

DRAFT 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 = 12.23.48 hectares

At

Pazhaveri Village, Uthiramerur Taluk,
Kancheepuram District, Tamil Nadu State

TOR Identification No. TO24B0108TN5130667N Dated:29.07.2024, File No.11015

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
M/s.M.S.M. Mining Partner, V.Sadaiyappan , S/o. Vaithy, No.15/1, Gandhi Street, Thiruneermalai, Chromepet, Chennai – 600044.	2.78.5ha 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A	Rough Stone-383552 m ³ Gravel – 40438 m ³

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



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NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: Dec, 31.12.2026



ENVIRONMENTAL LAB

ACCURACY ANALABS	GREEN LINK ANALYTICAL AND RESEARCH LABORATORY (INDIA) PVT LTD
Baseline Monitoring March to May - 2024	



GEO TECHNICAL MINING SOLUTIONS

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.11015

TOR Identification No. TO24B0108TN5130667N, dated.29/07/2024

M/s. M.S.M Mining, Rough Stone and Gravel Quarry

Specific Terms of Reference for (Mining of Minerals)

1. SEIAA Standard Conditions:

Standard:

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.	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 under Chapter II in the EIA report page 20-27.

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 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.
Agriculture & Agro-Biodiversity		
9	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 in the EIA report page 105-108.
10	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III in the

		EIA report page 65-81. 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.
11	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.	Details of vegetation in the lease area have been provided in Section 3.5 under Chapter III in the EIA report page 65-81. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV in the EIA report page 105-108.
12	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 in the EIA report page 65-81 and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 105-108.
13	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 in the EIA report page 94-111.
14	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 in the EIA report page 94.
Forests		
15	The project proponent shall detail study on	The project proponent shall do barbed

	impact of mining on Reserve forests free ranging wildlife.	wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.
16	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 in the EIA report page 105-108.
17	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 in the EIA report page 105-108.
18	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	The protected areas, National Parks, Corridors and Wildlife pathways near project site within 10 km radius has been provided in Table 3.41 under Chapter III in the EIA report page 90-91.
Water Environment		
19	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.	The hydrogeological study is discussed in the Section 3.2.3 under Chapter III in the EIA report page 42-51.

20	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 in the EIA report page 95-96.
21	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.	The matter has been discussed under Chapter IV in the EIA report page 94-111.
22	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.5 under Chapter 3 in the EIA report page 65-81.
23	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 in the EIA report page 94-111.
24	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.	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV in the EIA report page 105-108.
25	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV in the EIA report page 95.
26	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 in the EIA report

		page 95-96.
27	<p>The EIA shall include the impact of mining activity on the following:</p> <ul style="list-style-type: none"> a) Hydrothermal / Geothermal effect due to destruction in the Environment b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams. 	<p>a. The quarrying operation is proposed to be carried out by open cast semi-mechanized mining method involving drilling and formation of benches of the prescribed dimensions.</p> <p>The rock formation of low resistivity values indicates occurrence of water at the depth of about 45 m BGL. The maximum depth proposed for the proposed project is 35m BGL. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period. So, there is no Hydrothermal / Geothermal effect due to destruction in the Environment.</p> <p>b. During the field study, there is no any Bio-geochemical process and it's foot prints in and around the proposed lease area.</p> <p>c. Sediment geochemistry is discussed in the Table 3.5 under the Chapter III in the EIA report page 38.</p>
Energy		
28	<p>The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.</p>	<p>The measures taken to control noise, air, water, and dust have been given under Chapter IV in the EIA report page 94-111.</p>

Climate Change		
29	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 in the EIA report page 105-108.
30	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features.	The matter has been discussed in Chapter IV in the EIA report page 94-111.
31	Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.	There is no emission impact to local livelihood from this quarry project. All the vehicles used for transportation of the quarry materials will be maintained regularly to keep the GHGs emissions within statutory limits.
Mine Closure Plan		
32	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 in the EIA report page 23.
EMP		
33	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 in the EIA report page 131-138.
34	The Environmental Impact Assessment should hold detailed study on EMP with	A detailed Environment Management plan has been given in Tables 10.1 &

	budget for Green belt development and mine closure plan including disaster management plan.	10.2 under Chapter X in the EIA report page 133-138.
Risk Assessment		
35	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 in the EIA report page 118-120.
Disaster Management Plan		
36	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 in the EIA report page 121-122.
Others		
37	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.	The VAO certificate of 300 m radius have been attached in the attached in the Annexure IV.
38	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	The concerns raised during the public consultation will be submitted in the final EIA report.

	Management Plan.	
39	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 plastic waste management has been given in Section 7.5 under Chapter VII in the EIA report page 126.

2. SEAC Conditions – Site Specific

S. No	Terms of Reference		Remarks
2.1	1	<p>A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:</p> <p>(i) Copy of the agreement forming CMC.</p> <p>(ii) The Organisation chart of the Committee with defining the role of the members</p> <p>(iii) The ‘Standard Operating</p>	The details regarding the Cluster Management Committee (CMC) will be submitted in the final EIA report.

	Procedures' (SoP) executing the planned activities.	
2	The proponent shall obtain a clarification letter from the concerned authority for the land classification pertaining to S.F.No.252/11B.	The Clarification letter from the concerned authority will be submitted in the final EIA report.
3	The proponent shall furnish a registered lease deed.	The registered lease deed is attached in the Approved mining plan book in Annexure III.
4	The proponent shall make necessary application to produce the NOC from the Competent Authority under the provisions of the Central Electricity Authority Notification No. CEA-PS16/1/2021-CEI Division dt 08.07.2023 at the time of lease execution	The NOC from the Competent Authority under the provisions of the Central Electricity Authority will be submitted in the final EIA report.
5	The proponent shall propose CER activity towards Govt. School, Karikili. The details of the same shall be included in the EIA Report.	The details will be submitted in the final EIA report.
6	Since waterbodies are situated nearby, the PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry to determine impacts of the mining operation on the ground water conditions in the waterbodies.	The detailed hydrogeological study was conducted and the details are given in the Section 3.2.3 under Chapter III in the EIA report page 42-50.
7	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km shall be enumerated with details such as dwelling houses with number of	The structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 300m from the proposed project area is shown in the Figure 4.3 under

	occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.	Chapter IV in the EIA report page 104.
8	The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs of adequate fencing, green belt, along the periphery of the project area and the photographs showing nearby water bodies will be included in final EIA report.
9	The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report.	The detailed Bio diversity study have been provided in Section 3.5 under Chapter III in the EIA report page 65-81.
10	The PP shall prepare the EMP for the entire project life of mine and also furnish the sworn affidavit stating 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 in the EIA report page 131-138. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final EIA report.
11	The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included drilling & blasting, loading & hauling on the surrounding village and structures.	The cumulative environmental impact study is discussed in the Section 7.4 under Chapter VII in the EIA report page 122-125.

3. SEAC Standard Conditions

3.1	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	As it is a fresh quarry, the conditions are not applicable.
	(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.			The VAO certificate is attached in Annexure IV.
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,		The structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 300m from the proposed project area is shown in the Figure 4.3 under Chapter IV in the Final EIA report page 95-96.

	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.	Detailed hydrological study will be submitted in the final EIA report.
5	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	The details of Bio diversity from the reputed institution will be submitted in the final 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.	The DFO letter will be submitted in 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 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-	As it is a fresh lease area, the Slope Stability report is not required.

	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.	As it is a fresh lease area, the Slope Stability report is not required.
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 will be enclosed in the final EIA report.
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 in the EIA report page 20-27.
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 details and the photographic evidence showing the project proponent's of past mining activities will be submitted in the EIA report.

	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?	As it is a new quarry, the conditions are not applicable.
14	Quantity of minerals mined out.	
	<ul style="list-style-type: none"> Highest production achieved in any one year 	
	<ul style="list-style-type: none"> Detail of approved depth of mining. 	
	<ul style="list-style-type: none"> Actual depth of the mining achieved earlier. 	
	<ul style="list-style-type: none"> Name of the person already mined in that leases area. If EC and CTO already obtained, the copy of the same shall be submitted. 	
	<ul style="list-style-type: none"> 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).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4, under Chapter II in the EIA report page 13.
16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,	The drone video will be submitted during final EIA presentation.

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 of adequate fencing, green belt along the periphery of the project area and the photographs showing nearby water bodies will be included in final EIA report.
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 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. The plate used for reserve estimation has been presented in Figure 2.6 & 2.7 results of geological resources and reserves have been shown in Table 2.3. under Chapter II in the EIA report page 15-17.
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.	Details of manpower required for this project have been given in Table 2.14 under Chapter II in the EIA report page 28.
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	The hydrogeological study is discussed in the Section 3.2.3 under Chapter III in the EIA report page 42-51.

	<p>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>	
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 & 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 in the EIA report page 29-93.</p>
22	<p>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.</p>	<p>Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII in the EIA report page 122-125.</p>
23	<p>Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.</p>	<p>As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the</p>

		water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.
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 in the EIA report page 31-36 under Chapter III. The details of surrounding sensitive ecological features have been provided in Table 3.41 under Chapter III in the EIA report page 90-91. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II in the EIA report page 22.
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.	This condition is not applicable to this project because no dumps have been 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	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.

	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.	As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.
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 in the EIA report page 87-89.
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 in the EIA report page 65-81.
30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	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 in the EIA report page 23.
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	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.

	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.	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 105-108.
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	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.
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 in the EIA report page 121-122.
35	A Risk Assessment and management Plan shall be prepared and included in the	A risk assessment plan for the project has been provided in Section 7.2 under

	EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Chapter VII in the EIA report page 118-120.
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 in the EIA report 109-110.
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 in the EIA report page 128-129.
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.	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 20 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 127.
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.
39	Benefits of the Project if the Project is implemented should be spelt out. The	Benefits of the project details have been given under Chapter VIII in the

	benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	EIA report page 127-129.
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.	The benefits of the project are discussed in the Chapter VIII in the EIA report page 127-129.
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.	It is fresh lease area and the condition is not applicable.
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.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X in the EIA report page 131-138. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during 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 Environment (Protection) Act, 1986.	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 of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.

Standard Terms of Reference for (Mining of minerals)

1.

1.1	An EIA-EMP Report shall be prepared for peak capacity (... MTPA) operation in an ML/project area of ...ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Yes, it is based on the generic structure specified in Appendix III of the EIA Notification, 2006. i.e., the peak capacity of the proposed quarry is 214789 MTPA and operation in an ML/project area of 2.78.5ha.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.	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 March through May 2024 with CPCB guidelines. The detailed baseline environmental monitoring studies were carried out and the results are discussed in the Chapter III and the approved mining plan is attached in the Annexure III.
1.3	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided	The KML file with proper pin drop and coordinate of the mine will be uploaded during the online submission.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions	The details of environmentally sensitive ecological features in the study area are given in the Table 3.41 under Chapter III in the EIA report page 90-91.

	including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also	
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	The map showing the lease area with cluster details is shown in the Figure 1.1, Chapter I in the EIA report page 4. The agriculture and water bodies details are given in the Table 3.41 under Chapter III in the EIA report page 90-91.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	The contour map will be submitted in the final EIA report.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ river let system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted.	The catchment area map will be submitted in the final EIA report.
1.8	(Details of mineral reserves, geological	The reserve details are discussed in the

	<p>status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.</p>	<p>Section 2.5 under Chapter II in the EIA report page 17.</p>
1.9	<p>Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.</p>	<p>The details of mining method, technology, equipment, etc is discussed in the Section 2.6 under Chapter II in the EIA report page 20-27.</p>
1.10	<p>Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.</p>	<p>There is no any drainage within or around the lease area. The drainage map is shown in Figure 3.4 under Chapter III, in the EIA report page 35.</p>
1.11	<p>A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape</p>	<p>Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II in the EIA report 22.</p> <p>There is no any drainage within or around the lease area. The drainage map</p>

	<p>features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.</p>	<p>is shown in Figure 3.4 under Chapter III in the EIA report 35.</p> <p>The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through Village Road (Arumbaliyur – Pazhaveri) as shown in Table 3.36 and in Figure 3.27 under Chapter III in the EIA report page 85-86.</p>			
1.12	<p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights.</p>				
	S.No	ML/Project Land use	Area under Surface Area Rights (ha)	Area Under Mining Rights (ha)	Area under Both (ha)
1	Agricultural land	---	---	---	
2	Forest Land	---	---	---	
3	Grazing Land	---	---	---	
4	Settlements	---	---	---	
5	Others (specify)	2.78.5	2.78.5	2.78.5	
S.N.	Details		Area (ha)		
1	Buildings		0		
2	Infrastructure		0.02.0		
3	Roads		0.07.0		
4	Others (specify)				
i	Green belt & Dume		0.75.0		
ii	Drainage & settling		0.08.5		

		Tanke		
	iii	Area under quarry	1.86.0	
	iv	Unutilized area	Nil	
	Total		2.78.5	
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.		The details on flora and fauna have been provided in Section 3.5 under Chapter III in the EIA report page 65-81.	
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/MoEF&CC certification of the respective		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 March through May	

	laboratory and NABET accreditation of the consultant to be provided.	2024 with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Accuracy Analabs & Green link analytical and research laboratory (India) pvt. ltd for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.	The detailed study is discussed in the Chapter III in the EIA report page 29-93.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be	10km baseline study can be conducted only when total cluster area extent of the

	<p>reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided</p>	<p>projects is above 25ha. Here, the proposed cluster area of the projects is less than 25ha, (i.e,12.23.48ha) and so baseline monitoring study is done for 5 km only.</p> <p>The baseline study of the air quality is discussed in the Section 3.3 under the Chapter III in the EIA report page 51-61.</p>
1.17	<p>A detailed traffic study along with presence of habitation in 100m distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.</p>	<p>There is no need of road widening, the details of traffic study are discussed in the Section 3.7 under Chapter III in the EIA report page 87-89.</p> <p>Carbon released from quarrying machineries and tippers during quarrying would be 124 kg per day, 33387kg per year and 166933 kg over five years.</p>
1.18	<p>The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.</p>	<p>The socio-economic study is discussed in the Section 3.6 under Chapter III in the EIA report page 81-87.</p>
1.19	<p>The Ecology and biodiversity study should</p>	<p>There is no forest within 10km. The</p>

	also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	Ecology and biodiversity study is discussed in the Section 3.5 under Chapter III in the EIA report page 65-81. 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 166933 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.	The occupational health and safety of the personnel and manpower for the mine is submitted in the Section 4.8 under Chapter IV in the EIA report page 109-110.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	The hydrological studies as per GEC 2015 guidelines will be prepared and submitted in the final EIA report.
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.	Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program. The detailed rain water harvesting will be submitted in the final EIA report.

1.23	Study on land subsidence including modelling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	It is fresh lease area and the condition is not applicable.		
1.24	Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.	Purpose	Quantity	Source
		Dust Suppression	1.0 KLD	The water requirement is purchased from the authorized water vendor.
		Green Belt development	1.0 KLD	
		Drinking & Domestic	1.05 KLD	
		Total	3.05 KLD	
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs	Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.		
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored	The PP is advised to use LNG/CNG trucks in mining operation because these trucks can control air pollution and noise pollution.		
1.27	PP to evaluate the greenhouse emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.	There is no greenhouse emission in the project lease area.		
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	The details are discussed in the Section 7.2 & 7.3 under Chapter VII in the EIA report page 118-122.		
1.29	Impacts of mineral transportation within the	The details regarding is discussed in the		

	<p>mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.</p>	<p>Section 4.4.2 under Chapter IV in the EIA report page 96-99.</p>
1.30	<p>Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.</p>	<p>The details are given in the Section 2.6 under Chapter II in the EIA report page 20-27.</p>
1.31	<p>The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.</p>	<p>Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted</p>
1.32	<p>Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-</p>	<p>The present mining is proposed to an average depth of 35m BGL has been envisaged as workable depth for safe & economic mining during the lease period. The mined out area with fenced on top of open cast working with SI fencing. No immediate proposals for closure of pit as the rough stone persist</p>

	handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.	still at deeper level. The details of mine closure budget are discussed in the Section 2.6.4 under Chapter II in the EIA report page 22-23.
1.33	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.	The details are given in the Section 4.6 under Chapter IV in the EIA report page 105-108.
1.34	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.	The detailed EMP is given in the Chapter X in the EIA report page 131-138.
1.35	Details of R&R. Detailed project specific R&R Plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.	Not Applicable. The proposed lease area belongs to the lessee and there is no any habitation in the lease area.
1.36	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.	The CSR plan is discussed in the Section 8.6 in Chapter VIII in the EIA report page 128-129.
1.37	Corporate Environment Responsibility:	
1.38	a) The Company must have a well laid down Environment Policy approved	The CER plan is discussed in the Section 8.7 in Chapter VIII in the EIA

		by the Board of Directors.	report page 129.
1.39	b)	The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	
1.40	c)	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	
1.41	d)	To have proper checks and balances, the company should have a well laid down 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.	
1.42	e)	Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report	
1.43	f)	In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	
1.44		Status of any litigations/ court cases filed/pending on the project should be provided.		No litigation is pending in any court against this project.
1.45		PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.	The DFO letter is attached in the Final EIA report.

1.46	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.				The clearance copy of approved mining plan letter is attached in the Annexure III.	
1.47	Details on the Forest Clearance should be given as per the format given:					
	Total ML Project Area	Total Forest land (ha) If more than one provide details of each FC	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of apply for diversion of forest land
	NA	NA	NA	NA	NA	NA
1.48	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report				Approved Mining plan of the expansion proposal is attached in the Annexure III and the mine closure plan is discussed in the Section 2.6.4 in Chapter II in the EIA report page 22-23.	
1.49	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.				The public hearing comments will be submitted during final EIA report.	
1.50	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes				The drone video survey will be submitted in the final EIA report.	
1.51	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of				The required documents for the proposed quarry are provided in the chronology order in Annexure III.	

	renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	
1.52	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)	The first page of the EIA report mentions the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification).
1.53	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter's section.	The provisions of ToR are shown in tabular form with respective chapter section and page no. Also, the sequence of respective ToR within the EIA-EMP report is mentioned in all chapter section.
1.54	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.	The proposed mine lease area is open cast semi mechanized mining operation. The impact and its mitigation measures are discussed under the Chapter IV in the EIA report page 94-111.

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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 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14th 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 Identification No. TO24B0108TN5130667N Dated:29.07.2024, File No.11015, this EIA report has been prepared for the project proponent, Ms.M.S.M Mining applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A over an extent of 2.78.5ha of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu. This EIA report takes into account the rough stone and Gravel quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects known as P1, P2 and two Existing projects E1 and E2. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016. The total extent of all the quarries is 12.23.48 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

Proposed Quarries					
Code	Name of the Owner	S.F. No	Village / Taluk	Extent (ha)	Status
P1	Tvl.MSM Mining	224/1A1, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F,252/11G, 252/11H, 252/12A, 252/5A4A,252/5A4B, 252/5A4C, 217/2, 217/3, 217/5, 217/7, 252/4A1,252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B	Pazhaveri, Uthiramerur Tk	2.78.50	Proposed Area
P2	Tvl.APK Minerals	207/4B, 207/5B, 207/6B, 207/7B, 207/8B, 207/9, 208/1A, 208/2A, 208/2B1, 208/2B2, 208/5A, 508/5C, 208/5D, 208/5E, 208/5F, 208/5G, 212/1L, 212/1M and 212/1N	Pazhaveri, Uthiramerur Tk	2.23.12	Newly Proposed quarry
Existing Quarry					
E1	Tvl.MSM Mining	225/1A, 225/1B2, 252/2A, 252/2B, 252/4B2, 252/5A1A, 252/5A1B, 252/5A1C, 252/5A1D, 252/5A1E, 252/5C, 252/6, 252/7B, 252/8A, 252/8B	Pazhaveri, Uthiramerur Tk	3.55.00	27.02.2020 to 26.02.2025
E2	Tvl. Udhayam Civil Constructions Pvt.Ltd	203/1A1A, 204/1A, 204/2, 205/1A, 205/2, 205/3, 206/1A, 206/2A, 207/1, 207/2A, 207/2B, 207/2C, 207/2D, 207/3, 207/4A, 207/5A, 207/6A, 207/7A, 207/8A	Pazhaveri, Uthiramerur Tk	3.66.86	12.07.2019 to 11.07.2024
Total Cluster Extent				12.23.48	

Source:

DD Letter - Rc.No.371/Q3/2023, Dated:12.06.2024.

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 **March-May 2024** 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/ 466184/2024, dated 17.06.2024) 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 21.06.2024.

Scoping

The proposal was placed in the 480th meeting of SEAC on 05.07.2024. 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 submitted in the final EIA report.

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.

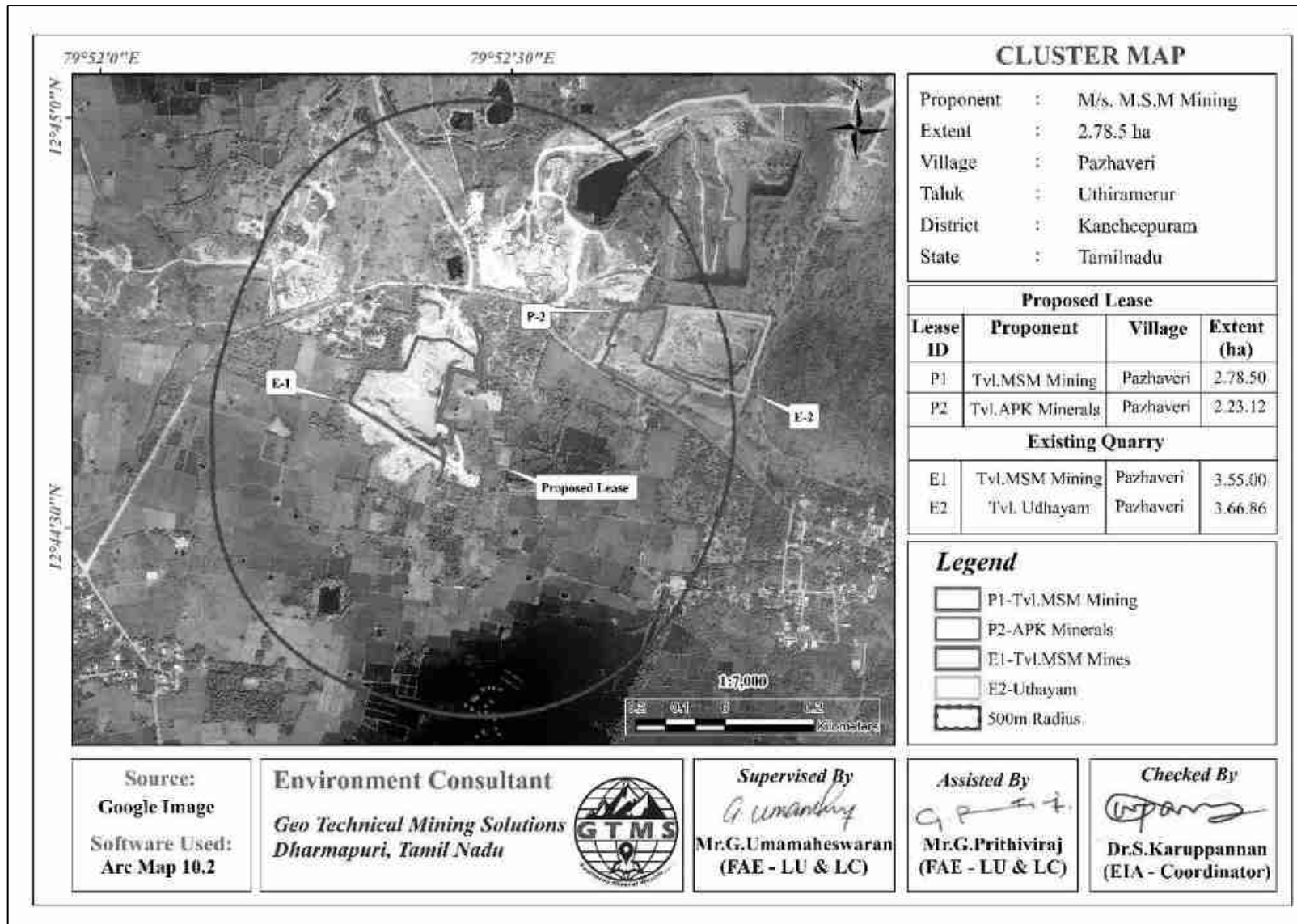


Figure 1.1 Location of the proposed and existing rough stone and gravel quarries in the cluster of 500m radius

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 Identification No. TO24B0108TN5130667N Dated:29.07.2024, File No.11015

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 1st June and 1st 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, 2010).

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

Name of the Project Proponent	M/s.M.S.M. Mining
Address	Partner, V.Sadaiyappan , S/o. Vaithy, No.15/1, Gandhi Street, Thiruneermalai, Chromepet, Chennai – 600044.
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 Pazhaveri Village, Uthiramerur Taluk, Kancheepuram

District, Tamil Nadu 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	M/s. M.S.M. Mining Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	2.78.5ha	
Toposheet No	57-P/14	
Location of Project Site	12°44'32.49"N to 12°44'44.94"N 79°52'24.68"E to 79°52'29.65"E	
Highest Elevation	70m AMSL	
Proposed depth of Mining	35m BGL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	918093	55642
Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	383552	40438
Proposed reserves for five years	Rough Stone in m ³	Gravel in m ³
	383552	40438
Method of Mining	Open-Cast Semi Mechanized mining	
Topography	Flat Topography	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Tipper	9
	Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.	
Proposed Manpower Deployment	20 Nos	
Project Cost	Rs.82,37,500	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	3.05 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 **March-May 2024** 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.

Note: As per the OM vide F.No.IA3-22/10/22-IA.III(E177258), the baseline monitoring data were collected during the period of March-May 2022 and utilized for preparation of this EIA report.

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, **M/s.MSM Mining** 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 26.10.2023 to extract rough stone and gravel. The precise area communication letter was issued by Department of Geology and Mining, Kancheepuram vide Rc.No.371/Q3/2023 Dated:06.06.2024. 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, Kancheepuram Rc.No.371/Q3/2023, dated:12.06.2024. 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 Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu as shown in Figure 2.2 & 2.3. The area lies between Latitudes from $12^{\circ}44'32.49''\text{N}$ to $12^{\circ}44'44.94''\text{N}$ and Longitudes from $79^{\circ}52'24.68''\text{E}$ to $79^{\circ}52'29.65''\text{E}$. The maximum altitude of the project area is 70m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

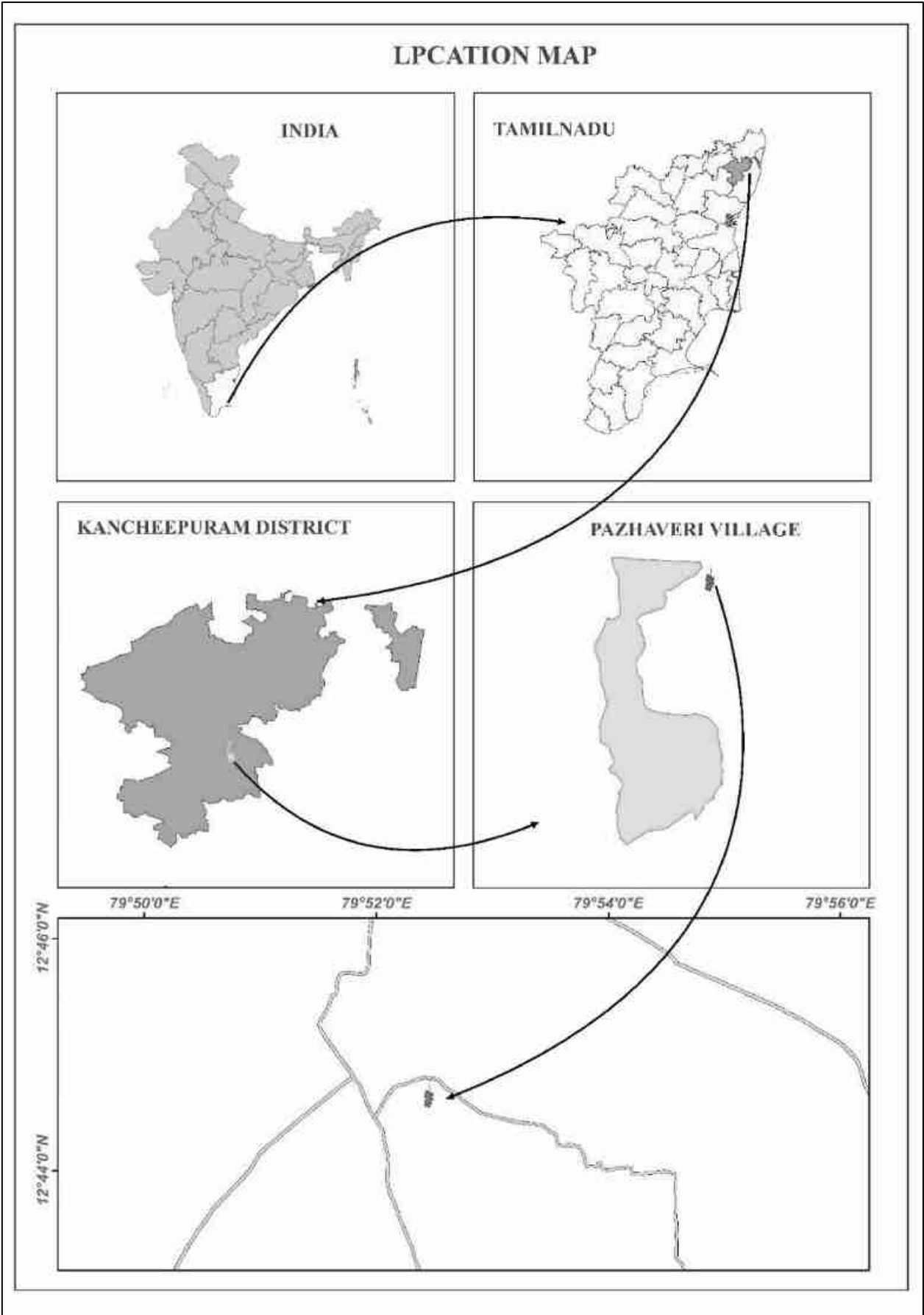


Figure 2.2 Location Map Showing the Project Site

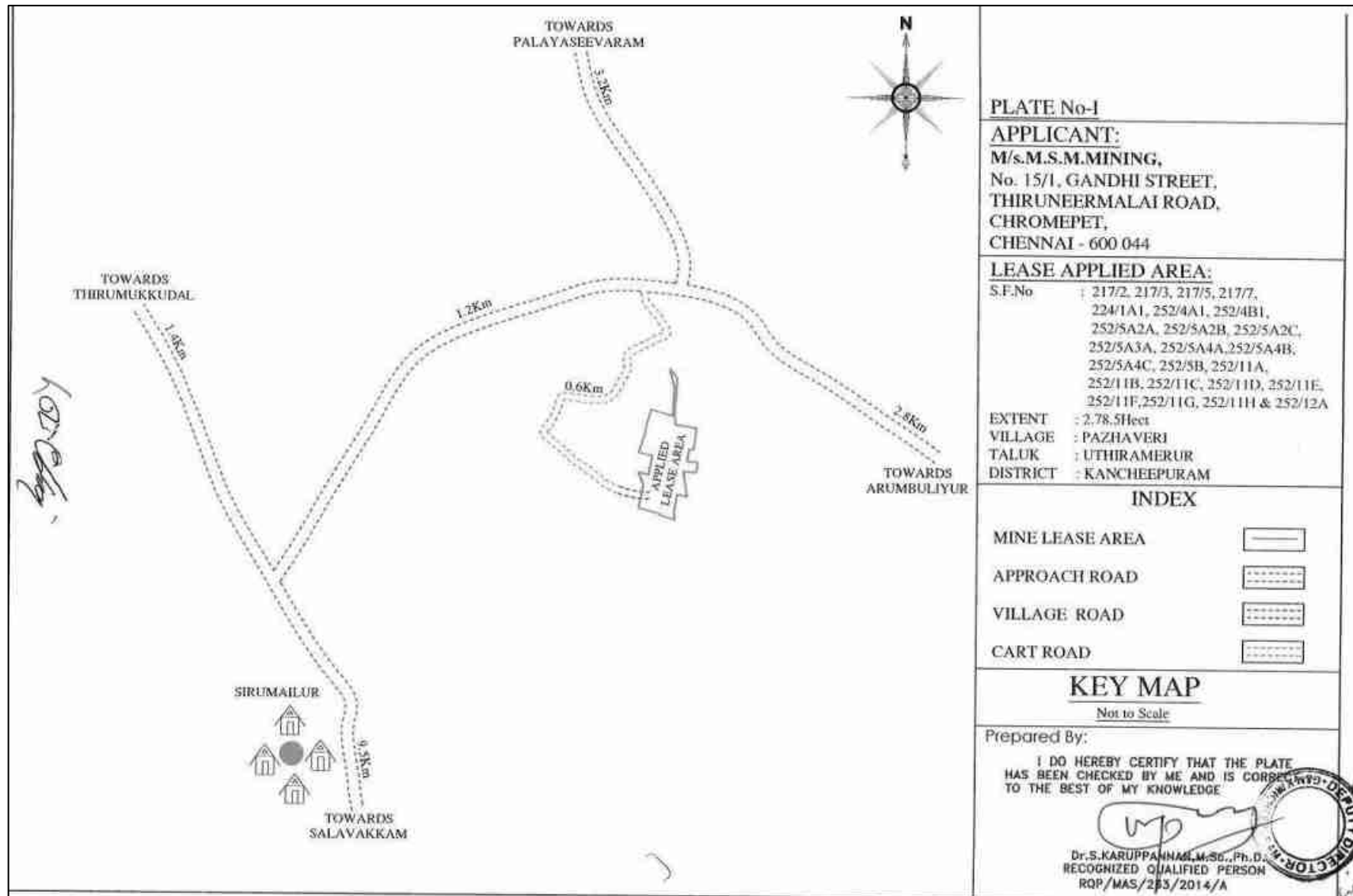


Figure 2.3 Key Map Showing Location of the Project Site

Table 2.1 Site Connectivity to the Project Area

Nearest Roadways	NH-132B - Walajabad - Chengalpattu	2.83 km N
	Village road - Arumbaliyur - Pazhaveri	70m-N
Nearest Town	Palur	4.1 km NE
Nearest Railway Station	Pazhayaseevaram	3.45 km N
Nearest Airport	Chennai	41.1 km NE
Nearest Seaport	Chennai	59.5 km NE
Nearest Villages	Thirumukkoodal	1.72 km NW
	Pinayur	1.77 km NE
	Pazhaveri	0.65 km E
	Arunkunram	0.8 km SW

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 2.78.5ha.
- ❖ 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 2.4 & 2.5.

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	12°44'44.94''N	79°52'27.25''E	15	12°44'32.49''N	79°52'27.79''E
2	12°44'44.10''N	79°52'27.87''E	16	12°44'32.83''N	79°52'26.59''E
3	12°44'40.98''N	79°52'27.66''E	17	12°44'32.95''N	79°52'26.59''E
4	12°44'40.29''N	79°52'27.78''E	18	12°44'33.47''N	79°52'24.74''E
5	12°44'40.05''N	79°52'29.49''E	19	12°44'35.40''N	79°52'25.12''E
6	12°44'38.26''N	79°52'29.26''E	20	12°44'36.38''N	79°52'24.68''E
7	12°44'38.30''N	79°52'28.91''E	21	12°44'36.18''N	79°52'25.53''E
8	12°44'37.29''N	79°52'28.74''E	22	12°44'37.72''N	79°52'25.85''E
9	12°44'37.20''N	79°52'29.65''E	23	12°44'37.99''N	79°52'24.70''E
10	12°44'36.40''N	79°52'29.49''E	24	12°44'39.71''N	79°52'25.24''E
11	12°44'36.50''N	79°52'28.43''E	25	12°44'39.91''N	79°52'25.24''E
12	12°44'34.41''N	79°52'28.78''E	26	12°44'41.53''N	79°52'25.72''E
13	12°44'34.61''N	79°52'27.96''E	27	12°44'41.02''N	79°52'27.52''E
14	12°44'33.06''N	79°52'27.69''E	28	12°44'43.35''N	79°52'27.61''E

2.4 GEOLOGY

The lease area geologically occurs over Acid to Intermediate Charnockite. The Charnockite, commercially called as rough stone occurs within the migmatite rock. Also, the lease area geomorphologically occurs pediment pediplain complex.

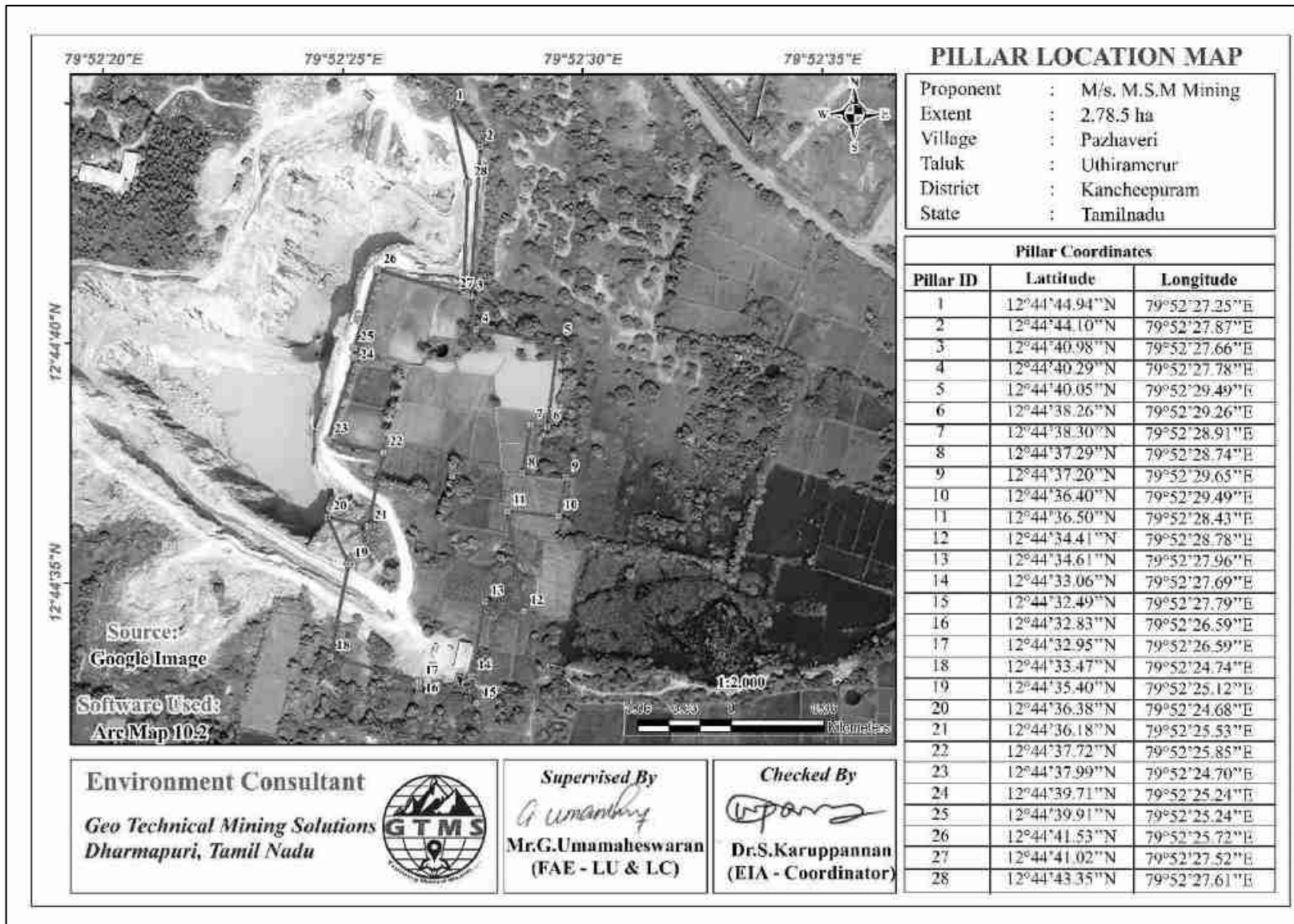
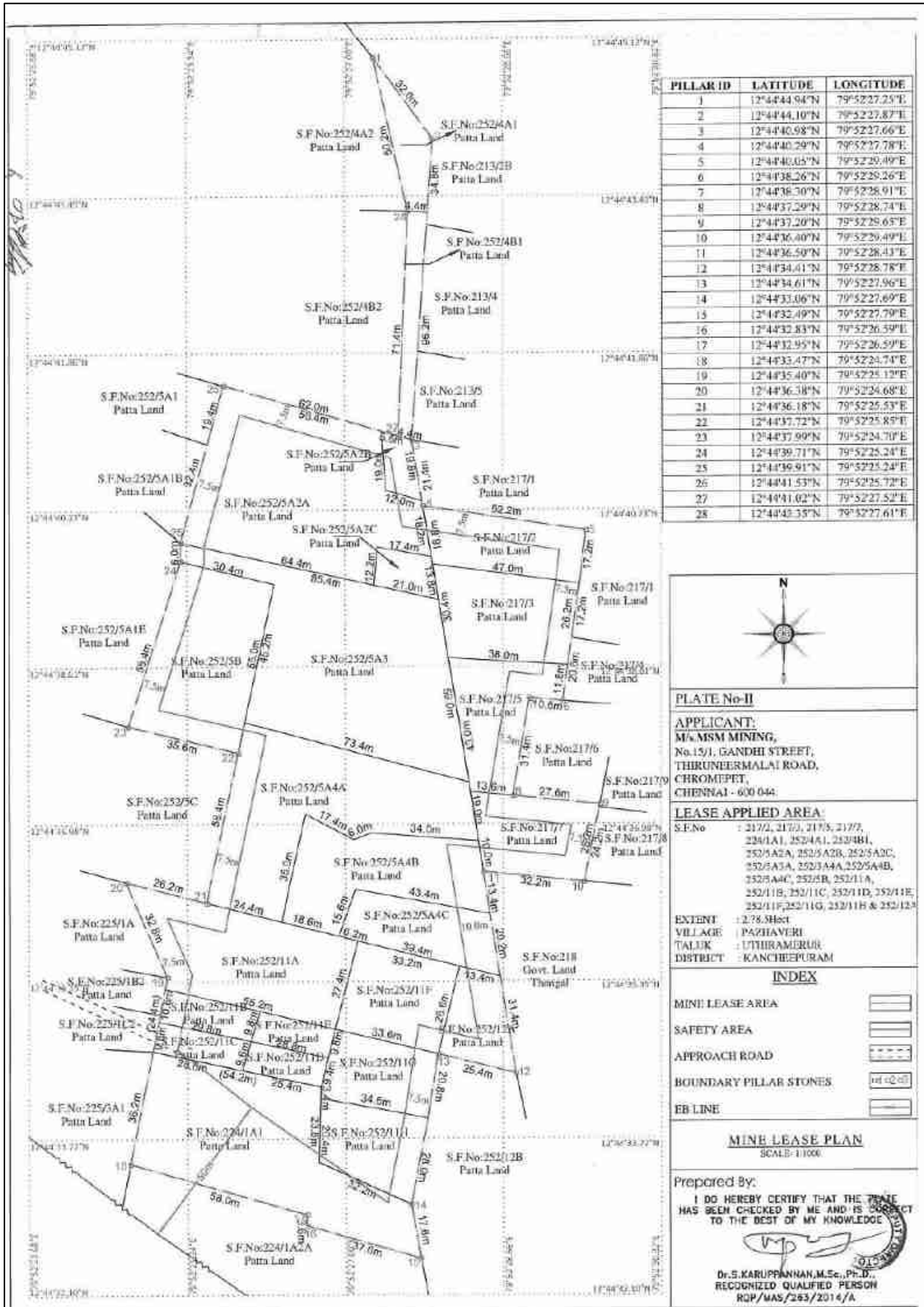


Figure 2.4 Google Earth Image Showing Lease Area with Pillars



PILLAR ID	LATITUDE	LONGITUDE
1	12°44'44.94"N	79°52'27.25"E
2	12°44'44.10"N	79°52'27.87"E
3	12°44'40.98"N	79°52'27.66"E
4	12°44'40.29"N	79°52'27.78"E
5	12°44'40.05"N	79°52'29.49"E
6	12°44'38.26"N	79°52'29.26"E
7	12°44'36.30"N	79°52'28.91"E
8	12°44'37.29"N	79°52'28.74"E
9	12°44'37.20"N	79°52'28.65"E
10	12°44'36.40"N	79°52'29.49"E
11	12°44'36.50"N	79°52'28.43"E
12	12°44'34.61"N	79°52'28.78"E
13	12°44'34.61"N	79°52'27.96"E
14	12°44'33.06"N	79°52'27.69"E
15	12°44'32.49"N	79°52'27.79"E
16	12°44'32.83"N	79°52'26.59"E
17	12°44'32.95"N	79°52'26.59"E
18	12°44'33.47"N	79°52'24.74"E
19	12°44'35.40"N	79°47'25.17"E
20	12°44'36.38"N	79°52'24.68"E
21	12°44'36.18"N	79°52'25.53"E
22	12°44'37.72"N	79°52'25.85"E
23	12°44'37.89"N	79°52'24.70"E
24	12°44'39.71"N	79°52'25.24"E
25	12°44'39.91"N	79°52'25.24"E
26	12°44'41.53"N	79°52'25.72"E
27	12°44'41.02"N	79°52'27.52"E
28	12°44'43.35"N	79°52'27.61"E

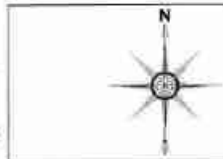


PLATE No-II

APPLICANT:
M/S MSM MINING,
No.15/1, GANDHI STREET,
THIRUNEERMALAI ROAD,
CHROMPET,
CHENNAI - 600 044.

LEASE APPLIED AREA:
S.F.No : 217/2, 217/3, 217/5, 217/7,
220/1A1, 252/4A1, 252/4B1,
252/5A2A, 252/5A2B, 252/5A2C,
252/5A3A, 252/5A4A, 252/5A4B,
252/5A4C, 252/5B, 252/11A,
252/11B, 252/11C, 252/11D, 252/11E,
252/11F, 252/11G, 252/11H & 252/12.

EXTENT : 2.78.Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHIPEPURAM

INDEX

- MINI LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONES
- EB LINE

MINE LEASE PLAN
SCALE: 1:1000

Prepared By:
I DO HEREBY CERTIFY THAT THE PLAN
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

[Signature]
Dr.S.KARUPPANNAN, M.Sc., Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

Figure 2.5 Mine Lease Plan

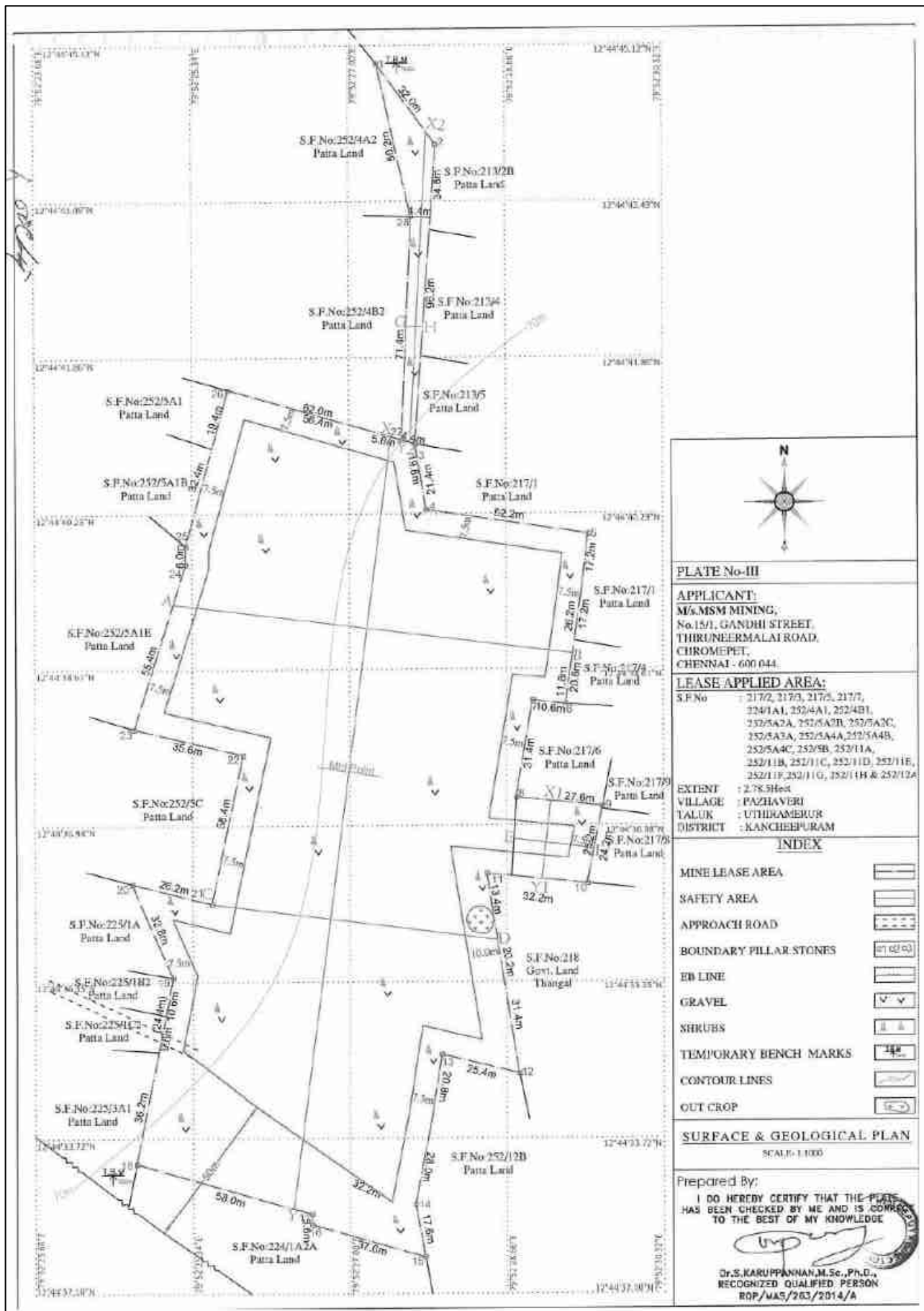


Figure 2.6 Surface & Geological Plan

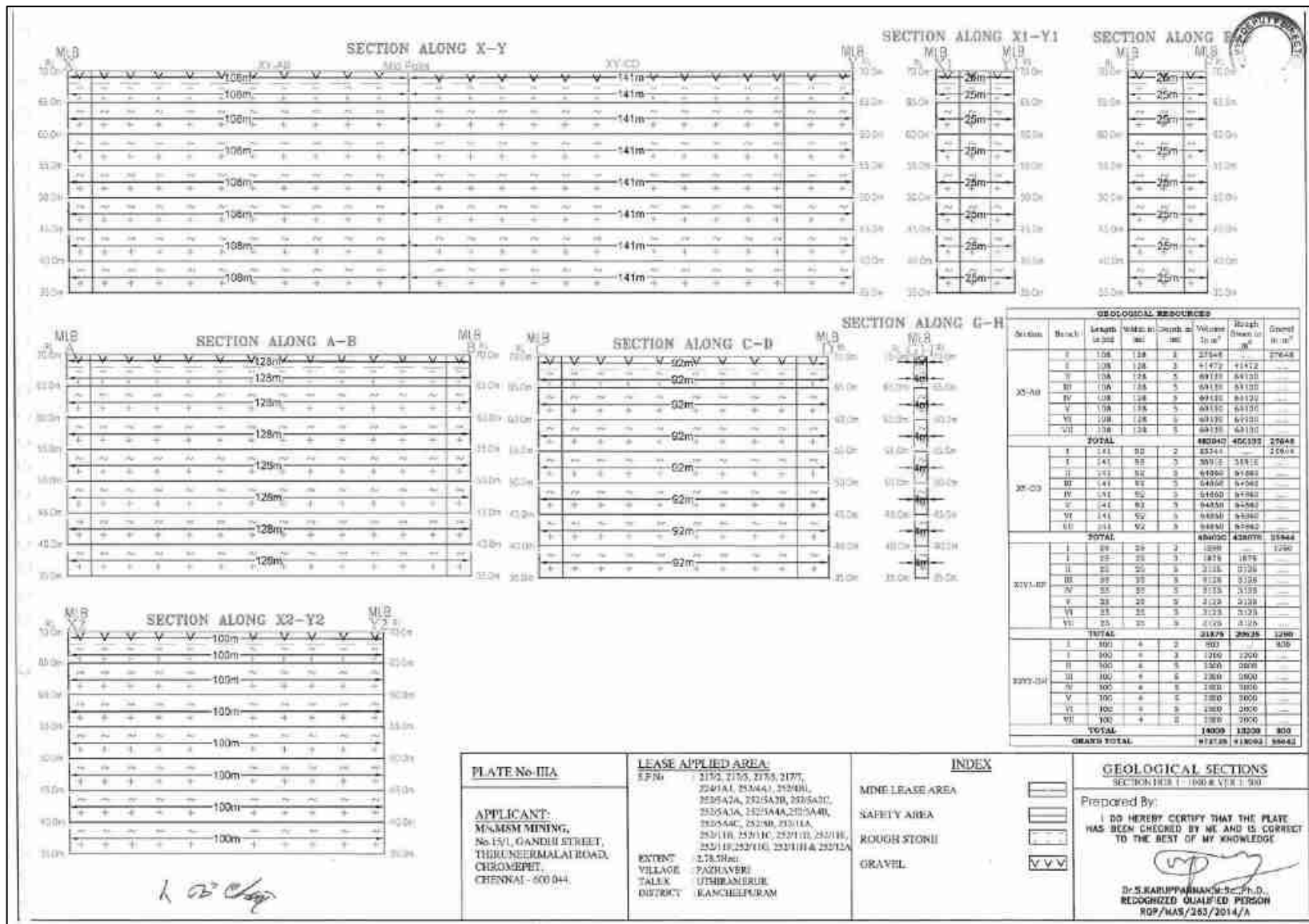


Figure 2.7 Geological Sections

2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone and Gravel 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 7.5 m and 10 m 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 35m 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 2.6 & 2.7 results of geological resources and reserves have been shown in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone in m ³	Gravel in m ³
Geological Resource in m ³	918093	55642
Mineable Reserves in m ³	383552	40438
Proposed production for 5 years m ³	383552	40438

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.8 & 2.9.

Table 2.4 Year-Wise Production Details

Year	Rough Stone in (m ³)	Top Soil in (m ³) / 1 year
I	84475	16950
II	77819	13276
III	78908	10212
IV	82085	0
V	60265	0
Total	383552	40438

Source: Approved Mining Plan & Tord

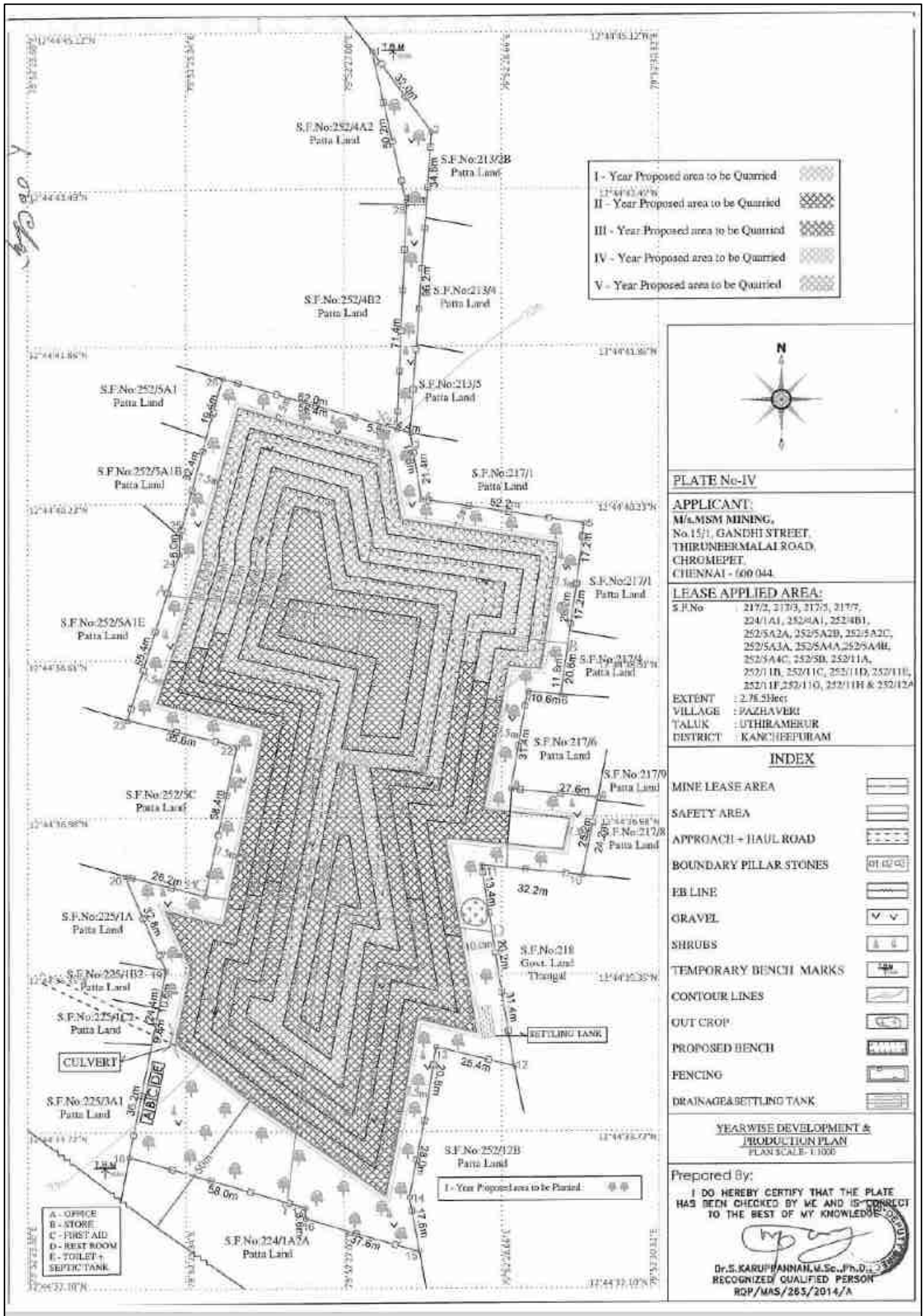


Figure 2.8 Year wise development & Production Plan

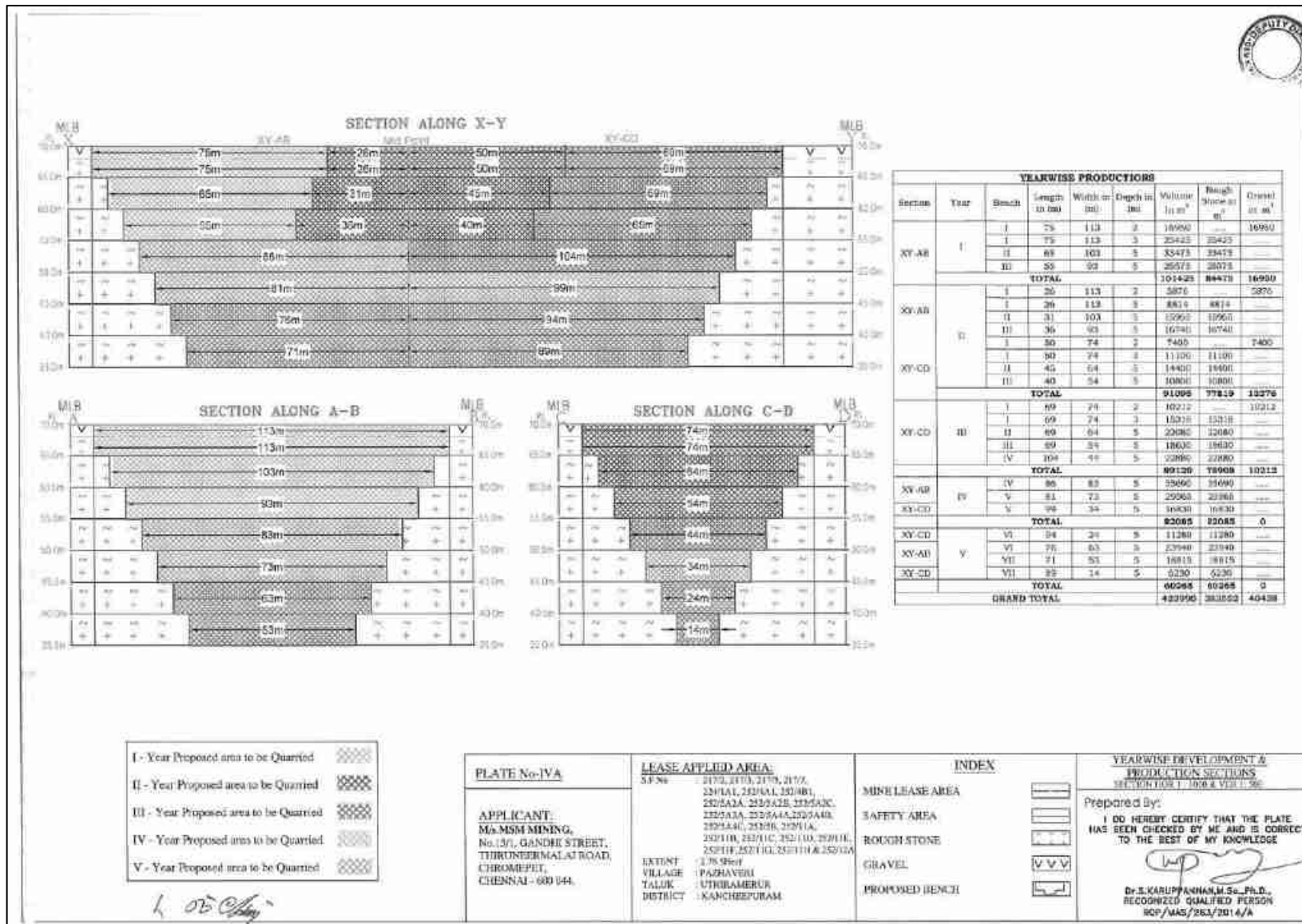


Figure 2.9 Year wise development & Production Section

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	1.2
Spacing (S) in m	1.38
Subdrill in m	0.5
Charge length (C) in m	0.70
Stemming	0.5
Hole Length (L) in m	1.2
Bench Height (BH) in m	2.5
Mass of explosive/hole in g	437.5
Stemming material size in mm	3.2
Burden stiffness ratio	2.08
Blast volume/hole in m ³	4.14
Production of rough stone/day in m ³	274
Number of blastholes/day	60
Number of blast round/day	2
Blasthole pattern	Staggered
Mass of explosive /day in kg	26.25
Powder factor in kg/m ³	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL

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

	Rough Stone in m³/ 5 years
Proposed production for 5 years	383552
Number of Working Days /Annum	270
Production of /Day (m ³)	284
No. of Lorry Loads	47

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	2	Hand held	--	Diesel
2	Compressor	1	Air	--	Diesel
3	Hydraulic Excavator	1	2.9 - 4.5 m ³	--	Diesel
4	Tipper	9	15MT	--	Diesel

2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan 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 2.78.5ha of land is unutilized. Whereas, at the end of the mine life, about 1.86.0ha of land is used for area under quarry, about 0.75.0ha of land is used for green belt, 0.07.0 will be used for roads, 0.02.0 is used for infrastructure and about 0.08.5ha of land is used for drainage & settling tank.

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 quarry	Nil	1.86.0
Infrastructure	Nil	0.02.0
Roads	Nil	0.07.0
Green Belt & Dump	Nil	0.75.0
Drainage & Settling Tank	Nil	0.08.5
Unutilized area	2.78.5	Nil
Total	2.78.5	2.78.5

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
557 plants inside the lease area	111400
836 plants outside the lease area	250650
Wire Fencing	557000
Renovation of Garland Drain	27850
Total	9,46,900

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 and Figure 2.11 & 2.12.

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth (m)
I	119	113	35

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.

2.6.7 Water Requirement

Detail of water requirement in 3.05 KLD is given in Table 2.11.

Table 2.11 Water Requirement for the Project

Purpose	Quantity	Source
Dust Suppression	1.0 KLD	Existing bore wells nearby the lease area
Green Belt development	1.0 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.05 KLD	Existing bore wells and approved water vendors
Total	3.05 KLD	

Source: Prefeasibility Report

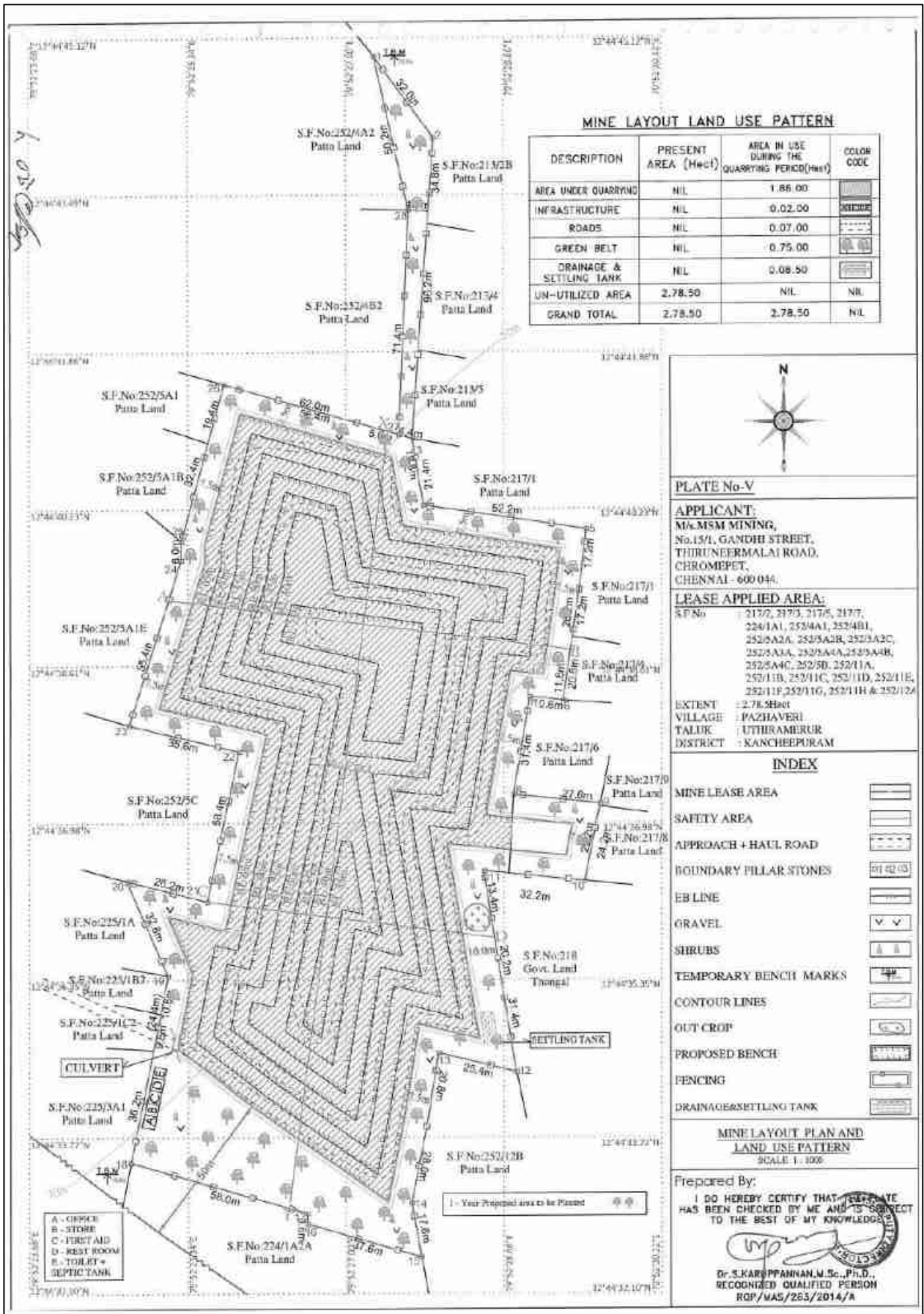


Figure 2.10 Mine Layout Plan and Land Use Pattern

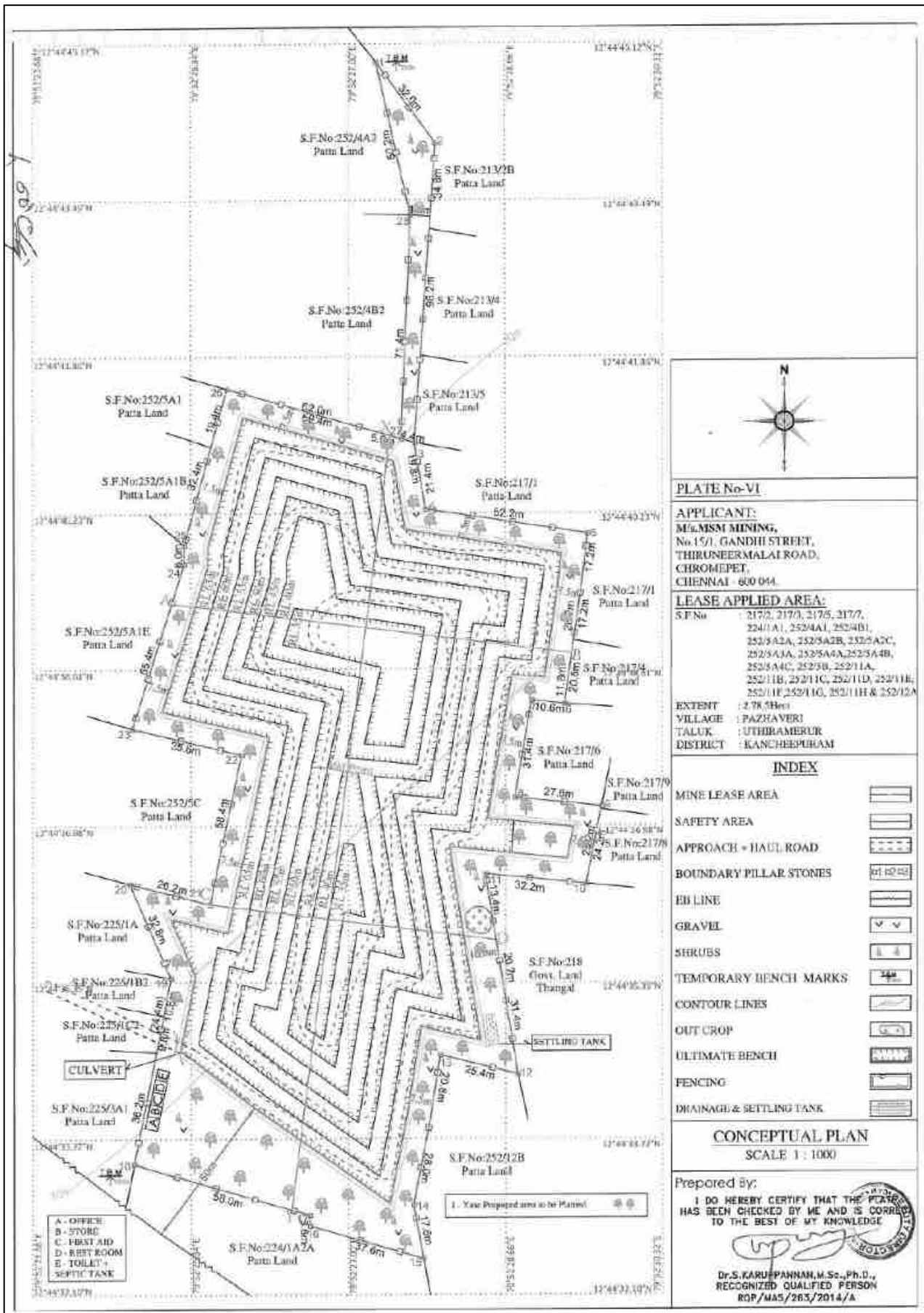


Figure 2.11 Conceptual Plan

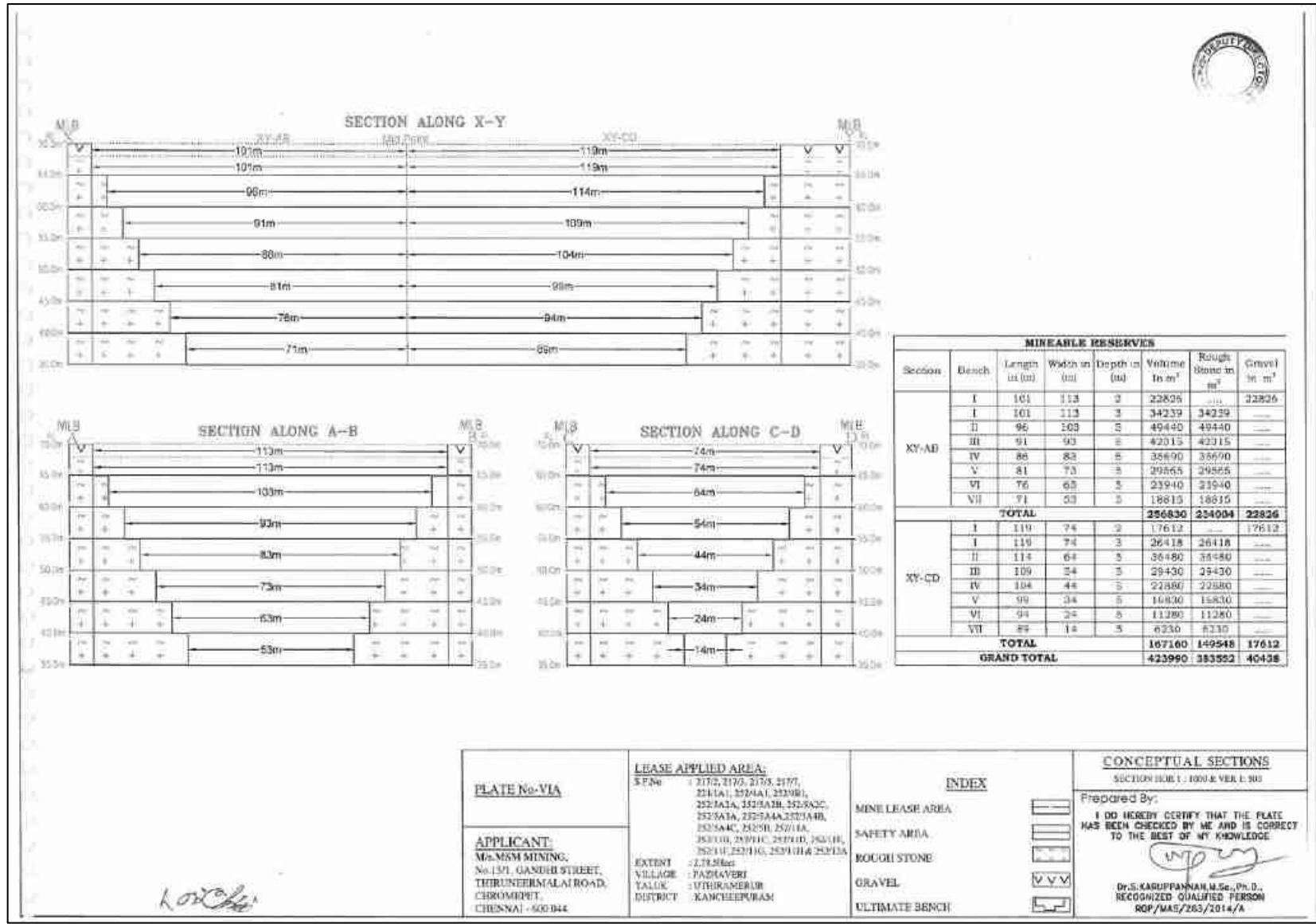


Figure 2.12 Conceptual Sections

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 1759282 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

Fuel Requirement for Excavator			
Details	Rough Stone (383552 m³)	Gravel (40438 m³)	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m ³ /hr)	20	60	---
Time Required (hours)	19178	674	---
Total Diesel Consumption for 5 years (litre)	306842	6740	313582
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	60	---	---
Total Diesel Consumption for 5 years (litre)	32400	---	32400
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m ³	6	6	---
Number of Trips / days	47	5	---
Number of Trips / 5 years	63925	6740	---
Total Diesel Consumption for 5 years (litre)	1278507	134793	1413300
Total Diesel Consumption by Excavator, Compressor and Tipper			17,59,282

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

2.6.9 Capital Requirement

The project proponent will invest **Rs.82,37,500/-** 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	34,54,000/-
2	Machinery cost	20,00,000/-
3	EMP Cost	27,83,500/-
Total Project Cost		82,37,500/-

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	16
Total			20

Source: Prefeasibility 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 st	2 nd	3 rd	4 th	5 th	
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. The environmental consultant for both the clusters are the same. The monitoring of ambient air quality, noise levels, water quality and soil analysis for the nearby cluster were done in pre monsoon season from March to May 2022 through the third party NABL accredited laboratory. The baseline monitoring done for 5km radius (TERMS OF REFERENCE [TOR] FOR EIA REPORT FOR ACTIVITIES / PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE Prepared by Administrative Staff College of India, Bellavista, Khairatabad, AUGUST 2009, Page No.86) not varied as much. Therefore, we utilize the baseline data for this cluster which is collected for the adjacent cluster in the year 2022 between March to May as per the Office Memorandum F. No. IA3-22/10/2022IA.III [E 177258] issued by Government of India Ministry of Environment, Forest and Climate Change (IA Division) dated 8th June 2022. We also collected the baseline data in one location i.e, in the core for the present cluster in the pre monsoon season March to May 2024 for cross verification. Field monitoring studies to evaluate the base line status of the project site were carried out covering **March through May 2024** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** 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

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
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	8 (1 in core & 7 in buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	10 (4 surface water & 6 ground water)	IS 10500& CPCB Standards
Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/aut omatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM ₁₀ PM _{2.5} SO ₂ NO _x	24 hours, twice a week	10 (1 core & 9 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	13 (1 core & 12 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 Quadrat & 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 acid to intermediate Charnockite, as shown in Figure 3.1. The lease area occurs in Charnockite 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.

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, 6 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 111.89 ha accounting for 1.35 %, of which lease area of 2.78.5 ha contributes only about 0.024 %. 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.	Classification	Area (ha)	Area (%)
1	Crop Land	5114.42	61.70
2	Builtup Area	934.48	11.27
3	Water bodies	747.35	9.02
4	Mining/Industrial Area	111.89	1.35
5	Plantation	162.44	1.96
6	River Sand	1218.12	14.70
Total		8288.7	100.0

Source: Sentinel II Satellite Imagery

3.1.3 Topography

The proposed lease area Exhibits flat topography the high elevation in 70m ASML observed in North Side of the lease area the Slope is towards South Side and falls in Toposheet No 57-P/14.

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 III, as defined by National Centre for Seismology ([Official Website of National Centre of Seismology](#)). The Zone III 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.

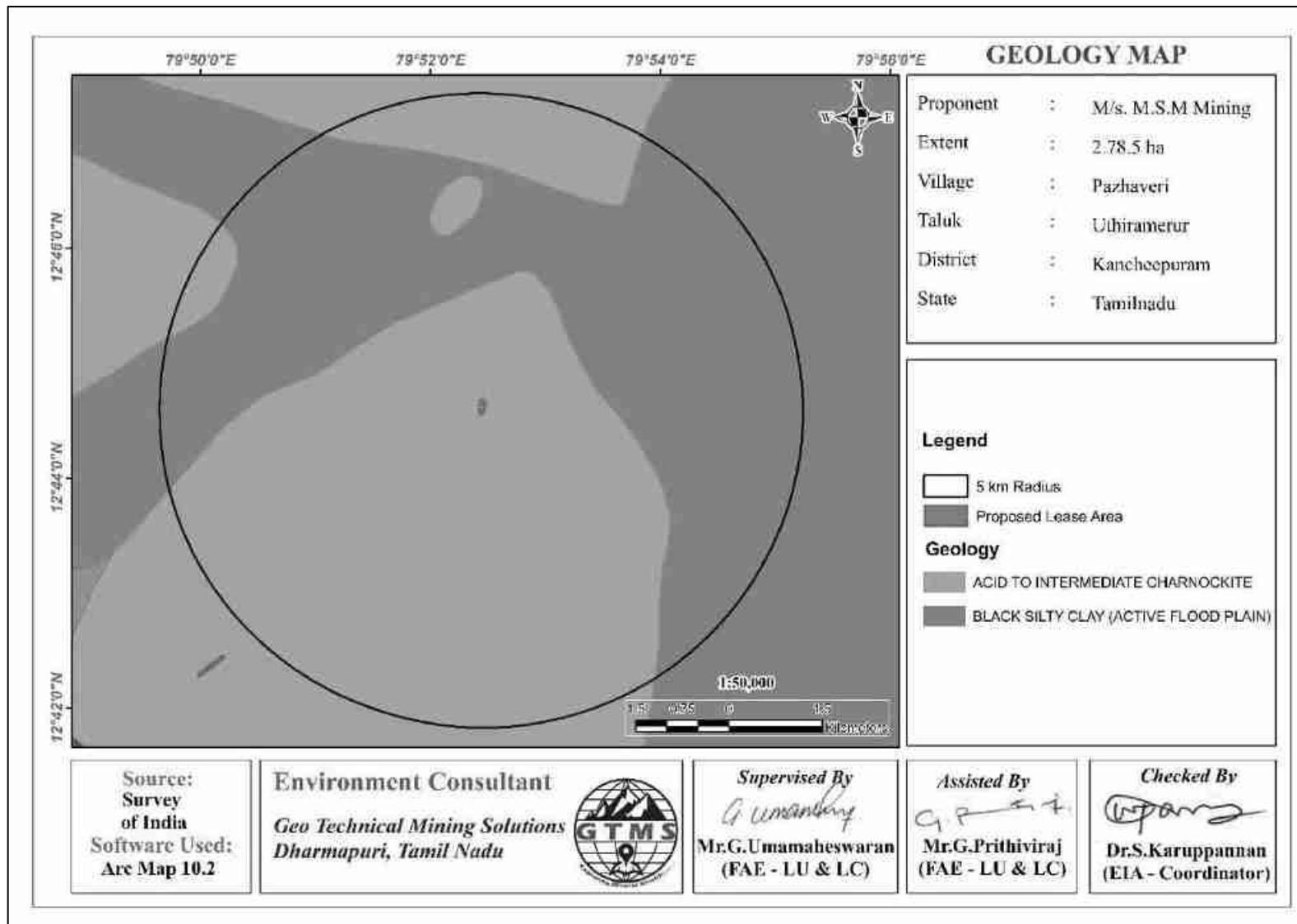


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

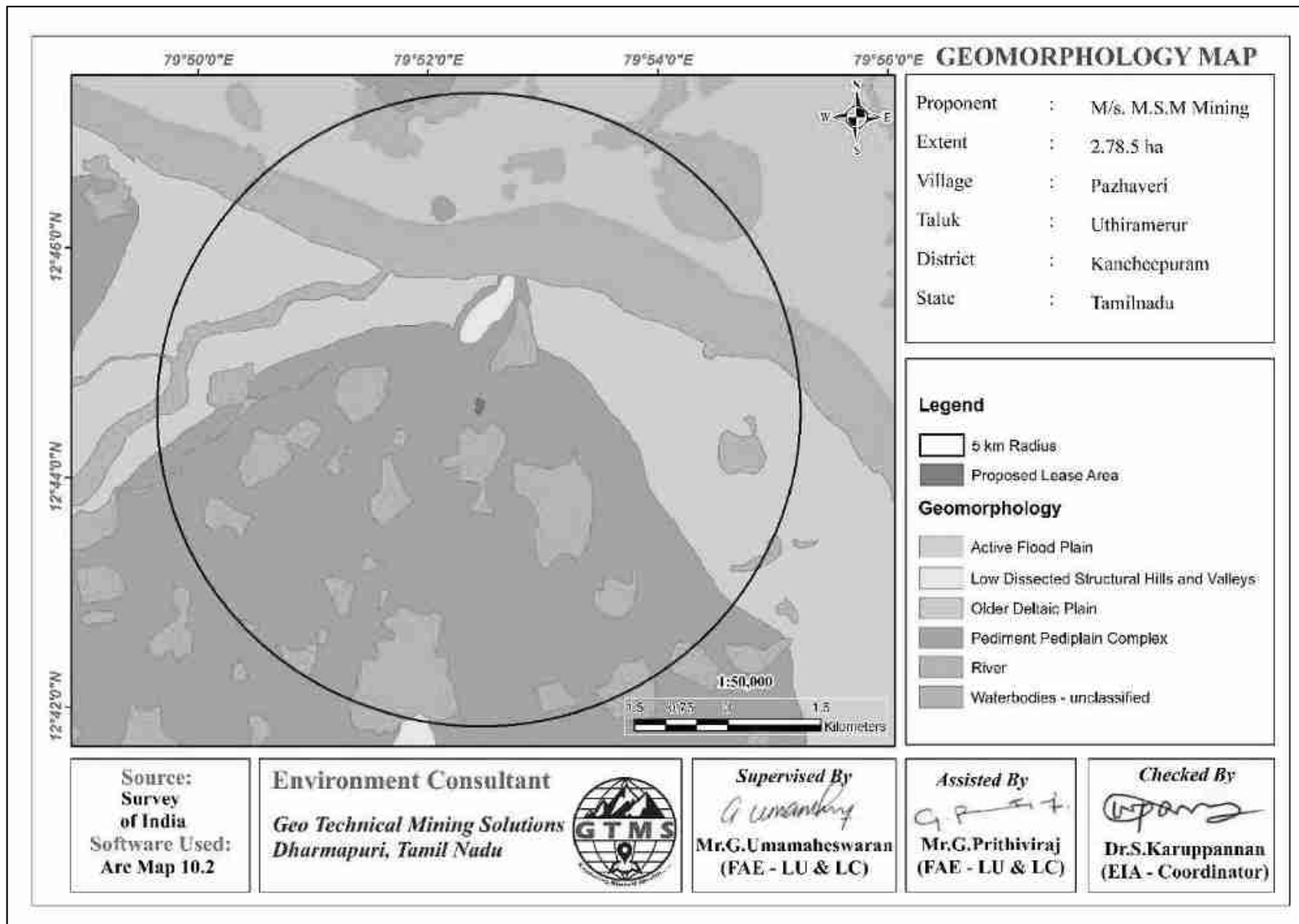


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site

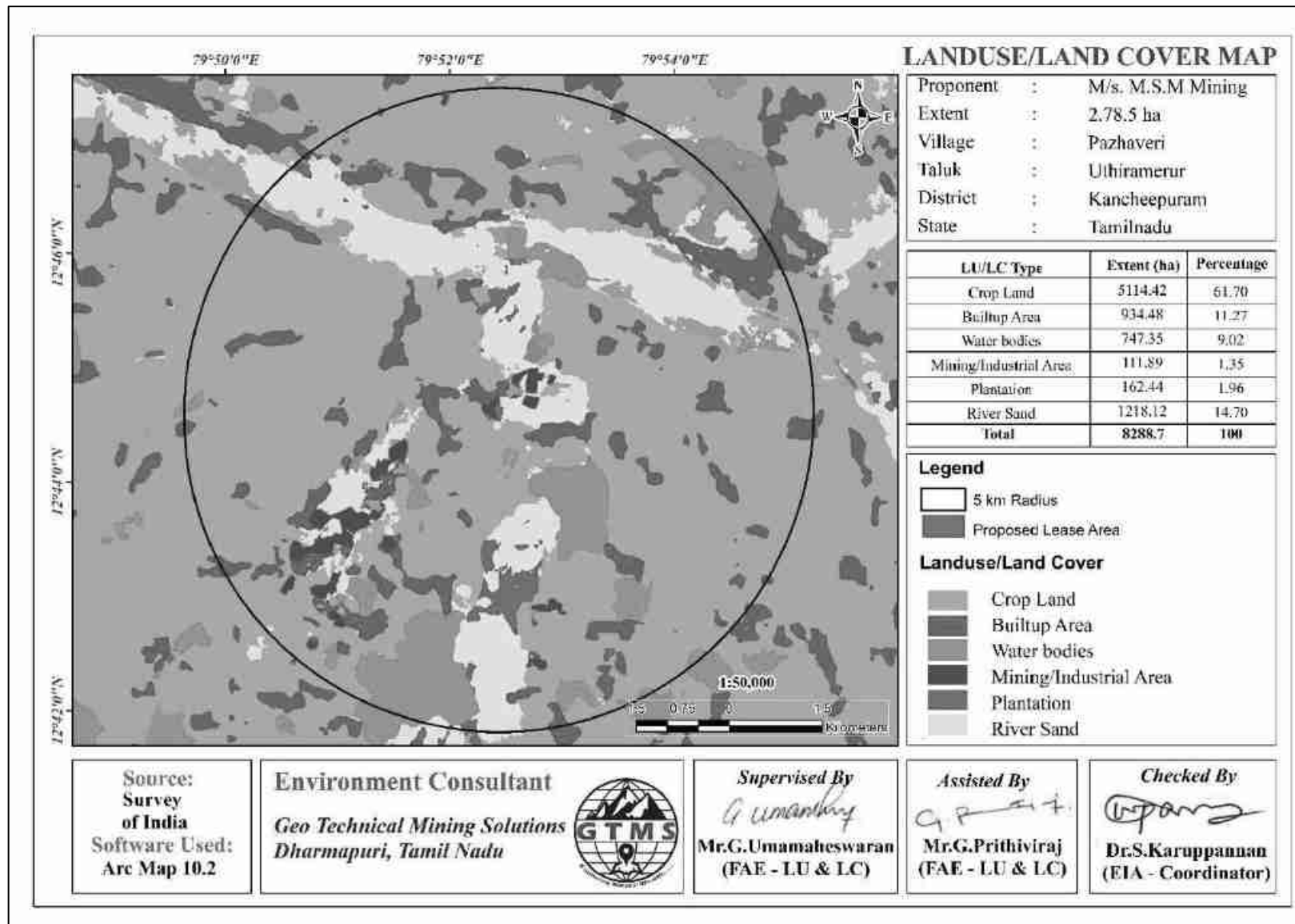


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site

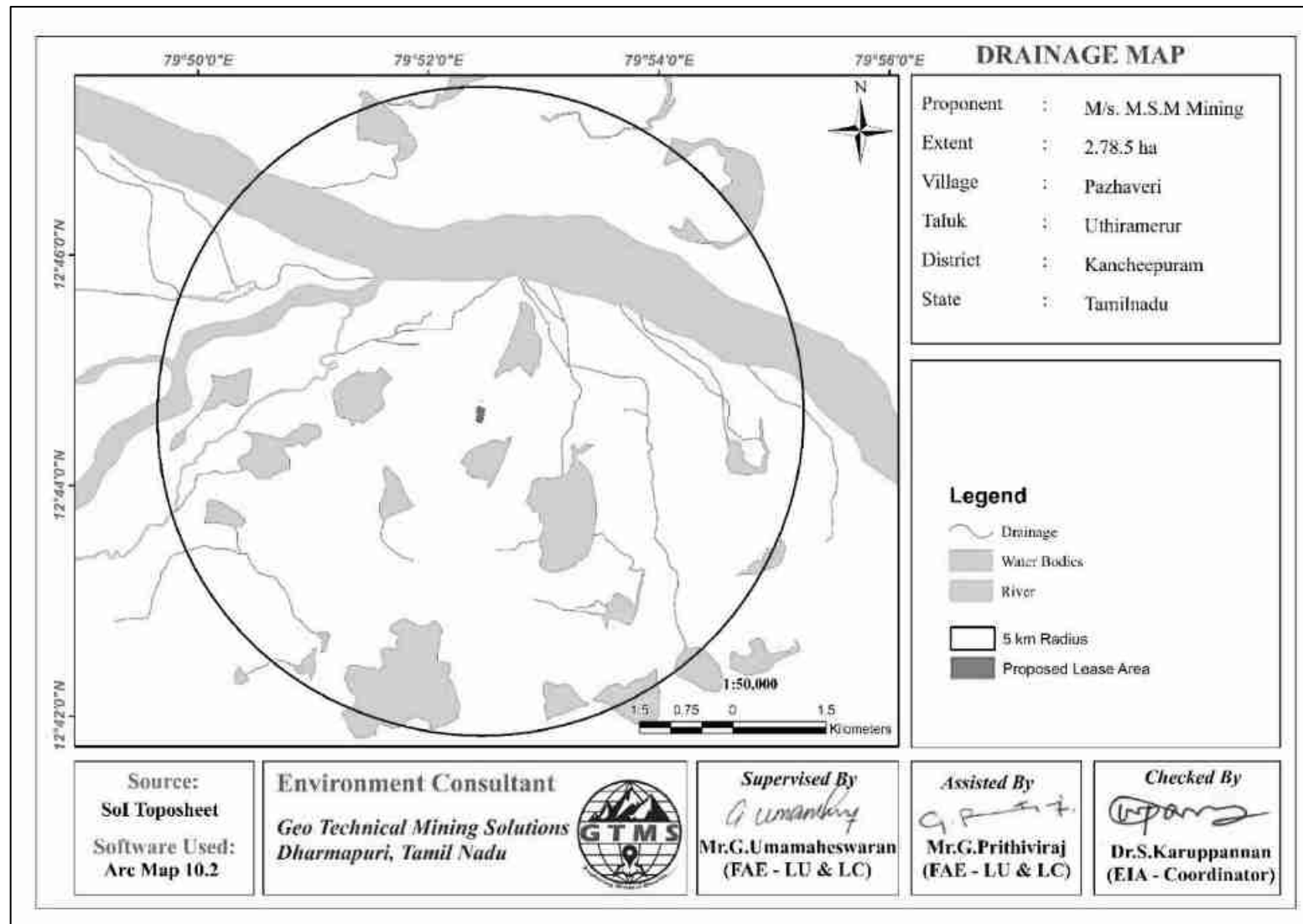


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site

3.1.6 Soil

Composite soil samples were collected from 6 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 3.5.

Table 3.3 Soil Sampling Locations

Sampling ID	Location	Distance (km)	Direction	Coordinates
S01	Core zone	---	---	12°44'37.84"N, 79°52'27.43"E
S02	Pazhaveri	1.43	SE	12°44'15.98"N, 79°53'11.99"E
S03	Hemprasath core	2.03	SW	12°43'35.49"N, 79°51'52.31"E
S04	Sirudamur	2.72	W	12°44'35.28"N, 79°50'54.56"E
S05	Thirumukkudal	1.78	NW	12°45'9.17"N, 79°51'34.05"E
S06	Pinayur	1.82	NE	12°45'17.83"N, 79°53'17.71"E

Source: On-site monitoring/sampling Accuracy Analabs Laboratory and Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS.

Physical Characteristics & Chemical Characteristics

The soil samples in the study area show loamy textures varying between clay loam and sandy loam. pH of the soil varies from 6.92 to 7.42 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 58.97 to 120.4 dsm^{-1} . The physical and chemical properties of soil is shown in the Table 3.5.

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 3.4 Water Sampling Locations

Sampling ID	Location	Distance (km)	Direction	Coordinates
GW1	Pazhaveri	0.68	E	12°44'32.04"N, 79°52'51.36"E
GW2	Edamichi	5.02	SSE	12°41'52.24"N, 79°53'0.28"E
GW3	Thirumukkudal	1.79	NW	12°45'8.95"N, 79°51'33.16"E
SW1	Siruthamur lake	1.67	SW	12°43'51.30"N, 79°51'50.02"E
SW2	Palar River	2.15	NE	12°45'47.43"N, 79°52'59.45"E

Source: On-site monitoring/sampling Accuracy Analabs Laboratory and Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS.

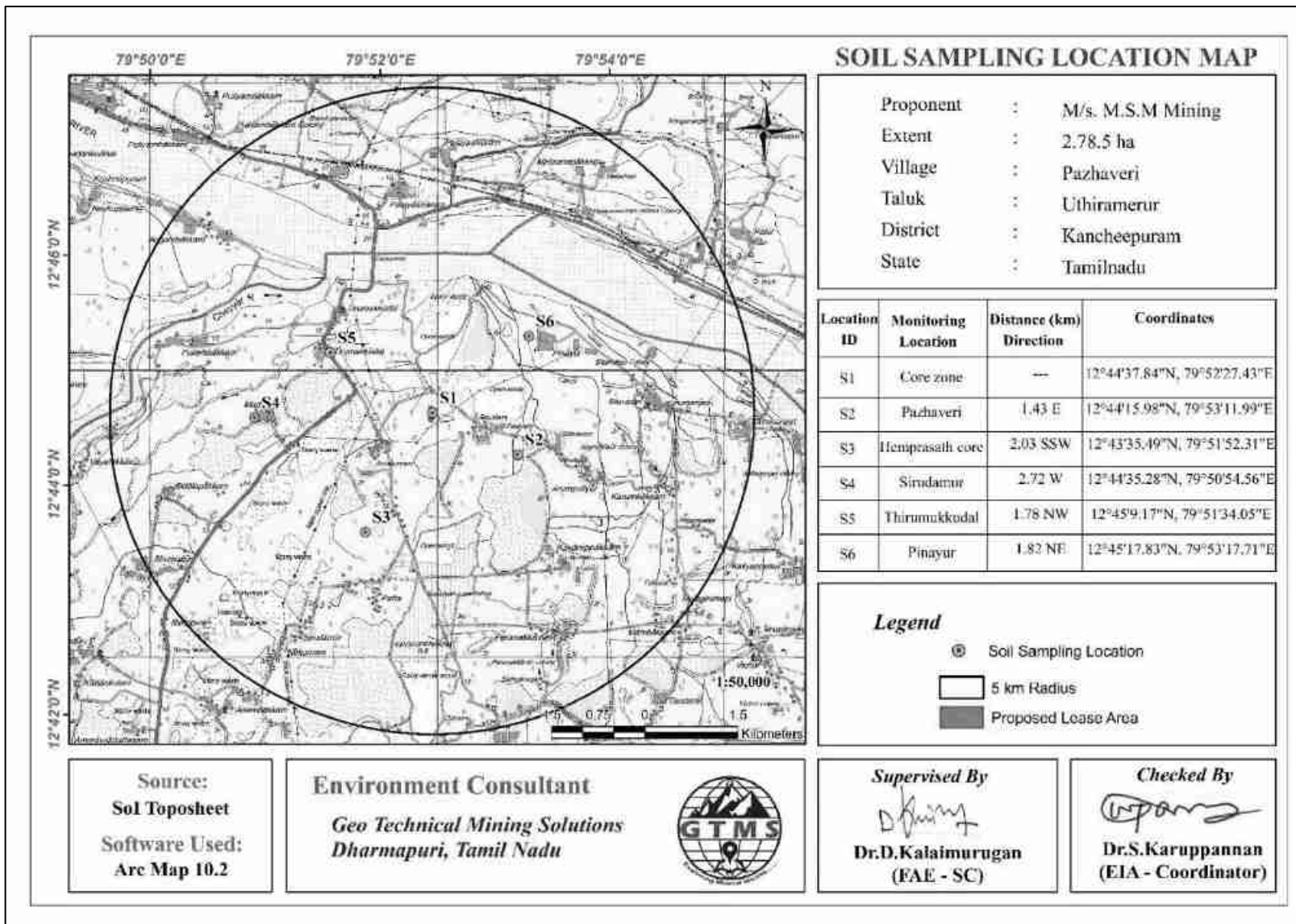


Figure 3.5 Toposheet Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.5 Soil Quality of the Study Area

Greenlink Analytical and Ressearch Laboratory					Accuracy Analabs					
S. No	Parameters	Unit	Core	Pinayur	Parameters	Unit	Pazhaveri	Hemprasath Core	Sirudamur	Thirumukkudal
1	pH	-	7.32	7.42	pH@25°C	-	7.26	6.92	7.14	7.12
2	EC	µS/cm	98.0	104.0	EC@25°C	µS/cm	120.4	84.56	58.97	95.43
3	Total Organic Carbon	%	0.34	0.42	Dry matter content	-	94.51	64.19	94.71	93.45
4	Available Nitrogen	kg/ha	165.0	172.0	Water content	%	5.49	6.19	5.29	6.55
5	Available Potassium	kg/ha	112.0	124.0	Organic matter	%	0.72	0.89	1.52	1.42
6	Available Phosphorous	mg/kg	46.8	48.2	Soil Texture	%	Sandy loam	Sandy loam	Sandy loam	Sandy loam
7	Available Calcium	mg/kg	880.0	910.0	Sand	%	39.52	59.13	56.68	52.3
8	Available Magnesium	mg/kg	428.0	453.0	Silt	%	37.63	17.56	32.56	35.32
9	Moisture	%	13.8	14.1	Clay	%	22.85	23.31	10.76	12.38
10	Organic matter	%	0.61	0.72	Phosphorous	mg/kg	1.9	0.84	1.24	1.15
11	Chloride	mg/100g	124.0	133.0	Sodium	mg/kg	420	423	585	654
12	Bulk Density	kg/cm ³	1345.0	1296.0	Potassium	mg/kg	308	384	910	765
13	Porosity	%	36.0	34.0	Nitrogen	mg/kg	120	96.5	122	128
14	Copper	ppm	39.6	40.4	Sulphur	%	BDL (D.L.0.02)	BDL(D.L.0.02)	BDL(D.L.0.02)	BDL(D.L.0.02)
15	Nickel	ppm	1.482	1.588	<i>Source: Sampling Results by Greenlink Analytical and Ressearch Laboratory & Accuracy Analabs in association with GTMS.</i>					
16	Zinc	ppm	26.61	27.41						
17	Iron	ppm	16780.0	17480.0						
18	Lead	ppm	6.98	6.81						

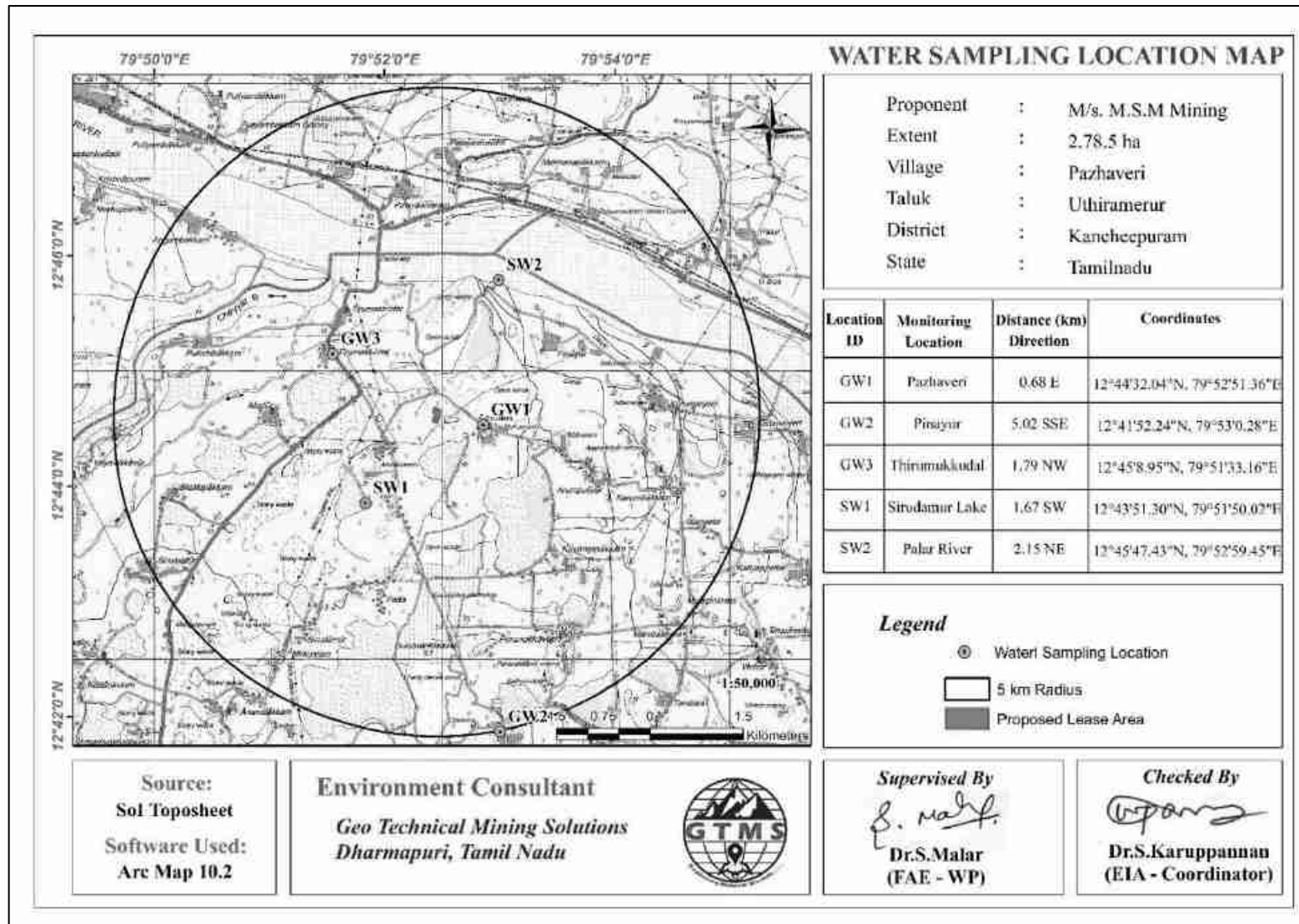


Figure 3.6 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.6 Ground Water Quality Result

Accuracy Analabs					
S.No.	Parameters	Unit	GW1 Pazhaveri	GW2 Edamichi	Standard
1	Colour	Hazen	Agreeable	Agreeable	5
2	Turbidity	NTU	<1	<1	1
3	pH@ 25°C	-	7.59	7.35	6.5 – 8.5
4	EC@25°C	µS/cm	632	698	---
5	TDS	mg/l	686	912	500
6	Total hardness	mg/l	302	561	200
7	Calcium	mg/l	91	92	75
8	Magnesium	mg/l	17	20	30
9	Sodium	mg/l	16	16	---
10	Potassium	mg/l	12	11.6	---
11	Total Alkalinity	mg/l	334	181	200
12	Chloride	mg/l	145	275	250
13	Sulphate	mg/l	61	84	200
14	Iron	Fe	0.14	0.17	0.3
15	Fluoride	F	0.52	0.720	1
Greenlink Analytical and Research laboratory (India) Private Ltd					
S.No	Parameters	Unit	GW3 - Thirumukkudal	Standard	
1	pH	-	7.21	6.5 – 8.5	
2	Total Dissolved Solids	mg/l	262.0	500	
3	EC	µS/cm	403.0	---	
4	Turbidity	NTU	0.61	1	
5	Color	Hazen	<1.0	5	
6	Calcium	mg/l	36.07	75	
7	Magnesium	mg/l	14.59	30	
8	Chloride	mg/l	121.2	250	
9	Sulphate	mg/l	61.2	250	
10	Silica	mg/l	1.75	---	
11	Total Residual Chlorine	mg/l	BDL[DL-0.1]	0.2	
12	Sodium	mg/l	23.0	---	
13	Total Hardness	mg/l	150.0	200	
14	Total Alkalinity	mg/l	122.0	200	
15	Fluoride	mg/l	<0.1	1	
16	Odour	-	Agreeable	Agreeable	
17	Taste	-	Agreeable	Agreeable	
18	Total Solids	mg/l	312.0	---	
19	Dissolved Oxygen	mg/l	5.2	---	
20	Phosphorous	mg/l	1.48	---	
21	Potassium	mg/l	2.6	---	
22	Nitrite	mg/l	BDL[DL-0.1]	---	
23	Phenolphthalein Alkalinity	mg/l	BDL[DL-1.0]	200	
24	Total Coliform	CFU/ml	Absent	Absent	
25	Escherichia Coli	CFU/ml	Absent	Absent	

Table 3.7 Surface Water Quality Result

Greenlink Analytical and Research laboratory (India) Private Ltd				
S.No	Parameters	Unit	SW2	Standard
1	pH	-	7.01	6.5-8.5
2	Total Dissolved Solids	mg/l	248.0	500
3	EC	µS/cm	396.0	---
4	Turbidity	NTU	0.51	1
5	Color	Hazen	<1.0	5
6	Calcium	mg/l	32.0	75
7	Magnesium	mg/l	14.59	30
8	Chloride	mg/l	101.4	250
9	Sulphate	mg/l	52.8	250
10	Silica	mg/l	1.28	---
11	Total Residual Chlorine	mg/l	BDL[DL-0.1]	0.2
12	Sodium	mg/l	18.0	---
13	Total Hardness	mg/l	130.0	200
14	Total Alkalinity	mg/l	118.0	200
15	Fluoride	mg/l	<0.1	1.0
16	Odour	-	Agreeable	Agreeable
17	Taste	-	Agreeable	Agreeable
18	Total Solids	mg/l	274.0	---
19	Dissolved Oxygen	mg/l	4.2	---
20	Phosphorous	mg/l	1.21	---
21	Potassium	mg/l	2.5	---
22	Nitrite	mg/l	BDL[DL-0.1]	---
23	Phenolphthalein Alkalinity	mg/l	BDL[DL-1.0]	200
24	Total Coliform	CFU/ml	Absent	Absent
25	Escherichia Coli	CFU/ml	Absent	Absent
Accuracy Analabs				
S.No	Parameters	Unit	SW1 Sirudamur	IS 2296 Class-A
1	Color	-	6	
2	Turbidity	NTU	5	1
3	pH@25 ⁰ C	-	7.1	6.5 – 8.5
4	EC@25 ⁰ C	ms/cm	495	---
5	TDS	mg/l	142	500
6	Total hardness	mg/l	48.34	200
7	Calcium	mg/l	54.7	---
8	Magnesium	mg/l	27	---
9	Sodium	mg/l	13	---
10	Potassium	mg/l	3	---
11	Chloride	mg/l	52	250
12	Sulphate	mg/l	37	400
13	Iron	mg/l	BDL	0.3

Source: Sampling Results by Greenlink research and Laboratory & Accuracy Analabs, in association with GTMS

3.2.1 Surface Water Resources and Quality

Palar River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 2.15 km NE of Palar River, as shown in Table 3.4 and Figure 3.6. Two surface water sample, known as SW1 were collected from the Sriudamur lake (1.67 km SW), SW2 were collected from the Palar River (2.15 km NE) to assess the baseline water quality. Table 3.7 summarizes surface water quality data of the collected sample. Result for surface water sample in the Table 3.7 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

3.2.2 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. Three groundwater samples, known as GW1, GW2 and GW3, were collected from bore 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 3.4 and the spatial occurrence of water sampling locations is shown in Figure 3.6. 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, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

3.2.3 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.

Rainfall

Rainfall data for the study area were collected for the period of 1981-2021([POWER | Data Access Viewer \(nasa.gov\)](#)). Long term monthly average rainfall was estimated from the data of 2000-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.10. The Figure 3.7 shows that rainfall is generally high in the months of August through November in every year. Particularly, rainfall in May through August of 2022 is higher than the previous years.

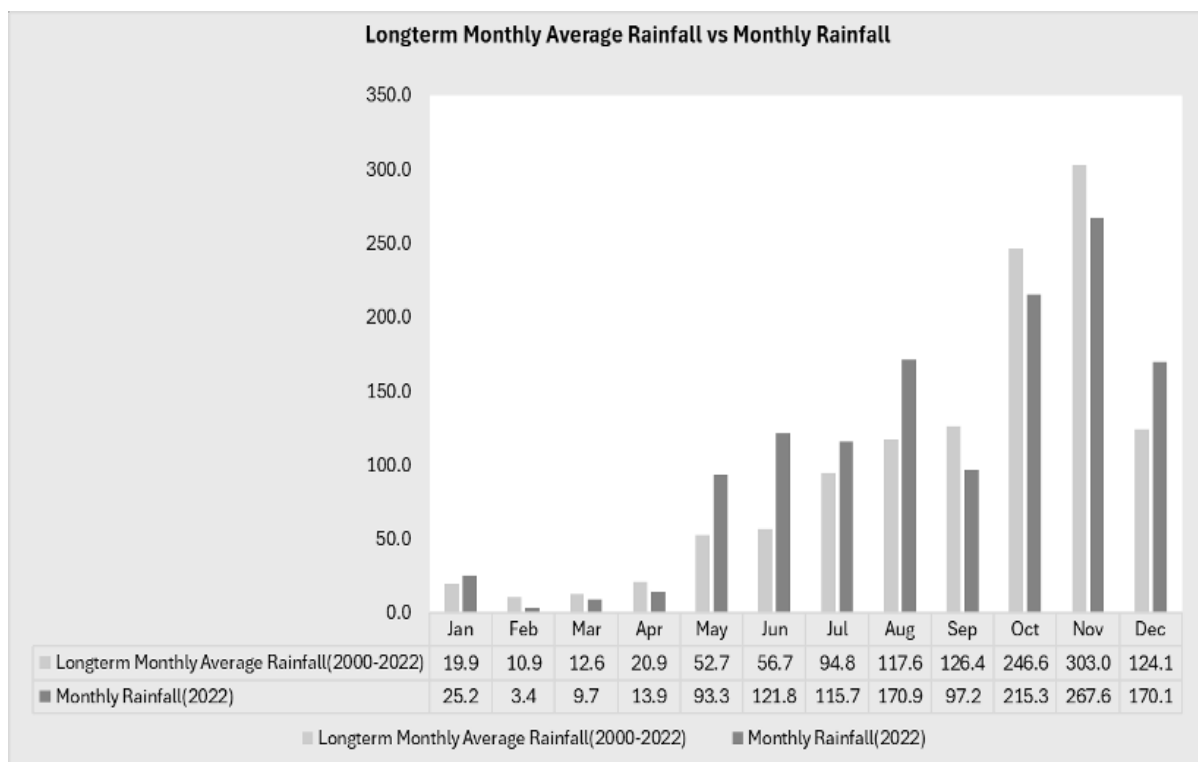


Figure 3.7 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.2.3.1 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2022, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.8 and 3.9. According to the data, average depths to the static water table in open wells range from 9.03 to 12.96 m BGL in pre monsoon and 10.77 to 12.57 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.10 and 3.11. The average depths to static potentiometric surface in bore wells for the period of October through December (Post-Monsoon Season) vary from 45.63 to 49.31 m and from 53.28 to 58.93 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.

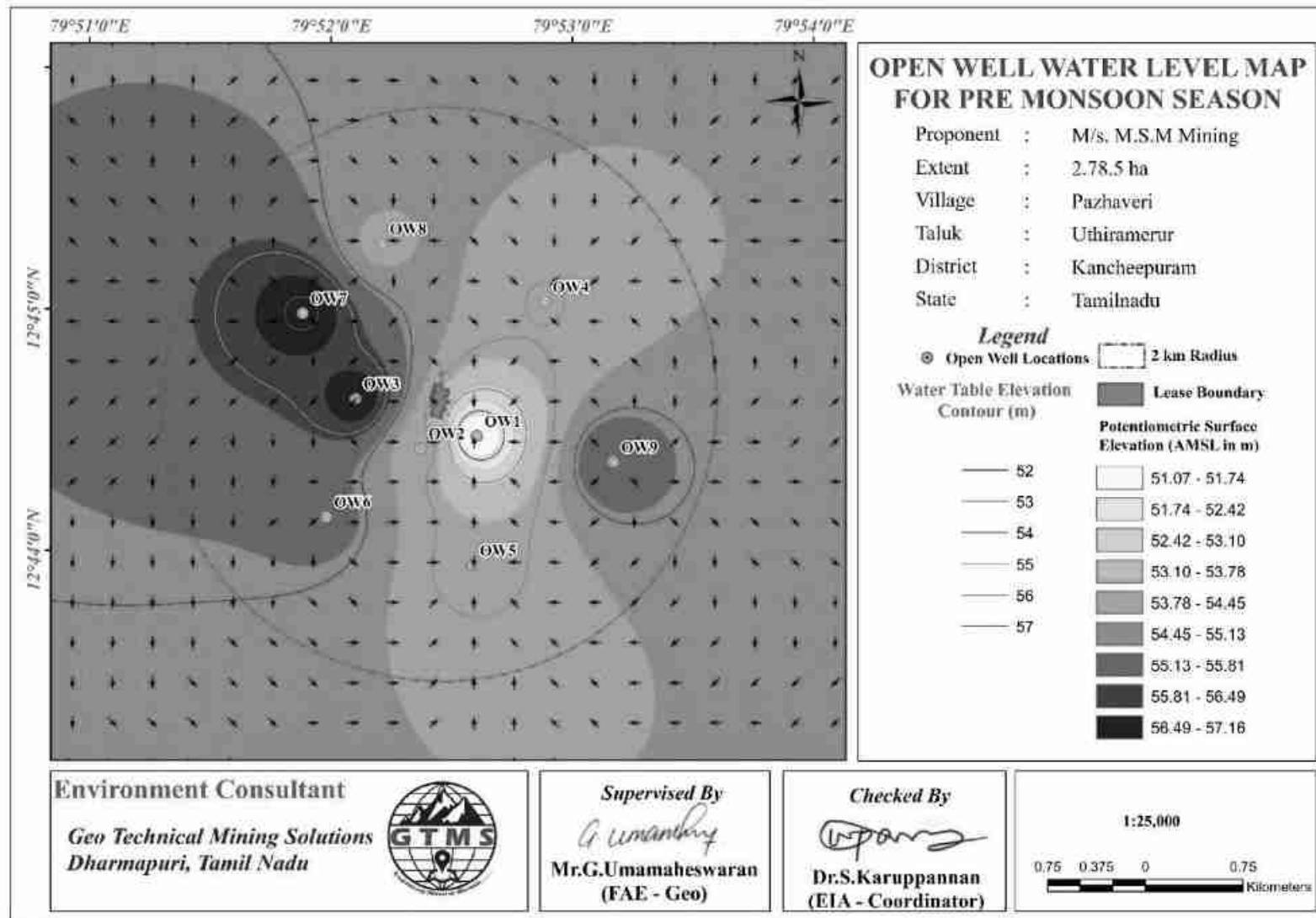


Figure 3.8 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

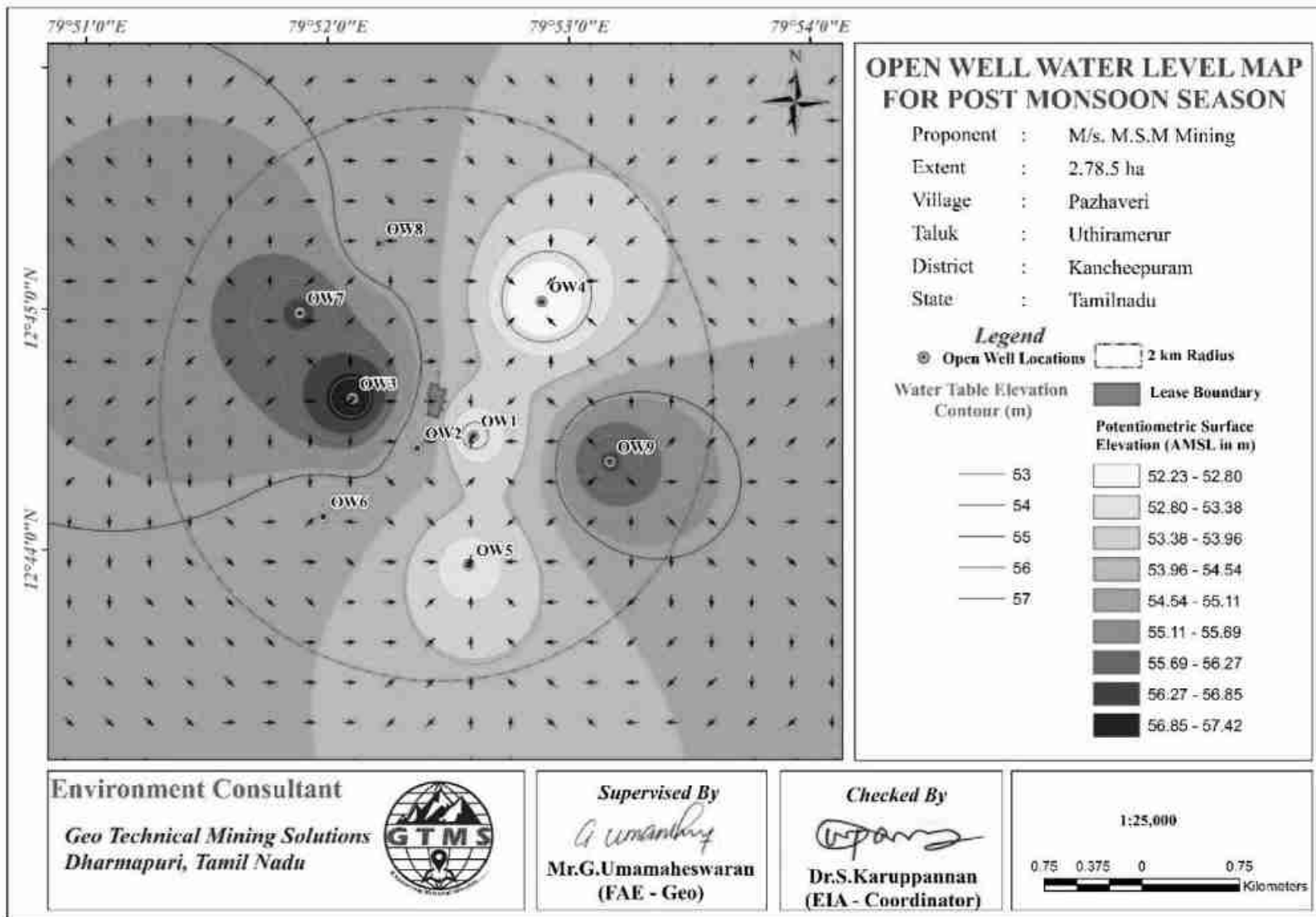


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

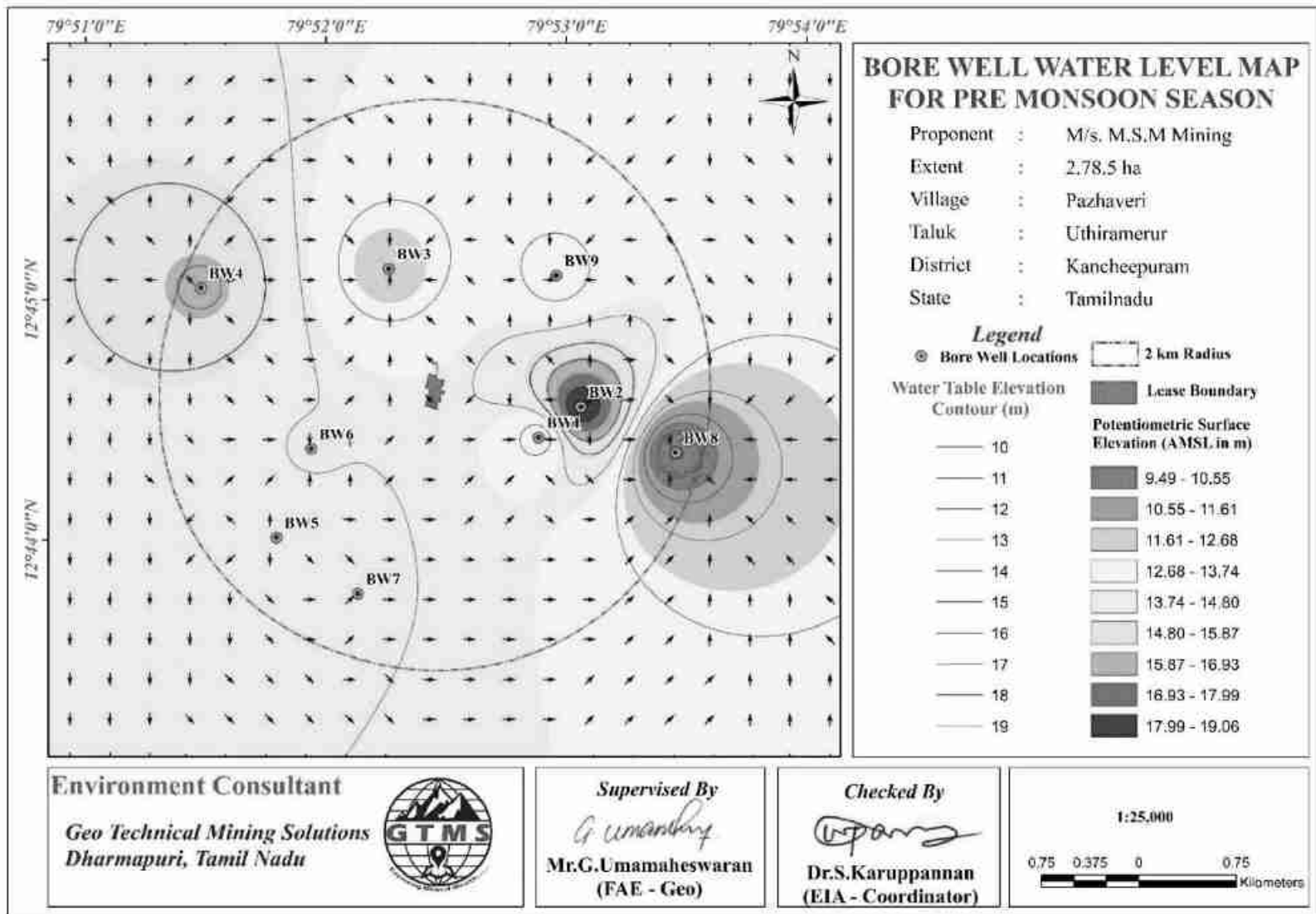


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

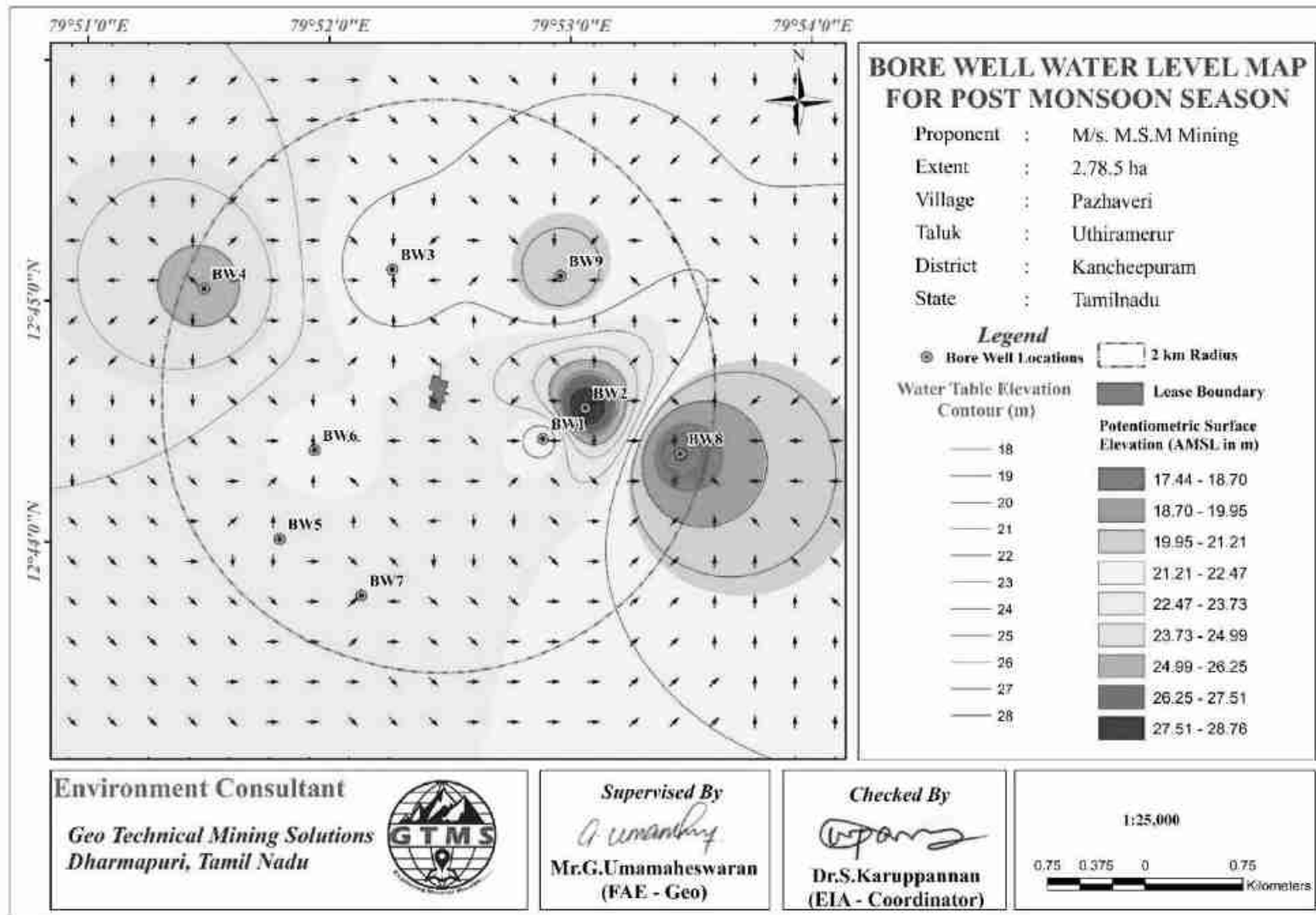


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

From the maps of open well groundwater flow direction shown in Figures 3.8-3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 1 located in north direction of the proposed project site. The groundwater flow maps in Figures 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 1 and 5. It is located in northeastern direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

Table 3.8 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		
OW01	11.9	13.3	13.6	12.93	12°44'28.37"N	9°52'36.28"E
OW02	12.5	12.8	13.2	12.83	2°44'25.31"N	79°52'22.34"E
OW03	12.22	12.14	14.52	12.96	2°44'37.67"N	79°52'6.16"E
OW04	8.6	8.9	9.6	9.03	12°45'1.75"N	79°52'53.20"E
OW05	9.6	10.2	10.8	10.20	2°43'56.26"N	79°52'35.05"E
OW06	10.1	10.6	11.12	10.61	12°44'8.30"N	9°51'58.89"E
OW07	10.4	10.8	11.3	10.83	2°44'58.92"N	79°51'53.05"E
OW08	11.1	11.8	12.3	11.73	2°45'16.18"N	79°52'12.73"E
OW09	12.1	12.3	12.5	12.30	12°44'21.94"N	79°53'10.23"E

Source: Onsite monitoring data

Table 3.9 Post-Monsoon Water Level of Open Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2022	Nov- 2022	Dec-2022	Average		
OW01	12.37	11.88	9.35	11.20	12°44'28.37"N	79°52'36.28"E
OW02	13.65	12.55	10.11	12.10	12°44'25.31"N	79°52'22.34"E
OW03	14.85	12.62	10.25	12.57	12°44'37.67"N	79°52'6.16"E
OW04	12.12	10.98	9.21	10.77	12°45'1.75"N	79°52'53.20"E
OW05	12.22	11.02	9.55	10.93	12°43'56.26"N	79°52'35.05"E
OW06	12.65	11.42	10.08	11.38	12°44'8.30"N	79°51'58.89"E
OW07	13.01	11.89	10.08	11.66	12°44'58.92"N	79°51'53.05"E
OW08	12.44	11.35	10.02	11.27	12°45'16.18"N	79°52'12.73"E
OW09	13.12	11.85	10.07	11.68	12°44'21.94"N	79°53'10.23"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2023	Apr-2023	May- 2023	Average		
BW01	53.95	55.48	59.84	56.42	2°44'25.64"N	79°52'53.07"E
BW02	56.45	58.23	62.12	58.93	12°44'33.28"N	79°53'3.60"E
BW03	54.18	55.85	59.94	56.66	12°45'7.76"N	79°52'15.65"E
BW04	55.2	57.22	61.22	57.88	12°45'2.97"N	79°51'28.78"E
BW05	54.82	56.98	61.11	57.64	12°44'0.69"N	79°51'47.61"E
BW06	54.55	56.22	60.35	57.04	12°44'22.78"N	79°51'56.34"E
BW07	54.48	56.18	60.31	56.99	12°43'46.59"N	79°52'7.94"E
BW08	51.22	54.11	58.2	54.51	12°44'21.85"N	79°53'27.28"E
BW09	49.94	53.22	56.68	53.28	12°45'6.11"N	79°52'57.49"E

Source: Onsite monitoring data

Table 3.11 Post-Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2022	Nov-2022	Dec-2022	Average		
BW01	51.85	48.12	42.45	47.47	12°44'25.64"N	79°52'53.07"E
BW02	55.33	47.22	45.12	49.22	2°44'33.28"N	79°53'3.60"E
BW03	51.95	48.08	42.55	47.53	12°45'7.76"N	79°52'15.65"E
BW04	53.22	48.15	44.22	48.53	12°45'2.97"N	79°51'28.78"E
BW05	54.12	48.95	44.85	49.31	12°44'0.69"N	79°51'47.61"E
BW06	55.23	47.58	43.56	48.79	2°44'22.78"N	79°51'56.34"E
BW07	54.98	46.98	43.32	48.43	12°43'46.59"N	79°52'7.94"E
BW08	53.22	45.33	41.12	46.56	2°44'21.85"N	79°53'27.28"E
BW09	52.12	44.55	40.22	45.63	12°45'6.11"N	79°52'57.49"E

Source: Onsite monitoring data

3.2.3.2 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 3.12. 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 3.12.

Table 3.12 Vertical Electrical Sounding Data

Location Coordinates - 12° 44'40.0"N 79°52'27.7"E

S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in Ω	Apparent Resistivity in Ωm
1	2	1	4.71	4.588	24.63
2	4	1	23.57	0.947	22.32
3	6	1	55.00	0.455	25.07
4	8	1	99.00	0.270	26.75
5	10	2	75.43	0.374	28.26
6	12	2	110.01	0.285	31.42
7	14	2	150.86	0.239	36.18
8	16	2	198.01	0.192	38.19
9	18	2	251.44	0.172	43.47
10	20	2	311.16	0.138	43.08
11	25	5	188.58	0.304	57.41
12	30	5	275.01	0.246	67.80
13	35	5	377.16	0.209	78.95
14	40	5	495.02	0.182	90.41
15	45	5	628.60	0.166	104.79
16	50	5	777.89	0.154	119.86

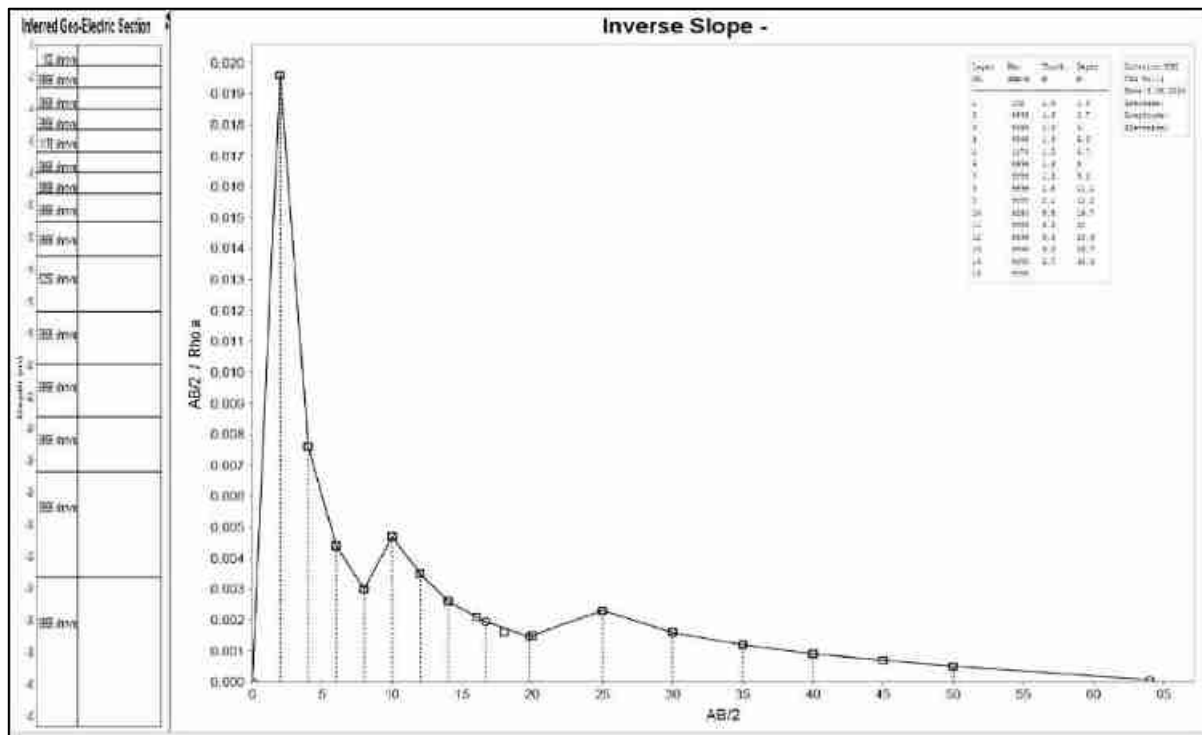


Figure 3.12 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 45m Below Ground Level in Proposed Project

The rock formation of low resistivity values indicates occurrence of water at the depth of about 45 m below ground level. The maximum depth proposed for the proposed project is 35 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 3.13.

According to the onsite data, the temperature in March,2024 varied from 23.58 to 35.19⁰C with the average of 28.48⁰C; in April, 2024 from 25.52 to 37.34⁰C with the average of 31.06⁰C; and in May,2024 from 27.22 to 38.37⁰C with the average of 31.20⁰C. In March,2024, relative humidity ranged from 32.31 to 92.88 % with the average of 67.51%; in April, 2024, from 36.0 to 94.19% with the average of 66.04%; and in May,2024, from 40.50 to 90.75% with the average of 71.21%. The wind speed in March,2024 varied from 0.05 to 6.12m/s with the average of 3.69m/s ; in April, 2024 from 0.34 to 6.92m/s with the average of 4.08m/s; and in May,2024 from 0.29 to 8.0m/s with the average of 4.06m/s. In March,2024, wind direction varied from 18.43 to 264.37⁰ with the average of 128.69⁰; in April, 2024, from 21.80 to 231.38⁰ with the average of 144.41⁰; and in May,2024, 0.34 to 349.96⁰ with the average of 172.77⁰. In March,2024, surface pressure varied 1003.90 to 1013.60 Pa with the average of 1008.52 Pa; in April, 2024, from 999.50 to 1009.80 kPa with the average of 1004.75 Pa; and in May,2024, from 994.50 to 1008.30Pa with the average of 1001.50Pa.

Table 3.13 Onsite Meteorological Data

S. No.	Parameters		March,2024	APRIL,2024	MAY,2024
1	Temperature (°C)	Min	23.58	25.52	27.22
		Max	35.19	37.34	38.87
		Avg	28.48	31.06	31.20
2	Relative Humidity (%)	Min	32.31	36.00	40.50
		Max	92.88	94.19	90.75
		Avg	67.51	66.04	71.21
3	Wind Speed (m/s)	Min	0.05	0.34	0.29
		Max	6.12	6.92	8.00
		Avg	3.69	4.08	4.06
4	Wind Direction (degree)	Min	18.43	21.80	0.34
		Max	264.37	231.38	349.96
		Avg	128.69	144.41	172.77
5	Surface Pressure (Pa)	Min	1003.90	999.50	994.50
		Max	1013.60	1009.80	1008.30
		Avg	1008.52	1004.75	1001.50

Source: On-site monitoring/sampling by *Accuracy Analabs and Greenlink Analytical and Research Laboratory (India) Private Ltd* 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 March through May of the years from 2020 to 2023 and the seasonal wind rose for the study period of March through May 2024. The wind rose diagrams thus produced are shown in Figures 3.13-3.13a. Figure 3.14 reveals that:

- ❖ The measured average wind velocity during the study period is 3.94 m/s.
- ❖ Predominant wind was dominant in the directions ranging from Southeast to Northwest.

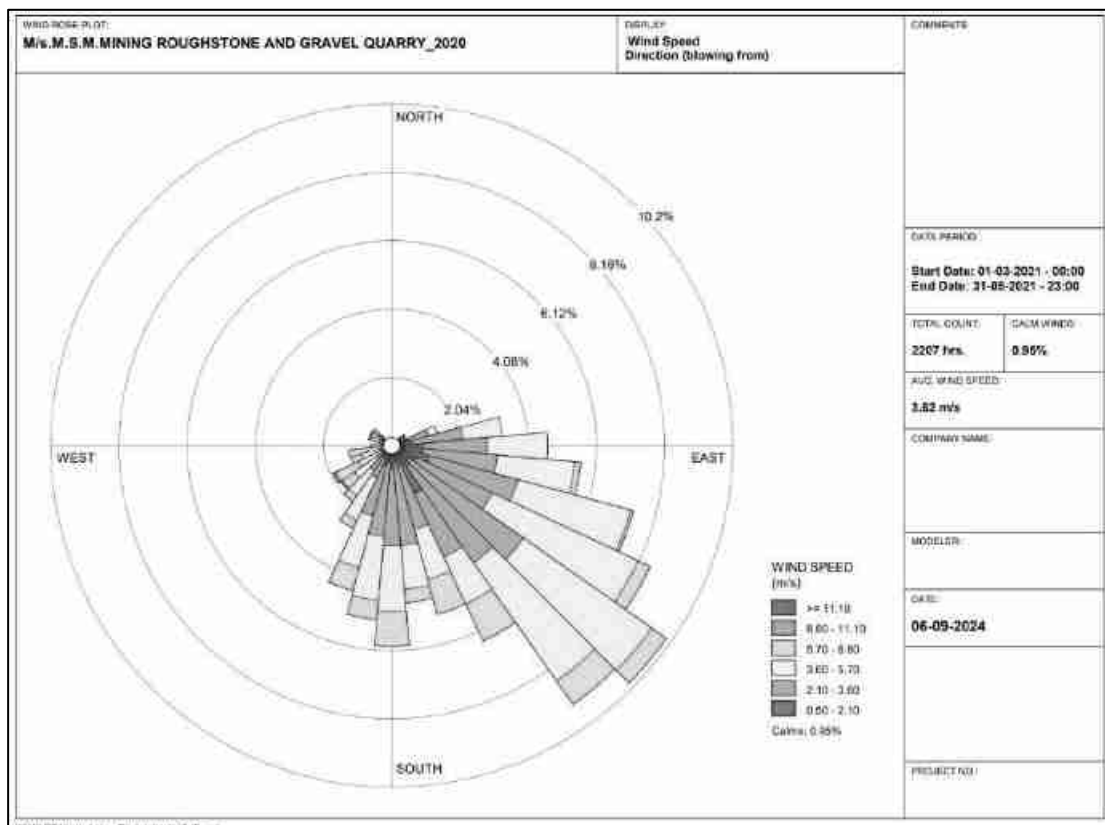
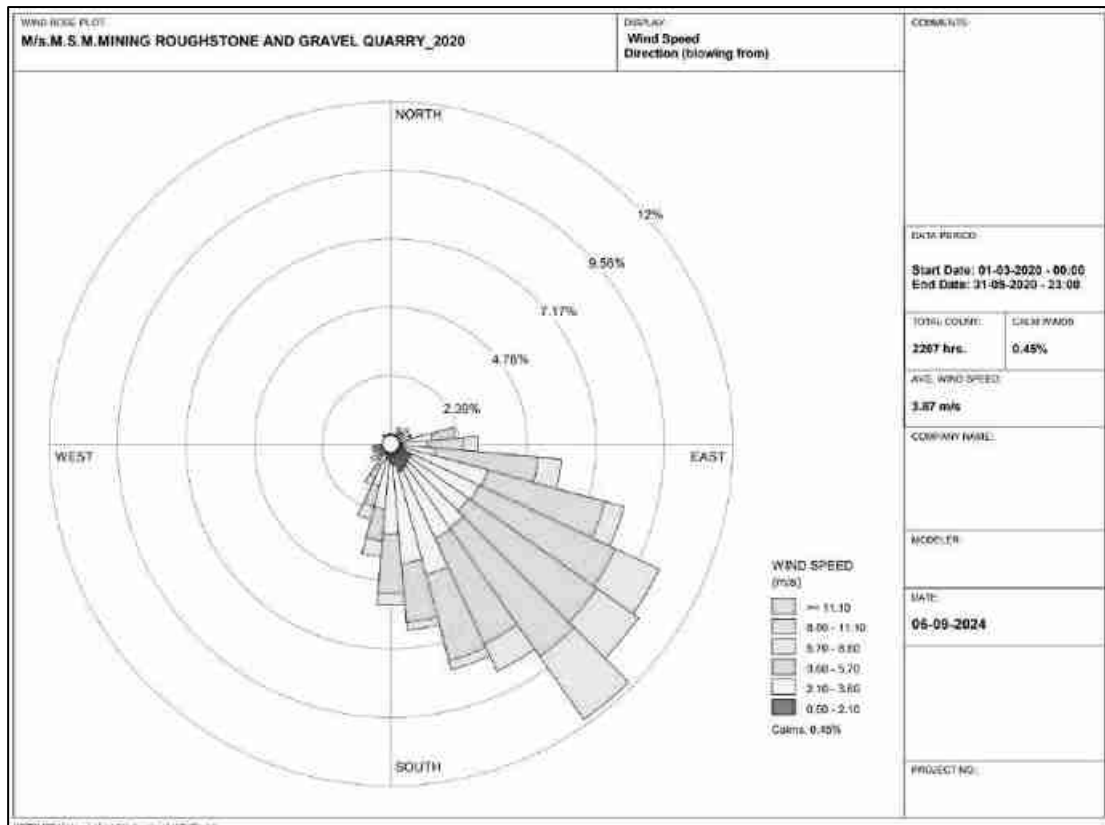


Figure 3.13 Windrose Diagram for 2020 and 2021 (March to May)

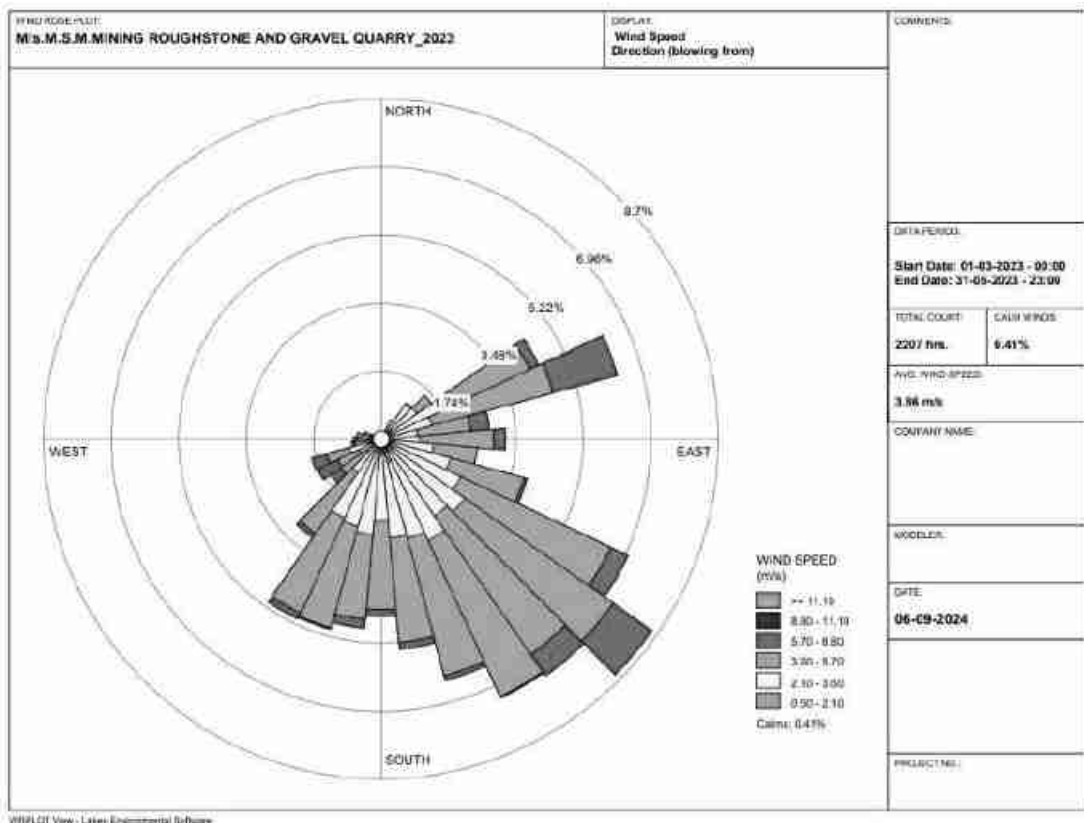
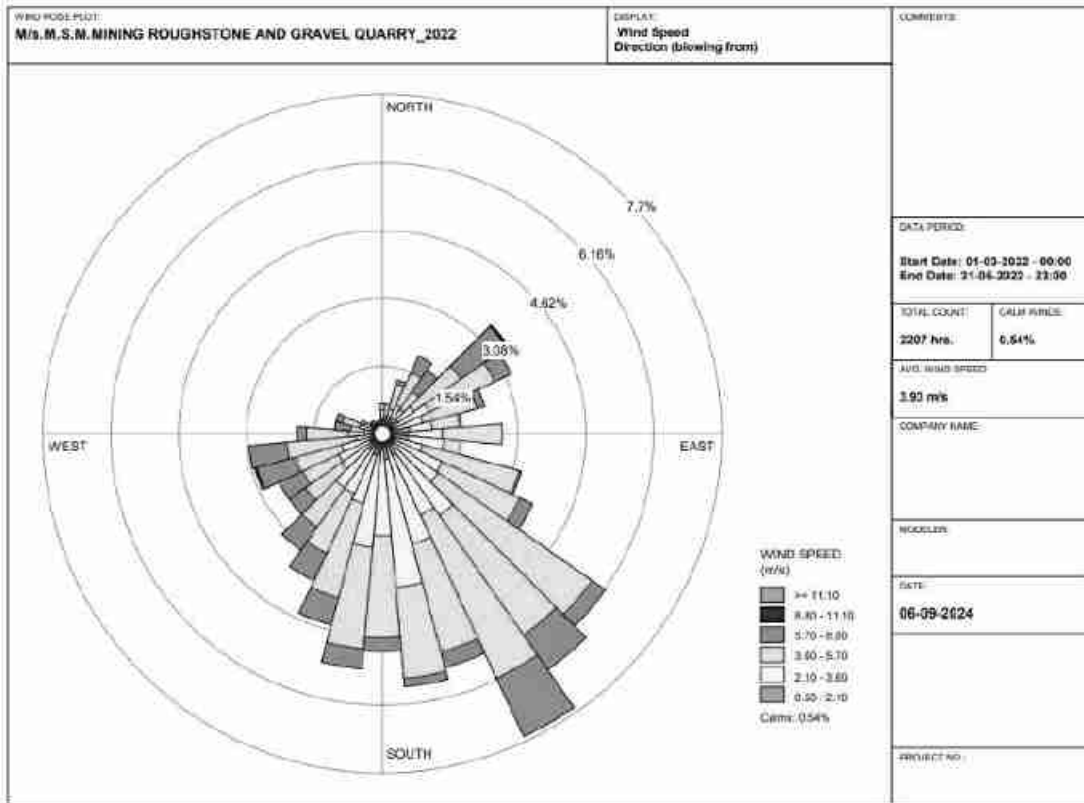


Figure 3.13a Windrose Diagram for 2022 and 2023 (March to May)

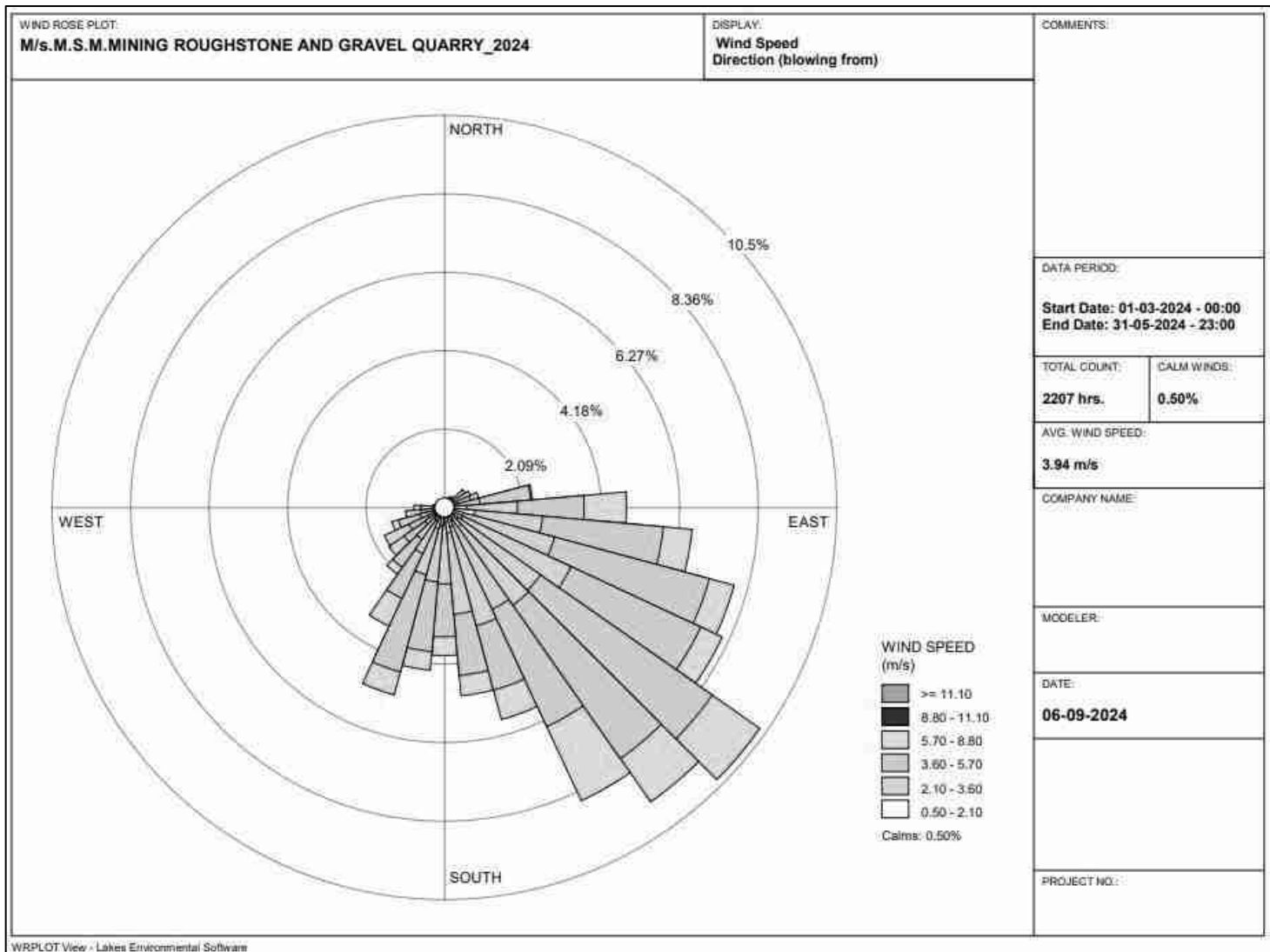


Figure 3.14 Onsite Wind Rose Diagram

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 3.14 Methodology and Instrument Used for AAQ Analysis

Parameter	Method	Instrument
PM _{2.5}	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM ₁₀	Gravimetric method Beta attenuation method	Respirable Dust Sampler
SO ₂	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO _x	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 Accuracy Analabs and Greenlink Analytical and Research Laboratory (India) Private Ltd & CPCB Notification

Table 3.15 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 ₂ (µg/m ³)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO _x (µg/m ³)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM ₁₀ (µg/m ³)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	PM _{2.5} (µg/m ³)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at Seven (07) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March-May, 2023 and March-May, 2024 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 $\text{PM}_{2.5}$, PM_{10} , sulphur dioxide (SO_2) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.15 and average concentrations of air pollutants are summarized in Tables 3.17 and are shown in Figures 3.16-3.20.

Table 3.16 Ambient Air Quality (AAQ) Monitoring Locations

Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates
AAQ1	Core	---	---	12°44'33.28"N,79°52'27.17"E
AAQ2	Pazhaveri	0.88	E	12°44'30.33"N,79°52'56.85"E
AAQ3	Kavanippakkam	3.20	SE	12°43'16.76"N,79°53'40.71"E
AAQ4	Palur	4.26	NE	12°45'44.34"N,79°54'34.94"E
AAQ5	Hemprasath Core	2.05	SW	12°43'35.76"N,79°51'51.07"E
AAQ6	Madhur	2.22	SW	12°44'19.05"N 79°51'12.97"E
AAQ7	Thirumukkudal	2.05	NW	12°45'30.23"N,79°51'37.33"E

Source: On-site monitoring/sampling by Accuracy Analabs and Greenlink Analytical and Research Laboratory (India) Private Ltd in association with GTMS

Results

As per the monitoring data, $\text{PM}_{2.5}$ ranges from $21.0\mu\text{g}/\text{m}^3$ to $25.6\mu\text{g}/\text{m}^3$; PM_{10} from $41.4\mu\text{g}/\text{m}^3$ to $45.7\mu\text{g}/\text{m}^3$; SO_2 from $6.6\mu\text{g}/\text{m}^3$ to $9.7\mu\text{g}/\text{m}^3$; NO_x from $19.3\mu\text{g}/\text{m}^3$ to $24.1\mu\text{g}/\text{m}^3$. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 42 causing minimal impact to human health.

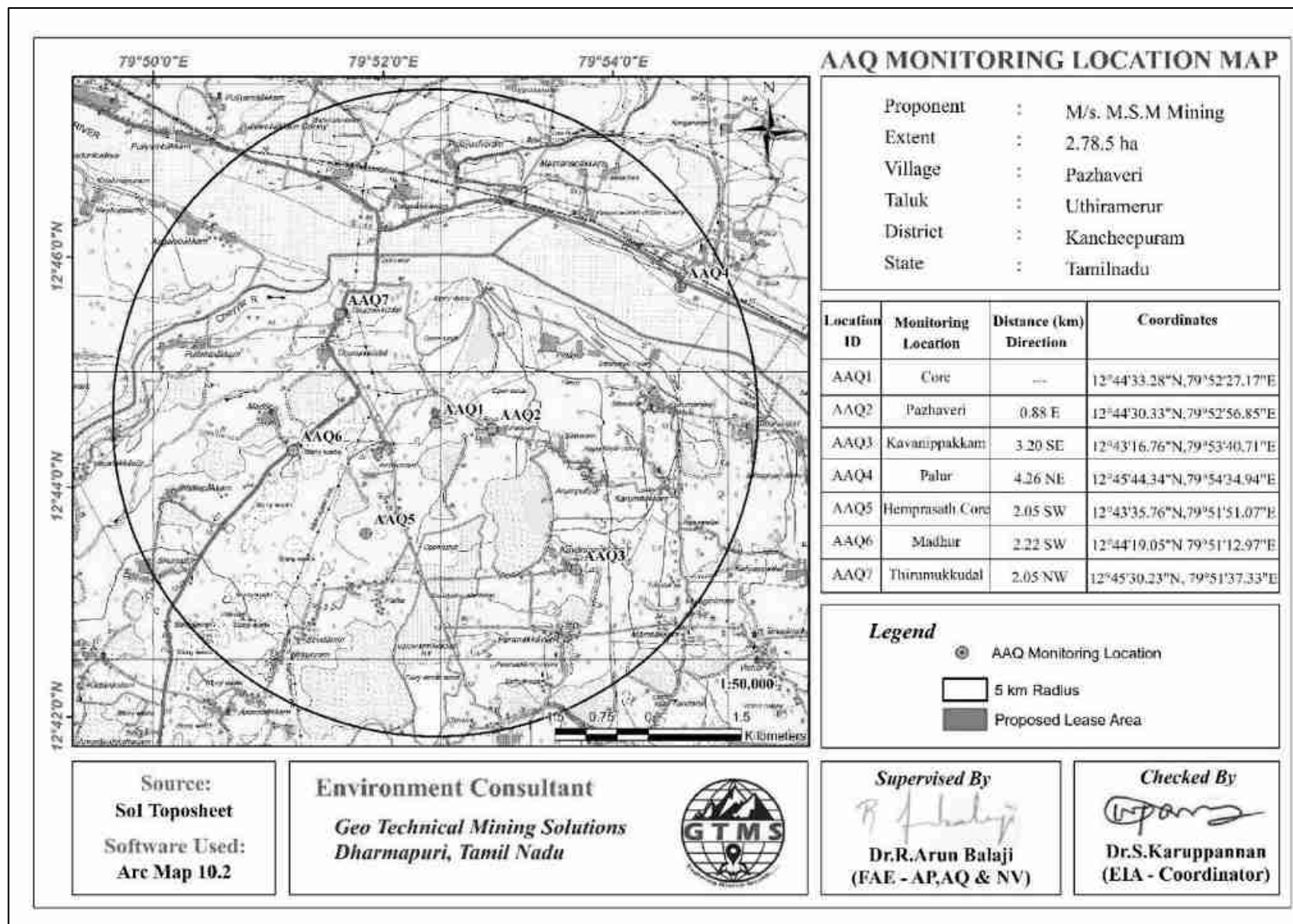


Figure 3.15 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

Table 3.17 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Min	Mean	98 th Percentile	Max	Min	Mean	98 th Percentile
AAQ1	25.6	22.5	23.95	25.6	47.9	43.1	45.2	47.9
AAQ2	23.8	20.8	22.3	23.7	43.0	38.9	41.0	42.8
AAQ3	26.7	24.1	25.25	25.7	47.9	45.2	46.7	47.8
AAQ4	27.2	22.4	25.1	27	47.1	42.7	45.2	47.0
AAQ5	23.1	19.1	21.2	23.1	41.7	37.9	39.8	41.7
AAQ6	26.8	17.8	24.4	26.8	45.9	39.8	43.4	45.5
AAQ7	25.9	20.2	23.5	25.7	46.6	42.5	44.7	46.6
SO ₂					NO _x			
AAQ1	9.9	7.5	8.57	9.8	26.9	24.2	25.9	26.9
AAQ2	7.7	4.9	6.5	7.7	20.7	16.4	18.8	20.6
AAQ3	9.8	8.3	9.07	9.5	27.6	25.3	26.6	27.6
AAQ4	10.8	5.1	8.7	10.5	25.6	19.8	22.2	25.2
AAQ5	10.2	7.4	8.9	10.2	19.4	12.9	16	19
AAQ6	8.9	6.1	7.2	8.8	22.8	18.7	20.9	22.6
AAQ7	10.5	6.7	8.6	10.4	25.9	17.7	21.7	24.9

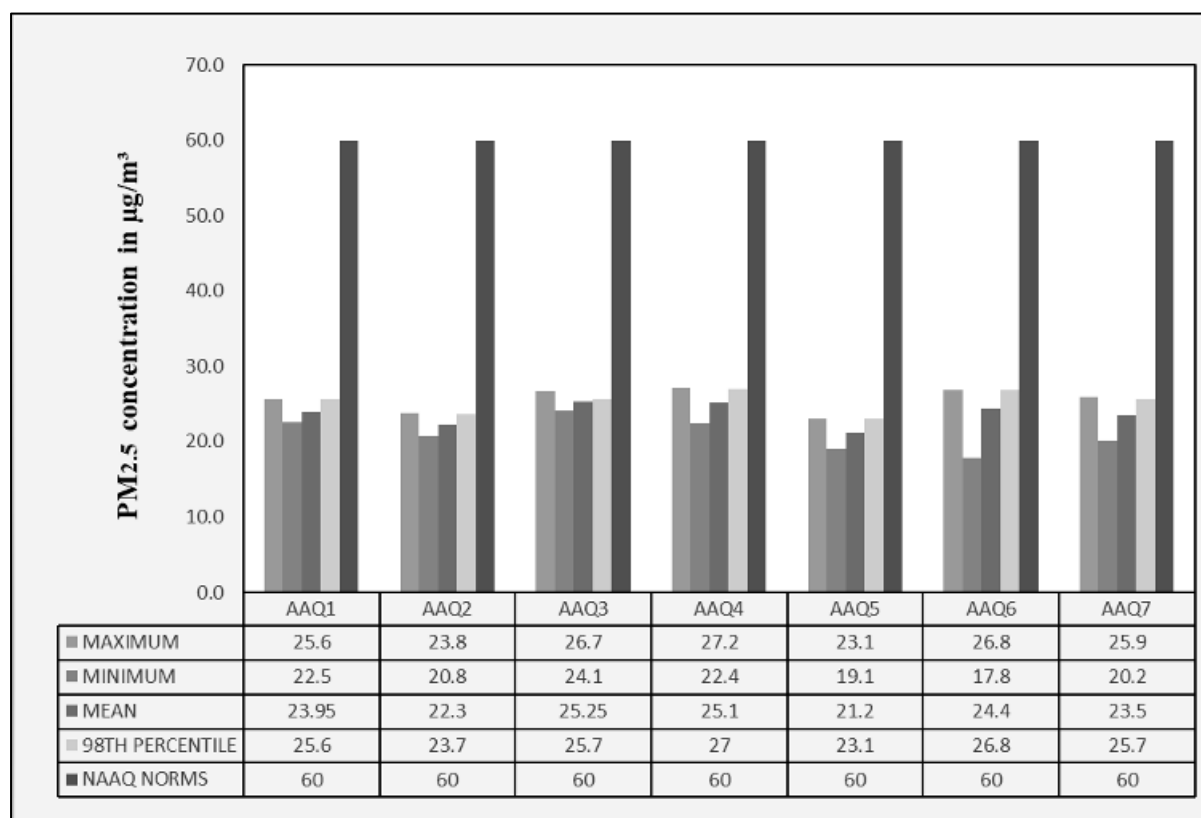


Figure 3.16 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{2.5} Measured from 7 Air Quality Monitoring Stations within 5 km Radius

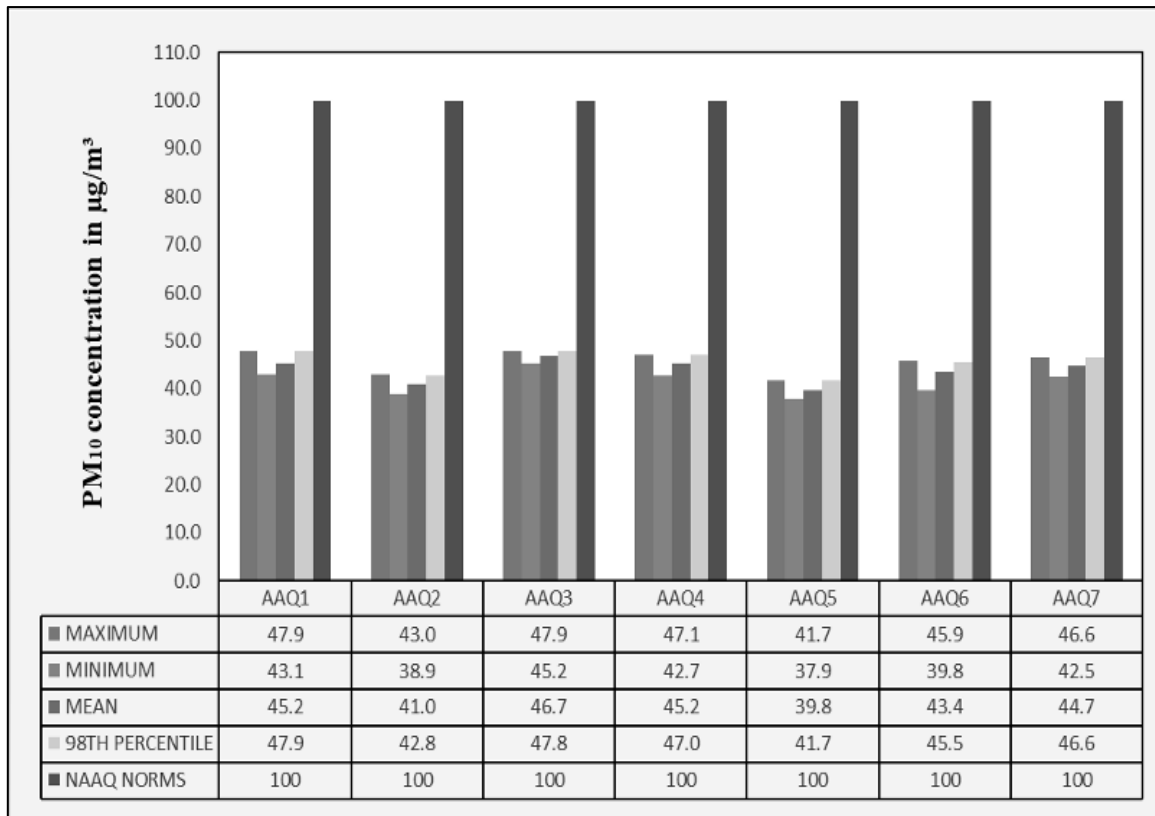


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM₁₀ Measured from 7 Air Quality Monitoring Stations within 5 km Radius

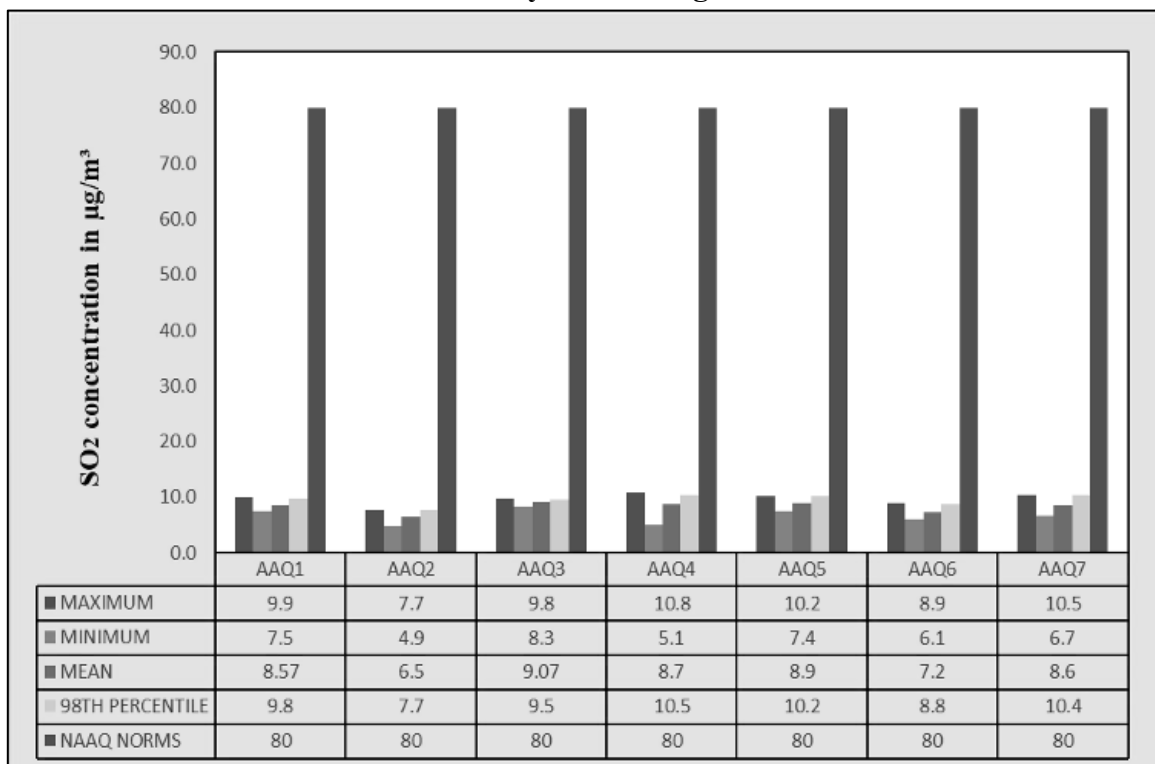


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO₂ Measured from 7 Air Quality Monitoring Stations within 5 km Radius

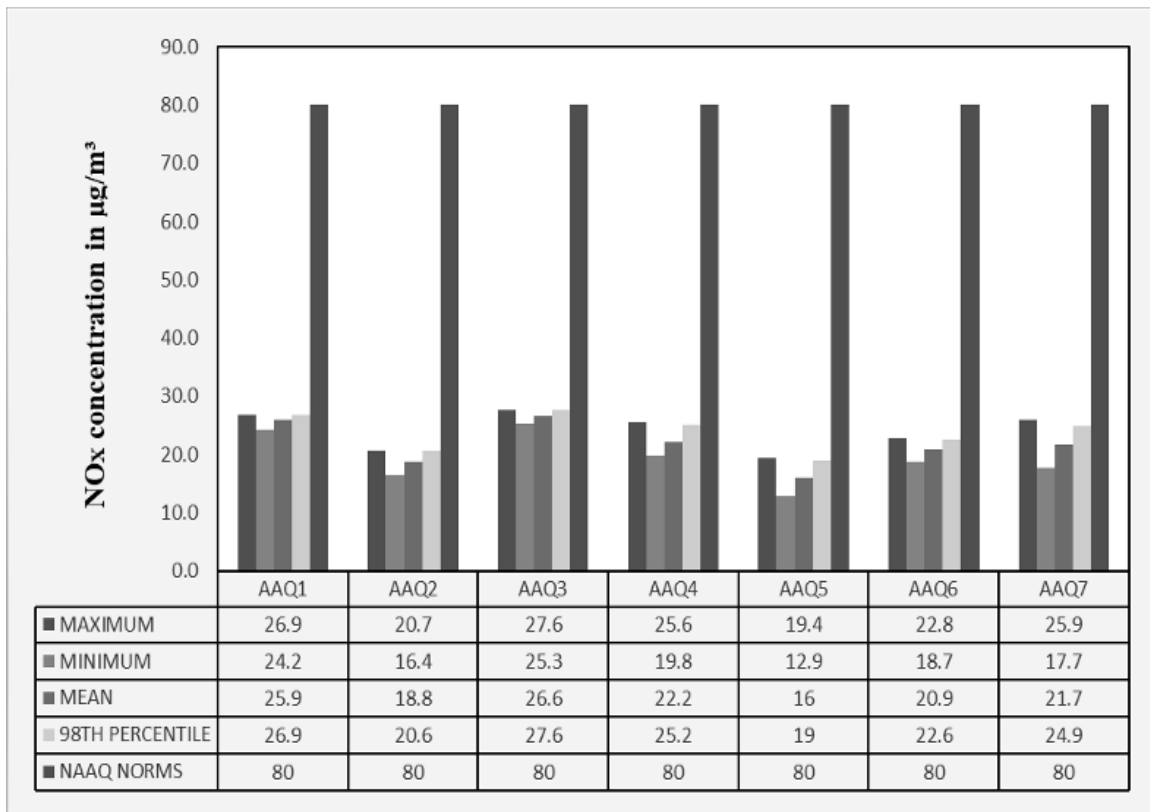


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO_x Measured from 7 Air Quality Monitoring Stations within 5km Radius

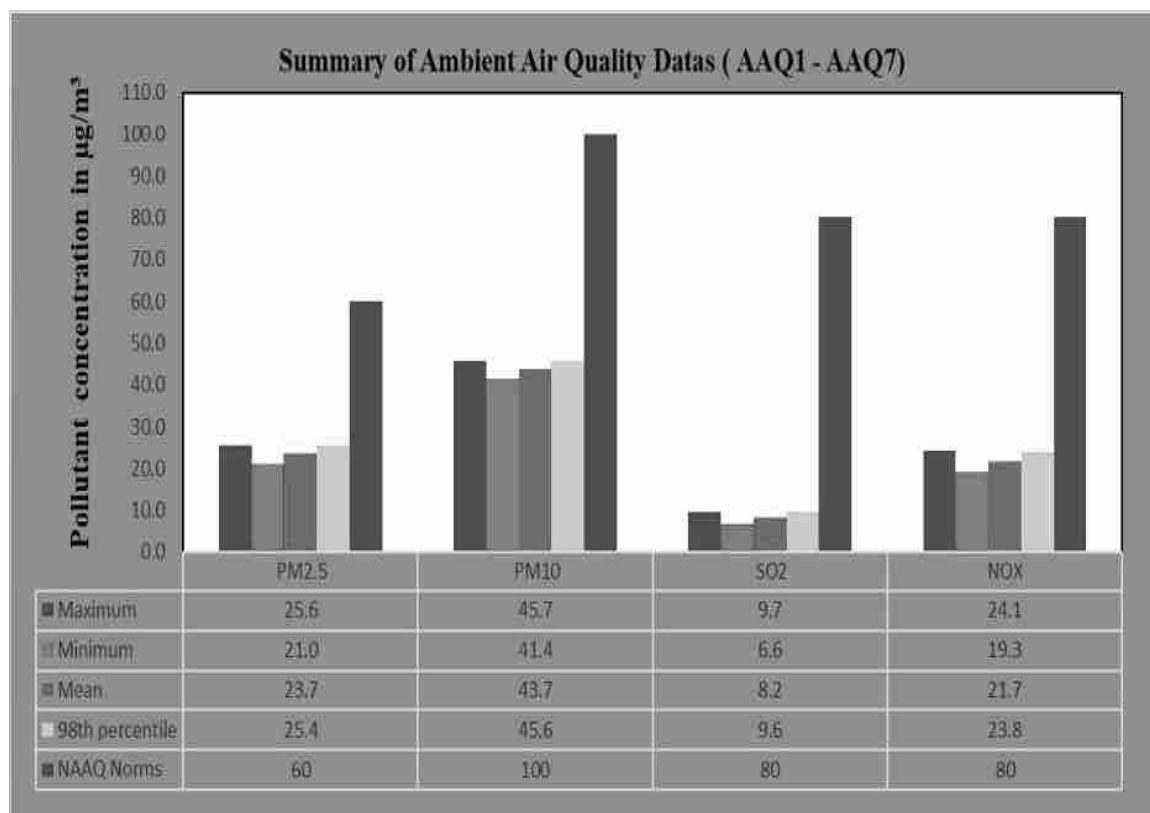


Figure 3.20 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius

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 Seven (07) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.18 and spatial occurrence of the locations are shown in Figure 3.21.

Table 3.18 Noise Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates
1	N1	Core	---	---	12°44'37.80"N, 79°52'27.02"E
2	N2	Pazhaveri	0.84	SE	12°44'28.97"N, 79°52'56.40"E
3	N3	Kavanippakkam	3.01	SE	12°43'21.62"N, 79°53'36.91"E
4	N4	Palur	4.75	NE	12°45'57.76"N, 79°54'46.45"E
5	N5	Hemprasath Core	2.05	SW	12°43'33.66"N, 79°51'54.46"E
6	N6	Madhur	2.21	SW	12°44'19.05"N, 79°51'12.97"E
7	N7	Thirumukkudal	2.04	NW	12°45'29.69"N, 79°51'37.19"E

Table 3.19 Ambient Noise Quality Result

Station ID	Location	Environment at 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	45.6	38.2	75	70
N2	Pazhaveri	Residential Area	42.9	31.5	55	45
N3	Kavanippakkam		45.9	38.6		
N4	Palur		45.1	38.9		
N5	Hemprasath Core	Industrial Area	41.2	29.6	75	70
N6	Madhur	Residential Area	40.2	29.8	55	45
N7	Thirumukkudal		44.9	33.0		

Source: On-site monitoring/sampling by Accuracy Analabs and Greenlink Analytical and Research Laboratory (India) Private Ltd in association with GTMS

The Table 3.18 shows that noise level in core zone was 45.6 dB (A) Leq during day time and 38.2dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 40.2 to 45.9dB (A) Leq and during night time from 29.6 to 38.9dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.22 and 3.23.

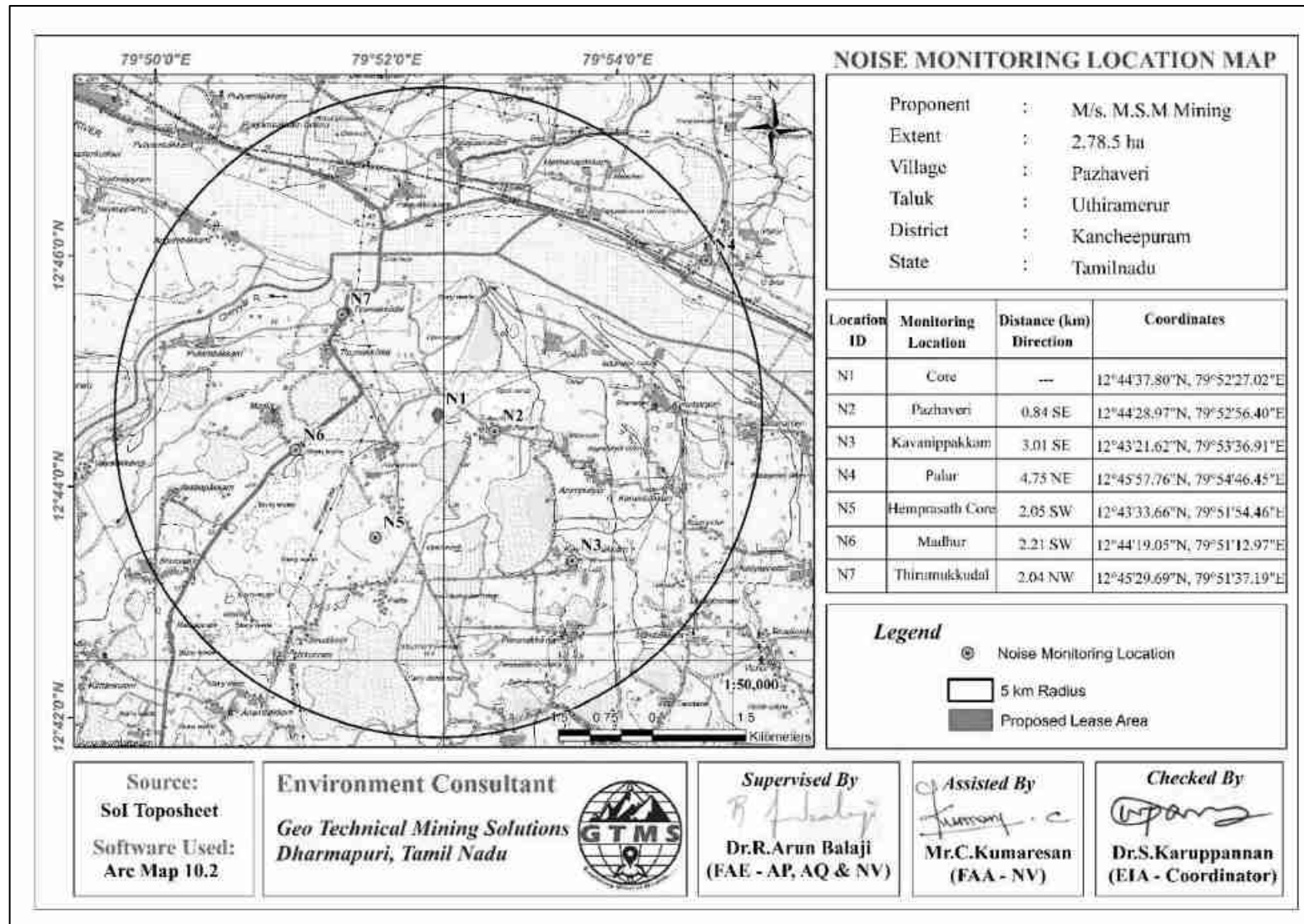


Figure 3.21 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site

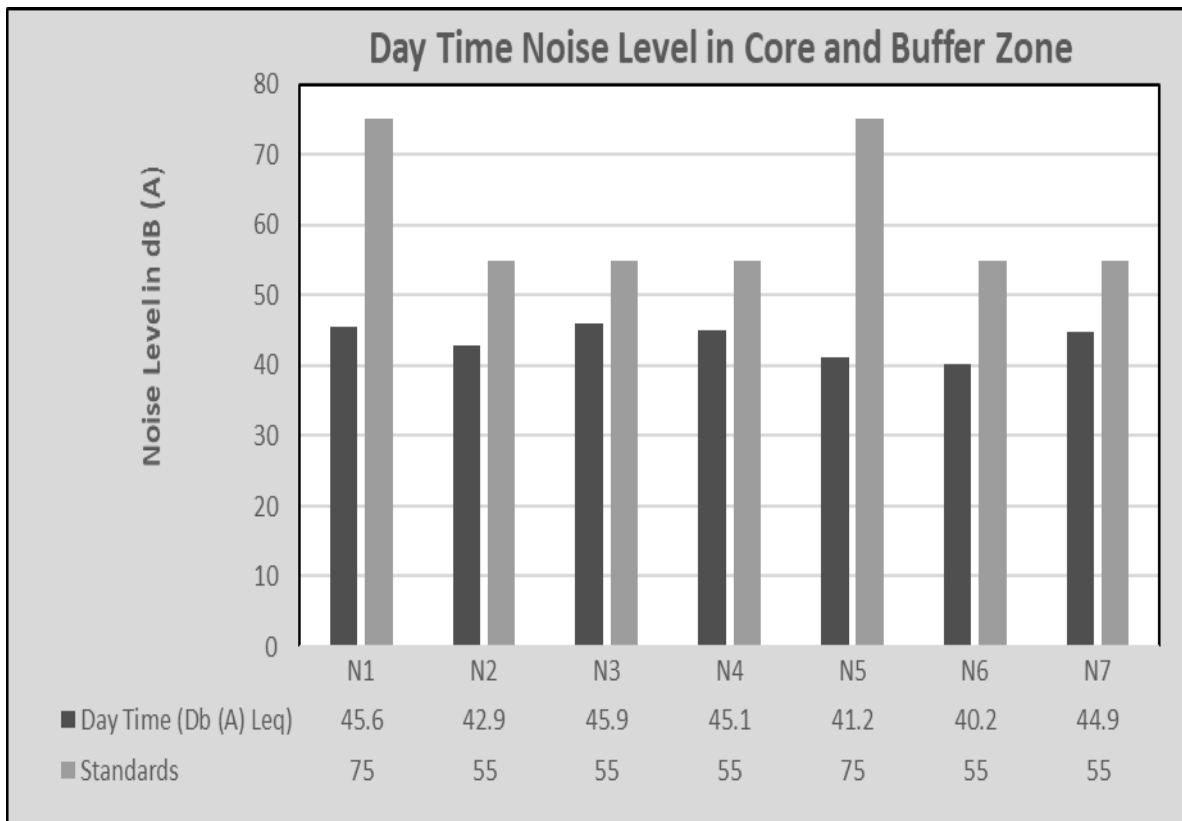


Figure 3.22 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

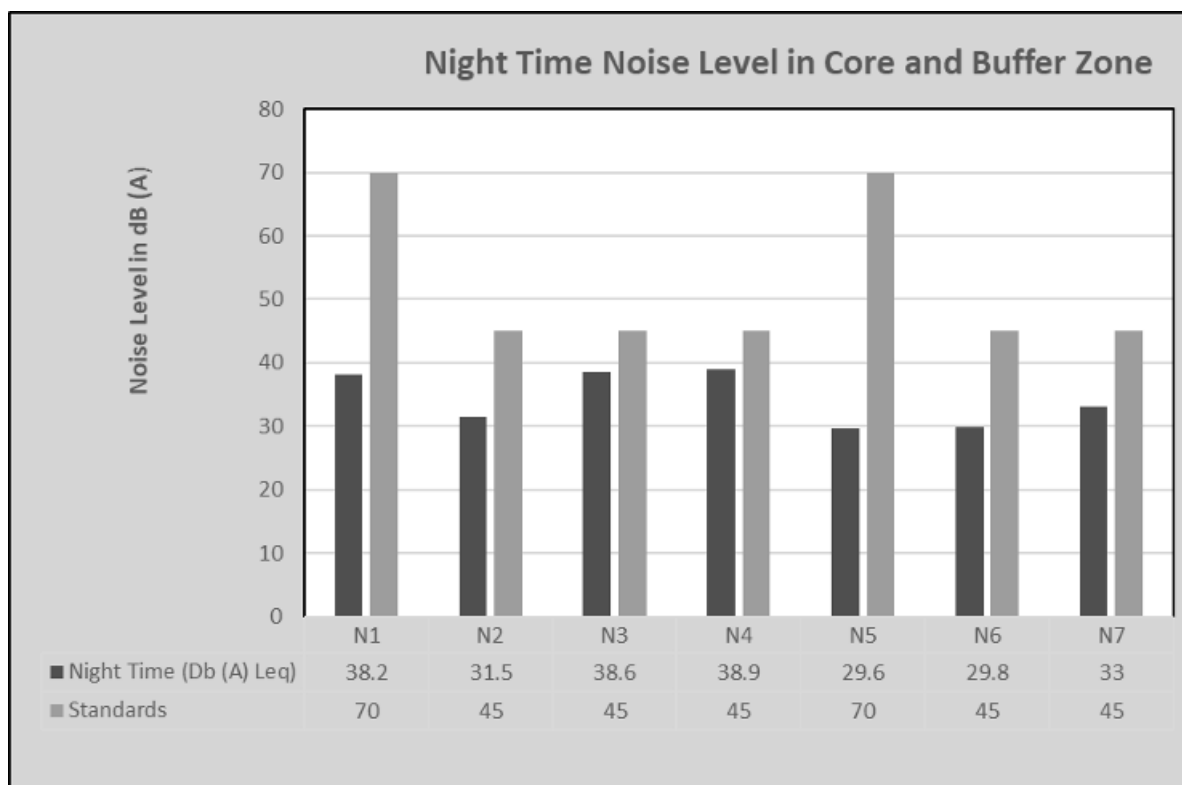


Figure 3.23 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

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 3.24.



Figure 3.24 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 3.20. Relative frequency, and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For Trees, 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 3.20 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 3.21.

Table 3.21 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 22 species belonging to 16 families have been recorded from the mine lease area. 3 shrubs, 19 herbs were identified. There are no trees in mine lease area. The floral analysis indicates that there are no threatened (Vulnerable, Endangered & Critically Endangered) species recorded from the core project site. A list of the IUCN Red List analysed plant species recorded inside the proposed project site. Details of vegetation with scientific name indicated in Table 3.22.

Table 3.22 Flora in mine lease area

S.no	Local name	Scientific name	Family name	IUCN Status
Shrubs				
1	Avaram chadi	<i>Senna auriculata</i>	Fabaceae	LC
2	Earuku	<i>Calotropis gigantea</i>	Apocynaceae	NL
3	communist pacha	<i>Chromolaena odorata</i>	Asteraceae	NL
Herbs /Climber				
1	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	NL
2	Thathapondu	<i>Tridax procumbens</i>	Asteraceae	NL
3	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	NL
4	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	NL
5	Nearunji mull	<i>Tribulus zeyheri</i>	Zygophyllaceae	NL
6	Pulapoo	<i>Aerva lanata</i>	Amaranthaceae	NL
7	American mint	<i>Hyptis suaveolens</i>	Lamiaceae	NL
8	Veetukaayapoond	<i>Tridax procumbens</i>	Asteraceae	NL
9	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	NL
10	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	NL
11	Kovaikodi	<i>Coccinia grandis</i>	Cucurbitaceae	NL
12	Arivalmanaiipoond	<i>Sida acuta</i>	Malvaceae	NL
13	Amman pacharisi	<i>Euphorbia hirta</i>	Euphorbiaceae	NL
14	Karaikai	<i>Canthium coromandelicum</i>	Rubiaceae	NL
15	Keelanelli	<i>Phyllanthus amarus</i>	Phyllanthaceae	NL
16	Chevvarakupul	<i>Chloris barbata</i>	Poaceae	NL
17	Mullukkeerai	<i>Amaranthus spinosus</i>	Amaranthaceae	NL
18	Vishnukarandi	<i>Evolvulus alsinoides</i>	Convolvulaceae	NL
19	Thulasi	<i>Ocimum sanctum</i>	Lamiaceae	NL

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

The 300m radius 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 3.23-25 and Figure 3.26. There is no threatened species in 300 m radius.

Table 3.23 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
Trees													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	10	7	10	1.0	70	1.4	11.36	9.86	21.22	LC
2	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	6	5	10	0.6	50	1.2	6.82	7.04	13.86	LC
3	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	7	6	10	0.7	60	1.2	7.95	8.45	16.41	NL
4	Manga	<i>Mangifera indica</i>	Anacardiaceae	4	3	10	0.4	30	1.3	4.55	4.23	8.77	NL
5	Puliyamaram	<i>Tamarindus indica</i>	Legumes	3	2	10	0.3	20	1.5	3.41	2.82	6.23	LC
6	Vadanarayani	<i>Delonix elata</i>	Fabaceae	3	3	10	0.3	30	1.0	3.41	4.23	7.63	LC
7	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae	5	4	10	0.5	40	1.3	5.68	5.63	11.32	LC
8	Punnai	<i>Calophyllu inophyllum</i>	Calophyllaceae	2	2	10	0.2	20	1.0	2.27	2.82	5.09	NL
9	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae	7	6	10	0.7	60	1.2	7.95	8.45	16.41	NL
10	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	5	3	10	0.5	30	1.7	5.68	4.23	9.91	NL
11	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	2	2	10	0.2	20	1.0	2.27	2.82	5.09	NL
12	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	4	3	10	0.4	30	1.3	4.55	4.23	8.77	LC
13	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	2	3	10	0.2	30	0.7	2.27	4.23	6.50	NL

14	Alamaram	<i>Ficus benghalensis</i>	Moraceae	2	2	10	0.2	20	1.0	2.27	2.82	5.09	NL
15	Vazhaimaram	<i>Musa</i>	Musaceae	3	3	10	0.3	30	1.0	3.41	4.23	7.63	NL
16	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	5	3	10	0.5	30	1.7	5.68	4.23	9.91	NL
17	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae	1	1	10	0.1	10	1.0	1.14	1.41	2.54	LC
18	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae	3	2	10	0.3	20	1.5	3.41	2.82	6.23	LC
19	Savukku	<i>Casuarina L.</i>	Casuarinaceae	5	4	10	0.5	40	1.3	5.68	5.63	11.32	NL
20	Echamaram	<i>Phoenix sylvestris</i>	Arecaceae	5	3	10	0.5	30	1.7	5.68	4.23	9.91	NL
Total				84	67								
Shrubs													
1	Avarai	<i>Senna auriculata</i>	Fabaceae	8	6	10	1	60	1.3	17.78	19.35	37.13	LC
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	9	5	10	0.9	50	1.8	20.00	16.13	36.13	NL
3	Vellai Erukku	<i>Calotropis procera</i>	Asclepiadaceae	2	2	10	0.2	20	1.0	4.44	6.45	10.90	LC
4	Ponnarali	<i>Thevetia peruviana</i>	Apocynaceae	8	6	10	0.8	60	1.3	17.78	19.35	37.13	NL
5	Nochi	<i>Vitex negundo</i>	Verbenaceae	4	3	10	0.4	30	1.3	8.89	9.68	18.57	LC
6	Suraimullu	<i>Ziziphus oenoplia</i>	Rhamnaceae	5	3	10	0.5	30	1.7	11.11	9.68	20.79	NL
7	Kattukkottai	<i>Jatropha curcas</i>	Euphorbiaceae	3	3	10	0.3	30	1.0	6.67	9.68	16.34	LC
8	Karaikai	<i>Canthium coromandelicum</i>	Rubiaceae	6	3	10	0.6	30	2.0	13.33	9.68	23.01	NL
Total				45	31								
Herbs													
1	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	6	10	0.9	60	1.5	3.18	4.00	7.18	NL
2	Thathapondur	<i>Tridax procumbens</i>	Asteraceae	17	9	10	1.7	90	1.9	6.01	6.00	12.01	NL
3	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	19	8	10	1.9	80	2.4	6.71	5.33	12.05	NL

4	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	26	7	10	2.6	70	3.7	9.19	4.67	13.85	NL
5	Nearunji mull	<i>Tribulus zeyheri</i>	Zygophyllaceae	10	5	10	1	50	2.0	3.53	3.33	6.87	NL
6	Pulapoo	<i>Aerva lanata</i>	Amaranthaceae	13	6	10	1.3	60	2.2	4.59	4.00	8.59	NL
7	American mint	<i>Hyptis suaveolens</i>	Lamiaceae	19	8	10	1.9	80	2.4	6.71	5.33	12.05	NL
8	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	12	6	10	1.2	60	2.0	4.24	4.00	8.24	NL
9	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	14	9	10	1.4	90	1.6	4.95	6.00	10.95	NL
10	Kovaikodi	<i>Coccinia grandis</i>	Cucurbitaceae	6	4	10	0.6	40	1.5	2.12	2.67	4.79	NL
11	Arivalmanaipoondu	<i>Sida acuta</i>	Malvaceae	9	6	10	0.9	60	1.5	3.18	4.00	7.18	NL
12	Amman pacharisi	<i>Euphorbia hirta</i>	Euphorbiaceae	13	5	10	1.3	50	2.6	4.59	3.33	7.93	NL
13	Keelanelli	<i>Phyllanthus amarus</i>	Phyllanthaceae	7	7	10	0.7	70	1.0	2.47	4.67	7.14	NL
14	Chevvarakupul	<i>Chloris barbata</i>	Poaceae	17	9	10	1.7	90	1.9	6.01	6.00	12.01	NL
15	Mullukkeerai	<i>Amaranthus spinosus</i>	Amaranthaceae	10	8	10	1	80	1.3	3.53	5.33	8.87	NL
16	Vishnukarandi	<i>Evolvulus alsinoides</i>	Convolvulaceae	13	6	10	1.3	60	2.2	4.59	4.00	8.59	NL
17	Thulasi	<i>Ocimum sanctum</i>	Lamiaceae	9	7	10	0.9	70	1.3	3.18	4.67	7.85	NL
18	Eallu	<i>Sesamum indicum</i>	Pedaliaceae	6	3	10	0.6	30	2.0	2.12	2.00	4.12	NL
19	Chatai	<i>Aeschynomene indica</i>	Fabaceae	5	4	10	0.5	40	1.3	1.77	2.67	4.43	LC
20	Yanaikkitti	<i>Cyperus iria</i>	Cyperaceae	17	7	10	1.7	70	2.4	6.01	4.67	10.67	LC
21	Thuthuvalai	<i>Solanum trilobatum</i>	Solanaceae	6	5	10	0.6	50	1.2	2.12	3.33	5.45	NL
22	Chirakkuli	<i>Spermacoce tenuior</i>	Rubiaceae	15	8	10	1.5	80	1.9	5.30	5.33	10.63	NL
23	Naikkatuku	<i>Cleome viscosa</i>	Cleomaceae	11	7	10	1.1	70	1.6	3.89	4.67	8.55	NL
Total				283	150								

NL - Not Listed in IUCN Red List Database LC - Least Concern - [Species categorized as Least Concern (LC) is a taxon when it has been evaluated against the Red List criteria and does not qualify for Endangered Near Threatened.] - Data Deficient (DD)

Table 3.24 Calculation of Species Diversity in 300 m Radius

S.No.	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Trees						
1	Vembu	<i>Azadirachta indica</i>	10	0.12	-2.13	-0.25
2	Pongam oiltree	<i>Pongamia pinnata</i>	6	0.07	-2.64	-0.19
3	Thennai maram	<i>Cocos nucifera</i>	7	0.08	-2.48	-0.21
4	Manga	<i>Mangifera indica</i>	4	0.05	-3.04	-0.14
5	Puliyamaram	<i>Tamarindus indica</i>	3	0.04	-3.33	-0.12
6	Vadanarayani	<i>Delonix elata</i>	3	0.04	-3.33	-0.12
7	Thenpazham	<i>Muntingia calabura</i>	5	0.06	-2.82	-0.17
8	Punnai	<i>Calophyllum inophyllum</i>	2	0.02	-3.74	-0.09
9	Ilanthai	<i>Ziziphus jujubha</i>	7	0.08	-2.48	-0.21
10	Karuvelam	<i>Acacia nilotica</i>	5	0.06	-2.82	-0.17
11	Nettilinkam	<i>Polylathia longifolia</i>	2	0.02	-3.74	-0.09
12	Panai maram	<i>Borassus flabellifer</i>	4	0.05	-3.04	-0.14
13	Navalmaram	<i>Syzygium cumini</i>	2	0.02	-3.74	-0.09
14	Alamaram	<i>Ficus benghalensis</i>	2	0.02	-3.74	-0.09
15	Vazhaimaram	<i>Musa</i>	3	0.04	-3.33	-0.12
16	Eucalyptus	<i>Eucalyptus globules</i>	5	0.06	-2.82	-0.17
17	Maramalli	<i>Millingtonia hortensis</i>	1	0.01	-4.43	-0.05
18	Kuduka puli	<i>Pithecellobium dulce</i>	3	0.04	-3.33	-0.12
19	Savukku	<i>Casuarina L.</i>	5	0.06	-2.82	-0.17
20	Echamaram	<i>Phoenix sylvestris</i>	5	0.06	-2.82	-0.17
H (Shannon Diversity Index) = 2.87						
Shrubs						
1	Avarai	<i>Senna auriculata</i>	8	0.21	-1.58	-0.32
2	Sundaika	<i>Solanum torvum</i>	9	0.23	-1.47	-0.34
3	Vellai Erukku	<i>Calotropis procera</i>	2	0.05	-2.97	-0.15
4	Ponnarali	<i>Thevetia peruviana</i>	8	0.21	-1.58	-0.32
5	Nochi	<i>Vitex negundo</i>	4	0.10	-2.28	-0.23
6	Suraimullu	<i>Ziziphus oenoplia</i>	5	0.13	-2.05	-0.26
7	Kattukkottai	<i>Jatropha curcas</i>	3	0.08	-2.56	-0.20
H (Shannon Diversity Index) = 1.83						
Herbs						
1	Perandai	<i>Cissus quadrangularis</i>	9	0.03	-3.45	-0.11
2	Thathapondu	<i>Tridax procumbens</i>	17	0.06	-2.81	-0.17
3	Kolunji chadi	<i>Tephrosia purpurea</i>	19	0.07	-2.70	-0.18
4	Nayuruvi	<i>Achyranthes aspera</i>	26	0.09	-2.39	-0.22
5	Nearunji mull	<i>Tribulus zeyheri</i>	10	0.04	-3.34	-0.12
6	Pulapoo	<i>Aerva lanata</i>	13	0.05	-3.08	-0.14

7	American mint	<i>Hyptis suaveolens</i>	19	0.07	-2.70	-0.18
8	Mukkirattai	<i>Boerhaavia diffusa</i>	12	0.04	-3.16	-0.13
9	Kuppaimeni	<i>Acalypha indica</i>	14	0.05	-3.01	-0.15
10	Kovaikodi	<i>Coccinia grandis</i>	6	0.02	-3.85	-0.08
11	Arivalmanaipoondu	<i>Sida acuta</i>	9	0.03	-3.45	-0.11
12	Amman pacharisi	<i>Euphorbia hirta</i>	13	0.05	-3.08	-0.14
13	Keelanelli	<i>Phyllanthus amarus</i>	7	0.02	-3.70	-0.09
14	Chevvarakupul	<i>Chloris barbata</i>	17	0.06	-2.81	-0.17
15	Mullukkeerai	<i>Amaranthus spinosus</i>	10	0.04	-3.34	-0.12
16	Vishnukarandi	<i>Evolvulus alsinoides</i>	13	0.05	-3.08	-0.14
17	Thulasi	<i>Ocimum sanctum</i>	9	0.03	-3.45	-0.11
18	Eallu	<i>Sesamum indicum</i>	6	0.02	-3.85	-0.08
19	Chatai	<i>Aeschynomene indica</i>	5	0.02	-4.04	-0.07
20	Yanaikkitti	<i>Cyperus iria</i>	17	0.06	-2.81	-0.17
21	Thuthuvalai	<i>Solanum trilobatum</i>	6	0.02	-3.85	-0.08
22	Chirakkuli	<i>Spermacoce tenuior</i>	15	0.05	-2.94	-0.16
23	Naikkatuku	<i>Cleome viscosa</i>	11	0.04	-3.25	-0.13

H (Shannon Diversity Index) = 3.05

Table 3.25 Species Richness (Index) in 300 m radius

Details	H	H max	Evenness	Species Richness
Trees	2.87	3.00	0.96	4.29
Shrubs	1.83	1.95	0.94	1.64
Herbs	3.05	3.14	0.97	3.90

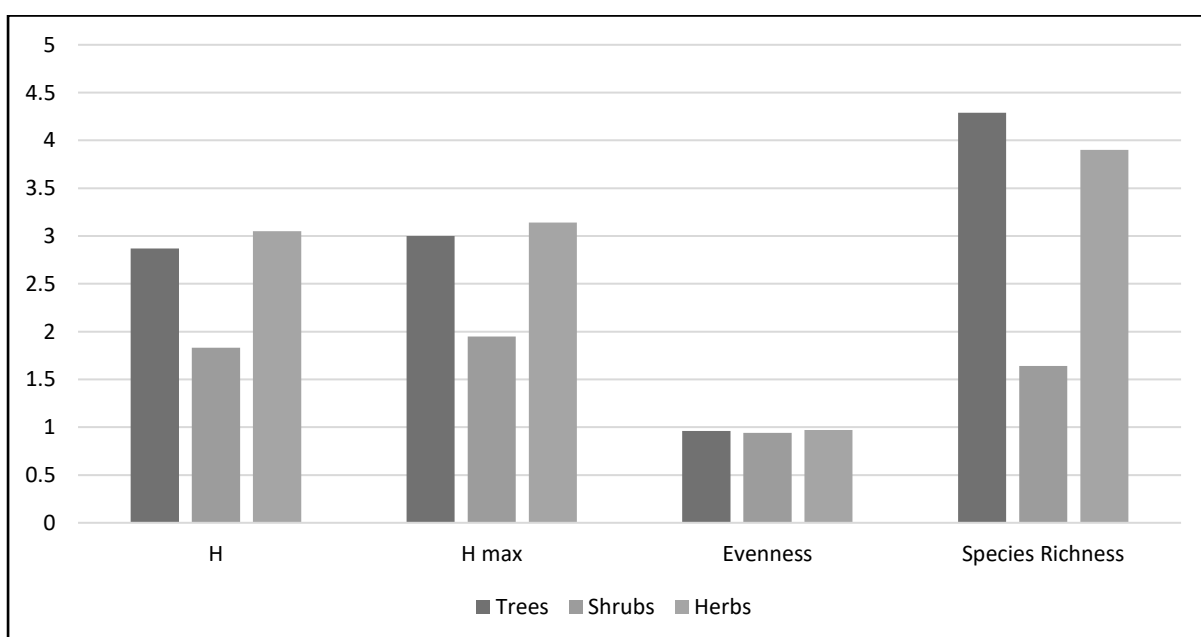


Figure 3.25 Species Richness (Index) in 300 m radius

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 40 families have been recorded. The floral (88) varieties among them 31 Trees (35.22%), 17 Shrubs (19.31%) Herbs and Climbers, Creeper, Grass & Cactus,40 (45.45%) were identified. Details of flora with the scientific name mentioned in Table 3.26.

Table 3.26 Flora in Buffer Zone

S. No	Local Name	Scientific name	Family name
1	Vembu	<i>Azadirachta indica</i>	Meliaceae
2	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
3	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae
5	Puliyamaram	<i>Tamarindus indica</i>	Legumes
6	Athi	<i>Ficus recemosa</i>	Moraceae
7	Vazhaimaram	<i>Musa</i>	Musaceae
8	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae
9	Amanakku	<i>Ricinus communis</i>	Euphorbiaceae
10	Perumungil	<i>Bambusa bambos</i>	Poaceae
11	Karungali	<i>Acacia sundra</i>	Legumes
12	Sapota	<i>Manilkara zapota</i>	Sapotaceae
13	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae
14	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae
15	Ezhumuchaipalam	<i>Citrus lemon</i>	Rutaceae
16	Alamaram	<i>Ficus benghalensis</i>	Moraceae
17	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
18	Manga	<i>Mangifera indica</i>	Anacardiaceae
19	Thekku	<i>Tectona grandis</i>	Verbenaceae
20	Nelli	<i>Embllica officinalis</i>	Phyllanthaceae
21	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae
22	Vadanarayani	<i>Delonix elata</i>	Fabaceae
23	Marudaani	<i>Lawsonia inermis</i>	Lythraceae
24	Pappali maram	<i>Carica papaya L</i>	Caricaceae
25	Nochi	<i>Vitex negundo</i>	Verbenaceae
26	Vilvam	<i>Aegle marmelos</i>	Rutaceae
27	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae
28	Koyya	<i>Psidium guajava</i>	Myrtaceae
29	Seethapazham	<i>Annona reticulata</i>	Annonaceae
30	vagai	<i>albizia lebbeck</i>	Fabaceae
31	Savuku	<i>Casuarina equisetifolia</i>	Casuarinaceae
SHRUBS			

32	Avarai	<i>Senna auriculata</i>	Fabaceae
33	Sundaika	<i>Solanum torvum</i>	Solanaceae
34	Arali	<i>Nerium indicum</i>	Apocynaceae
35	Idlipoo	<i>Ixorococ cineia</i>	Rubiaceae
36	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae
37	Icham	<i>Phoenix pusilla</i>	Arecaceae
38	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
39	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae
40	Thuthi	<i>Abutilon indicum</i>	Meliaceae
41	Chemparuthi	<i>Hibiscu rosa- sinensis</i>	Malvaceae
42	Kundumani	<i>Abrus precatorius</i>	Fabaceae
43	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
44	cirututti	<i>Hibiscus vitifolius</i>	Malvaceae
45	rigida	<i>Ehretia rigida</i>	Boraginaceae
46	Marul-umattai	<i>Xanthium strumarium L</i>	Asteraceae
47	Venmalar	<i>Ligustrum vulgare</i>	Oleaceae
48	Unishedi	<i>Lantana camara</i>	Verbenaceae
HERBS&CLIMBER &CREEPER &GRASSES			
49	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae
50	Veetukaayapoond	<i>Tridax procumbens</i>	Asteraceae
51	Koraikkilangu	<i>Cyperus articulates</i>	Cyperaceae
52	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae
53	Chempu	<i>Colocasia indica</i>	Araceae
54	Karisilanganni	<i>Eclipta prostata</i>	Asteraceae
55	Korai	<i>Cyperus rotundus</i>	Cyperaceae
56	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae
57	Milagai	<i>Capsicum frutescens</i>	Solanaceae
58	Kanamvazha	<i>Commelina benghalensis</i>	Commelinaceae
59	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae
60	Thumbai	<i>Leucas aspera</i>	Lamiaceae
61	Parttiniyam	<i>Parthenium hysterophorus</i>	Asteraceae
62	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae
63	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
64	Manathakkali	<i>Solanumnigrum</i>	Solanaceae
65	Kumipoond	<i>Gomphrena celosioides</i>	Amaranthaceae
66	Kattuthulasi	<i>Ocimum sanctum</i>	Lamiaceae
67	Kattukolingi	<i>Tephrosia purpurea</i>	Fabaceae
68	Wight, Contrib	<i>Blumea axillaris</i>	Asteraceae
69	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
70	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
71	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae
72	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae

73	Nannari	<i>Hemidesmus indicus</i>	Asclepiadaceae
74	Malli	<i>Jasminum augustifolium</i>	Oleaceae
75	Musumusukkai	<i>Mukia maderaspatana</i>	Cucurbitaceae
76	Poonaipiduku	<i>Passiflora foetida</i>	Passifloraceae
77	Ptruukodi	<i>Helinus integrifolius</i>	Rhamnaceae
78	Kattuppirantai	<i>Causonis trifolia</i>	Vitaceae
79	Vallikeerai	<i>Ipomoea aquatica</i>	Convolvulaceae
80	Siru Puladi	<i>Desmodium triflorum</i>	Fabaceae
81	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae
82	Korai	<i>Cyperus rotandus</i>	Poaceae
83	Mookuthi Poondu	<i>Wedelia trilobata</i>	Asteraceae
84	Nellu	<i>Oryza sativa</i>	Poaceae
85	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
86	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae
87	Arugampul	<i>Cynodon dactylon</i>	Poaceae
88	kathalai	<i>Opuntia guatemalensis</i>	Cactaceae

Aquatic Vegetation

The Field Survey for Assessing the Aquatic Vegetation Was Also Undertaken During the Study Period. The List of Aquatic Plants Observed in The Study Area Is Given in Table 3.27.

Table 3.27 Aquatic Vegetation

S. No.	Scientific Name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Eichornia Crassipe</i>	Water Hyacinth	Agayatamarai	NA
2	<i>Aponogeton natans</i>	Floating Lace Plant	Kottikizhangu	NA
3	<i>Nymphaea Nouchali</i>	Blue Water Lily	Nellambal	LC
4	<i>Carex Cruciata</i>	Cross Grass	Koraipullu	NA
5	<i>Cynodon Dactylon</i>	Scutch Grass	Arugampullu	LC
6	<i>Cyperus Exaltatus</i>	Tall Flat Sedge	Koraikizhangu	LC

*Lc- Least Concern, Na-Not Yet Assessed

Food chain

The food chain in aquatic ecosystems often begins with the algae or phytoplankton producers, and then the zooplankton that feed on them. This type of food chain is found in Noyal River by phytoplankton, zooplankton, fish and Artiola gray.

Ex: Phytoplankton→Zooplankton→small fish→large fish

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 in 10km radius.

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 3.28 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 9 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. 3.29.

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 3.30.

Table 3.29 Fauna in Core Zone

S. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
INSECTS					
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	Acraea violae	Nymphalidae	<i>Acraea violae</i>	NL	LC
REPTILES					
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
MAMMALS					
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
AVES					
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

Table 3.30 Fauna in Buffer Zone

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
INSECTS					
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
REPTILES					
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
MAMMALS					
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
AVES					
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	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 macrocercus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
AMPHIBIANS					
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 Kanchipuram district

The pre-monsoon rainfall is almost uniform throughout the district. The coastal taluks get more rains rather than the interior regions. This district is mainly depending on the seasonal rains, the distress conditions prevail in the event of the failure of rains. Northeast and Southwest

monsoon are the major donors with 54% and 36% contribution each to the total annual rainfall. Agriculture is the main occupation of the people with 20% of the population engaged in it. Paddy is the major crop cultivated in this district. Groundnuts, Sugarcane, Cereals and Millets and Pulses are the other major crops. Paddy is the major crop cultivated in this district. Groundnuts, Sugarcane, Cereals & Millets and Pulses are the other major crops cultivated.

Major Agricultural Crops 1km radius

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. 3.31.

Table 3.31 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	Cotton	<i>Gossypium herbaceum</i>	Malvaceae

Major Horticulture Crops 1km radius

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 1km radius

Major horticulture crops cultivated in Kanchipuram 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 3.32.

Table 3.32 Major Field Crops & Horticulture cultivation in 1km radius.

S. No	Common Name	Scientific Name	Family
Major Horticultural Crops			
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
Vegetables			
5	Onion	<i>Allium cepa</i>	Amaryllidaceae
6	Tapioca	<i>Manihot esculenta</i>	Spurges

7	Brinjal	<i>Solanum melongena</i>	Nightshade
8	Tomato	<i>Solanum lycopersicum</i>	Nightshade
9	Bottle Gourd	<i>Lagenaria siceraria</i>	Cucurbits
10	Veandai kai	<i>Abelmoschus esculentus</i>	Mallows
11	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

3.6.0 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.

3.6.1 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.

3.6.2 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

3.6.3 Socio-Economic Status of Study area

The study area covers 26 villages including Angambakkam, Arumbuliur, Devariambakkam, Ezhichur, Kamarajapuram, Karumbakkam, Kavanipakkam, Kurumanjeri, Melmanapakkam, Mulaginimeni, Nathanallur, Palayaseevaram, Palur, Peranakkavur, Sirupinayur, Puliyambakkam, Pullampakkam, Sathananjeri, Seethananjeri, Sirudamur, Thirumukkudal, Thollazhi, Thonankulam, Ullavur, Villiambakkam. As Pazhaveri is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.33 and for other 25 villages in Tables 3.34 - 3.36.

Table 3.33 Pazhaveri Village Population Facts

Pazhaveri Village	
Number of Households	191
Population	727
Male Population	362
Female Population	365
Children Population	76
Sex-ratio	932
Literacy	73.27%
Male Literacy	83.13%
Female Literacy	63.38%
Scheduled Tribes (ST) %	5
Scheduled Caste (SC) %	368
Total Workers	264
Main Worker	260
Marginal Worker	4

Table 3.34 Population and Literacy Data of Study Area

Village	No of Households	Total Population Person	Total Population Male	Total Population Female	Literates Population Person	Literates Population Male	Literates Population Female	Illiterate Persons	Illiterate Male	Illiterate Female
Angambakkam	450	1907	963	944	1167	674	493	740	289	451
Arumbuliyur	402	1618	777	841	1025	546	479	593	231	362
Devariambakkam	232	875	426	449	571	329	242	304	97	207
Ezhichur	343	1373	658	715	886	457	429	487	201	286
Kambarajapuram	380	1527	766	761	944	553	391	583	213	370
Karumbakkam	211	850	438	412	518	289	229	332	149	183
Kavanipakkam	190	780	382	398	508	272	236	272	110	162
Kurumanjeri	164	666	330	336	451	248	203	215	82	133
Melmanapakkam	282	1212	622	590	859	470	389	353	152	201
Mulaginimeni	90	381	201	180	241	137	104	140	64	76
Nathanallur	520	2158	1047	1111	1288	690	598	870	357	513
Palayaseevaram	1411	5634	2792	2842	3563	2013	1550	2071	779	1292
Palur	1660	6964	3466	3498	4637	2496	2141	2327	970	1357
Peranakkavur	235	926	478	448	586	332	254	340	146	194
Sirupinayur	541	2053	1028	1025	1269	702	567	784	326	458
Puliyambakkam	502	2158	1253	905	1550	999	551	608	254	354
Pullampakkam	209	872	424	448	494	269	225	378	155	223
Sathananjeri	544	2166	1095	1071	1387	796	591	779	299	480
Seethananjeri	110	494	247	247	374	204	170	120	43	77

Sirudamur	755	3097	1555	1542	1920	1101	819	1177	454	723
Thirumukkudal	406	1673	850	823	1216	672	544	457	178	279
Thollazhi	272	980	501	479	587	347	240	393	154	239
Thonankulam	123	435	216	219	270	149	121	165	67	98
Ullavur	444	1749	908	841	1096	662	434	653	246	407
Villiambakkam	347	1344	673	671	879	511	368	465	162	303

Table 3.35 Details on Educational Facilities, Water, and Drainage & Health Facilities

Village	Private Primary School (Numbers)	Govt. Vocational Training School/ITI (Numbers)	Primary Health Centre (Numbers)	Tap Water Untreated	River/Canal	Is the Area Covered under Total Sanitation Campaign (TSC)?	Telephone (landlines)	Public Bus Service	Gravel (kutcha) Roads	Commercial Bank	Agricultural Credit Societies	Self - Help Group (SHG)	Nutritional Centres- Anganwadi Centre	Community Centre with/without TV	Power Supply for Domestic Use
Angambakkam	2	2	0	1	2	2	1	2	1	2	2	1	1	1	1
Arumbuliyur	2	2	0	1	2	2	1	1	1	1	1	1	1	2	1
Devariyambakkam	2	2	0	1	2	2	1	1	1	2	1	1	1	2	1
Ezhichur	2	2	1	1	2	1	1	1	1	2	2	1	1	2	1
Kambarajapuram	2	2	0	1	2	2	1	1	1	2	2	1	1	2	1
Karumbakkam	1	2	0	2	2	2	1	2	1	2	2	1	1	1	1
Kavanipakkam	2	2	0	1	2	2	1	1	1	2	2	1	1	1	1
Kurumanjeri	2	2	0	2	2	2	1	1	1	2	2	1	1	2	1
Melmanapakkam	2	2	0	1	2	1	1	2	1	2	2	1	1	2	1
Mulaginimeni	2	2	0	1	2	2	2	1	1	2	2	1	2	2	1
Nathanallur	2	2	0	1	2	2	1	1	1	2	2	1	1	1	1

Palayaseevaram	1	2	0	1	2	2	1	1	1	1	2	1	1	1	1
Palur	2	2	0	1	2	2	1	1	1	2	2	1	1	2	1
Peranakkavur	2	2	0	1	2	2	1	1	1	2	2	1	1	1	1
Sirupinayur	2	2	0	1	2	2	1	1	1	2	2	1	1	1	1
Puliyambakkam	2	2	0	2	2	1	1	2	1	2	2	1	1	2	1
Pullampakkam	2	2	0	1	2	1	1	1	1	2	2	1	1	1	1
Sathananjeri	2	2	0	1	2	2	1	1	1	2	1	1	1	2	1
Seethananjeri	2	2	0	2	2	2	1	1	1	2	2	1	2	1	1
Sirudamur	1	2	0	1	2	1	1	1	1	2	2	1	1	2	1
Thirumukkudal	2	2	0	1	2	2	1	1	1	2	2	1	1	2	1
Thollazhi	2	2	0	2	2	2	1	1	1	2	2	1	1	2	1
Thonankulam	2	2	0	1	2	2	1	1	1	2	2	1	1	2	1
Ullavur	2	2	0	1	2	2	1	1	1	2	2	1	1	1	1
Villiambakkam	2	2	0	1	2	2	1	1	1	2	1	1	1	1	1

Table 3.36 Workers Profile of Study Area

Village	Total Worker Population Person	Total Worker Population Male	Total Worker Population Female	Main Working Population Person	Main Working Population Male	Main Working Population Female	Main Cultivator Population Person	Main Agricultural Labourers Population Person	Main Other Workers Population Person	Non-Working Population Person
Angambakkam	1004	549	455	831	473	358	183	409	233	903
Arumbuliyur	657	475	182	583	428	155	95	148	337	961
Devariambakkam	435	263	172	428	262	166	82	202	135	440
Ezhichur	607	381	226	537	339	198	33	204	295	766
Kambarajapuram	818	460	358	731	430	301	57	407	259	709
Karumbakkam	441	253	188	427	249	178	32	269	125	409

Kavanipakkam	364	239	125	286	213	73	25	122	138	416
Kurumanjeri	369	201	168	330	183	147	63	156	98	297
Melmanapakkam	558	395	163	557	394	163	44	203	304	654
Mulaginimeni	185	116	69	47	42	5	13	3	31	196
Nathanallur	1138	630	508	777	565	212	127	276	350	1020
Palayaseevaram	2158	1587	571	1753	1360	393	141	273	1318	3476
Palur	3387	2118	1269	2297	1598	699	96	737	1429	3577
Peranakkavur	536	290	246	533	289	244	175	261	93	390
Sirupinayur	1058	606	452	1036	601	435	195	629	203	995
Puliyambakkam	749	502	247	457	346	111	38	105	309	1409
Pullampakkam	425	246	179	412	238	174	43	250	118	447
Sathananjeri	1220	728	492	1212	727	485	27	978	197	946
Seethananjeri	200	145	55	107	93	14	13	0	93	294
Sirudamur	1520	936	584	1316	842	474	402	581	319	1577
Thirumukkudal	540	447	93	527	437	90	25	340	161	1133
Thollazhi	472	296	176	376	287	89	24	143	202	508
Thonankulam	241	125	116	241	125	116	4	166	69	194
Ullavur	657	437	220	369	263	106	75	153	132	1092
Villiambakkam	697	408	289	405	267	138	57	140	206	647

3.6.7 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.

3.6.8 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 (Arumbuliyur – Pazhaveri) and SH-789 - (Nelvoy cross road to Walajabad) as shown in Table 3.35 and in Figure 3.26. 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 3.37 Traffic Survey Locations

Station Code	Road Name	Distance and Direction
TS1	Village Road (Arumbuliyur – Pazhaveri)	74m-North
TS2	SH-789 (Nelvoy cross road to Walajabad)	0.80 Km-SW

Source: On-site monitoring by GTMS FAE & TM

Table 3.38 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	80	240	61	61	93	46	347
TS2	140	420	82	82	120	60	562

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 3.39 Rough Stone Transportation Requirement

Transportation of Rough Stone Per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	76	228

Source: Approved Mining Plan

Table 3.40 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 – 1960guidelines
Village Road (Arumbuliyur – Pazhaveri)	347	228	575	1200
SH-789 (Nelvoy cross road to Walajabad)	562	228	790	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

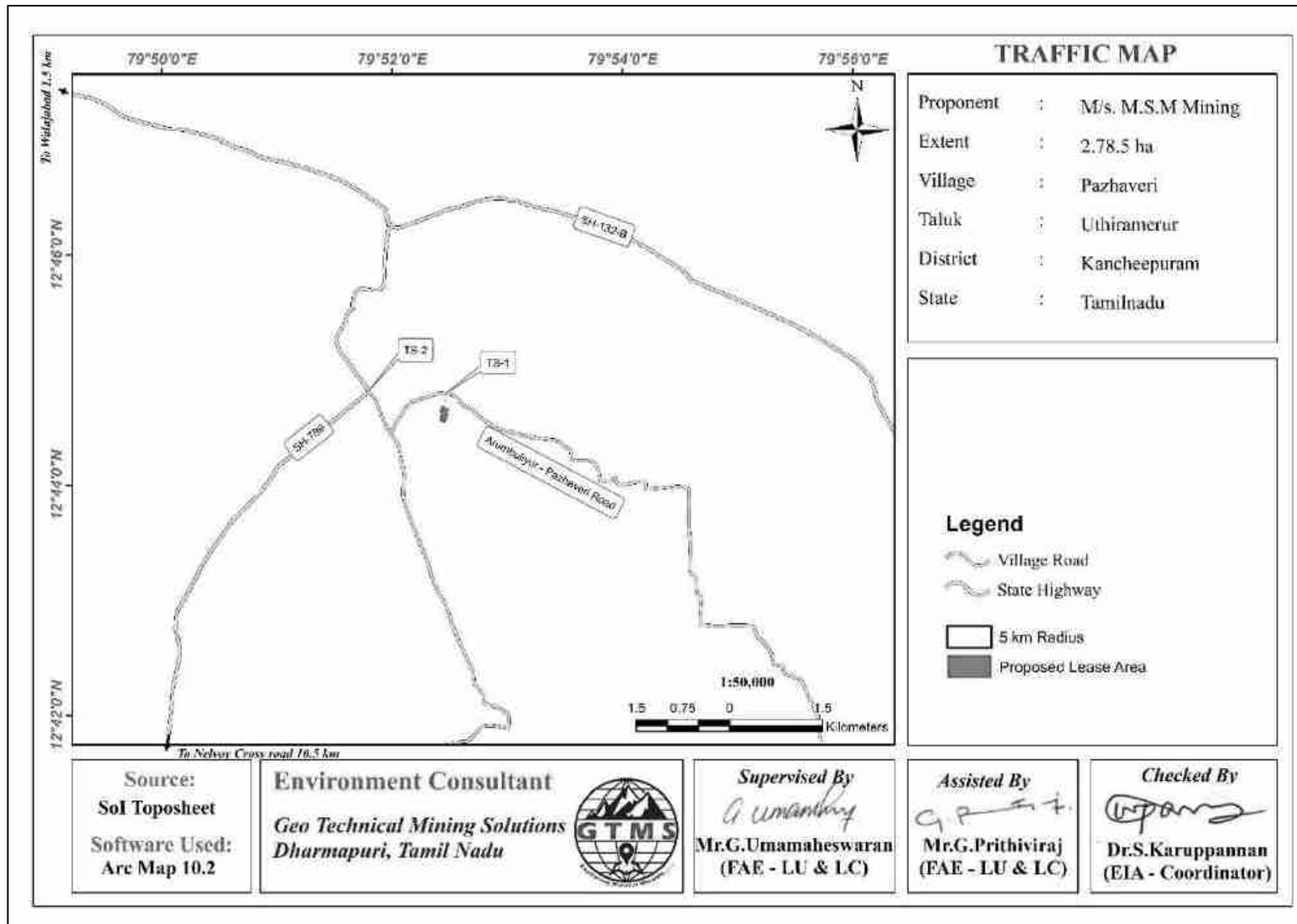


Figure 3.26 Traffic Density Map

3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries 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 3.41.

Table 3.41 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
		Karikili birds Santuari	16km -South
2	Reserve Forest	Kavanipakkam R.F	1.80km-South
		Edamachi R.F	5.03km SW
		Maiyur R.F	9.75km SE
		Appur R.F	8.85km NE
		Vadakkupattu R.F	9.90km NE
		Maduram R.F	10.25km SW
		Paranur R.F	10.60km East
		Anumanthapakkam R.F	11.75km SE
		Thirutheri R.F	12.32km East
		Vattampakkam R.F	12.75km NE
		Siruvanjur R.F	14.25km NE
		Thirumanai R.F	14.50km SE
		Vallam R.F	16.20km SE
		Kattankulathur R.F	16.35km NE
		Anjur R.F	16.57km East
		Senkundram R.F	17.0km East
		Perugoli R.F	17.85km SW
Valluvampakkam R.F	19.05km SE		
Thirukalukundram R.F	19.30km SE		
Gudalur (Kpm) R.F	19.53km NE		

		Sirukundram R.F	19.77km East
		Salur R.F	19.93km SE
		Sirukundram Extn R.F	21.15km SE
		Koliyalam R.F	21.98km SE
3	Lakes/ Reservoirs/ Dams/Streams/Rivers	Pazhaveri Lake	0.35km South
		Arumbuliyur lake	1.30km SE
		Sirumsilur lake	1.50km SW
		Cheyur River	4.65km West
		Puliampakkam Lake	5.83km NW
		Kovalai Lake	12km SE
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	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet





Figure 3.27 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 or temporary change on land use and land cover.
- ❖ Change in topography of the mine lease area will change at the end of the life of the mine.
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ❖ Degradation of the aesthetic environment of the core zone due to quarrying
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- ❖ Siltation of water course due to wash off from the exposed working area

4.1.2 Mitigation Measures from Proposed Project

- ❖ The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.
- ❖ Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- ❖ Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- ❖ Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- ❖ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m, 10m and 50m 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

Following impacts are anticipated due to mining operations:

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

4.2.2 Common Mitigation Measures from proposed project

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

4.3 WATER ENVIRONMENT

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 3.05KLD 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 (PM₁₀ and PM_{2.5}) 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 emission estimation have been given in Table 4.1.

Table 4.1 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E = [u^{0.4} a^{0.2} \{9.7 + 0.01p + b/(4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); 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 PM₁₀ emission rate is derived from the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM_{2.5} and PM₁₀ 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 ²	Calculated Value (g/s/m ²)
Overall Mine	PM _{2.5}	1.785717237	27850	6.41191E-07
Overall Mine	PM ₁₀	3.571434474	27850	1.28238E-06

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 4.3-4.4.

4.4.2.2 Model Results

The post project resultant concentrations of PM₁₀ and PM_{2.5} (GLC) is given in Tables 4.3-4.4.

Table 4.3 Incremental & Resultant GLC of PM_{2.5}

Station ID	Distance to core area (km)	Direction	PM _{2.5} concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	---	---	23.9	2.9	26.8	Below standard	12.3	Not significant
AAQ2	0.88	E	22.3	0.2	22.5		0.9	
AAQ3	3.20	SE	25.2	0	25.2		0.0	
AAQ4	4.26	NE	25.1	0	25.1		0.0	
AAQ5	2.05	SW	21.2	1	22.2		4.7	
AAQ6	2.22	SW	24.4	0.5	24.9		2.0	
AAQ7	2.05	NW	23.5	0.2	23.7		0.9	

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station ID	Distance to core area (km)	Direction	PM ₁₀ concentrations(µg/m ³)			Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	---	---	45.2	6.0	51.2	Below standard	13.3	Not significant
AAQ2	0.88	E	41.0	0.5	41.5		1.2	
AAQ3	3.20	SE	46.7	0	46.7		0.0	
AAQ4	4.26	NE	45.2	0.5	45.7		1.1	
AAQ5	2.05	SW	39.8	1	40.8		2.5	
AAQ6	2.22	SW	43.4	0.5	43.9		1.2	
AAQ7	2.05	NW	44.7	0.5	45.2		1.1	

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.

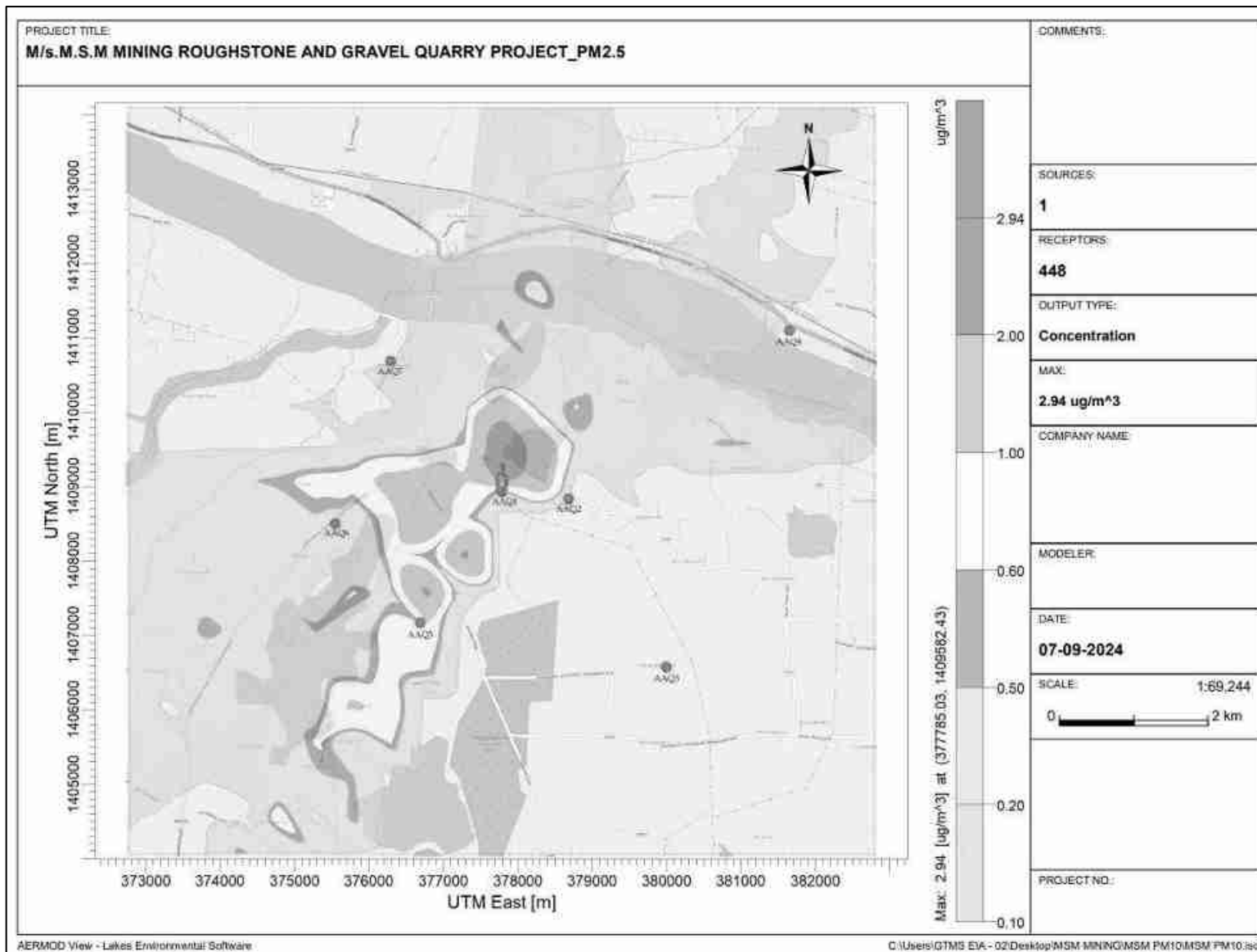


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

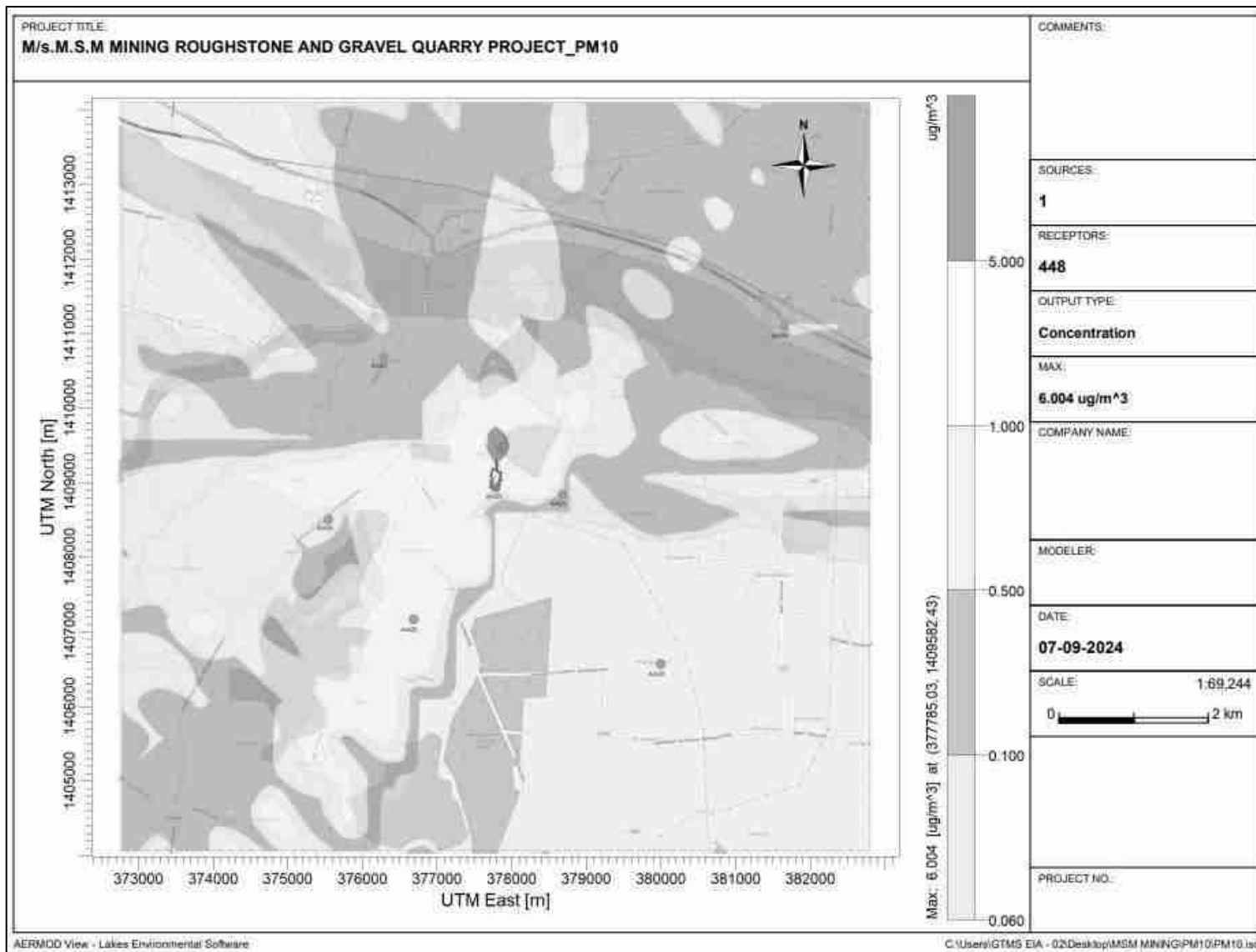


Figure 4.2 Predicted Incremental Concentration of PM₁₀

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.

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - A_{e1,2}$$

Where,

L_{p1} & L_{p2} are sound levels at points located at distances r_1 and r_2 from the source

$A_{e1,2}$ is the excess attenuation due to environmental conditions.

Combined effect of all sources can be determined at various locations by logarithmic addition.

$$L_{p \text{ total}} = 10 \log \{10^{(L_{p1}/10)} + 10^{(L_{p2}/10)} + 10^{(L_{p3}/10)} + \dots\}$$

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 4.5.

Table 4.5 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
Total			95.8

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). Generally, most mining operations produce noise between 95.8 dB (A).

Table 4.6 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level (dBA)	Total (dBA)
Core	100	45.6	44.0	47.9
Pazhaveri	840	42.9	25.5	43.0
Kavanippakkam	3010	45.9	14.4	45.9
Palur	4750	45.1	10.4	45.1
Hemprasath Core	2050	41.2	17.7	41.2
Madhur	2210	40.2	17.1	40.2
Thirumukkudal	2040	44.9	17.8	44.9
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

Ground vibrations due to the proposed mining activities are anticipated due to operation of mining machines like excavators, drilling and blasting, transportation vehicles, etc., however, 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. Nearest habitation from the proposed project areas is listed in below table. 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 4.7 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	26.25	840	0.143	19	0.05	128

Table 4.8 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	26.25	100	4.30	19	0.66	150
		200	1.42		0.29	143
		300	0.74		0.18	139
		400	0.46		0.13	136
		500	0.32		0.10	134

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, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- ❖ A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- ❖ Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- ❖ Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s.
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

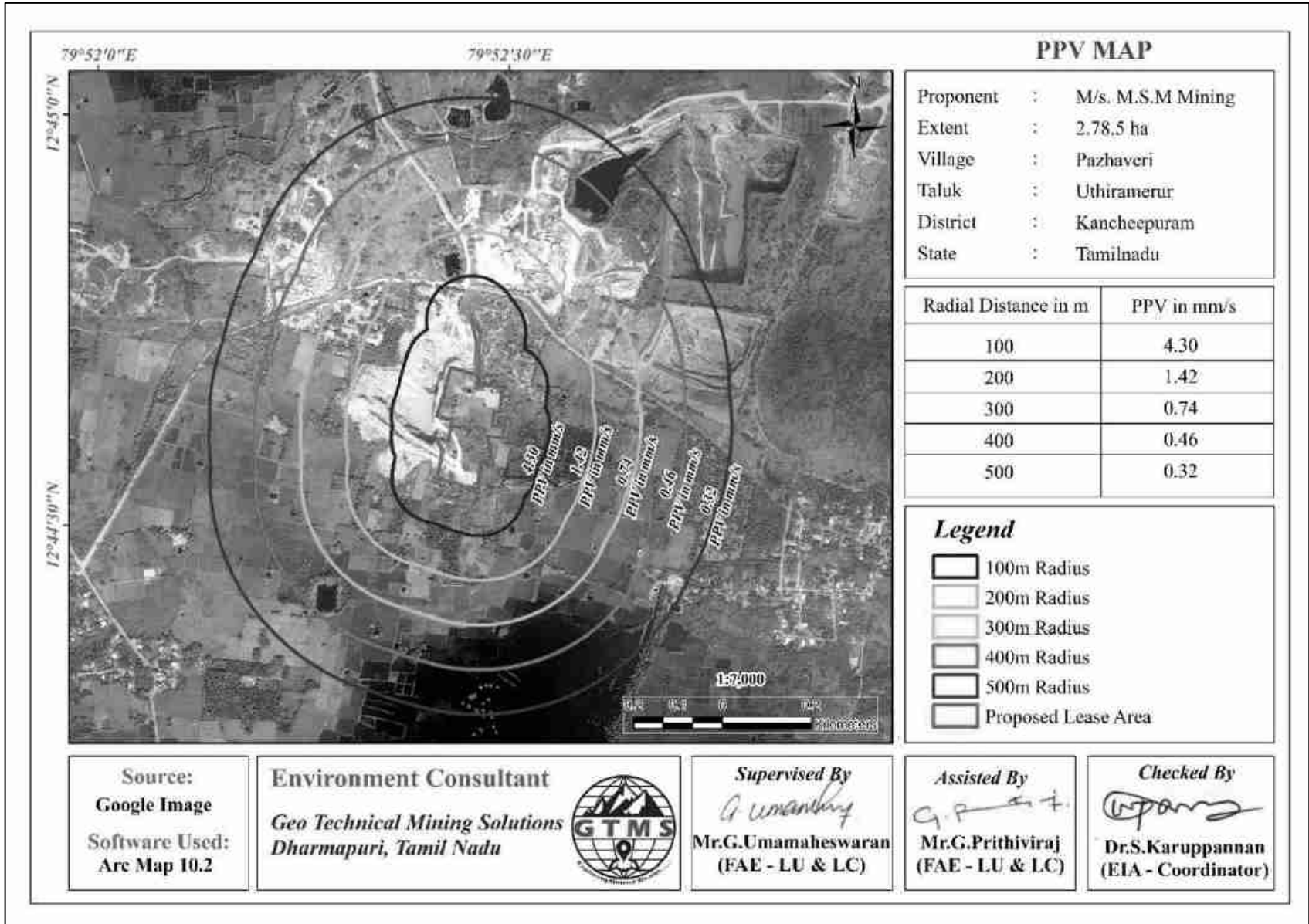


Figure 4.3 Predicted PPV Values due to Blasting at 100-500 m radius

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- ❖ 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. There are no trees in mine lease area.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 3492 kg per day, 942975 kg per year and 4714874 kg over five years, as provided in Table 4.9.

Table 4.9 Carbon Released During Five Years of Rough Stone and Gravel Production

	Per day	Per year	Per five years
Fuel consumption of excavator	232	62716	313581
Fuel consumption of compressor	24	6480	32400
Fuel consumption of tipper	1047	282660	1413300
Total fuel consumption in liters	1303	351856	1759281
Co ₂ emission in kg	3492	942975	4714874

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.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Carbon Sequestration

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 33387 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 1393 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 166933 kg of the total carbon, as provided in Table 4.12.

Table 4.10 CO₂ Sequestration

CO ₂ sequestration in kg	124	33387	166933
Remaining CO ₂ not sequestered in kg	3369	909588	4547941
Trees required for environmental compensation	37900		
Area required for environmental compensation in hectares	76		

Table 4.11 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 Well distinct in 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	Nettilling	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 4.12 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m ²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	557	446	5013
	Number of plants outside the mine lease area		
	836	668	7520
Total	1393	1114	12533

Table 4.13 Budget for Greenbelt Development Plan

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	557	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for	1,11,400	16,710

		plantation inside the lease area and @ 30 per plant maintenance (recurring))"		
Plantation outside the area	836	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	2,50,650	25,065
Total			3,62,050	41,775

Source: EMP budget

After complete extraction of mineral, the excavated pits will be allowed to collect rainwater and seepage water to serve as a reservoir to charge the nearby wells. Fish culture will also be attempted. A bund will be constructed around the pits. In order to minimize the impact of mining on the vegetation outside the mine lease area, it is recommended that adequate protection measures must be implemented. As mining involves movement of vehicles and increased anthropogenic activities, some of the areas can be fenced by involving local people and educating them about increased benefits of such activities.

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. There is no fauna in mine lease area.

4.6.4 Mitigation Measures on Fauna

- ❖ 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

4.6.5 Impact on agriculture and horticulture crops in 1km Radius

- ❖ Problems to agricultural and horticulture land due to dust caused by movement of heavy vehicles.
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season.
- ❖ The fugitive dust released from the mining operations may cause effect on the agricultural and horticulture land who are directly exposed to the fugitive dust.
- ❖ Dust from the quarries is likely to affect reproductive systems in nearby agricultural and horticulture lands.
- ❖ Dust from quarries can affect plant growth and reduce vegetable yields.

4.6.6 Mitigation Measures on agriculture and horticulture crops.

- ❖ The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- ❖ It is a granite quarry, no explosives are used, there is no possibility of vibration and dust, thus there is no possibility of damage to the adjacent agricultural land.
- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ❖ A green belt will be created in 7.5 safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- ❖ 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.

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, Spirometric tests
- ❖ Periodic medical examination – yearly
- ❖ Lung function test – yearly, those who are exposed to dust
- ❖ Eye test

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

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.

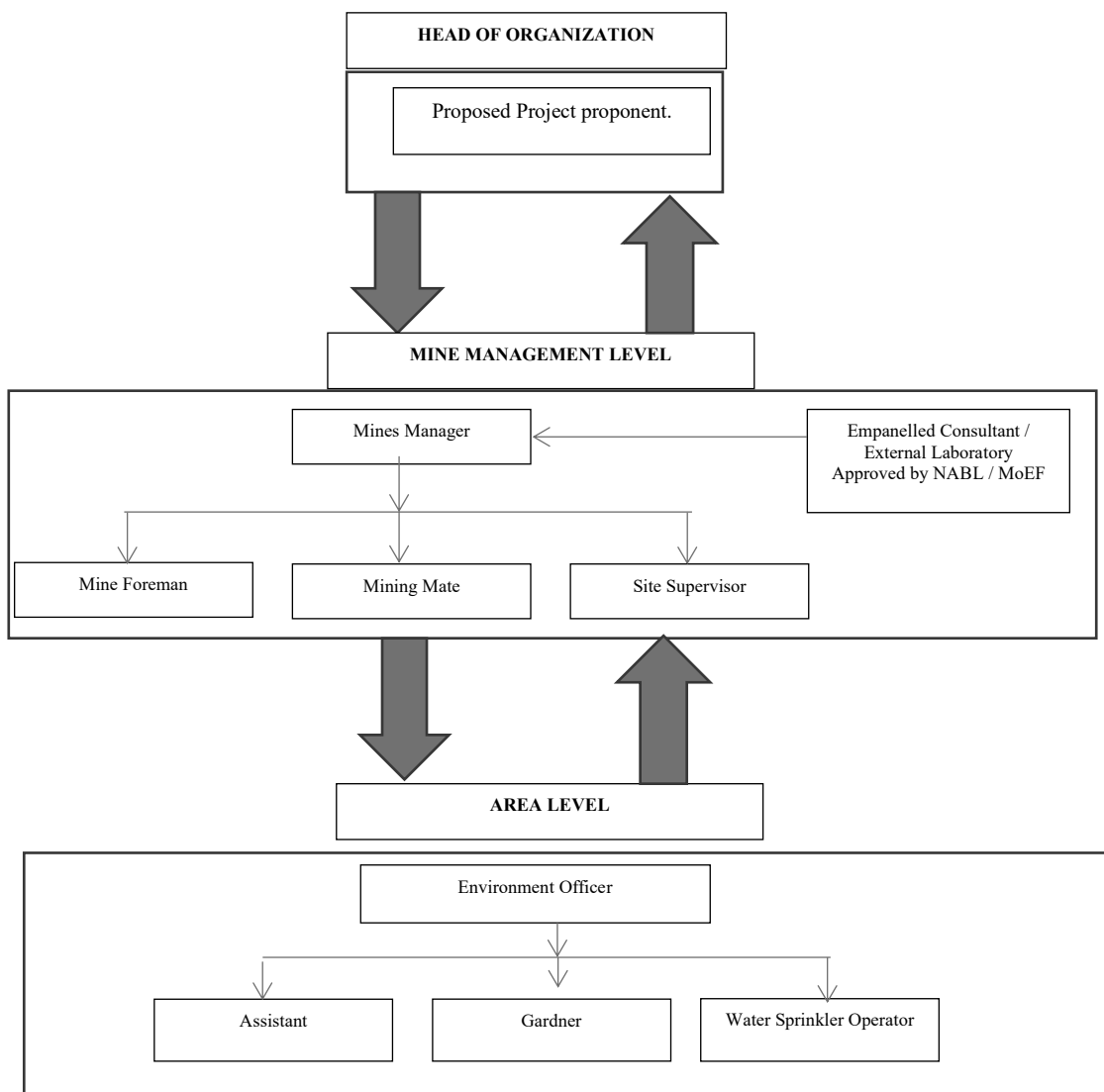


Figure 6.1 Proposed environmental monitoring chart

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

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

6.4 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/-
Total		-	Rs 2,95,000 /-

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
- ❖ Plastic Waste Management

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 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project. 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	Improper handling and unsafe working practice	✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation,

	mining machineries.		<p>1961 and Mines Rules, 1955 will be strictly followed during all mining operations.</p> <ul style="list-style-type: none"> ✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited. ✓ Fire-fighting and first-aid provisions in the mine office complex and mining area. ✓ 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. ✓ Working of quarry, as per approved plans and regularly updating the mine plans. ✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut. ✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager. ✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.
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"> ✓ Safe operating procedure established for drilling (SOP) will be strictly followed. ✓ Only trained operators will be deployed. ✓ 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, ✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other. ✓ Periodical preventive maintenance and replacement of worn-out accessories in the

			<p>compressor and drill equipment as per operator manual.</p> <ul style="list-style-type: none"> ✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition. ✓ Operator shall regularly use all the personal protective equipment.
3	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal & overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<ul style="list-style-type: none"> ✓ 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. ✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. ✓ Concave mirrors should be kept at all corners ✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point ✓ Loading according to the vehicle capacity ✓ Periodical maintenance of vehicles as per operator manual
4	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> ✓ Escape Routes will be provided to prevent inundation of storm water ✓ Fire Extinguishers & Sand buckets
5	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	<ul style="list-style-type: none"> ✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.

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.

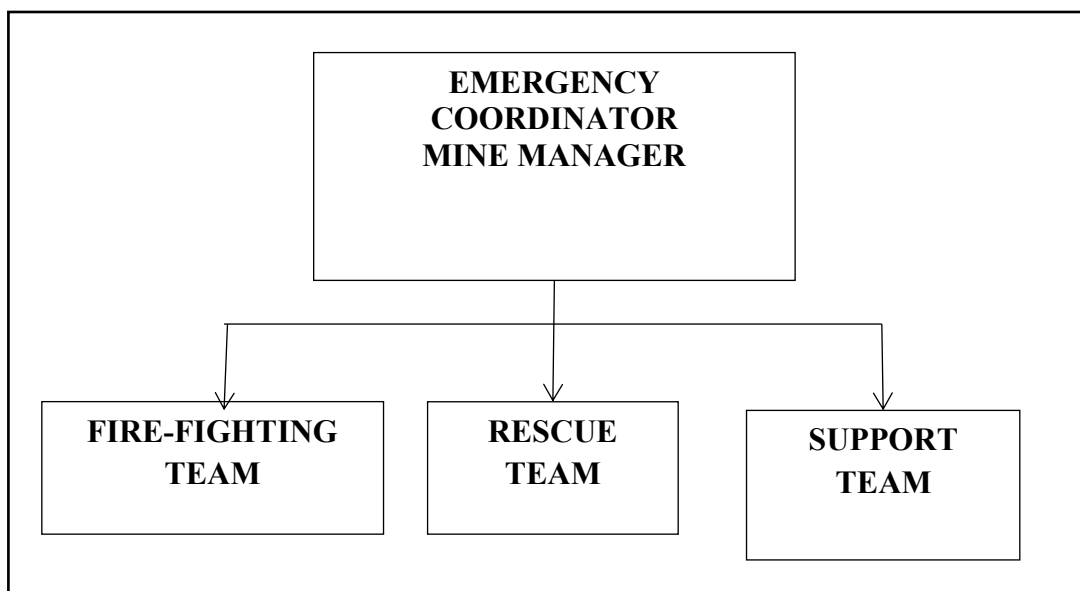


Figure 7.1 Disaster management team layout for proposed project

The emergency organization shall be headed by emergency coordinator who will be qualified competent mines manager. In his absence senior most people available at the mine shall be emergency coordinator till arrival of mines manager. There would be three teams for taking care of emergency situations – Fire-Fighting Team, Rescue Team and Support Team.

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, 2 proposed projects, known as P1, P2 are taken into consideration. The details of P1 have been given in Table 1.3 and the details of P2 are given in the Table 7.2.

Table 7.2 Salient Features of the Proposed Project P2

Name of the Quarry	Tvl.APK Minerals Rough Stone and Gravel Quarry
Type of Land	Patta Land
Extent	2.23.12 Ha
S.F.No	207/4B, 5B, 6B, 7B, 8B, 9, 208/1A, 2A, 2B1, 2B2, 5A, 5C, 5D, 5E, 5F, 5G, 212/1L, 1M, 1N
Toposheet No	57 P/13

Location of Project Site	12° 44'46.1684"N to 12° 44'38.8482"N 79°52'42.9836"E to 79°52'36.3755"E	
Highest Elevation	70 m AMSL	
Ultimate depth of Mining	32m BGL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	1027890	45684
Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	215556	55160
Proposed reserves for five years	Rough Stone in m ³	Gravel in m ³
	158460	31776
Method of Mining	Open-Cast Semi Mechanized mining	
Topography	Flat Topography	
Machinery proposed	Jack Hammer	6
	Compressor	2
	Tipper	4
	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	12 Nos	
Project Cost	Rs.2,30,00,000	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	8.0 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 two proposed project have been given in Tables 7.3 and 7.4.

Table 7.3 Cumulative Production Load of Rough Stone

Quarry	5 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	383552	76710	284	47
P2	158460	31692	117	20
Grand Total	542012	108402	401	67

Table 7.4 Cumulative Production Load of Gravel

Quarry	Production for 5 Years (m ³)	Yearly Production (m ³)	Daily Production (m ³)	Number of Lorry Loads Per Day
P1	40438	8088	30	5
P2	31776	6355	24	4
Grand Total	72214	14443	54	9

The cumulative study shows that the overall production of rough stone from the quarry is 401 m³ per day with a capacity of 67 trips of rough stone per day and that production of gravel from two proposed quarry is 54 m³ per day accounting for 9 trips/day.

7.4.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the two proposed projects on air environment of the cluster have been provided in Table 7.5 The cumulative values resulting from the 4 projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.5 Cumulative Impact Results from the two proposed projects

Pollutants	Baseline Data (µg/m ³)	Incremental Values (µg/m ³)		Cumulative Value (µg/m ³)
		P1	P2	
PM _{2.5}	23.9	2.9	2.2	29.0
PM ₁₀	45.2	6.0	5.8	57.0

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.7.6 Cumulative Impact of Noise from two Proposed Quarries

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	840	SE	45.6	44	47.9	55
Habitation Near P2	540	SE	45.6	29.3	43.1	
Cumulative Noise (dB (A))					49.1	

Source: Lab Monitoring Data

The cumulative analysis of noise due to two proposed projects shows that habitation will receive about 49.1dB (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 2Quarries have been shown in Table 7.7.

Table 7.7 Cumulative Effect of Ground Vibrations Resulting from two Quarries

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	26.25	840	0.143
P2	11.30	540	0.148
Total			0.291

Results from the above tables 7.7 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 two proposed project were calculated and the results have been shown in Table 7.8 the two quarries together will contribute Rs. 10,00,000/-towards CER fund.

Table 7.8 Socio Economic Benefits from two Quarries

Location ID	Project Cost	CER Cost
P1	Rs.8237500	Rs. 500000
P2	Rs.23000000	Rs. 500000
Grand Total	Rs. 3,12,37,500	Rs. 10,00,000

Table 7.9 Employment Benefits from two Quarries

Location ID	Employment
P1	20
P2	12
Grand Total	32

A total of 32 people will get employment due to two proposed Quarries in cluster

7.4.4 Ecological Environment

Table 7.10 Greenbelt Development Benefits from two Quarries

Code	Number of Trees proposed	Area to be covered (m ²)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1393	12533	1114	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Techtona grandis, etc.,</i>
P2	1116	10040	892	
Total	2509	22573	2006	

Cumulative studies show that the two proposed Quarries will plant about 6888 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., 2509 trees will survive in this green belt development program.

7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

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

7.5.1 Objective

- ❖ To investigate the actual supply chain network of plastic waste.
- ❖ To identify and propose a sustainable plastic waste management by installing bins for collection of recyclables with all the plastic waste
- ❖ Preparation of a system design layout, and necessary modalities for implementation and monitoring.

A detailed action plan to manage plastic waste has been provided in Table 7.11.

Table 7.11 Action Plan to Manage Plastic Waste

S. No.	Activity	Responsibility
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance.	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste.	Mines Manager
3	Collection of plastic waste.	Mines Foreman
4	Setting up of Material Recovery Facilities.	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities.	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers.	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction.	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility.	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance.	Mine Owner

Source: Proposed by FAEs and EC

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

The proposed project at Pazhaveri Village aims to produce **383552m³** of rough stone and **40438m³ 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 20 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 Pazhaveri Village, Uthiramerur Taluk, Kancheepuram 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 Pazhaveri 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 ≤ 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
	Total	Rs.5,00,000

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 4,46,41,048** 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 ³ of rough stone Rs.56/m ³ of gravel	3,45,19,680	22,64,528
District Mineral Foundation Tax @ 10% of Seigniorage	34,51,968	2,26,452
Green Tax @ 10% of Seigniorage	34,51,968	2,26,452
Total	4,19,23,616	27,17,432

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 ENVIRONMENTAL POLICY

The project proponent is committed to conduct all its operations and activities in an environmentally responsible manner and to continually improve environmental performance.

The Proponent M/s.MSM Mining will:

- ❖ Meet the requirements of all laws, acts, regulations, and standards relevant to its operations and activities.
- ❖ Implement a program to train employees in general environmental issues and individual workplace environmental responsibilities.
- ❖ Allocate necessary resources to ensure the implementation of the environmental policy.
- ❖ Ensure that an effective closure strategy is in place at all stages of project development and that progressive reclamation is undertaken as early as possible to reduce potential long-term environmental and community impacts.
- ❖ Implement monitoring programs to provide early warning of any deficiency or unanticipated performance in environmental safeguards.
- ❖ Conduct periodic reviews to verify environmental performance and to continuously strive towards improvement.

10.1.1 Description of the Administration and Technical Setup

The environment monitoring cell discussed under Chapter VI will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through mine management level of each proposed quarry. The said team will be responsible for:

- ❖ Monitoring of the water/ waste water quality, air quality and solid waste generated.

- ❖ Analysis of the water and air samples collected through external laboratory.
- ❖ Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- ❖ Co-ordination of the environment related activities within the project as well as with outside agencies.
- ❖ Collection of health statistics of the workers and population of the surrounding villages.
- ❖ Green belt development.
- ❖ Monitoring the progress of implementation of the environmental monitoring program.
- ❖ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2 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/annum
			(Rs.)	(Rs.)
Air Environment	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	27850	27850
	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	50000	5000
	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	45000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	11250
	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	55700
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			972850	239800
Noise Environment	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 vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	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	1073946
Total Noise Environment			50000	1075946
Water Environment	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)	27850	13925
Total Water Environment			27850	13925
Waste Management	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 lease on the land of owner itself	Provision made in Operating Cost	0	0
Total Waste Management			30000	22000
Implementation of EC, Mining Plan & DGMS Condition	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
Total Implementation of EC, Mining Plan			10000	1000

Occupational Health and Safety	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)	80000	20000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	20000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	11140
	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)	557000	27850
	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	139250	27850
	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 st Class / 2 nd 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

Total Occupational Health and Safety			816250	893840
Development of Green Belt	Green belt development - 500 trees per hectare (200 Inside Lease Area & 3 00 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))"	111400	16710
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	250650	25065
Total Development of Green Belt			362050	41775
Mine Closure	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	94690
	G.O.(Ms)No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for rough stone = Rs.90)	3678421	0
TOTAL			59,47,421	22,88,286 (Exclude. Mine Closure)

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

Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year (including Mine Closure Cost)	Total Recurring Cost	Total EMP Cost
2288286	2402700	2522835	2648977	2876115	12738912	18686333

In order to implement the environmental protection measures, an amount of **Rs.59,47,421** as capital cost and recurring cost as **Rs.22,88,286** 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.1,86,86,333** as shown in Table 10.2.

10.3 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 and gravel mining project (B1) falls within the quarry cluster of 500 m radius with the total extent of 12.23.48ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No.217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A over the extent of 2.78.5ha is situated in the cluster falling in Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu. The quarries involved in the calculation of cluster extent are of two proposed quarries and two existing quarries.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°44'32.49"N to 12°44'44.94"N Longitudes from 79°52'24.68"E to 79°52'29.65"E in Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu. According to the approved mining plan, about 383552m³ of rough stone and 40438m³ of gravel will be mined up to the depth of 35 m BGL in the five years. The quarrying operation is proposed to be carried out by open cast semi-mechanized mining method involving drilling 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 March - May 2024 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** 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 11.1.

Table.11.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Crop Land	5114.42	61.70
2	Builtup Area	934.48	11.27

3	Water bodies	747.35	9.02
4	Mining/Industrial Area	111.89	1.35
5	Plantation	162.44	1.96
6	River Sand	1218.12	14.70
Total		8288.7	100.0

11.3.2 Soil Environment

The soil samples in the study area show loamy textures varying between clay loam and sandy loam. pH of the soil varies from 6.92 to 7.42 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 58.97 to 120.4 dsm⁻¹.

11.3.3 Water Environment

Surface Water Resources and Quality

Palar River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 2.15 km NE of Palar River. Two surface water sample, known as SW1 were collected from the Sriudamur lake (1.67 km SW), SW2 were collected from the Palar River (2.15 km NE) to assess the baseline water quality. Summarizes surface water quality data of the collected sample. Result for surface water sample indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

Ground Water Resources 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. Three groundwater samples, known as GW1, GW2 and GW3, were collected from bore 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. 6 summarizes ground water quality data of the six samples.

11.3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 21.0µg/m³ to 25.6µg/m³; PM₁₀ from 41.4µg/m³ to 45.7µg/m³; SO₂ from 6.6µg/m³ to 9.7µg/m³; NO_x from 19.3µg/m³ to 24.1g/m³.

The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 42 causing minimal impact to human health.

11.3.5 Noise Environment

Noise level in core zone was 45.6 dB (A) Leq during day time and 38.2dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 40.2 to 45.9dB (A) Leq and during night time from 29.6 to 38.9dB (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.

Flora in core zone

The mine lease area contains total of 22 species belonging to 16 families have been recorded from the mine lease area. 3 shrubs, 19 herbs were identified. There are no trees in mine lease area.

Flora in 300 m radius zone

The 300m radius 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.

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 40 families have been recorded. The floral (88) varieties among them 31 Trees (35.22%), 17 Shrubs (19.31%) Herbs and Climbers, Creeper, Grass & Cactus,40 (45.45%) were identified.

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.

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

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

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

Mitigation Measures

- ✦ The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.
- ✦ Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- ✦ Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- ✦ Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- ✦ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.

- ✦ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m, 10m and 50m 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.

11.4.2 Soil Environment

Anticipated Impact

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

Mitigation Measures

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

11.4.3 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 3.05 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

11.4.4 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

11.4.5 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 19.8kg 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, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- ✚ A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- ✚ Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- ✚ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ✚ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects

- ✦ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

11.4.6 Biological Environment

Anticipated Impact

- ✦ 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 which vegetation in the lease area may be removed during mining.
- ✦ Carbon released from quarrying machineries and tippers during quarrying would be 3492 kg per day, 942975 kg per year and 4714874 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.
- ✦ 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 33387 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ✦ As per the greenbelt development plan as recommended by SEAC, about 1393 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 166933 kg of the total carbon.

11.4.7 Socio Economic Environment

Anticipated Impact

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

Mitigation Measures

- ✦ Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems

- ✚ Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines
- ✚ Air pollution control measure will be taken to minimize the environmental impact within the core zone
- ✚ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules
- ✚ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly

11.4.8 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

Table 11.2 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 _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms

4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Peak particle velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

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

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 two 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 two proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- ✦ The proposed two projects will allocate Rs. 10,00,000/- towards CER as recommended by SEAC
- ✦ The proposed two projects will directly provide jobs to 32 local people, in addition to indirect jobs
- ✦ The proposed two projects will plant 2509 about trees in and around the lease area.
- ✦ The proposed two projects will add 228 PCU per day to the nearby roads.

11.7 Project Benefits

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

- ✦ Direct employment to 20 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.5947521** as capital cost and recurring cost as Rs.2288286 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.18686333.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **M/s.M.S.M. Mining** 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
Web: 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
Approved Functional Area Experts & EC					
1	Dr. S. Karuppannan	EIA Coordinator (EC) In-house	1(a)(i)	Mining	B
2	Dr. M. Vijayprabhu	In-house, FAE	1(a)(i)	HG, LU, GEO	B
3	Dr. J. Rajarajeswari	In-house, FAE	1(a)(i)	EB, SC	B
4	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
5	Dr. R. Arunbalaji	In-house, FAE	1(a)(i)	AP, AQ, NV	B
6	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW, AP	B
7	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
8	G. Umamaheswaran	In-house, FAE	1(a)(i)	HG, LU, GEO	B
9	S. Gopalakrishnan	In-house, FAE	1(a)(i)	HG, 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
Approved Functional Area Associates					
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)	HG, GEO	B
15	P. Dhatchayini	FAA	1(a)(i)	AQ	B
16	V. Malavika	FAA	1(a)(i)	NV, SHW	B
Abbreviations					
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**



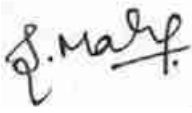

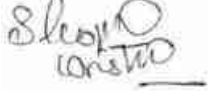


Designation : EIA Coordinator







Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date



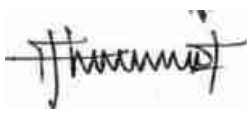


We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **M/s.M.S.M. Mining** rough stone and gravel quarry project with the extent of 2.78.50 ha situated in the cluster with the extent of 12.23.48ha in Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District of 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	<ul style="list-style-type: none"> ○ Identification of different sources of air pollution due to the proposed mine activity ○ Prediction of air pollution and propose mitigation measures / control measures 	J.N. Manikandan	
			P.Venkatesh	
2	WP	<ul style="list-style-type: none"> ○ Suggesting water treatment systems, drainage facilities ○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures. 	Dr.S. Malar	
3	HG	<ul style="list-style-type: none"> ○ Interpretation of ground water table and predict impact and propose mitigation measures. ○ Analysis and description of aquifer Characteristics 	G.Umamaheshwaran	
4	GEO	<ul style="list-style-type: none"> ○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology. 	G.Gopala Krishnan	
5	SE	<ul style="list-style-type: none"> ○ Revision in secondary data as per Census of India, 2011. ○ Impact Assessment & Preventive Management Plan ○ Corporate Environment Responsibility. 	Dr. G. Prabhakaran	
6	EB	<ul style="list-style-type: none"> ○ Collection of Baseline data of Flora and Fauna. ○ Identification of species labelled as 	Dr.J. Rajarajeshwari	


		<p>Rare, Endangered and threatened as per IUCN list.</p> <ul style="list-style-type: none"> ○ Impact of the project on flora and fauna. ○ Suggesting species for greenbelt development. 		
7	RH	<ul style="list-style-type: none"> ○ Identification of hazards and hazardous substances ○ Risks and consequences analysis ○ Vulnerability assessment ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety. 	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> ○ Construction of Land use Map ○ Impact of project on surrounding land use ○ Suggesting post closure sustainable land use and mitigative measures. 	G.Uma Maheswaran	
9	NV	<ul style="list-style-type: none"> ○ Identify impacts due to noise and vibrations ○ Suggesting appropriate mitigation measures for EMP. 	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> ○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ○ Recommending mitigations measures for EMP 	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> ○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr. D.Kalaimurugan	
12	SHW	<ul style="list-style-type: none"> ○ Identify source of generation of non-hazardous solid waste and hazardous waste. ○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled. 	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"> ○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG 	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling 	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> ○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection 	
4	P. Dhatchayini	AQ	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data 	
5	V. Malavika	NV, SHW	<ul style="list-style-type: none"> ○ 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 **M/s.M.S.M. Mining** rough stone and gravel quarry project with the extent of 2.78.50ha situated in the cluster with the extent of 12.23.48ha in Pazhaveri Village, Uthiramerur Taluk, Kancheepuram 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/23-26/RA 0319

Validity : Till 31.12.2026



सत्यमेव जयते

File No: 11015
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment
Authority(SEIAA), TAMIL NADU)



Dated 29/07/2024

To,

M/s. M.S.M Mining
Partner, V.Sadaiyappan,S/o. Vaithy,
No.15/1, Gandhi Street, Thiruneermalai,Chromepet, Chennai- 600044 , Chennai, CHENNAI, TAMIL
NADU, , 600044
msmmining38@gmail.com

Subject: Grant of **ToR issued along with Public Hearing** under the provision of the EIA Notification 2006 as amended-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference with Public hearing under the provision of the EIA Notification 2006-regarding in respect of project Proposed Rough Stone and Gravel Quarry lease area over an extent of 2.78.5 Ha (Patta Land) at S.F.Nos. 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu by M/s. MSM Mining submitted to Ministry vide proposal number SIA/TN/MIN/466184/2024 dated 04/07/2024.

Ref:

1. Online proposal No. SIA/TN/MIN/466184/2024 dated.17/06/2024.
2. Your application submitted for Terms of Reference submitted at SEIAA-TN on 21.06.2024.
3. Minutes of the 480th SEAC meeting held on 05.07.2024.
4. Minutes of the 741st SEIAA meeting held on 23.07.2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5130667N
(ii) File No.	11015
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Pazhaveri Village Rough Stone and Gravel Quarry

(viii) Name of Company/Organization	MSM MINING
(ix) Location of Project (District, State)	KANCHIPURAM, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the SEAC in the SEIAA under the provision of EIA notification 2006 and its subsequent amendments.
4. The above-mentioned proposal has been considered by State Environment Impact Assessment Authority(SEIAA) in the meeting held on 23/07/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
5. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference With Public Hearing under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).
6. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to grant Terms of Reference with Public Hearing for instant proposal of M/s. M.S.M Mining under the provisions of EIA Notification, 2006 and as amended thereof.
7. The Ministry/SEIAA reserves the right to stipulate additional conditions, if found necessary.
8. The Terms of Reference with Public Hearing to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
9. The TORs prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OM No.J-11013/41/2006-IA-II(I)(part) dated 29th August 2017.
10. This issues with the approval of the Competent Authority.

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. Monitoring Cell, IA Division, Ministry of Environment, Forests &CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Kancheepuram District.
6. Stock File

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Standard Conditions:

S. No	Terms of Reference
1.1	<p><u>Cluster Management Committee</u></p> <ol style="list-style-type: none"> 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., 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 & emergency management plan, fire safety & evacuation plan and sustainable development goals 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 in the EIA Report. 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 deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. <p><u>Agriculture & Agro-Biodiversity</u></p> <ol style="list-style-type: none"> 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro-forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. <p><u>Forests</u></p> <ol style="list-style-type: none"> 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. <p><u>Water Environment</u></p> <ol style="list-style-type: none"> 19. 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. 20. Erosion Control measures.

S. No	Terms of Reference
	<p>21. 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.</p> <p>22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.</p> <p>23. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.</p> <p>24. 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.</p> <p>25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.</p> <p>26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.</p> <p>27. The EIA shall include the impact of mining activity on the following:</p> <ol style="list-style-type: none"> a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams. <p><u>Energy</u></p> <p>28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.</p> <p><u>Climate Change</u></p> <p>29. 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.</p> <p>30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features.</p> <p>31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.</p> <p><u>Mine Closure Plan</u></p> <p>32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.</p> <p><u>EMP</u></p> <p>33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs.</p> <p>34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.</p> <p><u>Risk Assessment</u></p> <p>35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.</p> <p><u>Disaster Management Plan</u></p> <p>36. 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.</p> <p><u>Others</u></p> <p>37. 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.</p> <p>38. 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</p>

S. No	Terms of Reference
	<p>all the activities proposed shall be part of the Environment Management Plan.</p> <p>39. 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.</p>

2. Seac Conditions - Site Specific

S. No	Terms of Reference
2.1	<p>1. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:</p> <p>(i) Copy of the agreement forming CMC.</p> <p>(ii) The Organisation chart of the Committee with defining the role of the members</p> <p>(iii) The ‘Standard Operating Procedures’ (SoP) executing the planned activities.</p> <p>2. The proponent shall obtain a clarification letter from the concerned authority for the land classification pertaining to S.F.No.252/11B.</p> <p>3. The proponent shall furnish a registered lease deed.</p> <p>4. The proponent shall make necessary application to produce the NOC from the Competent Authority under the provisions of the Central Electricity Authority Notification No. CEA-PS-16/1/2021-CEI Division dt 08.07.2023 at the time of lease execution.</p> <p>5. The proponent shall propose CER activity towards Govt. School, Karikili. The details of the same shall be included in the EIA Report.</p> <p>6. Since waterbodies are situated nearby, the PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry to determine impacts of the mining operation on the ground water conditions in the waterbodies.</p> <p>7. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km 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. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.</p> <p>8. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.</p> <p>9. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report.</p> <p>10. The PP shall prepare the EMP for the entire project life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.</p> <p>11. The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included drilling & blasting, loading & hauling on the surrounding village and structures.</p>

3. Seac Standard Conditions

S. No	Terms of Reference
3.1	<p>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:</p> <ul style="list-style-type: none"> (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. <p>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.</p> <p>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.</p> <p>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.</p> <p>5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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, I/I Class mines manager appointed by the proponent.</p> <p>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.</p> <p>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.</p> <p>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,</p> <p>13. What was the period of the operation and stoppage of the earlier mines with last work permit</p>

S. No	Terms of Reference
	<p>issued by the AD/DD mines?</p> <p>14. Quantity of minerals mined out.</p> <ul style="list-style-type: none"> · Highest production achieved in any one year · 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. <p>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).</p> <p>16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.</p> <p>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.</p> <p>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.</p> <p>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,</p>

S. No	Terms of Reference
	<p>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.</p> <p>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.</p> <p>28. Impact on local transport infrastructure due to the Project should be indicated.</p> <p>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.</p> <p>30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.</p> <p>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.</p> <p>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.</p> <p>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</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>43. Concealing any factual information or submission of false/fabricated data and failure to</p>

S. No	Terms of Reference
	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.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (.....MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green

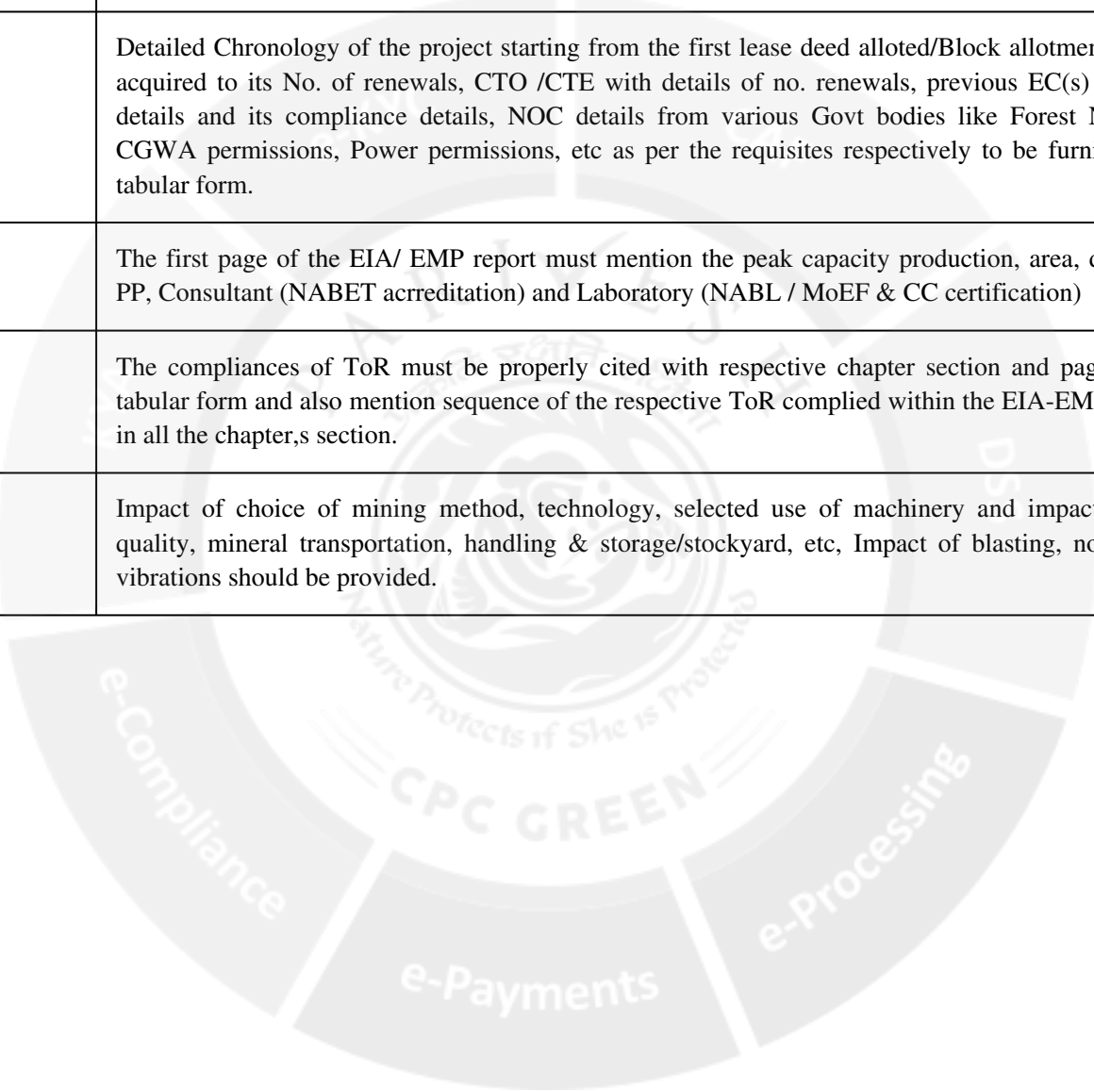
S. No	Terms of Reference																																										
	field and expansion projects.																																										
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.																																										
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.																																										
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.																																										
1.12	<p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights</p> <table border="1"> <thead> <tr> <th>S.N ML/Project Land use</th> <th>Area under Surface Rights(ha)</th> <th>Area Under Mining Rights(ha)</th> <th>Area under Both (ha)</th> </tr> </thead> <tbody> <tr> <td>1 Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 Forest Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 Grazing Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4 Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5 Others (specify)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>S.N.</th> <th>Details</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings</td> <td></td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td></td> </tr> <tr> <td>3</td> <td>Roads</td> <td></td> </tr> <tr> <td>4</td> <td>Others (specify)</td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> </tr> </tbody> </table>	S.N ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	1 Agricultural land				2 Forest Land				3 Grazing Land				4 Settlements				5 Others (specify)				S.N.	Details	Area (ha)	1	Buildings		2	Infrastructure		3	Roads		4	Others (specify)			Total	
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1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.																																										

S. No	Terms of Reference
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SO _x , NO _x and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within

S. No	Terms of Reference
	dark/grey zone.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored
1.27	PP to evaluate the green house emission gases from the mine operation and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.29	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
1.30	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.31	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.32	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.33	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.
1.34	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.

S. No	Terms of Reference																																																												
1.35	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.																																																												
1.36	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.																																																												
1.37	Corporate Environment Responsibility:																																																												
1.38	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.																																																												
1.39	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.																																																												
1.40	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.																																																												
1.41	d) To have proper checks and balances, the company should have a well laid down 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.																																																												
1.42	e) Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report																																																												
1.43	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.																																																												
1.44	Status of any litigations/ court cases filed/pending on the project should be provided.																																																												
1.45	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.																																																												
1.46	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.																																																												
1.47	<p>Details on the Forest Clearance should be given as per the format given:</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;">Total ML Total</td> <td style="width: 15%;"></td> <td style="width: 15%;">Date</td> <td style="width: 15%;">Extent</td> <td style="width: 15%;">of</td> <td style="width: 15%;">Balance area for which</td> <td style="width: 15%;">Status</td> <td style="width: 15%;">of appl</td> <td style="width: 15%;">For</td> </tr> <tr> <td></td> <td>Project Area Forest</td> <td></td> <td>of FC</td> <td>of Forest Land</td> <td></td> <td>FC is yet to be</td> <td>of diversion</td> <td>of forest</td> <td></td> </tr> <tr> <td></td> <td>(ha)</td> <td>land (ha)</td> <td></td> <td></td> <td></td> <td>obtained</td> <td>land</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>If more than one</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>provide details of</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>each FC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		Total ML Total		Date	Extent	of	Balance area for which	Status	of appl	For		Project Area Forest		of FC	of Forest Land		FC is yet to be	of diversion	of forest			(ha)	land (ha)				obtained	land					If more than one										provide details of										each FC							
	Total ML Total		Date	Extent	of	Balance area for which	Status	of appl	For																																																				
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	(ha)	land (ha)				obtained	land																																																						
		If more than one																																																											
		provide details of																																																											
		each FC																																																											
1.48	In case of expansion of the proposal, the status of the work done as per mining plan and approved																																																												

S. No	Terms of Reference
	mine closure plan shall be detailed in EIA/ EMP report
1.49	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
1.50	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes
1.51	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.
1.52	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)
1.53	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.
1.54	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.



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 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 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 is acquisition, nearby (in 2-3 km.) water body, population, with in 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 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th 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 29th August, 2017.

From
Dr. S.Vediappan, M.Sc.,Ph.d.,
Deputy Director,
Dept of Geology and Mining,
Kancheepuram.

To
M/s. MSM Mining,
No.15/1, Gandhi Street,
Thiruneeermalai Road,
Chrompet,
Chennai-600044.

Roc.No.371/Q3/2023 Dated:12.06.2024

Sir,

Sub: Mines and Minerals – Minor Mineral - Rough Stone and Gravel – Kancheepuram District – Uthiramerur Taluk – Pazhaveri Village- Patta land in S.F.Nos. 224/1A1, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H, 252/12A, 252/5A4A, 252/5A4B and 252/5A4C Over an extent of 1.38.50 Hects - Application preferred by M/s. MSM Mining - Precise area communicated - Draft Mining Plan submitted - Approved – Based on the request of the applicant additional area in patta S.F.Nos. 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B - Over an extent of 1.40.00 Hects - totally over an extent of 2.78.50 Hectares -Revised Precise area communicated - Revised Mining plan submitted Approved – Other quarries situated in 500 mtrs radial distance – Details furnished - reg.

- Ref:**
- 1 Application preferred by M/s. MSM Mining, No.15/1, Gandhi Street, Thiruneeermalai Road, Chrompet, Chennai-44 application dated 26.10.2023
 - 2 This Office Memorandum Letter No.371/Q3/2023 dated 07.03.2024.
 - 3 Draft Mining plan submitted by M/s. MSM Mining dated 08.03.2024.
 - 4 Mining Plan approved by the Deputy Director of Geology and Mining, Kancheepuram Lr.Rc.No. 371/ Q3/ 2023 dated 12.03.2024.
 - 5 M/s. MSM Mining letter dated: 30.04.2024.

- 345 -
- 6 This Office Memorandum (revised Precise area communication) No.371/ Q3/ 2023 dated 06.06.2024.
 - 7 M/s. MSM Mining letter dated: 11.06.2024. (enclosed with revised Mining Plan).
 - 8 Revised Mining plan approved by the Deputy Director of Geology and Mining, Kancheepuram vide Letter.No.371/Q3/2023 dated.12.06.2024.

Kind attention is invited to the references cited above.

2. M/s. MSM Mining has preferred an application for grant of lease for quarrying Rough stone and Gravel over an extent of 1.38.50 Hects of patta land in S.F.Nos. 224/1A1 (0.28.00), 252/11A (0.18.00), 252/11B (0.03.00), 252/11C (0.03.00), 252/11D (0.02.50), 252/11E (0.02.50), 252/11F (0.09.00), 252/11G (0.06.50), 252/11H (0.08.50), 252/12A (0.05.50), 252/5A4A (0.28.50), 252/5A4B (0.14.00) and 252/5A4C (0.09.50) in Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District for a period of 05 years under the provisions of Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959. In this regard, based on the reports of Revenue Divisional Officer, Kancheepuram and Assistant Geologist (Mines) the precise area communication has been issued vide letter dated: 07.03.2024 with a direction to submit approved mining plan and Environment Clearance.

3. Accordingly the mining plan submitted by the applicant was approved vide letter dated: 12.03.2024. Subsequently, the applicant vide letter dated:30.04.2024 has requested to grant quarry lease also for the additional S.F.Nos. 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B over an extent of 1.40.0 hectares of Pazhaveri Village with a total extent of 2.78.50 Hectares. Based on the additional reports submitted by the Revenue Divisional Officer, Kancheepuram and Assistant Geologist (Mines) revised Precise area

K. G. G.

Communication has been issued for the total extent of 2.78.50 hectares vide Memo dated:06.06.2024. Accordingly he has submitted revised mining plan and requested to take action to approve the revised mining plan

4. M/s. MSM Mining has submitted three copies of Revised Mining Plan vide letter dated: 11.06.2024 and the same has been examined in detail and approved by Deputy Director of Geology and Mining, Kancheepuram vide Letter.No.371/Q3/2023 dated. 12.06.2024

5) In this connection, M/s. MSM Mining has requested vide letter dated.11.06.2024 to issue the details of other quarries situated within 500 mts radial distance from the subject quarries are furnished as follows.

I. Details of Existing quarries.

Sl. No	Name of the Lessee	Village	SF.No	Extent in Hect	GO.No./Proceeding No. & Date	Lease Period
1.	Tvl. MSM Mining	Pazhaveri	225/1A, 225/1B2, 252/2A, 252/2B, 252/4B2, 252/5A1A, 252/5A1B, 252/5A1C, 252/5A1D, 252/5A1E, 252/5C, 252/6, 252/7B, 252/8A, 252/8B	3.55.00	Rc.No. 151/Q3/2018 dated:12.07.2019	27.02.2020 To 26.02.2025
2.	Tvl. Udhayam Civil Constructions Pvt. Ltd.,	Pazhaveri	203/1A1A, 204/1A, 204/2, 205/1A, 205/2, 205/3, 206/1A, 206/2A, 207/1, 207/2A, 207/2B, 207/2C, 207/2D, 207/3, 207/4A, 207/5A, 207/6A, 207/7A, 207/8A	3.66.86	Rc.No. 569/Q3/2018 dated.27.02.2020	12.07.2019 To 11.07.2024


[Handwritten signature]

II. Details of abandoned/Old quarries.

Sl. No.	Name of the lessee	ROC.NO. dated	Village & Taluk	S.F No.	Extent in Het	Lease period.
1			Nil			

III. Details of other Proposed/applied quarries

Sl. No.	Name of the lessee	Name of the Mineral	Village & Taluk	S.F No.	Extent in Het	Lease period.
1.	Tvl. MSM Mining	Rough stone and Gravel	Pazhaveri , Uthiramerur Tk	224/1A1, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H, 252/12A, 252/5A4A, 252/5A4B and 252/5A4C, 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B	2.78.50	Instant Proposal
2.	Tvl. APK Minerals,	Rough stone and Gravel	Pazhaveri , Uthiramerur Tk	207/4B, 207/5B, 207/6B, 207/7B, 207/8B, 207/9 , 208/1A, 208/2A, 208/2B1, 208/2B2, 208/5A, 508/5C, 208/5D, 208/5E, 208/5F, 208/5G, 212/1L, 212/1M and 212/1N	2.23.12	Nearly Proposed quarry


 Deputy Director,
 Dept of Geology and Mining,
 Kancheepuram.

Copy to :-

The Chairman, Tamil Nadu State Environment
 Impact Assessment Authority,
 3rd Floor, Panakal Maligai,
 No. 1 Jeenes Road, Saidapet, Chennai -15.



From

Dr.S.Vediappan,M.Sc.,Ph.D.,
Deputy Director,
Dept of Geology and Mining,
Kancheepuram.

To

M/s. MSM Mining,
No.15/1, Gandhi Street,
Thiruneermalai Road,
Chrompet,
Chennai-600044.

Rc.No.371/Q3/2023, Dated:12.06.2024.

Sir,

Sub: Mines and Minerals – Minor Mineral - Rough Stone and Gravel – Kancheepuram District – Uthiramerur Taluk – Pazhaveri Village- Patta land in S.F.Nos. 224/1A1, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H, 252/12A, 252/5A4A, 252/5A4B and 252/5A4C Over an extent of 1.38.50 Hects - Application preferred by M/s. MSM Mining - Precise area communicated - Draft Mining Plan submitted - Approved – Based on the request of the applicant additional area in patta S.F.Nos. 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B - Over an extent of 1.40.00 Hects - totally over an extent of 2.78.50 Hectares -Revised Precise area communicated - Revised Mining plan submitted – Approved – Regarding.

- Ref:**
1. Application preferred by M/s. MSM Mining, No.15/1, Gandhi Street, Thiruneermalai Road, Chrompet, Chennai-44 application dated 26.10.2023
 2. This Office Memorandum Letter No.371/Q3/2023 dated 07.03.2024.
 3. Draft Mining plan submitted by M/s. MSM Mining dated 08.03.2024.
 4. Mining Plan approved by the Deputy Director of Geology and Mining, Kancheepuram Lr.Rc.No. 371/ Q3/ 2023 dated 12.03.2024.
 5. M/s. MSM Mining letter dated: 30.04.2024.
 6. This Office Memorandum (revised Precise area communication) No.371/ Q3/ 2023 dated 06.06.2024.
 7. M/s. MSM Mining letter dated: 11.06.2024. (enclosed with revised Mining Plan).
 8. Other connected records.

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[Handwritten Signature]

Kind attention is invited to the references cited above.

2. M/s. MSM Mining has preferred an application for grant of lease for quarrying Rough stone and Gravel over an extent of 1.38.50 Hects of patta land in S.F.Nos. 224/1A1 (0.28.00), 252/11A (0.18.00), 252/11B (0.03.00), 252/11C (0.03.00), 252/11D (0.02.50), 252/11E (0.02.50), 252/11F (0.09.00), 252/11G (0.06.50), 252/11H (0.08.50), 252/12A (0.05.50), 252/5A4A (0.28.50), 252/5A4B (0.14.00) and 252/5A4C (0.09.50) in Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District for a period of 05 years under the provisions of Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959. In this regard, based on the reports of Revenue Divisional Officer, Kancheepuram and Assistant Geologist (Mines) the precise area communication has been issued vide letter dated: 07.03.2024 with a direction to submit approved mining plan and Environment Clearance.

3. Accordingly the mining plan submitted by the applicant was approved vide letter dated: 12.03.2024. Subsequently, the applicant vide letter dated:30.04.2024 has requested to grant quarry lease also for the additional S.F.Nos. 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B over an extent of 1.40.0 hectares of Pazhaveri Village with a total extent of 2.78.50 Hectares. Based on the additional reports submitted by the Revenue Divisional Officer, Kancheepuram and Assistant Geologist (Mines) revised Precise area Communication has been issued for the total extent of 2.78.50 hectares vide Memo dated:06.06.2024. Accordingly he has submitted revised mining plan and requested to take action to approve the revised mining plan.

4. In this regard, revised mining plan submitted by the applicant over an extent of 2.78.50 Hectares of patta land in S.F.Nos. 224/1A1 (0.28.00), 252/11A (0.18.00), 252/11B (0.03.00), 252/11C (0.03.00), 252/11D (0.02.50), 252/11E (0.02.50), 252/11F (0.09.00), 252/11G (0.06.50), 252/11H (0.08.50), 252/12A (0.05.50), 252/5A4A (0.28.50), 252/5A4B (0.14.00), 252/5A4C (0.09.50) and 217/2 (0.9.50), 217/3 (0.13.00), 217/5

(0.9.50), 217/7 (0.9.50), 252/4A1 (0.3.50), 252/4B1 (0.3.00), 252/5A2A (0.33.50), 252/5A2B (0.1.50), 252/5A2C (0.2.00), 252/5A3A (0.37.00), 252/5B (0.18.00) of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, has been examined in detail and found correct.

5. As per the revised mining plan, the year wise production for the proposed Five years as detailed below.

Five years	Year	Recoverable Reserves (M ³) @ 100%	Gravel in (m ³)
	1 st Year	84475	16950
2 nd year	77819	13276	
3 rd year	78908	10212	
4 th year	82085	0	
5 th year	60265	0	
Total	383552	40438	

6. Hence, as per the power delegated under Rule 41 of TNMMCR, 1959 and as per the guidelines/instructions issued by the Commissioner of Geology and Mining, vide letter Rc.No.3868/LC/2012 dated 19.11.2012, the revised mining plan submitted by the applicant is hereby approved subject to the following conditions.

i) That the revised 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 revised mining plan does not in any way imply the approval of the Government in terms of any other provisions of Mines and Minerals Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act 1957, or any other connected Laws industry Forest (Conservation) Act 1980, Forest Conservation Rules 1981 Environment protection Act 1980, Indian Explosive Act 1884 (Central Act IV of 1884) and the rules made there

under, Minor Mineral Conservation and Development Rules, and The Tamil Nadu Minor Mineral Concession rules, 1959.

iii) The revised mining plan is approved without prejudice to any other order or directions from any court of competent jurisdiction.

iv) All the conditions mentioned in the precise area communication letter / lease agreement / Environment Clearance / Tamil Nadu Pollution Control Board conditions etc., should be followed during entire lease period as per rules.

v) The applicant should get prior Environmental clearance from the appropriate authority and same has to be submit to the District Collector, Kancheepuram.

(vi) The approval accorded for the Mining Plan approved earlier vide letter dated 12.03.2024 is hereby automatically nullified from the date of approval of this revised mining plan.

vi) Every Mining Plan duly approved under rule 41(9) of TNMMCR, 1959 shall be valid for a period of five years. Further, the applicant shall submit modification in the mining plan if any, review the mining plan and submit scheme of mining plan for the next five years of the lease if any as per TNMMCR 1959.

[Signature]
12.10.24
Deputy Director,
Dept of Geology and Mining,
Kancheepuram.

Copy submitted to

[Signature]
12.10.24
The Commissioner,
Dept of Geology and Mining,
Guindy, Chennai -32.

MINING PLAN



FOR

PAZHAVERI VILLAGE ROUGH STONE AND GRAVEL MINE LEASE & PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/ Opencast-Semi-Mechanized mining /Non-forest/ Non-Captive Use – "B" Category

Lease period 5 Years from the date of lease execution

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

LOCATION OF THE LEASE AREA

STATE : TAMILNADU
DISTRICT : KANCHEEPURAM
TALUK : UTHIRAMERUR
VILLAGE : PAZHAVERI
S.F. No's : 217/2, 217/3, 217/5, 217/7, 224/1A1,
252/4A1, 252/4B1, 252/5A2A, 252/5A2B,
252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B,
252/5A4C, 252/5B, 252/11A, 252/11B,
252/11C, 252/11D, 252/11E, 252/11F,
252/11G, 252/11H & 252/12A
EXTENT : 2.78.5Hectares

ADDRESS OF THE APPLICANT

M/s.MSM MINING,
No.15/1, Gandhi Street,
Thiruneermalai Road, Chromepet,
Chennai – 600044.

PREPARED BY

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

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, Tamil Nadu.

Mob. : +91 9443937841, +917010076633,

E-mail: info.gtmsdpi@gmail.com ,

Website: www.gtmsind.com



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18/12/2017



ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of FMB (Field Measurement book)	II
3.	Copy of Village Map	III
4.	Copy of A-register	IV
5.	Copy of Patta, Adangal & Consent document	V
6.	Copy of Company Registration and Partnership deed document	VI
7.	Copy of GST Certificate	VII
8.	Photo copy of the applied lease area	VIII
9.	Copy of ID Proof of the authorized signatory	IX
10.	Copy of RQP Certificate	X

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LIST OF PLATES

Sl. 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	1:1,00,000
4.	Satellite imagery map	I-C	1: 5,000
5.	Environmental plan	I-D	1: 5,000
6.	Mine lease plan	II	1:1000
7.	Surface & Geological plan	III	1:1000
8.	Geological Sections	IIIA	Sections HOR 1:1000 VER 1:500
9.	Year wise Development, Production plan & sections	IV	1:1000
10.	Year wise Development, Production sections	IVA	Sections HOR 1:1000 VER 1:500
11.	Mine layout plan and Land use pattern	V	1:1000
12.	Conceptual plan	VI	1:1000
13.	Conceptual sections	VIA	Sections HOR 1:1000 VER 1:500



M/s.MSM MINING,
No.15/1, Gandhi Street,
Thiruneermalai Road, Chromepet,
Chennai – 600044.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of rough stone and gravel quarry lease in S.F.No's: 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A, over an extent of 2.78.5 hectares of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nādu State has been prepared by

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

I request "The Deputy Director", Department of Geology and Mining, Kancheepuram 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, Natesan Complex,
Oddapatti, Collectorate Post office, Dharmapuri-636705
Ph: +91 9443937841, +91 7010076633
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com

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

Place: Chennai, TN.
Date:


Signature of the applicant
(M/s.MSM MINING)



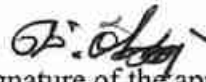
M/s.MSM MINING,
No.15/1, Gandhi Street,
Thiruneermalai Road, Chromepet,
Chennai - 600044.

DECLARATION

The Mining Plan in respect of rough stone and gravel quarry lease S.F.No's: 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A, over an extent of 2.78.5 hectares of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamilnadu 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: Chennai, TN.

Date:


Signature of the applicant
(M/s.MSM MINING)

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Dr. S. KARUPPANNAN. M.Sc., Ph.D.
 (Regn. No. RQP/MAS/263/2014/A)
GEO TECHNICAL MINING SOLUTIONS
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 Ph: +91 9443937841, +91 7010076633
 E-mail: info.gtmsdpi@gmail.com,
 Website: www.gtmsind.com

CERTIFICATE

This is to certify that, the provisions of 19 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: 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A, over an extent of 2.78.5 hectares of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamilnadu State applied to **M/s.MSM MINING, Chennai.**

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:

Signature of the Recognized Qualified Person

Dr.S.KARUPPANNAN, M.Sc, Ph.D.,
 RQP/MAS/263/2014/A
 GEO TECHNICAL MINING SOLUTIONS
 A NABET Accredited and ISO Certified Company
 1/213-B, Ground Floor, Natesan Complex,
 Collectorate Post Office, Oddapatti,
 Dharmapuri-636705, TamilNadu, India



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

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

GEO TECHNICAL MINING SOLUTIONS

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Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

E-mail: info.gtmsdpi@gmail.com,

Website: www.gtmsind.com

CERTIFICATE

I certify that in preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A in an extent of 2.78.5 hectares of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu State prepared to **M/s.MSM MINING**, Kancheepuram covers all the provisions of Mines Act, Rules and Regulations etc. made there under and whenever specific permission are required the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date:

Signature of the Recognized Qualified Person

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

RQP/MAS/263/2014/A

GEO TECHNICAL MINING SOLUTIONS

A NABET Accredited and ISO Certified Company

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

Collectorate Post Office, Oddapatti,

Dharmapuri-636705, TamilNadu, India



MINING PLAN

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

Patta- Ryotwari land/ Open cast-Semi-Mechanized mining /Non-forest/ Non-Captive Use – “B” Category.

Lease period 5 Years from the date of lease execution

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

INTRODUCTORY NOTES:

a) Introduction:

- The applicant M/s.MSM MINING, office at No.15/1, Gandhi Street, Thiruncermalai Road, Chromepet, Chennai District, Tamil Nadu-44, filed an application for new proposals has submitted to the “Deputy Director”, Department of Geology and Mining, Kancheepuram dated 26.10.2023 had requested to grant the quarry lease for rough stone and gravel in S.F.No’s: 224/1A1, 252/5A4A, 252/5A4B, 252/5A4C, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A, over an extent of 1.38.5 hectares of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu State.
- According to the subsequent letter dated 05.03.2024, it is sufficient if the license is granted only for a period of 5 years. Following this, the draft mining plan submitted by the applicant on 08.03.2024 was approved by the Deputy Director, Geology and Mining Department, Kancheepuram and accepted as per letter dated 12.03.2024.
- Further to this, in this letter dated 30.04.2024, the applicant has already applied for field numbers and further S.F.No’s: 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B, over an extent of 1.40.0 Hectares and a total extent of 2.78.5 Hectares is to be granted lease license for five years for quarrying rough stone and gravel submitted with proper documents by M/s.MSM MINING.

- b) The Precise area communication letter: The Deputy Director, Department of Geology and Mining, Kancheepuram has directed to the applicant M/s.MSM MINING, through his precise area communication letter Roc.No.371/Q3/2023 Dated: 06.06.2024, before execution of lease deed should submit the mining plan for approval and obtain environmental clearance from the competent authority of State Level Environment Impact Assessment Authority- TamilNadu (SEIAA) per



EIA notification S.O.1533(E) dated 14th September 2006 and its subsequent amendments S.O.3977(E), dated 14th August 2018, MoEF & CC office memorandum letter F.No.22-1/2019 -IA.III [E116917] dated 15th December, 2021 for quarrying lease rough stone and gravel at Tamil Nadu State, Kancheepuram District, Uthiramerur Taluk, Pazhaveri Village in S.F.No's: 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A, over an extent of 2.78.5 hectares has recommended as following conditions for a period of five years under Rule 19 of Tamil Nadu Minor Mineral Concession Rules, 1959.

1. TNMCR Rules 1959, schedule II The seigniorage amount must pay by the proponent for the quantity taken in the area.
 2. A safety distance of 7.5 meter should be provided to the adjacent patta lands.
 3. Excavation work should be done leaving a safety distance of 50 meters due to high voltage line passing beyond 20 meters in the southern side of the applied lease area. Mining should be carried out only after obtaining NOC from the (Power Grid Corporation of India) before execution of lease deed.
 4. In the South – East of the applied field there is Thangal Lake in S.F.No's: 218 as stated by Block Development Officer, Uthiramerur, excavation should be done leaving a safety distance of 10 meters.
 5. Explosives should be carried out by experienced persons using low power explosives without any disturbance to adjacent leaseholders/ without any encroachment on adjacent leasehold and government lands.
 6. The mining plan should be submitted within the stipulated time.
 7. Quarry license shall be issued only on submission of clearance certificate from Environment Impact Assessment authority for the area for which quarry license is to be issued.
- c) **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 **Roc.No.371/Q3/2023 Dated: 06.06.2024**
- d) **Geological resources and Mineable reserves:** Geological resource of estimated as **973735m³** including the resources of safety zone, and gravel, etc. of which, rough stone resources of about **918093m³**, Gravel is **55642m³**. The total mineable reserve

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is estimated to be 423990m^3 by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about 383552m^3 and gravel is 40438m^3 up to a depth of 35m below the ground level (Refer Plate No. IIIA & VIA).



e) **Proposed Production Schedule** Total proposed production of 423990m^3 of which, rough stone is about 383552m^3 and gravel is about 40438m^3 up to a depth of 35m below the ground level for five years plan period. Average production is 76710m^3 of rough stone per year and gravel is 13479m^3 per year (Refer Plate No. IVA).

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

i). **Interstate boundary:** No interstate boundary around 10Km radius periphery of proposed lease area.

ii). **Wildlife Protection Act, 1972:** There is no wild life animal sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.

iii). **Indian Reserve Forest Act, 1980:** There is no reserve forest within the radius of 1.0km. The Nearest Reserve Forest is Kavanipakkam R.F- 1.8Km – South Side.

iv). **CRZ Notification, 2019:** There is no Sea coastal zone found around 10km radius and this project site doesn't attract CRZ Notification, 2019.

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

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

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1.0 GENERAL:

a.	Name of the Applicant	:	M/s.MSM MINING,
	Applicant address	:	No.15/1, Gandhi Street, Thiruneermalai Road, Chromepet,
	District	:	Chennai
	State	:	Tamilnadu
	Pin code	:	600044
	Phone	:	----
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
E-mail	:	.....
b.	Status of the Applicant		
	Private individual	:	---
	Cooperative Association	:	---
	Private company	:	Private company
	Public Company	:	---
	Public Sector Undertaking	:	---
	Joint Sector Undertaking	:	---
Other (pl. specify)	:	---	
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	:	Rough stone and gravel quarry lease
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of five years.
e.	Name of the RQP preparing the Mining Plan	:	Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,
	Address	:	GEO TECHNICAL MINING SOLUTIONS (A NABET Accredited & ISO Certified Company) No: 1/213-B, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Website: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
	Fax	:	Nil
	e-mail	:	info.gtmsdpi@gmail.com
	Telex	:	Nil
	Registration Number	:	RQP/MAS/263/2014/A
	Date of grant/renewal	:	16.12.2014
	Valid upto	:	15.12.2024
	f.	Reference No. and date of consent letter from the state government	

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2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: IA & IB			
	District & State	:	Kancheepuram, Tamil Nadu			
	Taluk	:	Uthiramerur			
	Village	:	Pazhaveri			
Khasra No./ Plot No./ Block Range/ Felling Series etc.:						
Survey No.	Sub division	Total Extent in Hect	Patta No.	Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area out of total area in hect.
217	2	0.09.5	5752	1.Sadaiyappan	217/2	0.09.5
217	3	0.13.0	5751	S/o. Vaithy	217/3	0.13.0
217	5	0.09.5	5752	2.Mohan	217/5	0.09.5
				S/o.		
217	7	0.09.5	5751	Madhuraimuthu	217/7	0.09.5
				3.Muralitharan		
				S/o. Raja		
224	1A1	0.28.0	5536	M/s.MSM Mining	224/1A1	0.28.0
252	4A1	0.03.5	5751	1.Sadaiyappan	252/4A1	0.03.5
252	4B1	0.03.0	5751	S/o. Vaithy	252/4B1	0.03.0
252	5A2A	0.33.5	5752	2.Mohan	252/5A2A	0.33.5
252	5A2B	0.01.5		S/o. Madhuraimuthu	252/5A2B	0.01.5
252	5A2C	0.02.0	5751	3.Muralitharan	252/5A2C	0.02.0
252	5A3A	0.37.0	5752	S/o. Raja	252/5A3A	0.37.0
252	5A4A	0.28.5	5536	M/s.MSM Mining	252/5A4A	0.28.5
252	5A4B	0.14.0			252/5A4B	0.14.0
252	5A4C	0.09.5			252/5A4C	0.09.5
252	5B	0.18.0	5752	1.Sadaiyappan	252/5B	0.18.0
				S/o. Vaithy		
				2.Mohan		
				S/o. Madhuraimuthu		
				3.Muralitharan		
				S/o. Raja		
252	11A	0.18.0	5536	M/s.MSM Mining	252/11A	0.18.0
252	11B	0.03.0			252/11B	0.03.0
252	11C	0.03.0			252/11C	0.03.0
252	11D	0.02.5			252/11D	0.02.5
252	11E	0.02.5			252/11E	0.02.5
252	11F	0.09.0			252/11F	0.09.0
252	11G	0.06.5			252/11G	0.06.5
252	11H	0.08.5			252/11H	0.08.5
252	12A	0.05.5			252/12A	0.05.5
Total Extent		2.78.5			...	Applied lease area extent
Lease area (hectares)			:	2.78.5hectares		

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Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	It is a patta land
Ownership / Occupancy	:	This is a Patta land S.F.No's. 217/3, 217/7, 252/4A1, 252/4B1, 252/5A2C & 217/2, 217/5, 252/5A2A, 252/5A2B, 252/5A3A, 252/5B is registered on the name of Mr.Sadaiyappan S/o.Vaithy, Mr.Mohan S/o. Madhuraimuthu, Mr.Muralitharan S/o.Raja vide patta no. 5751 and 5752 & S.F.No's.224/1A1, 252/5A4A, 252/5A4B, 252/5A4C, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A is registered on the name of M/s.MSM Mining vide patta no. 5536.
Existence of Public Road / Railway line if any nearby and approximate distance	:	<ul style="list-style-type: none">✓ Exploited quarry materials will be transported through the patta land and connecting village road (Arumbuliyur – Pazhaveri Rd) is situated on the North side.✓ There is NH-132B road situated on the northern side about 2.83km which is connecting Walajabad – Chengalpattu.✓ There is no SH road situated around 5km radius from the site.✓ There is a railway line situated on the northern side about 3.6km radius from the site.
Toposheet No. with latitude and longitude:		SOI Toposheet No. 57-P/14 Latitude : From 12°44'32.49"N to 12°44'44.94"N Longitude : From 79°52'24.68"E to 79°52'29.65"E

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Geo-Coordinates of the lease boundary:

PILLAR ID	LATITUDE	LONGITUDE	PILLAR ID	LATITUDE	LONGITUDE
1	12°44'44.94"N	79°52'27.25"E	15	12°44'32.49"N	79°52'27.79"E
2	12°44'44.10"N	79°52'27.87"E	16	12°44'32.83"N	79°52'26.59"E
3	12°44'40.98"N	79°52'27.66"E	17	12°44'32.95"N	79°52'26.59"E
4	12°44'40.29"N	79°52'27.78"E	18	12°44'33.47"N	79°52'24.74"E
5	12°44'40.05"N	79°52'29.49"E	19	12°44'35.40"N	79°52'25.12"E
6	12°44'38.26"N	79°52'29.26"E	20	12°44'36.38"N	79°52'24.68"E
7	12°44'38.30"N	79°52'28.91"E	21	12°44'36.18"N	79°52'25.53"E
8	12°44'37.29"N	79°52'28.74"E	22	12°44'37.72"N	79°52'25.85"E
9	12°44'37.20"N	79°52'29.65"E	23	12°44'37.99"N	79°52'24.70"E
10	12°44'36.40"N	79°52'29.49"E	24	12°44'39.71"N	79°52'25.24"E
11	12°44'36.50"N	79°52'28.43"E	25	12°44'39.91"N	79°52'25.24"E
12	12°44'34.41"N	79°52'28.78"E	26	12°44'41.53"N	79°52'25.72"E
13	12°44'34.61"N	79°52'27.96"E	27	12°44'41.02"N	79°52'27.52"E
14	12°44'33.06"N	79°52'27.69"E	28	12°44'43.35"N	79°52'27.61"E

Land use pattern (Forest, Agricultural, Grazing, Barren etc.)

It is an barren and virgin land

b). *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 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.*

Refer plate no-IA & IB

i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Thirumukkoodal	2.0Km	Northwest
b.	Nearest police station	Palur	4.1Km	Northeast
c.	Nearest fire station	Chengalpattu	13.1km	East
d.	Nearest medical facility	Padur	6.5Km	Southwest
e.	Nearest school	Arumbuliyur	2.6Km	East
f.	Nearest railway station	Pazhayaseevaram	3.45km	North
g.	Nearest port facility	Chennai	59.5km	Northeast
h.	Nearest airport	Chennai	41.1km	Northeast
i.	Nearest DSP office	Chengalpattu	13.2km	Southeast
j.	Nearest villages	Thirumukkoodal	1.72Km	Northwest
		Pinayur	1.77Km	Northeast
		Pazhaveri	0.65Km	East
		Arunkunram	0.8Km	Southwest

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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 highest elevation in 70m AMSL observed in North side of the lease area. The slope is towards South side and falls in Toposheet no. 57-P/14.
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(ii) General Geology of the district:

a) Geomorphology:

The Kancheepuram area is endowed with a complex geological set up with crystalline rocks occurring in the southern part of the area and the northern part of the area the crystalline rocks occur at depths covered by sedimentary formations ranging from gondwana to recent. The depth at which the crystalline rocks occur progressively increase towards north. The eastern part comprises unconsolidated sediments of fluvio-marine and marine origin. The precambrian crystalline rocks are represented by charnockites and contain several enclave's mafic granulite. Garnetiferous and biotite gneisses are also encountered as linear bands.

b) Soils:

The analysis of the soil type reveals that the proposed lease area is predominantly covered by river alluvium is transported and is seen in coastal area

c) Lineaments:

The general trend of the gneiss is NE-SW direction and the regional trend observed is NNE-SSW to NW-SE direction. The deposition of gondwana rocks, the sedimentary rocks, in faulted troughs and in the rugged topography of crystalline rocks took place during jurassic period. The insitu soils laterites and alluvial deposits were deposited along the palar and cheyyar rivers during the quaternary period. The data have been checked by field studies and survey of India topographical maps at the 1: 50,000 scales.

Order of superposition of the proposed lease area,

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Age	Group	Rock Formation
Recent	Alluvium and beach sands	Sand, gravel, silt and clay
Pleistocene	Laterite, soils, talus	Laterites, sandy clay, silt
-----Unconformity-----		
Lower Cretaceous to Jurassic	Sandstones & Shales	Fine to medium grained sand stone with clay intercalations of greenish soft shale
-----Unconformity-----		
Archaean	Crystalline formations	Charnockites, granites and associated basic and ultra-basic intrusive

(iii) Local / Mine Geology of The Mineral Deposit:

Topography of the proposed lease area:

The proposed lease area is flat terrain and altitude of 70m maximum above MSL. The area is sloping towards south side and charnockite composed mainly of quartz, perthite or antiperthite and orthopyroxene (usually hypersthene) formed at high temperature and pressure, commonly found in granulite facies metamorphic regions, as an end-member of the charnockite series. charnockite is extensively quarried for rough stone productivity / which is used as blue metals for construction of building.

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:

Dark colour and clouding of the feldspars are typical features of these rocks as bluish in quartz.

d). Chemical composition of rocks:

Charnockite, any member of a series of metamorphic rocks with variable chemical composition, the term is often limited to the characteristic ortho pyroxene granite of the series. The alkali feldspar may be intermediate between microcline and orthoclase, the fine micro perthitic texture being common.

Order of superposition of the proposed lease area,

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

(iv) Drainage Pattern : There is no major river located within 50m radius. The drainage in the area is dendritic in nature.

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(b)	<i>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:</i>		
	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 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
(d)	<i>Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below :-</i> No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.		

(e) 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.

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 (Three longitudinal and four transverse) to calculate the volume of material up to the depth of 35m below ground level. The longitudinal and transverse cross sections were assigned (XY-AB), (XY-CD), (X1Y1-EF) & (X2Y2-GH) as respectively. Using the cross-sectional method, total reserve is estimated to be **973735m³** including the resources of safety zone, and gravel, etc. Of which, rough stone resources of about **918093m³**, and gravel is **55642m³**.

Gravel is obtained about 0-2m from the surface level and a rough stone starts from 2 to 35m from below the ground level. (Refer plate no's. III & IIIA).

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GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m ³	Rough Stone in m ³	Gravel in m ³
XY-AB	I	108	128	2	27648	.....	27648
	I	108	128	3	41472	41472	.....
	II	108	128	5	69120	69120	.....
	III	108	128	5	69120	69120	.....
	IV	108	128	5	69120	69120	.....
	V	108	128	5	69120	69120	.....
	VI	108	128	5	69120	69120	.....
	VII	108	128	5	69120	69120	.....
TOTAL					483840	456192	27648
XY-CD	I	141	92	2	25944	.....	25944
	I	141	92	3	38916	38916	.....
	II	141	92	5	64860	64860	.....
	III	141	92	5	64860	64860	.....
	IV	141	92	5	64860	64860	.....
	V	141	92	5	64860	64860	.....
	VI	141	92	5	64860	64860	.....
	VII	141	92	5	64860	64860	.....
TOTAL					454020	428076	25944
X1Y1-EF	I	25	25	2	1250	.....	1250
	I	25	25	3	1875	1875	.....
	II	25	25	5	3125	3125	.....
	III	25	25	5	3125	3125	.....
	IV	25	25	5	3125	3125	.....
	V	25	25	5	3125	3125	.....
	VI	25	25	5	3125	3125	.....
	VII	25	25	5	3125	3125	.....
TOTAL					21875	20625	1250
X2Y2-GH	I	100	4	2	800	.....	800
	I	100	4	3	1200	1200	.....
	II	100	4	5	2000	2000	.....
	III	100	4	5	2000	2000	.....
	IV	100	4	5	2000	2000	.....
	V	100	4	5	2000	2000	.....
	VI	100	4	5	2000	2000	.....
	VII	100	4	5	2000	2000	.....
TOTAL					14000	13200	800
GRAND TOTAL					973735	918093	55642



(f) Indicate mineable reserves by slice plan / level plan method, as applicable, as per the proposed mining parameter: -

The total mineable reserve is estimated to be **423990m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 35m below ground level. Of which, rough stone is about **383552m³** and gravel is **40438m³**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are

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prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate No. VI & VIA).

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m ³	Rough Stone in m ³	Gravel in m ³
XY-AB	I	101	113	2	22826	.....	22826
	I	101	113	3	34239	34239	.....
	II	96	103	5	49440	49440	.....
	III	91	93	5	42315	42315	.....
	IV	86	83	5	35690	35690	.....
	V	81	73	5	29565	29565	.....
	VI	76	63	5	23940	23940	.....
	VII	71	53	5	18815	18815	.....
TOTAL					256830	234004	22826
XY-CD	I	119	74	2	17612	.....	17612
	I	119	74	3	26418	26418	.....
	II	114	64	5	36480	36480	.....
	III	109	54	5	29430	29430	.....
	IV	104	44	5	22880	22880	.....
	V	99	34	5	16830	16830	.....
	VI	94	24	5	11280	11280	.....
	VII	89	14	5	6230	6230	.....
TOTAL					167160	149548	17612
GRAND TOTAL					423990	383552	40438

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)	:	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.	<p>Indicate quantum of development and tonnage and grade of production expected pit wise as in table below.</p> <p>Total proposed production of 423990m³ of which, rough stone is about 383552m³ and gravel is 40438m³ up to a depth of 35m below the ground level for five years plan period. Average production is 76710m³ of rough stone per year and gravel is 13479m³ in a year (Refer Plate No's. IVA).</p>		

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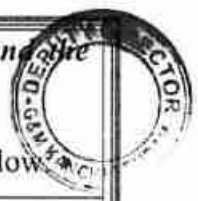
Year	Pit No.(s)	ROM (m ³)	Saleable rough stone (m ³) @ 100%	Rough stone rejects(m ³)	Saleable Gravel (m ³)	Rough stone to waste ratio
I	I	101425	84475	...	16950	....
II	I	91095	77819	...	13276	....
III	I	89120	78908	...	10212	....
IV	I	82085	82085	...	....	....
V	I	60265	60265	...	....	....
Total	---	423990	383552	...	40438	....

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

YEARWISE PRODUCTIONS								
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m ³	Rough Stone in m ³	Gravel in m ³
XY-AB	I	I	75	113	2	16950	.....	16950
		I	75	113	3	25425	25425	.....
		II	65	103	5	33475	33475	.....
		III	55	93	5	25575	25575	.....
TOTAL						101425	84475	16950
XY-AB	II	I	26	113	2	5876	.....	5876
		I	26	113	3	8814	8814	.....
		II	31	103	5	15965	15965	.....
		III	36	93	5	16740	16740	.....
XY-CD	II	I	50	74	2	7400	.....	7400
		I	50	74	3	11100	11100	.....
		II	45	64	5	14400	14400	.....
III	40	54	5	10800	10800	.....	
TOTAL						91095	77819	13276
XY-CD	III	I	69	74	2	10212	.....	10212
		I	69	74	3	15318	15318	.....
		II	69	64	5	22080	22080	.....
		III	69	54	5	18630	18630	.....
		IV	104	44	5	22880	22880	.....
TOTAL						89120	78908	10212
XY-AB	IV	IV	86	83	5	35690	35690	.....
XY-CD		V	81	73	5	29565	29565	.....
XY-CD		V	99	34	5	16830	16830	.....
TOTAL						82085	82085	0
XY-CD	V	VI	94	24	5	11280	11280	.....
XY-AB		VI	76	63	5	23940	23940	.....
XY-AB		VII	71	53	5	18815	18815	.....
XY-CD		VII	89	14	5	6230	6230	.....
TOTAL						60265	60265	0
GRAND TOTAL						423990	383552	40438

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

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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 = 383552m³

Production per year = 76710m³

Gravel

Mineable reserves of gravel = 40438m³

Monthly production of gravel = 1123m³

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 upto 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 deposit is proved beyond the workable limits about up to a depth of 35m below ground level from the petrogenetic character of the charnockite 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 5 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.70 to 65m	Five years Period	Gravel	101	113	2
			Rough stone	101	113	3
II	R.L.65 to 60m		Rough stone	96	103	5
III	R.L.60 to 55m		Rough stone	91	93	5
IV	R.L.55 to 50m		Rough stone	86	83	5
V	R.L.50 to 45m		Rough stone	81	73	5
VI	R.L.45 to 40m		Rough stone	76	63	5
VII	R.L.40 to 35m		Rough stone	71	53	5
Total						35m

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ULTIMATE PIT LIMIT-(XY-CD)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.70 to 65m	Five years Period	Gravel	119	74	2
			Rough stone	119	74	3
II	R.L.65 to 60m		Rough stone	114	64	5
III	R.L.60 to 55m		Rough stone	109	54	5
IV	R.L.55 to 50m		Rough stone	104	44	5
V	R.L.50 to 45m		Rough stone	99	34	5
VI	R.L.45 to 40m		Rough stone	94	24	5
VII	R.L.40 to 35m		Rough stone	89	14	5
Total						35m
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-term use in the event of continuation of mining activity: -		:	The recovery of rough stone in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary.		
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.	Open cast Mines:					
i	Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)		:	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		

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			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. Hydraulic 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 suffice	:	The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers, smooth blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers and transported to the needy customer. Bench height = 5mts. Bench width = 5mts.																					
	a. Details of Topsoil/ Overburden	:	No separate of topsoil will be removed.																					
	b. Rough Stone waste and side burden waste:-	:	The recovery of rough stone in this quarry is 100%. There is no mineral waste will be proposed in this lease area																					
h.	Underground Mines:	:	Not applicable																					
i.	Extent of mechanization: Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations. (1) Drilling Machines: Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.																							
	<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>2</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>			Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P.	Jack Hammer	2	32 mm	Hand held	--	Diesel	--	Compressor	1	---	Air	--	Diesel	--
Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P.																		
Jack Hammer	2	32 mm	Hand held	--	Diesel	--																		
Compressor	1	---	Air	--	Diesel	--																		

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(2) Loading Equipment:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Hydraulic Excavator	1	2.9-4.5m ³	--	Diesel	--

(3) Haulage and Transport Equipment

(a) Haulage within the mining leasehold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	9	15MT	--	Diesel	--

Whether the dumpers are fitted with exhaust conditioner should be indicated:

The dumpers not used in this quarry area, hence it's a small B category mine.

(b) Transport from mine head to the destination : Tipper will be used for transport rough stone from the mine head to needy customer.

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) : The excavated stone materials road metal will be supplied to the consumers like road laying, earth filling, building construction, etc

f. Details of hauling / transport equipment:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
--	--	--	--	--	--

(4).Miscellaneous:

Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.

(A) Operations : The mining operation is open-cast, 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.

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5. BLASTING:

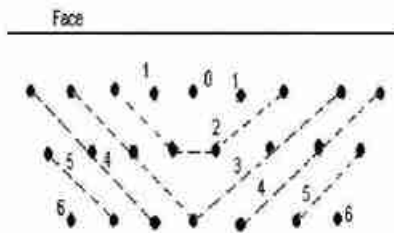
a) *Broad blasting parameters like charge per hole, blasting pattern, charge delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.*

Blasting pattern:

The quarrying operation is proposed to be carried by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and to loosen the rough stone.

Rough stone Production for 5 Years = 383552m³

BLAST DESIGN	
Blasthole Diameter (D) in mm	32
Burden (B) in m	1.2
Spacing (S) in m	1.38
Subdrill in m	0.5
Charge length (C) in m	0.70
Stemming	0.5
Hole Length (L) in m	1.2
Bench Height (BH) in m	2.5
Mass of explosive/hole in g	437.5
Stemming material size in mm	3.2
Burden stiffness ratio	2.08
Blast volume/hole in m ³	4.14
Production of rough stone/day in m ³	274
Number of blast holes/day	60
Number of blast round/day	2
Blasthole pattern	Staggered
Mass of explosive /day in kg	26.25
Powder factor in kg/m ³	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Note: If >2kg of explosives per day use for blasting if proponent get the permission from the DGMS	



Blastholes/Initiation patterns for shot fired to an open face

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

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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	:	60holes
Yield	:	274m ³
Powder factor	:	0.10kg per hole of explosives
Total explosive required	:	26.25kg- Nonel explosives
Blasting at day time only	:	12.00p.m-1.00p.m

c) Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.10kg per hole of explosives
d) 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 crushers.
e) Storage of explosives (like capacity and type of explosive magazine)	:	<ol style="list-style-type: none"> 1. The applicant is advised to engage an authorized explosive agency to carry out blasting. 2. First Aid Box will be keeping ready at all the time. 3. Necessary precautionary announcement will be carried out before the blasting

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		operation.
6.	MINE DRAINAGE:	
a)	Likely depth of water table based on observations from nearby wells and water bodies	: The ground water table is reported as of 60m in summer and 55m in rainy season from the general ground level observed in the adjacent bore well.
b)	Workings expected to be _____ m. above / reach below water table by the year _____.	: Proposed mining depth is 35m below ground level. Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.
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	: The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 Lpm and it shall 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 it is not contaminated with any hazardous things.
7.	STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:	
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.	
b).	Land chosen for disposal of waste with proposed justification	: There is no waste are proposed.
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.	: There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.
8.	USE OF MINERAL:	
a).	Describe briefly the end-use of the mineral (sale to intermediary	: The excavated stone materials will be supplied to the consumers like stone pillar,

2015



	parties, captive consumption, export, industrial use)		sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc																		
b).	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone (charnockite) and the same are used for building materials and road metal. So, there is 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.																		
9. OTHERS																					
	Describe briefly the following	:	Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and bath rooms have been provided as per the Metalliferous Mines Regulations, 1961, as a welfare amenity for quarry laborers.																		
	a) Site services																				
	b) Employment potential: As per Mines safety under the provisions of Metalliferous Mines Regulations, 1961 and 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. The following man power is proposed for quarrying rough stone 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 the DGMS norms.																				
	<table border="1"> <tr> <td rowspan="4">1.</td> <td rowspan="4">Highly Skilled</td> <td>Mines Manger</td> <td>1No.</td> </tr> <tr> <td>Mines 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>16 No's</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total =</td> <td>20 No's</td> </tr> </table>			1.	Highly Skilled	Mines Manger	1No.	Mines Engineer	1No.	Mine Geologist	1No.	Blaster	1No.	2.	Unskilled	Musdoor / Labours	16 No's	Total =			20 No's
1.	Highly Skilled	Mines Manger	1No.																		
		Mines Engineer	1No.																		
		Mine Geologist	1No.																		
		Blaster	1No.																		
2.	Unskilled	Musdoor / Labours	16 No's																		
Total =			20 No's																		
10 MINERAL PROCESSING/BENEFICIATIONS:																					
(a)	If processing / beneficiations of the ore or minerals mined is planned to be conducted on site	:	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")																		

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	or adjacent to 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.		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 shall 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 shall 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.	:	---
(d)	Specify quantity and type of chemicals to be used in the processing plant.	:	---
(e)	Specify quantity and type of chemicals to be stored on site / plant.	:	----
(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 0.25KLD, utilized water is 0.8KLD, Dust suppression is 1.0KLD and Green Belt is 1.0KLD. Minimum quantity of water 3.05KLD per day has to be maintained as per the Mines Rules, 1952. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for 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.



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>Roads</td> <td>Nil</td> </tr> <tr> <td>4</td> <td>Unutilized</td> <td>2.78.5</td> </tr> <tr> <td>5</td> <td>Green belt</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Drainage & Settling tank</td> <td>Nil</td> </tr> <tr> <td colspan="2">Grand Total</td> <td>2.78.5</td> </tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under Mining	Nil	2	Infrastructure	Nil	3	Roads	Nil	4	Unutilized	2.78.5	5	Green belt	Nil	6	Drainage & Settling tank	Nil	Grand Total		2.78.5
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5	Green belt	Nil																								
6	Drainage & Settling tank	Nil																								
Grand Total		2.78.5																								
11.2	Water Regime	: Water table in this area is noticed at a depth of 60m in summer and 55m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 35m bgl. Hence, it will not affect the ground water depletion of this area. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except bushes, shrubs, 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																								

200 *Chetty*



		minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																									
11.5	<p>Climatic conditions:</p> <p>Rainfall: - The district receives rainfall Rainfall of this area is southwest monsoon, with an onset in June and lasting up to September, brings rainfall of 517.1 mm, with September being the rainiest month.</p> <p>Climatic Conditions: - The temperature ranges from a maximum of 37 °C to a minimum of 25°C. Like the rest of the state, April to June is the hottest months and December to January are the coldest</p>																										
11.6	<p>Human Settlement:</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.No</th> <th>Village</th> <th>Direction</th> <th>Distance in Kms</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Thirumukkoodal</td> <td>Northwest</td> <td>1.72Km</td> <td>1673</td> </tr> <tr> <td>2</td> <td>Pinayur</td> <td>Northeast</td> <td>1.77Km</td> <td>1068</td> </tr> <tr> <td>3</td> <td>Pazhaveri</td> <td>East</td> <td>0.65Km</td> <td>727</td> </tr> <tr> <td>4</td> <td>Arunkunram</td> <td>Southwest</td> <td>0.8Km</td> <td>1056</td> </tr> </tbody> </table>	S.No	Village	Direction	Distance in Kms	Population	1	Thirumukkoodal	Northwest	1.72Km	1673	2	Pinayur	Northeast	1.77Km	1068	3	Pazhaveri	East	0.65Km	727	4	Arunkunram	Southwest	0.8Km	1056	
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3	Pazhaveri	East	0.65Km	727																							
4	Arunkunram	Southwest	0.8Km	1056																							
11.7	Public buildings, places of worship and monuments	: No infrastructure like residential building situated within radius of 300m and places of special interest like archeological monuments, Sanctuaries, etc., are found around 10km radius.																									
11.8	Attach plans showing the locations of sampling stations	: It is fresh quarry lease. 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.																									
11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	: The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974																									

21/11/2017



b) Attach an Environmental Impact Assessment Statement describing the impact Mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)

i) **Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:**

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:

Sl. No.	Land Use	Area in use during the quarrying period (Hect.)
1.	Area under Mining	1.86.0
2.	Infrastructure	0.02.0
3.	Roads	0.07.0
4.	Green belt	0.75.0
5.	Drainage & Settling tank	0.08.5
6.	Un-utilized area	Nil
Grand Total		2.78.5

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 shall be recoded using mini seismograph devises as per the guidance of MoEF and EIA

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			Notification 2006 and also covering DGMS norms.
vi).	Water regime	:	There is no major river located within a radius of 50m.
vii).	Socio-economics	:	1. To provide Employment opportunities of the nearby 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	:	No separate of topsoil will be removed
ii).	Yearwise 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 35m 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.

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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	7500	835	80%		83500/-
Second	Approach road and Nearby Village Road	--	300	80%	@100 Rs Per sapling	30000/-
Third	Schools	--	300	80%		30000/-
Total						1,43,500/-

iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and upto 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.

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			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 B category open cast, semi mechanized mining and no heavy machinery shall 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 B 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 35 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. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 835 trees will be proposed in the lease area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.

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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 35m 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 Mines 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 mining method 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

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		quarry and one vehicle always ready 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 security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 20 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:

A	Fixed Asset Cost:	
	1. Land Cost (Own & consent land)	: Rs. 23,00,000/-
	2. Labour Shed	: Rs. 1,00,000/-
	3. Sanitary Facility	: Rs. 1,00,000/-
	4. Fencing	: Rs. 4,54,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 5,00,000/-
	Total	: Rs. 34,54,000/-
B	B. Machinery cost	: Rs. 20,00,000/- (Hire Basis)
C	Total Expenditure of EMP cost (for five years)	
	1. Drinking Water Facility	: Rs. 1,00,000/-

2195-11/14



2. Sanitary facility & Maintenance	:	Rs. 1,00,000/-
3. Permanent water sprinkler	:	Rs. 3,00,000/-
4. Afforestation and its maintenance	:	Rs. 1,43,500/-
5. Safety Kits	:	Rs. 1,00,000/-
6. Provision of tyre washing facility	:	Rs. 2,00,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.08.5 Hect or 850Sq.m X 400)	:	Rs. 3,40,000/-
8. Blasting materials with blast mat cost	:	Rs. 10,00,000/-
9. Environment monitoring	:	Rs. 5,00,000/-
Total	:	Rs. 27,83,500/-
D	Total Project Cost (A+B+C)	Rs. 82,37,500/-

13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small B 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 and gravel 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, Department of Geology and Mining, Kancheepuram vide letter **Roc.No.371/Q3/2023 Dated: 06.06.2024**
- (iv) Total proposed production **423990m³**. Of which, rough stone is **383552m³** and gravel is **40438m³** up to a depth of 35m below the ground level for five years plan period. Average production is **76710m³** of rough stone per year and the gravel is **13479m³** for per year.

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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:

Signature of the Recognized Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri-636705, TamilNadu, India

This Mining Plan is approved subject to the conditions / stipulations indicated in the Mining Plan approval Letter No. RC.NO. 371 / 03 / 2023 Dated. 12.06.2024

This Mining Plan is approved as per the powers conferred Under Rule 41 (2) of Tamil Nadu Minor Mineral Concession Rules, 1959

[Handwritten signature and date: 12.06.24]

Deputy Director of Geology and Mining, Kancheepuram District.

[Handwritten initials SKS and date 12.06.24]

நக.எண்.371/க்யூ3/2023
நாள்.06.06.2024.

துணை இயக்குநர் அலுவலகம்
புவியியல் மற்றும் சுரங்கத்துறை
காஞ்சிபுரம்.



திருத்திய குறிப்பாணை

பொருள்:- கனிமங்களும் குவாரிகளும் - சிறுகனிமம் - சாதாரண கற்கள் மற்றும் மண் - காஞ்சிபுரம் மாவட்டம் - உத்திரமேரூர் வட்டம் - நெ.89. பழவேரி கிராமம் - பட்டா புன்செய் புல எண். 224/1A1, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H, 252/12A, 252/5A4A, 252/5A4B மற்றும் 252/5A4C - மொத்த பரப்பு 1.38.50 - ஹெக்டேர்ஸ் பரப்பில் சாதாரண கற்கள் / கிராவல் குவாரி செய்ய தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினர் என்பவர் 10 ஆண்டுகளுக்கு அனுமதிக்கோரி விண்ணப்பம் செய்தது - மேலும் புல எண்கள். 217/2, 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5B - ன் மொத்த பரப்பு 1.40.00 ஹெக்டேரினை சேர்த்து ஆக மொத்தம் 2.78.50 ஹெக்டேர் பரப்பளவில் குத்தகை உரிமம் கோரியது - அறிக்கைகள் வரப்பெற்றது - புலத்தணிக்கை செய்யப்பட்டது - மனுதாரர் கோரிக்கையின் அடிப்படையில் 05 வருட காலத்திற்கு உரிமம் வழங்க தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்கதிட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மை சான்று பெற்று சமர்ப்பிக்க கோருதல்- தொடர்பாக.

- பார்வை:-
1. தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினரின் விண்ணப்ப நாள்.26.10.2023 (பெறப்பட்ட நாள் 27.10.2023).
 2. இவ்வலுவலக நக.எண்.371/க்யூ3/2023 நாள் 27.10.2023.
 3. உத்திரமேரூர், வட்டாட்சியர் அவர்களின் கடித நக.2091/2023/அ1 நாள்.31.01.2024.
 4. காஞ்சிபுரம் வருவாய் கோட்டாட்சியர் அவர்களின் கடித நக. எண்.369/2024/அ1 நாள் 29.02.2024.
 5. உதவி புவியியலாளர் மற்றும் தனிவருவாய் ஆய்வாளர் (கனிமம்), காஞ்சிபுரம் அவர்களின் புலத்தணிக்கை அறிக்கை நாள் 05.03.2024.
 6. தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினரின் கடித நாள்.05.03.2024.



7. வட்டார வளர்ச்சி அலுவலர் (வ.உஊ), உத்திரமேரூர் ஊராட்சி ஒன்றியம் அவர்களின் அறிக்கை ந.க.எண்.0820/2024/அ2, நாள் 07.03.2024.
8. இவ்வலுவலக இதே எண்ணிட்ட குறிப்பாணை நாள்.07.03.2024.
9. தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினரின் கடித நாள்.08.03.2024.
10. துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, காஞ்சிபுரம் அவர்களின் இதே எண்ணிட்ட கடித நாள்.12.03.2024
11. தி/ள்.எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினரின் கடித நாள்.30.04.2024.
12. காஞ்சிபுரம் வருவாய் கோட்டாட்சியர்அவர்களின் கடித ந.க. எண்.1519/2024/அ1 நாள் 31.05.2024.
13. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, காஞ்சிபுரம் அவர்களின் புலத்தணிக்கை அறிக்கை நாள் 05.06.2024.
14. மற்றும் உரிய ஆவணங்கள்.

பார்வையில் காணும் கடிதங்களின்பால் கனிவான கவனம் வேண்டப்படுகிறது.

2. காஞ்சிபுரம் மாவட்டம், உத்திரமேரூர் வட்டம், பழவேரி கிராம பட்டா புல எண்கள். 224/1A1 (0.28.00), 252/11A (0.18.00), 252/11B (0.03.00), 252/11C (0.03.00), 252/11D (0.02.50), 252/11E (0.02.50), 252/11F (0.09.00), 252/11G (0.06.50), 252/11H (0.08.50), 252/12A (0.05.50), 252/5A4A (0.28.50), 252/5A4B (0.14.00) மற்றும் 252/5A4C (0.09.50) -ல் மொத்த பரப்பு 1.38.50 ஹெக்டேர்ஸ் பரப்பில் சாதாரண கற்கள் / கிராவல் மண் குவாரி செய்ய பத்து ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கக்கோரி தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினர் என்பவர் 26.10.2023 நாளிட்ட விண்ணப்பித்தினை உரிய ஆவணங்களுடன் சமர்ப்பித்துள்ளார். அதன் தொடர்ச்சியாக அளித்த 05.03.2024 நாளிட்ட கடிதத்தின்படி 05 வருட காலத்திற்கு மட்டும் உரியம் வழங்கினால் போதுமானது என தெரிவித்துள்ளார்.

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3. அதன் அடிப்படையில், மேற்படி புலத்தில் குவாரிப்பணி செய்ய தகுதி வாய்ந்த நிலமாக கருதி, 07.03.2024-நாளிட்ட குறிப்பானை விண்ணப்பதாரருக்கு வழங்கப்பட்டது. இதனை தொடர்ந்து, 08.03.2024-ல் விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட்ட வரைவு சுரங்கத்திட்டத்தினை, துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, காஞ்சிபுரம் அவர்களால் வரைவு சுரங்கத்திட்டமானது அங்கீகரிக்கப்பட்டு 12.03.2024-நாளிட்ட கடிதத்தின்படி ஏற்பளிப்பு செய்யப்பட்டது.

4. இதன் தொடர்ச்சியாக, 30.04.2024-நாளிட்ட கடிதத்தில் விண்ணப்பதாரர் ஏற்கனவே விண்ணப்பித்த புல எண்களுடன் மேலும் புதியதாக புல எண்கள். 217/2 (0.9.50), 217/3 (0.13.00), 217/5 (0.9.50), 217/7 (0.9.50), 252/4A1 (0.3.50), 252/4B1 (0.3.00), 252/5A2A (0.33.50), 252/5A2B (0.1.50), 252/5A2C (0.2.00), 252/5A3A (0.37.00), 252/5B (0.18.00)-ன் மொத்த பரப்பு 1.40.00 ஹெக்டேரினை சேர்த்து ஆக மொத்தம் 2.78.50 ஹெக்டேர்ஸ் பரப்பளவில் சாதாரண கற்கள் / கிராவல் மண் குவாரி செய்ய ஐந்து ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கக்கோரி தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினர் உரிய ஆவணங்களுடன் சமர்ப்பித்துள்ளார்.

5. மேற்கண்ட விண்ணப்பம் தொடர்பாக வட்டாட்சியர், உத்திரமேரூர் வருவாய் கோட்டாட்சியர், காஞ்சிபுரம் மற்றும் உதவி புவியியலாளர் (கனிமம்) காஞ்சிபுரம் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு காஞ்சிபுரம் மாவட்டம், உத்திரமேரூர் வட்டம், பழுவேரி கிராம பட்டா புல எண்கள். 224/1A1 (0.28.00), 252/11A (0.18.00), 252/11B (0.03.00), 252/11C (0.03.00), 252/11D (0.02.50), 252/11E (0.02.50), 252/11F (0.09.00), 252/11G (0.06.50), 252/11H (0.08.50), 252/12A (0.05.50), 252/5A4A (0.28.50), 252/5A4B (0.14.00) மற்றும் 252/5A4C (0.09.50) -ல் மொத்த பரப்பு 1.38.50 ஹெக்டேர்ஸ் மேலும் புதியதாக சேர்க்கப்பட்ட புல எண்கள். 217/2 (0.9.50), 217/3 (0.13.00), 217/5 (0.9.50), 217/7 (0.9.50), 252/4A1 (0.3.50), 252/4B1 (0.3.00), 252/5A2A (0.33.50), 252/5A2B (0.1.50), 252/5A2C (0.2.00), 252/5A3A (0.37.00), 252/5B

A 08/08/24



(0.18.00)-ன் மொத்த பரப்பு 1.40.00 ஹெக்டேரினை சேர்த்து ஆக மொத்தம் 2.78.50 ஹெக்டேர்ஸ் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவெல்டியெடுக்க தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினருக்கு உரிமம் வழங்க மனுதாரரின் கோரிக்கை மற்றும் மேலநிகைகளின் அடிப்படையில் 05 ஆண்டு காலத்திற்கு கீழ்க்கண்ட நிபந்தனைகளுக்கு உட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

நிபந்தனைகள்

- i. 1959-ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை II-ல் கண்டுள்ளபடி குவாரி செய்யப்படும் கனிமங்களுக்கு சீனியரேஜ் தொகை அவ்வப்போது செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.
- ii. விண்ணப்ப புலத்தின் அருகே உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரிப் பணி மேற்கொள்ளப்பட வேண்டும்.
- iii. விண்ணப்ப புலத்தின் தெற்கு பகுதியில் 20 மீட்டர் தொலைவிற்கு அப்பால் செல்லும் உயர்மின்னழுத்த கம்பிவடம் செல்வதால் 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு குவாரிப்பணி செய்யப்பட வேண்டும். மேலும் குத்தகை ஒப்பந்த பத்திரம் நிறைவேற்றுவதற்கு முன்பு (Power Grid Corporation of India) என்ற நிறுவனத்திடம் தடையின்மை சான்று NOC பெற்ற பின்னரே குவாரிப்பணி மேற்கொள்ளப்பட வேண்டும்.
- iv. விண்ணப்ப புலத்தின் தெற்கு- கிழக்கில் புல எண். 218-ல் தாங்கல் நீர்நிலை உள்ளதால் வட்டார வளர்ச்சி அலுவலர் (வ.உள) உத்திரமேரூர் அவர்கள் தெரிவித்துள்ளபடி 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு குவாரிப்பணி செய்யப்பட வேண்டும்.
- v. அனுபவம் வாய்ந்த வெடிபொருள் பயன்படுத்துவோர் மூலம் குறைந்த அளவு சக்தி கொண்ட வெடிபொருட்களை பயன்படுத்தி அருகிலுள்ள பட்டா தாரர்களுக்கு எவ்வித இடையூறுமின்றி / அருகிலுள்ள பட்டா மற்றும் அரசு புலங்களில் எவ்வித ஆக்கிரமிப்பும் இன்றி குவாரிப் பணி மேற்கொள்ள வேண்டும்.
- vi. விதிகளின்படி ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினை உரிய காலத்திற்குள் சமர்ப்பிக்க வேண்டும்.
- vii. குவாரி உரிமம் வழங்க உள்ள பகுதிக்கு சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும்.

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6. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை அவர்களின் 10.08.2020 நாள்ிட்ட கடிதத்துடன் இணைத்து வரப்பெற்ற அரசாணை எண்.169 தொழில் துறை (எம்.எம்.சி-1) நாள் 04.08.2020ன்படி பட்டா புலங்களில் கிராவல், சாதாரண வகை கற்கள் ஆகிய சிறுகனிம உரிமம் வழங்கும் நேர்வுகளில் நடவடிக்கை எடுக்க விதி 19 மற்றும் 33-ல் மாவட்ட ஆட்சியருக்கு வழங்கப்பட்ட அதிகாரம் தற்போது சம்மந்தப்பட்ட உதவி/துணை இயக்குநர் அவர்களுக்கு மாற்றி வழங்க உத்திரவிடப்பட்டுள்ளது.

7. எனவே, வட்டாட்சியர், உத்திரமேரூர் வருவாய் கோட்டாட்சியர், காஞ்சிபுரம், உதவி புவியியலாளர் (கனிமம்) காஞ்சிபுரம் மற்றும் வட்டார வளர்ச்சி அலுவலர் (வ.உ), உத்திரமேரூர் ஊராட்சி ஒன்றியம் ஆகியோரின் அறிக்கைகள் மற்றும் மேலறிக்கைகளின் நிபந்தனைகளின் அடிப்படையில் காஞ்சிபுரம் மாவட்டம், உத்திரமேரூர் வட்டம், பழுவேரி கிராம பட்டா புல எண்கள். 224/1A1 (0.28.00), 252/11A (0.18.00), 252/11B (0.03.00), 252/11C (0.03.00), 252/11D (0.02.50), 252/11E (0.02.50), 252/11F (0.09.00), 252/11G (0.06.50), 252/11H (0.08.50), 252/12A (0.05.50), 252/5A4A (0.28.50), 252/5A4B (0.14.00) மற்றும் 252/5A4C (0.09.50) -ல் மொத்த பரப்பு 1.38.50 ஹெக்டேர்ஸ் மேலும் புதியதாக சேர்க்கப்பட்ட புல எண்கள். 217/2 (0.9.50), 217/3 (0.13.00), 217/5 (0.9.50), 217/7 (0.9.50), 252/4A1 (0.3.50), 252/4B1 (0.3.00), 252/5A2A (0.33.50), 252/5A2B (0.1.50), 252/5A2C (0.2.00), 252/5A3A (0.37.00), 252/5B (0.18.00)-ன் மொத்த பரப்பு 1.40.00 ஹெக்டேரினை சேர்த்து ஆக மொத்தம் 2.78.50 ஹெக்டேர்ஸ் பரப்பில் பரப்பில் 1959-ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19-ன்படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு 05 (ஐந்து) வருட காலத்திற்கு தி/ள். எம்எஸ்எம் மைனிங் என்ற நிறுவனத்தினருக்கு சாதாரண கற்கள் மற்றும் கிராவல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

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6. மேலும், தமிழ்நாடு சிறுகனிம சலுகை விதிகள் -1959 விதி எண்.41-ன்படி குவாரிப் பணி மேற்கொள்வது தொடர்பாக திருத்திய சரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு மனுதாரரைக் கேட்டுக் கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், விதி எண்.42-ன்படி சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

26.06.24
துணை இயக்குநர்,

புவியியல் மற்றும் சரங்கத்துறை,
காஞ்சிபுரம்.

பெறுநர்

தி/ள். எம்எஸ்எம் மைனிங்,
எண்.15/1, காந்தி தெரு,
திருநீர்மலை ரோடு, குரோம்பேட்டை,
சென்னை- 600 044.

நகல்.

1. தலைவர், மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை
2. ஆணையர் , புவியியல் மற்றும் சரங்கத்துறை, சென்னை-32.

h. 26/6/24

மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

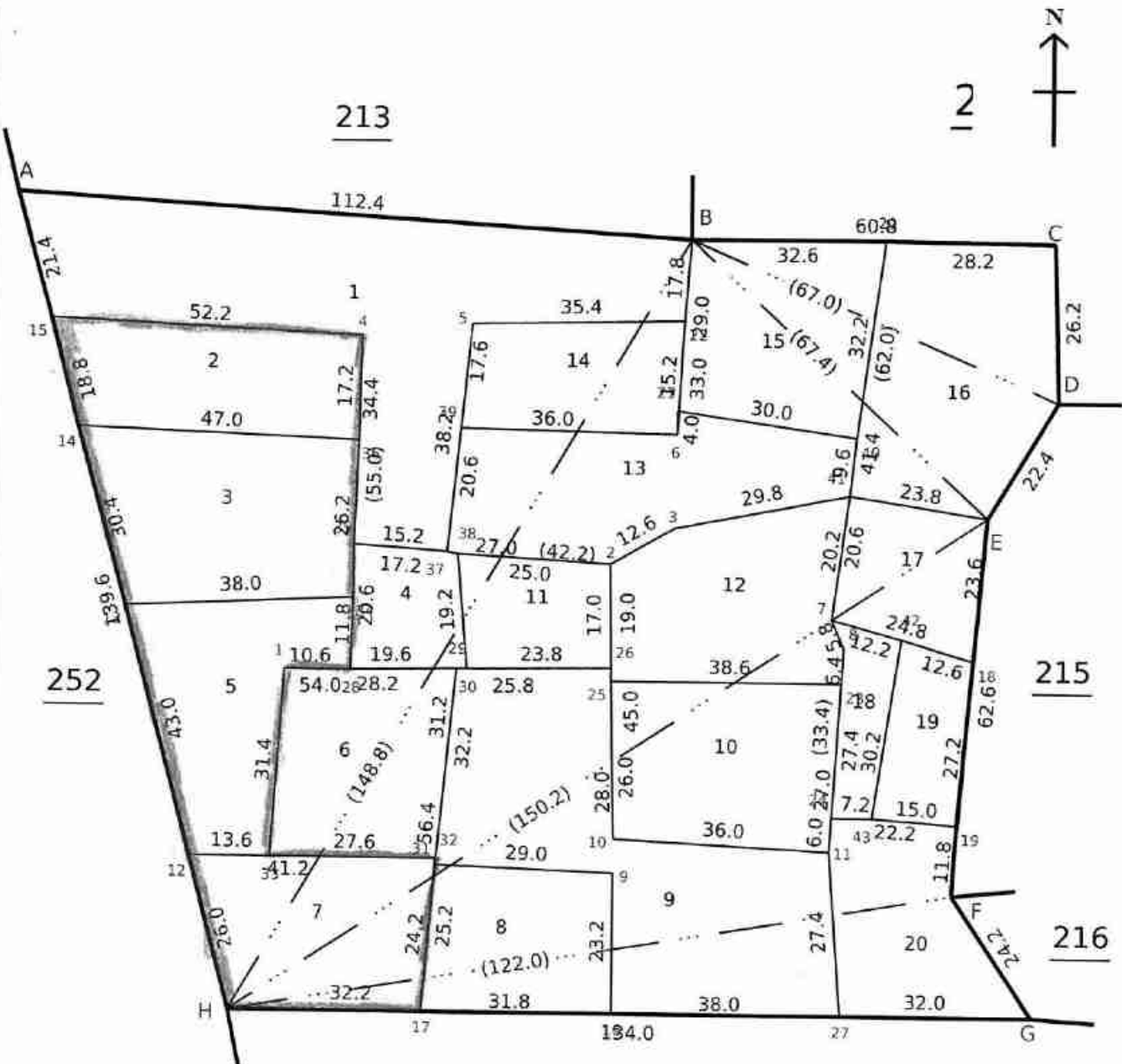
கிராமம் : பழவேரி [89]



புல எண் : 217

பரப்பளவு : எக்டர் 01 ஏர் 95.00

அளவு : 1 : 1000



LEASE APPLIED AREA

218

Date of Issue: 13-05-2024 10:02:47

K. S. Chelvan

Signed By Tahsildar
Name of approver : rajan
Date of Approval : 30-06-2017

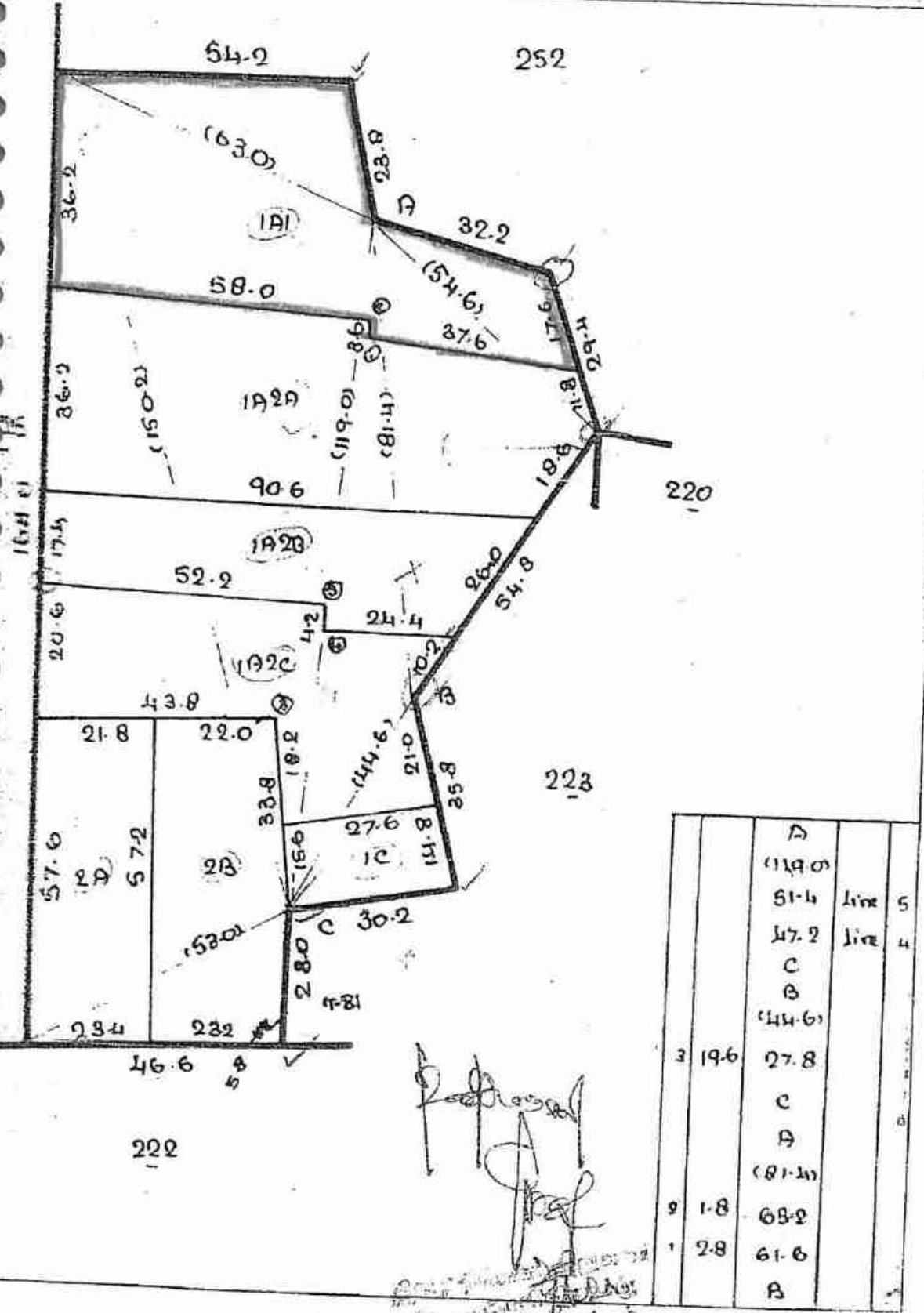


மேல் கிராமம்

உத்தரவிடப்பட்டது

புல எண். 224

எண் 89
 கிராமம் பெயர். பழையார்
 பரப்பு: ஏக்கர்கள் 1-20-6 சா.



		A		
		(119.0)		
		51.4	line	5
		47.2	line	4
		C		
		B		
		(144.6)		
3	19.6	27.8		
		C		
		A		
		(81.4)		
9	1.8	68.2		
1	2.8	61.6		
		B		

அளவு. 1,000

சுயாதீனம்
 50/2/2

A P. S.

LEASE APPLIED AREA 227

கி. எண். 89. பழவேலி.

113



1	2	3	4	5	6	7	8	9	10	11	12
							கு. பை.	தொ. ஏர்ஸ்.	கு. பை.		
	222-7	ர	4	...	8-3	6	1 85	0 31.0	0 57	192	கெ. தனபால் நாயக்கர்.
	-8	ர	4	...	8-3	6	1 85	0 34.0	0 63	595	ச. முருகப்ப நாயக்கர் மற்றும் நான்கு பேர்களும்.*
								1 49.5	2 92		
	223	ர	4	...	8-3	6	1 85	0 16.0	0 29	227	பொ. தேசம்மாள்.
1A1	224-1A1	ர	4	...	8-3	6	1 85	0 28.0	0 52	336	தா. ரத்தின நாயக்கர்.
1A2A	-1A2A	ர	4	...	8-3	6	1 85	0 32.5	0 61	320	பொ. முனியாண்டி நாயக்கர்.
1A2B	-1A2B	ர	4	...	8-3	6	1 85	0 16.0	0 30	415	பொ. வேலாயுதம்.
1A2C	-1A2C	ர	4	...	8-3	6	1 85	0 13.5	0 25	319	பொ. முனுசாமி நாயக்கர்.
1C	-1C	ர	4	...	8-3	6	1 85	0 04.5	0 08	227	பொ. தேசம்மாள்.
2A	-2A	ர	4	...	8-3	6	1 85	0 13.0	0 24	62	ந. கமலம்மாள்.
2B	-2B	ர	4	...	8-3	6	1 85	0 13.0	0 24	351	மா. இராதா கிருஷ்ணன்.
								1 20.5	2 24		
A	225-1A	ர	4	...	8-3	6	1 85	0 21.5	0 40	506	க. ஜெயராமன்(1), து. புண்ணிகோட்டி நாயக்கர் (2).
1B1	-1B1	ர	4	...	8-3	6	1 85	0 03.5	0 06	59	ரா. வண்ணப்ப நாயக்கர்.
1B2	-1B1	ர	4	...	8-3	6	1 85	0 08.0	0 06	52	தா. எழுமலை நாயக்கர்.
1C1	-1C1	ர	4	...	8-3	6	1 85	0 03.5	0 06	87	தா. கிஷ்டப்ப நாயக்கர்.
C2	-1C1	ர	4	...	8-3	6	1 85	0 10.0	0 19	59	ரா. வண்ணப்ப நாயக்கர்.
A	-2A	ர	4	...	8-3	6	1 85	0 18.5	0 34	622	அ.எ. கோவிந்தன் மற்றும் ஒரு பேர்களும்.*
B	-2B	ர	4	...	8-3	6	1 85	0 18.5	0 34	295	ந. மணிநாயக்கர்

* விவரம் பட்டியலைப் பார்க்கவும்.

A 85/20

230

2008/03/01
 F. சுவாமிநாதன்
 கிராம நிர்வாக அலுவலர்
 89 பழவேலி



	2	3	4	5	6	7	8	9	10	11
							ரு. பை.	ஹெ.ஏர்ஸ்.	ரு. பை.	
1	250-1	ர	4	...	8-3	6	1 85	0 05.0	0 09	353 கோ. ராஜேத் திரை
2	-2	ர	4	...	8-3	6	1 85	0 12.0	0 23	505 க. மலக் (1), க. ஜெயக் குமார் (2).
								0 17.0	0 32	
1	251-பா	ர	4	...	8-3	6	1 85	0 05.5	0 10	505 த. கமலக்கண் சன் (1), க. ஜெயக் குமார் (2).
2	-பா	ர	4	...	8-3	6	1 85	0 06.0	0 11	353 கோ. ராஜேத் திரை.
3	-பா	ர	4	...	8-3	6	1 85	0 18.5	0 35	505 க. மலக் சன் (1), க. ஜெயக் குமார் (2).
								0 30.0	0 56	
1A	252-1A	ர	4	...	8-3	6	1 85	0 71.0	1 32	148 க. சிங்கப்பாடி திரை.
1B	-1B	ர	4	...	8-3	6	1 85	0 53.5	0 97	356 க. சிங்கப்பாடி திரை.
1C	-1C	ர	4	...	8-3	6	1 85	0 25.5	1 48	512 காத்தம்மாள் (1), தேவராஜ் தாயடு (2).
2	-2	ர	4	...	8-3	6	1 85	0 66.5	1 24	163 க. சிங்கப்பாடி திரை.
3	-3	ர	4	...	8-3	6	1 85	0 10.0	0 19	512 காத்தம்மாள் (1), தேவராஜ் தாயடு (2).
4A	-4A	ர	4	...	8-3	6	1 85	0 54.0	1 00	286 க. சிங்கப்பாடி திரை.
4B	-4B	ர	4	...	8-3	6	1 85	0 53.5	0 99	453 கா. அடுப்புவாதி க. சிங்கப்பாடி திரை.
A1A	-5A1ur	ர	4	...	8-3	6	1 85	0 04.0	0 07	102 க. தனபாடி திரை.
A1B	-5A1ur	ர	4	...	8-3	6	1 85	0 04.5	0 08	90 க. தனபாடி திரை.

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Handwritten signature and text: கிராம தீர்வாக அலுவலர் 89, பழவேரி கிராமம்.



தி. என். டி. பி. சேலம்.

131

1	2	3	4	5	6	7	8	9	10	11	12
52	8E	252-8 ur	ர	4	...	8-3	6	1 85	0 09-0	0 17	192 செ. தளபாடி நாயக்கர்.
	(8F)	-8ur	ர	4	...	8-3	6	1 85	0 25-0	0 46	298 டி. மணிநாயக்கர்.
	9A	-9ur	ர	4	...	8-3	6	1 85	0 02.5	0 06	505 கமலக்கண்ணன்(1) ஜெயக்குமார் (2).
	9B	-9ur	ர	4	...	8-3	6	1 85	0 11-0	0 19	353 ஜார் ரெடிங் தீர்ச்சு.
	10	-10	அ	4	...	8-3	6	1 85	0 07.5	0 13	..... தீர்ச்சு.
	11A	-11ur	ர	4	...	8-3	6	1 85	0 18-0	0 33	506 து. புள்ளிய சேட்டி (1), து. ஜெயராசன்(2).
	11B	-11ur	ர	4	...	8-3	6	1 85	0 03-0	0 06	59 ரா. கண்ணப்ப நாயக்கர்.
	11C	-11ur	ர	4	...	8-3	6	1 85	0 03-0	0 06	52 தா. ரமணி நாயக்கர்.
	11D	-11ur	ர	4	...	8-3	6	1 85	0 02.5	0 05	59 ரா. கண்ணப்ப நாயக்கர்.
	11E	-11ur	ர	4	...	8-3	6	1 85	0 02.5	0 06	52 தா. ரமணி நாயக்கர்.
	11F	-11ur	ர	4	...	8-3	6	1 85	0 02.5	0 06	52 தா. ரமணி நாயக்கர்.
	11G	-11ur	ர	4	...	8-3	6	1 85	0 05.5	0 11	506 து. புள்ளிய சேட்டி (1), து. ஜெயராசன்(2).
	11H	-11ur	ர	4	...	8-3	6	1 85	0 08-5	0 14	59 ரா. கண்ணப்ப நாயக்கர்.
	12A	-12ur	ர	4	...	8-3	6	1 85	0 05-5	0 10	53 செ. ரமணி நாயக்கர்.
	12B	-12ur	ர	4	...	8-3	6	1 85	0 29-5	0 55	90 செ. கிஷ்டப்ப நாயக்கர்.
									9 84-5	18 50	
	1	253-1	ர	4	...	8-3	6	1 85	0 05-5	0 10	79 கோ. கண்ணன்.
	2	-2	ர	4	...	8-3	6	1 85	0 30-0	0 56	607 கோ. கண்ணன் மற்றும் நான்கு பேர்களும்.*
	3	-3	ர	4	...	8-3	6	1 85	0 05-5	0 10	269 அ. பார்த்தசாரதி நாயக்கர்.
									0 41-0	0 76	

*. விவரப்படி யலைப் பார்க்கவும்.

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தி. என். டி. பி. சேலம்



1	2	3	4	5	6	7	8	9	10	11	12
							கு. னப.	தெ. வர்ஸ்	கு. னப.		
4B	216-4B	ர	மா	...	7-1	3	6 79	0 01.5	0 11	54 கெ. ஏகப்ப நாய்க்கர்.	†
5A	-5A	ர	மா	...	7-1	3	6 79	0 01.0	0 08	54 கெ. ஏகப்ப நாய்க்கர்.	†
5B	-5B	ர	மா	...	7-1	3	6 79	0 01.0	0 08	54 கெ. ஏகப்ப நாய்க்கர்.	†
5C	-5C	ர	மா	...	7-1	3	6 79	0 01.0	0 08	54 கெ. ஏகப்ப நாய்க்கர்.	†
6	-6	ர	மா	...	7-1	3	6 79	0 01.0	0 08	53 கெ. பழுமலை நாய்க்கர்.	†
								0 20.0	1 39		
1	217-1	ர	பு	...	7-4	6	1 85	0 27.0	0 50	113 ந. கோதண்டன் நாய்க்கர்.	
2	-2	ர	பு	...	7-4	6	1 85	0 09.5	0 18	90 கெ. கிஷ்டப்ப கய்க்கர்.	
3	-3	ர	பு	...	7-4	6	1 85	0 13.0	0 24	54 கெ. ஏகப்ப நாய்க்கர்.	
4	-4	ர	பு	...	7-4	6	1 85	0 03.5	0 07	418 து. ஜெயராஜன்.	
5	-5	ர	பு	...	7-4	6	1 85	0 09.5	0 18	90 கெ. கிஷ்டப்ப நாய்க்கர்.	
6	-6	ர	பு	...	7-4	6	1 85	0 09.0	0 17	113 ந. கோதண்டன் நாய்க்கர்.	
7	-7	ர	பு	...	7-4	6	1 85	0 09.5	0 17	113 ந. கோதண்டன் நாய்க்கர்.	
8	-8	ர	பு	...	7-4	6	1 85	0 07.5	0 14	113 ந. கோதண்டன் நாய்க்கர்.	
9	-9	ர	பு	...	7-4	6	1 85	0 19.5	0 36	113 ந. கோதண்டன் நாய்க்கர்.	
10	-10	ர	பு	...	7-4	6	1 85	0 10.0	0 19	113 ந. கோதண்டன் நாய்க்கர்.	
11	-11	ர	பு	...	7-4	6	1 85	0 05.0	0 09	113 ந. கோதண்டன் நாய்க்கர்.	
12	-12	ர	பு	...	7-4	6	1 85	0 11.5	0 21	113 ந. கோதண்டன் நாய்க்கர்.	
13	-13	ர	பு	...	7-4	6	1 85	0 12.0	0 23	90 கெ. கிஷ்டப்ப நாய்க்கர்.	
14	-14	ர	பு	...	7-4	6	1 85	0 05.5	0 11	113 ந. கோதண்டன் நாய்க்கர்.	

†. கள்ளி கோவில் நாய்க்கல் ஏரி தீர்ப்புமுனை.

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2 கண்டலா 136
 E. சம்பு
 கிராம நிர்வாக
 89. பழவேரி க
 க. கிராம நிர்வாக

லர்
 ம்.
 ம்.

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	3 - 4
2. உட்பிரிவு எண்	5A2A	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-5A2A	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 33.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.56
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5752
7. பாசன ஆதாரம்	D	15. குறிப்பு	-
8. இரு போகமா	1	16. பெயர்	சடையப்பன்மற்றும 26பர்

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A2A/20959 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	3 - 4
2. உட்பிரிவு எண்	5A2B	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-5A2B	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 1.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.06
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5752
7. பாசன ஆதாரம்	D	15. குறிப்பு	-
8. இரு போகமா	1	16. பெயர்	சடையப்பன்மற்றும 2பேர்

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A2B/20959 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

1 மென்

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	8 - 3
2. உட்பிரிவு எண்	5A3A	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 37.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.68
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5752
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	சடையப்பன்மற்றும 2பேர்

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A3A/20959 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

K. S. Srinivasan

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	8 - 3
2. உட்பிரிவு எண்	5A3A	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்		11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 37.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.68
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5752
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	சடையப்பன்மற்றும 2பேர்

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A3A/20959 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	3 - 4
2. உட்பிரிவு எண்	5A4A	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-5A4A	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 28.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.52
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	5536
7. பாசன ஆதாரம்	D	15. குறிப்பு	-
8. இரு போகமா	1	16. பெயர்	1.MSM MINING

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A4A/20999 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

10/08/24

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	3 - 4
2. உட்பிரிவு எண்	5A4B	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-5A4B	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 14.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.26
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5536
7. பாசன ஆதாரம்	D	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.MSM MINING

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A4B/20999 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

1 மென்

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	3 - 4
2. உட்பிரிவு எண்	5A4C	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-5A4C	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 9.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.18
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5536
7. பாசன ஆதாரம்	D	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.MSM MINING

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5A4C/20999 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.

1 சென்

அ-பதிவேடு விவரங்கள் - ஊரகம்



மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

கிராமம் : பழவேரி

1. புல எண்	252	9. மண் வயனமும் ரகமும்	3 - 4
2. உட்பிரிவு எண்	5B	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	-5B	11. தீர்வை (ரூ - ஹெ)	1.85
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 18.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.34
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	5752
7. பாசன ஆதாரம்	D	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	சடையப்பன்மற்றும 26பர்

குறிப்பு:



மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
1. பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய
தளத்தில் 03/03/089/252/5B/20959 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து
உறுதி செய்துகொள்ளவும்.



தமிழ்நாடு அரசு
வருவாய்த் துறை

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

மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

வருவாய் கிராமம் : பழவேரி

பட்டா எண் : 5536

உரிமையாளர்கள் பெயர்

MSM MINING

சு

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	
224	1A1	0 - 28.00	0.52	-	-	-	-	2023/0103/03/307170- -- 21-10-2023
224	1A2A	0 - 32.50	0.61	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
224	1A2B	0 - 16.00	0.30	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
225	1A	0 - 21.50	0.40	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
225	1B1	0 - 3.50	0.06	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
225	1B2	0 - 8.00	0.06	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
225	1C1	0 - 3.50	0.06	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
225	1C2	0 - 10.00	0.19	-	-	-	-	2023/0103/03/294184- -- 15-07-2023
225	3A1A	0 - 11.00	0.20	-	-	-	-	2021/0103/03/228398- -395/1423 - 16-10- 2021
225	3A2	0 - 9.50	0.18	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	2	0 - 25.50	0.47	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	3	0 - 8.00	0.15	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	4	0 - 7.50	0.14	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	5A	0 - 4.00	0.07	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	5B	0 - 3.50	0.07	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	6	0 - 9.00	0.17	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	7	0 - 8.50	0.16	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	8A	0 - 5.00	0.09	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
226	8B	0 - 3.50	0.07	-	-	-	-	2021/0103/03/228398- -- 16-10-2021

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226	9A	0 - 11.50	0.22	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
226	9B	0 - 6.00	0.11	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
226	9C	0 - 7.50	0.14	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11A	0 - 18.00	0.33	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11C	0 - 3.00	0.06	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11D	0 - 2.50	0.06	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11E	0 - 2.50	0.06	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11F	0 - 9.00	0.17	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11G	0 - 6.50	0.10	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	11H	0 - 8.50	0.14	-	-	-	-	2023/0103/03/294184 -- 15-07-2023
252	12A	0 - 5.50	0.10	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	1C1	0 - 21.50	0.38	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	2A	0 - 44.00	0.90	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	2B	0 - 22.50	0.40	-	-	-	-	2018/0103/03/116222- -209/1420 - 07-10- 2018
252	4A2	0 - 50.50	1.00	-	-	-	-	2021/0103/03/228398- -344/1421 - 16-10- 2021
252	4B2	0 - 50.50	1.00	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	5A1A	0 - 4.00	0.07	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	5A1B	0 - 4.50	0.08	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	5A1C	0 - 15.50	0.30	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	5A1D	0 - 10.50	0.19	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	5A1E	0 - 24.50	0.46	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	5A4A	0 - 28.50	0.52	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	5A4B	0 - 14.00	0.26	-	-	-	-	2022/0103/03/242654 -- 20-04-2022
252	5A4C	0 - 9.50	0.18	-	-	-	-	2021/0103/03/228398 -- 16-10-2021
252	6	0 - 63.00	1.17	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	8A	0 - 5.50	0.10	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	8B	0 - 2.50	0.06	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	8C	0 - 84.50	1.56	-	-	-	-	2018/0103/03/116222- -- 07-10-2018

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252	8D	0-15.00	0.58	-	-	-	-	2018/0103/03/116222- -- 07-10-2018
252	8E	0-9.00	0.17	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
252	8F1	0-12.00	0.22	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
252	8F2	0-13.00	0.24	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
253	1	0-5.50	0.10	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
253	2	0-30.00	0.56	-	-	-	-	2021/0103/03/228398- -- 16-10-2021
252	11B	-	-	0-3.00	0.06	-	-	2021/0103/03/228398- -- 16-10-2021
252	5C	-	-	0-48.00	0.89	-	-	2018/0103/03/116222- -- 07-10-2018
252	7B	-	-	0-30.50	0.56	-	-	2018/0103/03/116222- -- 07-10-2018
252	7C	-	-	0-25.50	0.47	-	-	2018/0103/03/116222- -- 07-10-2018
256	3	-	-	0-41.50	0.77	-	-	2021/0103/03/228398- -- 16-10-2021
		8-38.50	15.96	1-48.50	2.75			

குறிப்பு2:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 03/03/089/05536/50999 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 25-02-2024 அன்று 09:49:22 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழ்நாடு அரசு

வருவாய்த் துறை

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

மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

வருவாய் கிராமம் : பழவேரி

பட்டா எண் : 5752

உரிமையாளர்கள் பெயர்

- | | | | |
|----|-------------|------|-----------|
| 1. | வைத்தி | மகன் | சடையப்பன் |
| 2. | மதுரைமுத்து | மகன் | மோகன் |
| 3. | ராஜா | மகன் | முரளிதரன் |



புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
217	2	0 - 9.50	0.18	--	--	--	--	2024/0103/03/326141- ----- 25-04-2024
217	5	0 - 9.50	0.18	--	--	--	--	2024/0103/03/326141- ----- 25-04-2024
252	5A2A	0 - 33.50	0.56	--	--	--	--	2024/0103/03/326141- ----- 25-04-2024
252	5A2B	0 - 1.50	0.06	--	--	--	--	2024/0103/03/326141- ----- 25-04-2024
252	5A3A	0 - 37.00	0.68	--	--	--	--	2024/0103/03/326141- ----- 25-04-2024
252	5B	0 - 18.00	0.34	--	--	--	--	2024/0103/03/326141- ----- 25-04-2024
		1 - 9.00	2.00					

குறிப்பு :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 03/03/089/05752/50959 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 08-06-2024 அன்று 01:34:43 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழ்நாடு அரசு

வருவாய்த் துறை

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

மாவட்டம் : காஞ்சிபுரம்

வட்டம் : உத்திரமேரூர்

வருவாய் கிராமம் : பழவேரி

பட்டா எண் : 5751

உரிமையாளர்கள் பெயர்

- | | | | | |
|----|-------------|------|-----------|--|
| 1. | வைத்தி | மகன் | சடையப்பன் | |
| 2. | மதுரைமுத்து | மகன் | மோகன் | |
| 3. | ராஜா | மகன் | முரளிதரன் | |

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
217	3	0 - 13.00	0.24	--	--	--	--	2024/0103/03/326134- -- ----- 25-04-2024
217	7	0 - 9.50	0.17	--	--	--	--	2024/0103/03/326134- -- ----- 25-04-2024
252	4A1	0 - 3.50	0.10	--	--	--	--	2024/0103/03/326134- -344/1421 ----- 25- 04-2024
252	4B1	0 - 3.00	0.10	--	--	--	--	2024/0103/03/326134- -- ----- 25-04-2024
252	5A2C	0 - 2.00	0.06	--	--	--	--	2024/0103/03/326134- -- ----- 25-04-2024
		0 - 31.00	0.67					

குறிப்பு :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து
- பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 03/03/089/05751/50948 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
 - இத் தகவல்கள் 08-06-2024 அன்று 01:37:28 PM நேரத்தில் அச்சடிக்கப்பட்டது.
 - கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

K. S. S. S.

1433 ஆம் பச்சலியில்

மாவட்டம்

கிராமக் கணக்

வட்டம்



நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					கைப்பற்று தாரகூடைய பெயரும் எண்ணும் ஆவ்வது அனுபோக தாரகூடைய பெயர்.	சாகுபடி யாளரின் பெயர்.	முதல் போகம்.				
(1) நில அளவை எண்.	(2) உட்பிரிவு எண்.	(3) பரப்பு.	(4) தீர்வை.	(5) ஒரு போகம் ஆவ்வது இரு போகம்.			(7) நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதா.	(8) எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	(9) பயிரின் பெயர்.	(10) பயிரான துறுவடை யான பரப்பு.	(11) உணமையான பாய்ச்சல் ஆதாரம்.	(12) விளைச்சல் அளவு விழுக்காடு.
224	1A	0040	002	5536	M30 mining						
224	1A	0025	001		do						
225	1C2	0000	019		do						
225	B01A	0110	020		do						
226	0C	0015	014		do						
252	11A	0010	0030		do						
252	1K	0030	0006		do						
252	1D	0025	0006		do						
252	1E	0025	0006		do						
252	1H	0005	010		do						
252	1H	0085	014		do						
252	12	0055	010		do						
252	5A	00285	052		do						
252	5A	0010	026		do						
252	5A	0045	008		do						
252	11B	0030	0006		do						
252	11F	0090	017		do						

சென்னை

கிராம நிர்வாக அலுவலர்
13, பழைய கிராமம்,
சென்னை-600008, 2022

105/2021



भारतीय गैर न्यायिक

बीस रुपये

रु. 20



Rs.

TWENTY
RUPEES

INDIA NON JUDICIAL

தமிழ்நாடு தமிலநாடு TAMIL NADU

2023

எம்.எஸ்.மெனிங் (நிறுவனம்)

23/4
V. Jayaraman

சென்னை

2024
30-4-24

குத்தகை உடன்படிக்கை ஆவணம்.

2024-ம் ஆண்டு ஏப்ரல் மாதம் 30-ம் தேதி, சென்னை, குரோம்பேட்டை, திருநீர்மலை ரோடு, காந்தி தெரு, எண். 15/1-ல் இயங்கி வரும் எம்.எஸ்.எம். மெனிங் நிறுவனத்தின் பங்குதாரர் திரு.மோகன் அவர்களுக்கு,

சென்னை - 45, மேற்கு தாம்பரம், அமல்நகர், எண்.18-ல் வசித்து வரும் திரு. V. சடையப்பன், காஞ்சிபுரம் மாவட்டம், ஸ்ரீபெரும்புதூர் வட்டம், எழுமையூர், மண்ணடியம்மன் கோயில் தெருவில் வசித்து வரும் திரு. M.மோகன், சென்னை-44, குரோம்பேட்டை, திருநீர்மலை, சிவராஜ் 1-வது குறுக்கு தெரு, எண். 51/11-ல் வசித்து வரும் R.முரளிதரன் ஆகிய நபர்கள் சம்மதித்து எழுதிக் கொடுக்கும் குத்தகை உடன்படிக்கை ஆவணம் என்னவென்றால்

F. R. 30/4/24
F. BERRY'S FORD JOSEPH, B.A., LL.B.
Advocate & Commissioner of Oaths
ROC No: 485/14/F?DI. 16.6.14.
No: 15.J/9-2, Damalwar Street,
Kanchipuram-631 502.
Cell: 9952276659.

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..2..

காஞ்சிபுரம் மாவட்டம், உத்திரமேரூர் வட்டம், சாலவாக்கம் சார்பதிவகம், பழவேரி கிராமத்தில் பட்டா எண். 544 மற்றும் 725-ல் தாக்கலாகி வரும் சர்வே எண்கள். 217/2, 217/5, 252/5A2A, 252/5A2B, 252/5A3A, 252/5B -ல் 2.69 சென்ட் நிலம் மற்றும் 217/3, 217/7, 252/5A2C, 252/4A, 252/4B - ல் ஏக்கர் 0.77 சென்ட் நிலத்தில் தாங்கள் கல் மற்றும் சாதாரண கற்கள் வெட்டியெடுக்க மற்றும் மண் குவாரி நடத்திக் கொள்ள ஒப்புதல் அளித்து, இன்று தேதியில் இருந்து 11 (பதினோறு) ஆண்டுகளுக்கு குத்தகை ஆண்டுக்கு ரூபாய். 90,000- எழுத்தால் ரூபாய் தொண்ணூறு ஆயிரம் மட்டும் கொடுத்துள்ளோம். இனி இதனடியிற்கண்ட சரத்துக்களின்படி நடக்க இரு பார்ட்டிகளும் சம்மதிக்கின்றார்.

1) இன்று தேதியில் இருந்து 11 வருடங்கள் மட்டுமே இந்த குத்தகை உடன்படிக்கையானது அமுல்படும். மேற்படி குத்தகை காலம் வரையில் 2-வது பார்ட்டி எவ்வித வாடகையும் இன்றி அனுபவித்துக் கொள்ள வேண்டியது.

2) இதனடியிற்கண்ட சொத்திற்கான மின் கட்டணத்தை 2-வது பார்ட்டி செலுத்தி வர வேண்டியது, சொத்து வரி போன்றவற்றினை 1-வது பார்ட்டி செலுத்தி வர வேண்டியது, இதில் 2-வது பார்ட்டிக்கு எந்தவித சம்மந்தமும் இல்லை.

3) இதில் கண்ட சொத்தினை 2-வது பார்ட்டி வேறு எவருக்கும் மேல் வாடகைக்கு விடக் கூடாது. இதற்கு 2-வது பார்ட்டி உடன்படுகிறார்.

1-வது பார்ட்டி

F. R. 30/4/24

F BERRYS FORD JOSEPH, BA., B.L.
 Advocate & Commissioner of Oaths
 ROC No: 485/14/F2Di. 16.6.14.
 No: 15.J/9-2, Damalwar Street,
 Kanchipuram-631 502.
 Cell- 9952226659.

[Handwritten signatures and notes]

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..3..

- 3) இதில் கண்ட சொத்தினை 2-வது பார்ட்டி வேறு எவருக்கும் மேல் வாடகைக்கு விடக் கூடாது. இதற்கு 2-வது பார்ட்டி உடன்படுகிறார்.
- 4) குத்தகைதாரர் தனது நிறுவனத்திற்கு தேவையான வசதிகள் அனைத்தையும் தன் பொறுப்பில் செய்து கொள்ள வேண்டியது.
- 5) கெடுவு காலம் முடிந்ததும் சொத்தினை ஒப்படைக்கும் பட்சத்தில் அட்வான்ஸ் தொகையை வட்டியின்றி திரும்ப செலுத்த வேண்டியது. இரு தரப்பினரும் விரும்பினால், இந்த குத்தகை உடன்படிக்கை ஆவணத்தினை நீட்டிப்பு செய்து கொள்ள வேண்டியது.
- 6) மற்ற அம்சங்கள் யாவும் சட்டப்படியும் கிரமப்படியும் அனுசரித்துக் கொள்ள வேண்டியது.

இப்படிக்கு

சாட்சிகள்

[Handwritten signatures and initials]

F. R. 2 30/9/25

F. BERRYS FORD JOSEPH, BA, BL.
 Advocate & Commissioner of Oaths
 ROC No: 485/14/F2Dt, 16.6.14.
 No: 15.1/9-2, Domalwar Street,
 Kanchipuram-631 502.
 Cell: 9952226689.



K. S. S.



**GOVERNMENT OF TAMIL NADU
REGISTRATION DEPARTMENT**

FORM C

See Rule 9 (a)

**ACKNOWLEDGEMENT OF REGISTRATION OF
FIRM**

The Registrar of firms, Chennai (South) hereby acknowledged the receipt of statement prescribed by section 58 (1) of the Indian Partnership Act-1932. The Statement has been filed and the name of the firm *MSM MINING* has been entered in the Register of Firm as No.1421 of 2017 in the office of the District Registrar of Firms, Chennai South.

District Registrar's Office
Chennai (South) Chennai-15

Dated 07th Day of AUGUST-2017



[Handwritten Signature]
Registrar of Firms
Chennai South

[Handwritten Signature]



தமிழ்நாடு தமில்நாடு TAMILNADU

MSM MINING
CHENNAI 44

21 APR 2022

AG 604526

V. Manohari

V.MANOHARI (S.V)
32, MUTHURANGAM RC
W.TAMBARAM, CHENNAI
No.16558 / C / 89 DT.4.1
Cell:90945 80808

RECONSTITUTED DEED OF PARTNERSHIP

This Deed Of Partnership Is Amended On This 21st April 2022 Executed At Chennai
Between:

Mr. V.SADAIYAPPAN Son of **Mr. VAITHY**, aged about 61 years residing at
No.18, Amal Nagar, West Tambaram, Chennai – 600 045, hereinafter called the party
of the First part "**continuing partner**"

Mr. M. MOHAN Son of **Mr. MADURA**, aged about 61 years residing at
No.1/79, Mannadiamman Koil Street, Erumaiyur, Chennai – 600 044 hereinafter called
the party of the Second part "**continuing partner**"

1. V. Sadaiyappan

3. M. Mohan

2. M. Mohan

4. P. M. M.

2

1. G. S. S.



Mr. M.Rohit Muralidharan Son of **Mr. Muralidharan**, aged about 20 years, (New Partner), residing at No.51/11, Sivaraj 1st Cross Sreet, Thiruneermalai, Chromepet – 600 044, hereinafter referred to as **"incoming partner"** of the Third Part respectively and,

Mr. R. MURALIDHARAN Son of **Mr. RAJA**, aged about 42 years, residing at No.51/11, Sivaraj 1st Cross Sreet, Thiruneermalai, Chromepet – 600 044, hereinafter referred to as the **"Retiring Partner"** of the Fourth Part

1. Whereas the parties hereto have agreed to carry on the business in **"Trading of Mining Crusher of Blue Metals and other related work"** in partnership under the name and style of **"MSM MINING"** at head quarters at **No.15/1, Gandhi Street, Thiruneermalai, Chromepet, Chennai – 600 044**, under the following terms and conditions:

NOW THIS DEED OF PARTNERSHIP WITNESSETH AS UNDER:

1. The name and style of firm shall be **"MSM MINING"** or such other names as may be mutually agreed upon by the parties hereto.
2. The place of business of the partnership firm shall be at **No.15/1, Gandhi Street, Thiruneermalai, Chromepet, Chennai – 600 044**, or such other place or places as may be mutually decided upon the parties hereto;
3. The business of partnership shall be mainly in **Trading of Mining Crusher of Blue Metals and other related work**, or such other business or businesses as the parties may be mutually agreed to do from time to time.
4. The partnership shall be commenced with effect from 14.07.2017 and is terminable AT WILL of the parties.
5. That the capital shall be the amount standing to Credit of the partners in the Individual Account. Loan Account Etc., as on 01.04.2021.
6. The partners are entitled to interest not more than 18% on Capital as to the credit balance standing as on 1st April of every year (Financial year) or such low rate prescribed by the Income-Tax Act, 1961 or any amendment thereof which may be in force in relevant financial year. However, it is mutually agreed that partners need not pay any interest on their overdrawn account if any. The partners shall pass necessary resolution in this regard from time to time for fixing and withdrawing the same.

1 *[Signature]*
2 *[Signature]*
3 *[Signature]*
4 *[Signature]*
5 *[Signature]*



7. All partners are actively engaged in the business and are being entitled to salary and remuneration as follows:

FIRST	Rs. 20,000/-
SECOND	Rs. 20,000/-
THIRD	Rs. 20,000/-

The above monthly remuneration shall be restricted to the specified limit u/s.40 (b) of the Income-tax Act, 1961 or any other provision in force for the relevant accounting period.

8. The partners can enhance, reduce or forgo the interest and remuneration according to conduct and profitability of the business from time to time by passing necessary resolution.

9. Profit or Loss shall be divided among the partners as follows:

First Part	-	33.3%
Second Part	-	33.3%
Third Part	-	33.3%

10. The partners may open necessary bank account or accounts with any bank or banks and the accounts shall be operated jointly by **Mr.Sadaiyappan**(First Part) and **Mr.Mohan**(Second Part).

11. Proper books of accounts shall be maintained and the same shall be closed on every 31st March or such other date as may be mutually agreed upon by the parties hereto;

12. Each partner shall devote his whole time and attention to the business of the partnership and shall on his best Endeavour's to promote the success of the partnership business.

13. Partnership will be AT:WILL. Death or retirement of a partner shall not dissolve the firm and will be carried on by the remaining partners with or without any other partners in the place of deceased or retiring partner.

14. In case of any of the partner's desires to retire from the firm, partner can do so after giving three month notice to the firm.

1 *[Handwritten signature]*

3 *[Handwritten signature]*

2 *[Handwritten signature]*

4 *[Handwritten signature]*

5 *[Handwritten signature]*



- 15. If any partners commits any breach of the terms of agreement then all other partners shall have liberty to send three month notice to the offending partner's forth wise to determine the partnership.
- 16. It is mutually agreed that no value of Good Will shall be placed at the time of dissolution or so.
- 17. In event of dispute between the partners or their legal representatives, upon conduct of business or regards terms of partnership or on reconstitution or dissolution, then such dispute will be referred to arbitrator, as agreed between partners and the decision will be binding on all the parties. In case of in absence of consensus between more than one arbitrator, the difference will be referred to an umpire as agreed between them and such a decision will be binding on all parties. In respect of matters not specified here in provision of Indian Arbitration Act will prevail.
- 18. The parties hereto can include or delete and of the conditions after passing necessary resolution in this regard.
- 19. In regard to other matters of the partnership the same shall be dealt with as provided in the Indian partnership Act, 1932 and its statutory modification thereof,

IN WITNESS WHERE OF THE PARTIES HERETO SET THEIR HANDS TO THIS ADVENTURE ON THIS DAY.

WITNESSES:

- 1. S. Jayaprakash
S. JAYAPRAKASH S/O
V. SADAIYAPPAN
NO: 18, AMALNAGAR,
WEST TAMBARAM
CH-45.
- 2.

[Signature]

PARTY OF THE FIRST PART

[Signature]

PARTY OF THE SECOND PART

[Signature]

PARTY OF THE THIRD PART

[Signature]

PARTY OF THE FOURTH PART

[Signature]



Government of India
Form GST REG-06
[See Rule 10(1)]

Registration Certificate

Registration Number :33ABGFM2280H1ZF

1.	Legal Name	MSM MINING			
2.	Trade Name, if any	MSM MINING			
3.	Constitution of Business	Partnership			
4.	Address of Principal Place of Business	NO.15/1, GANDHI STREET, THIRUNEERMALAI, CHROMEPET, CHENNNAI, Kancheepuram, Tamil Nadu, 600044			
5.	Date of Liability	01/12/2017			
6.	Date of Validity	From	09/01/2018	To	Not Applicable
7.	Type of Registration	Regular			
8.	Particulars of Approving Authority	Centre Goods and Services Tax Act, 2017			
Signature		Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK(4) Date: 2022.05.17 16:46:29 IST			
Name		SHIVKUMAR SHIVSANKAR			
Designation		Superintendent			
Jurisdictional Office		THIRUMUDIVAKKAM			
9.	Date of issue of Certificate	17/05/2022			
Note: The registration certificate is required to be prominently displayed at all places of Business/Office(s) in the State.					

This is a system generated digitally signed Registration Certificate issued based on the approval of application granted on 17/05/2022 by the jurisdictional authority.



Annexure A



सत्यमेव जयते

Details of Additional Place of Business(s)

GSTIN	33ABGFM2280H1ZF
Legal Name	MSM MINING
Trade Name, if any	MSM MINING

Total Number of Additional Places of Business(s) in the State 0

Handwritten signature



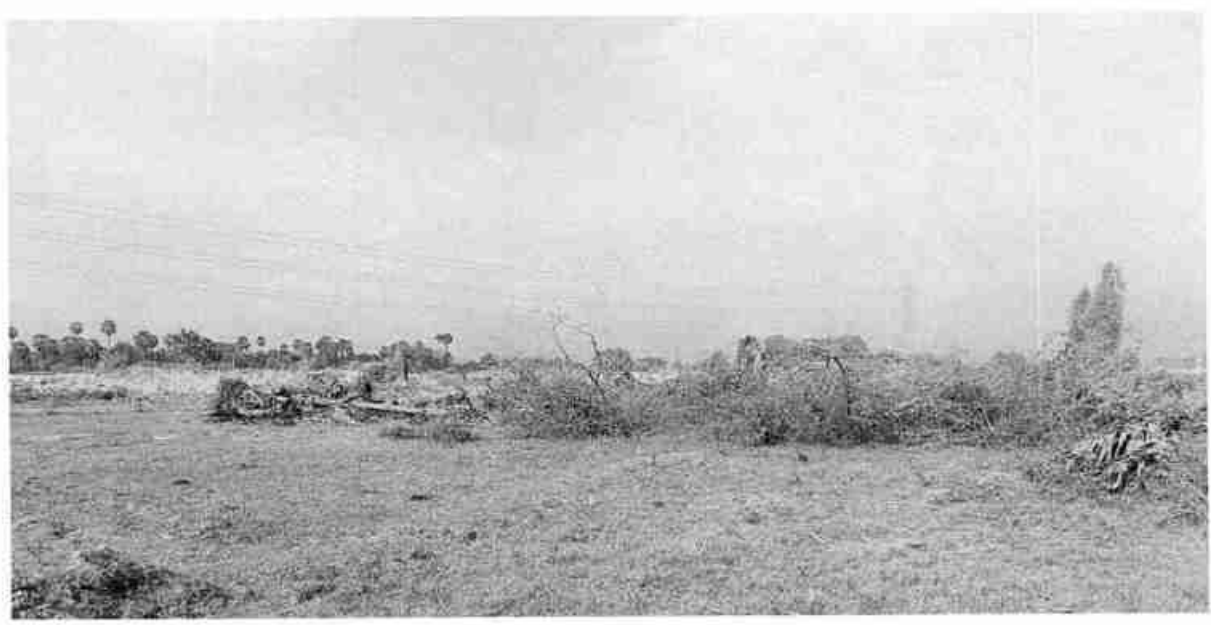
GSTIN 33ABGFM2280H1ZF
 Legal Name MSM MINING
 Trade Name, if any MSM MINING

Details of Managing / Authorized Partners

1		Name	VAITHY SADAIYAPPAN
		Designation/Status	PARTNER
		Resident of State	Tamil Nadu
2		Name	MADURAI MOHAN
		Designation/Status	PARTNER
		Resident of State	Tamil Nadu
3		Name	ROHIT MURALIDHARAN
		Designation/Status	Partner
		Resident of State	Tamil Nadu

PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of rough stone and Gravel quarry lease in S.F.No's. 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A over an extent of 2.78.5 hectares of Pazhaveri Village, Uthiramerur Taluk, Kancheepuram District, Tamil Nadu State belongs to Tvl. M.S.M. Mining.





आयकर विभाग
INCOME TAX DEPARTMENT

भारत सरकार
GOVT. OF INDIA

स्थायी लेखा संख्या कार्ड
Permanent Account Number Card

ABGFM2280H

नाम / Name
MSM MINING

निगमन / गठन की तारीख
Date of Incorporation / Formation
14/07/2017

06/08/2017

इस कार्ड को खोने / पाने पर कृपया सूचित करें। लौटकर:
आयकर पैन सेवा इकाई, एन एस डी एस
5 वीं मंजिल, मन्त्री स्टर्लिंग, प्लॉट नं. 341, सर्वे नं. 997/8,
मॉडल कॉलोनी, दीप बंगला चौक के पास,
पुणे - 411 016.

*If this card is lost / someone's lost card is found,
please inform / return to:*

Income Tax PAN Services Unit, NSDL
5th floor, Mantri Sterling,
Plot No. 341, Survey No. 997/8,
Model Colony, Near Deep Bungalow Circle,
Pune - 411 016.

Tel: 91-20-2721 8080, Fax: 91-20-2721 8081
e-mail: info@nsdl.co.in



Government of India



UIDAI



ம. மோகன்
M Mohan
பிறந்த நாள்/DOB: 14/02/1961
ஆண்/ MALE

3781 5869 8546
VID : 9165 0912 2471 0877

எனது ஆதார், எனது அடையாளம்

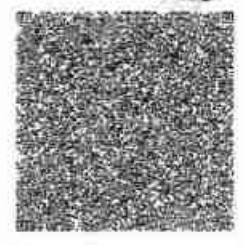


Unique Identification Authority of India

UIDAI

முகவர்:
என். / தாய் பெயர்: மதுரைமுத்து, 2/154,
மன்னடியம்மன் கோயில் தெரு, எரூமலூர்,
காஞ்சேபுரம்,
தமிழ் நாடு - 600044

Address:
S/O: Madhuraimuthu, 2/154,
MANNADIYAMMAN KOVIL STREET,
Erumalyur, Kancheepuram,
Tamil Nadu - 600044



3781 5869 8546
VID : 9165 0912 2471 0877

☎ 1047 | ✉ help@uidai.gov.in | 🌐 www.uidai.gov.in

Handwritten signature
261



இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

பதிவு அடையாளம் / Enrollment No.: 2007/13837/03501

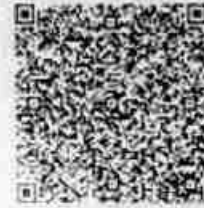
To
சடையப்பன் வைதி
Sadaiyappan Vaithy
S/O: Vaithy
18 AMAL NAGAR
WEST TAMBARAM
Tambaram
Tambaram
Tambaram Kancheepuram
Tamil Nadu 600045

14/04/2013

29442286



MN294422867FT



உங்கள் ஆதார் எண் Aadhaar No. :

9702 8144 8386

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

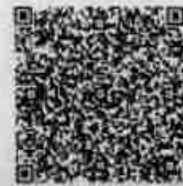


இந்திய அரசாங்கம்

Government of India



சடையப்பன் வைதி
Sadaiyappan Vaithy
தந்தை வைதி
Father: Vaithy
பிறந்தவருடம் / Year of Birth: 1961
ஆண்பால் / Male



9702 8144 8386

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

262
K. S. S. S.



Rupasingh

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. करुपण्णन, मॉगनीकाडू, मुत्तमपट्टी पोस्ट, बोम्मीडी वर्यो, ओमलूर तालुक, सेलम डीस्ट्रिक्ट, 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), Bommididi (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.

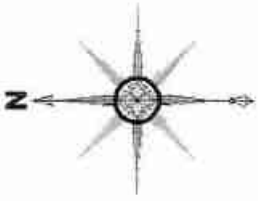
उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की स्थिति में यह प्रमाण पत्र वापस लिया जाएगा / निरस्त किया जाएगा।

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.

क्षेत्रीय खाननियंत्रक / Regional Controller of Mines
भारतीय खानब्यूरो/ Indian Bureau of Mines
चेन्नई क्षेत्र / Chennai Region

h. d. e. s. m.



TOWARDS
PALAYASEEVARAM

3.2Km

TOWARDS
THIRUMUKKUDAL

1.4Km

1.2Km

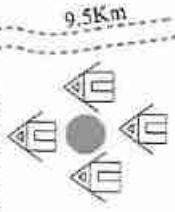
0.6Km

2.8Km

TOWARDS
ARUMBULTIYUR

APPLIED
LEASE AREA

SIRUMAILUR



9.5K
1.5K
1.5K
1.5K
1.5K

TOWARDS
SALAVAKKAM

264
[Signature]

PLATE No-1

APPLICANT:

M/s.M.S.M.MINING,
No. 15/1, GANDHI STREET,
THRUNEERMALAI ROAD,
CHROMEPEET,
CHENNAI - 600 044

LEASE APPLIED AREA:

S.F.No : 2172, 2173, 2175, 2177,
224/1A1, 252/4A1, 252/4B1,
252/5A2A, 252/5A2B, 252/5A2C,
252/5A3A, 252/5A4A, 252/5A4B,
252/5A4C, 252/5B, 252/11A,
252/11B, 252/11C, 252/11D, 252/11E,
252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect

VILLAGE : PAZHAVERI

TALUK : UTHIRAMERUR

DISTRICT : KANCHEEPURAM

INDEX

MINE LEASE AREA



APPROACH ROAD



VILLAGE ROAD



CART 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

[Signature]
Dr.S.KARUPPANNALM, B.E., Ph.D.
RECOGNIZED QUALIFIED PERSON
ROP / MAS / 253 / 2014 / A



12°44'44.94"N

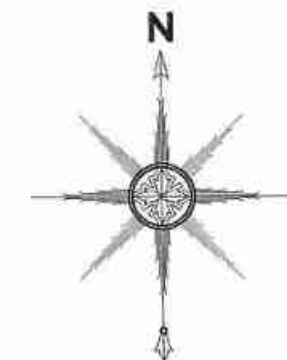


PLATE No-IA

APPLICANT:
M/s.M.S.M.MINING,
No. 15/1, GANDHI STREET,
THIRUNEERMALAI ROAD,
CHROMEPET,
CHENNAI - 600 044

LEASE APPLIED AREA:
S.F.No : 217/2, 217/3, 217/5, 217/7,
224/1A1, 252/4A1, 252/4B1,
252/5A2A, 252/5A2B, 252/5A2C,
252/5A3A, 252/5A4A, 252/5A4B,
252/5A4C, 252/5B, 252/11A,
252/11B, 252/11C, 252/11D, 252/11E,
252/11F, 252/11G, 252/11H & 252/12A
EXTENT : 2.78.5Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHEEPURAM

INDEX

MINE LEASE AREA: ●
TOPO SHEET NO : 57-P/14
LATITUDE : 12°44'32.49"N to 12°44'44.94"N
LONGITUDE : 79°52'24.68"E to 79°52'29.65"E

LOCATION PLAN
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

79°52'24.68"E

12°44'44.94"N

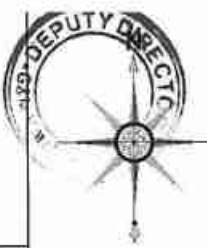


PLATE No-IC

APPLICANT:

M/s.M.S.M.MINING,
No. 15/1, GANDHI STREET,
THIRUNEERMALAI ROAD,
CHROMEPET,
CHENNAI - 600 044

LEASE APPLIED AREA:

S.F.No : 217/2, 217/3, 217/5, 217/7,
224/1A1, 252/4A1, 252/4B1,
252/5A2A, 252/5A2B, 252/5A2C,
252/5A3A, 252/5A4A, 252/5A4B,
252/5A4C, 252/5B, 252/11A,
252/11B, 252/11C, 252/11D, 252/11E,
252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHEEPURAM

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING QUARRY'S PIT	

TOPO SHEET NO : 57-P/14

LATITUDE : 12°44'32.49"N to 12°44'44.94"N

LONGITUDE : 79°52'24.68"E to 79°52'29.65"E

SATELLITE IMAGERY MAP

SCALE- 1:5000

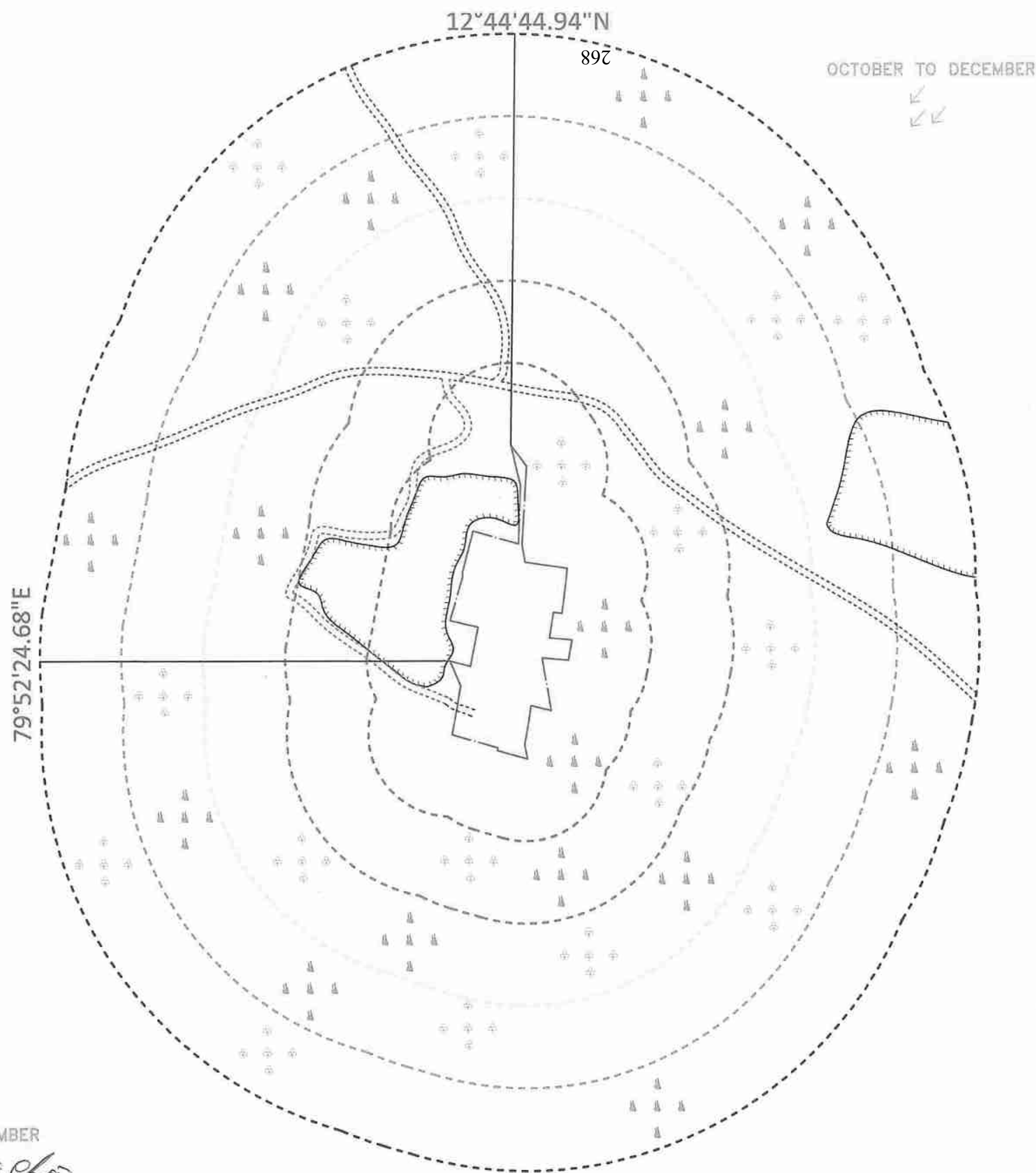
Prepared By:

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



Handwritten signature/initials at the bottom left of the map.



OCTOBER TO DECEMBER



JULY TO SEPTEMBER

Handwritten signature and initials.

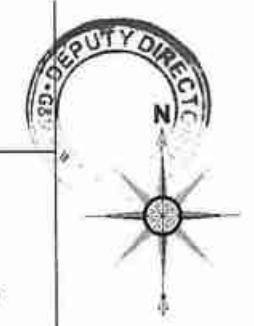


PLATE No-ID

APPLICANT:
M/s.M.S.M.MINING,
 No. 15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMEPET,
 CHENNAI - 600 044

LEASE APPLIED AREA:

S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A,
 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
 VILLAGE : PAZHAVERI
 TALUK : UTHIRAMERUR
 DISTRICT : KANCHEEPURAM

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING QUARRY'S PIT	
SHRUBS AND TREES	

TOPO SHEET NO : 57-P/14
 LATITUDE : 12°44'32.49"N to 12°44'44.94"N
 LONGITUDE : 79°52'24.68"E to 79°52'29.65"E

ENVIRONMENTAL PLAN

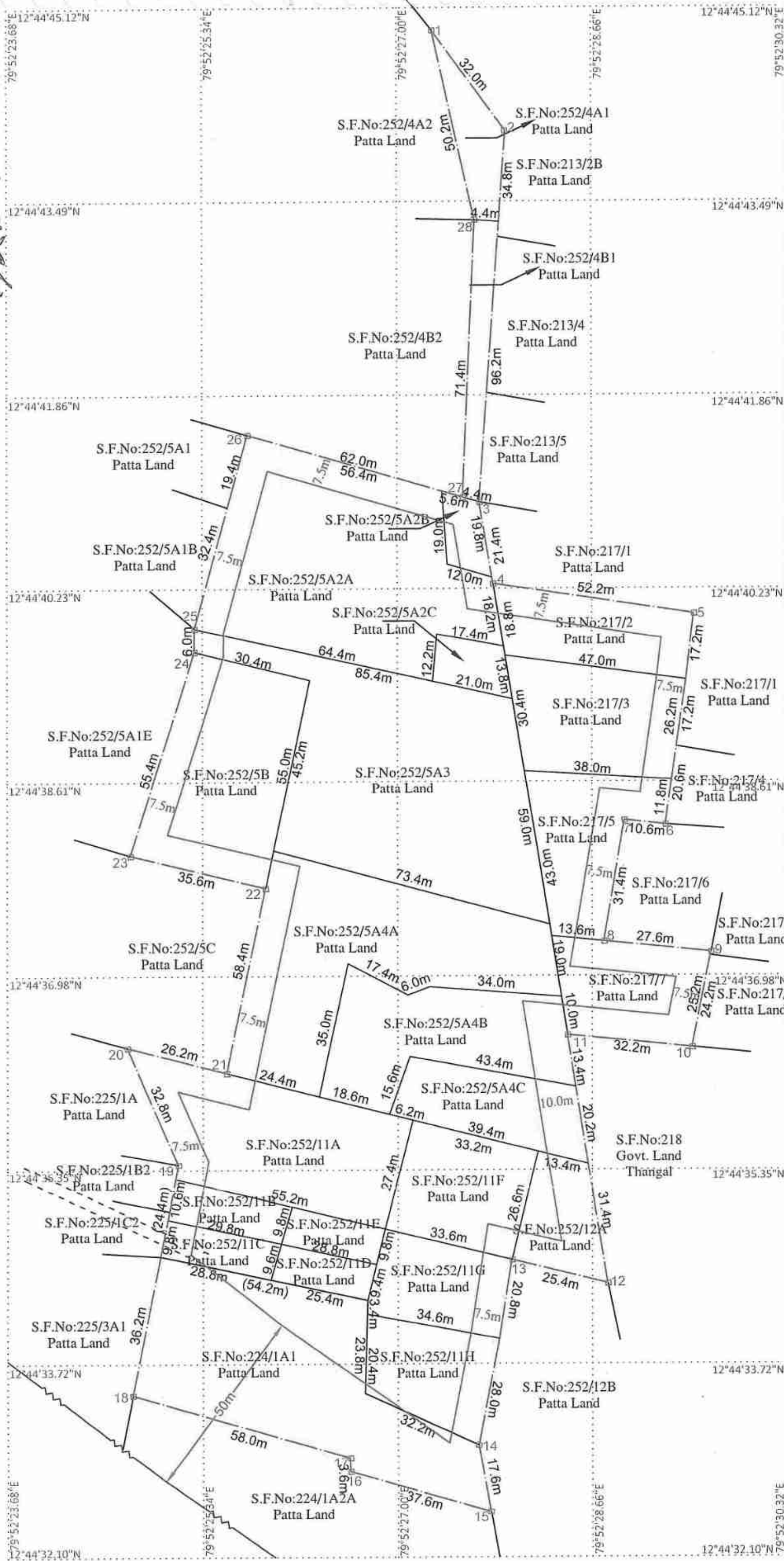
SCALE- 1:5000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE
 HAS BEEN CHECKED BY ME AND IS CORRECT
 TO THE BEST OF MY KNOWLEDGE

Handwritten signature of Dr. S. Karuppannan.

Dr.S.KARUPPANNAN, M.Sc., Ph.D.
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A



PILLAR ID	LATITUDE	LONGITUDE
1	12°44'44.94"N	79°52'27.25"E
2	12°44'44.10"N	79°52'27.87"E
3	12°44'40.98"N	79°52'27.66"E
4	12°44'40.29"N	79°52'27.78"E
5	12°44'40.05"N	79°52'29.49"E
6	12°44'38.26"N	79°52'29.26"E
7	12°44'38.30"N	79°52'28.91"E
8	12°44'37.29"N	79°52'28.74"E
9	12°44'37.20"N	79°52'29.65"E
10	12°44'36.40"N	79°52'29.49"E
11	12°44'36.50"N	79°52'28.43"E
12	12°44'34.41"N	79°52'28.78"E
13	12°44'34.61"N	79°52'27.96"E
14	12°44'33.06"N	79°52'27.69"E
15	12°44'32.49"N	79°52'27.79"E
16	12°44'32.83"N	79°52'26.59"E
17	12°44'32.95"N	79°52'26.59"E
18	12°44'33.47"N	79°52'24.74"E
19	12°44'35.40"N	79°52'25.12"E
20	12°44'36.38"N	79°52'24.68"E
21	12°44'36.18"N	79°52'25.53"E
22	12°44'37.72"N	79°52'25.85"E
23	12°44'37.99"N	79°52'24.70"E
24	12°44'39.71"N	79°52'25.24"E
25	12°44'39.91"N	79°52'25.24"E
26	12°44'41.53"N	79°52'25.72"E
27	12°44'41.02"N	79°52'27.52"E
28	12°44'43.35"N	79°52'27.61"E

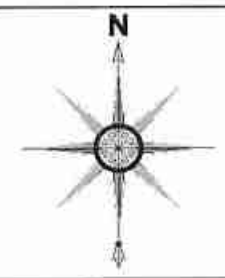


PLATE No-II

APPLICANT:
 M/s.MSM MINING,
 No.15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMPET,
 CHENNAI - 600 044.

LEASE APPLIED AREA:
 S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A,
 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHEEPURAM

INDEX

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONES
- EB LINE

MINE LEASE PLAN
 SCALE: 1:1000

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

Handwritten signature/initials

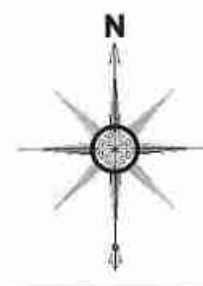
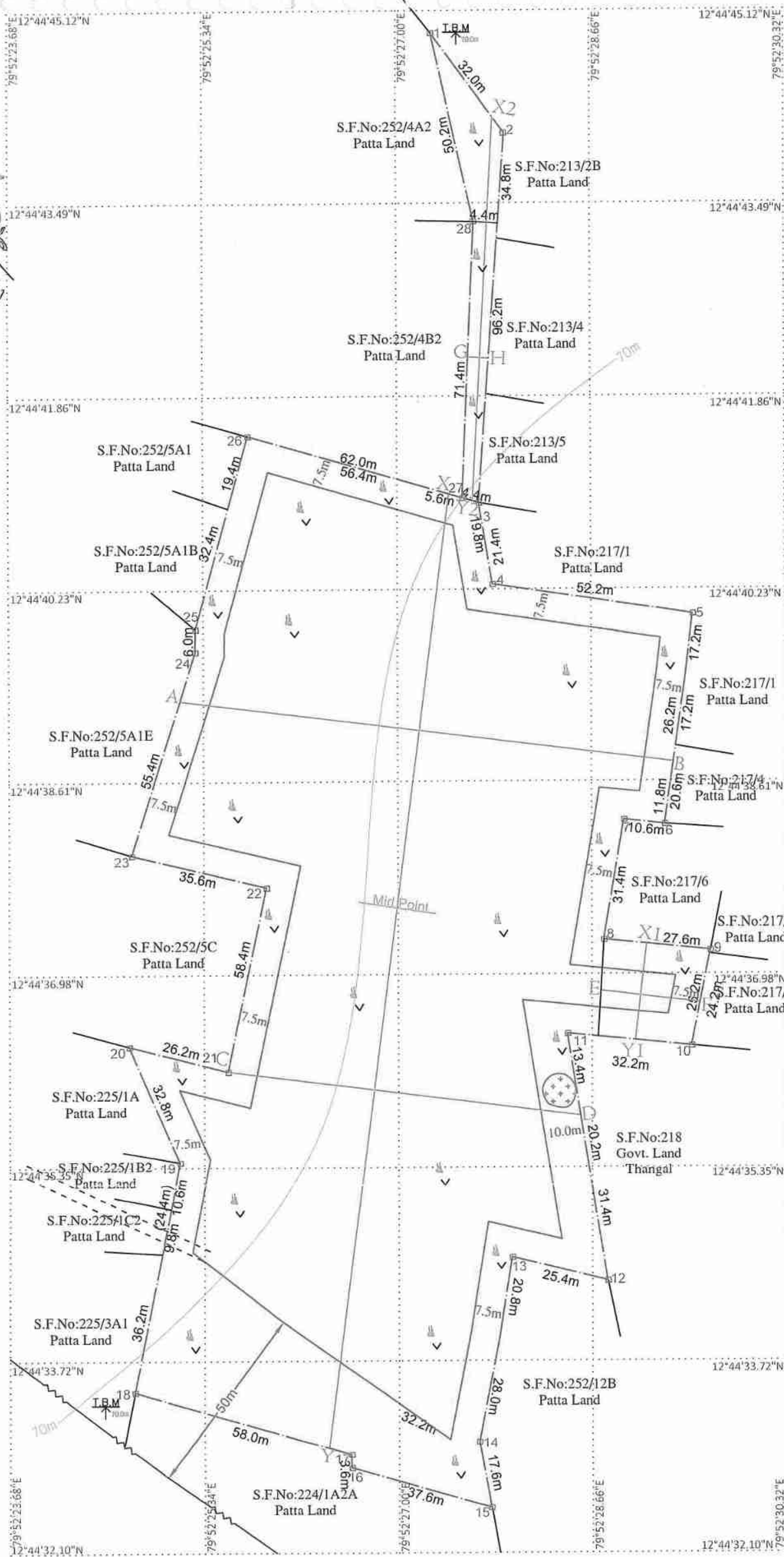


PLATE No-III

APPLICANT:
 M/s.MSM MINING,
 No.15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMEPET,
 CHENNAI - 600 044.

270

LEASE APPLIED AREA:

S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A,
 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHEEPURAM

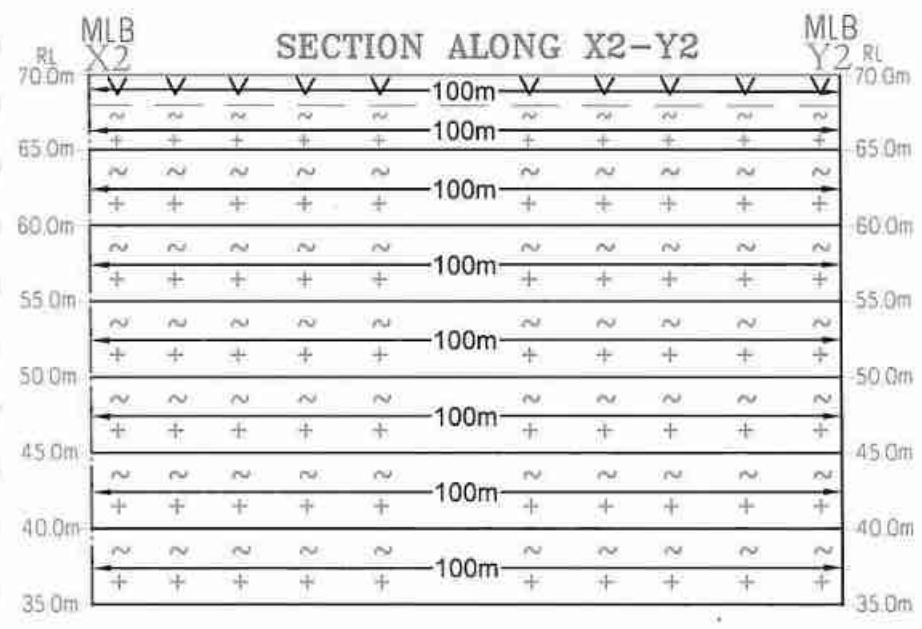
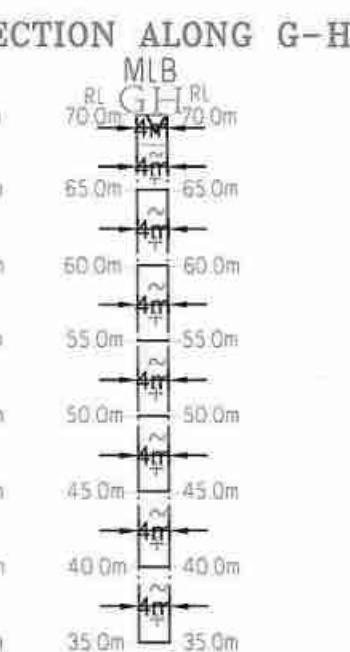
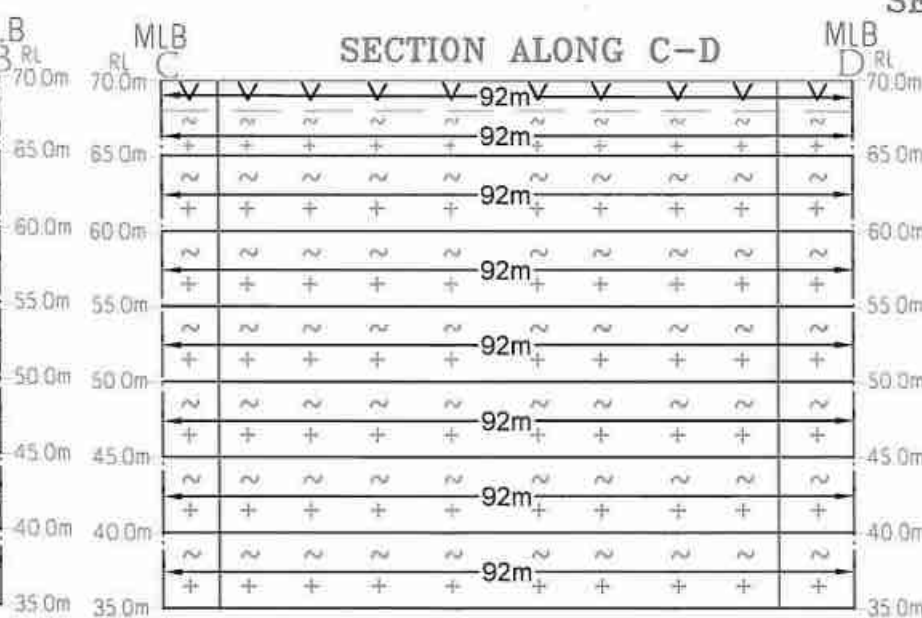
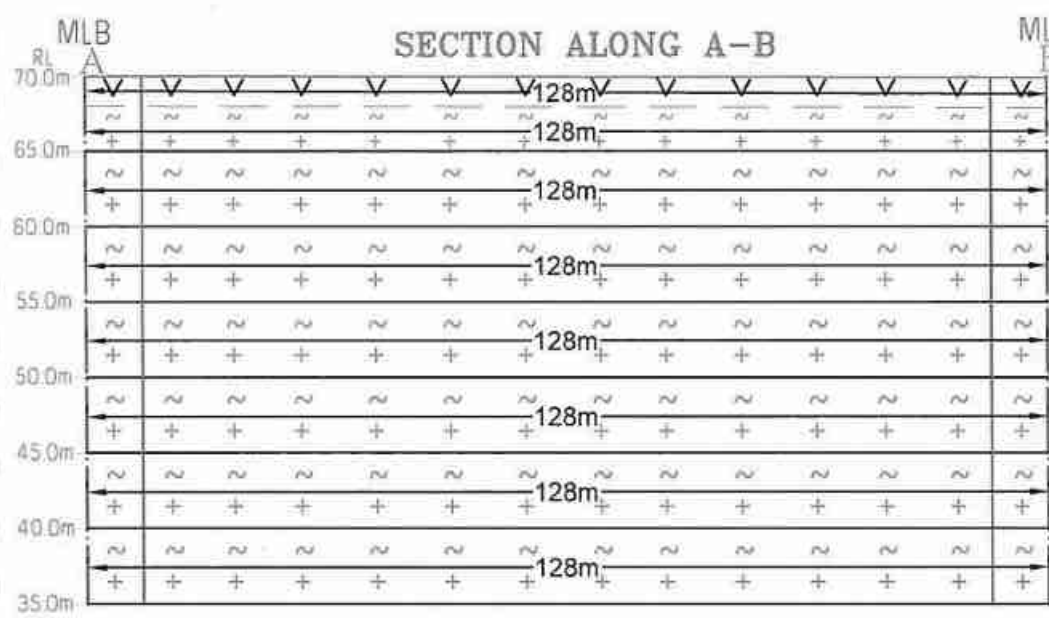
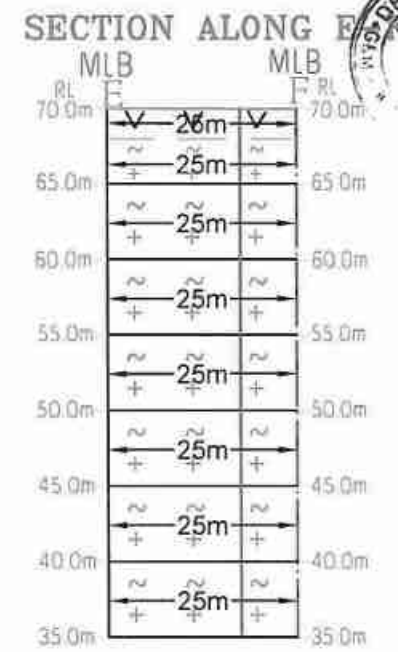
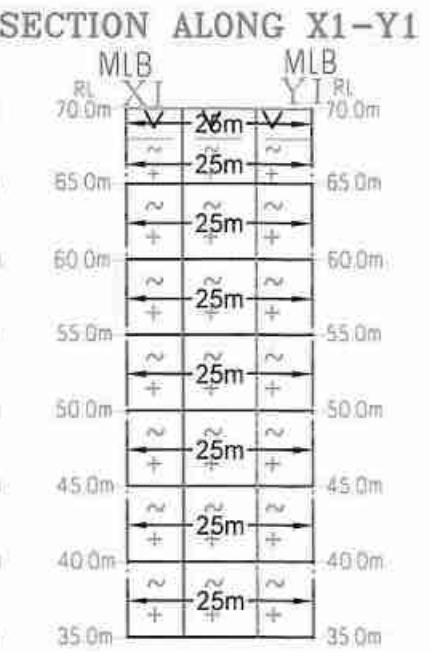
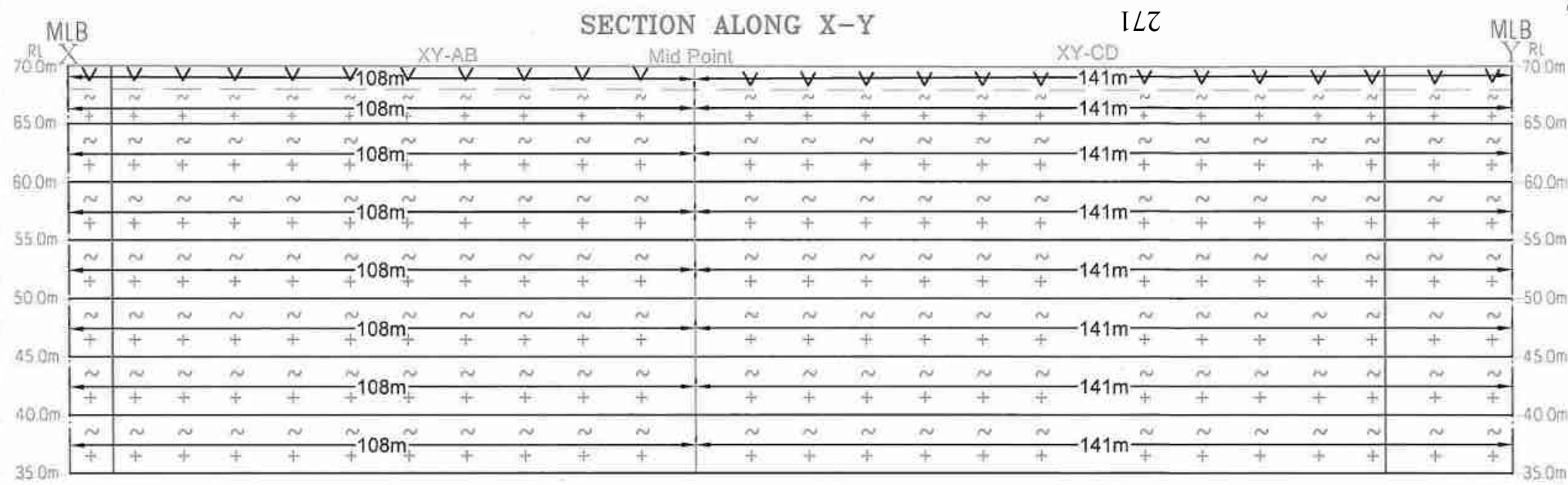
INDEX

MINE LEASE AREA	
SAFETY AREA	
APPROACH ROAD	
BOUNDARY PILLAR STONES	
EB LINE	
GRAVEL	
SHRUBS	
TEMPORARY BENCH MARKS	
CONTOUR LINES	
OUT CROP	

SURFACE & GEOLOGICAL PLAN
 SCALE- 1:1000

Prepared By:
 I DO HEREBY CERTIFY THAT THE PLAN
 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



GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m ³	Rough Stone in m ³	Gravel in m ³
XY-AB	I	108	128	2	27648	.....	27648
	I	108	128	3	41472	41472	.....
	II	108	128	5	69120	69120	.....
	III	108	128	5	69120	69120	.....
	IV	108	128	5	69120	69120	.....
	V	108	128	5	69120	69120	.....
	VI	108	128	5	69120	69120	.....
TOTAL					483840	456192	27648
XY-CD	I	141	92	2	25944	.....	25944
	I	141	92	3	38916	38916	.....
	II	141	92	5	64860	64860	.....
	III	141	92	5	64860	64860	.....
	IV	141	92	5	64860	64860	.....
	V	141	92	5	64860	64860	.....
	VI	141	92	5	64860	64860	.....
TOTAL					454020	428076	25944
X1Y1-EF	I	25	25	2	1250	.....	1250
	I	25	25	3	1875	1875	.....
	II	25	25	5	3125	3125	.....
	III	25	25	5	3125	3125	.....
	IV	25	25	5	3125	3125	.....
	V	25	25	5	3125	3125	.....
	VI	25	25	5	3125	3125	.....
TOTAL					21875	20625	1250
X2Y2-GH	I	100	4	2	800	.....	800
	I	100	4	3	1200	1200	.....
	II	100	4	5	2000	2000	.....
	III	100	4	5	2000	2000	.....
	IV	100	4	5	2000	2000	.....
	V	100	4	5	2000	2000	.....
	VI	100	4	5	2000	2000	.....
TOTAL					14000	13200	800
GRAND TOTAL					973735	918093	55642

PLATE No-III A

APPLICANT:
M/s.MSM MINING,
 No.15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMEPET,
 CHENNAI - 600 044.

LEASE APPLIED AREA:
 S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A,
 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHEEPURAM

INDEX

MINE LEASE AREA

SAFETY AREA


ROUGH STONE

GRAVEL

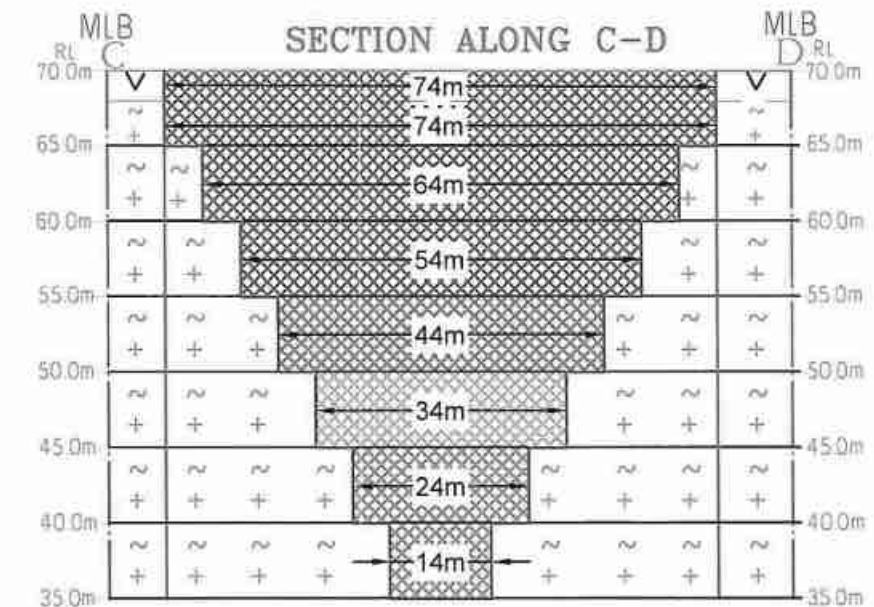
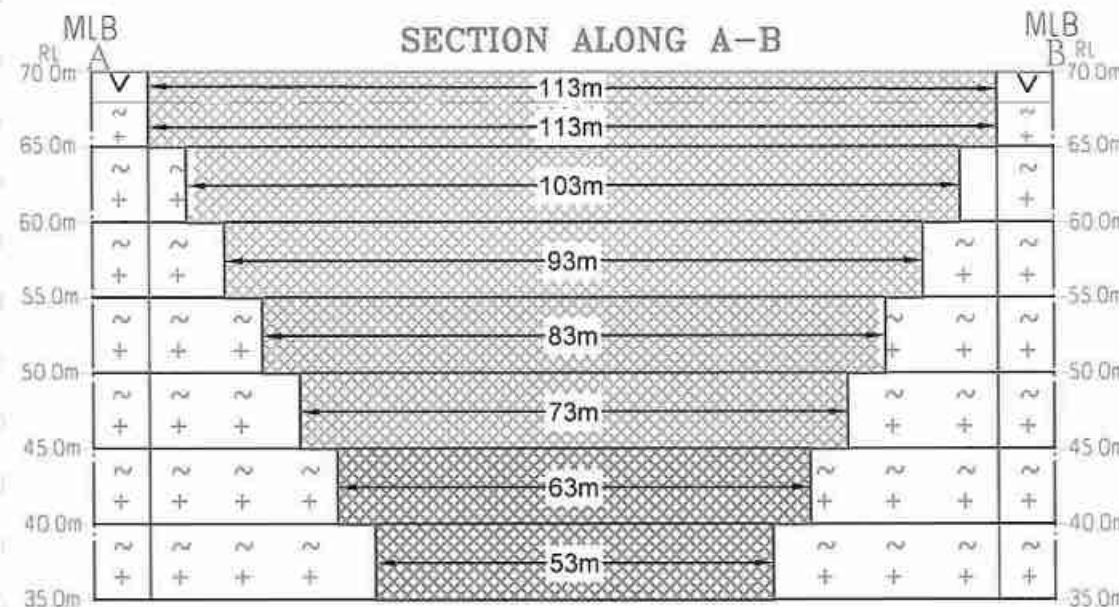
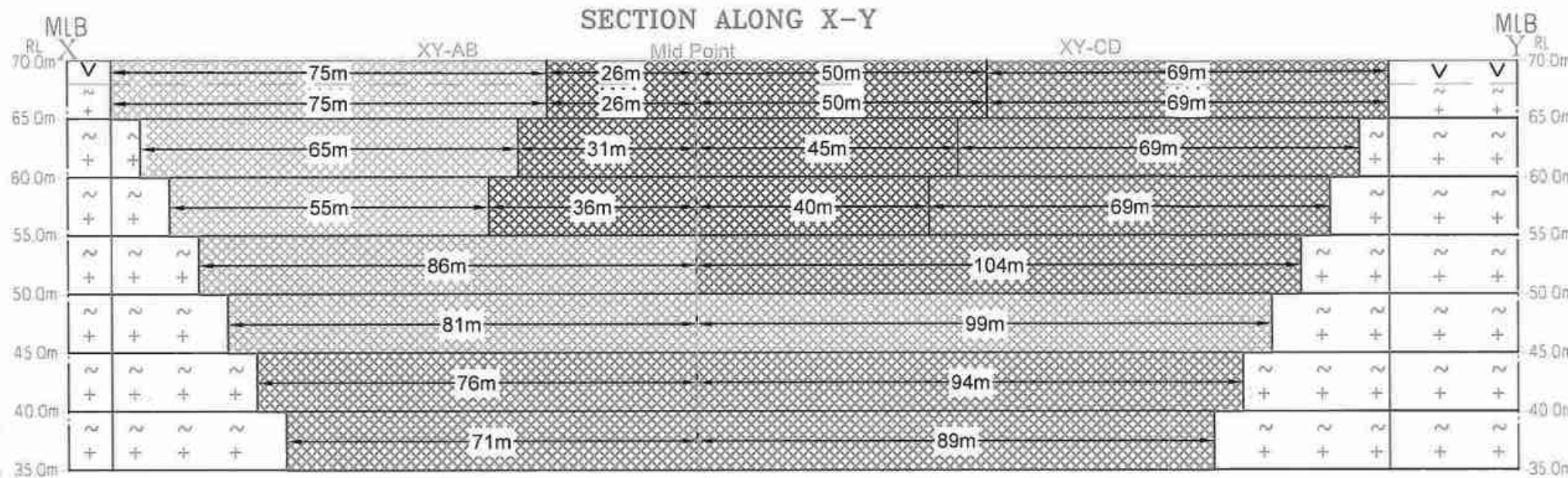
GEOLOGICAL SECTIONS
 SECTION HOR 1 : 1000 & VER 1 : 500

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

K. S. Chari



YEARWISE PRODUCTIONS										
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m ³	Rough Stone in m ³	Gravel in m ³		
XY-AB	I	I	75	113	2	16950	.....	16950	
		I	75	113	3	25425	25425	.....	
		II	65	103	5	33475	33475	.....	
		III	55	93	5	25575	25575	.....	
TOTAL						101425	84475	16950		
XY-AB	II	I	26	113	2	5876	.....	5876	
		I	26	113	3	8814	8814	.....	
		II	31	103	5	15965	15965	.....	
		III	36	93	5	16740	16740	.....	
XY-CD	II	I	50	74	2	7400	.....	7400	
		I	50	74	3	11100	11100	.....	
		II	45	64	5	14400	14400	.....	
XY-CD	II	III	40	54	5	10800	10800	.....	
		TOTAL						91095	77819	13276
		XY-CD	III	I	69	74	2	10212	10212
I	69			74	3	15318	15318	.....	
II	69			64	5	22080	22080	.....	
III	69			54	5	18630	18630	.....	
XY-CD	III	IV	104	44	5	22880	22880	.....	
		TOTAL						89120	78908	10212
		XY-AB	IV	IV	86	83	5	35690	35690
				V	81	73	5	29565	29565
XY-CD	IV	V	99	34	5	16830	16830	.....	
TOTAL						82085	82085	0		
XY-CD	V	VI	94	24	5	11280	11280	.....	
		VI	76	63	5	23940	23940	.....	
		VII	71	53	5	18815	18815	.....	
XY-CD	V	VII	89	14	5	6230	6230	.....	
TOTAL						60265	60265	0		
GRAND TOTAL						423990	383552	40438		

- 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

Handwritten signature/initials

PLATE No-IVA

APPLICANT:
M/s.MSM MINING,
 No.15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMEPET,
 CHENNAI - 600 044.

LEASE APPLIED AREA:
 S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A,
 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
 VILLAGE : PAZHAVERI
 TALUK : UTHIRAMERUR
 DISTRICT : KANCHEEPURAM

INDEX

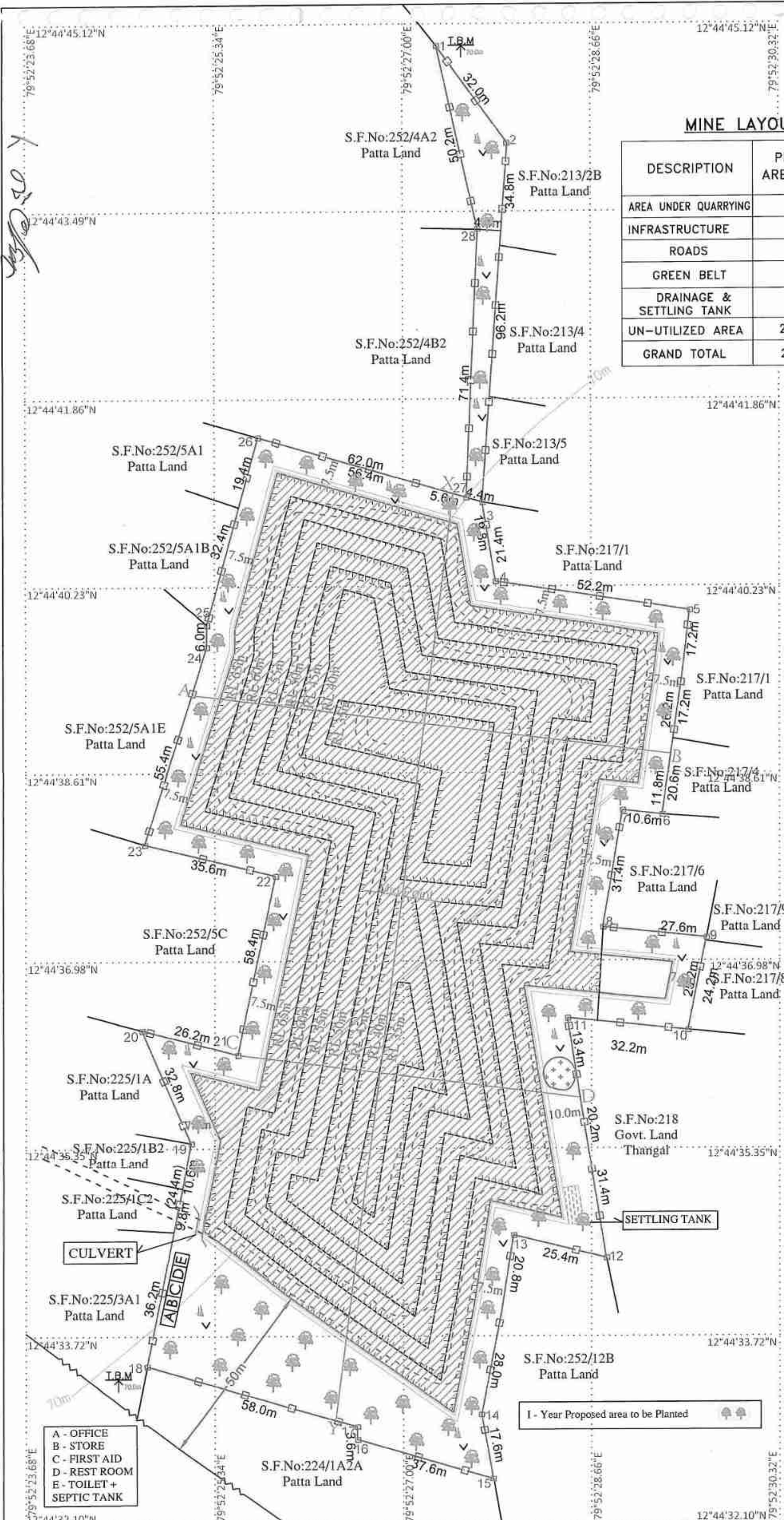
MINE LEASE AREA	
SAFETY AREA	
ROUGH STONE	
GRAVEL	
PROPOSED BENCH	

YEARWISE DEVELOPMENT & PRODUCTION SECTIONS
 SECTION HOR 1 : 1000 & VER 1 : 500

Prepared By:

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Dr.S.KARUPPANNAN, M.Sc., Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A



MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	1.86.00	
INFRASTRUCTURE	NIL	0.02.00	
ROADS	NIL	0.07.00	
GREEN BELT	NIL	0.75.00	
DRAINAGE & SETTLING TANK	NIL	0.08.50	
UN-UTILIZED AREA	2.78.50	NIL	NIL
GRAND TOTAL	2.78.50	2.78.50	NIL

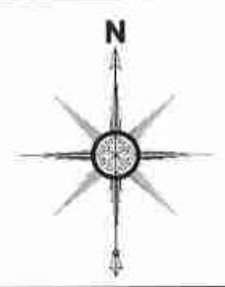


PLATE No-V

APPLICANT:
M/s.MSM MINING,
 No.15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMEPET,
 CHENNAI - 600 044.

LEASE APPLIED AREA:
 S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A,
 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
VILLAGE : PAZHAVERI
TALUK : UTHIRAMERUR
DISTRICT : KANCHEEPURAM

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MINE LEASE AREA	
SAFETY AREA	
APPROACH + HAUL ROAD	
BOUNDARY PILLAR STONES	
EB LINE	
GRAVEL	
SHRUBS	
TEMPORARY BENCH MARKS	
CONTOUR LINES	
OUT CROP	
PROPOSED BENCH	
FENCING	
DRAINAGE&SETTLING TANK	

**MINE LAYOUT PLAN AND
 LAND USE PATTERN**
 SCALE 1 : 1000

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

30

24

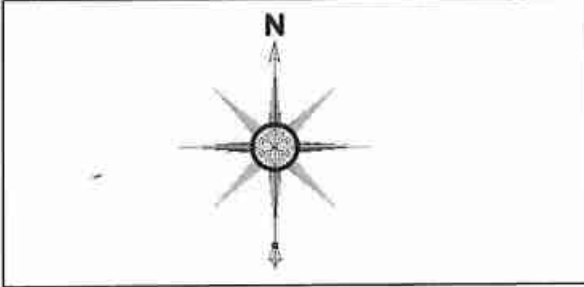
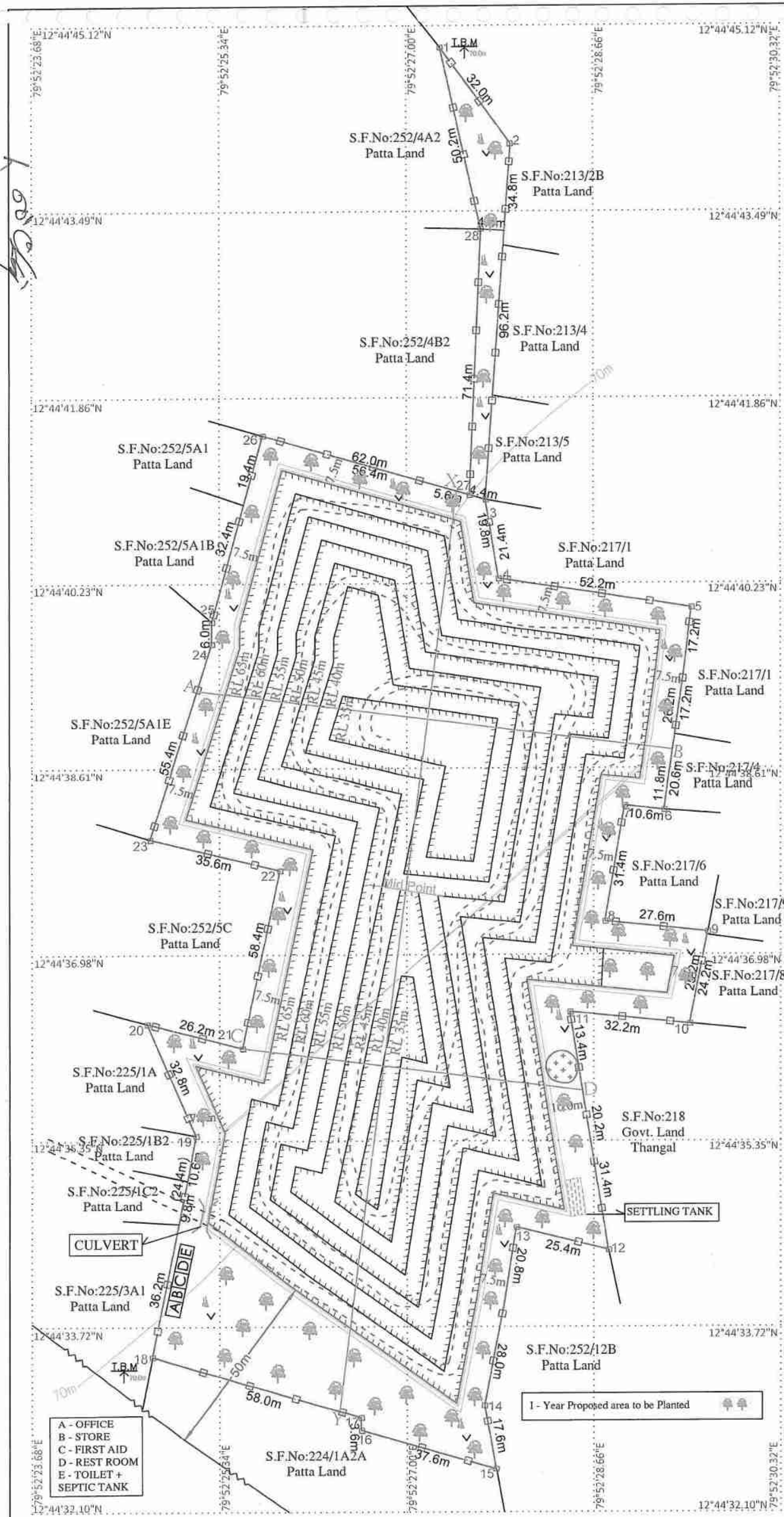


PLATE No-VI

APPLICANT:
 M/s.MSM MINING,
 No.15/1, GANDHI STREET,
 THIRUNEERMALAI ROAD,
 CHROMEPET,
 CHENNAI - 600 044.

LEASE APPLIED AREA:
 S.F.No : 217/2, 217/3, 217/5, 217/7,
 224/1A1, 252/4A1, 252/4B1,
 252/5A2A, 252/5A2B, 252/5A2C,
 252/5A3A, 252/5A4A, 252/5A4B,
 252/5A4C, 252/5B, 252/11A, 252/11B,
 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H & 252/12A

EXTENT : 2.78.5Hect
 VILLAGE : PAZHAVERI
 TALUK : UTHIRAMERUR
 DISTRICT : KANCHEEPURAM

INDEX

MINE LEASE AREA	
SAFETY AREA	
APPROACH + HAUL ROAD	
BOUNDARY PILLAR STONES	
EB LINE	
GRAVEL	
SHRUBS	
TEMPORARY BENCH MARKS	
CONTOUR LINES	
OUT CROP	
ULTIMATE BENCH	
FENCING	
DRAINAGE & SETTLING TANK	

CONCEPTUAL PLAN
 SCALE 1 : 1000

Prepared By:

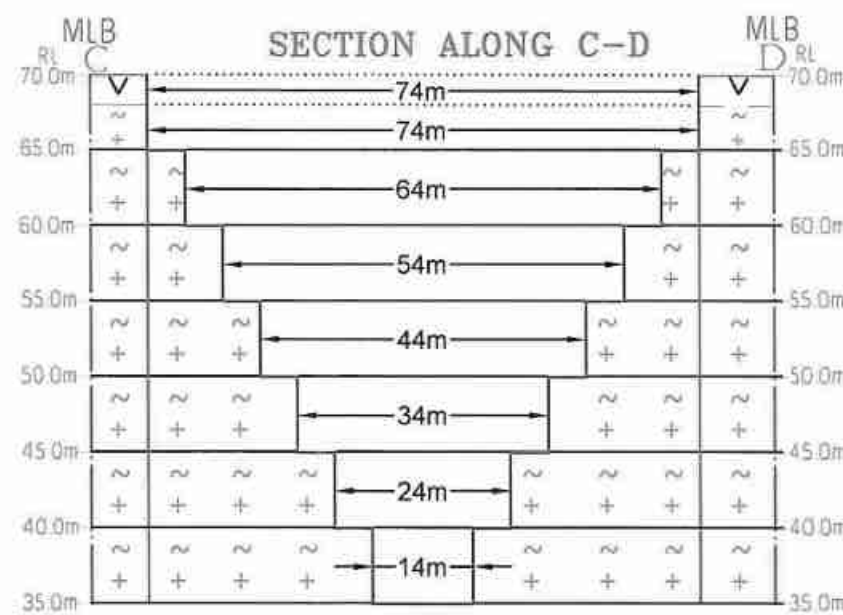
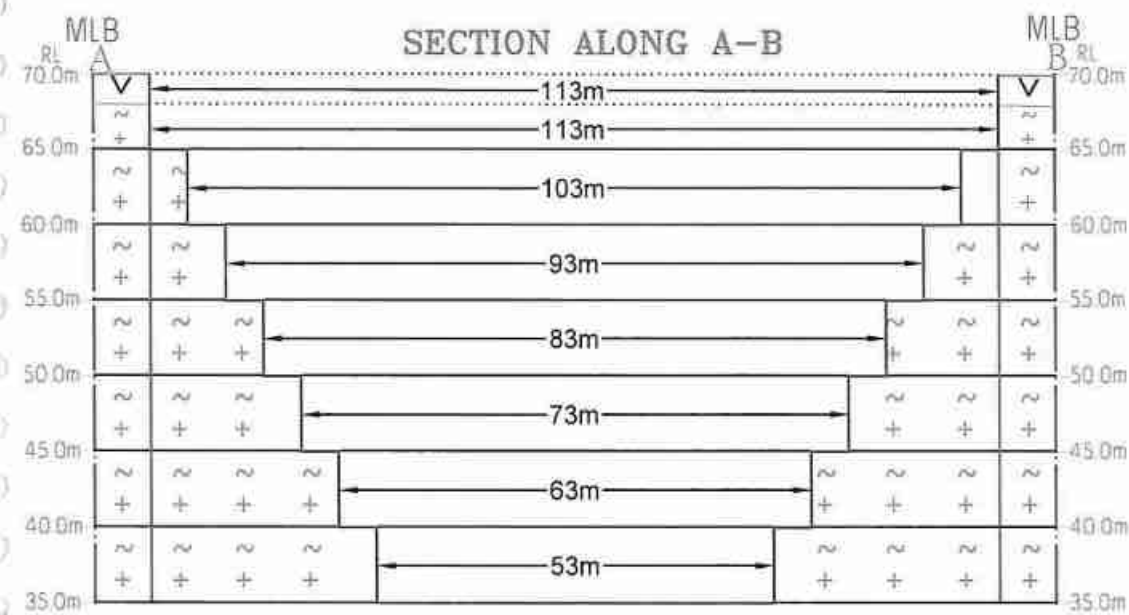
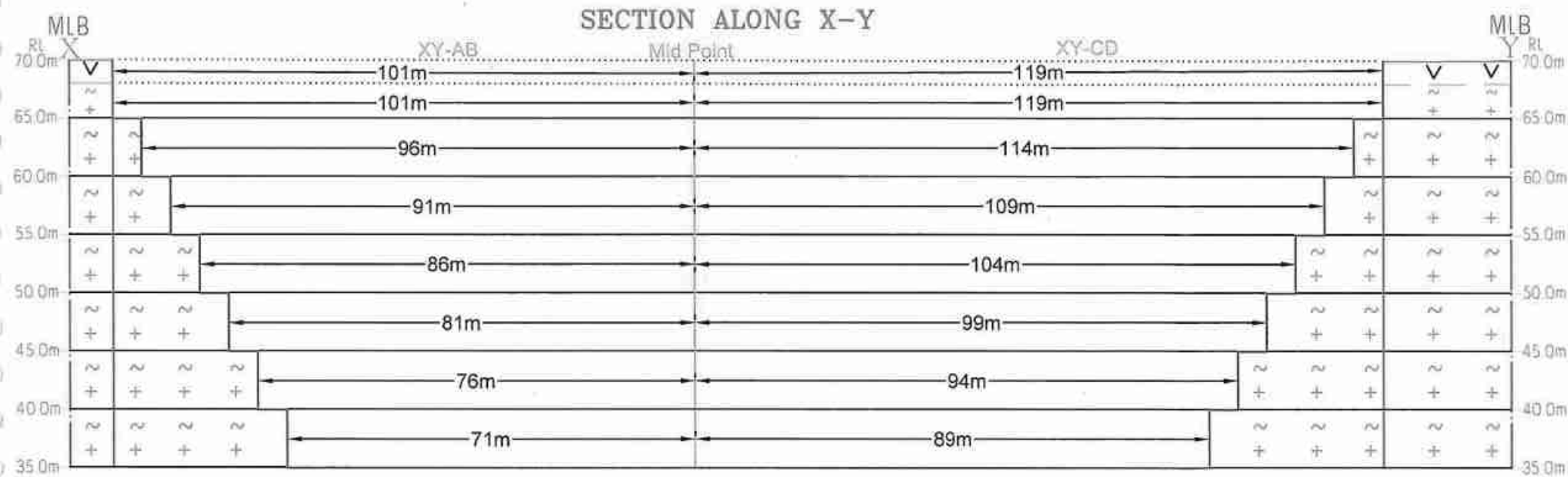
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Dr.S.KARUPPANNAN, M.Sc., Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A

100/24

- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET + SEPTIC TANK

I - Year Proposed area to be Planted



MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m ³	Rough Stone in m ³	Gravel in m ³
XY-AB	I	101	113	2	22826	.....	22826
	I	101	113	3	34239	34239	.....
	II	96	103	5	49440	49440	.....
	III	91	93	5	42315	42315	.....
	IV	86	83	5	35690	35690	.....
	V	81	73	5	29565	29565	.....
	VI	76	63	5	23940	23940	.....
	VII	71	53	5	18815	18815	.....
TOTAL					256830	234004	22826
XY-CD	I	119	74	2	17612	.....	17612
	I	119	74	3	26418	26418	.....
	II	114	64	5	36480	36480	.....
	III	109	54	5	29430	29430	.....
	IV	104	44	5	22880	22880	.....
	V	99	34	5	16830	16830	.....
	VI	94	24	5	11280	11280	.....
	VII	89	14	5	6230	6230	.....
TOTAL					167160	149548	17612
GRAND TOTAL					423990	383552	40438

R. O. Chinn

<p>PLATE No-VIA</p>	<p>LEASE APPLIED AREA: S.F.No : 217/2, 217/3, 217/5, 217/7, 224/1A1, 252/4A1, 252/4B1, 252/5A2A, 252/5A2B, 252/5A2C, 252/5A3A, 252/5A4A, 252/5A4B, 252/5A4C, 252/5B, 252/11A, 252/11B, 252/11C, 252/11D, 252/11E, 252/11F, 252/11G, 252/11H & 252/12A</p>	<p>INDEX</p> <p>MINE LEASE AREA <input type="checkbox"/></p> <p>SAFETY AREA <input type="checkbox"/></p> <p>ROUGH STONE <input type="checkbox"/></p> <p>GRAVEL <input type="checkbox"/></p> <p>ULTIMATE BENCH <input type="checkbox"/></p>	<p>CONCEPTUAL SECTIONS SECTION HOR 1 : 1000 & VER 1 : 500</p> <p>Prepared By:</p> <p>I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</p> <p><i>[Signature]</i></p> <p>Dr.S.KARUPPANNAN, M.Sc., Ph.D., RECOGNIZED QUALIFIED PERSON RQP/MAS/263/2014/A</p>
	<p>APPLICANT: M/s.MSM MINING, No.15/1, GANDHI STREET, THIRUNEERMALAI ROAD, CHROMEPET, CHENNAI - 600 044.</p>			EXTENT : 2.78.5Hect VILLAGE : PAZHVERI TALUK : UTHIRAMERUR DISTRICT : KANCHEEPURAM

சீர்தரம் :

கீழ்க்கண்ட லாபக்கடம் சீர்தரங்களை உடல்
 படிவம் கிராமத்தின் 4ஆம் சிங்கை ரீதி 224/1A1,
 252/11A, 252/11B, 252/11C, 252/11D, 252/11E,
 252/11F, 252/11G, 252/11H, 252/12A,
 252/5A4A, 252/5A4B and 252/5A4C, 217/2,
 217/3, 217/5, 217/7, 252/4A1, 252/4B1, 252/5A2A,
 252/5A2B, 252/5A2C, 252/5A3A, 252/5B

சீர்தரங்களை ஒன்றிச் சேர்த்து 2.78-50 ஒன்றாகச் சேர்த்து,
 மேற்படி சீர்தரங்களை சீர்தரம் கீழ்க்கண்ட
 கிராமம் ஒப்ப சர்க்கார் MSM Mining பங்குதாரர்
 சா. ம. சேகரன் சி. பி. சீர்தரம் சீர்தரங்களை சீர்தரம்
 சீர்தரம் சீர்தரம் சீர்தரம் 300 சீர்தரம் சீர்தரம்
 கிராமத்தின் சீர்தரங்களை சீர்தரம் சீர்தரம் சீர்தரம்
 சீர்தரங்களை சீர்தரம் சீர்தரம் சீர்தரம் சீர்தரம்

சீர்தரம்
 கிராமத்தின் சீர்தரம் சீர்தரம்
 80, பழுவேளி கிராமம்,
 உத்திரமேரூர் வட்டம்.

சீர்தரம்



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Geo Technical Mining Solutions, Dharmapuri

5/1485-3, Salem Main Road, Elakkiyampatty, Dharmapuri, Tamil Nadu

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

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals - including opencast and underground mining	1	1 (a) (i)	A


Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated January 24, 2024, 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/24/3142 dated Feb 19, 2024. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

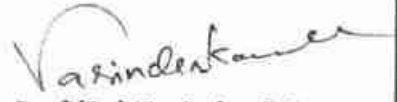
Issue Date
Feb 19, 2024

Valid up to
Dec 31, 2026




Mr. Ajay Kumar Jha
Sr. Director, NABET

Certificate No.
NABET/EIA/23-26/RA 0319


Prof (Dr) Varinder S Kanwar
(CEO NABET)

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