேன் / அறிவோம்.

எழுதி வாங்குபவர்/கள்

T. M. Pradeepan.

எழுதி கொடுப்பவர்/கள்:

S. Thamilselvi

S. Yashodha

1 புத்தகம் 2022 ம்  
வருடத்திய 515 ம்  
ஆவணம் 26 தாள்களைக்  
கொண்டது 20 வரு தாள்கள்

பதிவு அலுவலர்



239

T. M. Pradeepan.



தமிழக அரசு

வருவாய்துறை துறை

நிலை உட்கட்டண வரிமுடிக்கல் : இ. எண் 10(1) 1101

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

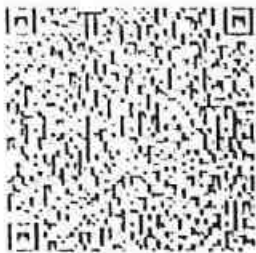
சுயநலவாரியகம் : குறிஞ்சி

வட்டா எண் : 4154

உட்கட்டண வரிமுடிக்கல் வெளியீடு

முடிக்கல் எண்	உட்கட்டண	முடிக்கல்		முடிக்கல்		மத்தியவாரியகம்		குறிப்புகள்
		மட்டம்	தீர்மானம்	மட்டம்	தீர்மானம்	மட்டம்	தீர்மானம்	
		ரூபாய் - பை	ரூ - பை	ரூபாய் - பை	ரூ - பை	ரூபாய் - பை	ரூ - பை	
603	-	3 - 64.50	5.05	-	--	--	--	2022/0103 /14/212146-- -- 13-05-2022
		3 - 64.50	5.05					

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / தகவல்கள் நகல் விவரங்கள் பின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தளங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/04154/400114 என்ற குறிப்பு எண்ணை உள்ளிட்டு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 01-03-2023 அன்று 01:01:15 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. வாகனமேலி கோணலில் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்.

T. M. Pradeep

S. Thamilselvi  
S. Pradeep

1. பத்திரம் 2023  
வருடத்திய 515  
ஆவணம் 26 தாக்கணைக்  
கொண்டது 21. அது தான்

பதிவு பதிவுகளை

240

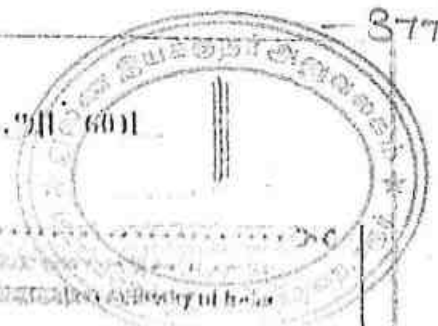


T. M. Pradeep





செய்தி அனுப்புகின்றவரின் அறிவுறுத்தல்



செய்தி அனுப்புகின்றவர் பெயர்: T.M. Prabhakar முகவரி: 2470 7040 4115	செய்தி அனுப்புகின்றவரின் அறிவுறுத்தல் முகவரி: 2470 7040 4115 செய்தி அனுப்புகின்றவரின் அறிவுறுத்தல்
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செய்தி அனுப்புகின்றவர் பெயர்: T.M. Prabhakar முகவரி: 2470 7040 4115 செய்தி அனுப்புகின்றவரின் அறிவுறுத்தல்	செய்தி அனுப்புகின்றவரின் அறிவுறுத்தல் முகவரி: 2470 7040 4115 செய்தி அனுப்புகின்றவரின் அறிவுறுத்தல்
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செய்தி அனுப்புகின்றவர்/கள்

T.M. Prabhakar

செய்தி அனுப்புகின்றவர்/கள்

- S. Tharmilselvi
- S. Subbalakshmi


1. புகார் 2. ம. 3. ம்  
 வருடத்திய 515 ம்  
 சி. அ. அ. 26 துணைகளைக்  
 கொண்ட 26/1/2019  
 பதிவு செய்யப்பட்டது




T.M. Prabhakar



எழுதி கொடுப்பவர்/கள் அடையாள அட்டை


**இந்திய அரசாங்கம்**  
 Government of India  
 உயர்மன்ற உறுப்பினர்  
**Yasodha Kumaresan**  
 தாய் பெயர்  
 Father SABAPATHI  
 பிறந்த நாள், Year of Birth: 1985  
 பாலினம், Sex: Female  



**இந்திய அடையாள அட்டை அமைப்பு**  
 Unique Identification Authority of India  
 முகவரி, Address: W/O: Kumaresan,  
 15 எண் வீடு, ஹரவாஹ நகர், கரையூர்  
 திருச்சிராப்பள்ளி, கரையூர்  
 திருச்சிராப்பள்ளி, தர்மீர் நகர்  
 620003  
 Address: W/O: Kumaresan,  
 HEW NO 5A/1, HARAVAHAN  
 NAGAR, WORAYYUR,  
 Tiruchirappalli, Worur, Tamil  
 Nadu, 620003  
 3596 7893 6429

ஆதார - சாதாரண மனிதனின் அதிகாரம்  1000 300 1947  help@uidai.gov.in  www.uidai.gov.in

**आयकर विभाग**  
**INCOME TAX DEPARTMENT**  
**GOVERNMENT OF INDIA**  
**K YASODHA**  
**SABAPATHI**  
**28/07/1985**  
 Permanent Account Number  
**ABUPY5733H**  
  
 Signature

எழுதி வாங்குபவர்/கள்  
 T. Mani Prabakaran

எழுதி கொடுப்பவர்/கள்  
 1. S. Thamilselvi  
 2. S. Jagan

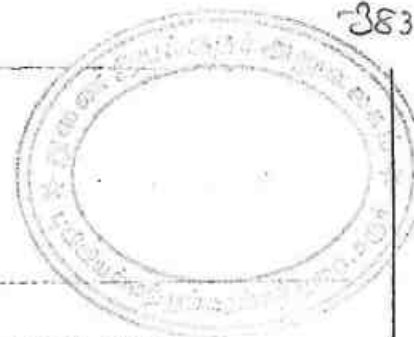
1. பத்தகம் 2023 ம்  
 வருடத்திய 515 ம்  
 வணம் 26 தாள்களைக்  
 கொண்டது 25 வருது தான்  
 பதிவு செய்தவர்



T. Mani Prabakaran







**பதிவுத்துறை**  
**இரசீது - ஆவணப்பதிவு**

முதிர்வு எண்

103472023

ஆவண எண்

: 117 2 எண் இணை சார்பதிவாளர் கருநர் புத்தகம்-11 515 / 2023

மேல்க்கண்டவற்றை அவர்களிடமிருந்து ₹ 3,42,104 (ரூபாய் மூன்று இலட்சத்து நூற்றுத்திண்பது மூன்று நூற்று நான்கு மூன்று) ரூபாய்க்கான வரி மொத்தம் ₹ 200000, REG202303029737376 ₹ 42104, REG202303029737375 ₹ 100000 கட்டப்பட்டுள்ளதை விவரம் கீழ்க்கண்டவாறு உள்ளது.

வகை	விவரம்	அளவை (₹)
	முத்திரைச்சுவை (முத்திரைச் சட்டம் பிரிவு 41ன் படி)	1,29,070
	பதிவுக் கட்டணம்	2,11,524
	கணினிக் கட்டணம்	420
	உட்பிரிவுக் கட்டணம்	400
	சுயநிர்வாகக் கட்டணம்	100
	ஆவண எழுத்து நலநிதி	10
	சொலுதகப்பட்டு மொத்தத் தொகை	3,42,104

குறிப்பு: இரூது அசல் ஆவணம் உடனடியாக பக்க சான்று இடப்பட்டு ஒளி வருடல் செய்யப்பட்டு, திரும்ப வழங்கப்படும். ஆகவே அசல் ஆவணத்தைத் திரும்பப் பெற தகுதி பெற்ற திரு. / திருமதி செல்வி திரு நாடராயன் இது தொடர்பாக குறுஞ்செய்தி பெறப்பட்டு அசல் ரசீதை அளித்து அசல் ஆவணத்தை திரும்ப பெற்றுக்கொள்ளலாம். இதுபோன்ற இடர்பாடுகள் இருப்பின் கட்டணமில்லா தொலைபேசி எண் 1800-102-5174 ஐ தொடர்பு கொள்ளவும்.

இணை சார்பதிவாளர் கருநர் அலுவலகம்  
நாள் 09/03/2023

  
பதிவு அலுவலர் கையொப்பம்

**உருவாக்கப்பட்ட ஆவண வரைவு ஆவணக் கருக்க விவரங்கள்**

வரைவு பெயர்	முழுப் பெயர்	கைப்பேசி எண்	உருவாக்கப்பட்ட நாள்
ஆவண வரைவுகள்	MOTAN	9952882341	01-03-23 03:22:38 PM

இது ஆவணத்தைத் திரும்பப் பெறும்போது உரிய நபரின் விரல் ரேகை பெறப்படுவதற்கான சிறப்புகள் உள்ளன. ஆவணங்கள், சாசனங்கள் சரியான கைப்பேசி எண்ணைப் பதிவுக்கு தூக்கலாகும் ஆவணத்தில் செலிபிரேஷன் ஆவணங்களின் மூலம் குறித்த குறுஞ்செய்தியை பெறலாம். ஆவணத்தை சமீபத்தில் திரும்பப் பெற்றுக்கொள்ளத் தவறும் பட்சத்தில் பாதுகாப்பு கட்டணம் வழங்கப்படும். மேலும் சார்பதிவாளர் ஆவணங்களுக்கு பட்டா மாற்றம் செய்யக் கோரும் படிவம் இன்வெஸ்டிகேஷனில் உள்ளது இணைப்பாக வழங்கப்பட்டுள்ளது. அதன் ஒப்புகைக் கீழை தரவரின் அசல் ஆவணத்தைத் திரும்பப் பெறும்போது கேட்டுப் பெற்றுக்கொள்ளலாம்.

REGISTRATION.ORG.IN என்ற இணைய இடமில்லாத மூலம் வழங்கப்படும் சேவைகள் சமீபத்தில் வரலாறு தரவரின் கையொப்பம் செய்யப்பட்டுள்ளது. சார்பதிவாளர் அலுவலகம் நேரில் வராமல் இணையதளம் மூலம் சான்றிட்டு நகல்கள், வில்லங்க சான்று விவரங்கள்

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**பதிவுத்துறை**  
**இரசீது - ஆவணப்பதிவு**

இரசீது எண் : 1034/2023  
 ஆவண எண் : 117 2 எண் இணை சார்பதிவாளர் கருர்/புத்தகம்-17 515 / 2023  
 இது, மாவட்டத்தினரின் அங்கீகரிக்கப்பட்டிருந்து ரூ.42,104 (ரூபாய் மூன்று இலட்சத்து நூற்றத்திரண்டாயிரத்து நான்கு மட்டும்) மதிப்பில் உள்ள பதிவு செய்யப்பட்டிருக்கிறது. ரெசு.202303029737578 & 42104, ரெசு.202303029737578 & 1088889 கீழ்க்கண்ட விவரம் படி  
 மதிப்பு : ரூ.42,104

விவரம்	மதிப்பு
பதிவுசெய்தல் (முத்திரைச் சட்டம் பிரிவு 41ன் படி)	121000
பதிவுக் கட்டணம்	20524
கண்காணிப்புக் கட்டணம்	420
உட்பிரிவுக் கட்டணம்	400
சுற்றுச்சூழல் கட்டணம்	100
ஆவண அட்டைத் தரவரி	10
மொத்தமட்ட தொகை	1,42,104

மேற்படி இந்த அசல் ஆவணம் உடனடியாக பக்க சான்று இடப்பட்டு ஒளி வரடல் செய்யப்படும். திரும்ப வழங்கப்படும். ஆகவே அசல் ஆவணத்தைத் திரும்பப் பெற தகுதி பெறாத திரு. / திருமதி / செல்வி திரு நாடராயன் இது தொடர்பாக குறுஞ்செய்தி பெறப்படும் அசல் ரசீதை அளித்து அசல் ஆவணத்தை திரும்ப பெற்றுக்கொள்ளலாம். இதுபோன்ற ஏதேனும் இடர்பாடுகள் இருப்பின் கட்டணமில்லா தொலைபேசி எண் 1800-102-5174 ல் தொடர்பு கொள்ளவும்.

இணை சார்பதிவாளர் கருர் அலுவலகம்  
 பதிவு அலுவலர் கையொப்பம்

**உருவாக்கப்பட்ட ஆவண வரைய ஆவணக் கருக்க விவரங்கள்**

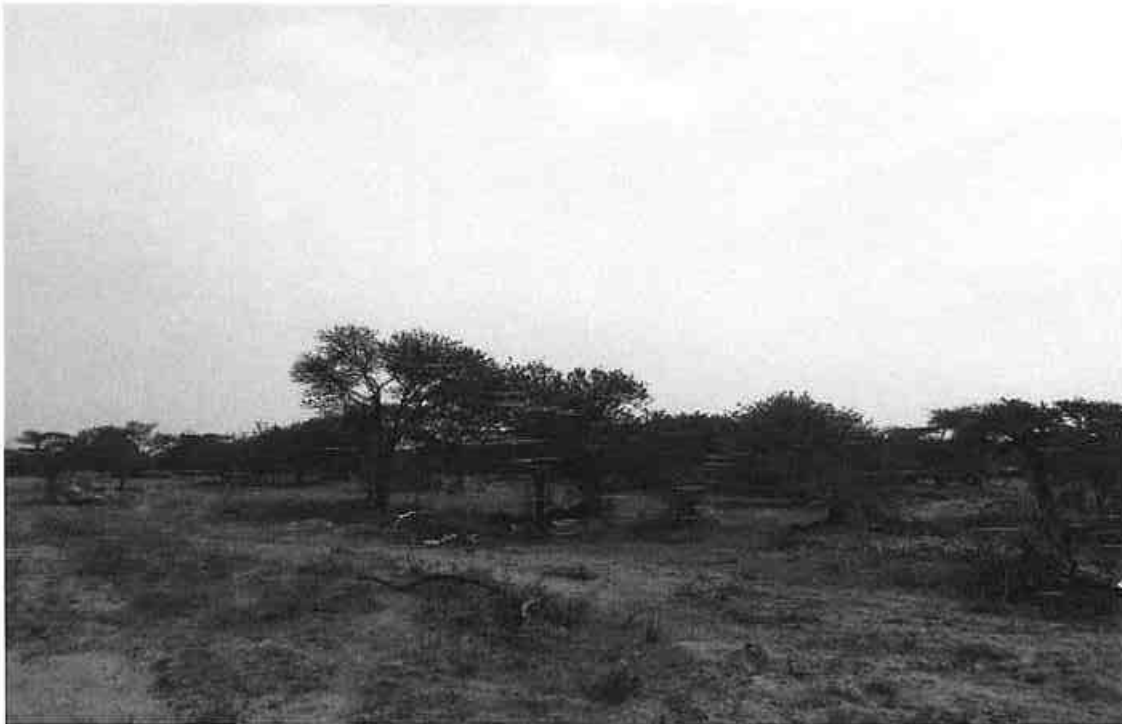
பதிவு செய்யப்பட்ட ஆவணம்	முழுப் பெயர்	கைப்பேசி எண்	உருவாக்கப்பட்ட நாள்
கட்டணம்	MOTIAN	9952882341	01-03-23 03:22 38 PM

இது ஆவணத்தைத் திரும்பப் பெறும்போது உரிய நபரின் விரல் சேகை பெறப்படுகிறது என உறுதிப்படுத்தப்படும்.  
 மேலும், அங்கீகரிக்கப்பட்ட சரியான கைப்பேசி எண்ணைப் பதிவுக்கு தாக்கலாகும் ஆவணத்தில் பெரிவிக்கப்படும் ஆவணம் அல்லாததில் நினைவு குறித்து குறுஞ்செய்தியை பெறலாம்.  
 மேலும், அங்கீகரிக்கப்பட்ட சரியான கைப்பேசி எண்ணைப் பெற்றுக்கொள்ளத் தவறும் பட்சத்தில் பதிவுகார்ப்பு கட்டணம் வழங்கப்படும். மேலும், மாவட்டம் மற்றும் தேசிய ஆவணங்களுக்கு பட்டா மற்றும் மாவட்ட சோதனை மாவட்டம் இன்வென்டரி அட்டையில் தரவரி மாவட்டம் வழங்கப்படும் வரையறுக்கப்பட்டிருக்கிறது அனுப்பப்பட்டுள்ளது அதன் ஒப்புகள் சி.என். நகரின் அசல் ஆவணத்தைத் திரும்பப் பெறும்போது கேட்டுப்பெறக்கூடாது.  
 மாவட்டம் மற்றும் மாவட்டம் இணை சார்பதிவாளர் மூலம் வழங்கப்படும் சேவைகள்  
 மாவட்டம் மற்றும் மாவட்டம் விவரம் தரவரிக்கள் செய்யும் வரதி  
 மாவட்டம் மற்றும் மாவட்டம் இணை சார்பதிவாளர் மூலம் சமீபத்தில் மாவட்டம், மில்லம் சமீபத்தில் மாவட்டம்

T. Manj Pradeep

PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of Rough stone and gravel quarry lease in S.F.Nos: 683/2(Part) & 686/1(Part)- Patta land – over an extent of 4.11.50 hectares – Kuppam Village – Pugalur Taluk - Karur District - Tamil Nadu State belongs to **Mr.T.Manoj Prabakar.**,



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T. Manoj Prabakar



भारत सरकार  
GOVERNMENT OF INDIA



தி மனோஜ் பிரபாகர்  
T Manoj Prabakar  
பிறந்த நாள் / DOB : 17/09/1990  
ஆண் / MALE

7485 9965 5292



ஆதாரம் - சாதாரண மனிதனின் அதிகாரம்



भारतीय विशिष्ट पहचान प्राधिकरण  
GOVERNMENT OF INDIA

முகவரி:  
S/O க திருநாவுக்கரசு, 450A  
3வது திசைக் காவேறி சாலை,  
பரமத்தி-வேலூர், வேலூர்,  
நாமக்கல், தமிழ்நாடு, 638182

Address:  
S/O K Thirunavukkarasu, 450A  
3RD cross college road,  
Paramathi-Velur, Velur  
(Namakkal), Namakkal, Tamil  
Nadu, 638182



1947  
1800 300 1947

help@uttal.gov.in

www.uttal.gov.in

P.G. Has No. 1947,  
Bangalore-560 901

249

T.M. Prabakar



*Signature*

अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रमाण पत्र  
(खनिज रियायत नियमावली, 1960 के नियम 22सी के तहत)  
**CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON**  
(Under Rule 22C of Mineral Concession Rules, 1960)

श्री एस. करुपण्ण, मॉगनीकाडू, मुत्तमंपट्टी पोस्ट, बोम्मीडी वयॉ, ओमलूर तालुक, सेलम डीस्टीक्ट, तमिलनाडू - 635 301, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोष जनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है ।

Shri S. Karuppannan, Manganikadu, Muthampatty (Post), Bommidi (Via), Omalur Taluk, Salem District, Tamilnadu - 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है  
His registration number is

RQP / MAS / 263 / 2014 / A

यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 15.12.2024 को समाप्त होगी।  
This recognition is valid for a period of 10 years ending on 15.12.2024.

उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की स्थिति में यह प्रमाण पत्र वापस लिया जाएगा / निरस्त किया जाएगा।

This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai  
दिनांक/ Date : 16.12.2014.

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क्षेत्रीय खाननियंत्रक / Regional Controller of Mines  
भारतीय खानब्यूरो/ Indian Bureau of Mines  
चेन्नई क्षेत्र / Chennai Region

*T. Mani Pradeep*

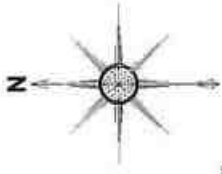


PLATE NO-I

APPLICANT:

**Mr. T.MANOJ PRABAKAR,**  
S/o. THIRUNAVUKKARASU,  
DOOR.No.450-A, COLLEGE ROAD,  
3<sup>rd</sup> CROSS, PARAMATHIVELUR  
NAMAKKAL DISTRICT- 638182

LEASE APPLIED AREA:

S.F.NO : 683/2 (Part) & 686/1 (Part)  
EXTENT : 4.11.5Hect  
VILLAGE : KUPPAM  
TALUK : PUGALUR  
DISTRICT : KARUR

INDEX

MINE LEASE AREA

APPROACH ROAD

CART ROAD

VILLAGE ROAD

NH - 81 ROAD

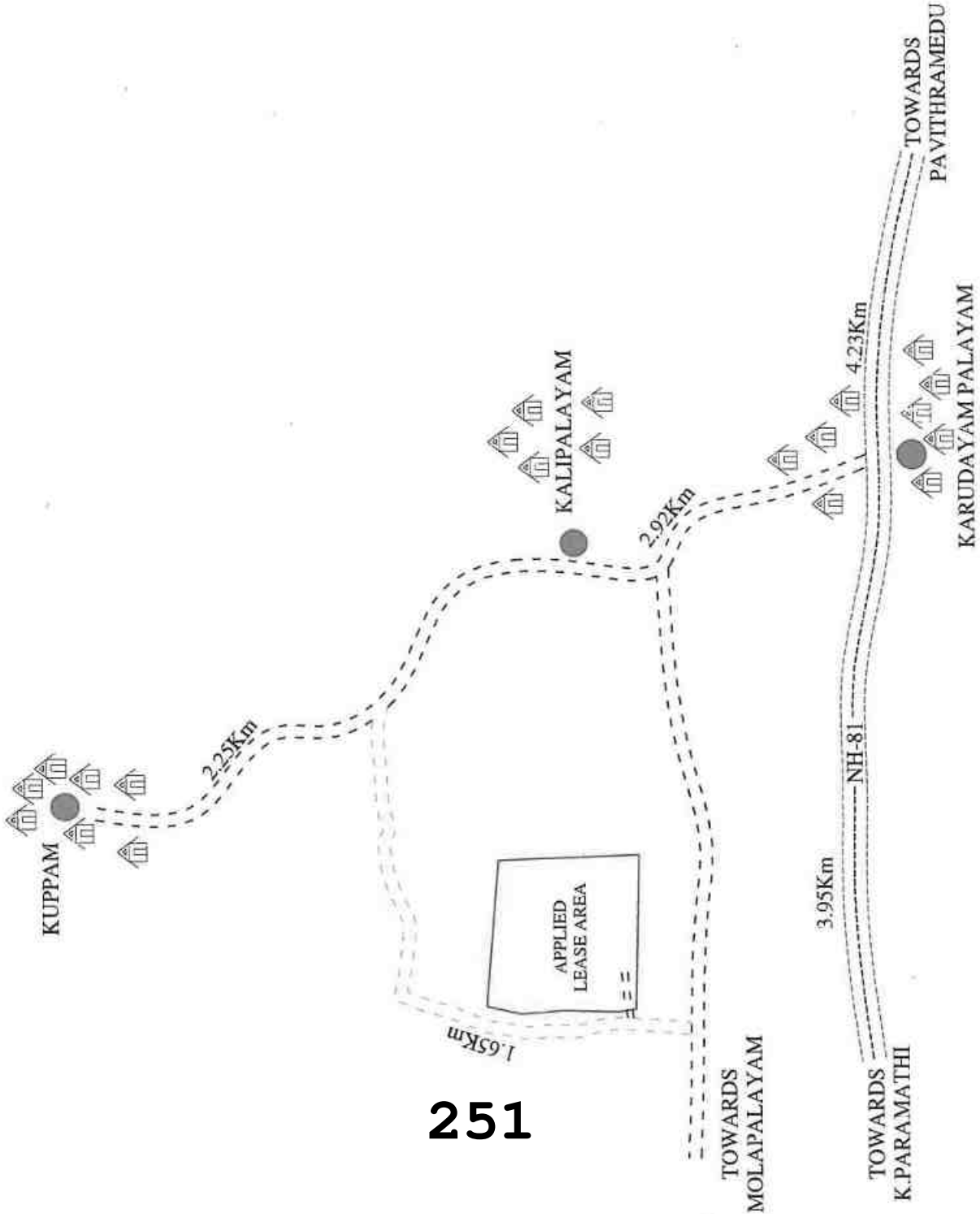
KEY MAP

Not to Scale

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr. S. KARUPPANNAN, M.Sc., Ph.D.  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/263/2014/A



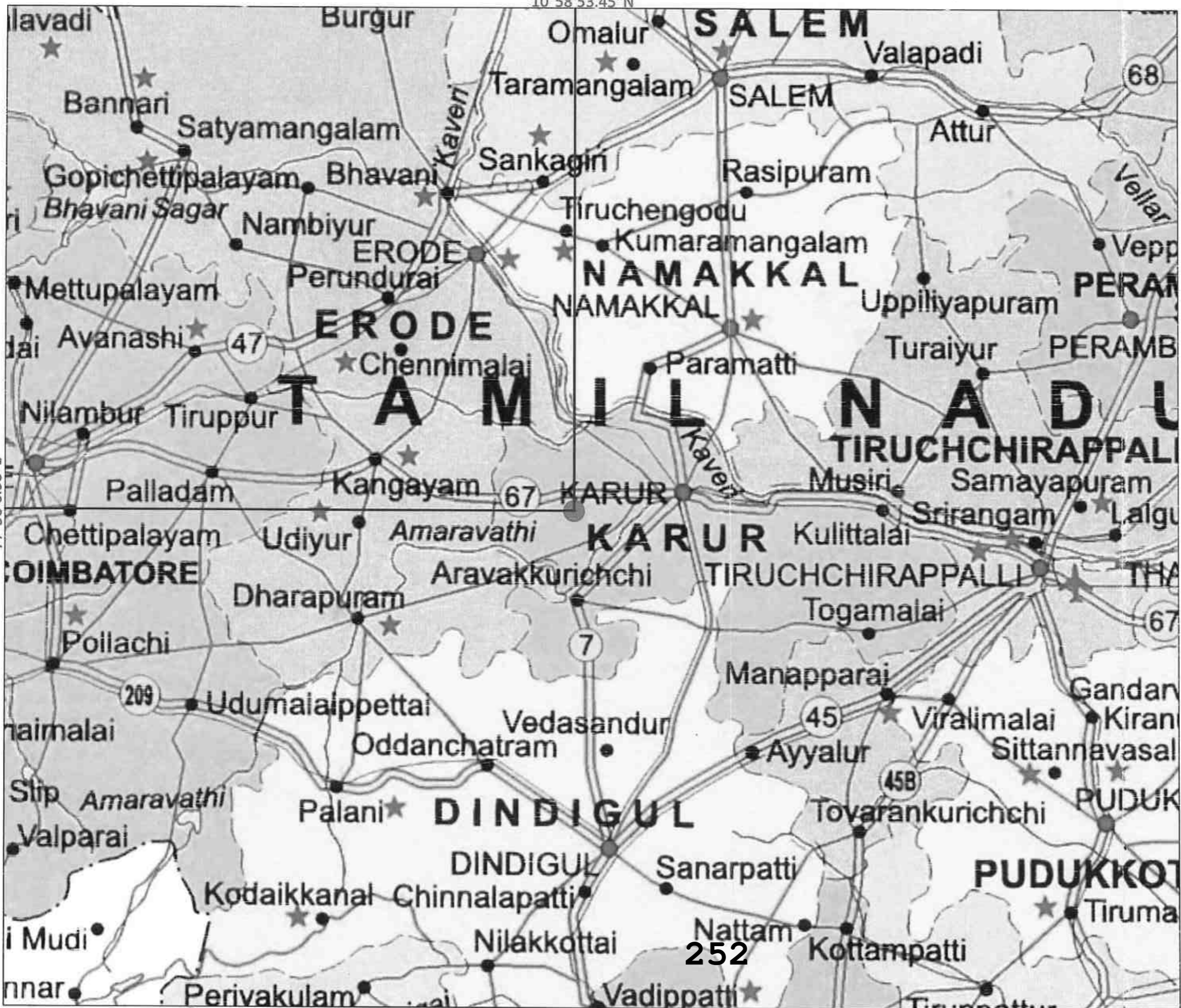
251

T. Manoj Prabakar



10°58'53.45"N

-395-



77°56'6.93"E

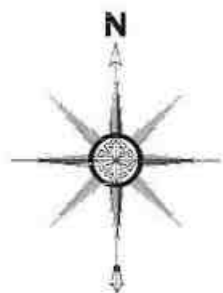


PLATE NO-IA

**APPLICANT:**  
 Mr.T.MANOJ PRABAKAR,  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

INDEX

MINE LEASE AREA : ●  
 TOPO SHEET NO : 58-F/13  
 LATITUDE : 10°58'46.65"N to 10°58'53.45"N  
 LONGITUDE : 77°56'6.93"E to 77°56'14.02"E

LOCATION PLAN  
NOT TO SCALE

Prepared By:  
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 TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

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T.M. Prabakar







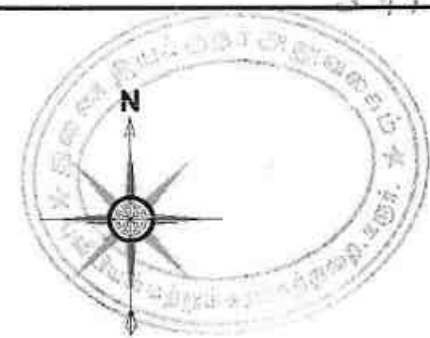
10°58'53.45"N



77°56'6.93"E

T. Mani Prabhakar

254



**PLATE NO-IC**

**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING QUARRY PIT	

TOPO SHEET NO : 58-F/13

LATITUDE : 10°58'46.65"N to 10°58'53.45"N

LONGITUDE : 77°56'6.93"E to 77°56'14.02"E

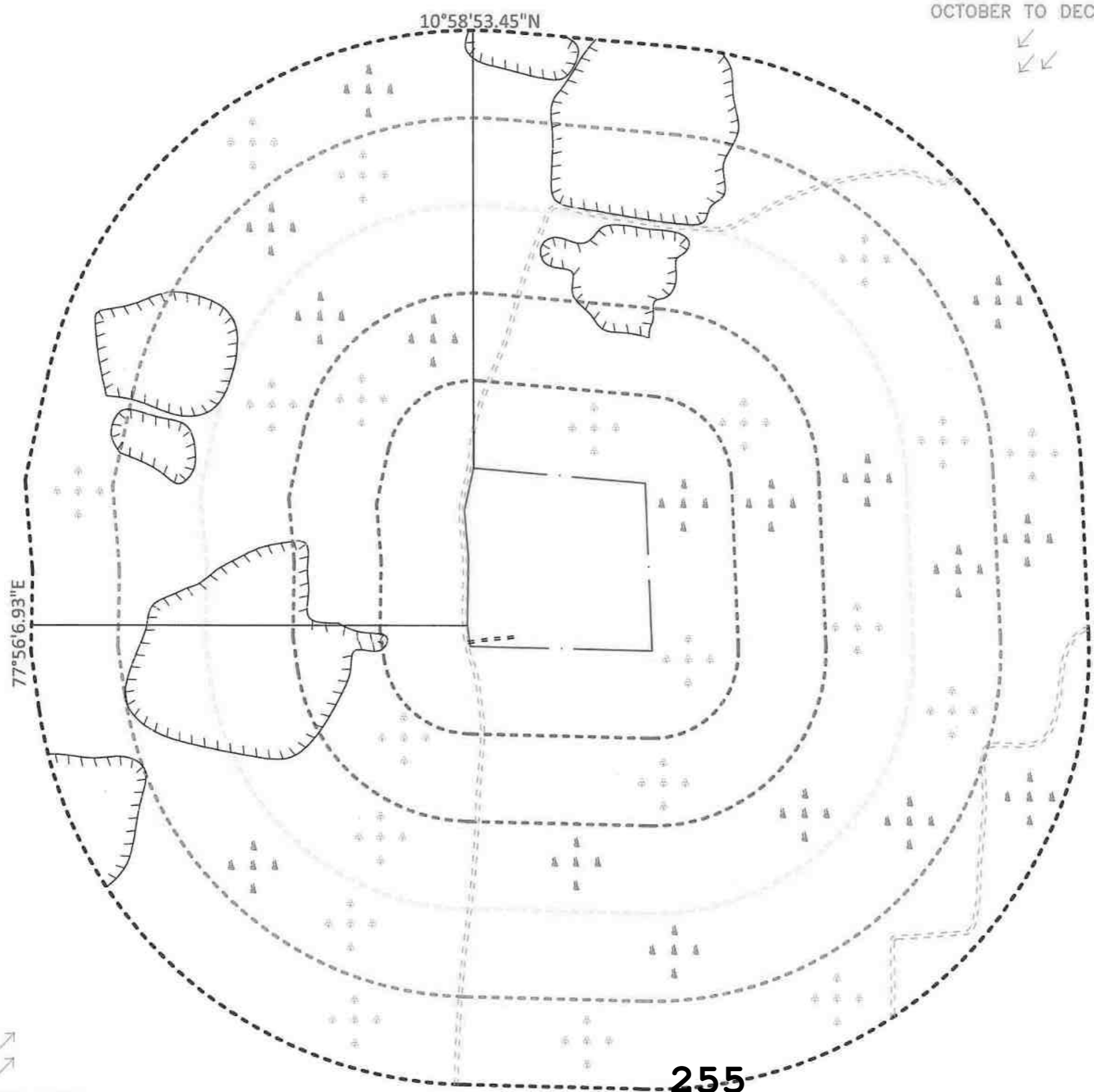
**SATELITE IMAGERY MAP**

SCALE- 1:5000

Prepared By:

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 HAS BEEN CHECKED BY ME AND IS CORRECT  
 TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A



OCTOBER TO DECEMBER

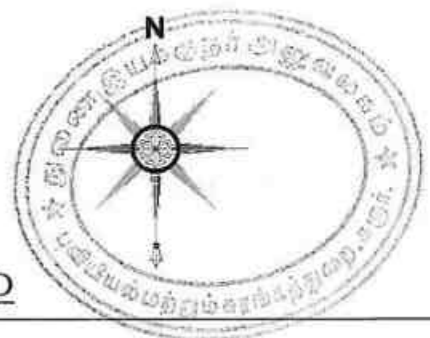


PLATE NO-ID

APPLICANT:  
**Mr.T.MANOJ PRABAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

LEASE APPLIED AREA:  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
WIND DIRECTION	
SHRUBS & TREES	
EXISTING QUARRY PIT	

TOPO SHEET NO : 58 F/13  
 LATITUDE : 10°58'46.65"N to 10°58'53.45"N  
 LONGITUDE : 77°56'6.93"E to 77°56'14.02"E

**ENVIRONMENTAL PLAN**  
 SCALE- 1:5000

Prepared By:  
 I DO HEREBY CERTIFY THAT THE PLATE  
 HAS BEEN CHECKED BY ME AND IS CORRECT  
 TO THE BEST OF MY KNOWLEDGE  
  
 Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

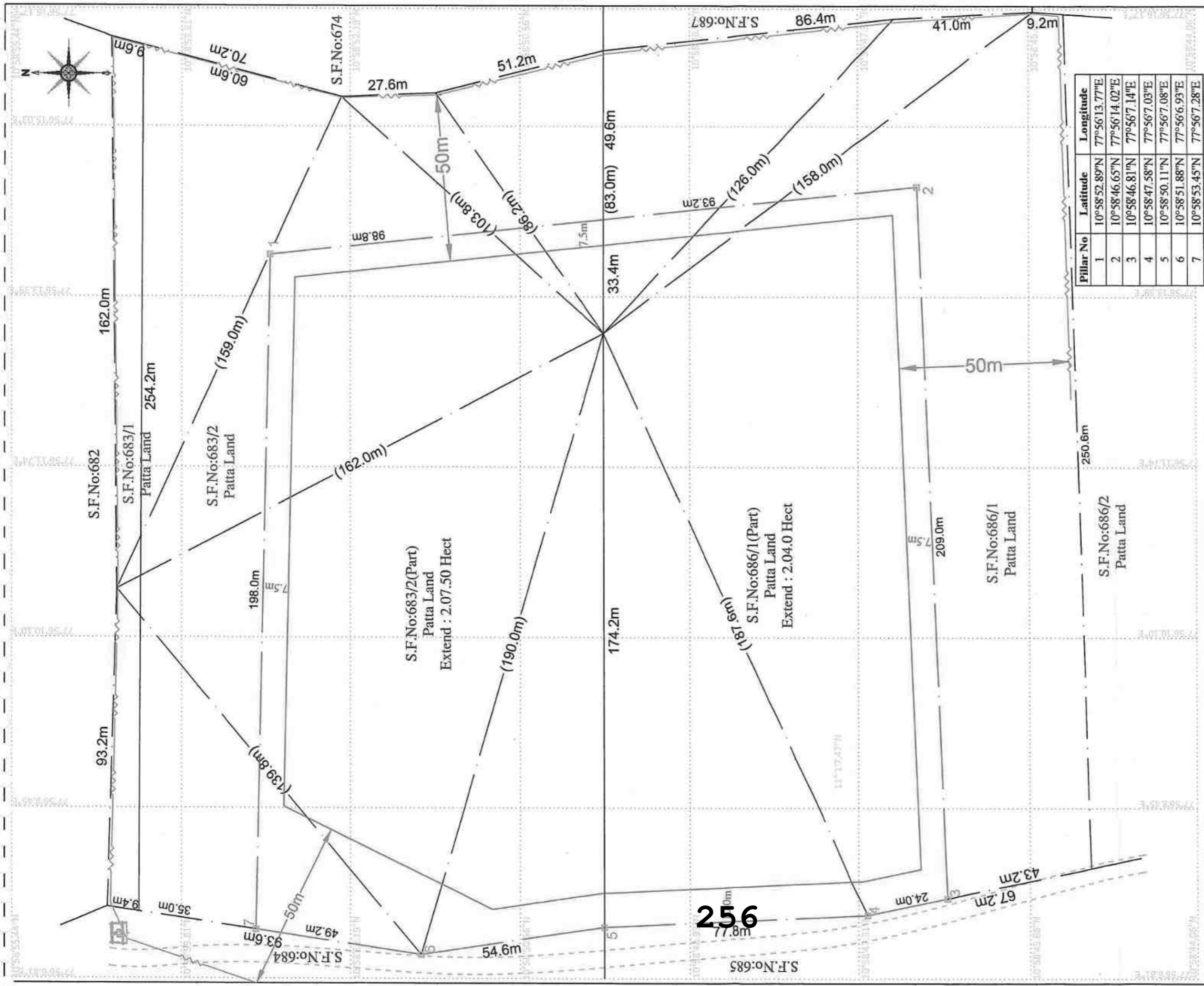
**255**

JULY TO SEPTEMBER



*T.M. Prabakar*





T.M. Prabhakar

Pillar No	Latitude	Longitude
1	10°58'52.89"N	77°56'13.77"E
2	10°58'46.65"N	77°56'14.02"E
3	10°58'46.81"N	77°56'14"E
4	10°58'47.58"N	77°56'14.03"E
5	10°58'50.11"N	77°56'14.08"E
6	10°58'51.88"N	77°56'14.93"E
7	10°58'53.45"N	77°56'14.28"E

**PLATE NO-II**

**APPLICANT:**  
**Mr. T. MANOJ PRABAKAR,**  
 S/o. THIRUNA VUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**MINE LEASE PLAN**  
 SCALE 1: 1000

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) &  
 686/1 (Part)  
 EXTENT : 4.11.5 Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH & CART ROAD
- PILLAR STONES
- EB LINES & TRANSFORMER

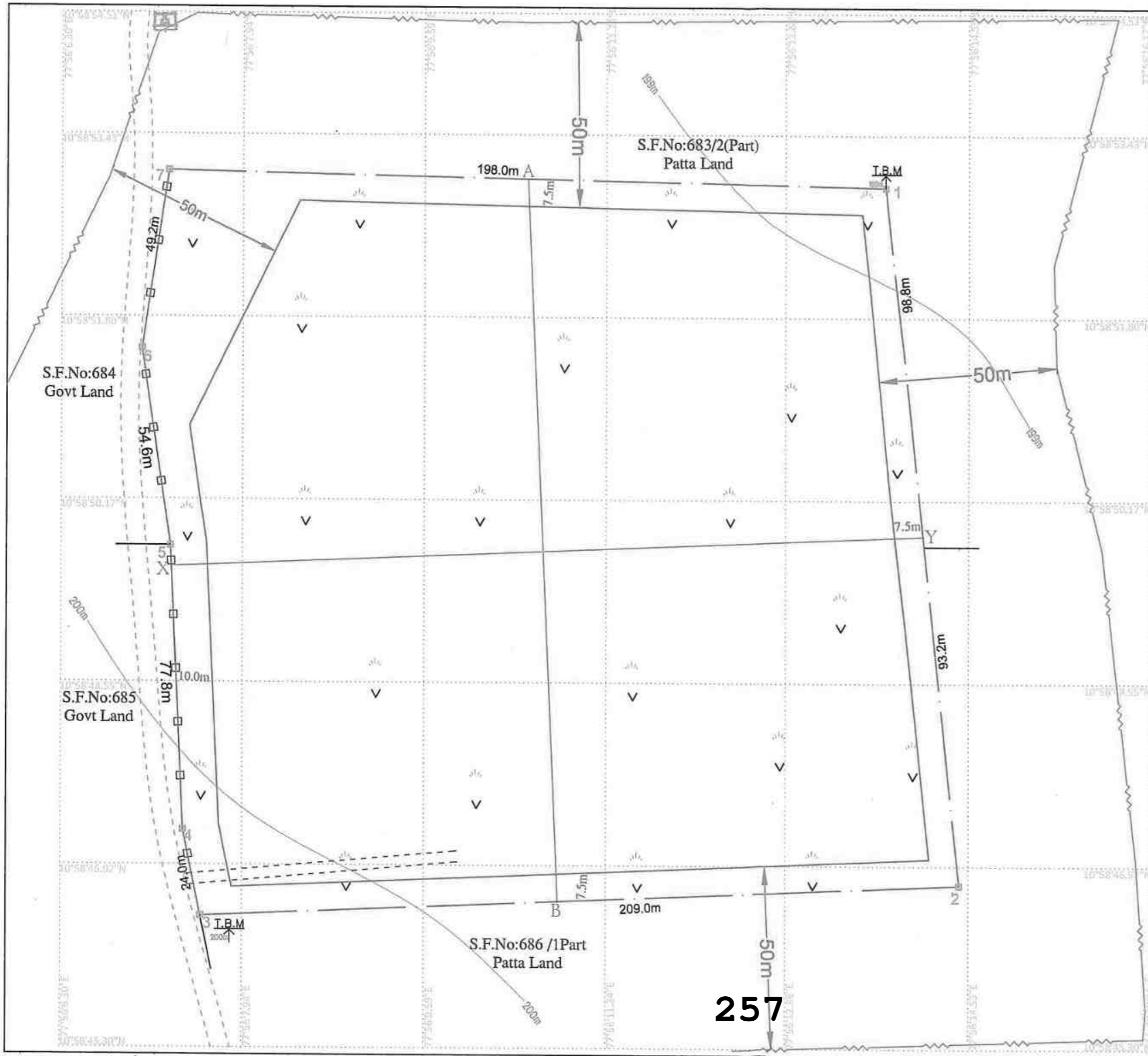
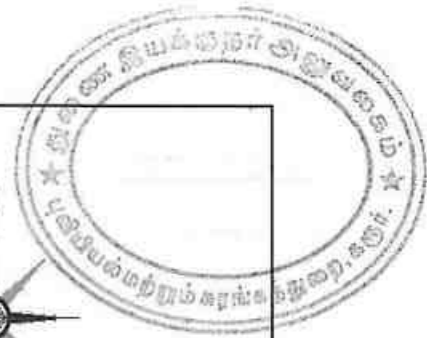
Prepared By:

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*(Signature)*

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RFP/MAS/263/2014/A





**PLATE NO-III**

**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

MINE LEASE AREA	
SAFETY DISTANCE	
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CART ROAD	
EB LINES & TRANSFORMER	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
GRAVEL	
FENCING	

**SURFACE & GEOLOGICAL PLAN**

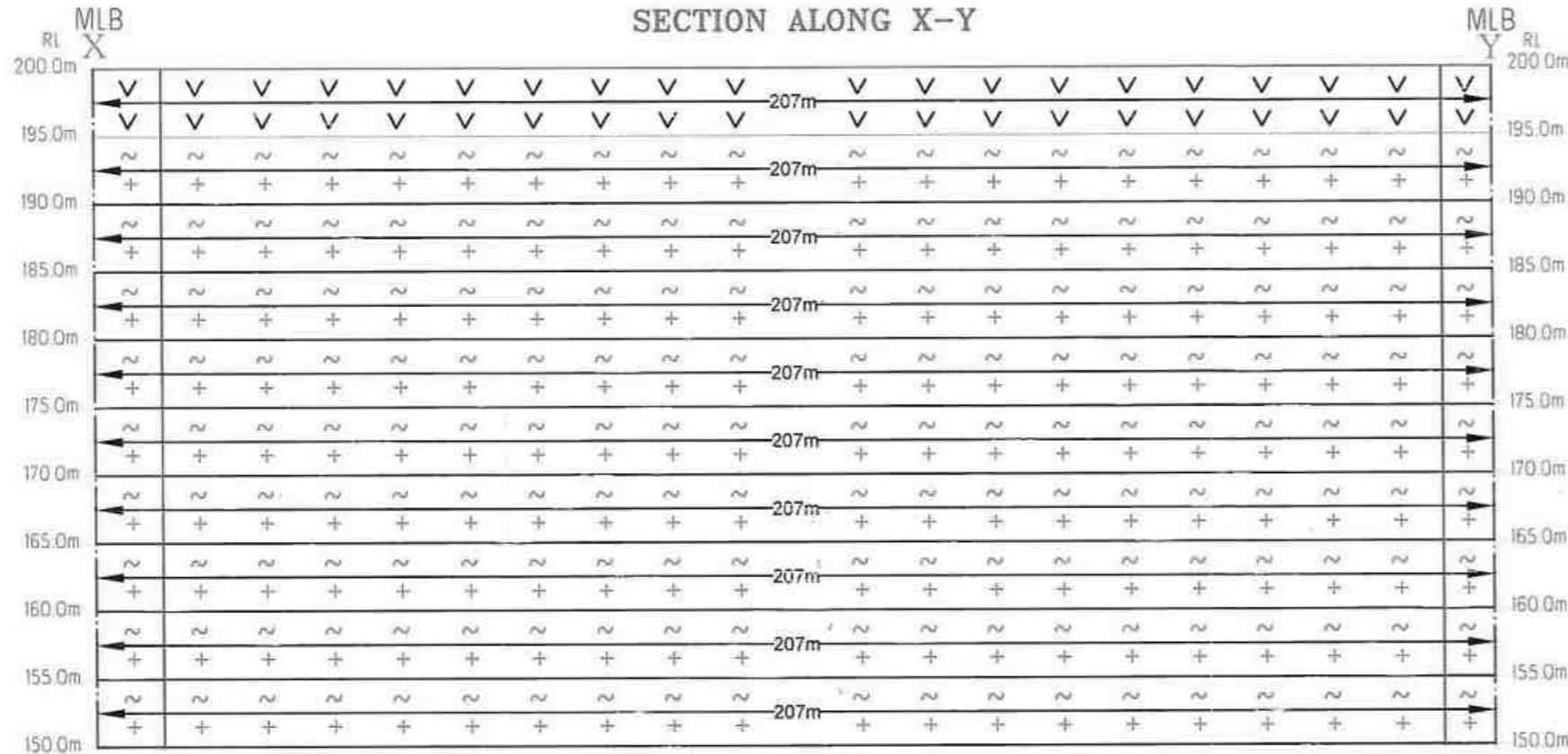
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Prepared By:  
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 TO THE BEST OF MY KNOWLEDGE

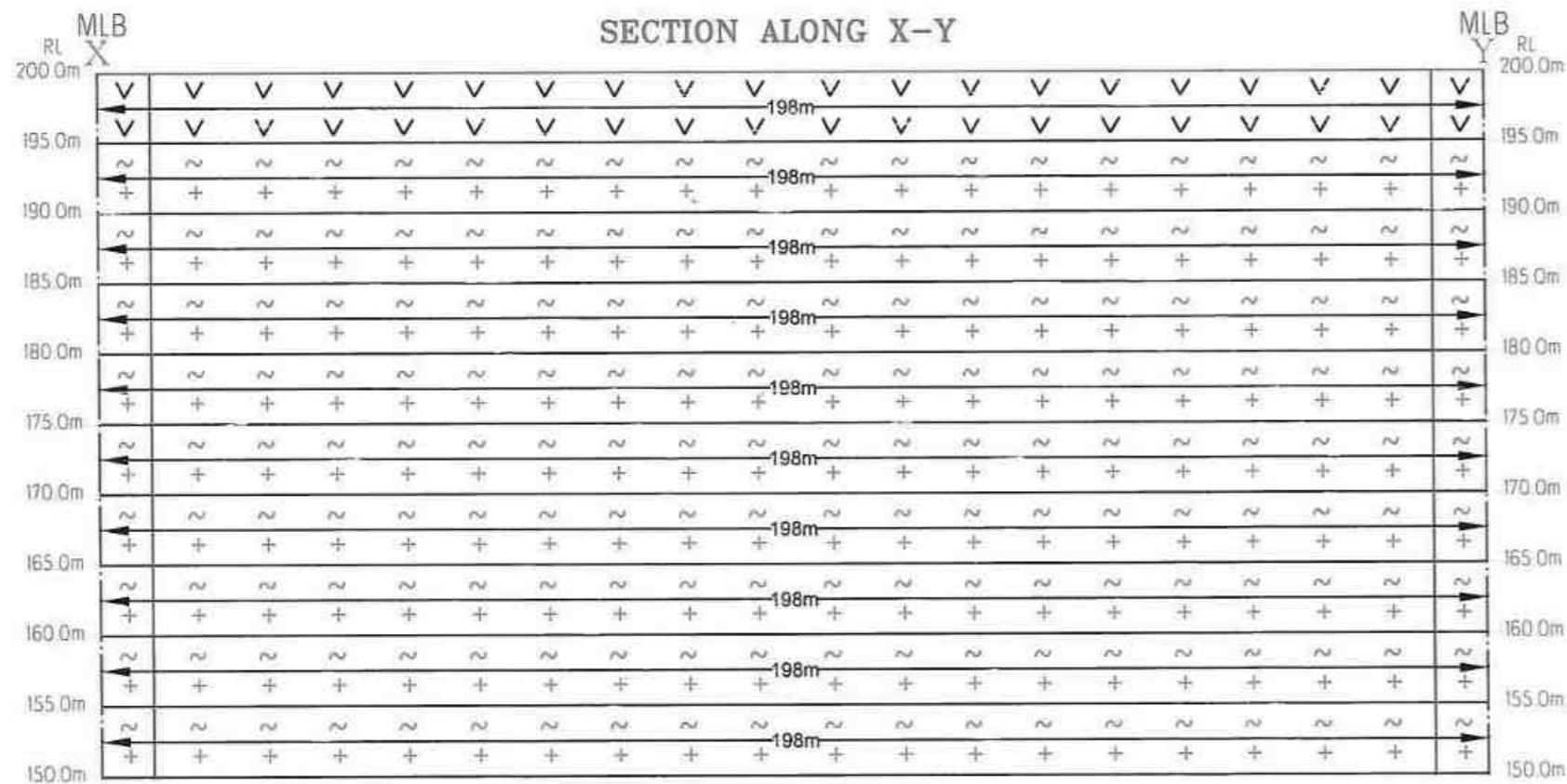
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

**257**

*T.ManjPrabakar*



GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Rough stone in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	207	198	5	204930	.....	204930
	II	207	198	5	204930	204930	.....
	III	207	198	5	204930	204930	.....
	IV	207	198	5	204930	204930	.....
	V	207	198	5	204930	204930	.....
	VI	207	198	5	204930	204930	.....
	VII	207	198	5	204930	204930	.....
	VIII	207	198	5	204930	204930	.....
	IX	207	198	5	204930	204930	.....
	X	207	198	5	204930	204930	.....
<b>TOTAL</b>				<b>50</b>	<b>2049300</b>	<b>1844370</b>	<b>204930</b>



**PLATE NO-III A**

**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR,  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

- MINE LEASE AREA =
- SAFETY DISTANCE =
- GRAVEL V V V
- ROUGH STONE ~ ~ ~

**GEOLOGICAL SECTIONS**  
 SECTION HOR 1 : 1000 & VER 1 : 500

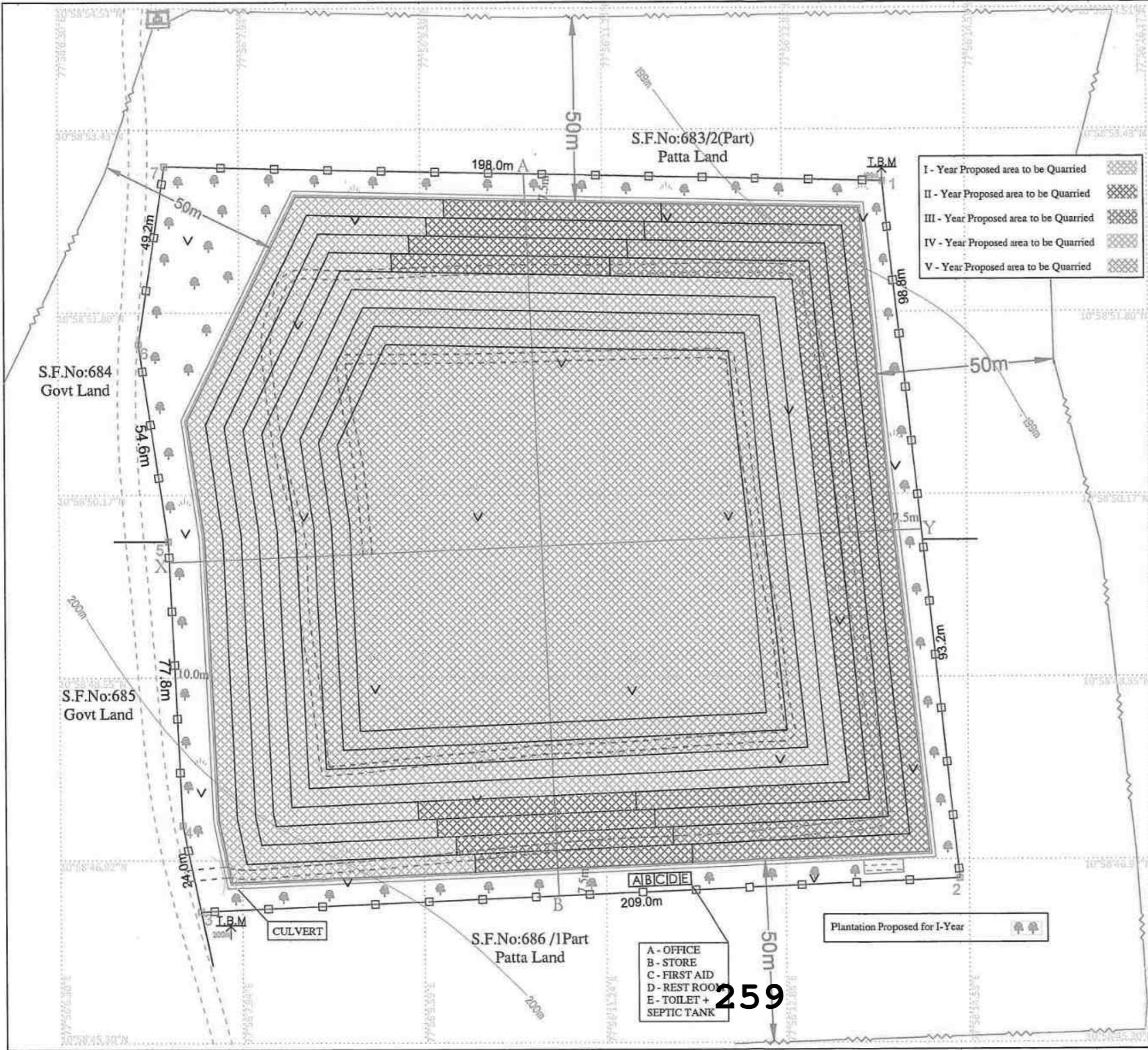
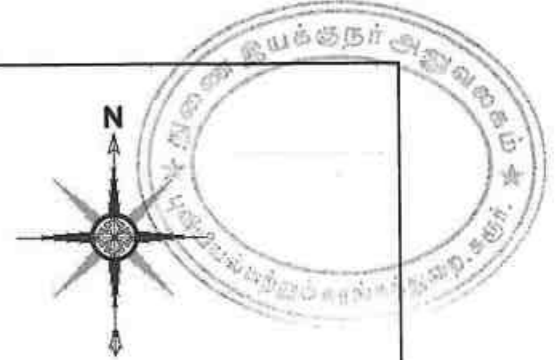
Prepared By:

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 TO THE BEST OF MY KNOWLEDGE

**Dr.S.KARUPPANNAN, M.Sc., Ph.D.**  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

*T. Manoj Prabakaran*





- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

**PLATE NO-IV**

**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o. THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
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 DISTRICT : KARUR

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MINE LEASE AREA	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
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BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
GRAVEL	
FENCING	
PROPOSED BENCH	

**YEARWISE DEVELOPMENT & PRODUCTION PLAN**  
 SCALE- 1:1000

Prepared By:  
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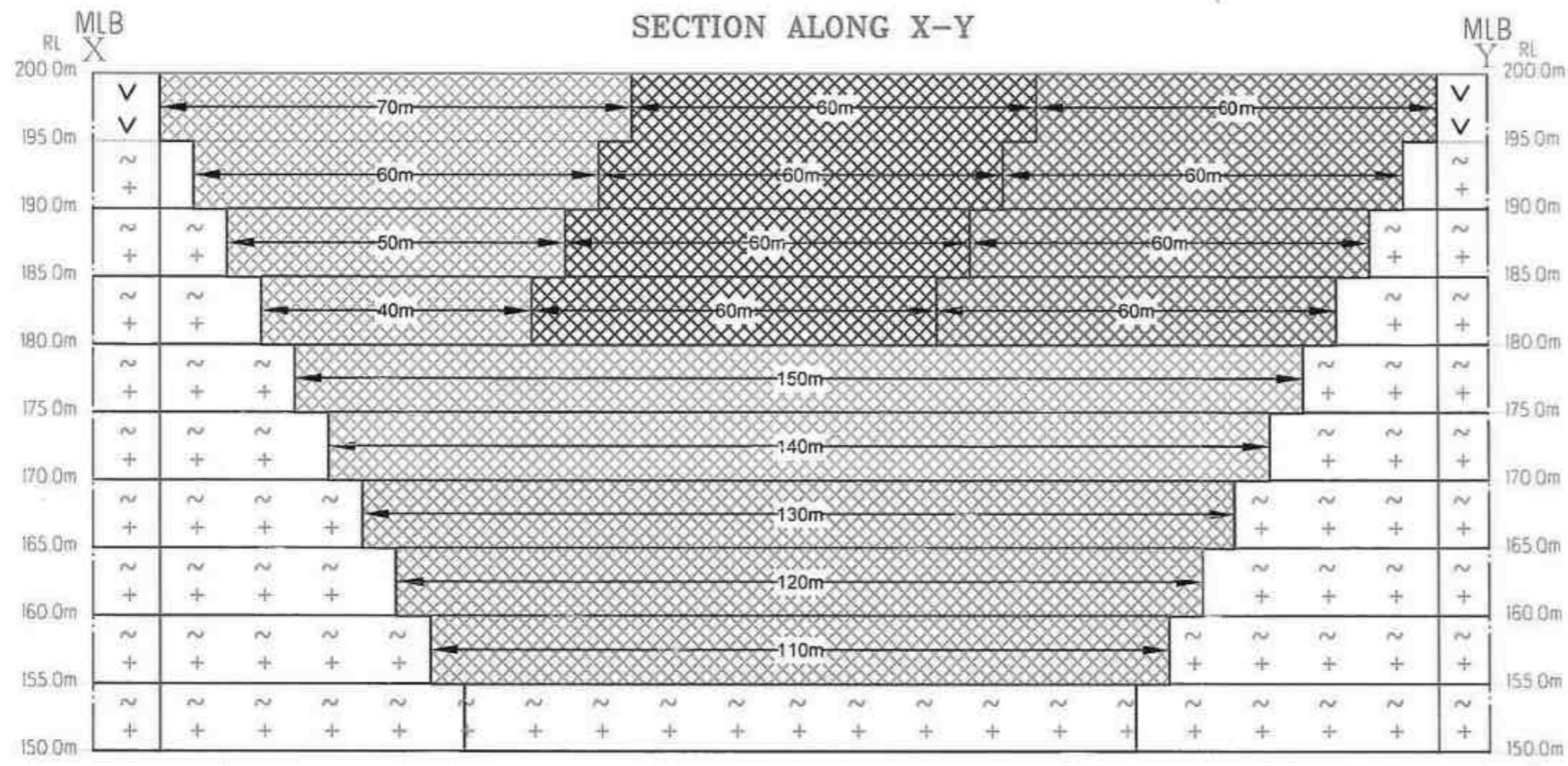
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET + SEPTIC TANK

259

*T. Manoj Prabakar*



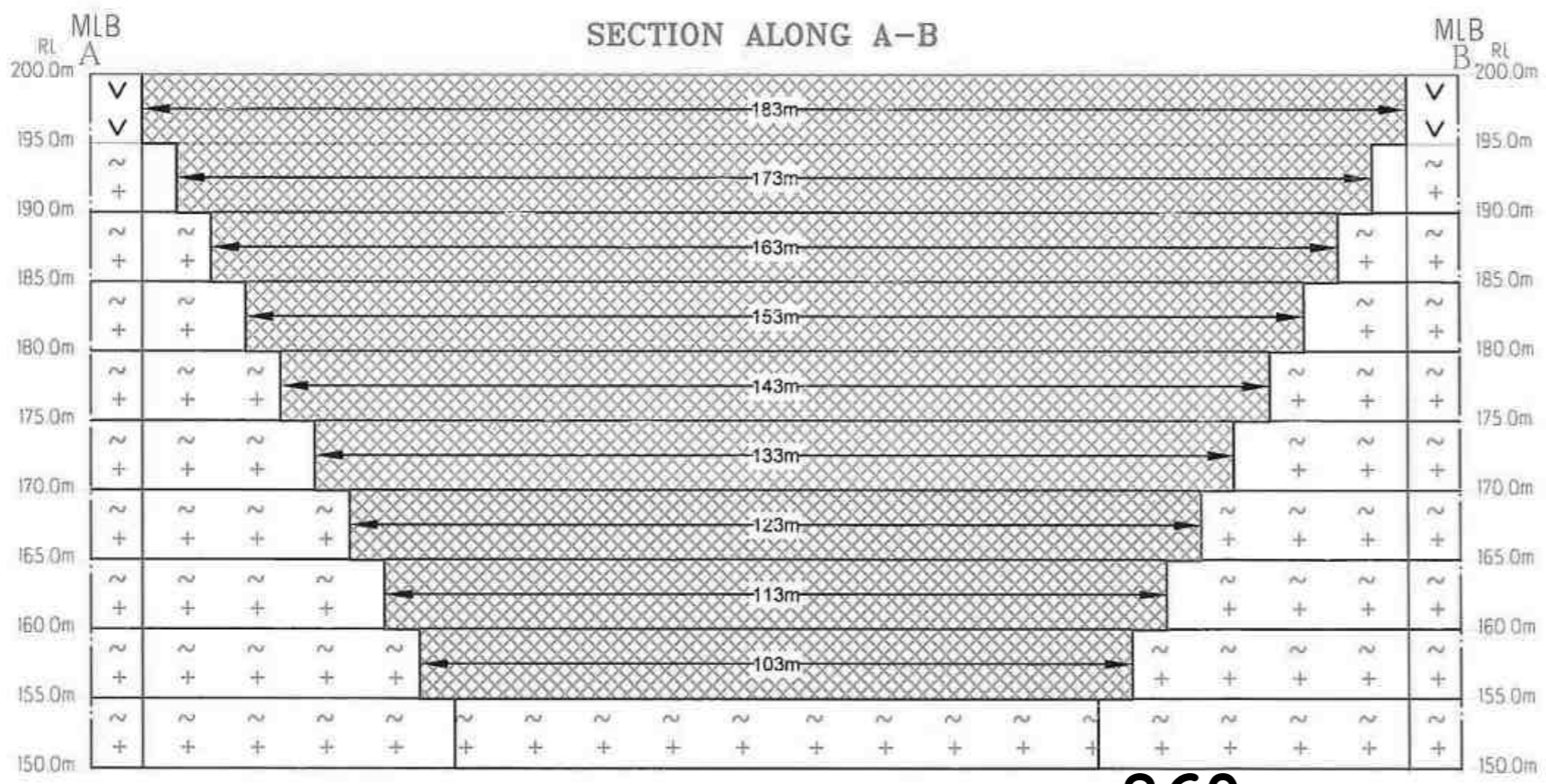


YEARWISE PRODUCTIONS									
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in M <sup>3</sup>	Rough stone in M <sup>3</sup>	Gravel in M <sup>3</sup>	
XY-AB	I-YEAR	I	70	183	5	64050	.....	64050	
		II	60	173	5	51900	51900	.....	
		III	50	163	5	40750	40750	.....	
		IV	40	153	5	30600	30600	.....	
	<b>TOTAL</b>						<b>187300</b>	<b>123250</b>	<b>64050</b>
	II-YEAR	I	60	183	5	54900	.....	54900	
		II	60	173	5	51900	51900	.....	
		III	60	163	5	48900	48900	.....	
		IV	60	153	5	45900	45900	.....	
	<b>TOTAL</b>						<b>201600</b>	<b>146700</b>	<b>54900</b>
	III-YEAR	I	60	183	5	54900	.....	54900	
		II	60	173	5	51900	51900	.....	
		III	60	163	5	48900	48900	.....	
		IV	60	153	5	45900	45900	.....	
	<b>TOTAL</b>						<b>201600</b>	<b>146700</b>	<b>54900</b>
	IV-YEAR	V	150	143	5	107250	107250	.....	
VI		140	133	5	93100	93100	.....		
<b>TOTAL</b>						<b>200350</b>	<b>200350</b>	<b>0</b>	
V-YEAR	VII	130	123	5	79950	79950	.....		
	VIII	120	113	5	67800	67800	.....		
	IX	110	103	5	56650	56650	.....		
<b>TOTAL</b>						<b>204400</b>	<b>204400</b>	<b>0</b>	
<b>GRAND TOTAL</b>						<b>995250</b>	<b>821400</b>	<b>173850</b>	

**PLATE NO-IVA**

**APPLICANT:**  
**Mr.T.MANOJ PRAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAI. DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
 EXTENT : 4.11.5Hect  
 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR



- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

**INDEX**

MINE LEASE AREA	
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GRAVEL	
ROUGH STONE	
PROPOSED & ULTIMATE BENCH	

**YEAR WISE PRODUCTION SECTIONS**  
 SECTION HOR 1 : 1000 & VER 1 : 500

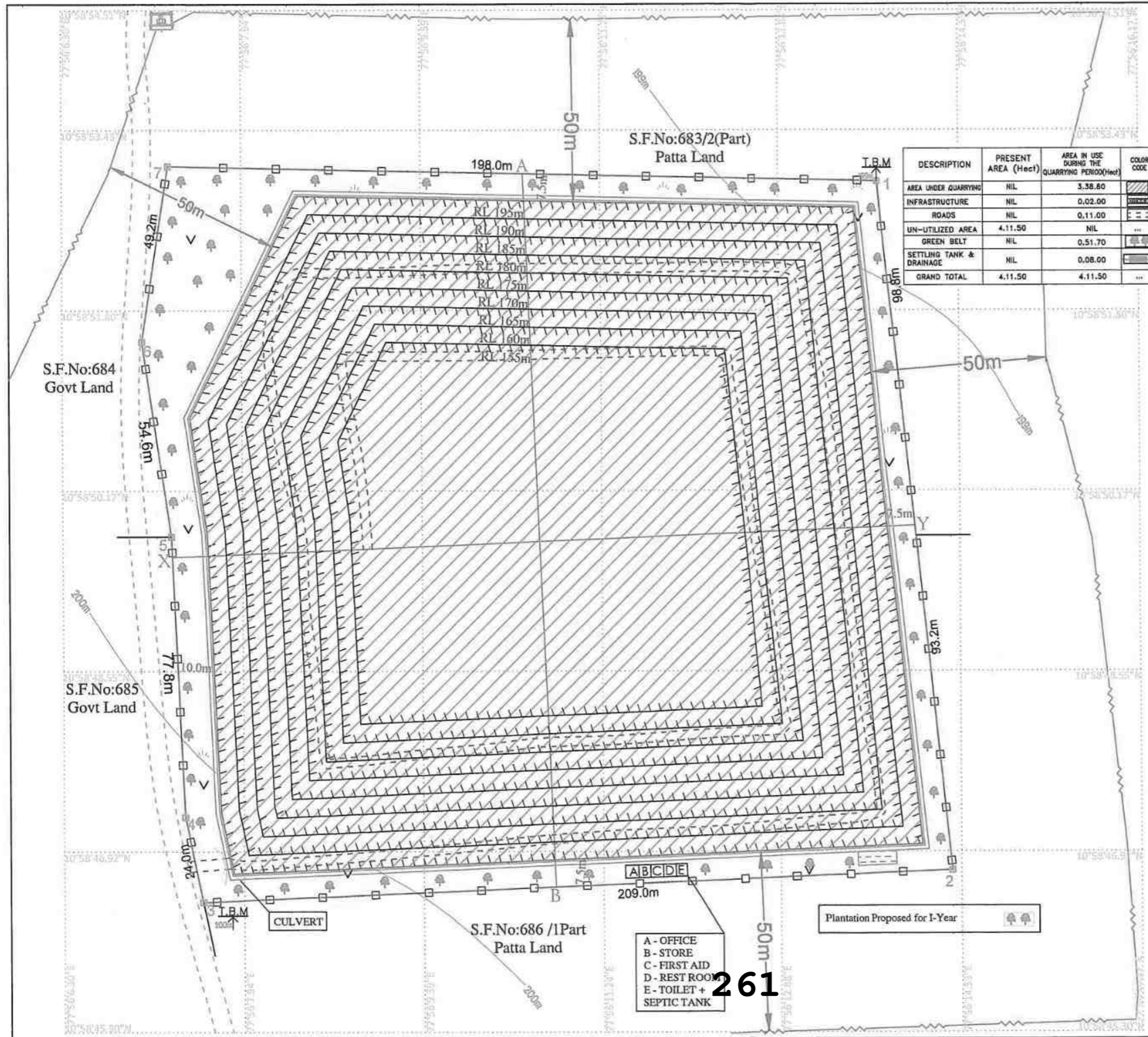
Prepared By:

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 TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN, M.Sc., Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

*T. Manj Prakar*





DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	3.38.80	
INFRASTRUCTURE	NIL	0.02.00	
ROADS	NIL	0.11.00	
UN-UTILIZED AREA	4.11.50	NIL	
GREEN BELT	NIL	0.51.70	
SETTLING TANK & DRAINAGE	NIL	0.08.00	
GRAND TOTAL	4.11.50	4.11.50	

**PLATE NO-V**

**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o. THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
 S.F.NO : 683/2 (Part) & 686/1 (Part)  
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 DISTRICT : KARUR

**INDEX**

- MINE LEASE AREA
- SAFETY DISTANCE
- APPROACH & HAUL ROAD
- CART ROAD
- EB LINES & TRANSFORMER
- BOUNDARY PILLAR STONES
- TEMPORARY BENCH MARK
- CONTOUR LINES
- SHRUBS
- GRAVEL
- FENCING
- PROPOSED BENCH

**MINE LAYOUT PLAN AND LAND USE PATTERN**  
 SCALE- 1:1000

Prepared By:  
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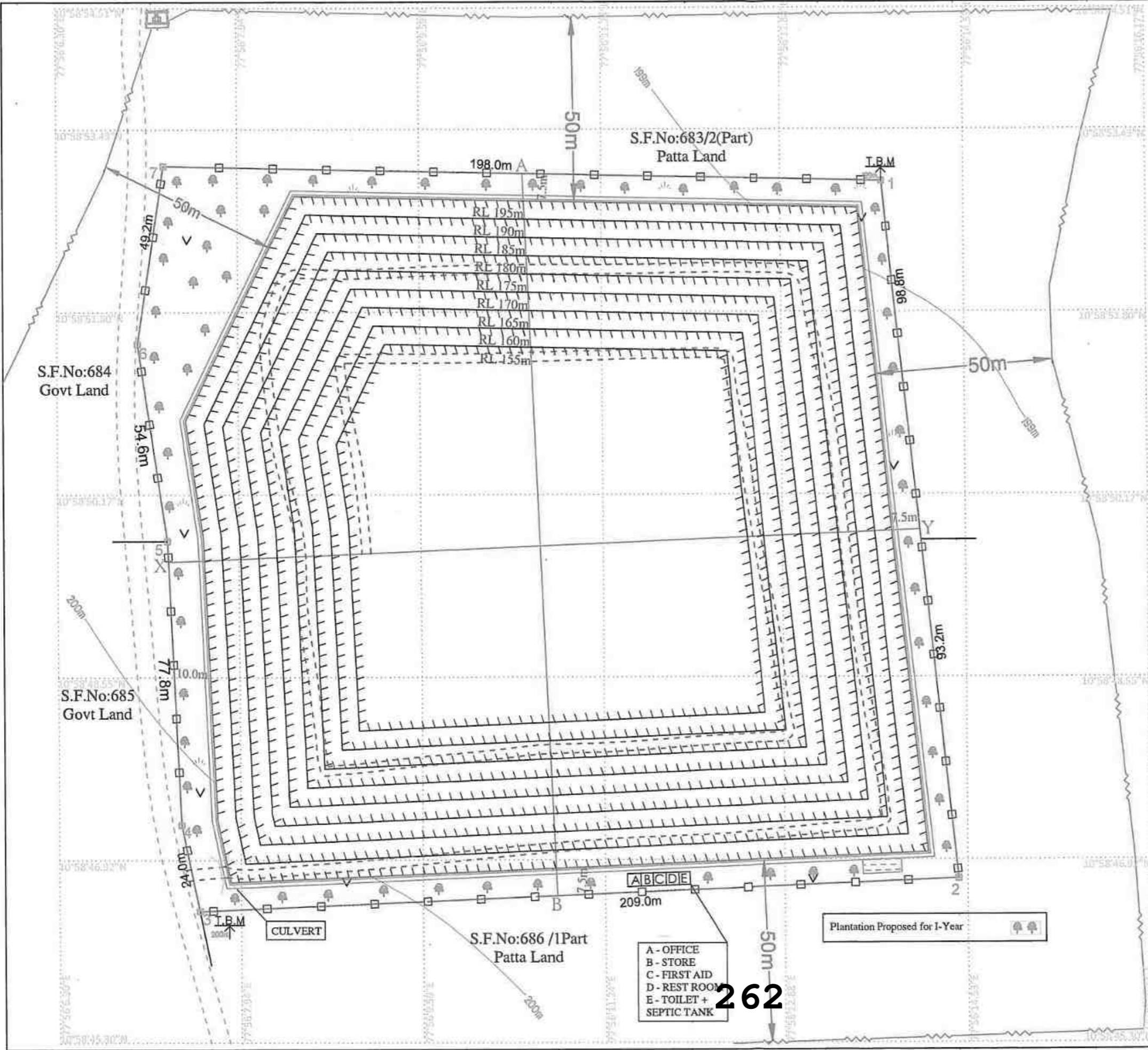
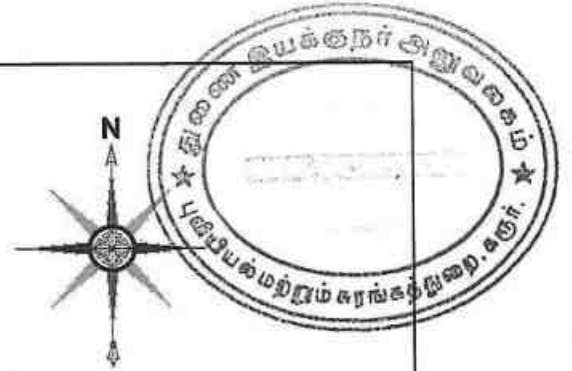
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET + SEPTIC TANK

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*T. Manoj Prabakar*





**PLATE NO-VI**  
**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
**S/o.THIRUNAVUKKARASU,**  
**DOOR.No.450-A, COLLEGE ROAD,**  
**3<sup>rd</sup> CROSS, PARAMATHIVELUR**  
**NAMAKKAL DISTRICT- 638182**

**LEASE APPLIED AREA:**  
**S.F.NO : 683/2 (Part) & 686/1 (Part)**  
**EXTENT : 4.11.5Hect**  
**VILLAGE : KUPPAM**  
**TALUK : PUGALUR**  
**DISTRICT : KARUR**

**INDEX**

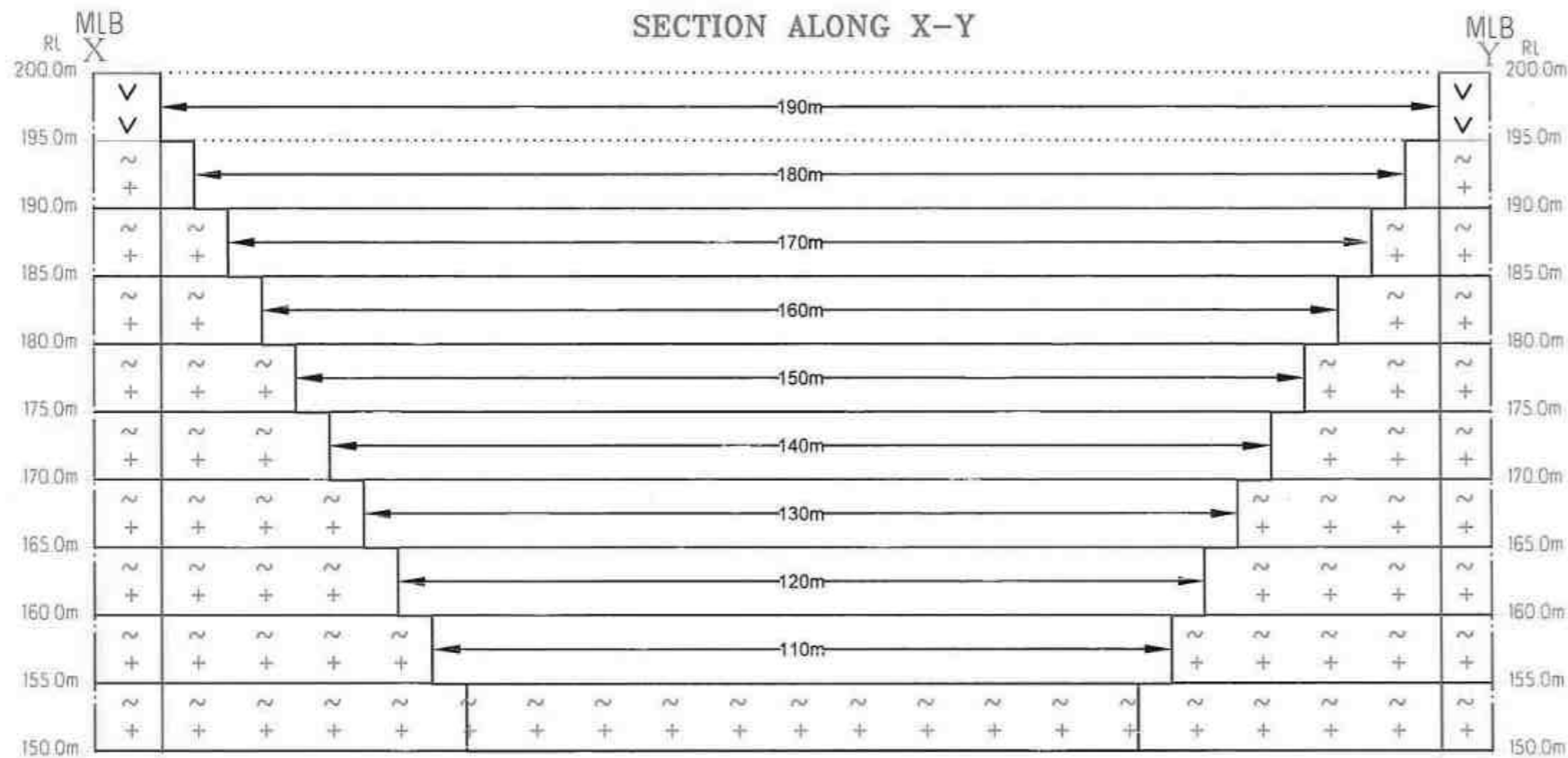
MINE LEASE AREA	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
CART ROAD	
EB LINES & TRANSFORMER	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
GRAVEL	
FENCING	
PROPOSED BENCH	

**PROGRESSIVE MINE CLOSURE PLAN**  
 SCALE- 1:1000

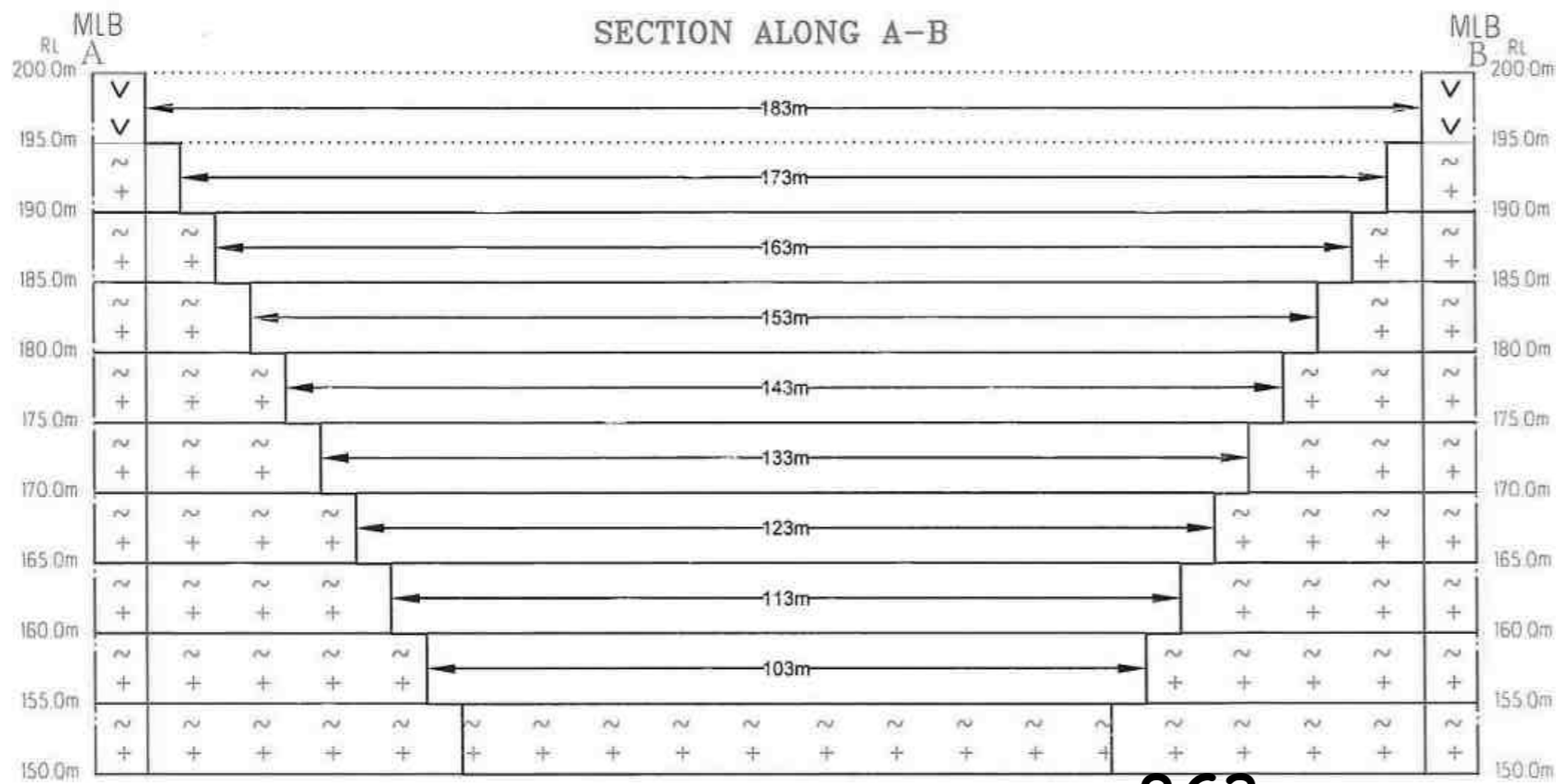
Prepared By:  
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**Dr.S.KARUPPANNAN,M.Sc.,Ph.D.**  
**RECOGNIZED QUALIFIED PERSON**  
**RQP/MAS/263/2014/A**

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T.M. Prabakar



PRODUCTION RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Rough stone in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	190	183	5	173850	.....	173850
	II	180	173	5	155700	155700	.....
	III	170	163	5	138550	138550	.....
	IV	160	153	5	122400	122400	.....
	V	150	143	5	107250	107250	.....
	VI	140	133	5	93100	93100	.....
	VII	130	123	5	79950	79950	.....
	VIII	120	113	5	67800	67800	.....
	IX	110	103	5	56650	56650	.....
<b>TOTAL</b>				<b>45</b>	<b>995250</b>	<b>821400</b>	<b>173850</b>



**PLATE NO-VIA**  
**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
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 TALUK : PUGALUR  
 DISTRICT : KARUR

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MINE LEASE AREA	▬▬▬
SAFETY DISTANCE	▬▬▬
GRAVEL	V V V
ROUGH STONE	+ + +
PROPOSED & ULTIMATE BENCH	▬▬▬

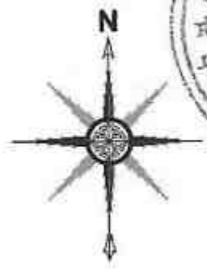
**PROGRESSIVE MINE CLOSURE SECTIONS**  
 SECTION HOR 1 : 1000 & VER 1: 500

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**Dr.S.KARUPPANNAN, M.Sc., Ph.D.**  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

*T. Manoj Prabakar.*





**PLATE NO-VII**

**APPLICANT:**  
**Mr. T.MANOJ PRABAKAR,**  
 S/o. THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

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**INDEX**

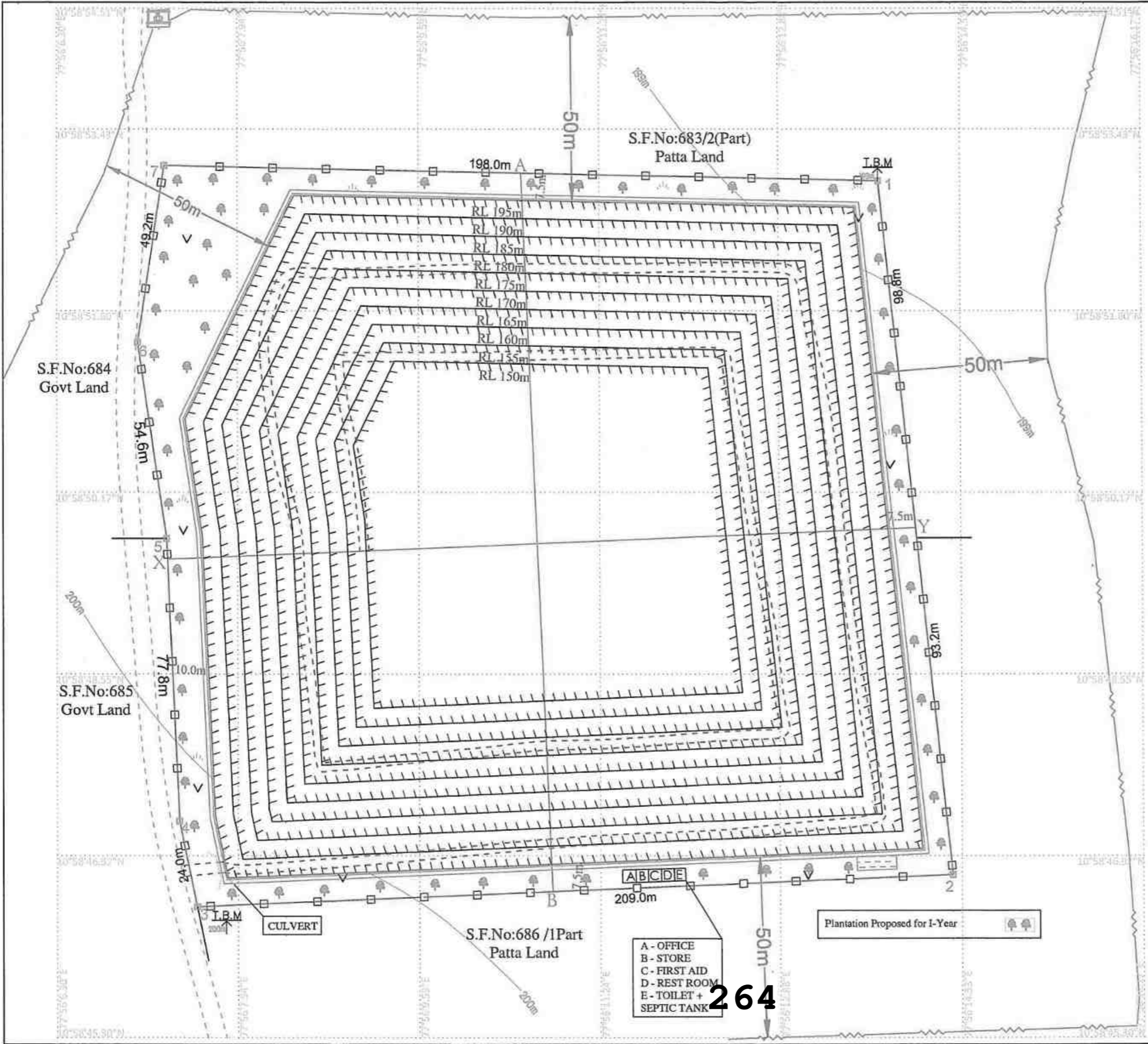
MINE LEASE AREA	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
CART ROAD	
EB LINES & TRANSFORMER	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
GRAVEL	
FENCING	
PROPOSED BENCH	

**CONCEPTUAL PLAN**

SCALE- 1:1000

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 TO THE BEST OF MY KNOWLEDGE

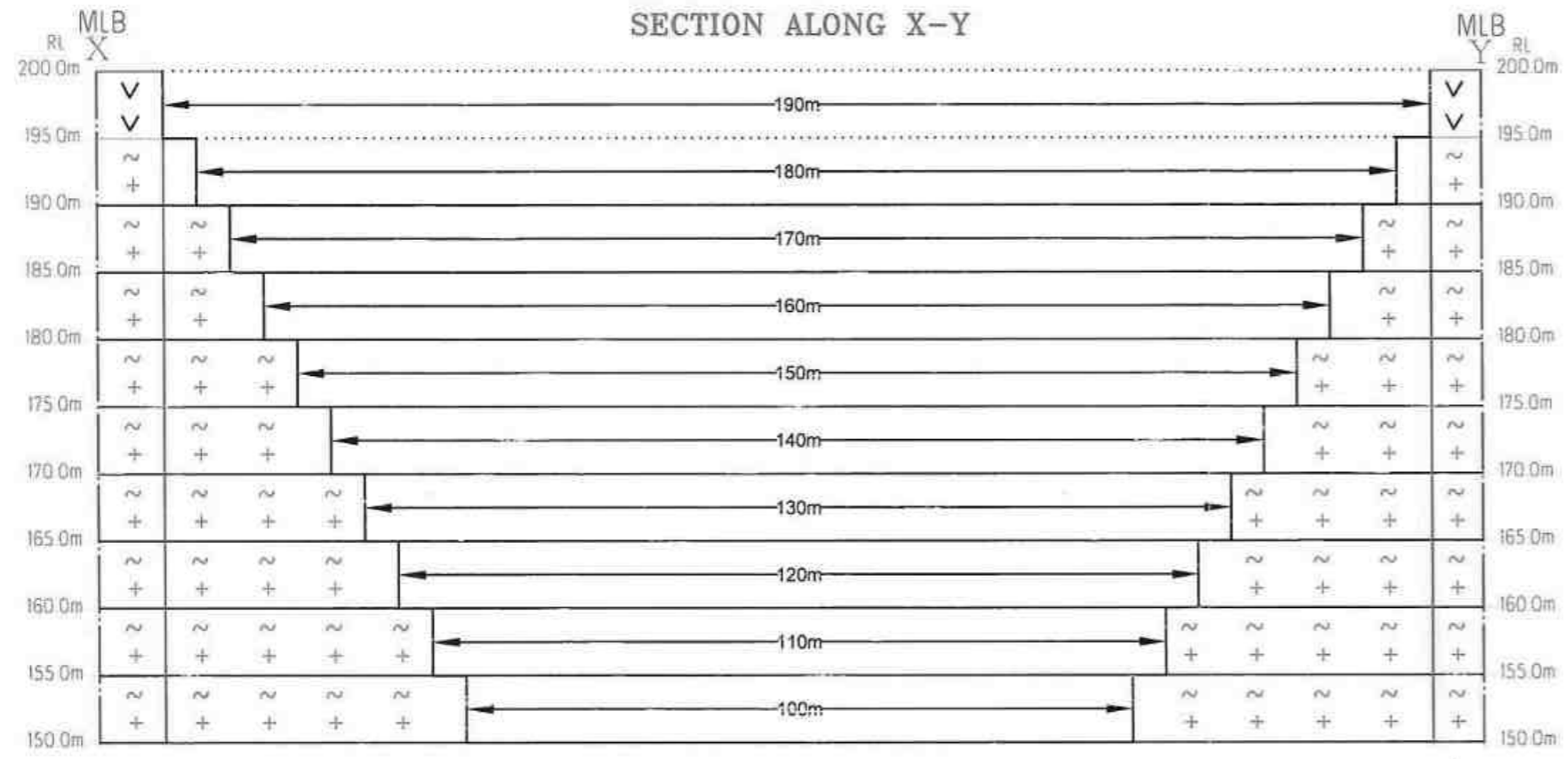
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A



- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET + SEPTIC TANK

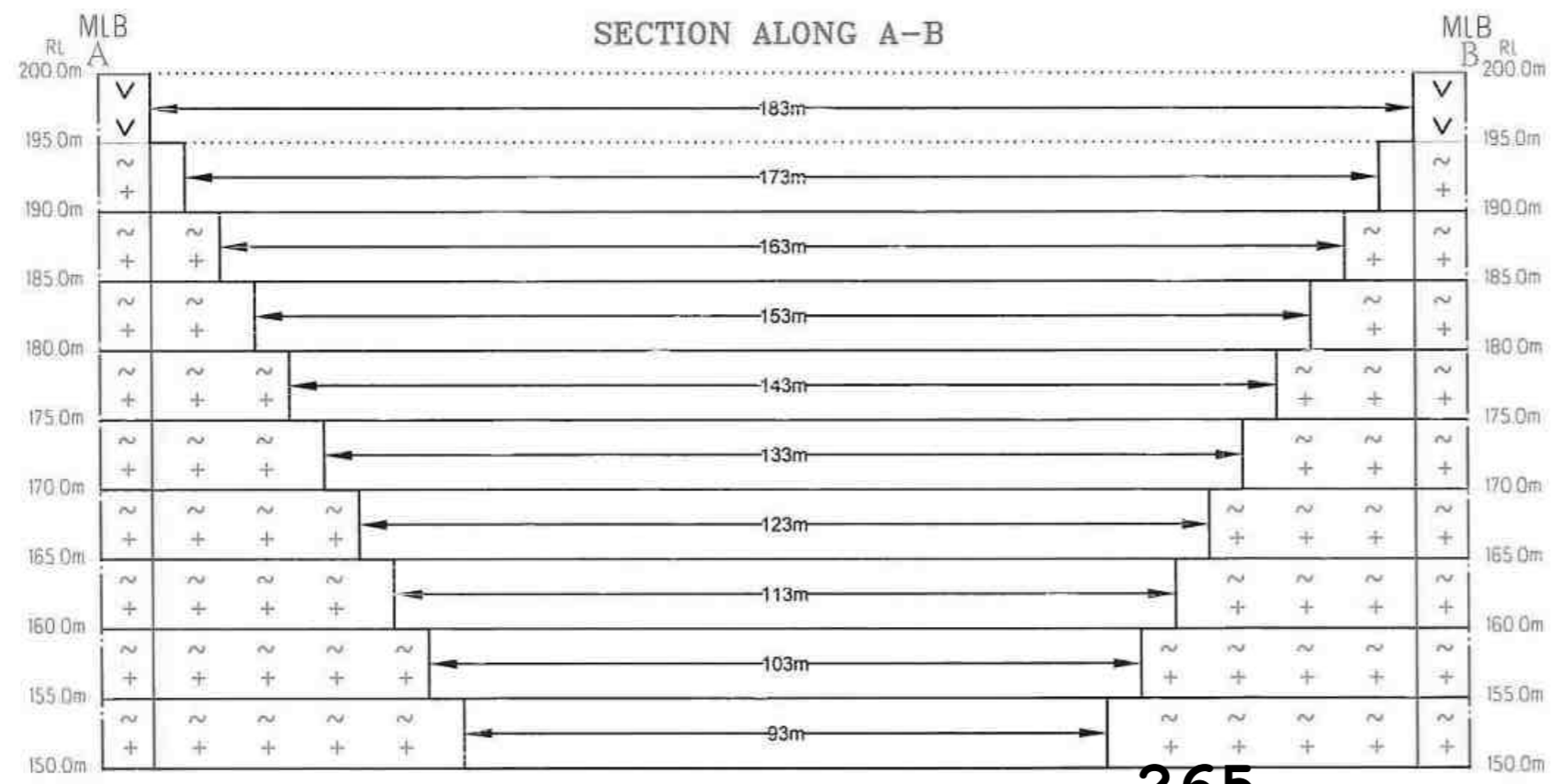
**264**

*T.M. Prabakaran*



**MINEABLE RESERVES**

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	stone in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	190	183	5	173850	.....	173850
	II	180	173	5	155700	155700	.....
	III	170	163	5	138550	138550	.....
	IV	160	153	5	122400	122400	.....
	V	150	143	5	107250	107250	.....
	VI	140	133	5	93100	93100	.....
	VII	130	123	5	79950	79950	.....
	VIII	120	113	5	67800	67800	.....
	IX	110	103	5	56650	56650	.....
	X	100	93	5	46500	46500	.....
<b>TOTAL</b>				<b>50</b>	<b>1041750</b>	<b>867900</b>	<b>173850</b>



**PLATE NO-VIIA**

**APPLICANT:**  
**Mr.T.MANOJ PRABAKAR,**  
 S/o.THIRUNAVUKKARASU,  
 DOOR.No.450-A, COLLEGE ROAD,  
 3<sup>rd</sup> CROSS, PARAMATHIVELUR  
 NAMAKKAL DISTRICT- 638182

**LEASE APPLIED AREA:**  
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 VILLAGE : KUPPAM  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

MINE LEASE AREA ▬▬▬

SAFETY DISTANCE ▬▬▬

GRAVEL V V V


ROUGH STONE + + +

ULTIMATE BENCH ┌┐

**CONCEPTUAL SECTIONS**  
 SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

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Dr.S.KARUPPANAN, M.Sc., Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

*T.M. Prabakar*

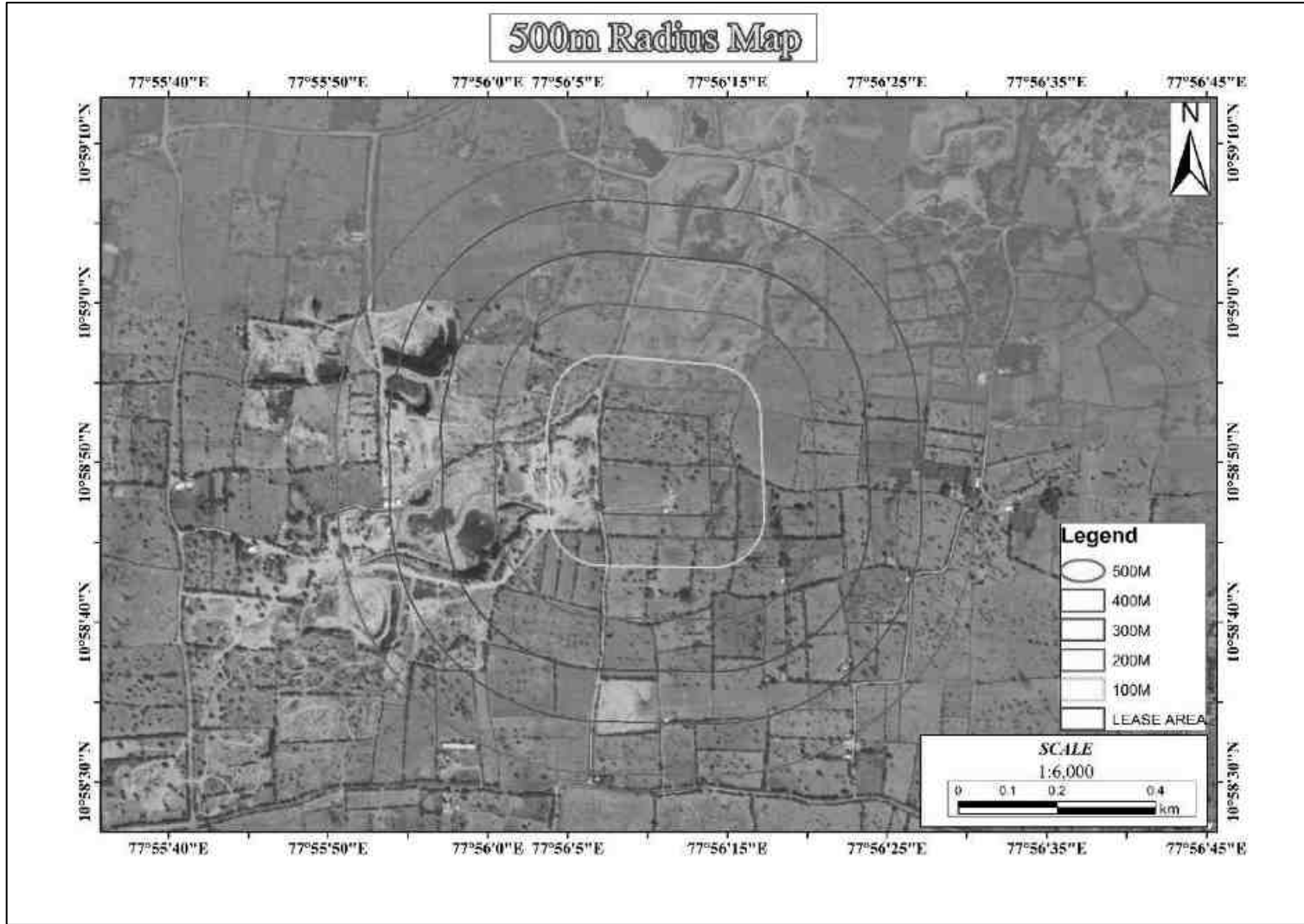
கீழ்க் காவலம், 486/1 வட்டம்.  
 சிப்பம் கிராமத்தில் திருமாவட்டம்  
 மனோகம்புலகம் சாலை காவல் மற்றும்  
 சிவசுப்பிரமணியம் காவல் மண்டலத்தை உட்பட காவலுக்கு  
 புள்ளி 683/2 (பகுதி) மற்றும் 686/1 (பகுதி)  
 ஆகியவற்றின் மீது தரவு 4.11.83  
 நிபந்தனை சிற்றி 300 மீட்டர் சிற்றளவில் கிராம  
 நகரம், அங்கீகரிக்கப்பட்ட கட்டிட மன்றத்தினால்,  
 நிர்மாணம், கோவை மன்றத்தை ஏதும்  
 இவை சான்றுகளை எதிர்த்துக்கொள்வதில்லை.

H  
 6/11/83  
 கிராம நிர்வாக அலுவலர்  
 16, சிப்பம் கிராமம்  
 புகளூர் வட்டம்  
 கீழ்க் காவலம்





GREEN BELT DEVELOPMENT PHOTOS AND BENCHING PHOTOS



Google image showing– 100m, 200m, 300m, 400m and 500m Radius



**National Accreditation Board  
for Education and Training**



**Certificate of Accreditation**

**Geo Technical Mining Solutions**

1/213B, Natesan Complex, Dharmapuri Salem Main Road, Oddapatti, Collectorate post office,  
Dharmapuri, Tamil Nadu-636705

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

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	B

*Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated September 13, 2022 posted on QCI-NABET website.*

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2641 dated January 19, 2023. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions following due process of assessment.*

Sr. Director, NABET  
Dated: January 19, 2023

Certificate No.  
NABET/EIA/2124/SA 0184

Valid up to  
Dec 31, 2023

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

