DRAFT OF ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

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

"B1" CATEGORY- MINOR MINERAL- CLUSTER- NONFOREST LAND- FRESH QUARRY

CLUSTER EXTENT = 5.62.5hectares

Govt Land- Rough Stone Quarry

At

Kadambur Village, Gangavalli Taluk,

Salem District, Tamil Nadu State.

TOR File No. 12534 and ToR Identification No. TO25B0108TN5979488N, Dated: 25.09.2025

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and address	Extent & S.F.No	Production in m^3 & Tons
M/s. VMI Constructions, (BID ID: 121509) Managing Partner Mr. M. Vasudevan S No.1/287, Pudur, Kalpaganur Post, Attur Taluk, Salem District – 636109.	2.00.0ha & S.F.No. 219/1A (Part- 5)	Rough Stone 196205 & 539564 Depth- 65m (40m AGL + 25m BGL)

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

No: 1/213-B, Ground Floor, Natesan Complex
Oddapatti, Collectorate Post office, Dharmapuri-636705. Tamil Nadu.
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com
NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: 31.12.2026

ENVIRONMENTAL LAB

GREEN LINK ANALYTICAL & RESERCH LAB

NABL Accredited and MoEF notified Laboratory
S.F. No,414/1, Tex Park Road, Opp. Good Luck,
Syndicate, Civil Aerodrome Post,
Coimbatore, Tamil Nadu- 641014,
NABL Certificate Number: TC- 15901,
Valid till: 18.05.2029

Baseline Study Period- October through December- 2025

JANUARY- 2026

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.12534

ToR Identification No. TO25B0108TN5979488N, dated. 25/09/2025,

M/s. VMI Constructions Rough Stone Quarry,

1. Seac Conditions - Site Specific

S.No		Terms of Reference		Remarks
1.1	**Major Condition**			
	1	The PP shall furnish modified MP incorporating benches on all the sides along with EIA Report.		The benches are formed properly, refer year wise development & Production Plan in Annexure IV, page no:282.
	Specific Condition			
	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:		
		(i)	Copy of the agreement forming CMC.	The Cluster Management Committee (CMC) will be formed among the proponents of cluster with organization chart, SoP and affidavit for the same will be submitted in the final EIA report.
		(ii)	The Organization chart of the Committee with defining the role of the members	
		(iii)	The 'Standard Operating Procedures' (SoP) executing the planned activities	
	2	The PP should submit an affidavit to follow the scientific formation of benches for 5m *5m		The Affidavit for scientific formation of benches will be submitted in final EIA report.

		properly during mining as per the approved mining plan.	
	3	The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.	The Photocopy of CCTV installation will be submitted in final EIA report.

2.Seac Standard Conditions

<table>
<tr><th>S.No</th><th colspan="3">Terms of Reference</th><th>Remarks</th></tr>
<tr><td rowspan="11">2.1</td><td rowspan="10">1</td><td colspan="2">In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:</td><td></td></tr>
<tr><td>(i)</td><td>Original pit dimension</td><td rowspan="9">As it is a fresh quarry, the conditions are not applicable.</td></tr>
<tr><td>(ii)</td><td>Quantity achieved vs EC Approved Quantity</td></tr>
<tr><td>(iii)</td><td>Balance Quantity as per Mineable Reserve calculated.</td></tr>
<tr><td>(iv)</td><td>Mined out Depth as on date Vs EC Permitted depth</td></tr>
<tr><td>(v)</td><td>Details of illegal/illicit mining</td></tr>
<tr><td>(vi)</td><td>Violation in the quarry during the past working.</td></tr>
<tr><td>(vii)</td><td>Quantity of material mined out outside the mine lease area</td></tr>
<tr><td>(viii)</td><td>Condition of Safety zone/benches</td></tr>
<tr><td>(ix)</td><td>Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</td></tr>
<tr><td>2</td><td colspan="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.</td><td>The VAO certificate is attached in Annexure IV.</td></tr>
</table>

	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	The Enumeration of structures is discussed in table 3.34 under chapter III in the EIA report page 96.
	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 is conducted and discussed in section 3.4.4 under chapter III in the EIA report page 47-56.
	5	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	The Bio-diversity study report 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	This is a fresh lease area; no benches were formed. The Slope Stability assessment may not require.

		constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	
	8	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	The slope stability plan might not require, as the ultimate working depth of the quarry is 25m below ground level only.
	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 stating blasting operations 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	A conceptual design of blasting has been given in Section 2.5 under Chapter II in the EIA report page 11-20.

		controlled as well as no fly rock travel beyond 30 m from the blast site.	
	11	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	The proponent has no other quarries anywhere else.
	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,	Not applicable.
	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, these conditions are not applicable.
	14	Quantity of minerals mined out.	
		• 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.	
	15	All corner coordinates of the mine lease area, superimposed on a High-Resolution	All corner coordinates of the mine lease area have been

		Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	superimposed on a high-resolution Google Earth Image, as shown in Figure 2.2 under Chapter II in the EIA report page 9.
	16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.	The drone video will be displayed during final 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 of all safety distances 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 detailed reserve estimation has been furnished in Table 2.6 under Chapter II in the EIA report page 11.
	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	The organization chart and details of manpower required for this project has given in Table 2.14 under Chapter II in the EIA report page 21.

		quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	
	20	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	The detailed hydro-geological study is discussed in the Section 3.4.4 under Chapter III in the EIA report page 47-56.
	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.	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, traffic and the results have been discussed under Chapter III in the EIA report page 26-101.
	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,	Results of cumulative impact study due to mining operations are discussed in Section 7.4 under Chapter VII in the EIA report page 135-142.

		biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	
	23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	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 and utilized for green belt development. Parts of the mined-out pit will be used to collect the rain water during the monsoons.
	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 3.2 under Chapter III in the EIA report page 26-36. The details of surrounding sensitive ecological features have been provided in Table 3.39 under Chapter III in the EIA report page 100.

			Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.10 under Chapter II in the EIA report page 16.
	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.	The rough stone is of 100% recovery without any wastes or remains. So, no dumps have been proposed within or outside the lease area. Hence, R&R is not required.
	26	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in any 'Critically Polluted' Area.
	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 water conservation measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks and utilized for green belt development. Parts of the mined-out pit will be used to collect the rain water during the monsoons.

	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 3.9 under Chapter III in the EIA report page 97-99.
	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 caried out within 300 m radius and the results have been discussed in Section 3.7 under Chapter III in the EIA report page 71-87.
	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 IV The budget details for the progressive mine closure plan are shown in Table 2.11 under Chapter II in the EIA report page 16.
	31	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	The EIA coordinator and the FAE for ecology and bio-diversity visited the study area and educated the local students about the importance of protecting the biological environment. Also planned for similar sessions in the future.
	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	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 117-120.

		species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	
	33	Taller/one year old Saplings raised in appropriate size of bags; preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	The FAE of ecology and bio-diversity 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 134-135.
	35	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII in the EIA report page 131-133.
	36	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical	Occupational health impacts of the project and preventive measures have been discussed in

		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.	Section 4.8 under Chapter IV in the EIA report 121-122.
	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 144-145.
	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, moreover this project shall benefit the socio-economic environment by offering employment for 20 people directly and many indirectly as discussed in Section 8.1 under Chapter VIII in the EIA report page 143.
	39	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
	40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate	The benefits of the project in all aspects are discussed in the

		environmental, social, economic, employment potential, etc.	Chapter VIII in the EIA report page 143-145.
	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, is shown in Chapter X in the EIA report page 147-154. The sworn affidavit stating the same will be included in 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.	This EIA report has been prepared with 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.

3. Seiaa Specific Conditions

S.No	Terms of Reference	Remarks
3.1	The authority noted that the subject was placed in the 609th SEAC-I meeting held on 26.08.2025. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 196205m³ of Rough Stone up to the depth of 65m (40m AGL + 25m BGL) as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the SEIAA Standard conditions.	The proponent thanking the authorities for granting Terms of Reference (ToR) along with Public Hearing for the quantity of **196205m³ of Rough Stone up to the depth of 65m (40m AGL + 25m BGL).** Will undertake the combined EIA study and prepare the separate EMP incorporating the recommendations of SEAC-I and conditions of SEIAA.

4. Seiaa Standard Conditions:

S.No	Terms of Reference		Remarks
	Cluster Management Committee		
4.1	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.	The proponent will organize a cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500m radius.
	2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt	The members of the cluster management committee will be instructed to organize themselves

		Development, Water sprinkling, tree plantation, blasting etc.	and 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.	The operational plan has been discussed in Section 2.5 under Chapter II in the EIA report page 11-20 and route map is given in figure 2.1, page-6.
	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.	The committee will frame a risk management plan with special respect to intense rain and will be educated to the mine workers. However, as a precaution measure, quarrying will be suspended during the intense rain.
	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.	The CMC will frame the environmental policy to practice sustainable mining in a scientific and systematic manner in accordance with the law and 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 framed and 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 in the vicinity.	The information on the health status of the mine workers and the local people will be monitored and updated periodically.
	Agriculture & Agro-Biodiversity		
	9	Impact on surrounding agricultural fields around the proposed mining Area.	There shall be negligible smoke 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 affect to the surrounding vegetation significantly, as discussed in Section 4.6 under Chapter IV in the EIA report page 117-120.
	10	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.7 under Chapter III in the EIA report page 71-87.
	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 3.7 under Chapter III in the EIA report page 71-87. Details about transplantation of plants have been provided in

			Section 4.6 under chapter IV in the EIA report page 117-120.
	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 ecology and bio-diversity aspects have been discussed in Section 3.7 under Chapter III in the EIA report page 71-87 and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 117-120.
	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 for sustainable management and restoration of ecosystem are discussed in Chapter IV in the EIA report page 102-124.
	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 103-104.
		Forests	
	15	The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	The proponent will do barbed wire fencing work and develop the green belt around the lease area to restrict the movement of the wildlife around 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 flora and fauna have been discussed in Section 4.6 under Chapter IV in the EIA report page 117-120.

	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 117-120.
	18	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	There are no reserve forests / national parks near the site. The protected areas, National Parks, Corridors and Wildlife pathways near project site within 10 km radius has been provided in Table 3.39 under Chapter III in the EIA report page 100.
	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 detailed hydro-geological study report is provided in section 3.4.4 of Chapter-III in EIA report, page-47-56.
	20	Erosion Control measures.	Garland drainage structures will be constructed around the lease area to control the erosion and further discussed in Section 4.3

			under Chapter IV in the EIA report page 105-107.
	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.	There are no such fragile areas nearby the site. The nearest waterbody details are furnished in table-3.8 of chapter-III, page-42. The impact has discussed under Chapter IV in the EIA report page 102-124.
	22	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.7 under Chapter 3 in the EIA report page 71-87.
	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 102-124.
	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 117-120.
	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 104-105.

	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 105-107.
	27	The EIA shall include the impact of mining activity on the following:	
		a. Hydrothermal / Geothermal effect due to destruction in the Environment	The average geothermal gradient of earth is 25°C/km. As the proposed depth of mining is 25m below the ground level, the temperature will increase by 0.625^{0}C at the ultimate depth of mining, which will not have any significant effect on health and environment.
		b. Bio-geochemical processes and its foot prints including environmental stress.	No Bio-geochemical processes and its foot prints including environmental stress are anticipated and at the end of life of mine. As the excavation is of homogenous hard rock.
		c. Sediment geochemistry in the surface streams	The details of sediment geochemistry are discussed in the Table 3.6a under Chapter III in the EIA report page 40.
	Energy		
	28	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize the Energy shall be furnished.	The measures taken to control noise, air, water, and dust control have been given under Chapter IV in the EIA report page 102-124.

	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 117-120.
	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 soil environment has been discussed in Chapter IV in the EIA report page 102-124.
	31	Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.	There will be no such emission impact on 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 with in statuary 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 IV. The budget details for the progressive mine closure plan are shown in Table 2.11 under Chapter II in the EIA report page 16.

	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 147-154.
	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.	A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X in the EIA report page 148-153.
	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 131-133.
	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 134-135.
	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 is attached in the Annexure V.
	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 Management Plan.	The concerns raised during the public consultation will be submitted in final EIA report.
	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 142.

Standard Terms of Reference for (Mining of minerals)

1.

S.No	Terms of Reference	Remarks
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994	Not applicable. This is a fresh quarry lease.

	came into force, w.r.t. the highest production achieved prior to 1994	
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	It is a Government poramboke land. Person identity proof documents are included in annexure.
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee	All the documents are in the name of lessee.
1.4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.2 under Chapter II, page no 9.
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics	Toposheets of Survey of India have been used for mapping geology, geomorphology, and other characteristic features are shown in Chapter III, page - 30.
1.6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the

	mining should have approval from State land use board or the concerned authority	land is fit for quarrying under the policy of State Government.
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report	The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, pp.147-148.
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided	It is an opencast quarrying operation proposed to operate in Manual method. The Rough Stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 45° bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary

		permissions will be obtained from DGMS after obtaining Environmental Clearance.
1.9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period	The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation etc., is for the life of the mine / Lease period.
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has provided in Table 3.39 under Chapter III, p.100. Land use plan of the project area showing pre- operational, operational and post-operational phases are discussed in Table 2.10 under Chapter II, p.16.
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	The rough stone is of 100% recovery without any wastes or remains. So, no dumps have been proposed inside or outside the lease area. Hence, no R&R issues.
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project	It is not applicable, as there is no forest land involved in the proposed project.

	Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees	
1.13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished	It is not applicable as the proposed project does not involve any forest land.
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No Reserve Forest is found within the vicinity of study area.

		The details of reserve forest within 10km have been furnished in Table 3.39 under Chapter III, p.100.
1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted	There is no any wildlife/protected area from the periphery of the project area. Information regarding wildlife /protected area within 10km has been given in Table 3.39 under Chapter III, p.100. Impact on Fauna and mitigation details are given in section 3.7 under chapter III, p.71-87.
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	The details of National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area has been given in Table 3.39under Chapter III, p.100.
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.7 under Chapter III, pp.71-87.

	primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	
1.19	Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
1.20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)	Not Applicable. The project doesn't attract the C.R.Z. Notification, 2018.
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be	Not Applicable.

	furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report	There are no approved habitations of SCs/STs and any other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan may not require.
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site- specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified	Baseline data were collected for the period of October 2025 - December 2025 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data analysis results have been discussed in sections 3.2-3.9 under Chapter III, pp. 26-99.

	keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given	
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been discussed in Section 4.4 under the Chapter IV, pp.107-112.
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The water requirement for the project, its availability and source have been provided in Table 2.13 under Chapter II, p.17.
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided	Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and

		purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
1.26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for nearby villages during droughts.
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, pp. 105-107.
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below	Not Applicable. The ground water table is found at the depth of 58m-65m below ground level. Ultimate depth of the mine is 65m (40m AGL and 25m BGL). Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III, pp.47-54.

	ground water and for pumping of ground water should also be obtained and copy furnished	
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 335m AMSL. Ultimate depth of the mine is 65m (40m AGL and 25m BGL). Depth to the water level in the area is 58-65 m BGL.
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with	Greenbelt development plan has been prepared and provided in Section 4.6 under Chapter IV, pp.117-120.

	emphasis on local and native species and the species which are tolerant to pollution.	
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines	Traffic density survey was carried out to analyze the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.9 under Chapter III, p.97-99.
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease has been discussed in Section 2.5.7 under Chapter II, p.17-20.
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report	Progressive mine closure plan has prepared for this project and is given in Table 2.11 under Section 2.5.5 under Chapter II, p.16.
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be	Occupational health impacts of the project and preventive measures have been explained in Section 4.8 under Chapter IV, pp.121-122.

	incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed	
1.36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.144-145.
1.37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation	No negative impact on socio-economic environment of local community is anticipated and this project shall improve the socio-economic environment by offering employment for 20 people directly and further discussed in Section 8.1 under Chapter VIII, p.143.
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project	A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.148-154.
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project	The outcome of public hearing and PP response will be submitted in the final EIA report.

1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	No litigation is pending in any court against this project.
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out	Project Cost is Rs.4,99,83,000/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs. 21.69 Lakhs as capital cost and recurring cost as Rs. 17.64 Lakhs 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 10 years will be Rs. 243.43 Lakhs, as shown in Tables 10.1 & 10.2 under Chapter X, pp.148-153.
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.134-135.
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project in all aspects have been given under Chapter VIII, pp.143-145.
1.44	Besides the above, the below mentioned general points are also to be followed	
a)	All documents to be properly referenced with index and continuous page numbering	All the documents have been properly referenced with index and continuous page numbering.

b)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated	List of tables and source of the data collected have been mentioned.
c)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	All the Original Baseline monitoring reports will be enclosed in final EIA report.
d)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.
e)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be submitted in final EIA report.
f)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009 have been followed while preparing the EIA report.
g)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public	No changes are made in the basic scope and the project parameters.

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

A. Standard Terms of Reference

1.	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable. This is a fresh quarry lease.

2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	The proposed site for quarrying is a government poramboke land.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents are in the name of the lessee.
4.	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.2 under Chapter II in the EIA report page 9.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Toposheets of Survey of India have been used for mapping geology, geomorphology, LULC and showing sampling locations of air, soil, water, and noise are displayed in Chapter III in the EIA report page 26-99.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.

7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The Environmental Policy is discussed in the Section 10.1 under Chapter X in the EIA report page 147-148.
8.	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided	It is an opencast quarrying operation proposed to operate in manual method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90° bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental clearance.

9.	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report is for the life of the mine / lease period.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.2 under Chapter III in the EIA report page 26-36. The details of surrounding sensitive ecological features have been provided in Table 3.39 under Chapter III in the EIA report page 100.0 Land use plan of the project area showing pre- operational, operational and post-operational phases are discussed in Table 2.10 under Chapter II in the EIA report page 16.
11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	The rough stone is of 100% recovery without any wastes or rejects. So, no dumps have been proposed inside or outside the lease area. Hence, R&R may not require.
12.	Certificate from the Competent Authority in the State Forest Department should be	It is not applicable, as there is no forest land involved in the proposed project.

	provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	
13.	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	It is not applicable, as the proposed project does not involve any forest land.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.

15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There is no reserve forest in the study area. The details of nearby reserve forest are furnished in the Table 3.39 under Chapter III in the EIA report page 100.
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the nearby protected areas has furnished in Table 3.39 under Chapter III in the EIA report page 100.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the nearby National Parks is provided in Table 3.39 under Chapter III in the EIA report page 100.
18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.7 under Chapter III in the EIA report page 71-87.

	authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared. in 'Critically Polluted' Area and does not come under 'Aravalli Range.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable. The project doesn't attract the C.R.Z. Notification, 2018.

21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspect should be discussed in the Report	Not Applicable. There are no approved habitations of SCs/STs and any other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan not provided.
22	One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as	Baseline data were collected for the period of October - December 2025 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and analysis results have been included in Sections 3.2-3.9 under Chapter III in the EIA report page 26-99.

	to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV in the EIA report page 107-112.
24.	The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	The water requirement for the project, its availability and source have been provided in Table 2.13 under Chapter II in the EIA report page 17.
25.	Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.	Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated

		rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the nearby villages during droughts.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV in the EIA report page 105-107.
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below	The ground water table is found at the depth of 58-65m below ground level. The ultimate depth of quarry is 65m (40mAGL & 25m BGL). Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.4.1 under Chapter III in the EIA report page 42-46.

	ground water and for pumping of ground water should also be obtained and copy furnished.	
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 335m AMSL. Ultimate depth of the mine is 65m (40m AGL+25m BGL). Depth to the water level in the area is 58-65m below the ground level.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up. Front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and	Greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 117-120.

	native species and the species which are tolerant to pollution.	
32.	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Traffic density survey was carried out to analyses the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.9 under Chapter III in the EIA report page 97-99.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities to be provided to the mine workers after the grant of quarry lease is provided in Section 2.5.7 under Chapter II in the EIA report page 17.
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Progressive mine closure plan has been prepared for this project and is given in Section 2.5.5 under Chapter II in the EIA report page 16.
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical	Occupational health impacts of the project and preventive measures have been explained in Section 4.8 under Chapter IV in the EIA report page 121-122.

	examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	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 144-145.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the people is anticipated, moreover this project will improve the socio-economic environment by offering employment for 20 people directly and further discussed in Section 8.1 under Chapter VIII 143.
38.	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	A detailed Environment Management Plan has been prepared and provided in Table 10.1 & 10.2 under Chapter X in the EIA report page 148-153.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also	The public hearing points and response of proponent will be submitted in the final EIA report.

	incorporated in the final EIA/EMP Report of the Project.	
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs.4,99,83,000/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs. 21.69 Lakhs as capital cost and recurring cost as Rs. 17.64 lakhs 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 10 years will be Rs. 243.43 Lakhs as shown in Tables 10.1 & 10.2 under Chapter X, pp.148-153.
42.	A disaster management plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 134-135.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project in all aspects have been given under Chapter VIII in the EIA report page 143-145.
44	Besides the above, the below mentioned general points are also to be followed:	

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

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

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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 the projects are categorized into A, B1 & B2 to determine the level of scrutiny and process. The mining projects whose extent is ≥ 5 ha or the cluster of quarries (if homogeneous mineral) within 500m radius extent is greater than 5ha falls under category B1. These projects require preparation and submission of an EIA report after public consultation to SEIAA to obtain environmental clearance as per the Office Memorandum F.No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.

1.1 PURPOSE OF THE REPORT

The purpose of the report is to evaluate the project's potential environmental, social and economic effects of the before it is implemented adhering to the guidelines outlined in the MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015 and MoEF & CC Office Memorandum dated 29.08.2017.

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

The project had applied in PARIVESH 2.O proposal no. SIA/TN/MIN/546446/2025, Dated: 29.09.2025 to obtain terms of reference.

Scoping

The mechanism for issuing online system generated Standard ToR as well as reference to SEAC has been enabled on the PARIVESH Portal on the acceptance of the complete application online. The concerned Member Secretary of SEAC shall refer the project to the concerned SEAC for prescribing additional ToR as per the circular F.No. IA 3-22/15/2022-IA-III [Computer No 178038] Dated: 6th May 2022.

Public Consultation

In this stage, an application along with the draft EIA and EMP report will be made to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) and request to conduct Public Hearing as per EIA notification 2006. The outcome of the public hearing will be upload in the final EIA report.

Appraisal

At this stage, the final EIA report will submit SEIAA in PARIVESH 2.O to SEIAA, TN. Based on the recommendations of SEAC the SEIAA, TN will grant EC or castoff.

1.3 TERMS OF REFERENCE (ToR)

The total extent of quarries within the 500m radius is greater than 5ha. The details of the quarries within the cluster are given in Table 1.1.

Table 1.1 Details of Quarries within the cluster area of 500m radius

Proposed Quarries					
Code	**Name of the Owner**	**Village**	**S.F. No**	**Extent (ha)**	**Remarks**
P1	VMI- Constructions	Kadambur Village, Gangavalli Taluk	219/1A (P-5)	2.00.0	Mining Plan Approved Vide Rc. No. 40/2025/Mines- A Dated: 07.07.2025.
P2	M. Sivakumar	Kadambur Village, Gangavalli Taluk	224/1C (P), 224/2A (P), 224/2B (P)	1.12.5	Mining Plan Approved Vide Rc. No. 15/2025/Mines- A Dated: 23.06.2025.
Existing Quarry					
E1	S. Mohankumar	Kadambur Village, Gangavalli Taluk	219/1A (P-4)	1.50.0	10 Years (19.10.2018 to 18.10.2028)
E2	M. Koteeshwara Muthu	Kadambur Village, Gangavalli Taluk	219/1A (P-3)	1.00.0	10 Years (17.02.2019 to 16.02.2029)
Total Cluster Extent				**5.62.5**	

Source: *AD Letter - Rc.No. 40/2025/Mines- A, dated: 08.07.2025.*

The file was appraised in 609th SEAC meeting on 26.08.2025 & 888th meeting on 17.09.2025 and issued terms of reference (ToR) identification no **TO25B0108TN5979488N** on **25/09/2025** by SEIAA, TN.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

- The project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of the website where it is displayed.

- The project proponent will submit a half-yearly compliance report of the stipulated environmental conditions to Regional Office, MoEF & CC & SEIAA on 1st June and 1st December of every year.

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

The prior environmental clearance granted for a project or activity may be transferred as per the provisions of para 11 of the Environmental Impact Assessment Notification, 2006 and its subsequent amendments and the office memorandum File No. IA3-22/19/2023-IA.III [E226246] Dated: 3rd November 2023.

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	Managing Partner Mr. M. Vasudevan
Address	**M/s. VMI CONSTRUCTIONS,** No.1/287, Pudur, Kalpaganur Post, Attur Taluk, Salem District- 636109.
Status	Partner

1.7 BRIEF DESCRIPTION OF THE PROJECT

The method adopted for rough stone excavation is open cast semi mechanized method involving formation of benches with 5m height and 5m width and the overall bench slope is less than 65°. The quarry operation involves shallow jackhammer drilling, slurry blasting, excavation, loading and transportation.

The overall extent of the project site is 2.00.0ha and it is located in Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu.

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The increasing demand for rough stone fuelled by a booming construction industry presents a valuable opportunity. This project will not only meet the rising demand for rough stone but also create jobs for the surrounding villages.

1.8 SCOPE OF THE STUDY

The primary focus of the EIA study is to measure the combined impact of the quarries in the cluster and develop efficient mitigation strategies. The baseline monitoring study was conducted from **October to December 2025**, focusing on various environmental aspects including land, soil, air, water, noise, and ecology, to evaluate the expected effects of the cluster on the environment and

recommend appropriate mitigation strategies for possible negative impacts arising from the proposed project.

1.9 LEGISLATION APPLICABLE TO MINING OF MINERAL SECTOR

A few important legislations are given below:

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

CHAPTER II

PROJECT DESCRIPTION

2.0 DESCRIPTION OF THE PROJECT

The proponent **M/s. VMI- Constructions** Projects is involved in the mining and its auxiliary activities. The proponent had applied for quarry lease on 10.01.2025 to extract rough stone quarry. The precise area communication letter was issued by Assistant Director of Geology and Mining, Salem vide (Roc.No.40/2025/Mines-A, Dated: 07.05.2025). The mining plan thus prepared was approved by Assistant Director Department of Geology and Mining, Salem (Roc.No.40/2025/Mines-A, Dated: 07.07.2025). The project area and the proposed excavation details were given in Table 2.1.

History of the Project

It's a fresh quarry lease.

Table 2.1 Proposed project area and excavation details

Name of the Quarry	M/s. VMI Constructions**,** Rough Stone Quarry			
Type of Land	Tender cum auction- Govt Land			
Extent	2.00.0Ha			
Toposheet No	58 I/10			
Location of Project Site	11°30'42.05"N to 11°30'49.92"N 78°36'22.74"E to 78°36'27.14"E			
Highest Elevation	335m AMSL			
Proposed depth of Mining	65m (40 AGL + 25m BGL)			
Geological Resources	**Rough Stone in m^3**		**Topsoil in m^3**	
	m^3	Tons (m^3* 2.75)	m^3	Tons (m^3* 2)
	707932	1946813	22555	45110
Mineable Reserves	196205	539564	16425	32850
Proposed reserves for ten years	196205	539564	16425	32850
Method of Mining	Open- Cast Mechanized mining			
Topography	Elevated Topography			
Machinery proposed	Jack Hammer		2	
	Compressor		1	
	Tipper		7	
	Hydraulic Excavator		1	
	Rock Breaker		1	
Proposed Manpower Deployment	20 Nos			
Project Cost	Rs. 4,99,83,000/-			
CER Cost	Rs. 5,00,000/-			
Proposed Water Requirement	3.0 KLD			

2.1 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu as shown in Figure 2.1.

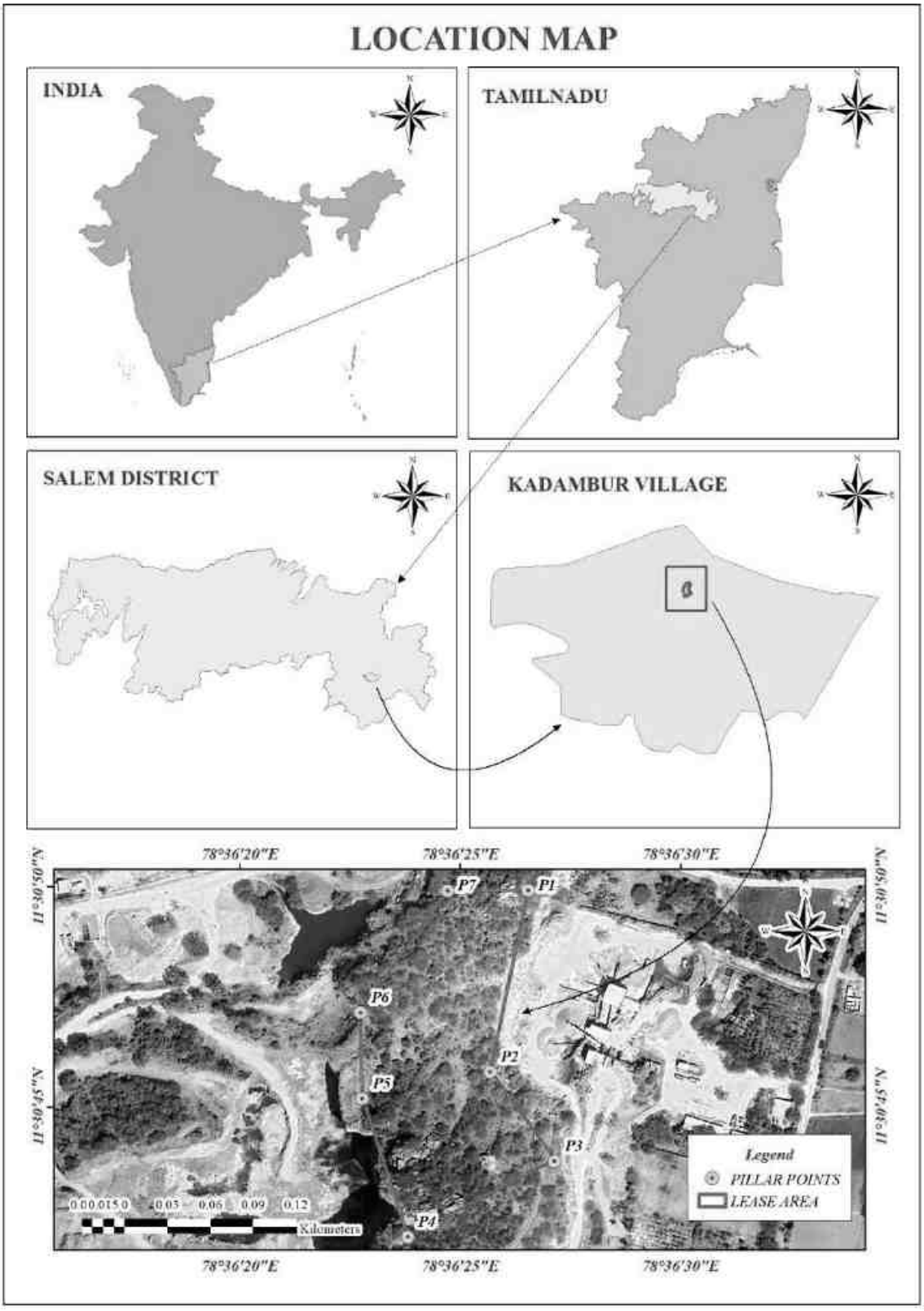


Figure 2.1 Location Map Showing the Project Site

On Attur- Perambalur NH-136, near Manjini village junction, turn into Manjini- Kadambur road and travel upto 5.63km and then take a right turn and travel for 0.2km, you will reach the lease area. Accessibility details to the proposed project site have been given in Table 2.2.

Table 2.2 Site Connectivity to the Project Area

Nearest Roadways	NH-136 Attur- Perambalur	5.37km- NE
Nearest Town	Attur	9.1km- N
Nearest Railway Station	Attur	9.04km- N
Nearest Airport	Salem (Omalur)	66.5km- NW
Nearest Seaport	Chennai	244km- NE
Nearest Village	Pudur	1.7km- N
	Gangavalli	3.6km- E
	Kadambur	1.0km- S
	Ramanathapuram	2.3km- W

2.2 LEASEHOLD AREA

The details of the field survey number, subdivision and their extent and the overall extent of the proposed project site is given in Table 2.3.

Table 2.3 Lease hold area details

Survey No	Sub Division	Total Extent in Ha	Patta No.	Village and Name of the Land Owner	Mine lease Applied S.F.No.	Applied area out of total area in Ha
219	1A (P-5)	2.00.0	Government Poramboke Land	M/s. VMI Constructions	219/1A (Part-5)	2.00.0
Total Extent		**2.00.0**	**Applied lease area extent**			**2.00.0**

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. The overall extent of the project area is 2.00.0Ha as per the precise area communication letter vide Roc.No.40/2025/Mines- A, Dated: 07.05.2025 issued by Dept of Geology and Mining, Salem District the project site on Kadambur village, Gangavalli Taluk, Salem District, Tamil Nadu. The breakup of the existing land use for mining and ancillary feature is given in Table 2.4.

Table 2.4 Present Land use pattern of the project area

Description	Present Area (ha)
Area under quarry	Nil
Infrastructure	Nil
Roads	Nil
Green Belt & Dump	Nil
Drainage & Settling Tank	Nil
Unutilized area	2.00.0
Total	**2.00.0**

2.2.1 Geo- Coordinates

The proposed lease area is flat topography. The maximum elevation (335m) was observed west side of the lease area and minimum elevation (295m) was observed northeast side of the site. The boundary corner and the intermediate stone geographic coordinates is given in Table 2.5. The quarries within the cluster of 500m radius as per the letter Roc.No.40/2025/Mines-A, Dated: 08.07.2025 is enclosed as Annexure- II is shown in Figure 2.3.

Table 2.5 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude
1	11°30'49.92"N	78°36'26.54"E
2	11°30'45.79"N	78°36'25.68"E
3	11°30'43.77"N	78°36'27.14"E
4	11°30'42.05"N	78°36'23.81"E
5	11°30'45.19"N	78°36'22.78"E
6	11°30'47.14"N	78°36'22.74"E
7	11°30'49.90"N	78°36'24.71"E

2.3 GEOLOGY

The compositional characteristics of co-existing orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites– Enderbites such as the granulites and gneisses. The mineral composition shows an unvarying presence of pleochroic rhombic pyroxene. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks. Order of superposition of the proposed lease

Age	Group	Rock Formation
Recent to Sub recent	---	Gravel
Archean	Charnockite Group	Charnockite

The topsoil available at a depth of 0-1m, weathered rock is obtained the average of 1-3m and a rough stone starts from 3m to 65m.

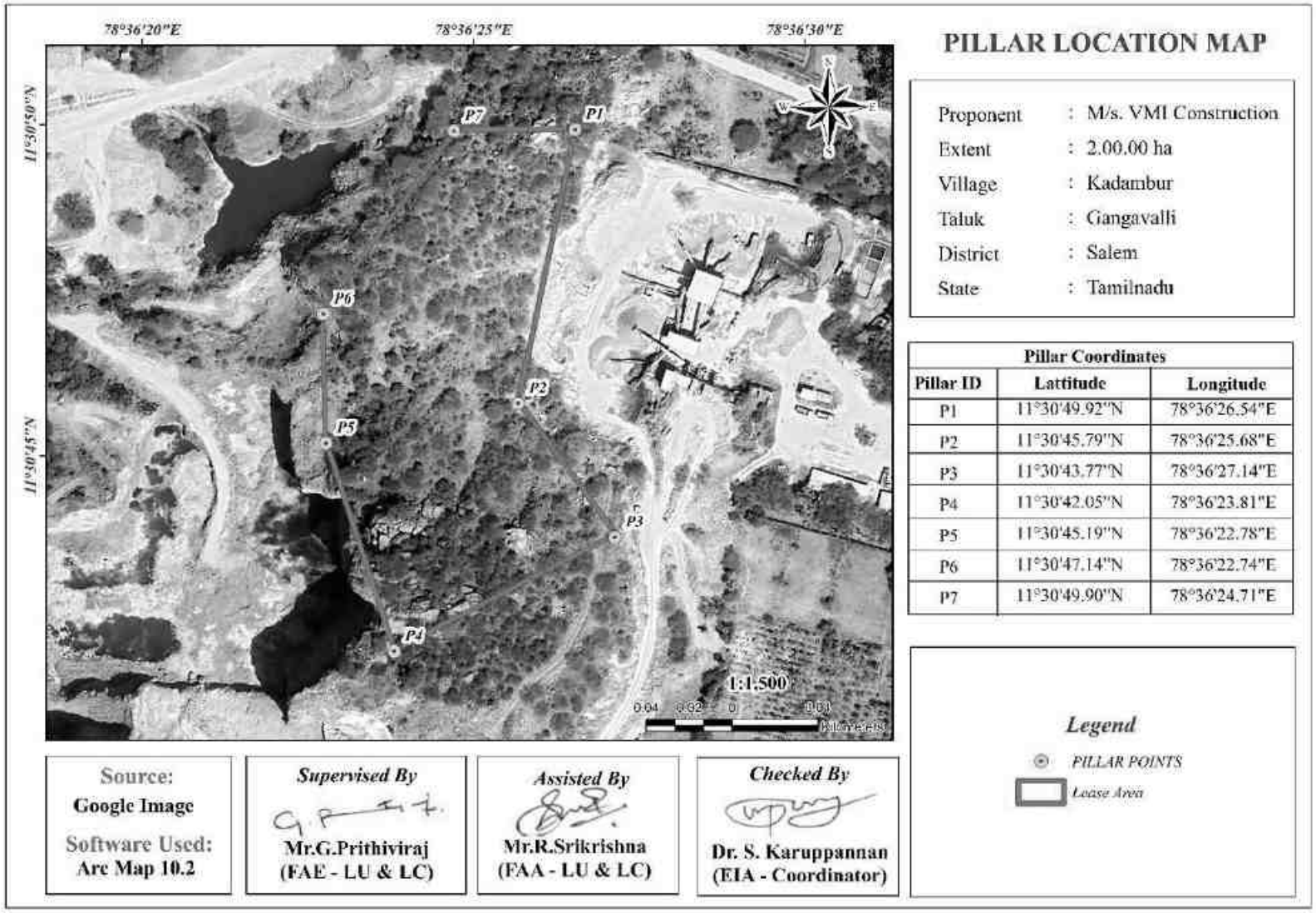
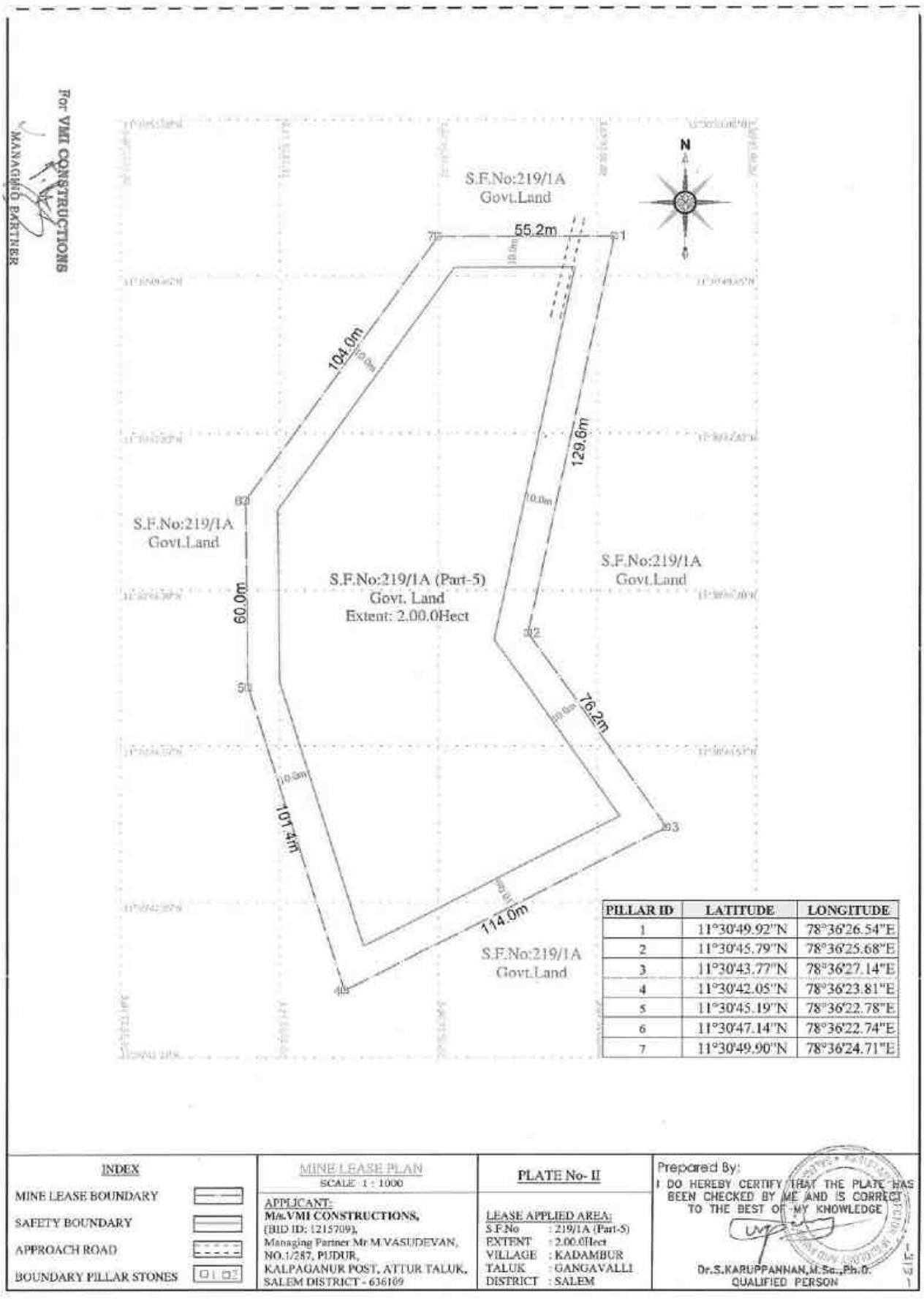


Figure 2.2 Google Earth Image Showing Lease Area with Pillars



PILLAR ID	LATITUDE	LONGITUDE
1	11°30'49.92"N	78°36'26.54"E
2	11°30'45.79"N	78°36'25.68"E
3	11°30'43.77"N	78°36'27.14"E
4	11°30'42.05"N	78°36'23.81"E
5	11°30'45.19"N	78°36'22.78"E
6	11°30'47.14"N	78°36'22.74"E
7	11°30'49.90"N	78°36'24.71"E

Figure 2.3 Mine Lease Plan

2.4 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 7.5m and 10m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as bench loss). The mineable reserves are calculated up to the depth of 65m (40m AGL + 25m BGL) considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been attached in approved mining plan results of geological resources and reserves have been shown in Table 2.6 and the approved year wise development plan is enclosed as Figure 2.4 & 2.5.

Table 2.6 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone		Topsoil in	
	m^3	Ts	m^3	Ts
Geological Resource in m^3 & Ts	707932	1946813	22555	45110
Mineable Reserves in m^3 & Ts	196205	539564	16425	32850
Ten years Production m^3 & Ts	196205	539564	16425	32850

Source: Approved Mining Plan & ToR

2.5 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 5m 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.

2.5.1 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 (Chapter 8 (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 2.7.

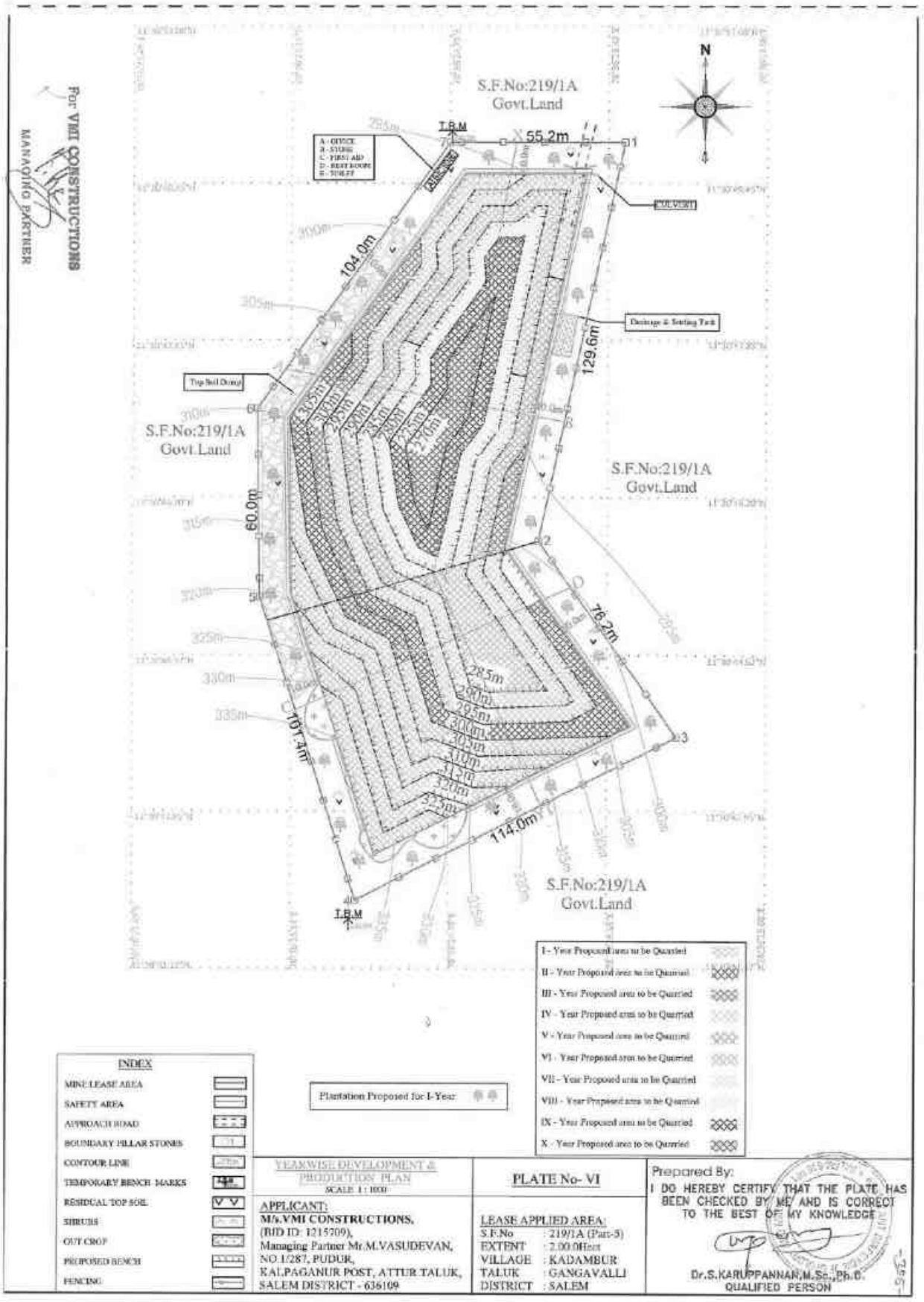
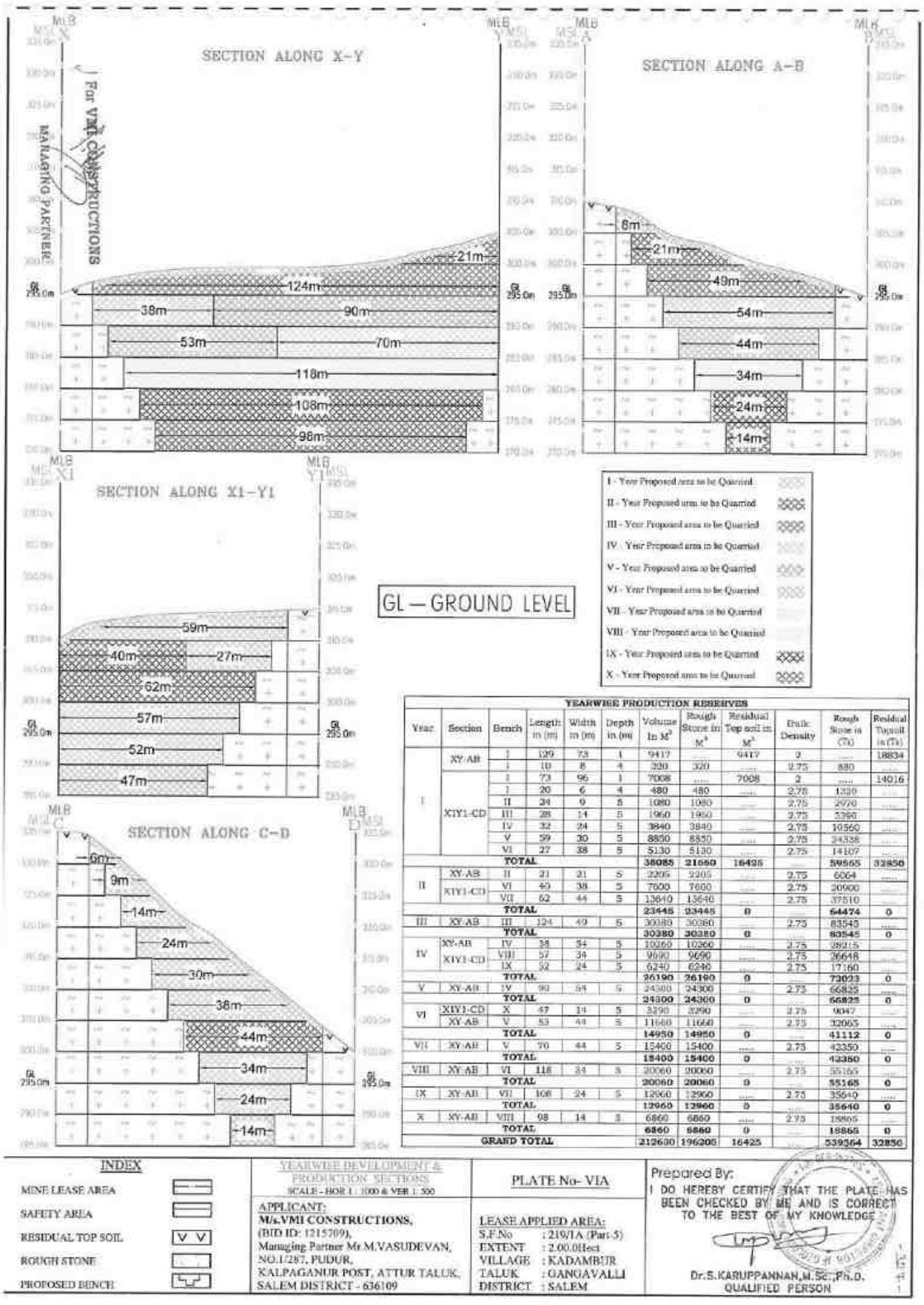


Figure 2.4 Year-Wise Production Plan & Section



YEARWISE PRODUCTION RESERVES

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Tn)	Residual Topsoil in (Tn)
I	XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
		I	10	8	4	320	320	.....	2.75	880	.....
		I	73	96	1	7008	.....	7008	2	.....	14016
	XIY1-CD	I	20	6	4	480	480	.....	2.75	1320	.....
		II	24	9	5	1080	1080	.....	2.75	2970	.....
		III	28	14	5	1960	1960	.....	2.75	5390	.....
		IV	32	24	5	3840	3840	.....	2.75	10560	.....
		V	59	30	5	8850	8850	.....	2.75	24338	.....
		VI	27	38	5	5130	5130	.....	2.75	14107	.....
	TOTAL					38085	21660	16425		59565	32850
II	XY-AB	II	21	21	5	2205	2205	.....	2.75	6064	.....
	XIY1-CD	VI	40	38	5	7600	7600	.....	2.75	20900	.....
		VII	62	44	5	13640	13640	.....	2.75	37510	.....
	TOTAL					23445	23445	0	.....	64474	0
III	XY-AB	III	124	49	5	30380	30380	.....	2.75	83545	.....
	TOTAL					30380	30380	0	.....	83545	0
IV	XY-AB	IV	38	34	5	10260	10260	.....	2.75	28215	.....
	XIY1-CD	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
		IX	52	24	5	6240	6240	.....	2.75	17160	.....
	TOTAL					26190	26190	0	.....	72023	0
V	XY-AB	V	90	54	5	24300	24300	.....	2.75	66825	.....
	TOTAL					24300	24300	0	.....	66825	0
VI	XIY1-CD	X	47	14	5	3290	3290	.....	2.75	9047	.....
	XY-AB	V	53	44	5	11660	11660	.....	2.75	32065	.....
	TOTAL					14950	14950	0	.....	41112	0
VII	XY-AB	V	70	44	5	15400	15400	.....	2.75	42350	.....
	TOTAL					15400	15400	0	.....	42350	0
VIII	XY-AB	VI	118	34	5	20060	20060	.....	2.75	55165	.....
	TOTAL					20060	20060	0	.....	55165	0
IX	XY-AB	VII	108	24	5	12960	12960	.....	2.75	35640	.....
	TOTAL					12960	12960	0	.....	35640	0
X	XY-AB	VIII	98	14	5	6860	6860	.....	2.75	18865	.....
	TOTAL					6860	6860	0	.....	18865	0
GRAND TOTAL						212600	196205	16425	.....	539364	32850

Figure 2.5 Year-Wise Production Plan & Section

Table 2.7 Conceptual Blasting Design

Blast hole Diameter (D) in mm	32
Burden (B) in m	1.2
Spacing (S) in m	1.38
Sub drill 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	70
Number of blast holes/day	17
Number of blast round/day	1
Blast hole pattern	Staggered
Mass of explosive /day in kg	7.41
Powder factor in kg/m^3	0.11
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL

Statutory Provision & Precaution during Blasting: -

- Blasting permission from DGMS will be taken by the proponent within 6 months from the date of execution of mine.
- Control blasting will be carried out by using delay detonators during multi rows blasting
- No secondary blasting will be carried out.
- Stemming column will be half of the depth of hole with coarse sand.
- Only Statutory designated Blaster will supervise the blasting operation.
- All persons in the radius of minimum 300m from the blasting site will be removed by siren.
- Blasting operation will be carried out during day time only particularly at noon time.

2.5.2 Magnitude of Operation

Based on the results of estimated production for the 10 years, details about the size of operation have been provided in Table 2.8.

Table 2.8 Operational Details for Proposed Project

	Rough Stone in (m^3 & Ts) 10 years	**Topsoil in (m^3 & Ts) /1 year**
Proposed production for 10 years	196205 & 539564	16425 & 32850
Number of Working Days /Annum	270	270
Production of /Day (m^3 & Ts)	72 & 199	60 & 121
No. of Lorry Loads	12	10

2.5.3 Extent of Mechanization

List of machineries proposed for the quarrying operation is given in Table 2.9.

Table 2.9 Machinery Details

S. No.	Type	No. of Unit	Size /Capacity	Motive Power
1	Jack Hammers	2	Hand held	Diesel
2	Compressor	1	Air	Diesel
3	Hydraulic Excavator	2	2.9-4.5m^3	Diesel
4	Tipper	7	15T	Diesel

2.5.4 Post Mining land use

The land use at present, at the end of plan period & at the end of conceptual period is given in Table 2.10 below

Table 2.10 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	1.40.3
Infrastructure	Nil	0.02.0
Roads	Nil	0.05.0
Green Belt	Nil	0.39.0
Drainage & Settling Tank	Nil	0.05.7
Unutilized area	2.00.0	0.08.0
Total	**2.00.00**	**2.00.0**

2.5.5 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 2.11.

Table 2.11 Mine Closure Budget

Activity	Capital Cost
400 plants inside the lease area	80,000
600 plants outside the lease area	1,80,000
Wire Fencing	4,00,000
Renovation of Garland Drain	22,800
Total	**6,82,800**

Source: Environment Management plan

2.5.6 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 2.12. Conceptual Plan has been shown in Figure 2.9 & 2.10.

Table 2.12 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth (m)
I	129	96	65

Source: Approved Mining Plan & ToR

2.5.7 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.

Other Infrastructure Requirement

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.

2.5.8 Water Requirement

Detail of water requirement in 3.0 KLD is given in Table 2.13.

Table 2.13 Water Requirement for the Project

Purpose	Quantity	Source
Drinking	0.3KLD	Will obtained from water vendors
Utilized Water	0.7KLD	
Dust Suppression	1.0KLD	
Green Belt development	1.0 KLD	
Total	**3.0KLD**	

Source: Prefeasibility Report

2.5.9 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.14. Around **1278103 litres of HSD** will be used for rough stone extraction during this 10 years plan period. The diesel will be brought to the site from nearby diesel pumps.

Table 2.14 Fuel Requirement Details

Fuel Requirement for Excavator			
Details	**Rough Stone (196205m^3)**	**Topsoil (16425m^3)**	**Total Diesel (litre)**
Average Rate of Fuel Consumption (1/hr)	16	10	---
Working Capacity (m^3/hr)	20	60	---
Time Required (hours)	9810	274	---
Total Diesel Consumption for 10 years (litre)	156964	2738	**159702**
Fuel Requirement for Compressor			

Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drill holes/day	24	---	---
Total Diesel Consumption for 10 years (litre)	12960	---	**12960**
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	24	20	---
Carrying Capacity in m^3	6	6	---
Number of Trips / days	12	10	---
Number of Trips / 10 years	32400	270	---
Total Diesel Consumption for 10 years (litre)	777600	5400	**783000**
Total Diesel Consumption by Excavator, Compressor and Tipper			**955662**

** Number of truck loads for gravel has been calculated for ten years.*

2.5.10 Capital Requirement

The project proponent will invest **Rs. 4,99,83,000/-**to the project. The breakup summary of the investment has been given in Table 2.15.

Table 2.15 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	4,50,50,000/-
2	Machinery cost (Rental)	25,00,000/-
3	EMP Cost	24,33,000/-
Total Project Cost		**4,99,83,000/-**

Source: Approved Mining Plan

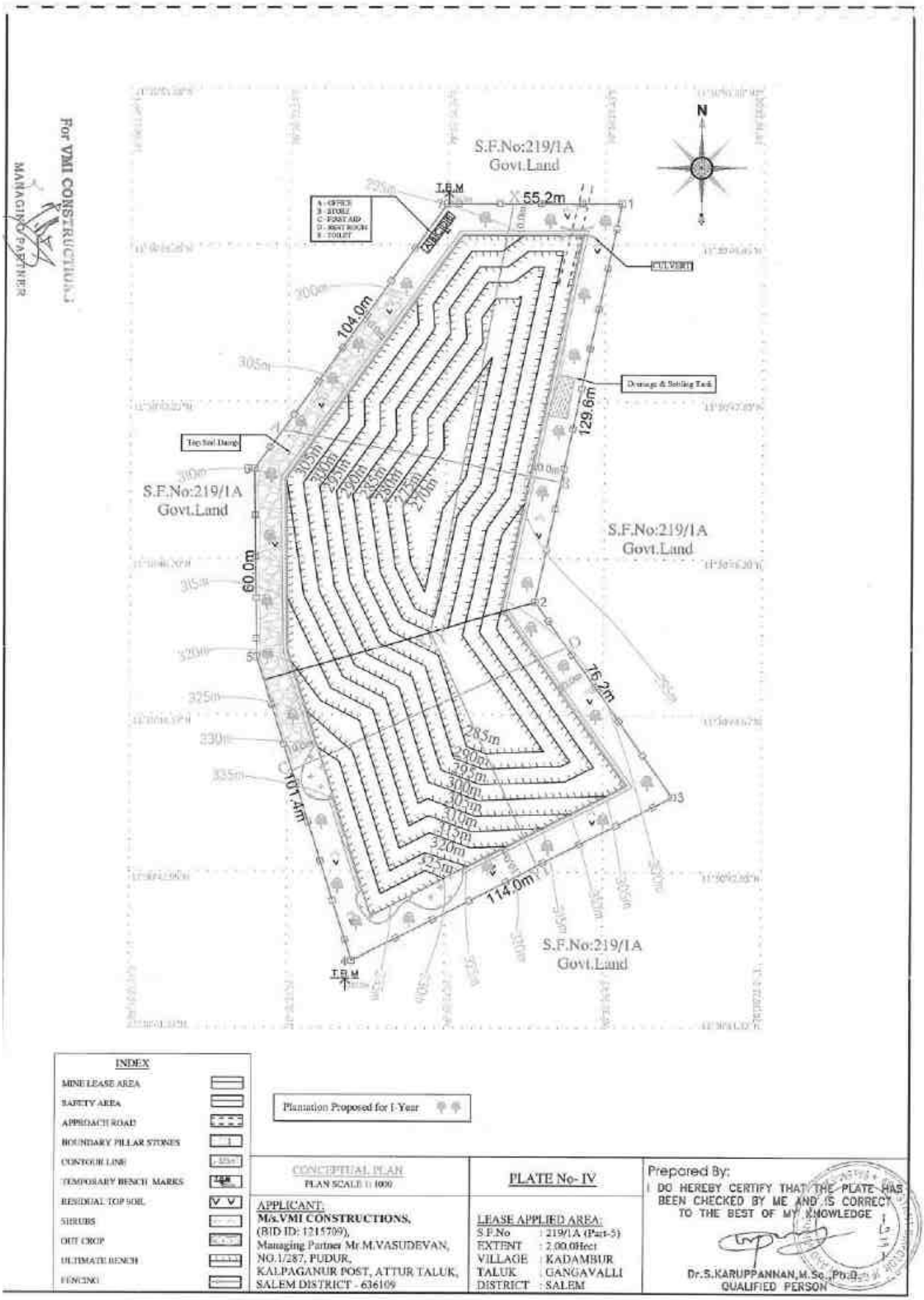
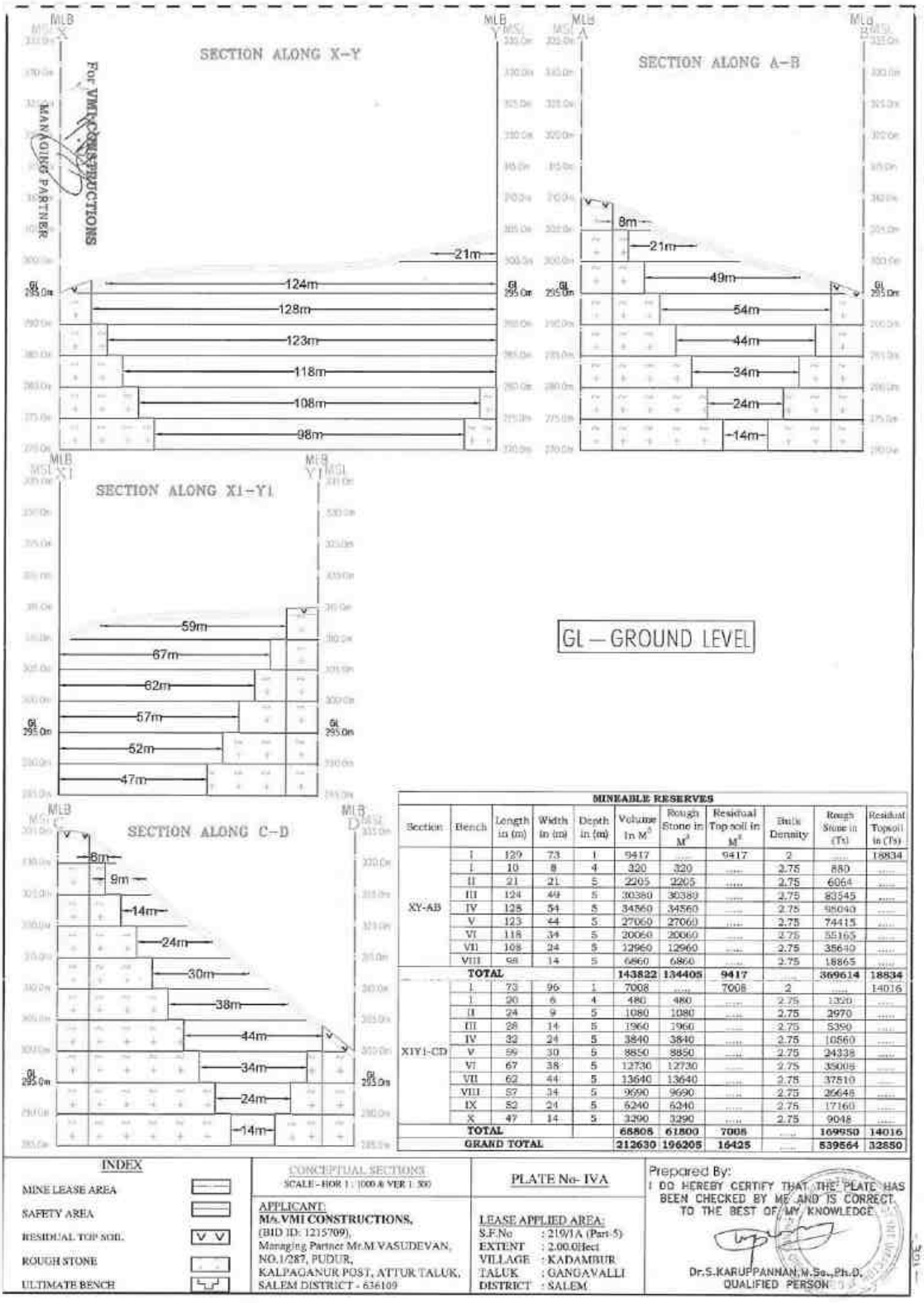


Figure 2.6 Conceptual Plan



Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M³	Rough Stone in M³	Residual Top soil in M³	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
	I	10	8	4	320	320	.....	2.75	880	.....
	II	21	21	5	2205	2205	.....	2.75	6064	.....
	III	124	49	5	30380	30380	.....	2.75	83545	.....
	IV	128	54	5	34560	34560	.....	2.75	95040	.....
	V	123	44	5	27060	27060	.....	2.75	74415	.....
	VI	118	34	5	20060	20060	.....	2.75	55165	.....
	VII	108	24	5	12960	12960	.....	2.75	35640	.....
	VIII	98	14	5	6860	6860	.....	2.75	18865	.....
TOTAL					**143822**	**134405**	**9417**	.....	**369614**	**18834**
XIY1-CD	I	73	96	1	7008	.....	7008	2	.....	14016
	I	20	6	4	480	480	.....	2.75	1320	.....
	II	24	9	5	1080	1080	.....	2.75	2970	.....
	III	28	14	5	1960	1960	.....	2.75	5390	.....
	IV	32	24	5	3840	3840	.....	2.75	10560	.....
	V	59	30	5	8850	8850	.....	2.75	24338	.....
	VI	67	38	5	12730	12730	.....	2.75	35008	.....
	VII	62	44	5	13640	13640	.....	2.75	37510	.....
	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
	IX	52	24	5	6240	6240	.....	2.75	17160	.....
	X	47	14	5	3290	3290	.....	2.75	9048	.....
TOTAL					**66808**	**61800**	**7008**	.....	**169950**	**14016**
GRAND TOTAL					**212630**	**196205**	**16425**	.....	**539564**	**32850**

Figure 2.7 Conceptual Sections

2.6 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 2.16.

Table 2.16 Employment Potential for the proposed project

S. No.	Category	Role	Nos.
1.	Highly Skilled	Mines manager	1
		Mine Geologist	1
		Mines Engineer	1
		Blaster	1
2.	Unskilled	Musdoor/ Labours	16
Total			**20**

Source: Prefeasibility Report

2.7 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 2.17.

Table 2.17 Expected Time Schedule

S. No.	Particulars	Time Schedule (in Months)							Remarks if any
		1st	2nd	3rd	4th	5th	6th	7th	
1	Baseline Environmental Study for preparing EIA report based on the Standard and Specific ToR Conditions								Soil, Water, Air, Noise, Socio Economics, Ecological Biodiversity and Traffic studies to be carried out by NABL accredited Laboratory and FAE's.
2	Draft EIA Report								Submission to TNPCB

3	Public Hearing Meeting								Minutes will be provided by the Tamil Nadu Pollution Control Board.
4	Final EIA Report (including Public reviews)								Submission to PARIVESH 2.0 Portal for obtaining EC
5	SEIAA Meeting								For environmental clearance
Note: 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

3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were carried out within 5km radius of the extraction of rough stone quarry to assess the existing environmental scenario in the area by **Green Link Analytical & Research Lab**, which is MoEF recognized and NABL certified lab. For the purpose of EIA studies, Quarry lease area of rough stone quarry was considered as the core zone and area outside the mine upto 5km radius was considered as buffer zone. The baseline environmental monitoring for various components of environment viz. air, noise, water, land was carried out during **Post Monsoon Season** (**October to December 2025)** in the study area covering 5km radius distance from the rough stone quarry. Other environmental data on flora and fauna, land-use pattern, forest etc. Were also generated through field surveys and secondary information collected from different departments of State Govt. socio-economic survey was conducted, through interaction with the people, medical officers by floating questionnaires and collection of information is supported by census data for demographic structures, amenities and infrastructure availability within the study area.

Study Area

The study area was divided into two zones:

- core zone– Project site cluster and
- buffer zone - 5km radius from the periphery of the cluster

Study area covers 5km radius from the mine located at S.F.No. 219/1A (Part-5) of Kadambur Village, Gangavalli Taluk, Salem District and Tamil Nadu. Except for ecological study, which considers 10km as buffer zone. Both core and buffer zones are taken as the study area briefly given in Table 3.1 & 3.2. The study area map on Topo- sheet is represented in Figure 3.1.

Table 3.1 Classification of study Area

Sl. No	Classification of Study area	Type of Baseline data collection	Environmental Attributes
1	Core Zone (Cluster Lease Area)	Primary Data	Soil Environment, Water Quality, Ambient Air Quality, Noise Levels, Flora Fauna, Socio Economic study.

2	Extended Core Zone (upto 500m radius from the Cluster lease boundary)	Primary and Secondary Data	Soil Environment, Water Quality, Ambient Air Quality, Noise Levels, Flora Fauna, Socio Economic study.
3	Buffer Zone (Cluster lease boundary of 500m to 10km radius)	Primary and Secondary Data	Meteorological Data, Soil Environment, Water Quality (Surface/ Groundwater), Ambient Air Quality, Noise Levels, Flora Fauna, Socio Economic study.

Table 3.2 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	5 (1 in core & 4in 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	5 (3 ground water & 2 Surface water)	IS 10500& CPCB Standards
Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/automatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM_{10} $PM_{2.5}$ SO_2 NO_X	24 hours, twice a week	5 (1 core & 4 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB

*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	5 (1 core & 4 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, Population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

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

Components and Methodology

To achieve the objectives of ToR, NABET approved in Functional Area Experts (FAE) of Geo Technical Mining Solutions- members visited the study area and monitored the environmental parameters in accordance with the Guidelines of EIA, issued by the Ministry of Environment, Forests and Climate Change (MoEF and CC) Government of India. The components of the study are given in Table no. 3.3.

Table No. 3.3 Component of the EIA/EMP studies

Sl. No	Component	Sl. No	Component
1.	Geology & Geomorphology	7.	Air Quality and Meteorology
2.	Land Use & Land Cover	8.	Noise Environment
3.	Hydrogeology	9.	Biological Environment
4.	Soil Environment	10.	Socio-economic Environment
5.	Water Environment	11.	Solid and Hazardous waste
6.	Air Environment	12.	Risk Assessment

3.2 LAND ENVIRONMENT

3.2.1 Geology

Salem is a Geologist's paradise, surrounded by hills and the landscape dotted with hillocks. The district is rich in mineral deposits like Magnesite, Bauxite, Granite, Limestone, Quartz, and Iron ore. Mining and allied industries such as Cement Industry, Refractory Bricks manufacturing, Smelting Plant, etc., thrive well.

The sedimentary rocks of the coastal belt include fluviatile, fluvio-marine and marine sequences, such as Gondwana supergroup, marine sediments of Cauvery basin, Cuddalore /Pannambarai formation and sediments of Quaternary and Recent age. General characteristics of the rocks of this series has recorded that the rocks are in general bluish grey or darkish in colour and extremely fresh in appearance with an even grained granular structure. The compositional characteristics of co-existing orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites- Enderbites such as the granulites and gneisses. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks.

The order of superposition of the proposed area is,

Age	Group	Rock Formation
Recent to Sub recent	----	Top soil
Archaean	Charnockite Group	Charnockites

3.2.2 Geomorphology

The district forms part of the upland region of Tami Nadu with many hill ranges, hillocks and undulating terrain with a gentle slope towards east. The important hill ranges in the district are Yercaud hills, Kanjamalai hills, Godumalai hills and Pachamalai hills. On the basis of image interpretation elements like tone, texture, size, shape, relief, pattern etc., various geomorphological units were identified. They are 1) Alluvial fan 2) Alluvial Plain 3) Pediplen 4) Inselberg 5) Valley fill 6) Flood Plain 7) Dyke. The Gangavalli region is characterised by an ancient, highly dissected Precambrian shield terrain, primarily composed of hard crystalline rocks and structured by significant regional shear zones. The region features dissected pediments and pediplains, indicative of significant erosion overtime.

3.2.3 Land Use/ Land Cover

The study utilizes the reclassified LULC dataset derived from the Advanced Wide Field Sensor (AWiFS) of the Indian Remote Sensing satellite Resourcesat-1 (P6). The data is accessed through the Bhuvan data portal (http://bhuvan.nrsc.gov.in). Sentinel 2-A images acquired in May-June are used for identifying changes. These images are pre-processed to correct atmospheric and radiometric errors ensuring data accuracy. The method calculates the

number of changed pixels within the LULC dataset to assess the intensity of land use and land cover changes. This provides insights into the spatial extent of these changes. Land Use and Land Cover (LULC) map as shown in Figure 3.4 & 3.4a was prepared using Sentinel II image for the study area of 5 km radius. LULC maps were created at five-year intervals from a table (Table 3.4) to track the growth of the built-up area and changes in crop land. Totally 7 LULCs for 5year interval were mapped and the areal extent of each LULC was provided in Table 3.4 & 3.4a is used to study the growth in the built area and crop land changes. To compute the change in percentage (%) using the formula

$$\text{Change in percentage (\%)} = \frac{\textbf{\textit{Present LULC area}} - \textbf{\textit{Previous LULC area}}}{\textbf{\textit{Previous LULC area}}} \; \boldsymbol{x\ 100}$$

In 2015 agriculture was identified as the main land use in the study area is 6034ha. Bare lands were identified as the second largest 1690ha land use followed by built-up area of 546 ha. Following a similar structure as that used in 2015 the unsupervised LULC classification from the satellite images in 2020 and 2025 resulted in the identification of 6 LULC types. More than 60% of the area was dominated by dry agricultural lands. Comparisons between the multiple-temporal datasets 2015, 2020 & 2025 revealed several changes in land-use configuration. The reason for the fall in crop land is due to the decreased agricultural facility and people getting involved in the industries than agriculture and also the decreasing price of crops. The minor change that has occurred in this study area is the buildup area. The reason behind this change may be the fast and good transportation system and the good environment for industrial development. Despite of increasing wetland area due to abandoned.

Table 3.4 LULC Statistics of the Study Area

S. No.	Classification	2025	
		Area (ha)	Area (%)
1	Waterbodies	0.6	0.01
2	Vegetation	1280.6	15.67
3	Crop Land	5286.5	64.67
4	Mining/Industrial area	24.2	0.30
5	Built-up Area	620.9	7.60
6	Bare land	2.6	0.03
7	Fallow land	958.8	11.73
Total		**8174.2**	**100**

Source: Sentinel II Satellite Imagery

Comparative study of Land Use Land Cover (LULC) Changes within 5km Radius (2020 vs 2025) was done and no any significant changes in land use and land cover were observed (Table 3.2a). Crop land has decreased from 5332.80ha (65.24%) to 5286.5ha (64.67%), indicating the decrease in agricultural activities, this change is due to the increase in

diverse economic activities than agriculture and source of irrigation is uncertain. But that cultivation land is included in the bare ground and fallow land whose extent have been increased. Mining activity has been increased to a little extent from 19.90 ha (0.24%) to 24.2 ha (0.30%), suggesting increased demand of building materials for various infrastructure developments. The decrease in common vegetation has noticed of 1398.72 ha (17.11%) to 1280.6 ha (15.67%) in last five years due to rise of urbanization as result of increase in mining or other industrial activities in the region. Built-up areas also rose from 479.93 ha (5.87%) to 620.9 ha (7.60%), pointing out the urban development due to increase in economic activity. In fact, the agricultural land has been reduced of an insignificant extent but that too included in fallow land which can be again add up in the agriculture land in future. The rise of unclassified water bodies shows an increase in the region because of accumulation of rainwater in the mined-out pits which serves as reservoir for nearby villages.

Table 3.4a Comparison of LULC Statistics of the 5km Radius

S. No.	Classification	2020		2025	
		Area (ha)	Area (%)	Area (ha)	Area (%)
1	Water Bodies	0.02	0.0	0.6	0.01
2	Vegetation	1398.72	17.11	1280.6	15.67
3	Crop Land	5332.80	65.24	5286.5	64.67
4	Mining	19.90	0.24	24.2	0.30
5	Built up lands	479.93	5.87	620.9	7.60
6	Bare land	0.0	0.0	2.6	0.03
7	Fallow land	942.65	11.53	958.8	11.73
Total		**8174.2**	**100**	**8174.2**	**100**

Source: Sentinel II Satellite Imagery

3.2.4 Topography

The proposed lease area is an elevated terrain with an average elevation of 40m above ground level. The maximum elevation of 335m was observed in southwest and minimum of 295m in northeast of the proposed area. The area falls in Survey of India, toposheet no. 58 I/10. In general, the landscape of the region is a result of ancient, hard rock geology heavily influenced by millions of years of tectonic forces and subsequent weathering and riverine processes.

3.2.5 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 taluk is part of Vellar river basin, with major rivers like Vasishta Nadi and Swetha Nadi (tributaries of Vellar) flowing eastward through the wider district. The weathered and fractured zones in the granites and charnockites form the major water-bearing formations (aquifer) in the area. The proposed area shows dendritic drainage pattern with first-order streams indicating well drained area and uniform lithology beneath the surface, as shown in Figure 3.4. Narrow extents of alluvium along river courses also contribute to the groundwater potential.

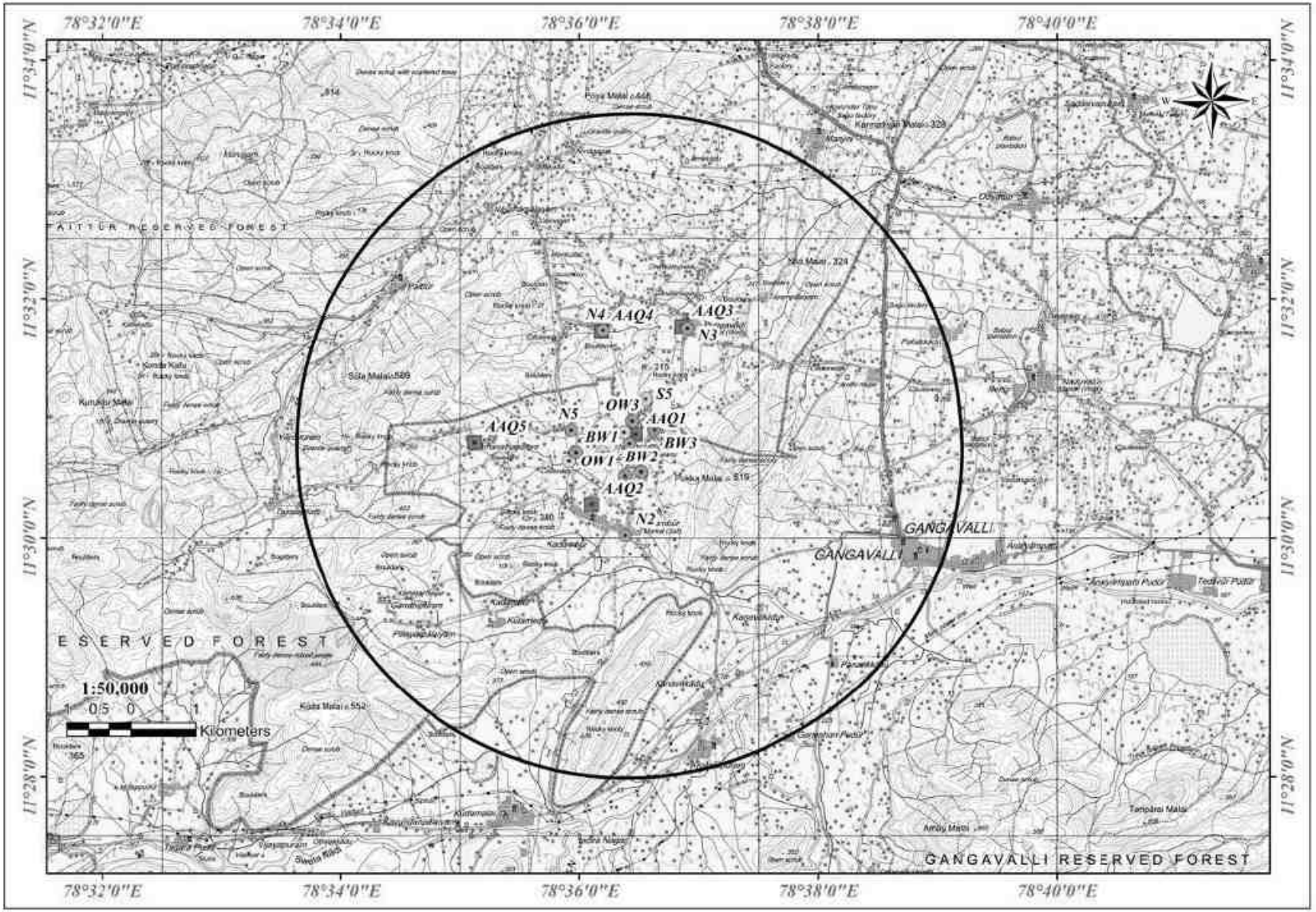


Figure 3.1. Topographical Map of 5km Radius Study Area

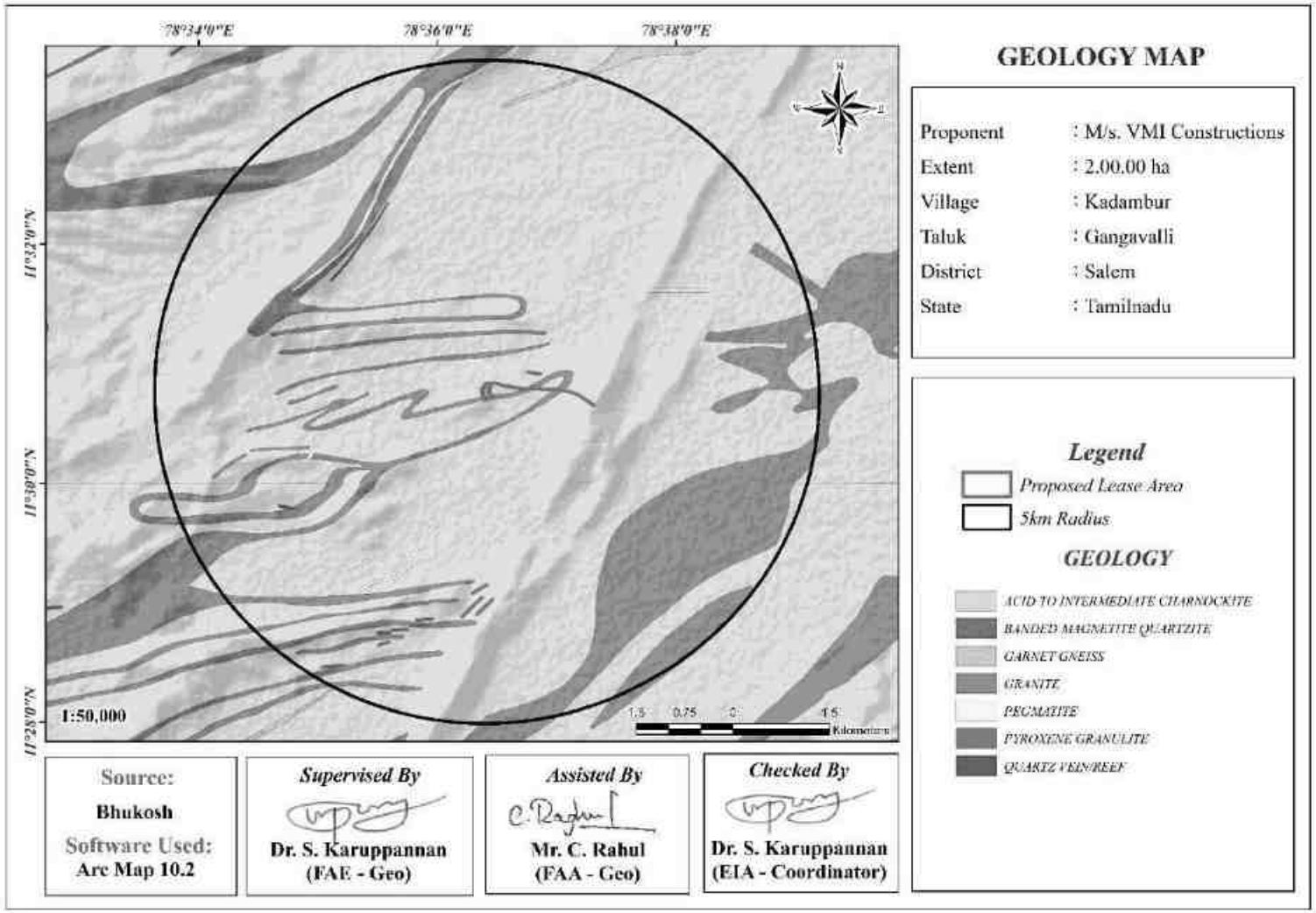


Figure 3.2 Geology Map of 5 km Radius from Proposed Project Site

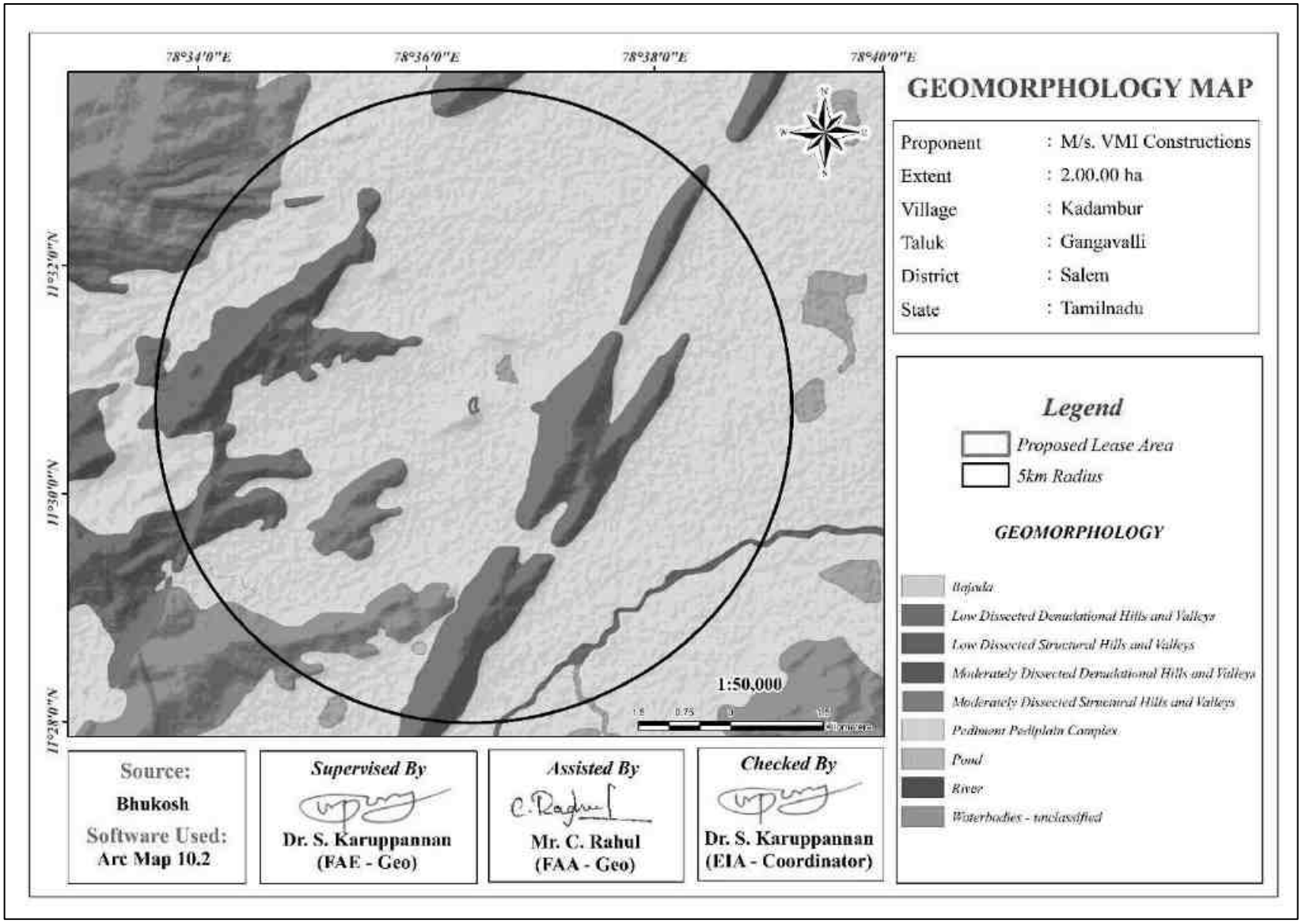


Figure 3.3 Geomorphology Map of 5 km Radius from Proposed Project Site

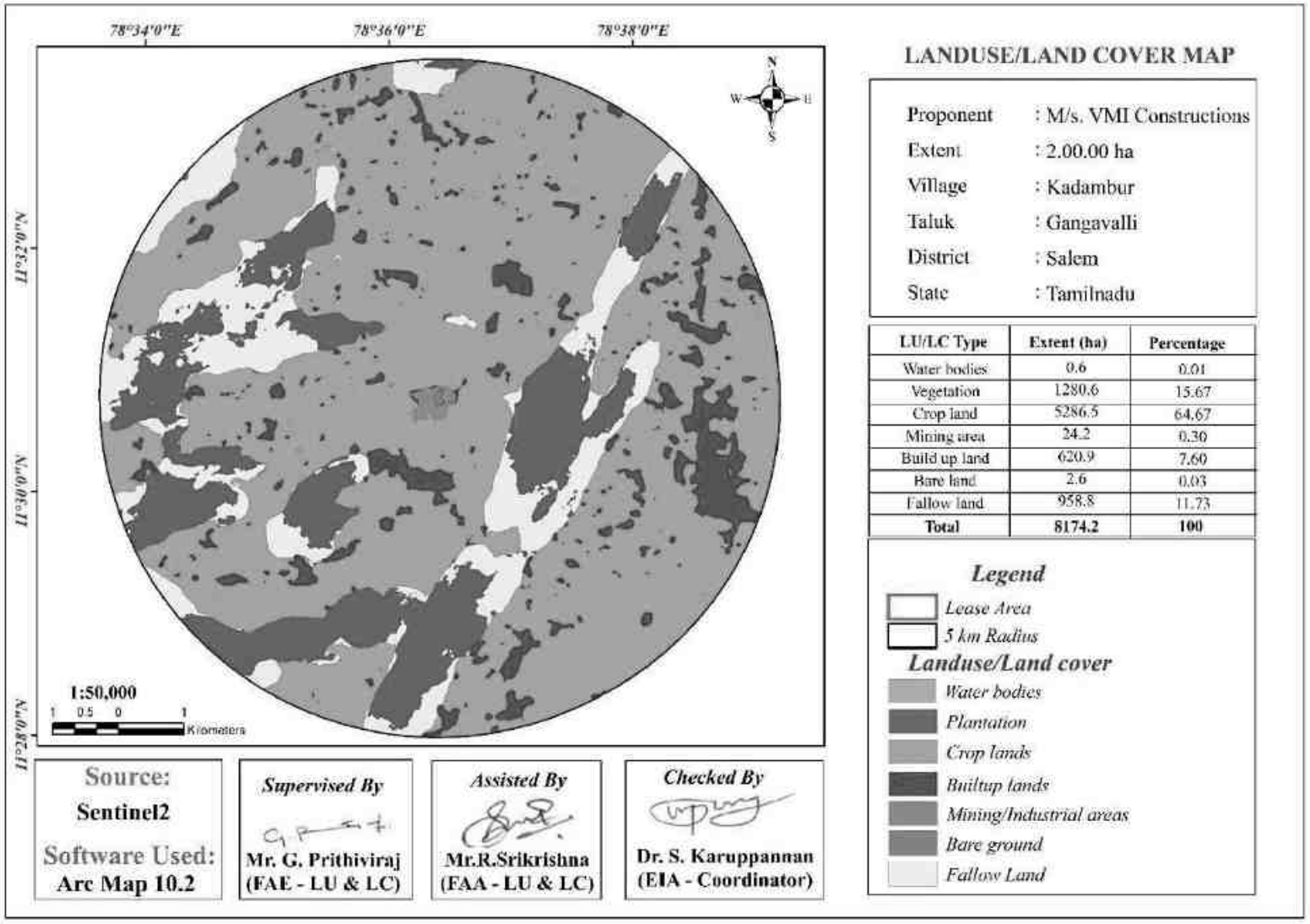


Figure 3.4 LULC Map of 5 km Radius from Proposed Project Site

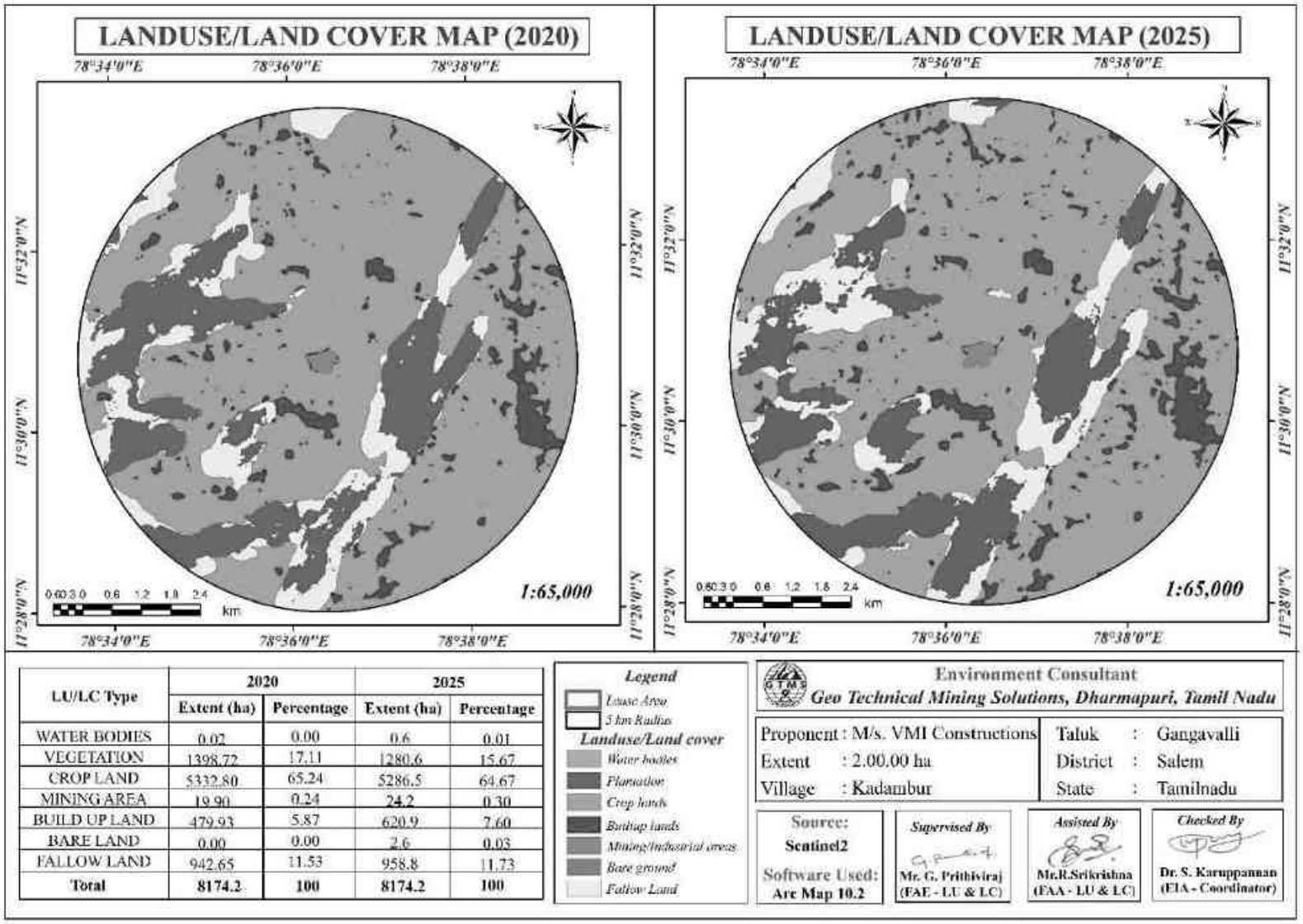


Figure 3.4a Comparison of LULC in 5 km Radius around Proposed Site (2020 & 2025)

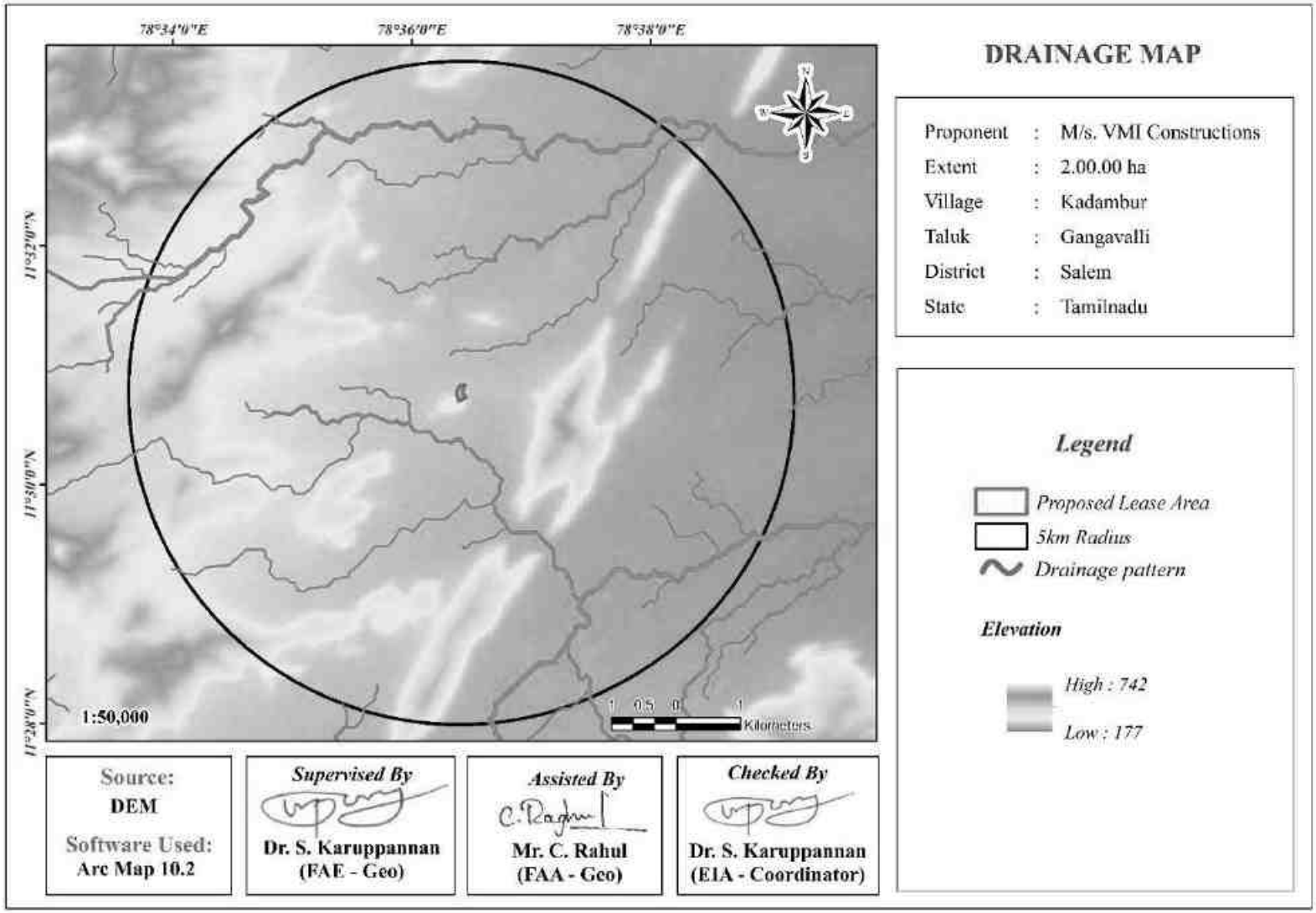


Figure 3.5 Drainage Map of 5 km Radius from Proposed Project Site

Seismic Sensitivity

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

3.3 SOIL ENVIRONMENTAL

The composite soil samples were collected from the 5- locations of the study area and analysed for different parameters. Auger instrument is used to collect samples at the desired depth typically 6-8 inches. The soil samples were placed in rigid paper bags, labelled and then subjected to air drying and sieving in the laboratory. This process ensures the samples are suitable for assessing macro and micronutrients as well as physicochemical properties. The locations of the sampling sites were given in Table 3.5 and shown in Figure 3.7.

Table 3.5 Soil Sampling Locations

Location code	Monitoring Locations	Distance in km	Directions	Coordinates	
				Latitude	Longitude
S1	Core	0.12	NW	11°30'53.01"N	78°36'22.32"E
S2	Kadambur	0.92	SW	11°30'18.25"N	78°36'5.50"E
S3	Pungavadi	1.89	NNE	11°31'46.64"N	78°36'50.53"E
S4	Paithur	1.68	NNW	11°31'42.83"N	78°36'11.19"E
S5	Ramanathapuram	2.24	W	11°30'48.66"N	78°35'8.86"E

Source: On-site monitoring/sampling Green Link Analytical & Research Lab, in association with GTMS.

3.3.1 Physical Characteristics & Chemical Characteristics

1. Soil pH and Electrical Conductivity (EC):

- **pH ranged from 6**.91 to 9.21 indicating that the soil is **neutral to alkaline**, which is favourable for most crops.
- **EC** value ranged from 71.0 to 180.0µS/cm, suggesting low salt concentration and non-saline soil across the sampling area.

2. Physical Properties

- **Bulk Density** values ranged from 1.19 to 1.38kg/cm^3, which are within the typical range for loamy soils and support good root penetration and aeration.

3. Soil Fertility Status:

- **Total Organic matter** levels ranged from 0.82 to 1.40% by weight, classifying soils as low to moderately fertile in terms of organic matter.

- **Nitrogen (N)** content varied from 188.0 to 368.0kg/ha by mass indicating moderate nitrogen availability.
- **Potassium (K)** ranged from 110.0 to 214.0kg/ha by mass moderate fertility potential in terms of potassium.

4. **Base Elements and Cation Ratios:**

- **Calcium (Ca)** levels were highest with 140mg/kg and lowest with 90.0 mg/kg.
- **Magnesium (Mg)** ranged from 48.0 to 72.0mg/kg.

Conclusion:

The soils in the study area are generally non- saline, neutral to slightly alkaline, and moderately fertile with low contamination levels. They exhibit good permeability, porosity, and suitable textural classes for agriculture and greenbelt development. The absence of heavy metals confirms that baseline soil conditions are unpolluted and safe for reclamation and vegetation growth.

Table 3.6 Assigning Scores to Soil Quality Indicators

Soil Quality Score							
S. No.	OM	BD	pH	CEC	EC	**Total Score**	**Recommendation**
S1	30	12	12	6	10	70	The Soil Requires Major and Immediate Treatment
S2	30	2	12	2	10	56	
S3	30	2	18	6	10	66	
S4	30	2	18	6	10	66	
S5	30	2	12	6	10	60	
S6	30	6	18	6	10	70	

Organic Matter- (%- 0.1 to 2.0- 15), (2.5 to 3.5- 20), (3.5 to 5.0- 25), Bulk Density- (0.64 to 0.92- 6), (0.92 to 0.98- 3), (0.98> - 1) pH- (5.8 to 7.3- 9), (7.3 to 8.0- 6), (8.0> - 3), Electrical Conductivity-dS/m (<0.98- 5), (0.98 to 1.71- 3), (1.71> - 1)

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

Source: PSS-2262_Soil_Quality_Monitoring.pdf (okstate.edu).

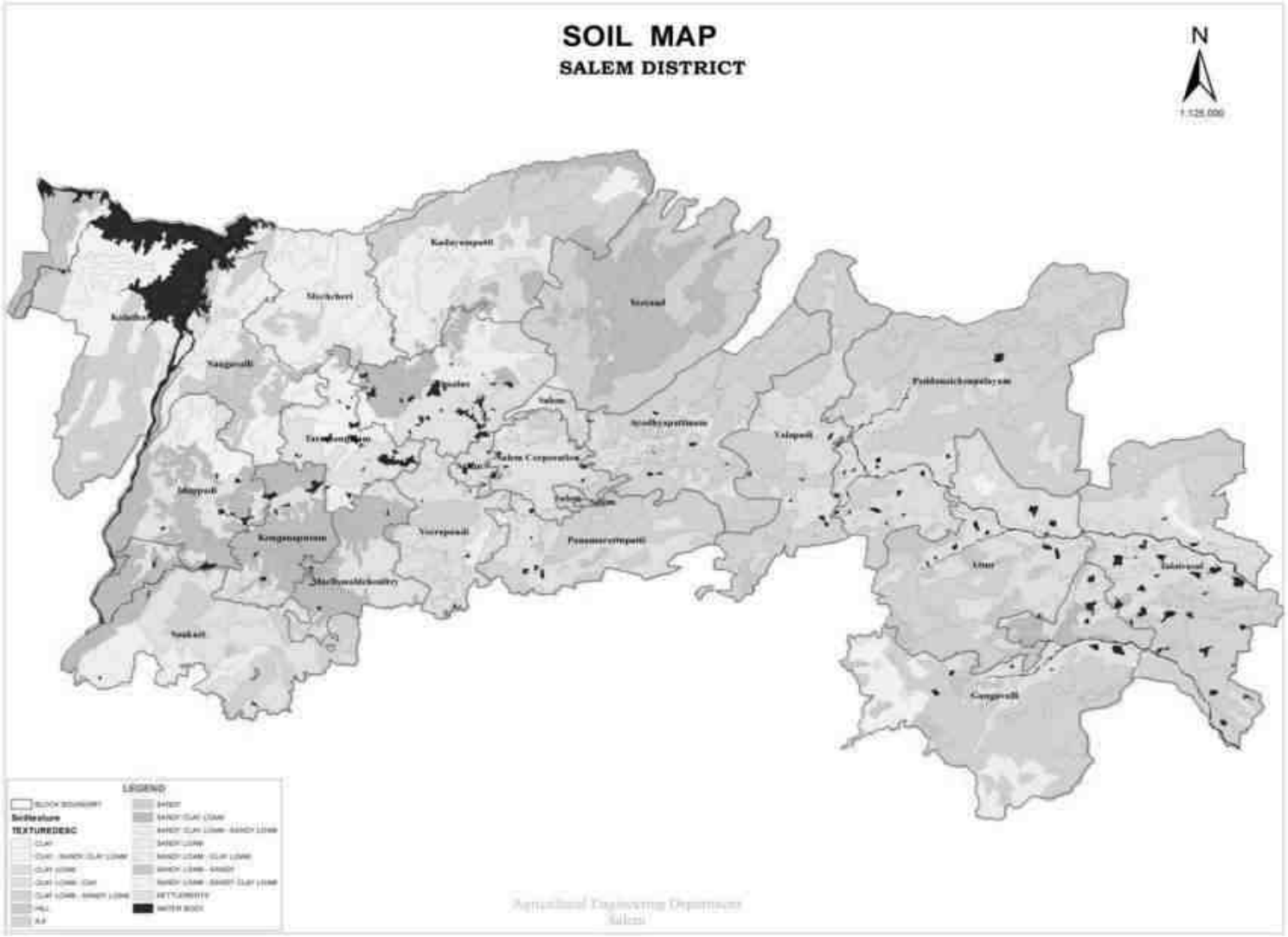


Figure 3.6 Soil Map of Salem District

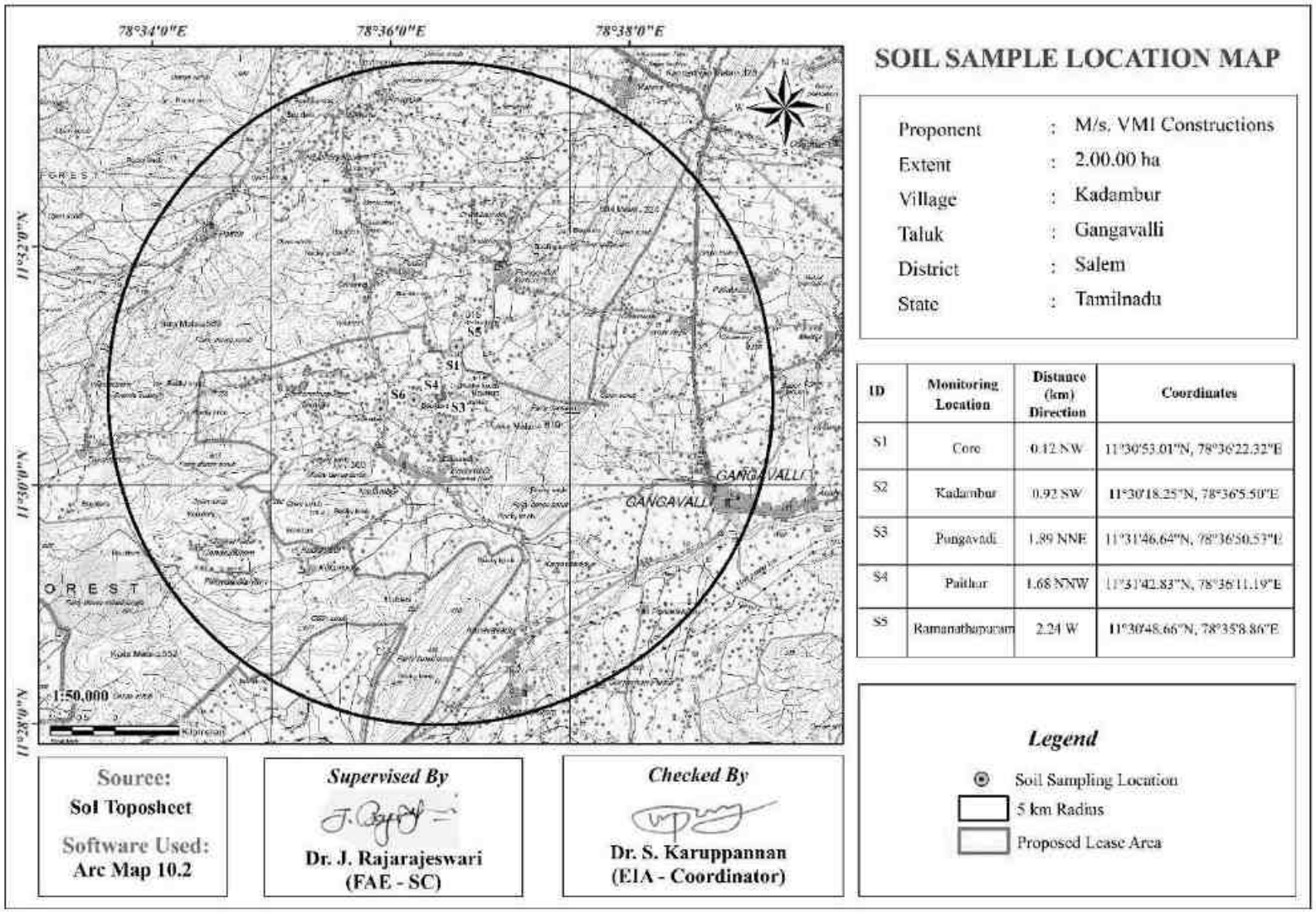


Figure 3.7 Map Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.6a Soil Quality of the Study Area

S. No	Parameters	Units	S1	S2	S3	S4	S5
1.	pH value @ 25°C	-	9.21	7.07	6.91	7.35	7.51
2.	Electrical Conductivity	µS/cm	71.0	104.0	135.0	158.0	180.0
3.	Total Organic Carbon	%	0.82	1.25	1.14	1.35	1.40
4.	Available Nitrogen	Kg/ha	196.0	230.0	188.0	368.0	296.0
5.	Available Potassium	Kg/ha	110.0	118.0	130.0	214.0	188.0
6.	Available Phosphorous	mg/kg	21.0	29.0	32.0	60.0	68.0
7.	Available Calcium	mg/kg	98.0	104.0	90.0	128.0	140.0
8.	Available Magnesium	mg/kg	62.0	60.0	48.0	72.0	62.0
9.	Moisture	%	1.18	1.26	1.89	5.14	8.18
10.	Organic Matter	%	1.42	2.20	1.98	2.40	2.48
11.	Chloride	mg/100g	22.0	34.0	25.0	40.0	51.0
Non- NABL							
12.	Bulk Density	Kg/cm^3	1.22	1.35	1.20	1.38	1.19
13.	Sand	%	23.56	22.18	21.78	22.45	23.17
14.	Clay	%	24.11	24.87	24.96	24.67	24.75
15.	Slit	%	22.18	23.64	24.15	23.18	22.96
16.	Porosity	%	22.96	23.17	23.56	23.98	23.54
17.	Copper as Cu	ppm	10.58	12.47	15.47	18.96	11.54
18.	Nickel as Ni	ppm	0.185	0.158	0.212	0.251	0.175
19.	Zinc as Zn	ppm	14.50	16.21	10.68	12.47	9.13
20.	Iron as Fe	ppm	960.0	870.0	1140.0	930.0	1040.0
21.	Lead as Pb	ppm	18.96	15.74	10.70	11.29	8.54

Source: Sampling Results by Green Link Analytical & Research Lab, in Association with GTMS.

3.4 WATER ENVIRONMENT

The study aims to establish a baseline understanding of the current water quality both surface and groundwater in the area recognizing the crucial role these resources play in its development. This involves assessing the existing water quality to understand its suitability for various uses and to identify potential issues or areas of concern. The water sample collected locations were given in Table 3.7 as well as in Figure 3.8.

Table 3.7 Water Sampling Locations

Sampling ID	Location	Distance (km)	Direction	Latitude	Longitude
GW1	Near lease	0.31	SE	11°30'35.36"N	78°36'31.45"E
GW2	Paithur	1.90	NW	11°31'43.93"N	78°35'54.42"E
GW3	Kadambur	1.15	SW	11°30'16.11"N	78°35'56.39"E
SW1	Swetha River	4.12	SE	11°29'9.16"N	78°38'1.72"E
OW1	kadambur	1.90	W	11°30'44.93"N	78°35'20.03"E

Source: Sampling locations by Green Link Analytical & Research Lab, in Association with GTMS.

The analysis of water samples involved several steps sample storage, field measurements and laboratory titrations. Polypropylene containers were used for storage pre-washed with hydrochloric acid and distilled water. Standard methods (APHA 1999) were applied for water analysis including pH and electrical conductivity (EC) measurements in the field and titrimetric analysis for hardness, calcium, magnesium and chloride. Sodium and potassium were quantified using a flame photometer. All results except pH and EC are reported in mg/l with EC measured in µS/cm at 25°C.

3.4.1 Water Consumption and Sources:

The water consumption in this opencast mine is mostly used for dust suppression by water sprinkling on haulage road, afforestation and domestic use etc.

Sl. No	Activities	Average demand (m^3 /day)	Peak demand (m^3 /day)
1	Drinking water	0.2	0.2
2	Utilized Water	0.8	0.8*
3	Dust suppression	1.0*	2.0
4	Green Belt	1.0*	0.5*
	Total	**3.0***	**3.5***

*Water for dust suppression and afforestation may not be required for four to five months during the monsoon

- The water required for quarrying activities shall be drawn from the Rainwater Harvesting Ponds and from nearby old pits.
- 4-5 months during the monsoon season, water is not required for dust suppression.
- Packed drinking water shall be provided at site for workers.

Table 3.8 Nearest Water Bodies

S. No	Location	Distance (km)	Direction
1	Pungavadi Lake	0.42km	NE
2	Swetha River	4.12km	SE
3	Naduvalur tank	5.38km	E
4	Othaiyathur Tank	6.86km	NE

3.4.2 Ground Water Quality Resources and Result

1. Barium, Boron, Copper, Lead, Mercury, Arsenic, Chromium, Zinc– All "Below Detection Limit (BDL)"

- These are toxic heavy metals. Their presence in groundwater is usually due to industrial effluents or natural geogenic sources (minerals in rocks).
- Since all are below detection limits, there is no sign of industrial or geogenic contamination from these toxic metals.
- This is positive from an environmental and health risk perspective.
- Interpretation: No heavy metal pollution.

2. Calcium (32.0– 166.0mg/l)

- Calcium contributes to hardness of water. High calcium makes water hard but is not harmful.
- Acceptable limit is 75mg/l, permissible up to 200 mg/l.
- Slightly above acceptable but within limits.
- Interpretation: Slightly hard water, no major concern.

3. Magnesium (10.0 – 120.0mg/l)

- Also contributes to water hardness.
- BIS acceptable limit: 30 mg/l (permissible up to 100 mg/l).
- Some samples exceed acceptable but are still under permissible limits.
- Interpretation: Water is moderately hard, but usable.

4. Chloride (45.0 – 815.0mg/l)

- High chloride affects taste and can cause corrosion in pipelines.
- Acceptable limit: 250mg/l; permissible up to 1000mg/l.

- Your values are slightly above the acceptable limit but safe.
- Interpretation: Mild salinity- may affect taste but not health.

5. Fluoride (0.72 – 0.96mg/l)

- Fluoride is beneficial in small quantities but harmful in excess (>1.5 mg/l causes fluorosis).
- All values are below the 1.0mg/l limit.
- Interpretation: No risk of dental or skeletal fluorosis.

6. Nitrate (BDL (DL-0.1))

- Nitrates come from agricultural runoff or sewage.
- Safe limit is 45 mg/l (to avoid blue baby syndrome in infants).
- Your values are below the limit.
- Interpretation: No significant nitrate pollution.

7. pH (7.05 – 7.99)

- pH is 6.5–8.5 for drinking water.
- All values within this range.
- Interpretation: Neutral pH, no corrosion or scaling tendency.

8. Total Dissolved Solids (TDS) (280.0 – 1020mg/l)

- TDS represents total minerals and salts in water.
- Acceptable limit is 500 mg/l; permissible up to 2000 mg/l.
- BW01, BW03, and BW05 exceed the acceptable but are within permissible.
- Interpretation: Slightly mineral-rich water; taste may be affected but safe to use.

9. Electrical Conductivity (EC) (510 – 3400µS/cm)

- Indicates overall ionic concentration in water.
- Higher EC = higher salinity.
- EC > 1000 µS/cm (in BW01 and BW05) suggests moderately saline water.
- Interpretation: Suitable for irrigation, but may need softening for drinking.

10. Total Alkalinity (160 – 360mg/l)

- Indicates the buffering capacity (resistance to pH change).
- Acceptable: 200 mg/l; Permissible: 600 mg/l.
- High alkalinity may indicate presence of bicarbonates/carbonates.
- Interpretation: Alkaline nature is common in groundwater. No health issue but may affect taste.

11. Total Hardness (TH) (120 – 808.0mg/l)

- Acceptable: 200 mg/l; Permissible: 600 mg/l.
- TH > 200 (BW03, OW01) means moderately hard water.
- Interpretation: May require softening for household use.

12. Turbidity (<0.1 NTU) and Colour (<1 CU)

- Very clear water, no suspended solids.
- Interpretation: Visually and physically very good water quality.

13. Silica (10.0 – 50.0mg/l)

- No BIS standard, but useful for understanding scaling potential in boilers and pipes.
- Normal in groundwater.
- Interpretation: No concern.

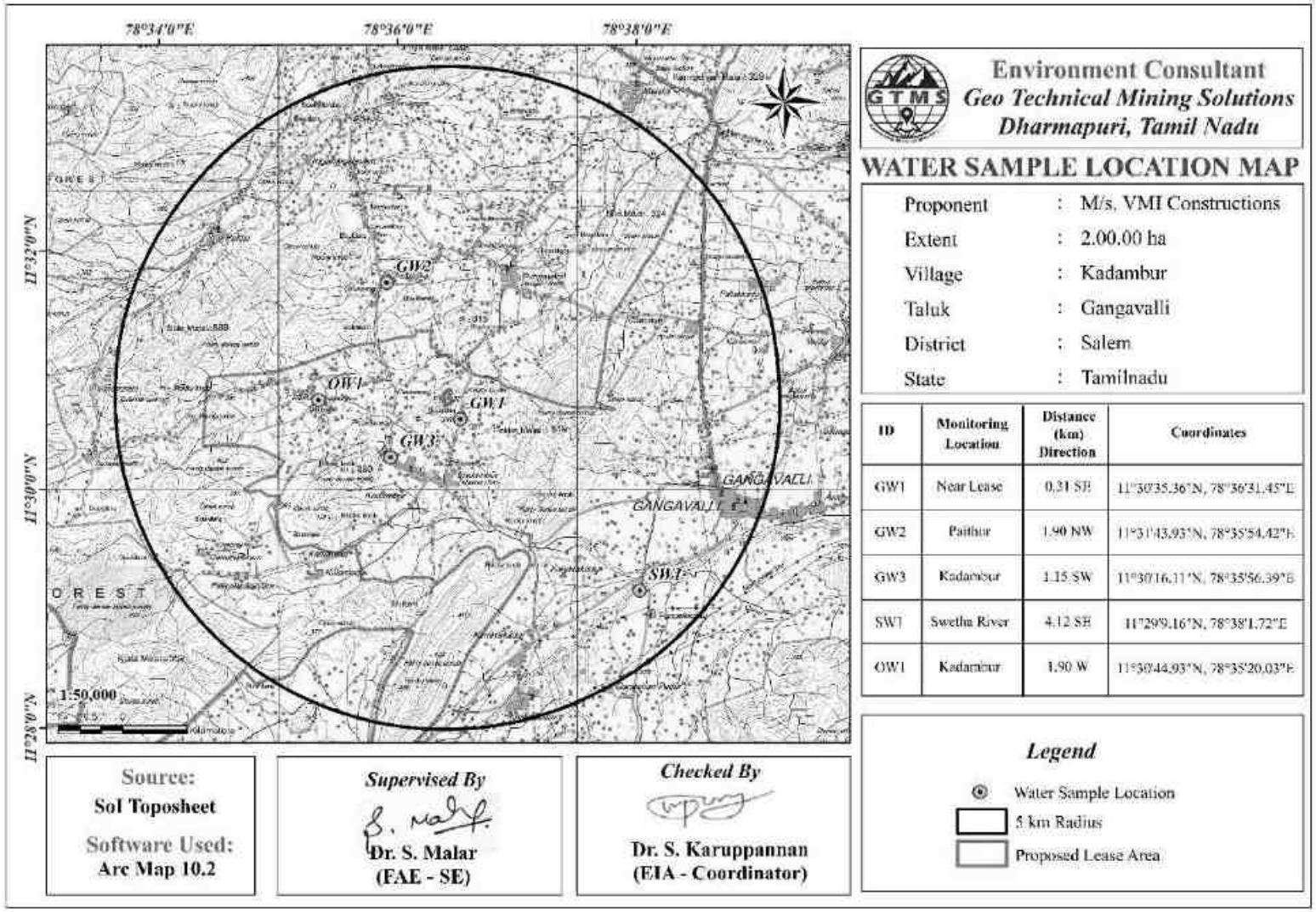


Figure 3.8 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.9 Water Quality Result

S. No.	Parameters	Units	GW01	GW02	GW03	SW04	OW05	As per IS 10500:2012	
								Acceptable Limit	Permissible Limit
1.	pH value @ 25°C	-	7.50	7.41	7.22	7.05	7.99	6.5-8.5	6.5-8.5
2.	Total Dissolved Solids	mg /L	1020	960.0	840.0	280.0	500.0	500	2000
3.	Electrical Conductivity	µS/cm	1670	1480	1350	510.0	3400	-	-
4.	Turbidity	NTU	<0.1	<0.1	<0.1	<0.1	<0.1	1.0	5.0
5.	Colour	Hazen	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	15
6.	Calcium (Ca)	mg /L	126.0	120.0	124.0	32.0	166.0	75	2000
7.	Magnesium (Mg)	mg /L	55.9	88.0	73.0	10.0	92.0	30	100
8.	Chloride (Cl)	mg /L	239.0	198.0	180.0	45.0	242.4	250	600
9.	Sulphates (SO_4)	mg /L	340.0	234.0	212.0	28.0	248.0	250	600
10.	Silica (SiO_2)	mg /L	38.0	30.0	26.0	10.0	50.0	-	-
11.	Total Residual Chlorine	mg /L	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	0.2	1.0
12.	Sodium (Na)	mg /L	110.0	92.0	78.0	18.0	64.0	-	-
13.	Total Hardness	mg /L	545.0	535.0	560.0	120.0	575.0	200	600
14.	Total Alkalinit($CaCO_3$)	mg /L	360.0	340.0	280.0	160.0	360.0	200	600
15.	Fluoride (F)	mg /L	0.96	0.91	0.88	-	-	<1.0	1.0
16.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
17.	Taste	-	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Disagreeable	Agreeable	Agreeable
18.	Total Solids	mg /L	1032	970.0	848.0	312.0	2035	-	-
19.	Dissolved Oxygen	mg /L	5.2	5.0	5.6	5.8	5.2	-	-
20.	Phosphorous	mg /L	3.2	2.6	1.8	0.6	3.0	-	-
21.	Potassium	mg /L	56.0	48.0	36.0	7.0	32.0	-	-
22.	Nitrate (NO_3)	mg /L	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	-	-
23.	Phenolphthalein Alkalinity ($CaCO_3$)	mg /L	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.1)	200	200
24.	Total Coliform	CFU/ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent
25.	E- Coli	CFU/ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent

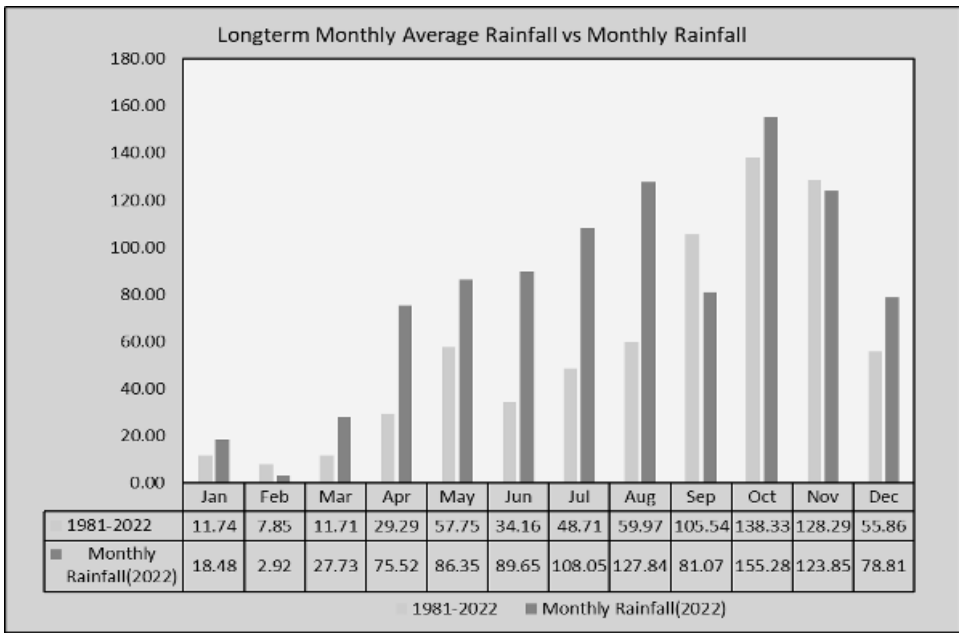
*Source: On-site monitoring/sampling **Green Link Analytical & Research Lab**, in association with GTMS.*

3.4.4 Hydrogeological Studies

The area within a 1.0km radius has numerous open and deep wells and groundwater level data were collected from both types of wells across two monsoon seasons. This data collection approach allows for a comprehensive understanding of groundwater behaviour in the region considering the variations in well types and seasonal influences.

3.4.4.1 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 1981-2021 and compared with the monthly rainfall for the year 2022, shown in Figure 3.7. The Figure 3.7 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in April through August and October of 2022 is higher than the previous years.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981-2022	11.74	7.85	11.71	29.29	57.75	34.16	48.71	59.97	105.54	138.33	128.29	55.86
Monthly Rainfall(2022)	18.48	2.92	27.73	75.52	86.35	89.65	108.05	127.84	81.07	155.28	123.85	78.81

Figure 3.9 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.4.4.2 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2km radius around the proposed project sites for the period from March through May 2025 (Pre-Monsoon Season) and from October through December 2025, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 16.2 to 19.5 m BGL in pre monsoon and 13.5 to 16.7 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December (Post- Monsoon Season) vary from 69.7 to 75.6 m and from 73.8 to 78.0 m for the period of March through May, (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

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

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2025	Apr-2025	May-2025	Average		
DW01	17.9	18.6	19.3	18.6	11°30'30.80"N	78°35'33.67"E
DW02	15.5	16.2	16.9	16.2	11°29'51.27"N	78°36'17.18"E
DW03	15.9	16.7	17.5	16.7	11°30'11.40"N	78°36'47.47"E
DW04	18.6	19.5	20.4	19.5	11°31'0.56"N	78°35'33.64"E
DW05	16.5	17.4	18.2	17.4	11°31'40.61"N	78°36'6.15"E
DW06	15.9	16.6	17.7	16.7	11°31'27.49"N	78°37'3.72"E
DW07	16.7	17.5	18.3	17.5	11°30'19.96"N	78°36'12.94"E
DW08	17.3	17.9	18.6	17.9	11°31'18.93"N	78°36'23.36"E
DW09	16.7	17.8	18.5	17.7	11°30'49.19"N	78°36'51.62"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2025	Nov- 2025	Dec-2025	Average		
DW01	17.2	16.5	15.6	16.4	11°30'30.80"N	78°35'33.67"E
DW02	14.3	13.4	12.7	13.5	11°29'51.27"N	78°36'17.18"E
DW03	14.8	13.7	12.9	13.8	11°30'11.40"N	78°36'47.47"E
DW04	17.5	16.8	15.8	16.7	11°31'0.56"N	78°35'33.64"E
DW05	15.4	14.6	13.7	14.6	11°31'40.61"N	78°36'6.15"E
DW06	14.7	13.5	12.6	13.6	11°31'27.49"N	78°37'3.72"E
DW07	15.5	14.6	13.4	14.5	11°30'19.96"N	78°36'12.94"E
DW08	16.2	15.6	14.8	15.5	11°31'18.93"N	78°36'23.36"E
DW09	15.8	14.7	13.6	14.7	11°30'49.19"N	78°36'51.62"E

Source: Onsite monitoring data

Table 3.12 Pre- Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2025	Apr-2025	May- 2025	Average		
BW01	75.6	76.3	77.2	76.4	11°30'13.99"N	78°35'50.52"E
BW02	71.5	72.8	73.9	72.7	11°31'40.97"N	78°37'1.73"E

BW03	75.5	76.7	77.8	76.7	11°30'40.77"N	78°35'25.43"E
BW04	74.2	75.4	76.8	75.5	11°31'43.91"N	78°35'54.32"E
BW05	72.6	73.8	75.1	73.8	11°31'1.71"N	78°36'53.92"E
BW06	76.8	77.9	79.2	78.0	11°31'8.70"N	78°35'33.57"E
BW07	73.8	75.1	76.8	75.2	11°31'26.18"N	78°36'22.41"E
BW08	74.9	76.2	77.5	76.2	11°30'48.03"N	78°36'11.10"E
BW09	72.9	74.3	75.8	74.3	11°30'19.45"N	78°36'40.25"E

Source: Onsite monitoring data

Table 3.13 Post- Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2025	Nov-2025	Dec-2025	Average		
BW01	75.2	73.9	72.1	73.7	11°30'13.99"N	78°35'50.52"E
BW02	71.1	69.8	68.2	69.7	11°31'40.97"N	78°37'1.73"E
BW03	74.8	73.7	71.2	73.2	11°30'40.77"N	78°35'25.43"E
BW04	73.8	72.6	71.8	72.7	11°31'43.91"N	78°35'54.32"E
BW05	72.1	70.8	69.5	70.8	11°31'1.71"N	78°36'53.92"E
BW06	76.5	75.8	74.6	75.6	11°31'8.70"N	78°35'33.57"E
BW07	73.3	72.1	70.7	72.0	11°31'26.18"N	78°36'22.41"E
BW08	74.4	73.2	71.9	73.2	11°30'48.03"N	78°36'11.10"E
BW09	72.6	71.5	69.9	71.3	11°30'19.45"N	78°36'40.25"E

Source: Onsite monitoring data

The water samples were collected from both borewells and dug wells during the pre-monsoon and post-monsoon in order to understand the water table dynamics within 2km radius of the lease area. After interpreting the observed values of water table depths in the sampling locations gradual variations in the depths were inferred from pre-monsoon to the post monsoon (Table 3.10 to 3.13). But this variation might be the usual due to differential downpour in the region. The uncertainty of the monsoon plays a vital role in the fluctuation of water depths in and around the lease area. As mentioned in rainfall data (1981-2021) and 2022, the region experiencing higher rainfall during the months of September to November than the other months of the year. The difference in depth of water table of open wells and borewells in the sampling locations exposes a gradual increase during the pre-monsoon and evidencing the decrease in depth during the post monsoon. This shows the rainfall influencing the water table of the region by the recharging the water bearing bodies naturally and regularly. And can be concluded that, mining activities has no impact on the quality and quantity of ground water in and around the lease area.

Water Balance management in site

A sustainable eco-friendly water management strategy will be adopted in this project. Since the water requirement during the mining period is estimated about 3.0KLD for drinking,

domestic and sanitary needs, creation and maintenance of green belt and for sprinkling purposes. The drinking water must be pure and safe, so it will be outsourced from nearby vendors/RO water plant will be installed in the site. The artificial rainwater harvesting structures are planned in and around the site. The excavated pits nearby the site will be connected by the garland drain system and water will be stored and this water will be utilised for the green belt maintenance and dust suppression sprinkling purpose. The rooftop harvesting structure is also planned from the labour sheds and other structures will be connected to the nearby excavated pits and utilised. These implementations will reduce the dependency of water from the nearby borewells and open wells. According to the soil resistivity data of the region, few locations are porous and permeable in nature. It will help in infiltration of rainwater and recharge the aquifer naturally during monsoon. This sustainable strategy will be helpful in maintaining the water balance within 2km radius of project site.

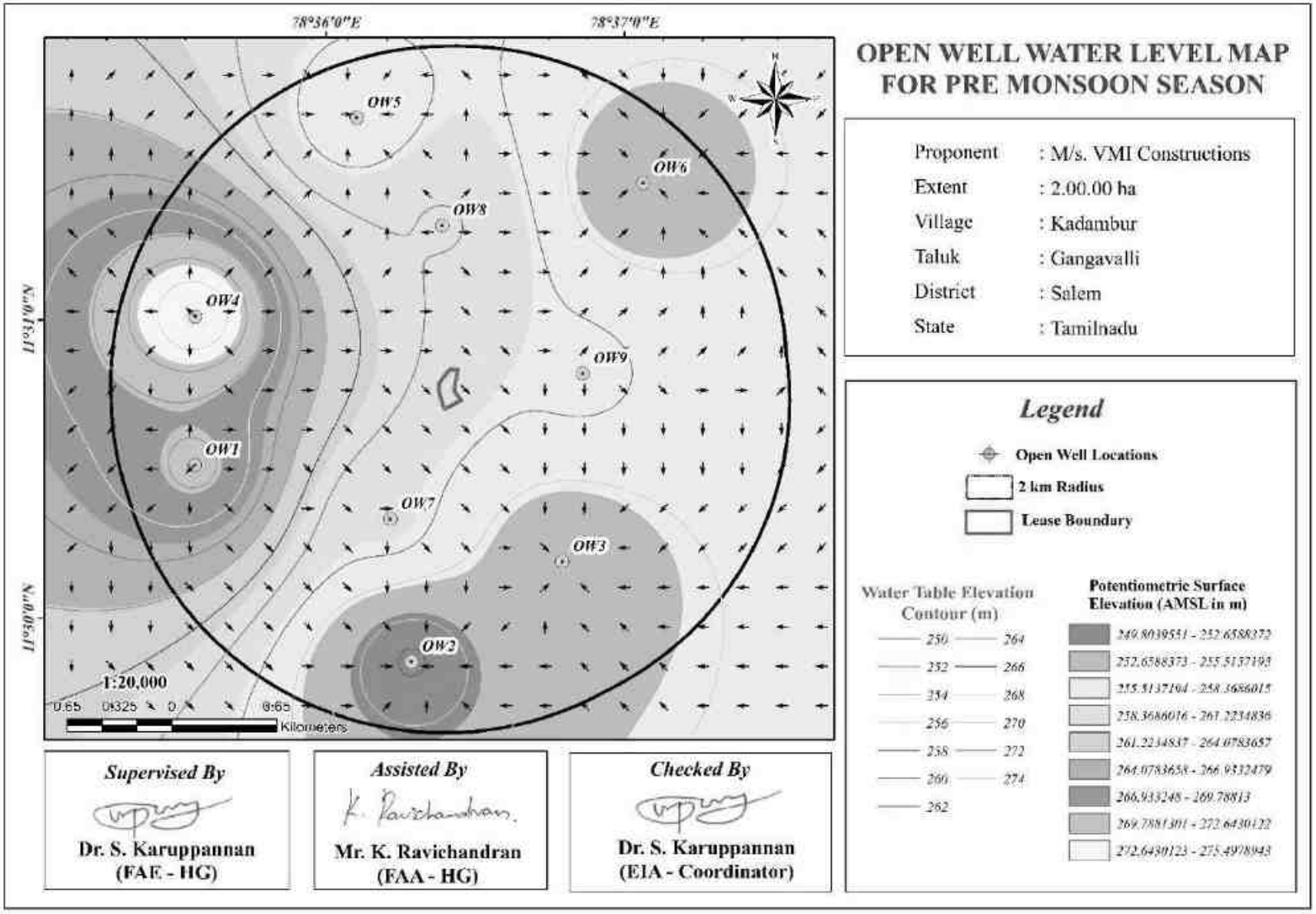


Figure 3.10 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

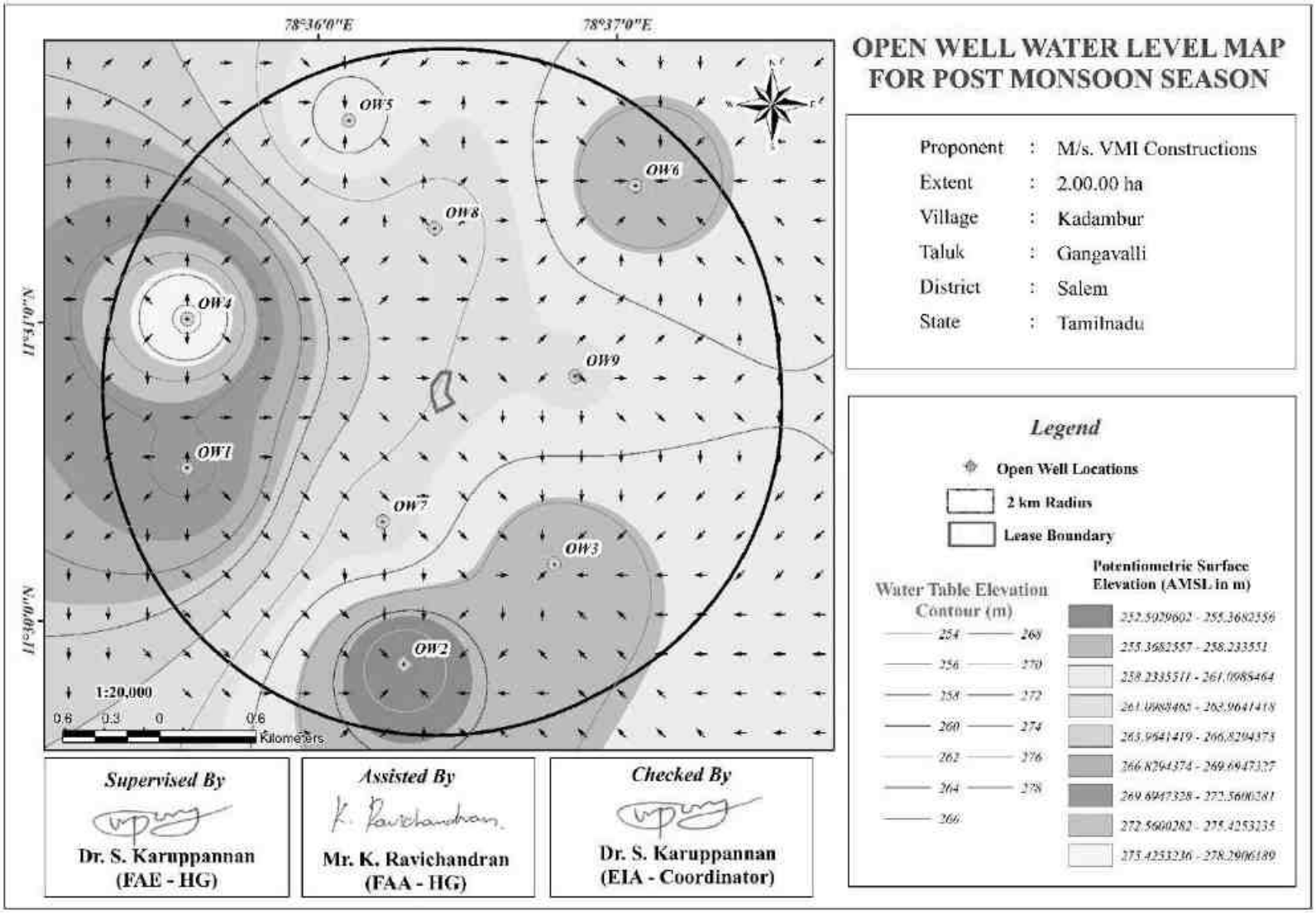


Figure 3.11 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

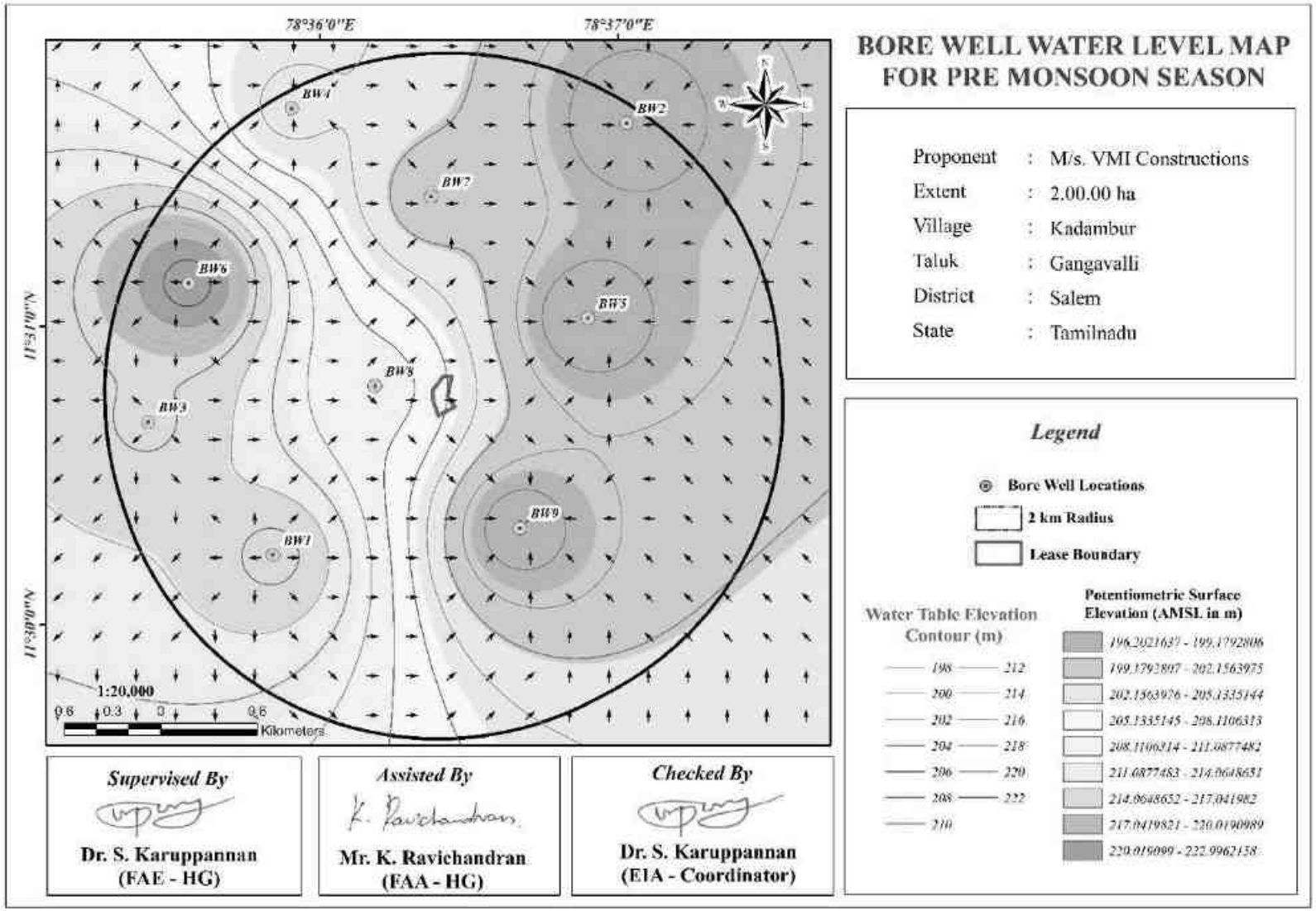


Figure 3.12 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

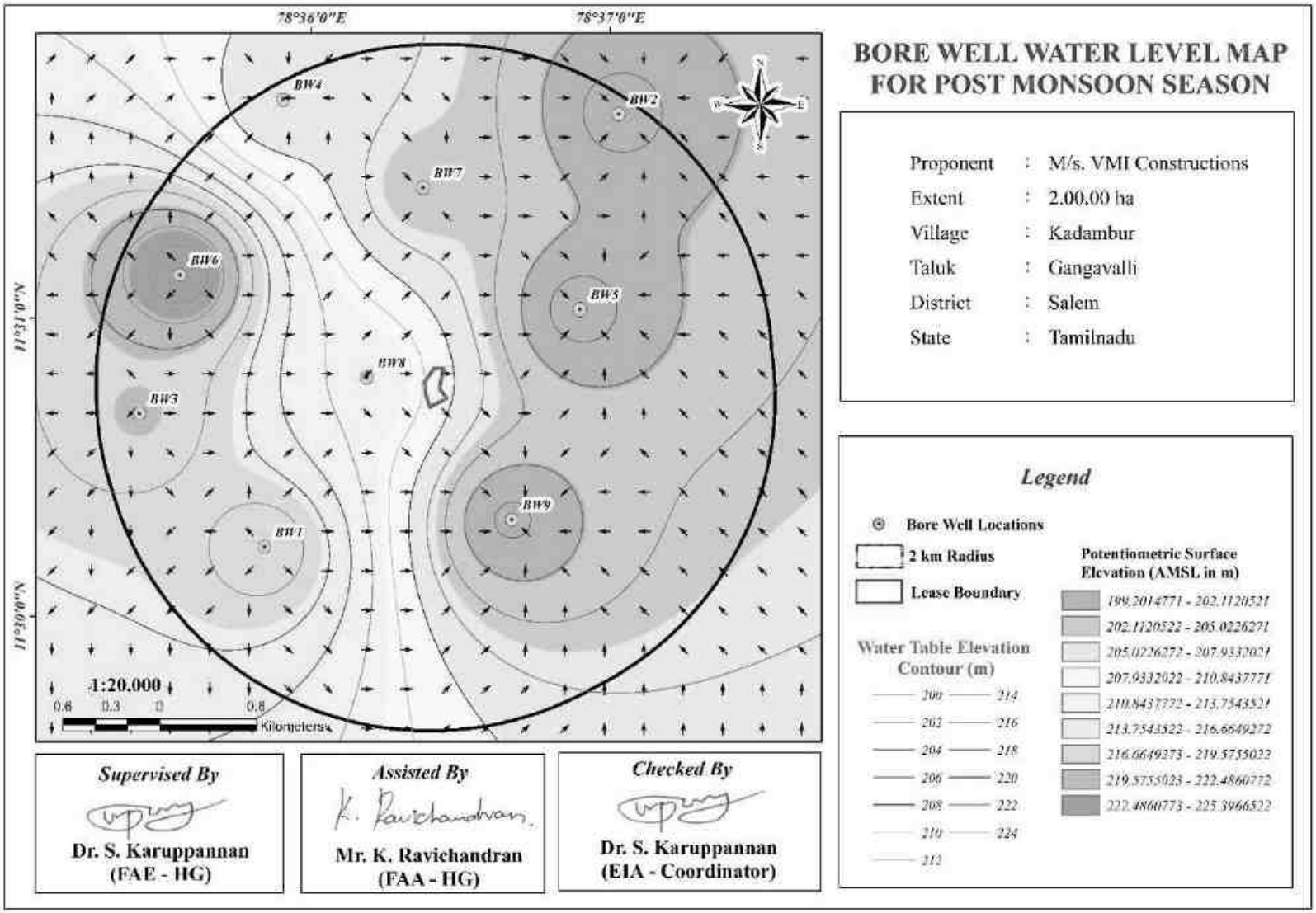


Figure 3.13 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

3.4.4.3 Electrical Resistivity Investigation

Electrical resistivity investigation, using vertical electric sounding (VES) and a four-electrode setup, is valuable for mapping subsurface layers and aquifers in areas lacking well data by measuring differences in electrical resistance. This method sends current through outer electrodes and measures the resulting voltage with inner electrodes, revealing variations in geological materials like weathered zones or fractured rock. These resistivity differences can help locate potential groundwater zones and identify different subsurface layers without needing exploratory wells. The geophysical VES data obtained from the project site was given in Table 3.14. The plot for the purpose of interpretation has been shown in Figure 3.14.

Table 3.14 Vertical Electrical Sounding Data

Location Coordinates - 11°30'51.99"N, 78°36'25.83"E					
S. No.	**AB/2 (m)**	**MN/2 (m)**	**Geometrical Factor (G)**	**Resistance in Ω**	**Apparent Resistivity in Ωm**
1	2	1	4.71	6.26	29.55
2	4	1	23.57	1.84	43.55
3	6	1	55.00	1.017	55.94
4	8	1	99.00	1.014	76.39
5	10	2	75.43	0.44	33.19
6	12	2	110.01	0.38	42.63
7	14	2	150.86	0.35	53.57
8	16	2	198.01	0.29	57.62
9	18	2	251.44	0.26	67.40
10	20	2	311.16	0.27	86.55
11	25	5	188.58	0.48	91.14
12	30	5	275.01	0.46	127.23
13	35	5	377.16	0.47	178.85
14	40	5	495.02	0.49	222.39
15	45	5	628.60	0.39	249.22
16	50	10	777.89	0.32	250.04
17	60	10	550.03	0.31	354.51

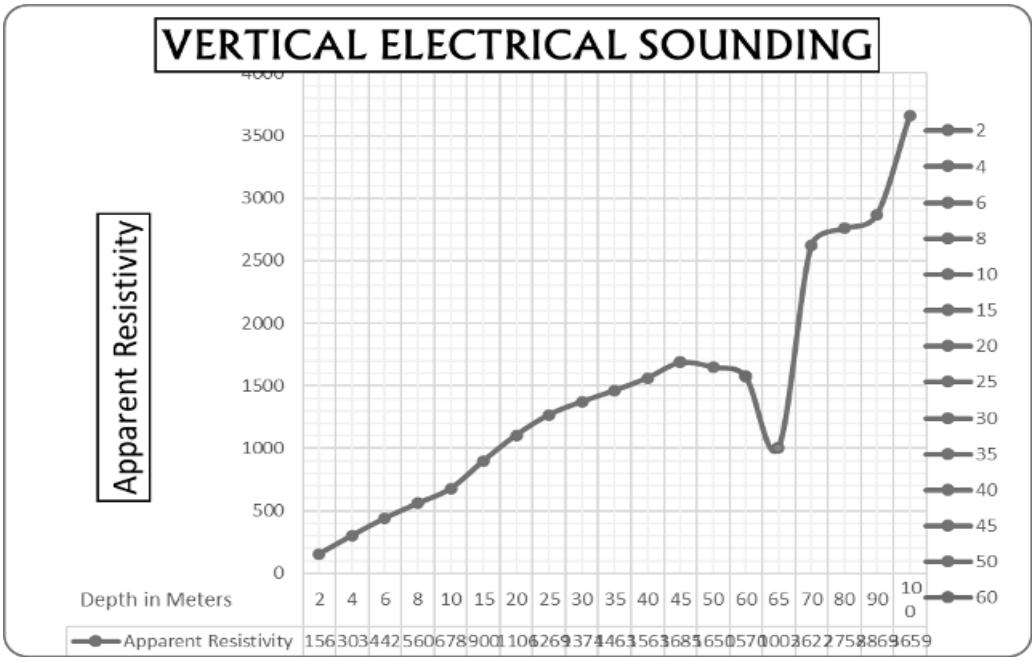


Figure 3.14 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 65 m Below Ground Level in Proposed Project

The low resistance values indicate occurrence of water at the depth of about 65m below ground level. The maximum depth proposed for the proposed project is 65m (40m AGL and 25m BGL). Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

3.5 AIR ENVIRONMENT

Baseline studies on the air environment involve identifying specific pollutants and their concentrations in the ambient air of a region. The primary sources of air pollution are identified as vehicular traffic, dust from unpaved roads and domestic and agricultural activities. These sources contribute to the overall air quality and can be further investigated to understand the specific pollutants and their impact.

3.5.1 Meteorology

3.5.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3m 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 3.15.

Table 3.15 Onsite Meteorological Data

S. No.	Parameters		OCT, 2025	NOV, 2025	DEC, 2025
1	Temperature (^{0}C)	Min	21.03	17.04	15.65
		Max	35.28	32.55	29.81
		Avg	26.13	24.26	23.09
2	Relative Humidity (%)	Min	35.41	44.56	48.94
		Max	100	100	100
		Avg	82.17	83.25	85.25
3	Wind Speed (m/s)	Min	0.03	0.15	0.42
		Max	4.98	5.7	5.28
		Avg	1.55	2.35	1.70
4	Wind Direction (degree)	Min	2.1	0.2	0.6
		Max	352.1	359.5	359.1
		Avg	165.63	105.60	90.94
5	Surface Pressure (kPa)	Min	97.01	97.24	97.4
		Max	98.04	98.25	98.91
		Avg	97.57	97.85	98.31

Source: Sampling Results by Green Link Analytical & Research Lab, in association with GTMS.

3.5.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of October through December of the years from 2021 to 2024 and the seasonal wind rose for the study period of October through December 2025. The wind rose diagrams thus produced are shown in Figures 3.15-3.15a. Figure 3.16 reveals that:

- The measured average wind velocity during the study period is 1.85m/s.
- Predominant wind was dominant in the directions ranging from Northeast to Southwest.

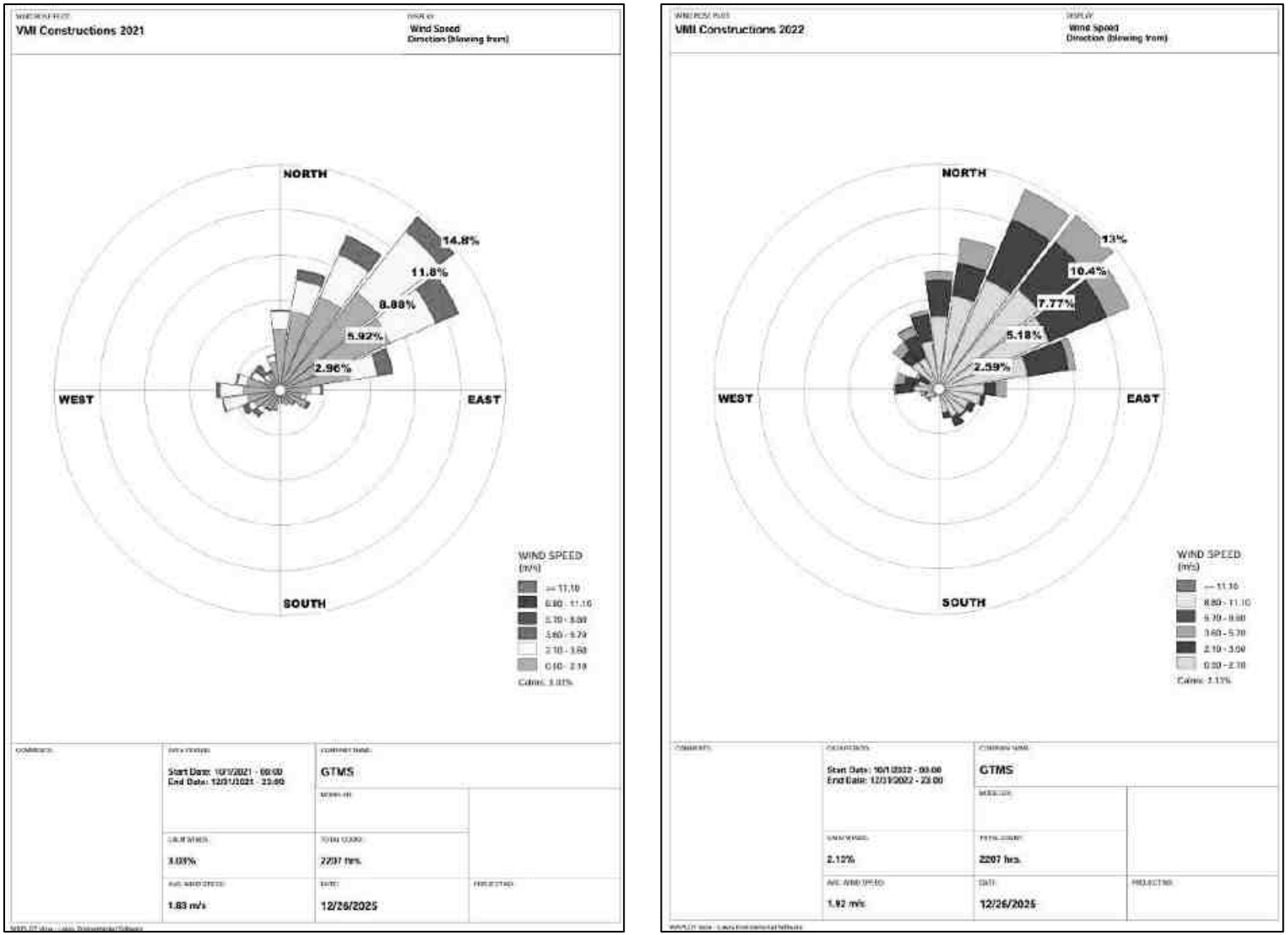


Figure 3.15 Windrose Diagram for 2021 and 2022 (October to December)

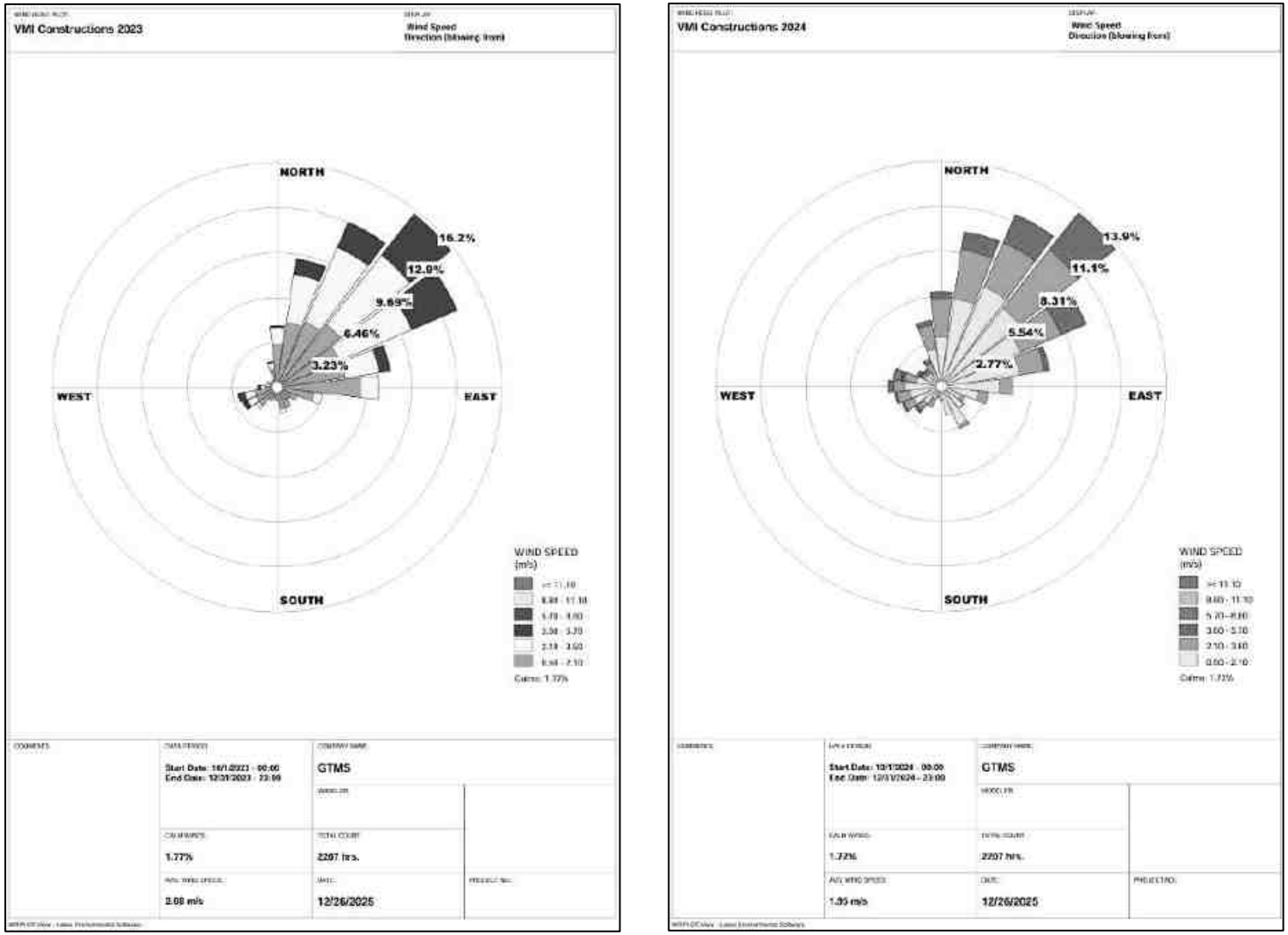


Figure 3.15a Windrose Diagram for 2023 and 2024 (October to December)

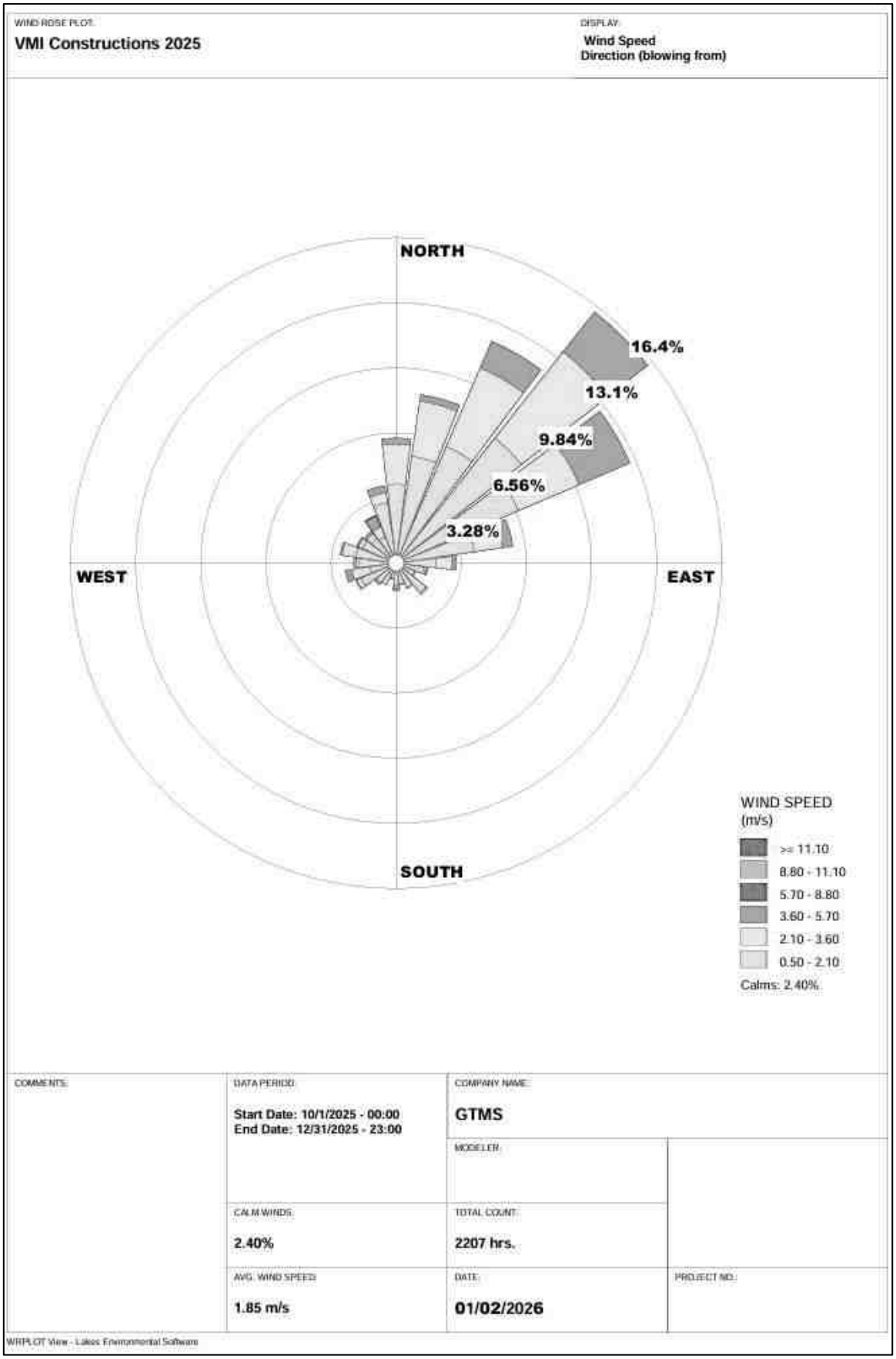


Figure 3.16 Onsite Wind Rose Diagram

3.5.2 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 3.16 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

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

Table 3.17 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 Five (05) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October to December, 2025 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least 3 ± 0.5m 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 $PM_{2.5}$, PM_{10}, sulphur dioxide (SO_2) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.17 and average concentrations of air pollutants are summarized in Tables 3.19 and are shown in Figures 3.18-3.22.

Table 3.18 Ambient Air Quality (AAQ) Monitoring Locations

Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
AAQ1	Nearby Core	0.09	NE	11°30'52.11"N	78°36'27.97"E
AAQ2	Kadambur	0.94	SW	11°30'16.76"N	78°36'6.10"E
AAQ3	Pungavadi	1.89	NNE	11°31'46.30"N	78°36'51.49"E
AAQ4	Paithur	1.72	NNW	11°31'44.08"N	78°36'11.01"E
AAQ5	Ramanathapuram	2.28	W	11°30'48.16"N	78°35'7.32"E

Source: On-site monitoring/sampling ***Green Link Analytical & Research Lab*** *in association with GTMS*

Results

As per the monitoring data, $PM_{2.5}$ ranges from 19.91 µg/m^3 to 25.60 µg/m^3; PM_{10} from 41.09 µg/m^3 to 47.40 µg/m^3; SO_2 from 7.51 µg/m^3 to 11.60µg/m^3; NO_x from 13.06µg/m^3 to 17.60g/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 44 causing minimal impact to human health.

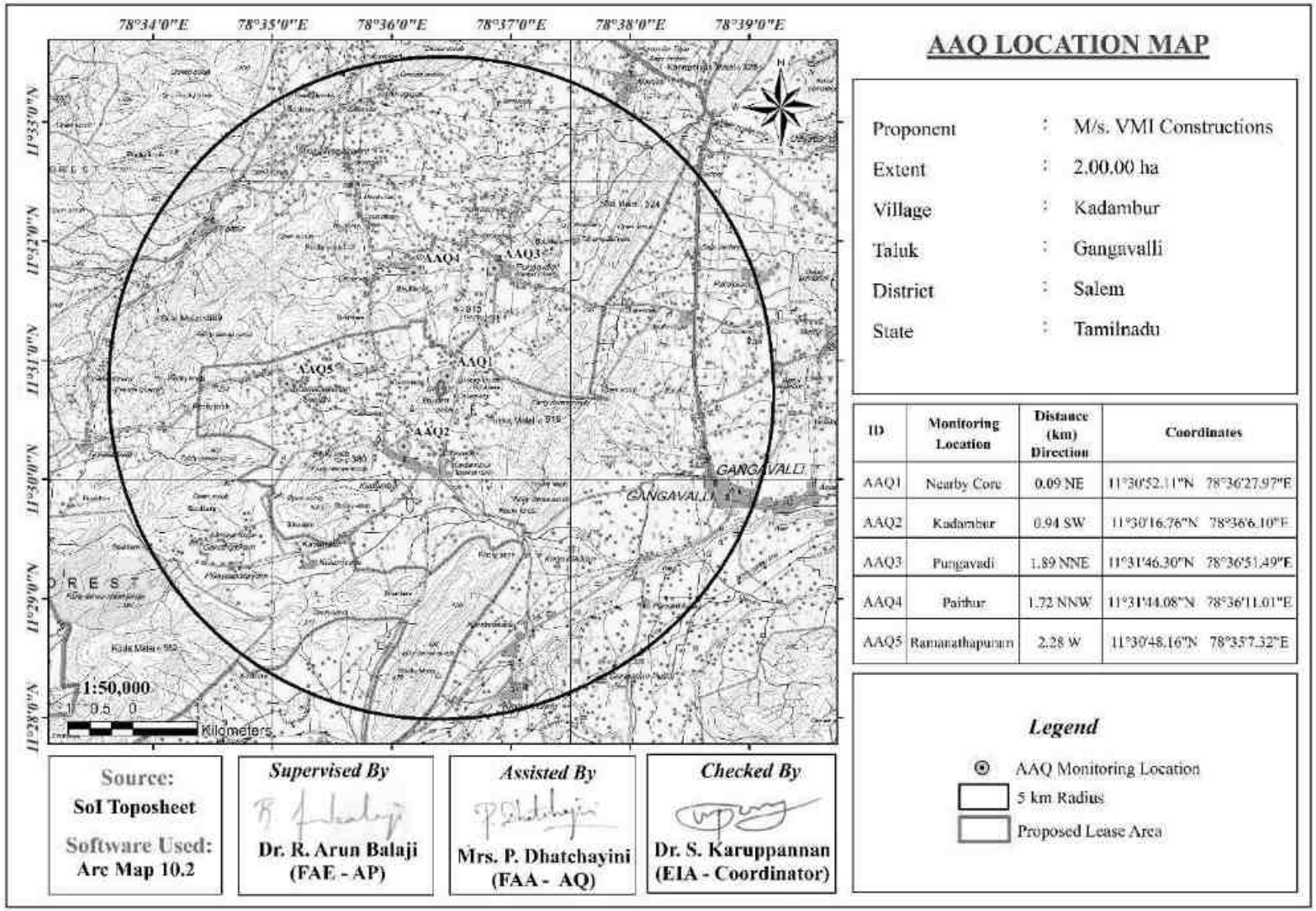


Figure 3.17 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

Table 3.19 Summary of AAQ Result

	$PM_{2.5}$				PM_{10}			
Station ID	**Max**	**Min**	**Mean**	**98th Percentile**	**Max**	**Min**	**Mean**	**98th Percentile**
AAQ1	31.00	22.98	26.42	30.49	54.00	43.99	47.63	53.12
AAQ2	28.00	23.30	24.81	27.70	50.00	43.99	45.97	49.52
AAQ3	25.00	19.32	21.36	22.17	46.00	41.64	43.20	45.83
AAQ4	20.00	14.54	16.75	19.82	42.00	36.05	38.46	41.70
AAQ5	24.00	19.43	21.61	23.96	45.00	39.79	42.30	44.75
	SO_2				NOx			
AAQ1	13.00	7.95	10.09	12.76	18.00	13.79	15.74	17.75
AAQ2	12.00	8.16	10.14	12.81	20.00	13.25	16.23	19.31
AAQ3	10.00	6.97	7.91	9.82	17.00	12.06	14.06	16.85
AAQ4	10.00	6.45	7.89	9.75	15.00	12.06	13.13	14.77
AAQ5	13.00	8.02	10.09	12.85	18.00	13.99	15.80	17.93

Free silica:

Crystalline silica is SiO_2 in a specific structural form distinct from the pure non-combined SiO_2 known as free silica. Sources like stone quarries sand mining and stone crushing can generate finely divided crystalline silica dust. Crystalline silica particles in these environments can be very small less than 4µm (PM4). There are no generally accepted methods of monitoring in ambient PM4 air.

Health Risks of Crystalline Silica Exposure

- **Inhalation:**

Over time, inhaling very small quantities of finely divided crystalline silica dust can lead to severe respiratory and other health problems.

- **Diseases:**

Exposure can result in silicosis (a type of scarring and inflammation of the lungs), bronchitis, and even cancer.

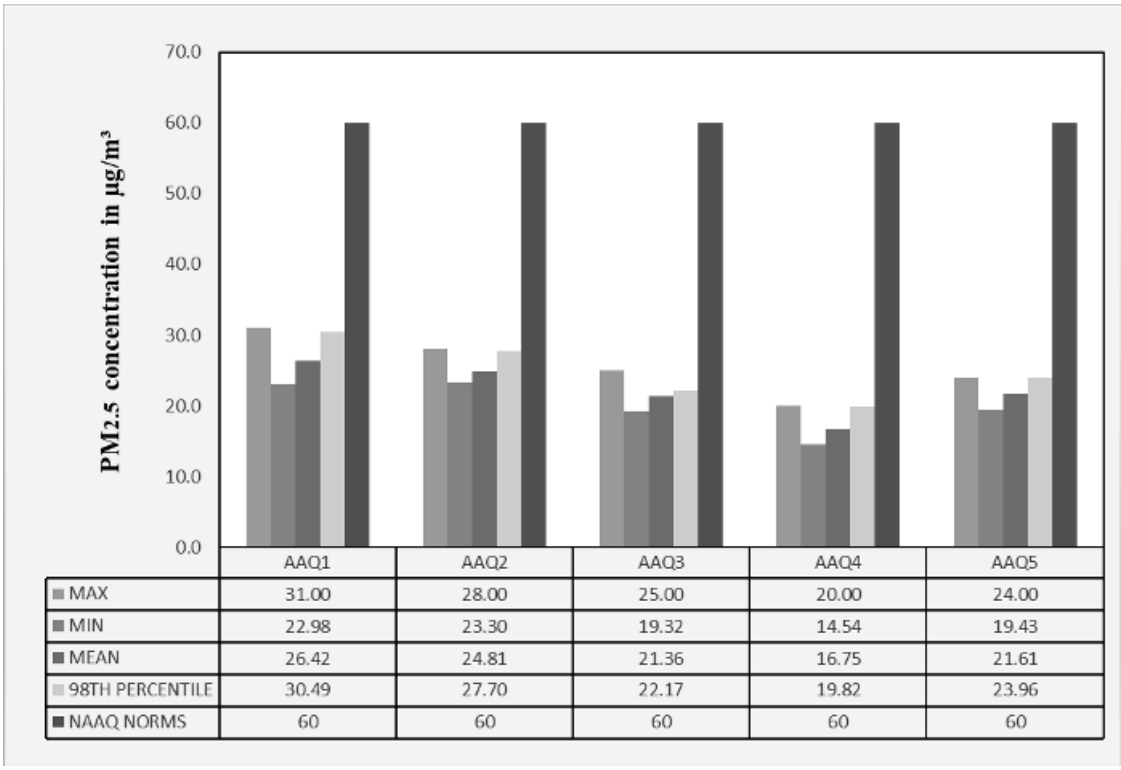
Exposure Limits and Regulations

- **ACGIH Recommendations:**

The American Conference of Governmental Industrial Hygienists recommends 0.1mg/m^3 (10µg/m^3) crystalline silica as respirable free silica as exposure limits.

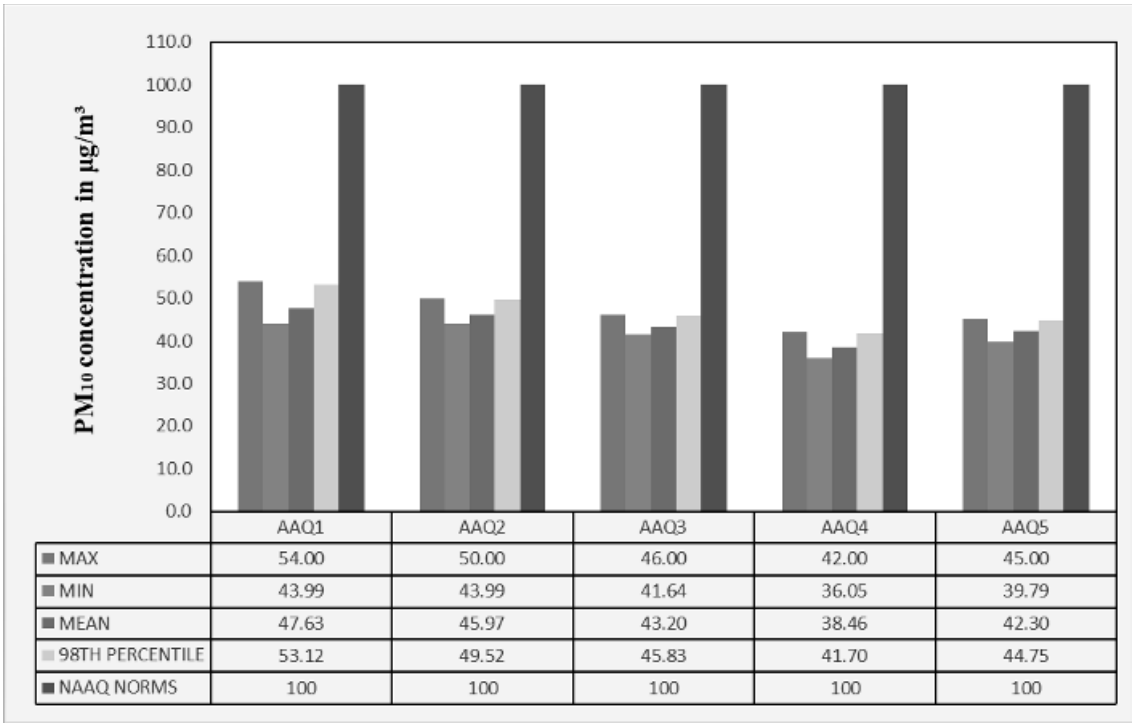
- **Directorate General of Mines safety (India):**

Free silica content should not exceed 5% as prescribed by Directorate General of Mines Safety.



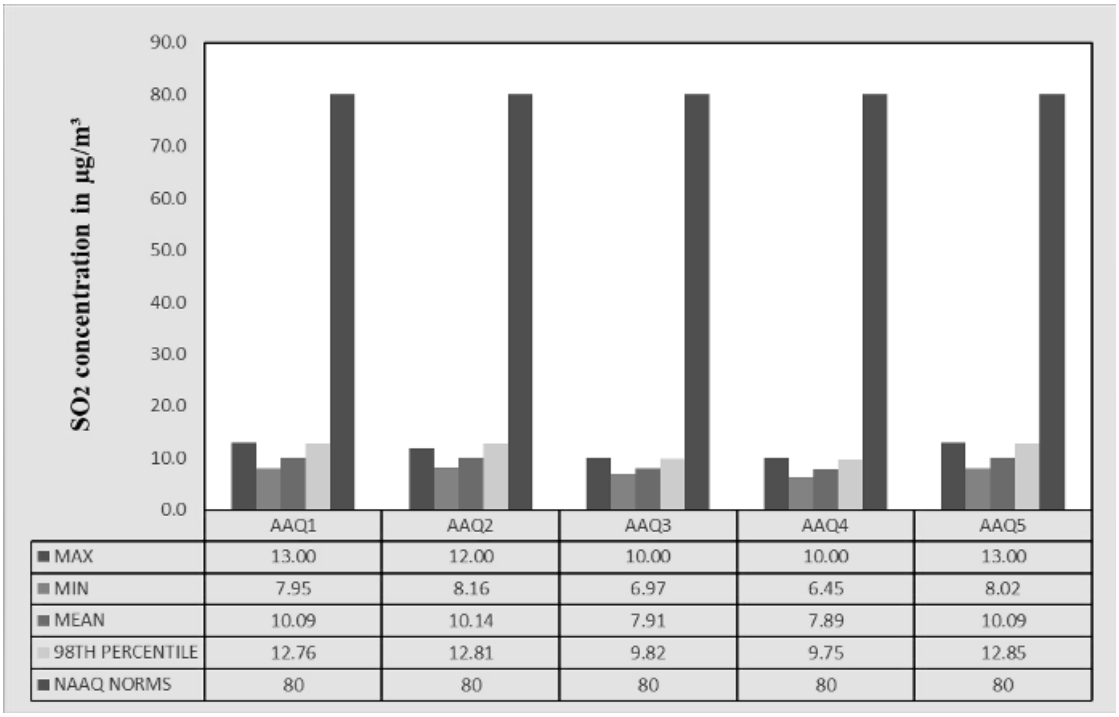
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5
MAX	31.00	28.00	25.00	20.00	24.00
MIN	22.98	23.30	19.32	14.54	19.43
MEAN	26.42	24.81	21.36	16.75	21.61
98TH PERCENTILE	30.49	27.70	22.17	19.82	23.96
NAAQ NORMS	60	60	60	60	60

Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of $PM_{2.5}$ Measured from 5 Air Quality Monitoring Stations within 5 km Radius



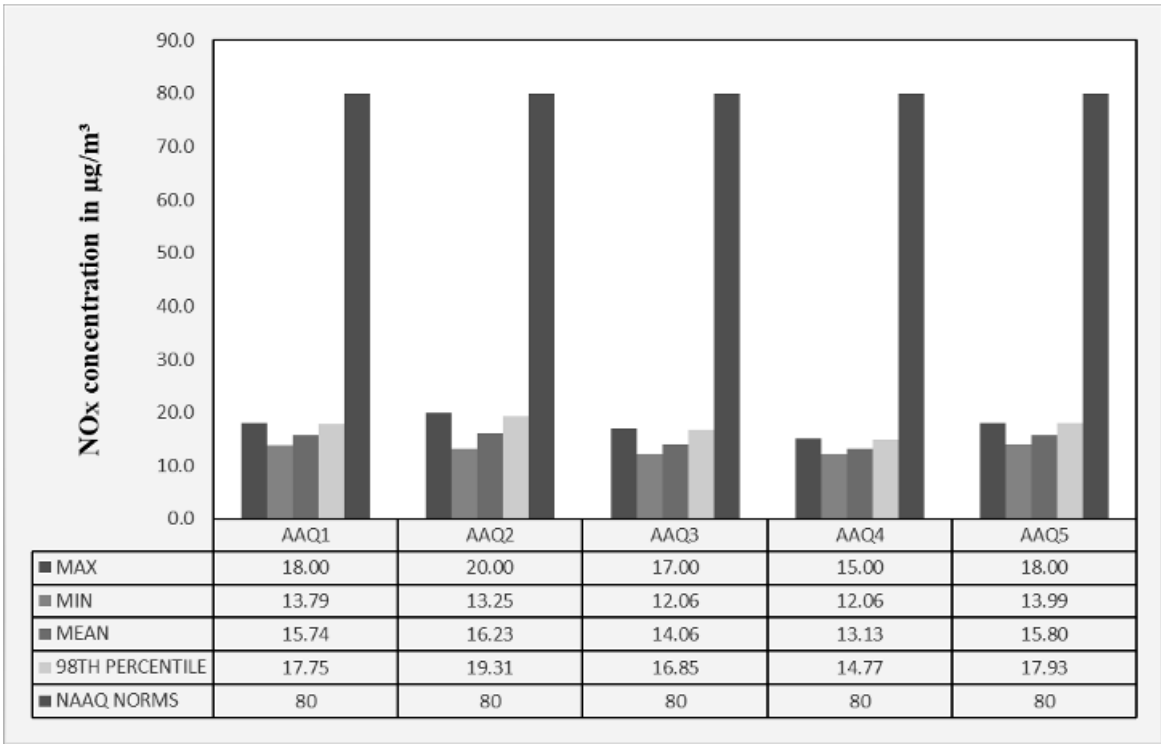
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5
MAX	54.00	50.00	46.00	42.00	45.00
MIN	43.99	43.99	41.64	36.05	39.79
MEAN	47.63	45.97	43.20	38.46	42.30
98TH PERCENTILE	53.12	49.52	45.83	41.70	44.75
NAAQ NORMS	100	100	100	100	100

Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{10} Measured from 5 Air Quality Monitoring Stations within 5 km Radius



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5
MAX	13.00	12.00	10.00	10.00	13.00
MIN	7.95	8.16	6.97	6.45	8.02
MEAN	10.09	10.14	7.91	7.89	10.09
98TH PERCENTILE	12.76	12.81	9.82	9.75	12.85
NAAQ NORMS	80	80	80	80	80

Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO_2 Measured from 5 Air Quality Monitoring Stations within 5 km Radius



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5
MAX	18.00	20.00	17.00	15.00	18.00
MIN	13.79	13.25	12.06	12.06	13.99
MEAN	15.74	16.23	14.06	13.13	15.80
98TH PERCENTILE	17.75	19.31	16.85	14.77	17.93
NAAQ NORMS	80	80	80	80	80

Figure 3.21 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO_x Measured from 5 Air Quality Monitoring Stations within 5km Radius

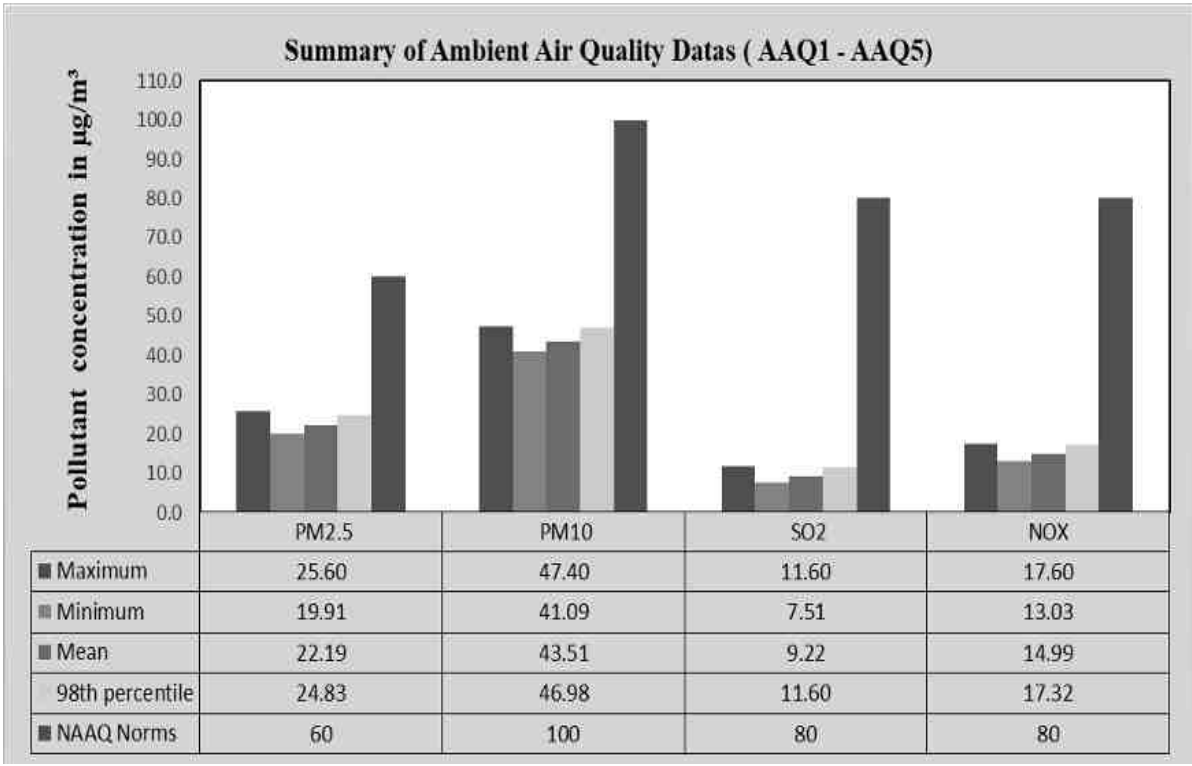


Figure 3.22 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius

3.6 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 Five (05) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.20 and spatial occurrence of the locations are shown in Figure 3.23.

Table 3.20 Noise Monitoring Locations

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	N1	Core	--	--	11°30'47.79"N	78°36'24.97"E
2	N2	Kadambur	1.24	S	11°30'1.58"N	78°36'22.82"E
3	N3	Pungavadi	1.92	NNE	11°31'45.58"N	78°36'54.34"E
4	N4	Paithur	1.74	NNW	11°31'44.71"N	78°36'11.82"E
5	N5	Ramanathapuram	0.86	W	11°30'54.48"N	78°35'55.92"E

Table 3.21 Ambient Noise Quality Result

Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (L_{eq} in dB (A))	
N1	Core	Industrial Area	52.1	46.8	75	70
N2	Kadambur	Residential Area	46.8	44.5	55	45
N3	Pungavadi		46.4	43.4	55	45
N4	Paithur		45.1	42.5	55	45
N5	Ramanathapuram		45.2	42.8	55	45

Source: On-site monitoring/sampling by ***Green Link Analytical & Research Lab*** *in association with GTMS*

The Table 3.21 shows that noise level in core zone was 52.1 dB (A) Leq during day time and 46.8 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 45.1 to 46.8dB (A) Leq and during night time from 42.5 to 44.5dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.24 and 3.25.

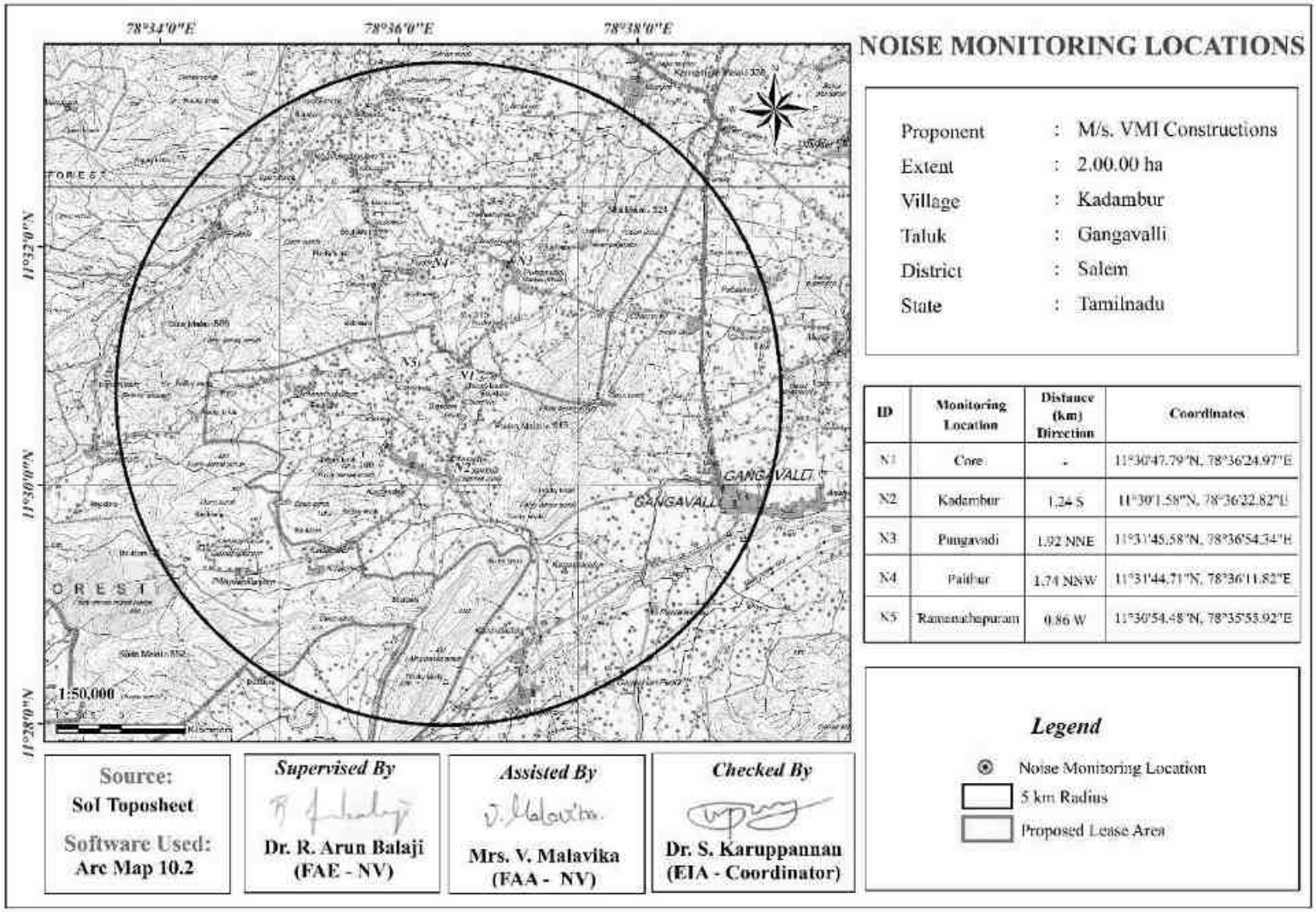


Figure 3.23 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site

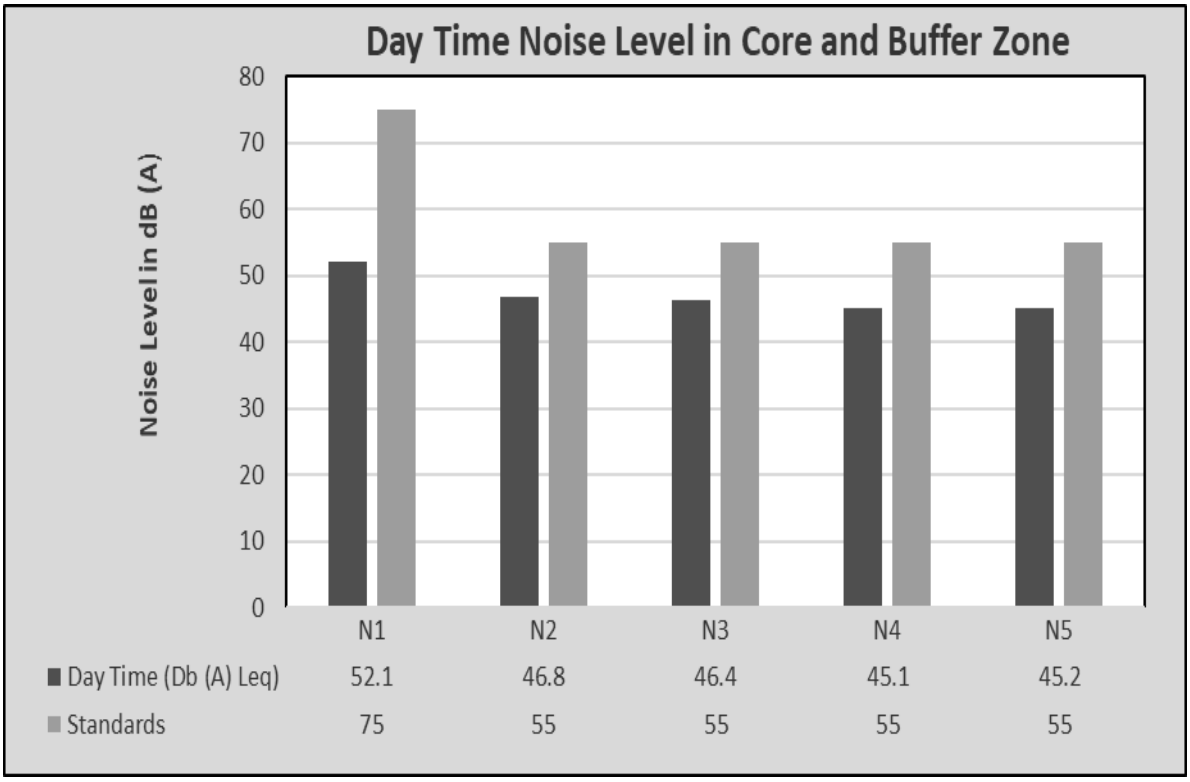


Figure 3.24 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

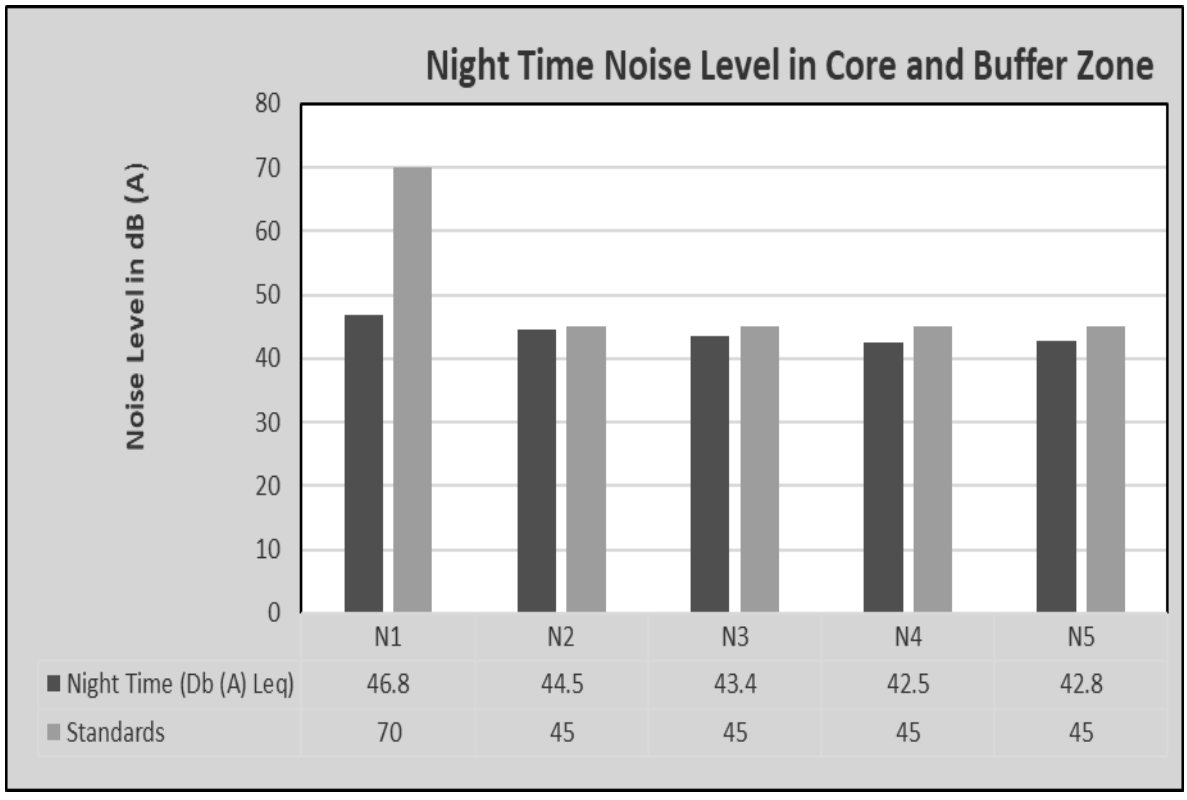


Figure 3.25 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

3.7 BIOLOGICAL ENVIRONMENT

Biological study of the ecosystem is essential to understand the impact of rough stone quarry on existing flora and fauna of the study area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact, if any. A survey was conducted to study the flora and fauna in 10km radius by direct and indirect sightings/ data. Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the wild plants as well as cultivated crop plants was made, and all the available information was recorded.

3.7.1 Biodiversity assessment methods

The Rapid Biodiversity Assessment (RBA) provides information about individual flora and fauna species and their habitats, ecosystems and communities, and threatening processes. It reviews existing information and the results of priority taxa and communities.

A major systematic program of fauna survey has been undertaken during the preparation of this RBA. Analysis of data involves the information identifying the flora and selected fauna groups in relation to different environmental strata across the site, and analysis of species and their responses to disturbance.

The RBA has focused primarily on the ecosystem and species levels of biodiversity because information about genetic variation within species is limited. The trees in each plot have been marked with metal plates so as to cater further field inspection easier. Physical marking of biodiversity has been dealt with for flora only, because of logical reasons. Floristic studies are dealt with in detail in the second part of the RBA.

The biodiversity information presented here is intended to reflect the best understanding of the available information, including information obtained through data audit, expert scientific opinion, and analysis of available data. It also points to deficiencies in existing information. The data presented will be used in the development of the restoration plans, including configuration of the quarry closure, and in the formulation of management recommendations by the experts.

The study has covered the following aspects to appraise the biodiversity of the site

S. No	Floral Component	Fauna elements
1	Plantations/ Agro- forestry	Total Listing of major Faunal elements
2	Natural Vegetation/ Forest type	Endangered Species/ Endemic Species
3	Flora Identification- Trees	Wildlife Schedules
4	Flora Identification- Shrubs	Migratory Species

5	Flora Identification- Herbs	Migratory corridors or Paths
6	Flora Identification- Climbers	Breeding & Spawning Grounds

The objective of this Section is to characterize and understand the present status of the ecosystems in the study area to assess the bio- diversity and to identify the critical areas. The present study was undertaken as a part of EIA report to understand the present status of ecosystem prevailing in the study area, to compare it with the past condition with the help of available data, to predict changes as a result of present activities and to suggest measures for maintaining the conditions.

3.7.2 Objectives of Biological Studies

The present study was undertaken with the following objectives:

- To study the likely impact of the proposed mining project on the local biodiversity and to suggest mitigation measure, if required, for vulnerable biota.
- To assess the nature and distribution of vegetation (Terrestrial and Aquatic) in and around the mining activity.
- Detail of flora and fauna, Endemic, Rare, Endangered and Threatened (RET Species) separately for core and buffer area based on such primary field survey and clearly indicating the Schedule of fauna present. In case of any schedule- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished.
- Devise management & conservation measures for biodiversity.

3.7.3 Methodology

A methodology of Sampling Flora and fauna studies were carried out to assess the list of terrestrial plant and animal species that occur in the core area and the buffer area up to 10km radius from the project site. No damage is created to flora and fauna during the sampling.

3.7.4 Flora Study

Identification of vegetation in relation to the natural flora and crops was conducted through reconnaissance field surveys and onsite observations in core and buffer zone. The plant species identification was done based on the reference materials and also by examining the morphological characteristics and reproductive materials i.e. flowers, fruits and seeds. Land use pattern in relation to agriculture crop varieties were identified through physical verification of land and interaction with local villagers. Transect method is used in the floral documentation in the buffer zone. Six

transects were selected for the study. Each transects were occupied within 10km radius. For trees plots of (10x10m), shrubs (5x5m) and herbs (1x1m) were used and recorded.

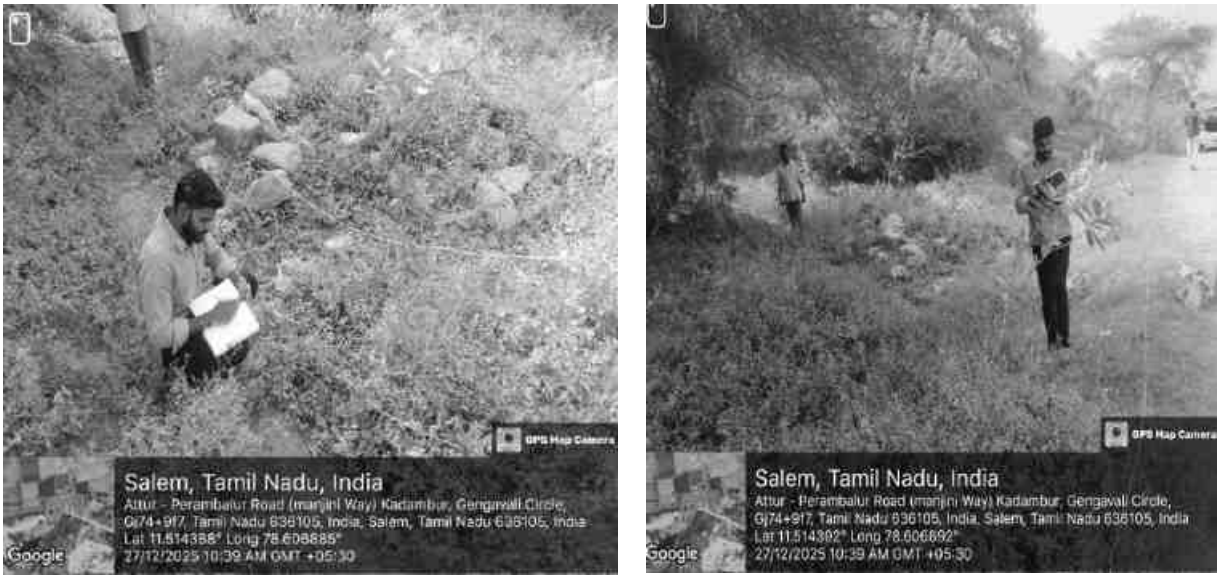


Figure 3.26 Quadrates Sampling Methods of Flora

3.7.5 Fauna Study

The faunal elements of core and buffer zone were identified by direct sightings or indirect evidences by recording occurrences such as holes, markings, hairs, spines, scats, pellets, droppings and quills (Menon 2003). Standard binocular was used for the observations. The authenticity of faunal elements occurrence was confirmed by interaction with the local people. Avifauna identification was done with pictorial descriptions of published literature. Information pertaining to existence of any migratory corridors and paths were obtained from local inhabitants. The status of each faunal element was determined and wildlife schedule category was ascertained as per the IUCN- Red Data Book and Wildlife protection (Amendment) Act 2022. The Birds, butterflies, reptiles and odonates were mainly focused during faunal assessment, in which transect method was employed for birds and butterflies. Transect is a path along which one counts and records the occurrence of an individual for study. A straight-line walk covering one km, within a time span of one hour to 30 minutes was carried out in each of the habitats. Each transects were occupied within the 10km radius of the site. Bird species were recorded during the hours of peak activity 07 am to 12 am and evening 3.00 pm to 5.00 pm. Direct observations and bird calls used for bird documentation. Same transects were used for counting birds and butterflies. Opportunistic observations were made for Amphibians, reptiles and odonates. Presence of mammals were recorded by indirect signs. They were classified into species level as and when possible. Recorded bird species were identified to species level using standard books (Ali & Ripley 1987, Grimmett et al., 2016).

Important Value Index (IVI)

The concept of 'Important Value Index (IVI)' has been developed for expressing the dominance and ecological success of any species, with a single value (Mishra, 1968, Sharma, 2005). This index utilizes three characteristics, they are (i) Relative frequency and (ii) Relative density. The three characteristics computed using frequency, density and abundance for all the species falling in all the quadrat by using the following formula. The relative frequency, relative density and relative abundance has been calculated to calculate the IVI value

IVI = Relative frequency + Relative abundance + Relative density [RF + RA + RD]

Relative Value Index (RVI) = Relative Density + Relative Frequency [RD + RF].

Relative Value Index used for Expressing dominance and Ecological success of Shrub and herb Species in a particular area.

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 **Shannon Diversity Index** (sometimes called the Shannon- Wiener Index) is a way to measure the diversity of species in a community.

The species diversity index (H) for floral and faunal diversity is calculated by the use of Shannon Wiener Index (Shannon Wiener, 1963) as:

$$\mathbf{H = - \Sigma (ni/n) \times \ln (ni/n)}$$

- Where, ni is individual density of a species and n is total density of all the species
- The Evenness Index (E) is calculated by using Shannon's Evenness formula (Magurran, 2004).
- The higher the value of H, the higher the diversity of species in a particular community

The lower the value of H, the lower the diversity. A value of H = 0 indicates a community that only has one species

$$\mathbf{Evenness\ Index\ (E) = H / \ln(S)}$$

Where, H is Shannon Wiener Diversity index; S is number of species

The Shannon evenness Index is a way to measure the evenness of species in a community. The term “evenness” simply refers to how similar the abundances of different species are in the community.

3.7.6 Floral diversity Analysis

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.

3.7.6.1 Flora Composition in Core Zone

The core zone presents in tree, shrubs, herbs and grasses. Taxonomically total of 23 species belonging to 19 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were Trees 6 (26%) followed by Shrubs 6 (26%), Herbs 8 (35%) and Climbers 3 (13%). The result of core zone of flora studies shows that Fabaceae and Amaranthaceae, Lamiaceae are the main dominating species in the study area it mentioned in Table 3.22 & 3. 23. No species found as threatened category.

3.7.6.2 Flora Composition in buffer Zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because of nearby forest covers and agriculture land was found to dominate mostly in Northwest and Southwest directions. There are 95 belonging to 41 families have been recorded from the buffer zone. Among the identified, floral (95) species were 40 (40%) trees, Shrubs 21 (19%) Herbs & Climbers 19 (28%), Creepers & Grasses 15 (13%). According to the findings of the buffer zone flora studies, the dominant species in the study area are Fabaceae, Asteraceae, and Euphorbiaceae, as shown in Table 3.24. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. Details of flora with the scientific name were mentioned in Table 3.24. A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.24.

Table 3.22 Flora in mine lease area

S.no	Local name	Scientific name	Family name	IUCN- Conservation Status
Trees				
1.	Manjal Konrai	Senna siamea	Meliaceae	Not Listed

2.	Arapu maram	*Albizia amara*	Fabaceae	Not Listed
3.	Seemai karuvelan	*Prosopis juliflora*	Fabaceae	Not Listed
4.	Wetpalai maram	*Wrightia tinctoria*	Apocynaceae	Not Listed
5.	Karuvelam maram	*Vachellia nilotica*	Fabaceae	Not Listed
6.	Nuna Maram	*Morinda citrifolia*	Rubiaceae	Not Listed
Shrubs				
7.	Avaram chadi	*Senna auriculata*	Fabaceae	Not Listed
8.	Unni chadi	*Lantana camara*	Verbenaceae	Not Listed
9.	Thazhuthaalai	*Chromolaena odorata*	Asteraceae	Not Listed
10.	Thuththi	*Abutilon indicum*	Meliaceae	Not Listed
11.	Erukku	*Calotropis gigantea*	Apocynaceae	Not Listed
12.	Perunerunji	*Pedalium murex*	Pedaliaceae	Not Listed
Herbs				
13.	Chevvarakupul	*Chloris barbata*	Amaranthaceae	Not Listed
14.	Kattu kanchippul	*Apluda mutica*	Poaceae	Not Listed
15.	Kolunji chadi	*Tephrosia purpurea*	Fabaceae	Not Listed
16.	Nayuruvi	*Achyranthes aspera*	Amaranthaceae	Not Listed
17.	Nearunji mull	*Tribulus zeyheri*	Zygophyllaceae	Not Listed
18.	Pulapoo	*Aerva lanata*	Amaranthaceae	Not Listed
19.	Sithrapaalavi	*Euphorbia prostrata*	Euphorbiaceae	Not Listed
20.	Thumattikai	*Cucumis callosus*	Cucurbitaceae	Not Listed
Climber				
21.	Veliparuthi	*Pergularia daemia*	Apocynaceae	Not Listed
22.	Kovakka	*Coccinia grandis*	Cucurbitaceae	Not Listed
23.	Perandai	*Cissus quadrangularis*	Vitaceae	Not Listed

NE- Not evaluated; LC- Least Concern, NT- Near Threatened, T- Threatened

Table 3.23 Species Richness (Index) in mine lease area

Details	H	H max	Evenness	Species Richness
Trees	0.89	1.08	0.69	0.75
Shrubs	1.34	1.42	0.57	1.34
Herbs	1.29	1.68	0.79	1.21

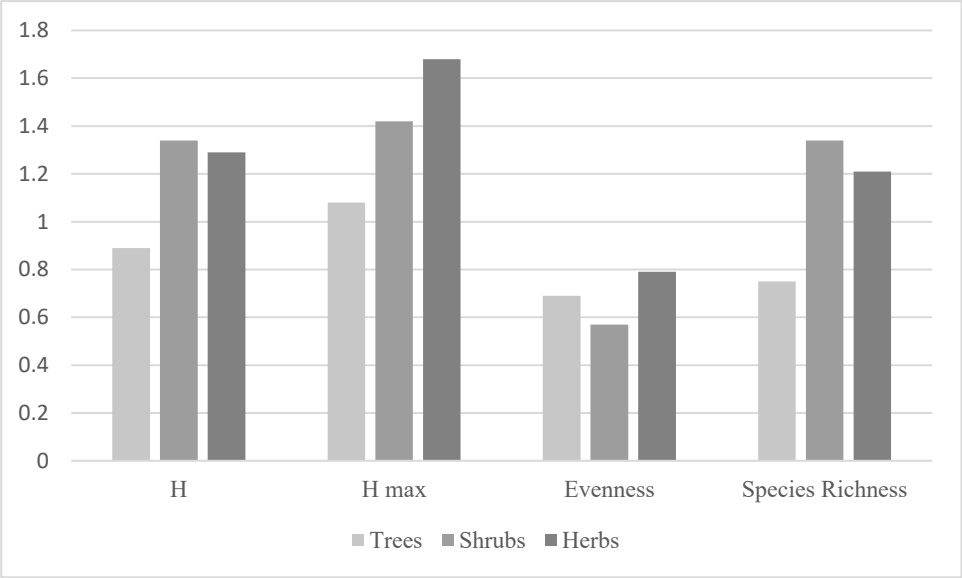


Figure 3.27 Species Richness (Index) in Mine Lease area

Table 3.24 Flora in Buffer Zone

S. No	Local name	Scientific name	Family Name	IUCN Conservation Status
Trees				
1.	Manjal Konrai	Senna siamea	Meliaceae	Not Listed
2.	Arapu maram	*Albizia amara*	Fabaceae	Not Listed
3.	Velikathan maram	*Prosopis juliflora*	Fabaceae	Not Listed
4.	Pongam oiltree	*Pongamia pin nata*	Fabaceae	Not Listed
5.	Panai maram	*Borassus flabellifer*	Arecaceae	Not Listed
6.	Nuna maram	*Morinda citrifolia*	Rubiaceae	Not Listed
7.	Vembu	*Azadirachta indica*	Meliaceae	LC
8.	Manga maram	*Mangifera indica*	Anacardiaceae	Not Listed
9.	Thennai maram	*Cocos nucifera*	Arecaceae	Not Listed
10.	Wetpalai maram	*Wrightia tinctoria*	Apocynaceae	Not Listed
11.	Unjai maram	*Albizia amara*	Fabaceae	Not Listed
12.	Neruppu Kondrai	*Delonix regia*	Fabaceae	LC
13.	Kodukkapuli maram	*Pithecellobium dulce*	Fabaceae	Not Listed
14.	Teak	*Tectona grandis*	Lamiaceae	Not Listed
15.	Savukku	*Casuarina equisetifolia*	Casuarinaceae	Not Listed

16.	Thailamaram	*Eucalyptus*	Myrtaceae	Not Listed
17.	Puliyamaram	*Tamarindus indica*	Fabaceae	Not Listed
18.	Arasanmaram	*Ficus religiosa*	Moraceae	Not Listed
19.	Punnaimaram	*Calophyllu inophyllum*	Calophyllaceae	Not Listed
20.	Athi	*Ficus recemosa*	Moraceae	Not Listed
21.	Vazhaimaram	*Musa*	Musaceae	Not Listed
22.	Kadukkai	*Terminalia chebula*	Combretaceae	Not Listed
23.	Nettilinkam	*Polylathia longifolia*	Annonaceae	Not Listed
24.	Sapota	*Manilkara zapota*	Sapotaceae	Not Listed
25.	Navalmaram	*Sygygium cumini*	Myrtaceae	Not Listed
26.	Ezhumuchaipalam	*Citrus lemon*	Rutaceae	Not Listed
27.	Alamaram	*Ficus benghalensis*	Moraceae	Not Listed
28.	Nelli	*Emblica officinalis*	Phyllanthaceae	Not Listed
29.	Vadanarayani	*Delonix elata*	Fabaceae	Not Listed
30.	Marudaani	*Lawsonia inermis*	Lythraceae	Not Listed
31.	Manja kadambai	*Adina cordifolia*	Rubiaceae	Not Listed
32.	Pappali maram	*Carica papaya L*	Caricaceae	Not Listed
33.	Vilvam	*Aegle marmelos*	Rutaceae	Not Listed
34.	Kariveppilai	*Murraya koenigii*	Asclepiadaceae	Not Listed
35.	Perumungil	*Bambusa bambos*	Poaceae	Not Listed
36.	Eetti	*Dalbergia latifolia*	Fabaceae	Not Listed
37.	Chitthakathi	*Sesbania sesban*	Fabaceae	Not Listed
38.	Vilvam	*Aegle marmelos*	Rutaceae	Not Listed
39.	Malvaceae	*Polylathia longifolia*	Annonaceae	Not Listed
40.	Elavam Panju Tree	*Ceiba pentandra*	Asclepiadaceae	Not Listed
Shrubs				
41.	Unichedi	*Lantana camara*	Verbenaceae	Not Listed
42.	Sundaika	*Solanum torvum*	Solanaceae	Not Listed
43.	Erukku	*Calotropis gigantea*	apocynaceae	Not Listed
44.	Avarai	*Senna auriculata*	Fabaceae	Not Listed
45.	Sappathikalli	*Cereus pterogonus*	Cactus	Not Listed

46.	Kattamanaku	*Jatropha gossypiifolia*	Euphorbiaceae	Not Listed
47.	Nochi	*Vitex negundo*	Lamiaceae	Not Listed
48.	Idlipoo	*xoracoc cinea*	Rubiaceae	Not Listed
49.	Neermulli	*Hydrophila auriculata*	Acanthaceae	Not Listed
50.	Chaturakalli	*Euphorbia antiquorum*	Euphorbiaceae	Not Listed
51.	Thuthi	*Abutilon indicum*	Meliaceae	Not Listed
52.	Chemparuthi	*Hibiscu rosa-sinensis*	Malvaceae	Not Listed
53.	Arali	*Nerium indicum*	Apocynaceae	Not Listed
54.	Icham	*Phoenix pusilla*	Arecaceae	Not Listed
55.	Karunochi	*Vitex negundo*	Lamiaceae	Not Listed
56.	Arali (White)	Nerium oleander	Apocynaceae	Not Listed
57.	Peacock flower	*Caesalpinia pulcherrima*	Fabaceae	Not Listed
58.	Yellow Trumpet	*Tecoma stans*	Bignoniaceae	Not Listed
59.	Indian Nightshade	*Solanum violaceum*	Solanaceae	Not Listed
60.	Pomegrante	*Punica granatum*	Lythraceae	Not Listed
61.	Rangoon Creeper	*Combretum indicum*	Combretaceae	Not Listed
Herbs/ Climber				
62.	Ponnangani	*Alternanthera pungens*	Amaranthaceae	Not Listed
63.	Wild thulasi	*Hyptis suaveolens (L.)*	Lamiaceae	Not Listed
64.	Gopuram Tangi	*Andrographis echioides*	Acanthaceae	Not Listed
65.	Amman Paccharisi	*Euphorbia hirta*	Euphorbiaceae	Not Listed
66.	Paca poondu	*Pavonia gallaensis*	Malvaceae	Not Listed
67.	Perandai	*Cissus quadrangularis*	Vitaceae	Not Listed
68.	Vishnukrandai	*Evolvulus alsinoides*	Convolvulaceae	Not Listed
69.	Musumusukkai	*Mukia maderaspatana*	Cucurbitaceae	Not Listed
70.	Sirupunaikkali	*Passiflora foetida*	Passifloraceae	Not Listed
71.	Nagathali	*Opuntia dillenii*	Cactaceae	Not Listed
72.	Thumbai	*Leucas aspera*	Lamiaceae	Not Listed
73.	Kantang kathrikai	*Solanum virginianum*	Solanaceae	LC
74.	Poolai poondu	*Aerva lanata*	Amaranthaceae	Not Listed
75.	Nayuruvi	*Achyranthes aspera*	Amaranthaceae	Not Listed

76.	Thottalchinungi	*Mimosa pudica*	Fabaceae	Not Listed
77.	Anachundaikai	*Solanum violaceum*	Solanaceae	Not Listed
78.	Kombumul	*Acanthospermum hispidum*	Asteraceae	Not Listed
79.	Wild thulasi	*Hyptis suaveolens (L.)*	Lamiaceae	Not Listed
80.	Agave	*Agave sisalana*	Asparagaceae	Not Listed
Creepers/ Grasses				
81.	Sithrapaalavi	*Euphorbia prostrata*	Euphorbiaceae	Not Listed
82.	Vallarai	*Merremia gangetica*	Convolvulaceae	Not Listed
83.	Thumattikai	*Cucumis callosus*	Cucurbitaceae	Not Listed
84.	Siru puladi	*Desmodium triflorum*	Fabaceae	Not Listed
85.	Vallikeerai	*Ipomoea aquatica*	Convolvulaceae	Not Listed
86.	Malli	*Jasminum augustifolium*	Oleaceae	Not Listed
87.	Sangupoo	*Clitoriaternatia*	Fabaceae	Not Listed
88.	Mudakkotan	*Cardiospermum helicacabum*	Sapindaceae	Not Listed
89.	Kattu kanchippul	*Apluda mutica*	Poaceae	Not Listed
90.	Korai	*Cyperus rotandus*	Poaceae	Not Listed
91.	Chevvarakupul	*Chloris barbata*	Amaranthaceae	Not Listed
92.	Arugampul	*Cynodon dactylon*	Poaceae	Not Listed
93.	Chevvarakupul	*Chloris barbata*	Amaranthaceae	Not Listed
94.	Nagathali	*Opuntia dillenii*	Nagathali	Not Listed
95.	Kala Pullu	*Eragrostis ferruginea*	Poaceae	Not Listed

NE- Not evaluated; LC- Least Concern, NT- Near Threatened, T- Threatened

3.7.7 Fauna Study

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 Mine lease area.

Table 3.25 Methodology applied during survey of fauna

S. No.		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)

3.7.7.1 Fauna in Core Zone

A total of 24 varieties of species were observed in the Core zone (Table.3.26). Among them are 8 (33%) Insects, 5 (21%) Reptiles, 3 (13%) Mammals and 9 (33%) Avian. A total of 24 species belonging to 18 families were recorded from the core area. The study shows that number of species decreases towards the mining area. This might be due the lack of vegetation. None of these species in the core zone are threatened or endemic. The survey was conducted to identify species listed in IUCN Red List. According to the field data, any species are not of Schedule I and nine species are of schedule IV. 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 3.26.

3.7.7.2 Fauna in Buffer Zone

A total of 49 species belonging to 35 families have been recorded from the buffer zone area (Table.3.27). Based on habitat classification the majority of species were Aves 20 (41%), followed by Insects 14 (29%), Reptiles 8 (16%), Mammals 4 (8%) and Amphibians 3 (6%). There are 7 Schedule II species and 24 species are under schedule IV according to Indian wild life Act 1972. A total fifteen species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable and endemic species were observed.

Table 3.26 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					
	Ant	Formicidae	*Camponotus vicinus*	NL	NL
1	Plain Tiger	Nymphalidae	*Dananuschrysippus*	NL	LC
2	Tawny coster	Nymphalidae	*Danaus chrysippus*	Schedule IV	LC
3	Red-veined darter	Libellulidae	*Sympetrum fonscolombii*	NE	LC

4	Grasshopper	Acrididae	*Hieroglyphus sp*	NL	LC
5	Striped tiger	Nymphalidae	*Danaus plexippus*	Schedule IV	LC
6	Termite	Blattodea	*Hamitermes silvestri*	NL	LC
7	Common grass yellow	Pieridae	*Euremahecabe*	NL	LC
8	Milkweed butterfly	Nymphalidae	*Danaus plexippus*	NL	LC
Reptiles					
1	Garden lizard	Agamidae	*Calotes versicolor*	NE	NE
2	Common house gecko	Gekkonidae	*Hemidactylus frenatus*	NE	NE
3	Rat snake	Colubridae	*Ptyas mucosa*	Sch II (Part II)	LC
4	Common krait	Elapid snakes	*Bungarus caeruleus*	Schedule IV	LC
5	Fan-Throated Lizard	Agamidae	*Sitanaponticeriana*	NL	LC
Mammals					
1	Indian Field Mouse	Muridae	*Mus booduga*	Schedule IV	LC
2	Asian Small Mongoose	Herpestidae	*Herpestes javanicus*	Schedule II	LC
3	Rat	Murids	*Rattusrattus*	Schedule IV	LC
Avian					
1	Common myna	Sturnidae	*Acridotheres tristis*	NE	LC
2	Black drongo	Dicruridae	*Dicrurus macrocercus*	NE	LC
3	Koel	Cucalidae	*Dynamism scolopaceus*	Schedule IV	LC
4	Common cuckoo	Cucalidae	*Cuculus canorus*	NE	LC
5	House crow	Corvidae	*Corvus splendens*	NE	LC
6	Crow Pheasant	Cucalidae	*Centropus sinensis*	Schedule IV	LC
7	Rose-ringed parakeet	Psittaculidae	*Psittacula krameri*	Schedule IV	LC
8	Asian green bee-eater	Meropidae	*Meropsorientalis*	NL	LC
9	Cattle egret	Ardeidae	*Bubulcus ibis*	NE	LC

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

Table 3.27 Fauna in Buffer Zone

S. No	Common name/ English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	UCN Red List data
Insects					
1	Honey bee	Apidae	*Apis cerana*	Schedule IV	LC
2	Blue tiger	Nymphalidae	*Tirumala limniace*	Schedule IV	LC
3	Common Indian crow	Nymphalidae	*Euploea core*	Schedule IV	LC
4	Tawny coster	Nymphalidae	*Danaus chrysippus*	Schedule IV	LC
5	Grasshopper	Acrididae	*Hieroglyphus sp*	NL	LC
6	Jewel beetle	Buprestidae	*Eurythyrea austriaca*	Schedule IV	LC
7	Red-veined darter	Libellulidae	*Sympetrum fonscolombii*	NL	LC
8	Ant	Formicidae	*Camponotus vicinus*	NL	LC
9	Praying mantis	Mantidae	*mantis religiosa*	NL	LC
10	Dragonfly	Gomphidae	*Ceratogomphus pictus*	Schedule IV	LC
11	Milkweed butterfly	Nymphalidae	*Danainae*	NL	LC
12	Striped tiger	Nymphalidae	*Danaus plexippus*	Schedule IV	LC
13	Lesser grass blue	Lycaenidae	*Zizina otis indica*	Schedule IV	LC
14	Common Tiger	Nymphalidae	*Danaus genutia*	Schedule IV	LC
Reptiles					
1	Garden lizard	Agamidae	*Calotes versicolor*	NL	LC
2	Chameleon	Chamaeleonidae	*Chameleon zeylanicus*	Schedule II	LC
3	Common house gecko	Gekkonidae	*Hemidactylus frenatus*	NL	LC
4	Rat snake	Colubridae	*Ptyas mucosa*	Sch II (Part II)	LC
5	Indian wall lizard	Gekkonidae	*Hemidactylus flaviviridis*	Schedule IV	NL
6	Saw scaled viper	Elapidae	*Echis carinatus*	Sch II (Part II)	LC
7	Brahminy skink	Scincidae	*Eutropis carinata*	NL	LC

8	Scincidae	Viperidae	*Vipera russseli*	Sch II (Part II)	LC
Mammals					
1	Indian palm squirrel	Sciuridae	*Funambulus palmarum*	Schedule IV	LC
2	Indian Field Mouse	Muridae	*Mus booduga*	Schedule IV	LC
3	Indian hare	Leporidae	*Lepus nigricollis*	Schedule IV	LC
4	Asian Small Mongoose	Herpestidae	*Herpestes javanicus*	Schedule (Part II)	LC
Aves					
1	Koel	Cucalidae	*Eudynamys*	Schedule IV	LC
2	Cattle egret	Ardeidae	*Bubulcus ibis*	NL	LC
3	Common myna	Sturnidae	*Acridotheres tristis*	NL	LC
4	House crow	Corvidae	*Corvussplendens*	NL	LC
5	Asian green bee-eater	Meropidae	*Meropsorientalis*	NL	LC
6	Red-vented Bulbul	Pycnonotidae	*Pycnonotuscafer*	Schedule IV	LC
7	Rose-ringed parkeet	Psittaculidae	*Psittacula krameri*	Schedule IV	LC
8	Shikra	Accipitridae	*Accipiter badius*	NL	LC
9	Common quail	Phasianidae	*Coturnix coturnix*	Schedule IV	LC
10	Black drongo	Dicruridae	*Dicrurus macrocercus*	Schedule IV	LC
11	Two-tailed Sparrow	Dicruridae	*Passer domesticus*	Schedule IV	LC
12	Grey Francolin	Phasianidae	*Francolinus pondicerianus*	Schedule IV	LC
13	Common Quail	Phasianidae	*Coturnix coturnix*	Schedule IV	LC
14	White-breasted waterhen	Rallidae	*Amaurornis phoenicurus*	NL	LC
15	Common Coot	Rallidae	*Fulica atra*	Schedule IV	LC
16	Indian pond heron	Ardeidae	*Ardeola grayii*	Schedule IV	LC
17	Brahminy starling	Sturnidae	*Sturnia pagodarum*	Schedule IV	LC
18	Small Sunbird	Nectariniidae	*Nectarinia asiatica*	Schedule IV	LC
19	Blue Rock Pigeon	Columbidae	*Columba livia*	Schedule IV	LC
20	Small blue Kingfisher	Alcedinidae	*Alcedo atthis*	Schedule IV	LC

Amphibians					
1	Indian Burrowing frog	Dicroglossidae	*Sphaerotheca breviceps*	Schedule IV	LC
2	Pond Frog	Ranidae	*Rana hexadactyla*	Schedule IV	LC
3	Tiger Frog	Chordata	*Hoplobatrachus tigerinus (Rana tigerina)*	Schedule IV	LC

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

Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. Fish is commonly found in all types of natural water bodies and very common source of food in Easterner South India. The local fishermen were enquired and also the secondary resources were reviewed to collect information on the fishes found in the study area. Few common species are; *Catla (Catla catla), Channa striata, Oreochromis niloticus.*

Table 3.28 Aquatic Fauna and Flora

Sl. No	Common Name	Scientific name	Family Name	IUCN Red List of Threatened Species
Flora				
1	Water hyacinth	*Eichornia crassipes*	Pontederiaceae	NA
2	Blue waterlily	*Nymphaea nouchali*	Nymphaeaceae	LC
3	Cross Grass	*Carex cruciata*	Cyperaceae	NA
4	Scutch grass	*Cynodon dactylon*	Poaceae	LC
Fauna				
5	Thilopia	*Oreochromis niloticus*	Cichlidae	LC
6	Catla	*Catla*	Cyprinidae	LC
7	Koravi meen	*Channa striata*	Channidae	LC
8	Roghu	*Labeo rohita*	Cyprinidae	LC

*LC- Least Concern, NA-Not yet assessed

Phytoplankton's:

Microcystis, Nitzschia, Oscillatoria, Navicula and Pediastrum sps.

Zooplanktons:

These consist of microscopic organisms from groups Protozoa, Rotifers, Cladocera and Copepoda etc. Some common species of zooplanktons are; *Deflandre, Arcella vulgaris, Centropyxis spinosa Arcella discoides, Arcella hemispherica, Centropyxis aculeate, Trigonopyxis*

arcula, Brachionus calyciflorus, Lecane curvicornis, Brachionus angularis, Polyarthra vulgaris, Filinia longiseta.

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 nearby lakes and rivers with phytoplankton, zooplankton, fish Artiola gray and humans.

Ex: Phytoplankton→ Zooplankton→ small fish→ large fish → Human

3.7.8 Agriculture & Horticulture in Salem district:

Major horticulture crops cultivated in this district are fruits crops like mango, banana, sapota, amla and guava, vegetables like brinjal, bhendi, capsicum, onion and chillies, spices like turmeric and pepper, and flower crops like rose, gerbera and carnations.

3.7.8.1 Major Agricultural Crops

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

Table 3.29 Major Crops in 1km radius

S. No	Major crops	Scientific name	Families
1	Sorghum	*Sorghum bicolor*	Poaceae
2	Gingelly	*Sesamum indicum*	Pedaliaceae
3	Groundnut	*Arachis hypogaea*	Legumes
4	Millets	*Panicum miliaceum L*	Poaceae
5	Sesame	*Sesamum indicum*	Pedaliaceae
6	Cotton	*Gossypium herbaceum*	Malvaceae

3.7.8.2 Major Horticulture Crops

Horticulture includes cultivation of fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees and plants. It also includes plant conservation, landscape restoration, landscape and garden design.

Horticulture

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

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

S. No	Common Name	Scientific Name	Family
Major Horticultural Crops			
1	Guava	*Psidium guajava*	Myrtaceae
2	Sapota	*Manilkara zapota*	Sapotaceae
3	Lemon	*Citrus × limon*	Rutaceae
4	Papaya	*Carica papaya*	Caricaceae
5	mango	*Mangifera indica*	Anacardiaceae
6	banana	*Musa × paradisiaca*	Musaceae
Vegetables			
7	Onion	*Allium cepa*	Amaryllidaceae
8	Tapioca	*Manihot esculenta*	Spurges
9	Brinjal	*Solanum melongena*	Nightshade
10	Tomato	*Solanum lycopersicum*	Nightshade
11	Bottle Gourd	*Lagenaria siceraria*	Cucurbits
12	Ladies finger	*Abelmoschus esculentus*	Mallows
13	Moringa	*Moringa oleifera*	Moringaceae

3.8 SOCIO-ECONOMIC ENVIRONMENT

The major developmental activities in the mining and industrial sector are crucial for economic development and the creation of direct and indirect employment opportunities. These activities also fulfil society's basic and modern needs of the society, ultimately improving the quality of life through advancements in social, economic, health, education, and nutritional status within the project region, state, and country. In this manner all developmental projects have direct as well as indirect relationships with socio-economic aspects, which also include public acceptability for developmental projects. Thus, the study of socio-economic environment component incorporating various facets related to prevailing social and cultural conditions and economic status of the mining (rough stone quarry) project region is an important part of the EIA study. The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio-economic and parameters of human interest due to the project.

Objectives of the Study

a) To study the socio-economic status of the people living in the study area villages.
b) To identify the basic needs of the villages within the study area.

c) To assess the impact on socio-economic environment due to the project.
d) To provide the employment and improved living standards.
e) To analysis of impact of socio economic and Environmental Infrastructure facilities and road accessibility.

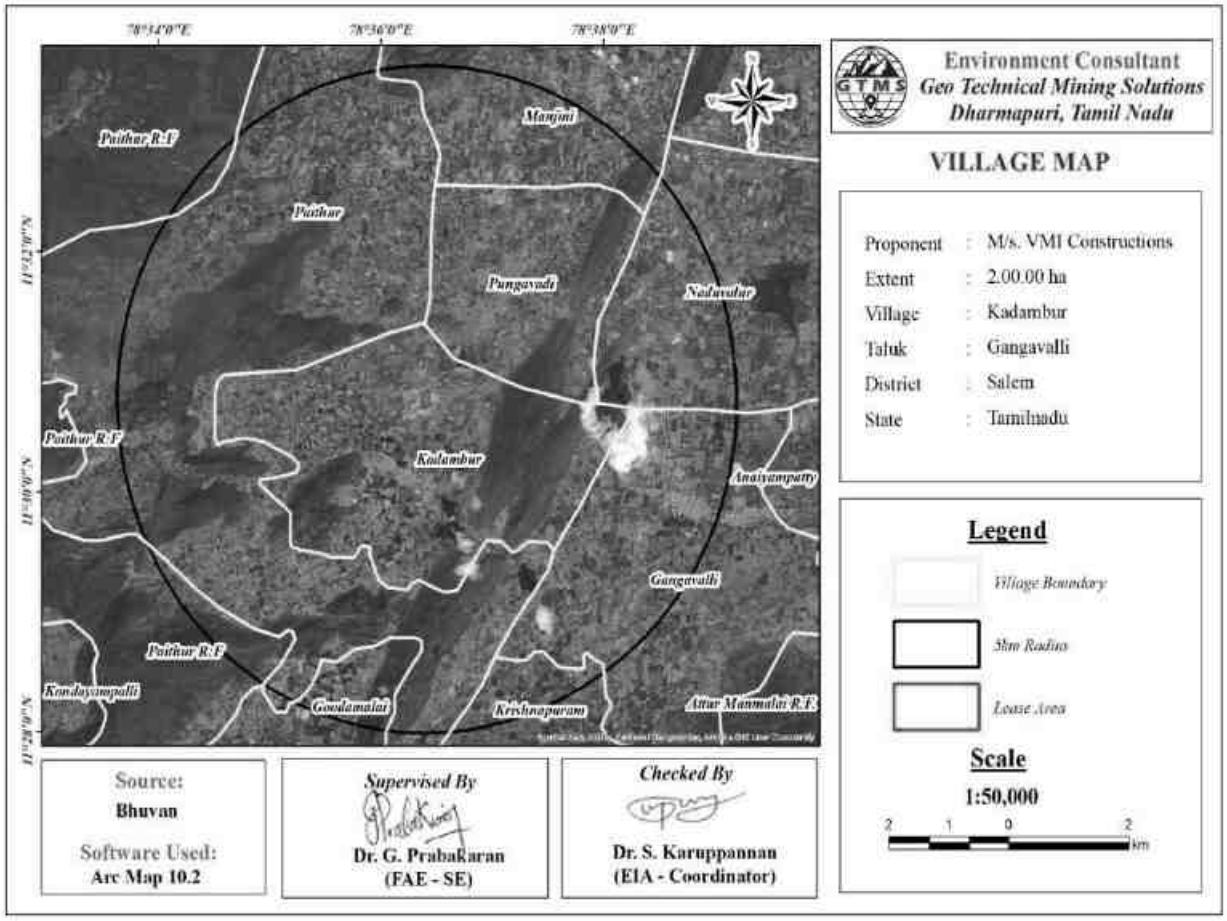


Figure 3.28 Village Boundaries in 5 km Radius of the Project area

Methodology

The study employed cluster sampling to outline two zones around the proposed project site: Zone 1 (Core Zone, 0-1 km radius) and Zone 2 (Low Impact Zone, 1–5 km radius). The primary data collection was conducted through structured interviews, field observation, and focus group discussions with the local people of Kadambur Village, Gangavalli Taluk of Salem District, Tamil Nadu. The secondary data were collected from the Census report 2011 and official records, covering demographics and basic services including information on population, number of households, literacy rates, sex ratios, worker details and the availability of basic services. This study covers the positive and negative impacts of the project's establishment, and provides recommendations for analysing and mitigating adverse effects. The study area is illustrated in Figure 3.28.

Demographic Profile of Salem District

Salem is central part of Tamil Nadu in India and is bounded by Dharmapuri district on the north, Coimbatore on the West, South Arcot on the Northeast and Tiruchirappalli on the South and Southwest. An official Census 2011 detail of Karur, a district of Tamil Nadu has been released by Directorate of Census Operations in Tamil Nadu. n 2011, Salem had population of 3,482,056 of which male and female were 1,781,571 and 1,700,485 respectively. In 2001 census, Salem had a population of 3,016,346 of which males were 1,563,633 and remaining 1,452,713 were females. Salem District population constituted 4.83 percent of total Maharashtra population. In 2001 census, this figure for Salem District was at 4.83 percent of Maharashtra population. There was change of 15.44 percent in the population compared to population as per 2001. In the previous census of India 2001, Salem District recorded increase of 17.20 percent to its population compared to 1991.

Literacy Rate

Average literacy rate of Salem in 2011 were 72.86 compared to 72.86 of 2001. If things are looked out at gender wise, male and female literacy were 80.24 and 65.15 respectively. For 2001 census, same figures stood at 74.39 and 55.20 in Salem District. Total literate in Salem District was 2,285,562 of which male and female were 1,285,107 and 1,000,455 respectively. In 2001, Salem District had 1,734,442 in its district.

Sex Ratio

With regards to Sex Ratio in Salem, it stood at 954 per 1000 male compared to 2001 census figure of 929. The average national sex ratio in India is 940 as per latest reports of Census 2011 Directorate. In 2011 census, child sex ratio is 916 girls per 1000 boys compared to figure of 851 girls per 1000 boys of 2001 census data.

(Source: https://www.census2011.co.in/census/district/28-salem.html)

Profile of Kadambur Village

Location

Kadambur is a Village in Gangavalli Block in Salem District of Tamil Nadu State, India. It is located 60 KM towards East from District headquarters Salem. 5 KM from Gangavalli. 291 KM from State capital Chennai. Gangavalli (5 KM), Goodamalai (5 KM), Paithur (6 KM), Anaiyampatti (6 KM), Manjini (8 KM) are the nearby Villages to Kadambur. Kadambur is surrounded by Attur Block towards North, Thammampatti Block towards west, Talavasal Block towards East, Peddanaickenpalayam Block towards North.

Demographic Aspects

Kadambur is a large village located in Gangavalli Taluk of Salem district, Tamil Nadu with total 1783 families residing, table 3.31. The Kadambur village has population of 6504 of which 3263 are males while 3241 are females as per Population Census 2011. In Kadambur village population of children with age 0-6 is 671 which makes up 10.32 % of total population of village. Average Sex Ratio of Kadambur village is 993 which is lower than Tamil Nadu state average of 996. Child Sex Ratio for the Kadambur as per census is 890, lower than Tamil Nadu average of 943. Kadambur village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Kadambur village was 64.92 % compared to 80.09 % of Tamil Nadu. In Kadambur Male literacy stands at 74.72 % while female literacy rate was 55.18 %.

Table 3.31 Kadambur Village Demographic profile

Particulars	Total	Male	Female
No. of households	1783	-	-
Population	6504	3263	3241
Child (0-6 years)	671	355	316
Schedule Caste	1777	896	881
Schedule Tribe	729	372	357
Literacy	64.92%	74.72%	55.18%
Total Workers	3918	2077	1841
Main Worker	3527	-	-
Marginal Worker	391	120	271

Source: https://www.census2011.co.in/data/village/634335-kadambur-tamil-nadu.html

Working Population

In Kadambur village out of total population, 3918 were engaged in work activities. 90.02 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 9.98 % were involved in Marginal activity providing livelihood for less than 6 months. Of 3918 workers engaged in Main Work, 1110 were cultivators (owner or co-owner) while 1832 were Agricultural labourer.

Benefits

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.

Caste Factor

Kadambur village has substantial population of Schedule Caste. Schedule Caste (SC) constitutes 27.32 % while Schedule Tribe (ST) were 11.21 % of total population in Kadambur village.

STUDY AREA VILLAGES – 5km radius

Demographic Aspects

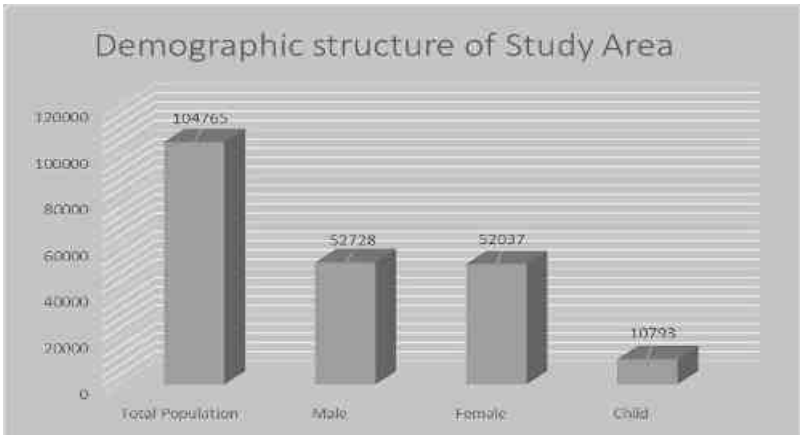
The study area comprises of 7 villages including Gangavalli Rural, with total population of 1,04,765 among 28,699 households. All villages have considerable settlements ranging from 941 households in Pungavadi and Paithur with highest of 2280 households. The villages also have similar considerable higher households like Naduvalur (2187 households) and Goodamalai (1876 households). Children aged 0–6 generally account for approximately 10% of the total population, indicating a relatively young demographic profile in most villages. Since Gangavalli Rural is the out skirts of Gangavalli Urban together serves as the district sub-headquarter and have higher population with abundant industrial and economical activities and have higher values in all demographic aspects.

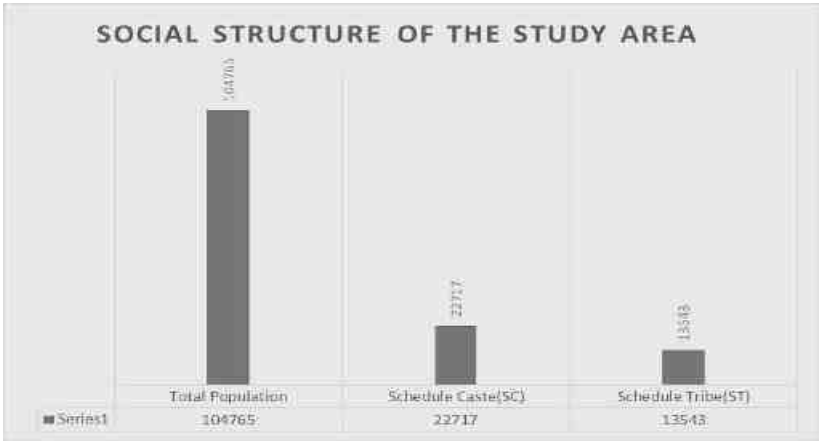
Social structure

Scheduled Castes (SC) are notably present in all villages with lowest in Manjini, Krishnapuram and Pungavadi, Goodmalai with relatively higher than other villages. Instead, Paithur and Naduvalur also has considerable count of population. Among all villages, Pungavadi and Manjini has no Schedule Tribe (ST) population, Krishnapuram and Nadvalur with very least count and Paithur has considerably higher ST population with 1653 males and 1620 females.

Literacy rate

In terms of literacy, the study area villages exhibit a notable number of 62.5% with a gender gap of male literacy at 35% and female literacy at 27.4%. Naduvalur and Paithur has higher literacy rates, while other villages like Googamalai, Manjini and Krishnapuram show considerable literate population. The village Pungavadi has lowest literacy rate of 2.1% among all study area villages. The low literacy levels are due to limited educational resources. Approximately, 25% of Illiterate population (excluding child and old population) is of serious concern in the study area villages.





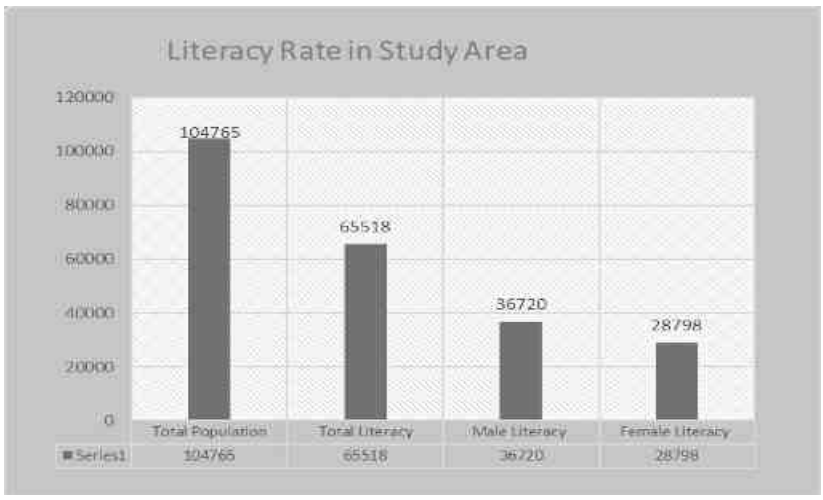


Figure 3.29 Population, Social Groups, and Literacy Rate in Study Villages

Workforce Participation of study area villages

The workforce distribution across various villages in terms of the total workers, main workers, cultivators, agricultural laborers, other workers, and non-workers. The worker distribution across the study area highlights significant variation in labour participation between villages. Of all 63,568-working population, Paithur (5506 workers), Naduvalur (3534) and

Goodamalai (3488) lead with the highest number of main workers, likely due to their agricultural base or labor-intensive industries. In contrast, Krisnapuram (1393 workers) shown minimal worker participation, possibly due to low population density with limited employment opportunities.

When looking at main workers those engaged in a primary occupation for over six months. Agriculture remains the primary occupation, with many individuals employed as cultivators or agricultural labours. Villages such as Paithur with 3,035 and Goodamalai with 1,235 have a notable proportion of their workforce involved in cultivation as main occupation and Naduvalur, Paithur and Goodamalai indicating higher number of agricultural labours indicates the agro-based economy in those regions. Non-agricultural employment, classified as 'other workers,' is relatively limited, suggesting low economic diversification and limited availability of alternative income sources.

Agriculture continues to dominate in most of the villages, as seen in Naduvalur and Paithur where agricultural labourers are the majority. The number of non-workers is substantial in most villages, particularly larger ones, indicating high dependency ratios and a significant portion of the population reliant on the working population for livelihood. Smaller villages, such as Koilkuppam and Agaram exhibit low workforce numbers, which may reflect either limited local employment opportunities or demographic factors such as higher proportions of children and elderly residents. Gender disparities in workforce participation are also visible, with males typically more involved in villages like Naduvalur, Manjini, Krishnapuram other villages show similar/equal female participation.

Additionally, the study finds that while certain villages are progressing with diverse employment and better gender inclusion, others remain heavily reliant on agriculture and have limited workforce engagement. Encouraging non-farm employment, particularly in rural and semi-urban areas, could bridge economic disparities.

Table 3.32 Demographic Structure and Literacy Rate of study area villages (5 km radius)

Village Name	No. of Houses	Population in Gender wise		Child (0-6years)		Schedule Caste		Schedule Tribe		Literacy Rate		Total Workers	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Paithur	2280	4206	4097	424	379	618	629	1653	1620	2867	2122	2808	2754
Pungavadi	941	1873	1796	213	198	1233	1222	0	0	1312	973	1217	1201
Naduvalur	2187	3928	3847	479	377	806	797	11	8	2943	2328	2350	1977
Manjini	1036	1872	1899	168	144	334	317	0	0	1383	1122	1201	953
Goodamalai	1876	3489	3500	384	356	945	968	63	27	2415	1907	2328	2231
Krishnapuram	1035	1833	1822	190	177	444	435	4	4	1283	1053	1150	996
Gangavalli Rural	19344	35527	35076	3863	3441	7021	6948	5151	5002	24517	19293	22533	19869
Total	**28699**	**52728**	**52037**	**5721**	**5072**	**11401**	**11316**	**6882**	**6661**	**36720**	**28798**	**33587**	**29981**

Source: Tamil Nadu districts Census Reports – 2011.

Table 3.33 Workforce structure of the Study Area Villages

Village Name	Total Worker	Total Male Workers	Total Female Workers	Total Main Workers	Total Main Cultivators	Total Main Agricultural Labourers	Total Other Workers	Total Non-Workers
Paithur	5562	2808	2754	5506	3035	1914	532	2741
Pungavadi	2418	1217	1201	2353	566	1597	166	1251
Naduvalur	4327	2350	1977	3534	872	1968	651	3448
Manjini	2154	1201	953	1764	594	808	343	1617
Goodamalai	4559	2328	2231	3488	1235	1823	402	2430
Krishnapuram	2146	1150	996	1393	441	598	320	1509
Gangavalli Rural	42402	22533	19869	35880	12553	18596	4474	28201
Total	**63568**	**33587**	**29981**	**53918**	**19296**	**27304**	**6888**	**41197**

Source: Tamil Nadu districts Census Reports – 2011

Skill development programs for women and youth, infrastructure enhancement, and local job creation through MSMEs or agro-processing units would help balance workforce participation and stimulate rural development across the district.

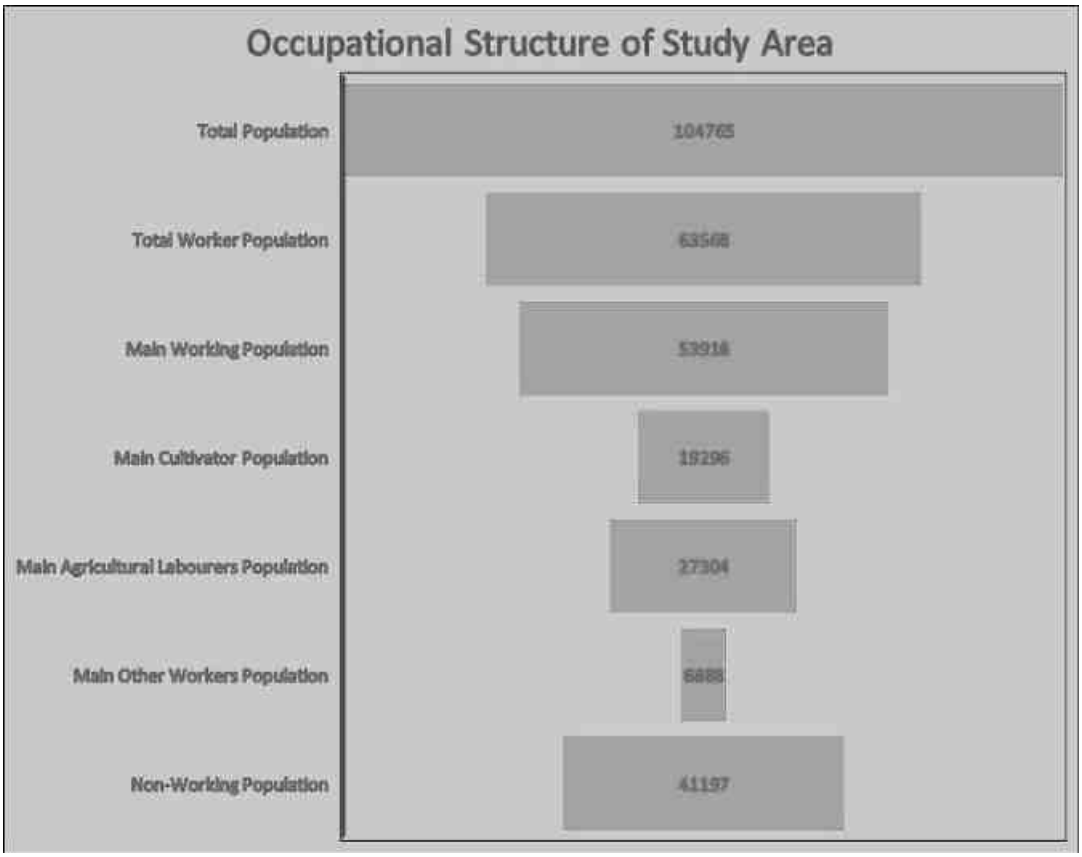


Figure 3.30 Details of Workforce in the Study Villages

As per SEAC recommendation the project proponent should spend minimum of 5 lakh rupees to the nearby school from the proposed project site as part of CER cost. Also, the village panchayat will get direct benefit from the government through District Mineral Resource Fund (DMF) for infrastructure development activities.

- Awareness and Opinion of the People about the Project, to assess public awareness and opinions regarding the proposed project, the following key observations were recorded,
- During the survey, it was observed that only residents of nearby villages were aware of the proposed project, while those in more distant villages were largely unaware.
- People in the region expressed expectations that the project would generate employment opportunities and lead to improvements in education, transportation, and sanitation facilities provided by the project authorities.

Table 3.34 Enumeration of Structures from 0- 300m Radius

Radius	Number & Type of Structures	Distance in M	Direction
0 - 300m	Crusher	60	E
	Labour Shed 1	140	E
	Farm House	230	E
	House 1	173	E
	Farm House	195	SE
	House 1, Poultry farm	290	SE
	Crusher	256	W
	Labour Shed- 2	238	W
	Poultry farm	120	N
	Shed 1	186	N
	Farm House	87	NE
	House 2	257, 285	NE
300m- 400m	House- 3	364	N
	Shed- 1	339	NE
	Farm House- 2	369	NE
	Labour Shed- 2	340	W
400m- 500m	Shed- 1	439	N
	Shed- 1	420	E
	Farm House- 1	480	SE
	Farm House- 1	419	S
	Poultry farm	406	S
	Farm House- 1	471	SW

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.

Summary & Conclusion

The socio- economic study gives a clear picture of its population, average household size, literacy rate and sex ratio and other demographic parameters. This study reveals that a part of population is suffering from a lack of organised jobs for survival of their daily life. Their expectation is to earn some regular income for their sustainability on a long-term basis. The proposed project shall aim to provide preferential employment to the local people there by increasing the employment potential of the area and in turn the improve their standards of living.

3.9 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through Village Road and (Attur- Perambalur NH-136),(Salem – Ulundurpet NH-68) as shown in Table 3.35- 3.36 and in Figure 3.21. Traffic density measurements were made continuously for 24hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station. During each shift one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

Table 3.35 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.23km-East	Village Road
TS2	Attur- Perambalur NH-136	5.37km- NE	NH-136
TS3	Salem - Ulundurpet NH - 68	8.90km-N	NH-68

Source: On-site monitoring by GTMS FAE & TM

Table 3.36 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	50	150	60	60	58	29	239
TS2	145	435	188	188	220	110	733
TS3	188	564	247	247	352	176	987

Source: On-site monitoring by GTMS FAE & TM

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

Table 3.37 Rough Stone Transportation Requirement

Transportation of Rough Stone and Topsoil Per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	12	36

Source: Approved Mining Plan

Table 3.38 Summary of Traffic Volume

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960guidelines
Village Road	239	36	275	811
Attur- Perambalur NH-136	733	36	769	1500
Salem - Ulundurpet NH-68	987	36	1023	1500

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.

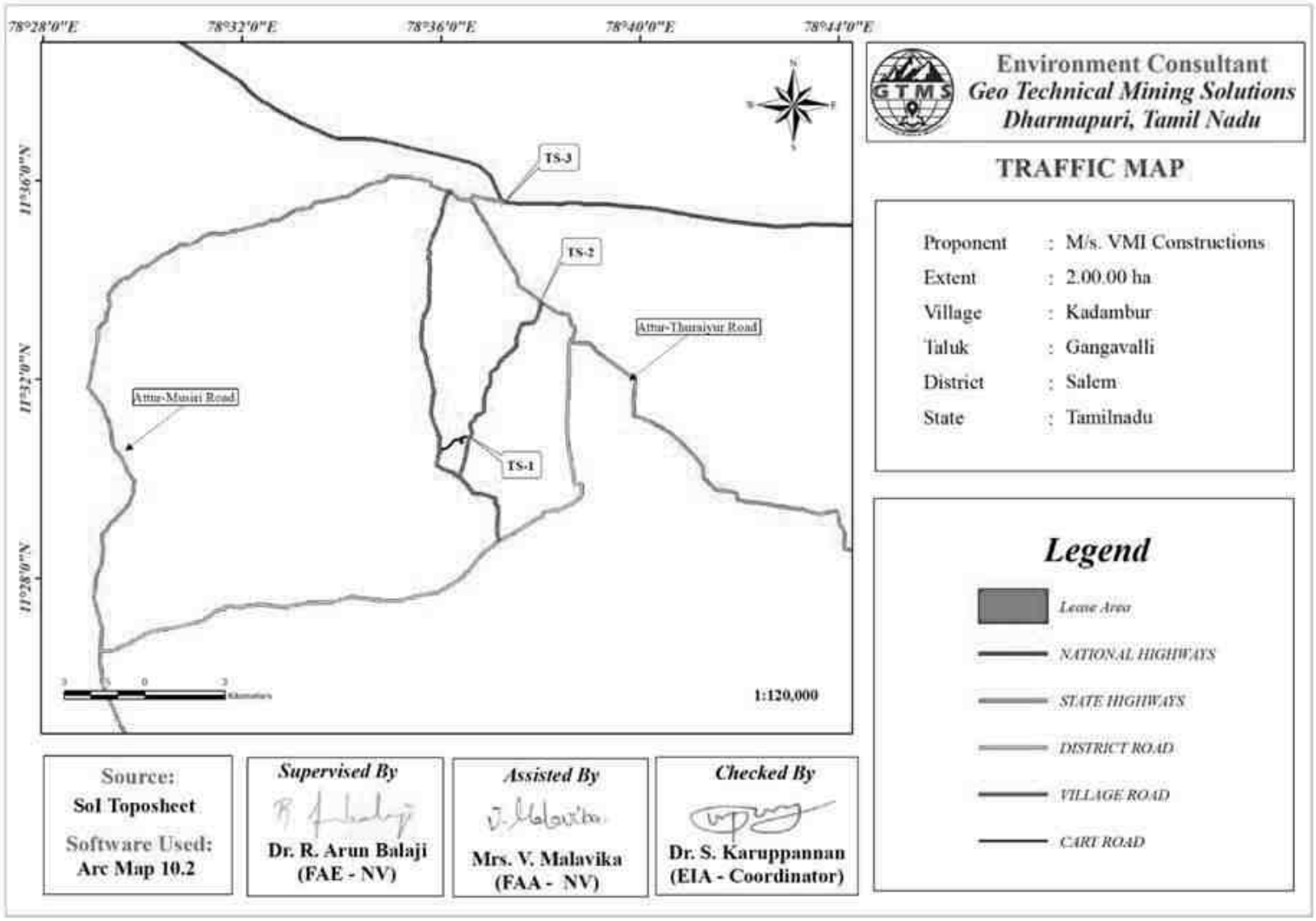


Figure 3.31 Traffic Density Maps

3.10 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries and National Park within 10km 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., 10km radius and the nearby water bodies are given in the Table 3.39.

Table 3.39 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	Karaivetti Bird Sanctuary	74.47km- SE
2	Reserve Forest & River	Oppusamalai R.F	1.04km- East
		Paittur R.F	4.35km- NW
		Gangavalli R.F	6.40km- SE
		Pungavadi Lake	0.42km- NE
		Swetha River Bank	2.3km- SE
		Naduvalur Tank	5.38km- E
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
School,College,Primary Health Centre			
10	Schools	1. GHS- Kadambur - 1.25km- SW 2. PUMS-Pungavadi- 1.89km- NE 3. RC primary school- Pungavadi – 2.13km- NE 4. P.U.P.S-K. Ramanathapuram-2.42km- W	
11	Colleges	1. Golden Polytechnic College - Pallakadu -5.07km-NE 2. Salem Institute of Agricultural Sciences- Pudupet-6.96km-N 3. Arignar Anna Govt Arts College- Vadachennimalai- 9.90km-NE	
12	Defense Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet



Figure 3.32 Field Study Photographs

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

The identification of potential environmental impacts is indeed the crucial first step in the Environmental Impact Assessment (EIA) process utilizing various techniques such as checklists, matrices and network diagrams to understand a project's effects. The matrix method used in this study provides a structured way to identify and assess the impacts ensuring the project can be implemented in an eco- friendly manner. This chapter discusses the anticipated impacts on land, soil, water, air, noise, biological and socioeconomic environments.

The proposed stone mining project involves blasting, drilling and screening operations which contribute to environmental impacts is given in Table 4.1. The project is designed to minimize these impacts by implementing mitigation measures and ensuring a marginal environmental footprint with a detailed analysis to follow in subsequent tables.

Table 4.1 Impact identification matrix.

Activities	**Environmental Attributes**								
	Land	**Soil**	**Water**	**Air**	**Noise**	**Ecology**	**Socio Economics**	**Aesthetics**	**OHS**
Site clearing & Site services	√	√		√		√			
Development of Greenbelt			√			√		√	
Operation Phase (Drilling,	√	√	√	√	√	√			√
Blasting	√	√	√	√	√	√			√
Loading and unloading,									
Transportation)	√	√	√	√	√	√			√
Employment and the material usage							√		
Mine closure (Removal of machineries, structures and Danger due to inadvertent entry)				√	√		√		√

√ Indicates Impact

4.1 LAND ENVIRONMENT

Anticipated Impact

- Converting barren land of 2.00.0hectares to rough stone mining creates a significant and usually irreversible change in land use and land cover involving the physical alteration of the land's surface, potential deforestation, loss of biodiversity, altered topography from pits and spoil dumps.
- Heavy vehicle movement causes significant problems to nearby agriculture and human habitation. These pollutants can degrade soil quality and introduce heavy metals into the environment.
- During transportation the tippers damage the bituminous roads. The primary damage is caused by the fourth power law (*The law posits that if you double an axle's load, the damage caused to the pavement increases by a factor of 2x4 or 16 times*) where pavement damage increases with the fourth power of the axle load. The immense weight of heavy payloads on an axle exerts a concentrated and repetitive stress on the road surface leading to permanent strain, premature failure and a cumulative damage.
- Rain drops hitting stone crushing waste can break apart the particles and flowing water detaches them from the surface transports and redeposits these particles especially from sloped surfaces. This a form of splash erosion followed by sheet erosion which can lead to environmental issues.

Mitigation Measures from Proposed Project

- After mining there is a huge void of 2.00.0hectares upto a depth of 51m is useful for rain water storage structure has an advantage for local farmers. The artificial pond boundary shall be fences to avoid any mishaps.
- Union ministry of road transport and highways on July 16th 2018 increased the maximum cap of axle load limit by 20 to 25 percent cross various categories to keep the limit “at par with international standards”.

Maximum Safe Axle Weight		
Sl. No	**Axle Tupe**	**Maximum safe Axle Weight**
1	Single Axle	-
1.1	Single Axle with single tyre	3.0 tonnes
1.2	Single Axle with two tyres	7.5 tonnes
1.3	Single Axle with four tyres	11.5 tonnes*

2.	**Tandem Axles (Two axles) (where the distance between two axles is less than 1.8 Mtr.)**	-
2.1	Tandem axles for rigid vehiles, trailers and semi-trailers	21 tonnes*
2.2	Tandem axles for puller tractors for hydraulic and pneumatic trailers	28.5tonnes
3.	**Tri-axles (Three axles) (where the distance between outer axles is less than 3 Mtr.)**	-
3.1	Tri-axles for rigid vehicles, trailers and semi- trailers	27 tonnes*
4	Axle Row (two axles with four tyres each) in Modular Hydraulic trailers (9 tonnes load shall be permissible for single axles)	18 tonnes
***Note:** If the vehicle is fitted with pneumatic suspension, I tonne extra Load is permitted for each axle.		

MoRTH knows that previously built Indian roads are made keeping standard axle loads. The new national and state highways along with expressways can be built by using new norms but for the existing roads the life will be reduced on average by one year.

- 6-wheel tipper generally has a maximum legal speed limit which can be up to 60 km/h and speeds should be reduced for loaded conditions. The mine management should take care of the speed of vehicles i.e up to 40km/h in village roads constructed under Pradhan Mantri Gram Sadak Yojana and other district roads developed by Highways and Minor Ports Department, Government of Tamil Nadu as each time a truck passes the concentrated stress causes a small amount of permanent strain on the pavement. Over time these small strains accumulate and lead to significant fatigue and eventual failure.
- 6-wheel tippers of not more than 9tons payload capacity covered with tarpaulin to stop the spillage and dust should use.
- Protective measures such as establish plants like grasses, cover crops and trees to form a dense layer over the dump absorbing raindrop energy and holding particles in place.

4.2 SOIL ENVIRONMENT

Anticipated Impact

- The fertility status of the soil near by the lease area may affect due to extra dust deposition on the soil. Dust deposition from a lease area can harm soil fertility by physically blocking soil pores, reducing aeration and water infiltration, and potentially altering the soil's chemical properties. This damage to the topsoil negatively impacts plant growth by interfering with photosynthesis and nutrient uptake ultimately decreasing crop production.

- Topsoil will be scraped from the area of 1.40.3hectares in the project site will store in safety area left for 7.5meters in the northern side as shown in mining plan.

Mitigation Measures

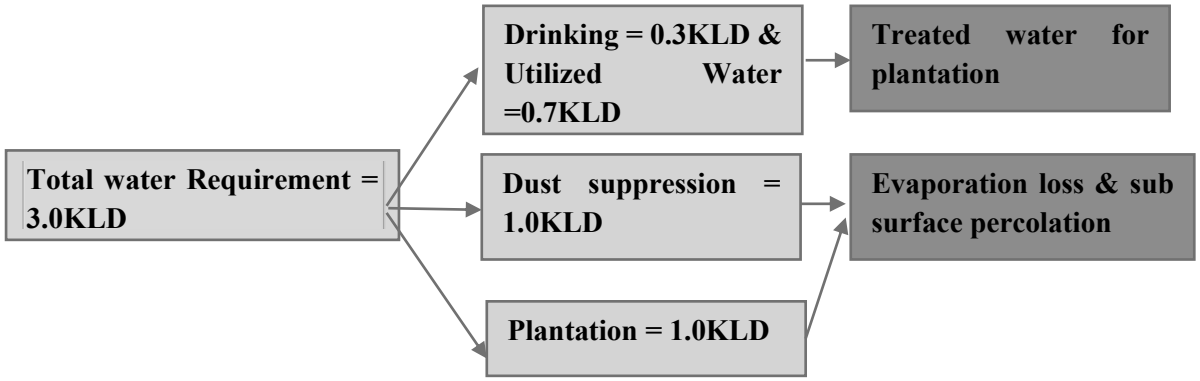
- When stock piling of top soil is done the mound should not be higher than 1.0m and Weathered Rock 3.0m.
- To minimize surface runoff and erosion the topography of a graded surface should be designed to create terraces or benches that follow land contours which intercept sheet flow. Additionally, a bulldozer's tracks can be used to create a fine-scale roughened surface perpendicular to the slope and stockpiles should be constructed with a rough surface to improve drainage, reduce erosion and encourage revegetation.
- Efforts will be made to minimize the storage time to prevent nutrient loss.
- To protect the quality of stockpiled topsoil immediate re-vegetation is crucial. Temporary seeding should be done within 30 days of stockpile formation to control erosion, prevent weed growth and maintain healthy soil microbes.
- If the stockpile will not be reused within 12 months it must be stabilized with permanent vegetation to ensure long-term erosion and weed control.
- The stored topsoil will be utilized for plantations in later phases during the progressive and final closure of the mine.

4.3 WATER ENVIRONMENT

Anticipated Impact

- 3.0KLD water requirement for drinking, domestic, dust suppression and plantation.

Water Balance Chart of the Mine



- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.

- Surface drainage may be affected due to Mining.
- The domestic effluents being generated during mine operation.
- Major impact of opencast mining on groundwater regime is quality deterioration. The proposed mining activities shall be carried out upto a depth of 25m from below ground level. The specific water table depth in the core and buffer zone is between 65m and 70meters below ground level.
- The major sources of water pollution normally associated due to mining and allied operations are:
    - ✓ Generation of waste water from vehicle washing.
    - ✓ Washouts from surface exposure or working areas
    - ✓ Domestic sewage
    - ✓ Disturbance to drainage course in the project area
    - ✓ Mine Pit water discharge

Mitigation Measures

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes.
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Domestic sewage from site office will be discharged in bio-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.
- ❖ Regular monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water.

4.4 AIR ENVIRONMENT

Anticipated Impact

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

Emission of air pollutants such as particular matter (PM), gases such as sulphur dioxide, oxides of nitrogen at various stages of activities such as excavation and transportation of materials. The rate of emission and the incremental concentration of pollutants is estimated in the following sections before providing mitigation measures.

4.4.1 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chaulya et al.,2001. The equations used for SPM emission estimation have been given in Table 4.2.

Table 4.2 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E= [u0.4a0.2\{9.7+ 0.01p+b/(4+0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm^3/yr); a = Lease area(km^2); E = Emission rate(g/s). V = Average Vehicle Speed, f= Frequency (no.of holes/Day), S=Slit Content (%)
Transport road	SPM	Road	$E = \{(100–m)\ s\} /\{m/(100– s)\}]^{0.1}u^{1.6}\{1.64+0.01(v+f\}\}10^{-3}$	

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that PM_{10} emission rate is derived from the SPM estimation in the background that PM_{10} constitutes 52% of SPM emission. The $PM_{2.5}$ and PM_{10} emission results have been given in Table 4.3.

Table 4.3 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m^2	Calculated Value ($g/s/m^2$)
Overall Mine	$PM_{2.5}$	0.1918	20000	9.573E-06
Overall Mine	PM_{10}	0.3835		1.91E-005

Modelling of Incremental Concentration

The post project resultant concentrations of PM_{10}, $PM_{2.5}$ is given in Tables 4.4 - 4.5.

Table 4.4 Incremental & Resultant GLC of $PM_{2.5}$

Station ID	Distance to core area (km)	Direction	PM 2.5 concentrations(µg/m³)			Comparison against air quality standard (60 µg/m3)	Magnitude of change (%)	Limit
			Baseline	Predicted	Total			
AAQ1	0.09	NE	26.42	7.25	33.67	Below standard	27.4	60
AAQ2	0.94	SW	24.81	2	26.81		8.1	60
AAQ3	1.89	NNE	21.36	1	22.36		4.7	60
AAQ4	1.72	NNW	16.75	0.5	17.25		3.0	60
AAQ5	2.28	W	21.61	1	22.61		4.6	60

Table 4.5 Incremental & Resultant GLC of PM_{10}

Station ID	Distance to core area (km)	Direction	PM 10 concentrations(µg/m³)			Comparison against air quality standard (100 µg/m³)	Magnitude of change (%)	Limit
			Baseline	Predicted	Total			
AAQ1	0.09	NE	47.63	15.4	63.03	Below standard	32.3	100
AAQ2	0.94	SW	45.97	5	50.97		10.9	100
AAQ3	1.89	NNE	43.20	3	46.20		6.9	100
AAQ4	1.72	NNW	38.46	1	39.46		2.6	100
AAQ5	2.28	W	42.30	1	43.30		2.4	100

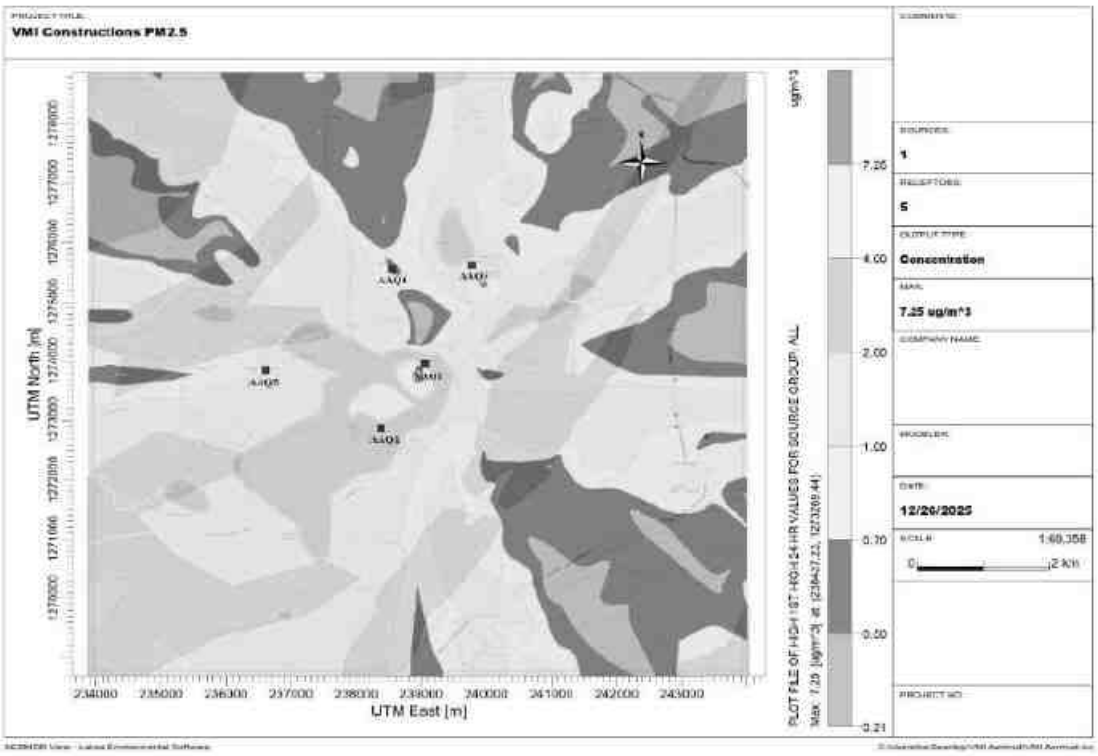


Figure 4.1 Predicted Incremental Concentration of $PM_{2.5}$

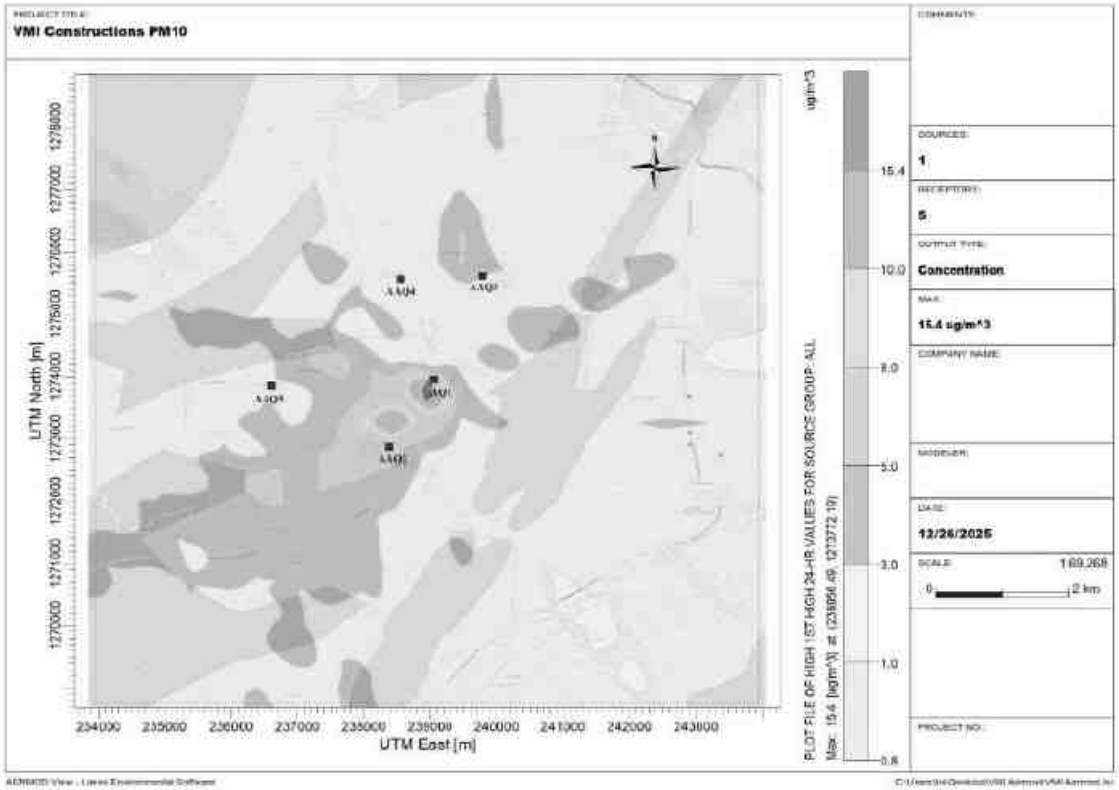
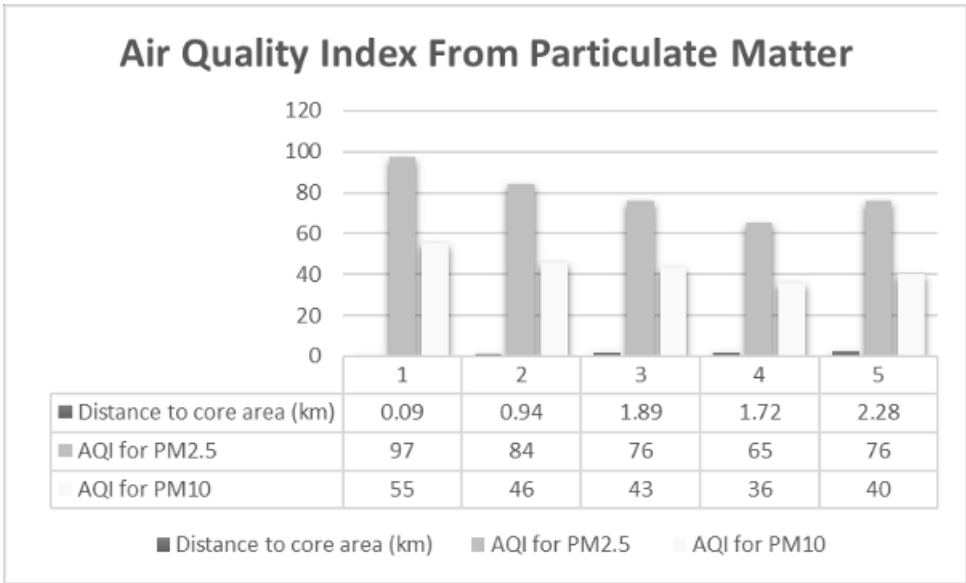


Figure 4.2 Predicted Incremental Concentration of PM_{10}

The Air Quality index for the baseline and predicted values of $PM_{2.5}$ and PM_{10} are given in table below.

Station ID	Distance to core area (km)	Direction	PM2.5 (µg/m³)		AQI for PM2.5	PM10 (µg/m³)		AQI for PM10
			Baseline Conc.	Total (Baseline + Predicted GLC)		Baseline Conc.	Total (Baseline + Predicted GLC)	
AAQ1	0.09	NE	26.42	33.67	97	47.63	63.03	55
AAQ2	0.94	SW	24.81	26.81	84	45.97	50.97	46
AAQ3	1.89	NNE	21.36	22.36	76	43.20	46.20	43
AAQ4	1.72	NNW	16.75	17.25	65	38.46	39.46	36
AAQ5	2.28	W	21.61	22.61	76	42.30	43.30	40

https://www.airnow.gov/aqi/aqi-calculator-concentration/



In the present study American Meteorological Society and the United States Environmental Protection Agency Dispersion Model (AERMOD) air quality model was run for pre monsoon season under maximum atmospheric temperature conditions. The AERMOD has been run for PM_{10} and $PM_{2.5}$ distribution with 24-Hr maximum concentration and concentration contours were obtained as given in Figure 4.1 and 4.2. From these Isopleths plots it is observed that the highest pollutants concentrations predicted by AERMOD was near the major source in the core area and a maximum of 63.03µg/m^3 of PM_{10} and 34µg/m^3 of $PM_{2.5}$ were found to be below the prescribed NAAQS near the source. The AQI vales of PM_{10} shows moderate and $PM_{2.5}$ shows good in all the locations. By adopting suitable mitigation measures the pollutant levels in the atmosphere can be controlled further.

Mitigation Measures

There will be transportation of rough stone from the area to the crusher which is located at a distance of about 200m within the cluster boundary. Considering average annual production of 53956tons per annum i.e. 200tons per day of stone there will be movement of around 12 trucks per day for transportation of the stone. This will create additional traffic load to the road and also additional emission due to vehicular movement. The mitigation measures to minimize the air pollution are given in Table 4.6 below.

Table 4.6 Proposed Mitigation Measures for Air pollution

Potential Sources of air pollution	Magnitude of air pollution	Proposed Pollution Control Measure
Excavation	Emission of Particulate Matter	Provide Personal Protective Equipment's for workers
Drilling and Blasting	Emission of Particulate Matter and emission gaseous	Wet drilling and controlled blasting will adopt. Optimized blast parameters and design were given in chapter 2 should follow for blasting. Safety shelter will construct within the lease area. Provide PPEs for workers.
Loading of material on dumper	Air emission	Water sprinkler with wide angle nozzle of angle 150˚ will be selected for water sprinkling in the dust prone area.
Transportation	High Dust generation	Regular grading of haul roads will be practiced. Planting of trees all along mine haul roads outside the lease. Water sprinklers will install along the haul road. Vehicle without PUC certificate will not be allowed. Cover tarpaulin to the tipper during transportation.
Storage of Topsoil	High Dust generation	High dust generation due to wind from the topsoil storage area. This are will be installed with permanent water sprinkler. Plantation will be provided in the dump slope.
Free silica	Crystalline silica	Crystalline silica is SiO_2 in a specific structural form distinct from the pure non- combined SiO_2

		known as free silica. Crystalline silica particles in these environments can be very small less than 4µm (PM4). There are no generally accepted methods of monitoring in ambient PM4 air.

4.5 NOISE ENVIRONMENT

According to DGMS Technical Circular No. 18 of 1975 and No.5 of 1990 on "Protection of Workers against noise" it is brought to the knowledge of all concerned that Noise is emerging as an important and challenging health hazard for mine workers. Source data has been computed taking into account of all the machinery and activities used in the open cast mining process had listed in Table 4.7.

Table 4.7 Activity and Noise Produced by Machinery in open cast mines

S. No.	Machinery / activity	Distance of measurement	Noise level dB(A)	
			Idling	Fully accelerated
1.	Jack hammer	1	80	97
2.	Compressor	1	-	96
3.	Bulldozer	2	84	100
4.	Tipper	2	75	92
5.	Drill	1	85	90

The permissible noise exposure levels in Indian mines are based on OSHA standards adapted and enforced by the Indian government through the Factories Act and CPCB norms are given in Table 4.9 below.

Table 4.8 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	-	52.1	44.0	52.7
Kadambur	1240	46.8	22.1	46.8
Pungavadi	1920	46.4	18.3	46.4
Paithur	1740	45.1	19.1	45.1
Ramanathapuram	860	45.2	25.3	45.2

Table 4.9 Permissible noise levels adopted by CPCB, 2000 and OSHA

Maximum Exposure Noise level Time per Working Day in hours	Noise level	
	CPCB, 2000 in dB (International Standard Organization)	OSHA code in dB (Occupational Safety and Health Act)
8	90	90
4	93	95
2	96	100
1	99	105
0.5	102	110
0.25	105	115

A noise level of 90 dB causes disruption, leading to annoyance, cognitive errors, and temporary hearing loss, while 85 dB is considered an upper comfort level with potential for cognitive decrements in tasks requiring decision-making with hearing loss possible at 300-1200 Hz frequencies in that range. Prolonged exposure to sounds at or above 85 dB can damage hearing over time. The mitigation measures to minimize the noise pollution are given below

Impact	Mitigation Measures
Noise impact due to mining activities. Noise impact due to vehicular movement. Auditory impact (hearing impairment resulting from excessive noise exposure)	❖ Diesel powered machineries which are major source of noise in open cast environment will be properly maintained as per maintenance schedule to prevent undesirable noise. ❖ Attention shall be paid towards rigorous maintenance of silencers of diesel engines. ❖ Static diesel engines shall be housed as far as possible (not made of sheet metals or surrounded by baffles). If possible, they will be placed on vibration isolators. ❖ Drill machine operators, blasters and dumper drivers will be issued earplugs and earmuffs. Duty hours of operators of noisy machinery will be regulated to keep their noise exposure levels within limits.

	❖ Provision of sound proof cabins for the workers deployed on machines producing higher level of sound like dumpers, shovels etc. ❖ 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 though training and awareness ❖ Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.

4.5.1 Ground Vibrations

Noise and Vibration:

- Mining operations generate significant noise and vibration impacting both worker health and nearby communities.
- These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise and vibration is crucial to mitigate these adverse effects.

  Sources of Noise and Vibration in Mining:

- ***Drilling and Blasting:*** A primary source of both noise and ground vibrations, with the intensity dependent on the amount of explosives, atmospheric conditions and proximity to the blast.
- ***Heavy Machinery***: Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- ***Loading and Transportation:*** The movement and handling of materials within the mine site contribute to noise pollution.

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 4.10 Predicted PPV Values due to Blasting

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Air Blast	
				Pressure (kPa)	Sound Level (dB)
P1	6.3	640	0.07	0.01	116

Table 4.11 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	Air Blast	
				Pressure (kPa)	Sound Level (dB)
P1	6.3	100	1.37	0.12	136
		200	0.45	0.05	128
		300	0.23	0.03	124
		400	0.15	0.02	121
		500	0.10	0.02	119

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.

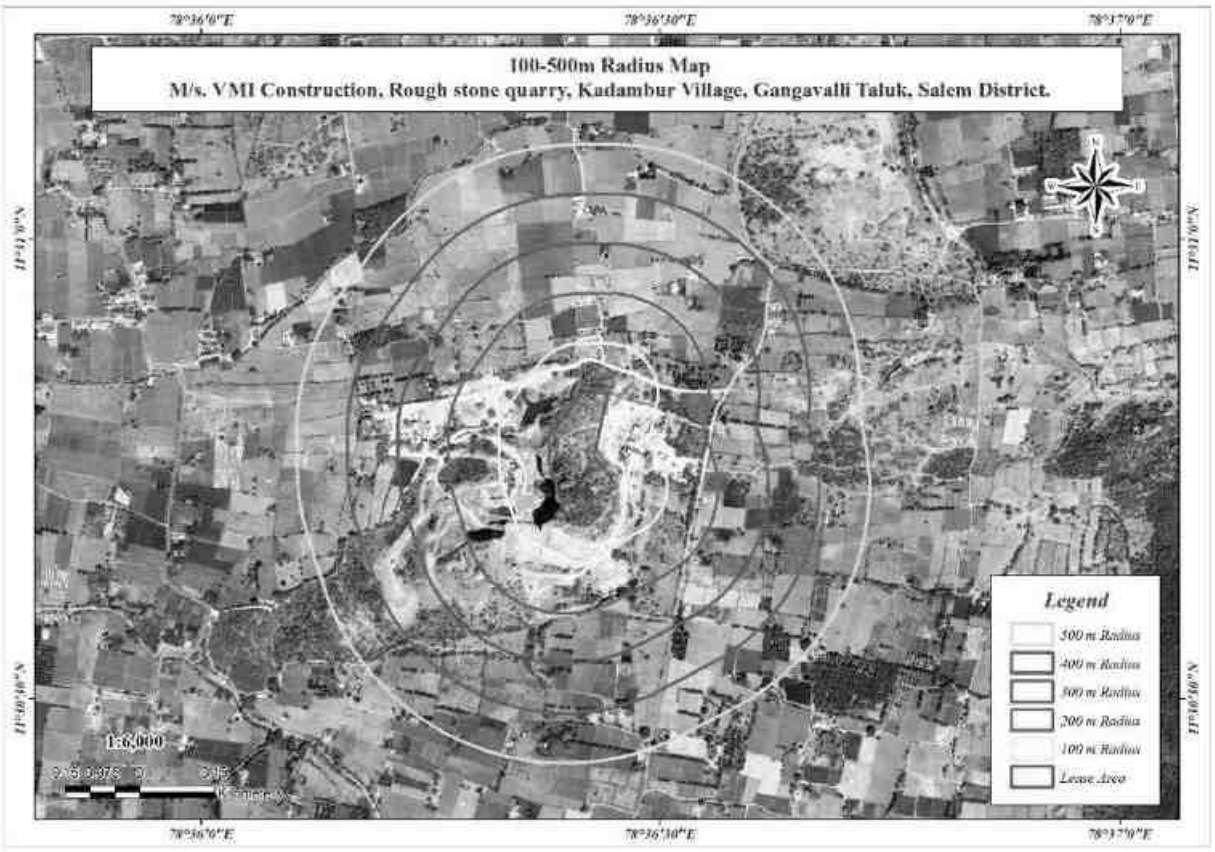


Figure 4.3: Predicted PPV Values due to Blasting at 100-500m radius

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 89kg per day, 23976kg per year and 119880kg over ten years, as provided in Table 4.12.

Table 4.12 Carbon Released During Ten Years of Rough Stone and Gravel Production

	Per day	Per year	Per Ten years
Fuel consumption of excavator	16	4320	43200
Fuel consumption of compressor	24	6480	64800
Fuel consumption of tipper	12	3240	32400
Total fuel consumption in liters	186	50220	502200
CO_2 emission in kg	89	23976	119880

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
- 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 23976kg 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 4.10), about 1000 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 119880kg of the total carbon, as provided in Table 4.13.

Table 4.13 CO_2 Sequestration

CO_2 sequestration in kg	89	23976	119880
Remaining CO_2 not sequestered in kg	410	110472	673834
Trees required for environmental compensation	4609		
Area required for environmental compensation in hectares	9		

Table 4.14 Recommended Species for Greenbelt Development Plan

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	*Azadirachta indica*	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer Well distinct in Palisade & Spongy
2	*Techtona grandis*	Lamiaceae	Teak	Tree	
3	*Polyalthia longifolia*	Annonaceae	Nettilling	Tree	
4	*Albizia lebbeck*	Fabaceae	Vagai	Tree	

5	*Delonix regia*	Fabaceae	Cemmayir-konrai	Tree	parenchyma. Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
6	*Bauhinia racemose*	Fabaceae	Aathi	Tree	
7	*Cassia fistula*	Fabaceae	Sarakondrai	Tree	
8	*Aegle marmelos*	Rutaceae	Vilvam	Tree	
9	*Pongamia pinnata*	Fabaceae	Pungam	Tree	
10	*Thespesia populnea*	Malvaceae	Puvarasu	Tree	

Table 4.15 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		
	400	320	3600
	Number of plants outside the mine lease area		
	600	480	5400
Total	**1000**	**800**	**9000**

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.
- ❖ 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 7.5m 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.

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.
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

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.

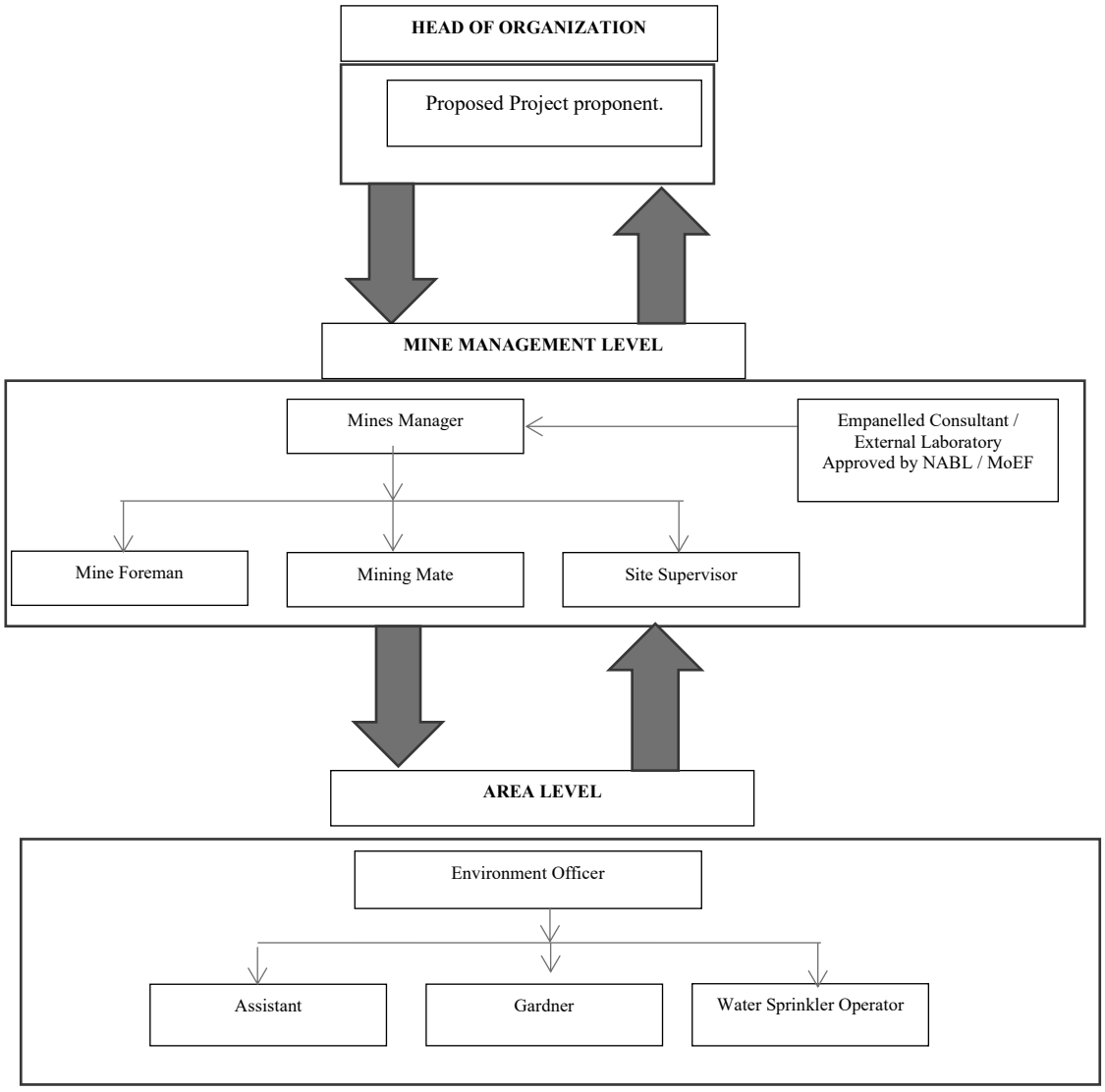


Figure 6.1 Proposed Environmental Monitoring Chart

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	Improper handling and	✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines

	heavy mining machineries.	unsafe working practice	Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations. ✓ 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;	✓ 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 compressor and drill equipment as per operator manual. ✓ 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	Blasting	Fly rock, ground vibration, Noise and dust. Improper charging, stemming & Blasting/ fining of blast holes Vibration due to movement of vehicles	✓ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely. ✓ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation ✓ Shots are fired during daytime only. ✓ All holes charged on any one day shall be fired on the same day. ✓ The danger zone is and will be distinctly demarcated (by means of red flags)
4	Transportation	Potential hazards and unsafe workings contributing to accident and injuries Overloading of material While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	✓ 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
5	Natural calamities	Unexpected happenings	✓ Escape Routes will be provided to prevent inundation of storm water ✓ Fire Extinguishers & Sand buckets
6	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	✓ 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.

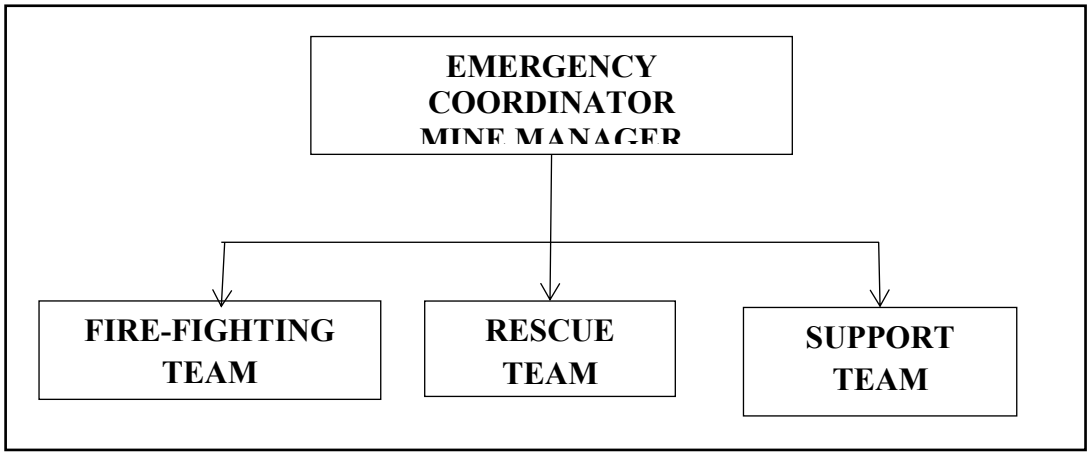


Figure 7.1 Disaster management team layout for proposed project

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 projects within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, there is two proposed projects known as P1 & P2 is taken into consideration. The details of P1 have been given in Table 7.2 and P2, E1, E2 are given in the Table 7.3-7.4,7.5.

Table 7.2 Salient Features of the cluster Project 'P1'

Name of the Quarry	M/s. VMI Constructions, Rough Stone Quarry	
Type of Land	Tender cum auction- Govt Land	
Extent	2.00.0 Ha	
Toposheet No	58- I/10	
Location of Project Site	11°30'42.05"N to 11°30'49.92"N 78°36'22.74"E to 78°36'27.14"E	
Highest Elevation	335m AMSL	
Proposed depth of Mining	65m (40 AGL + 25m BGL)	
	Rough Stone	Topsoil

	m^3	Tons	m^3	Tons
Geological Resources	7,07,932	19,46,813	22,555	45,110
Mineable Reserves	1,96,205	5,39,564	16,425	32,850
Proposed reserves for ten years	1,96,205	5,39,564	16,425	32,850
Method of Mining	Open-Cast Mechanized mining			
Topography	Flat Topography			
Machinery proposed	Jack Hammer	2		
	Compressor	1		
	Tipper	7		
	Hydraulic Excavator	1		
	Rock Breaker	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	20Nos			
Project Cost	Rs. 4,99,83,000/-			
CER Cost	Rs. 5,00,000/-			
Proposed Water Requirement	3.0 KLD			

Table 7.3 Salient Features of the cluster Project 'P2'

Name of the Quarry	M. Sivakumar rough stone and gravel quarry			
Type of Land	Patta Land			
Extent	1.12.5Ha			
S.F. No	224/1C (P), 224/2A (P) & 224/2B (P)			
Toposheet No	58- I/10			
Location of Project Site (Centre Point)	11°30'36.27"N to 11°30'41.93"N 78°36'27.90"E to 78°36'31.02"E			
Highest Elevation	285m AMSL			
Ultimate Depth of Mining	50m BGL			
Geological Resources	Rough Stone		Gravel	
	m^3	Ts	m^3	Ts
	5,62,500	15,46,875	33,750	67,500
Mineable Reserves	2,25,000	6,18,750	13,500	27,000
Proposed reserves for ten years	2,27,340	6,18,750	13,500	27,000
Method of Mining	Open-Cast Semi Mechanized mining			
Topography	Flat Topography			
Machinery proposed	Jack Hammer		1	

	Compressor	1
	Tipper	2
	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	18 Nos	
Project Cost	Rs. 92,80,000/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	2.0 KLD	

Table 7.4 Salient Features of the cluster Project 'E1'

Name of the quarry	Mr.S. Manokaran Rough stone quarry			
Type of land	Government Poramboke land			
Extent	1.50.0 Ha			
S.F. No	219/1A (Part-4)			
Toposheet no.	58-I/10			
Location of project site	11°30'39.03"N to 11°30'43.36"N 78°36'14.56"E to 78°36'19.10"E			
Highest elevation	315 m AMSL			
Ultimate depth of mining	The quarry operation is Proposed up to depth **31m** from above ground level during this period.			
	Rough stone		Top Soil in	
	m^3	Ts	m^3	Ts
Geological resources	6,90,140	18,97,885	15,000	30,000
Mineable reserves	4,95,140	13,61,635	15,000	30,000
Proposed depth of reserves for five years as per ToR	3,13,940	8,63,335	15,000	30,000
Method of mining	Opencast semi mechanized mining			
Topography	Flat			
Machinery proposed	Jack Hammer		4	
	Compressor		1	
	Tipper		2	

	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	16 Nos	
Project cost	Rs. 92, 77,000/-	
CER cost	Rs. 5,00,000	
Proposed water requirement	1.0 KLD	

Table 7.5 Salient Features of the cluster Project 'E2'

Name of the quarry	Thiru. M. Koteeshwaramuthu rough stone quarry			
Type of land	Government PorambokeLand –Tender Quarry			
Extent	1.00.0 Ha			
S.F. No	219/1A (PART-3)			
Toposheet No	58-I/11			
Location of project site	11°30'35.86"N to 11°30'39.87"N 78°36'19.00"E to 78°36'23.40"E			
Highest elevation	341m AMSL			
Ultimate pit dimensions	Length (m)	Width (m)	Depth (m)	
	55	93	22.5	
Depth of mining	55.5m (AGL 40.5m + BGL 15.0m)			
Geological resources	Rough Stone		Top Soil	
	m^3	Ts	m^3	Ts
	3,02,425	8,31,669	4,895	9,790
Mineable reserves	83,510	2,29,652	2,365	4,730
Proposed reserves for five years	83,510	2,29,652	2,365	4,730
Method of mining	Open-Cast Semi mechanized mining			
Topography	Flat Topography			
Machinery proposed	Jack Hammer	2		
	Compressor	1		
	Tipper	2		
	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	17 Nos
Project Cost	Rs. 64,99,000/-
CER Cost	Rs. 5,00,000/-
Proposed Water Requirement	1.0 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 cluster project have been given in Tables 7.6.

Table 7.6 Cumulative Production Load of Rough Stone

Quarry	10 Years in (m^3)	10 Years in Ts (m^3 X 2.75)	Per Year in (m^3)	Per Year in Ts (m^3 X 2.75)	Per Day in (m^3)	Per Day in Ts (m^3 X 2.75)	Number of Lorry Load Per Day
P1	196205	539564	19620	53955	73	201	12
P2	227340	625185	22734	62518	84	231	14
E1	313940	863335	31394	86333	116	319	19
E2	83510	229652	8351	22965	31	85	5
Total	**820995**	**2257736**	**82099**	**225771**	**304**	**836**	**50**

Table 7.7 Cumulative Production Load of Top Soil & Gravel

Quarry	Production Year m^3	Production Year Ts (m^3 X 2.0)	Yearly Production m^3	Yearly Production Ts (m^3 X 2.0)	Daily Production m^3	Daily Production Ts (m^3 X 2.0)	Number of Lorry Loads Per Day
P1	16425	45110	5475	10950	167	334	56
P2	13500	27000	6750	13500	25	50	5
E1	15000	30000	5000	10000	18	36	6
E2	2365	4730	788	1576	3	6	1
Grand Total	**47290**	**106840**	**18013**	**36026**	**213**	**426**	**68**

The cumulative study shows that the overall production of rough stone from the proposed quarry is 304m^3 & 836Ts per day with a capacity of 50 trips of rough stone per day and that production of gravel from the proposed quarry is 213m^3 & 426Ts per day accounting for 68trip/day.

Cumulative Impact of Air Pollutants

The results on the cumulative impact of the cluster projects on air environment of the cluster have been provided in Table 7.8 The cumulative values resulting from the three projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.8 Cumulative impact results from the cluster projects

Pollutants	Baseline Data (µg/m^3)	Incremental Values (µg/m^3)	Cumulative Value (µg/m^3)
		P1	
$PM_{2.5}$	17.6	4.37	**17.6**
PM_{10}	44.0	5.2	**44.0**

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 projects within the 500m radius.

Table.7.9 Cumulative impact of noise from cluster projects

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	640	SE	42.2	27.8	42.4	**55**
Habitation Near P1	229	S		19.7	39.6	
Habitation Near E1	503	NW		29.2	43.2	
Habitation Near E2	678	NW		27.4	45.7	
Cumulative Noise (dB (A))					**42.1**	

Source: Lab Monitoring Data

The cumulative analysis of noise due to cluster proposed projects shows that habitation will receive about 42.1dB (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 cluster projects have been shown in Table 7.10.

Table 7.10 Cumulative effect of ground vibrations resulting from cluster projects

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	6.3	640	0.07
P2	12.0	460	0.20
E1	40.40	730	0.25

E2	7.40	630	0.08
Total			**0.60**

Results from the above tables 7.8 indicate that the cumulative PPV value of each habitation is well below the peak particle velocity of 8mm/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 three proposed project were calculated and the results have been shown in Table 7.11. The cluster project will contribute Rs. 20,00,000/-towards CER fund.

Table 7.11 Socio Economic benefits from the cluster project

Location ID	Project Cost	CER Cost
P1	Rs. 4,99,83,000/-	Rs. 5,00,000/-
P2	Rs. 92,80,000/-	Rs. 5,00,000/-
E1	Rs. 92, 77,000/-	Rs. 5,00,000/-
E2	Rs. 64,99,000/-	Rs. 5,00,000/-
Grand Total	**Rs. 6,57,62,000/-**	**Rs. 20,00,000/-**

Table 7.12 Employment benefits from the cluster projects

Location ID	Employment
P1	20
P2	18
E1	16
E2	17
Grand Total	**71**

A total of 71 people will get employment due to the cluster project in cluster

7.4.4 Ecological Environment

Table 7.13 Greenbelt Development Benefits from cluster Projects

Code	Number of Trees proposed	Area to be covered (m^2)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1000	9248	800	*Azadirachta indica, Albizia lebbeck, Delonix regia, Techtona grandis,* etc.,
P2	978	8798	782	
E1	1330	11970	1064	
E2	1078	9698	862	
Total	**4414**	**39174**	**3530**	

Cumulative studies show that the three proposed Projects will plant about 4414 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., 3530 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 7.14.

Table 7.14 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 Kadambur Village aims to produce of rough stone **196205m^3** & **539564Ts** and Topsoil is **16425m^3 & 32850Ts** up to a depth of **65m (40m AGL + 25m BGL)** over a period of 10 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 Kadambur Village, Gangavalli Taluk, Salem 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 5km 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 Kadambur 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. 4,99,83,000** 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 Topsoil (Rs.)
CER	5,00,000	
Seigniorage @ Rs.90/m^3 of rough stone Rs.56/m^3 of gravel & Topsoil	17658450	919800
District Mineral Foundation Tax @ 10% of Seigniorage	1765845	91980
Green Tax @ 10% of Seigniorage	1765845	91980
Total	**21190140**	**1103760**

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. VMI Constructions** 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 (Rs.)	Recurring Cost/annum (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	20000	20000
	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
	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	Monitoring through weighing machines	0	225000
	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- 7 Units	35000	3500
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	5000
	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	40000
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			**955000**	**383500**
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	Provision made in Operating Cost	0	0

	the diesel engines of vehicles.			
	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	Bulk density of rock = 2.6 for Rough Stone/Granite; = 2.5 for Limestone; 6 tons of production requires 1 kg pf explosives; Cost of NONEL = Rs. 30 per kg.	0	394940
Total Noise Environment			**50000**	**396940**
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum (2.96.5 X 10000)	20550	10275
Total Water Environment			**20550**	**10275**

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**
Mine Closure	1. Progressive Closure Activity - Surface Runoff management	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	20000	10000
	2. Progressive Closure Activity 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	4,00,000	20,000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - 200 trees inside lease area & 300 trees outside the 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)	1,60,000	24,000
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	60,000	6,000

	4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	64,000	0
	5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budget and not necessarily implemented in the Project Site	0	0
Total Mine Closure			**704000**	**60000**
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 mentioning Environmental Conditions	10,000	1,000
	Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions	Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms	0	50,000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) – 20 Employees	80,000	20,000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	20,000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/- for 2 kits	0	4,000

	Slope stability action plan	Slope stability action plan when depth beyond 30m BGL	2,00,000	0
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10,000	2,000
	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	1,00,000	20,000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30,000	5,000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd 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	7,80,000
Total Implementation of EC			**430000**	**902000**
TOTAL			**21.69 Lakhs**	**17.64 Lakhs**

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

Ist Year	**IInd Year**	**IIIrd Year**	**IVth Year**	**Vth Year**	**Total Recurring Cost**	**Total EMP Cost**
17.64	18.52	19.44	20.41	21.43	**221.74 Lakhs**	**21.69+221.74 =243.43 Lakhs**
VIth Year	**VIIth Year**	**VIIIth Year**	**IXth Year**	**Xth Year**		
22.50	23.62	24.80	26.04	27.34		

In order to implement the environmental protection measures, an amount of **Rs.21.69Lakhs** as capital cost and recurring cost as **Rs. 17.64 Lakhs** 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 10 years will be **Rs. 243.43 Lakhs** 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 mining project (B1) falls within the quarry cluster of 500m radius with the total extent of 5.62.5ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F. No. 219/1A (Part- 5) over the extent of 2.00.0ha is situated in the cluster falling in Kadampur Village, Gangavalli Taluk, Salem District, Tamil Nadu. The projects involved in the calculation of cluster extent are of two proposed quarry and two existing quarries.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes 11°30'42.05"N to 11°30'49.92"N Longitudes from 78°36'22.74"E to 78°36'27.14"E in Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu. According to the approved mining plan, about 196205m^3 & 539564MTTs of rough stone and 16425m^3 & 32850Ts of topsoil will be mined up to the depth of 65m (40m AGL + 25m BGL) in the ten 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 **October through December 2023** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Green Link Analytical & Research Lab** 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 5km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 1.

Table.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Water bodies	0.6	0.56
2	Plantation	1280.6	0.19
3	Crop land	5286.5	75.92
4	Mining/ Industrial area	24.2	1.27
5	Built-up land	620.9	16.24
6	Bare ground	2.6	0.09
7	Fallow land	958.8	5.73
Total		**8174.2**	**100**

Source: Sentinel II Satellite Imagery

11.3.2 Soil Environment

The soil is nutrient-rich, well-balanced, and structurally suitable for agriculture. No corrective measures are immediately necessary, but continued monitoring and sustainable land management practices are recommended to maintain soil health.

Physical Characteristics & Chemical Characteristics

1. Soil pH and Electrical Conductivity (EC):

- **pH ranged from 6**.91 to 9.21 indicating that the soil is **neutral to alkaline**, which is favourable for most crops.
- **EC** value ranged from 71.0 to 180.0µS/cm, suggesting low salt concentration and non-saline soil across the sampling area.

2. Physical Properties

- **Bulk Density** values ranged from 1.19 to 1.38kg/cm^3, which are within the typical range for loamy soils and support good root penetration and aeration.

3. Soil Fertility Status:

- **Total Organic matter** levels ranged from 0.82 to 1.40% by weight, classifying soils as low to moderately fertile in terms of organic matter.
- **Nitrogen (N)** content varied from 188.0 to 368.0kg/ha by mass indicating moderate nitrogen availability.
- **Potassium (K)** ranged from 110.0 to 214.0kg/ha by mass moderate fertility potential in terms of potassium.

4. **Base Elements and Cation Ratios:**

- **Calcium (Ca)** levels were highest with 140mg/kg and lowest with 90.0 mg/kg.
- **Magnesium (Mg)** ranged from 48.0 to 72.0mg/kg.

Conclusion:

The soils in the study area are generally non-saline, neutral to slightly alkaline, and moderately fertile with low contamination levels. They exhibit good permeability, porosity, and suitable textural classes for agriculture and greenbelt development. The absence of heavy metals confirms that baseline soil conditions are unpolluted and safe for reclamation and vegetation growth.

11.3.3 Water Environment

Swetha river is the prominent surface water resources present in the study area. This lake was ephemeral in nature which convey water only after rainfall events. The surface water sample known as SW1 were collected from the Swetha river (4.12km- SE) to assess the baseline water quality as shown in Table 3.8 and Figure 3.10.

Key findings include:

pH (7.05-7.99)

- pH is 6.5-8.5 for drinking water.
- All values within this range.
- Interpretation: Neutral pH, no corrosion or scaling tendency.

Fluoride (0.72 – 0.96 mg/l)

- Fluoride is beneficial in small quantities but harmful in excess (>1.5 mg/l causes fluorosis).
- All values are below the 1.0 mg/l limit.
- Interpretation: No risk of dental or skeletal fluorosis.

Total Dissolved Solids (TDS) (280 – 1020 mg/l)

- TDS represents total minerals and salts in water.
- Acceptable limit is 500 mg/l; permissible up to 2000 mg/l.
- BW01, BW03, and BW05 exceed the acceptable but are within permissible.
- Interpretation: Slightly mineral-rich water; taste may be affected but safe to use.

Electrical Conductivity (EC) (510 – 3400 µS/cm)

- Indicates overall ionic concentration in water.
- Higher EC = higher salinity.
- EC > 1000 µS/cm (in BW01 and BW05) suggests moderately saline water.
- Interpretation: Suitable for irrigation, but may need softening for drinking.

Conclusion:

The groundwater quality assessment reveals that the water is generally safe and suitable for drinking, domestic, and irrigation purposes. All tested heavy metals such as barium, boron, copper, lead, mercury, arsenic, chromium, and zinc were found to be below detection limits, indicating no industrial or geogenic contamination. Key health-related parameters including fluoride, nitrate, iron, and pH levels are well within the acceptable standards, posing no health risk. Some physico- chemical parameters like calcium, magnesium, total hardness, total dissolved solids (TDS), electrical conductivity (EC), and chloride showed slightly elevated levels in a few samples, but they remain within permissible limits prescribed by BIS standards.

11.3.4 Air Environment

As per the monitoring data, $PM_{2.5}$ ranges from 19.91 µg/m^3 to 25.60 µg/m^3; PM_{10} from 41.09 µg/m^3 to 47.40 µg/m^3; SO_2 from 7.51 µg/m^3 to 11.60µg/m^3; NO_x from 13.06µg/m^3 to 17.60g/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 39 causing minimal impact to human health.

11.3.5 Noise Environment

Noise level in core zone was 52.1 dB (A) Leq during day time and 46.8 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 45.1 to 46.8dB (A) Leq and during night time from 42.5 to 44.5dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.3.6 Biological Environment

Biological study of the ecosystem is essential to understand the impact of rough stone quarry on existing flora and fauna of the study area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact, if any. A survey was conducted to study the flora and fauna in 10km radius by direct and indirect sightings/ data. Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the wild plants as well as cultivated crop plants was made, and all the available information was recorded.

Flora Composition in Core Zone

The core zone presents in tree, shrubs, herbs and grasses. Taxonomically total of 23 species belonging to 19 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were Trees 6 (26%) followed by Shrubs 6 (26%), Herbs 8 (35%) and Climbers 3 (13%). The result of core zone of flora studies shows that Fabaceae and Amaranthaceae, Lamiaceae are the main dominating species in the study area it mentioned in Table 3.22 & 3. 23. No species found as threatened category.

Flora Composition in buffer Zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because of nearby forest covers and agriculture land was found to dominate mostly in Northwest and Southwest directions. There are 95 belonging to 41 families have been recorded from the buffer zone. Among the identified, floral (95) species were 40 (40%) trees, Shrubs 21 (19%) Herbs & Climbers 19 (28%), Creepers & Grasses 15 (13%). According to the findings of the buffer zone flora studies, the dominant species in the study area are Fabaceae, Asteraceae, and Euphorbiaceae, as shown in Table 3.24. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area.

Details of flora with the scientific name were mentioned in Table 3.24. A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people.

Fauna in Core Zone

A total of 24 varieties of species were observed in the Core zone (Table.3.26). Among them are 8 (33%) Insects, 5 (21%) Reptiles, 3 (13%) Mammals and 9 (33%) Avian. A total of 24 species belonging to 18 families were recorded from the core area. The study shows that number of species decreases towards the mining area. This might be due the lack of vegetation. None of these species in the core zone are threatened or endemic. The survey was conducted to identify species listed in IUCN Red List. According to the field data, any species are not of Schedule I and nine species are of schedule IV. 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 3.26.

Fauna in Buffer Zone

A total of 49 species belonging to 35 families have been recorded from the buffer zone area (Table.3.27). Based on habitat classification the majority of species were Aves 20 (41%), followed by Insects 14 (29%), Reptiles 8 (16%), Mammals 4 (8%) and Amphibians 3 (6%). There are 7 Schedule II species and 24 species are under schedule IV according to Indian wild life Act 1972. A total fifteen species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable and endemic species were 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

- Converting barren land of 2.00.0hectares to rough stone mining creates a significant and usually irreversible change in land use and land cover involving the physical alteration of the land's surface, potential deforestation, loss of biodiversity, altered topography from pits and spoil dumps.
- Heavy vehicle movement causes significant problems to nearby agriculture and human habitation. These pollutants can degrade soil quality and introduce heavy metals into the environment.

- During transportation the tippers damage the bituminous roads. The primary damage is caused by the fourth power law (*The law posits that if you double an axle's load, the damage caused to the pavement increases by a factor of 2x4 or 16 times*) where pavement damage increases with the fourth power of the axle load. The immense weight of heavy payloads on an axle exerts a concentrated and repetitive stress on the road surface leading to permanent strain, premature failure and a cumulative damage.
- Rain drops hitting stone crushing waste can break apart the particles and flowing water detaches them from the surface transports and redeposits these particles especially from sloped surfaces. This a form of splash erosion followed by sheet erosion which can lead to environmental issues.

Mitigation Measures

- ❖ After mining there is a huge void of 2.00.0hectares upto a depth of 51m is useful for rain water storage structure has an advantage for local farmers. The artificial pond boundary shall be fences to avoid any mishaps.
- ❖ Union ministry of road transport and highways on July 16th 2018 increased the maximum cap of axle load limit by 20 to 25 percent cross various categories to keep the limit "at par with international standards".

Maximum Safe Axle Weight		
Sl. No	**Axle Tupe**	**Maximum safe Axle Weight**
1	Single Axle	-
1.1	Single Axle with single tyre	3.0 tonnes
1.2	Single Axle with two tyres	7.5 tonnes
1.3	Single Axle with four tyres	11.5 tonnes*
2.	**Tandem Axles (Two axles) (where the distance between two axles is less than 1.8 Mtr.)**	-
2.1	Tandem axles for rigid vehiles, trailers and semi-trailers	21 tonnes*
2.2	Tandem axles for puller tractors for hydraulic and pneumatic trailers	28.5tonnes
3.	**Tri-axles (Three axles) (where the distance between outer axles is less than 3 Mtr.)**	-
3.1	Tri-axles for rigid vehicles, trailers and semi- trailers	27 tonnes*

4	Axle Row (two axles with four tyres each) in Modular Hydraulic trailers (9 tonnes load shall be permissible for single axles)	18 tonnes
***Note:** If the vehicle is fitted with pneumatic suspension, I tonne extra Load is permitted for each axle.		

MoRTH knows that previously built Indian roads are made keeping standard axle loads. The new national and state highways along with expressways can be built by using new norms but for the existing roads the life will be reduced on average by one year.

- 6-wheel tipper generally has a maximum legal speed limit which can be up to 60 km/h and speeds should be reduced for loaded conditions. The mine management should take care of the speed of vehicles i.e up to 40km/h in village roads constructed under Pradhan Mantri Gram Sadak Yojana and other district roads developed by Highways and Minor Ports Department, Government of Tamil Nadu as each time a truck passes the concentrated stress causes a small amount of permanent strain on the pavement. Over time these small strains accumulate and lead to significant fatigue and eventual failure.
- 6-wheel tippers of not more than 9tons payload capacity covered with tarpaulin to stop the spillage and dust should use.
- Protective measures such as establish plants like grasses, cover crops and trees to form a dense layer over the dump absorbing raindrop energy and holding particles in place.

11.4.2 SOIL ENVIRONMENT

Anticipated Impact

- The fertility status of the soil near by the lease area may affect due to extra dust deposition on the soil. Dust deposition from a lease area can harm soil fertility by physically blocking soil pores, reducing aeration and water infiltration, and potentially altering the soil's chemical properties. This damage to the topsoil negatively impacts plant growth by interfering with photosynthesis and nutrient uptake ultimately decreasing crop production.
- Topsoil will be scraped from the area of 1.47.0hectares in the project site will store in safety area left for 7.5meters in the northern side as shown in mining plan.

Mitigation Measures

- When stock piling of top soil is done the mound should not be higher than 1.0m and Weathered Rock 3.0m.
- To minimize surface runoff and erosion the topography of a graded surface should be designed to create terraces or benches that follow land contours which intercept sheet

flow. Additionally, a bulldozer's tracks can be used to create a fine-scale roughened surface perpendicular to the slope and stockpiles should be constructed with a rough surface to improve drainage, reduce erosion and encourage revegetation.

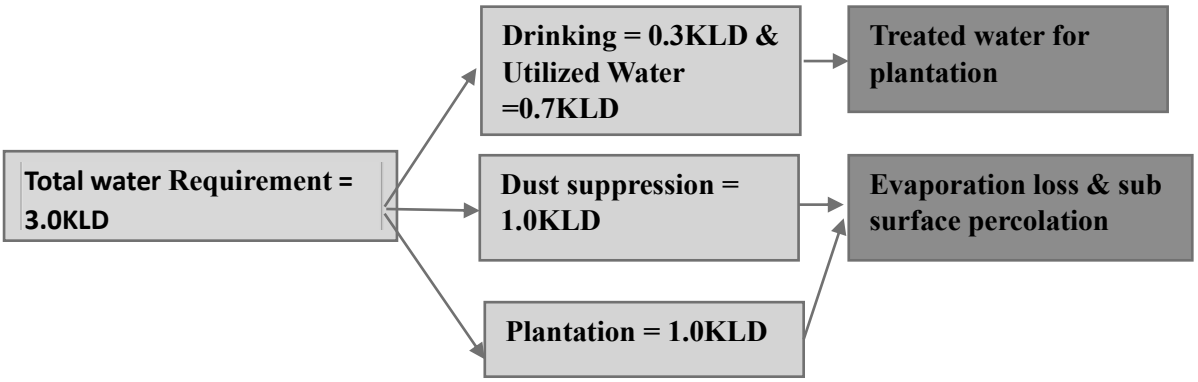
- ❖ Efforts will be made to minimize the storage time to prevent nutrient loss.
- ❖ To protect the quality of stockpiled topsoil immediate re-vegetation is crucial. Temporary seeding should be done within 30 days of stockpile formation to control erosion, prevent weed growth and maintain healthy soil microbes.
- ❖ If the stockpile will not be reused within 12 months it must be stabilized with permanent vegetation to ensure long-term erosion and weed control.
- ❖ The stored topsoil will be utilized for plantations in later phases during the progressive and final closure of the mine.

11.4.3 WATER ENVIRONMENT

Anticipated Impact

- ❖ 3.0KLD water requirement for drinking, domestic, dust suppression and plantation.

Water Balance Chart of the Mine



- ❖ Increase in sediment load during monsoon in downstream of lease area
- ❖ This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- ❖ The sewage from soak pit may percolate to the ground water table and contaminate it.
- ❖ Surface drainage may be affected due to Mining.
- ❖ The domestic effluents being generated during mine operation.
- ❖ Major impact of opencast mining on groundwater regime is quality deterioration. The proposed mining activities shall be carried out upto a depth of 25m from below ground level. The specific water table depth in the core and buffer zone is between 65m and 70meters below ground level.
- ❖ The major sources of water pollution normally associated due to mining and allied operations are:

- ✓ Generation of waste water from vehicle washing.
- ✓ Washouts from surface exposure or working areas
- ✓ Domestic sewage
- ✓ Disturbance to drainage course in the project area
- ✓ Mine Pit water discharge

Mitigation Measures

- ❖ Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes.
- ❖ Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- ❖ Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- ❖ Domestic sewage from site office will be discharged in bio-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.
- ❖ Regular monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water.

11.4.4 AIR ENVIRONMENT

Anticipated Impact

During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.

- ➢ Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.

- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

Emission of air pollutants such as particular matter (PM), gases such as sulphur dioxide, oxides of nitrogen at various stages of activities such as excavation and transportation of materials. The rate of emission and the incremental concentration of pollutants is estimated in the following sections before providing mitigation measures.

Mitigation Measures

Haul Road and Transportation

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

Green Belt

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

Occupational Health

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

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

11.4.5 NOISE ENVIRONMENT

Anticipated Impact

- Mining operations generate significant noise impacting both worker health and nearby communities.
- These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise is crucial to mitigate these adverse effects.

Sources of Noise in Mining:

- ***Drilling and Blasting:*** Prolonged exposure to high-intensity noise from drilling and blasting can lead to hearing loss and other auditory problems
- **Heavy Machinery:** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- **Loading and Transportation:** The movement and handling of materials within the mine site contribute to noise pollution.

Common Mitigation Measures

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

- Optimizing blast design to minimize ground noise.
- Constructing noise barriers or enclosing noisy equipment can help reduce noise propagation.
- Proper maintenance and operation of mining equipment can help minimize noise generation.
- 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 though training and awareness
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects

Ground Vibrations

Noise and Vibration:

- Mining operations generate significant noise and vibration impacting both worker health and nearby communities.
- These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise and vibration is crucial to mitigate these adverse effects.

  Sources of Noise and Vibration in Mining:
- ***Drilling and Blasting:*** A primary source of both noise and ground vibrations, with the intensity dependent on the amount of explosives, atmospheric conditions and proximity to the blast.
- ***Heavy Machinery:*** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- ***Loading and Transportation:*** The movement and handling of materials within the mine site contribute to noise pollution.

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.

11.4.6 BIOLOGICAL ENVIRONMENT

Anticipated Impact on Flora

- 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 89kg per day, 23976kg per year and 119880kg over ten years.

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
- 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 123177kg 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 4.10), about 1000 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 119880kg of the total carbon.

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.

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

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.

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.
- ❖ 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 7.5m 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.

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

Mitigation Measures

- Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines
- Air pollution control measure will be taken to minimize the environmental impact within the core zone
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc.., from this project directly and indirectly.
- From above details, the quarry operations will have highly beneficial positive impact in the area.
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

11.4.8 OCCUPATIONAL HEALTH

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

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

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.

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.

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.

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 (1 SW & 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 three proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time
- PPV resulting from three proposed project is well below the permissible limit of Peak Particle Velocity of 5mm/s.
- The cluster projects will allocate Rs. 20,00,000/- towards CER as recommended by SEAC
- The cluster projects will directly provide jobs to 71 local people, in addition to indirect jobs
- The cluster projects will plant 4386 about trees in and around the lease area.
- The cluster projects will add 304PCU 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.21.69Lakhs** as capital cost and recurring cost as **Rs. 17.64 Lakhs** 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 10 years will be **Rs. 243.43 Lakhs.**

11.9 OVERALL STUDY AREA CONCLUSION

The Environmental Impact Assessment (EIA) for the proposed rough stone quarry project in Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu, has comprehensively evaluated the baseline environmental conditions and projected impacts associated with quarry operations. The study concludes that the project is environmentally sustainable with appropriate mitigation and management practices in place.

The land use analysis using Sentinel II imagery reveals that agricultural land dominates the study area, with limited urbanization and industrial activity. While minor land use changes are expected due to quarrying, these are localized and reversible. The soil environment is assessed to be healthy and agriculturally productive, with good moisture retention, neutral to slightly alkaline pH, and moderate nutrient levels. Surface and groundwater quality are generally good. Surface water meets all drinking and irrigation standards with minimal treatment, and groundwater is safe for consumption after mild treatment for hardness and taste. No microbial contamination was detected, and key parameters fall within permissible limits.

Air quality and noise levels are within Central Pollution Control Board (CPCB) norms, and the Air Quality Index remains causing minimal impact to human health. Quarrying impacts on air and noise can be effectively controlled through dust suppression, green belt development, and controlled blasting techniques.

The biological environment in the core zone shows limited flora and fauna due to existing quarry activity, but the buffer zone hosts a healthy diversity of species with no presence of endangered or migratory species. Green belt development and post-mining reclamation plans are proposed to enhance biodiversity and carbon sequestration.

The socio-economic environment will benefit from direct and indirect employment, infrastructure development, and improved livelihoods. The project also contributes to the local economy through taxes, royalty payments, and community development initiatives under Corporate Environmental Responsibility (CER).

Potential environmental impacts such as dust, noise, and runoff are anticipated but can be managed with the proposed Environment Management Plan (EMP). Adequate provisions have been made for water management, air pollution control, soil conservation, occupational health, and post-mining restoration. Risk assessment and a disaster management plan have been integrated to ensure safety and emergency preparedness.

Overall, the study concludes that the proposed quarry project is technically feasible, environmentally sound, and socio-economically beneficial. With strict implementation of the mitigation measures and monitoring programs, the project can proceed without causing significant adverse impacts on the environment or local communities.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **M/s. VMI Constructions** 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)	HG, GEO	B
2	G. Prithiviraj	In-house, FAE	1(a)(i)	LU & LC	B
3	Dr. J. Rajarajeswari	In-house, FAE	1(a)(i)	SC, EB	B
4	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
5	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW	B
6	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
7	Dr. R. Arun Balaji	In-house, FAE	1(a)(i)	AP, AQ	B
8	Dr. R. Arun Balaji	In-house, FAE	1(a)(i)	NV	B
Approved Functional Area Associates					
9	V. Malavika	FAA	1(a)(i)	NV	B
10	P. Dhatchayini	FAA	1(a)(i)	AQ	B
11	C. Ragul	FAA	1(a)(i)	Geo	B
12	R. Srikrishna	FAA	1(a)(i)	LU, LC	B
13	K. Ravichandran	FAA	1(a)(i)	HG	**B**
Team Members					

14	M.Muralidharan	In-house, FAE	1(a)(i)	TM for FAE NV, HW	-
15	A. Jothibasu	In-house, FAE	1(a)(i)	TM for FAE AP, AQ	-

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. VMI Constructions** rough stone quarry project with the extent of 2.00.0 ha situated in the cluster with the extent of 5.62.5ha in Kadambur Village, Gangavalli Taluk, Salem District of Tamil Nadu is true and correct to the best of our knowledge.

List of Functional Area Experts Engaged in this Project

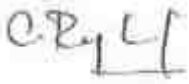
S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity ○ Prediction of air pollution and propose mitigation measures / control measures	Dr. R. Arun Balaji	
2	WP	○ Suggesting water treatment systems, 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	○ Interpretation of ground water table and predict impact and propose	Dr. S. Karuppannan	

		mitigation measures. o Analysis and description of aquifer Characteristics		
4	GEO	o Field Survey for assessing the regional and local geology of the area. o Preparation of mineral and geological maps. o Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	Dr. S. Karuppannan	
5	SE	o Revision in secondary data as per Census of India, 2011. o Impact Assessment & Preventive Management Plan o Corporate Environment Responsibility.	Dr. G. Prabhakaran	
6	EB	o Collection of Baseline data of Flora and Fauna. o Identification of species labelled as Rare, Endangered and threatened as per IUCN list. o Impact of the project on flora and fauna. o Suggesting species for greenbelt development.	Dr. J. Rajarajeswari	
7	RH	o Identification of hazards and hazardous substances o Risks and consequences analysis o Vulnerability assessment o Preparation of Emergency Preparedness Plan o Management plan for safety.	J.N. Manikandan	
8	LU	o Construction of Land use Map o Impact of project on surrounding land use o Suggesting post closure sustainable land use and mitigative measures.	G. Prithiviraj	

9	NV	○ Identify impacts due to noise and vibrations ○ Suggesting appropriate mitigation measures for EMP.	Dr. R. Arun Balaji	
10	AQ	○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ○ Recommending mitigations measures for EMP	Dr.R. Arun Balaji	
11	SC	○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. J. Rajarajeswari	
12	SHW	○ 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	V. Malavika	NV, SHW	○ Site visit along with FAE Assistance in report preparation. ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling	
2	P. Dhatchayini	AQ	○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data	
3	K. Ravichandran	HG	○ Site visit with FAE ○ Provide inputs & Assisting FAE for HG	
4	R. Srikrishna	LU & LC	○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection	

5	C.Ragul	GEO	o Field visits along with FAE Assistance to FAE in both primary and secondary data collection	
6	M.Muralidharan	NV, HW	TM for FAE	
7	A.Jothibasu	AP, AQ	TM for FAE	

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. VMI Constructions** rough stone quarry project with the extent of 2.00.0ha situated in the cluster with the extent of 5.62.5ha in Kadambur Village, Gangavalli Taluk, Salem 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

File No: 12534

Government of India

Ministry of Environment, Forest and Climate Change

(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)

***

Dated **25/09/2025**

To,

Mr.M.Vasudevan, Managing Partner
M/s. VMI CONSTRUCTIONS
(BID ID: 1215709),No.1/287, Pudur,Kalpaganur Post,Attur Taluk,Salem District - 636109. TAMIL NADU.
vmiv1930@gmail.com

Subject: Grant of Terms of Reference along with Public Hearing under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

Sub: SEIAA-TN Proposed Rough Stone quarry lease over an extent of 2.00.0 Ha at S.F.No. 219/1A (Part-5) of Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu by **M/s. VMI Construction** - under project category – "B1" and Schedule S.No.1(a) "Mining of Minerals Projects" of EIA Notification, 2006, as amended – **ToR issued along with Public Hearing** - preparation of EIA report – Regarding.

Ref: 1. Online proposal No. SIA/TN/MIN/546446/2025, Dated: 29/07/2025.
2. Your application submitted for Terms of Reference dated: 30.07.2025.
3. Minutes of the 609th SEAC meeting held on 26.08.2025
4. Minutes of the 888th SEIAA meeting held on 17.09.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5979488N
(ii) File No.	12534
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals,1(a) Mining of minerals
(vii) Name of Project	Kadambur Village Rough Stone Mining Lease
(viii) Name of Company/Organization	V M I CONSTRUCTIONS
(ix) Location of Project (District, State)	SALEM, TAMIL NADU
(x) Issuing Authority	SEIAA
(xi) Applicability of General Conditions	no
(xii) Applicability of Specific Conditions	no

1.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 under the provision of EIA notification 2006 and its subsequent amendments.
2.The above-mentioned proposal has been considered by SEIAA in the meeting held on 17.09.2025. 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.
3.The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations on all technical aspects 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).
4.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 issue the following Terms of Reference with public hearing for instant proposal of **M/s. VMI Construction** under the provisions of EIA Notification, 2006 and as amended thereof.
5.The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.
6.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.
7.This issues with the approval of the Competent Authority.
8.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.

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, Salem District.
6. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seac Conditions - Site Specific

S. No	Terms of Reference
1.1	**Major Condition:** 1. **The PP shall furnish modified MP incorporating benches on all the sides along with EIA Report.** **Specific Condition:** 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:**

S. No	Terms of Reference
	(i) Copy of the agreement forming CMC. **(ii) The Organisation chart of the Committee with defining the role of the members** **(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities**. 2. The PP should submit an affidavit to follow the scientific formation of benches for 5m *5m properly during mining as per the approved mining plan. 3. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic evidence along with the EIA report.

2. Seac Standard Conditions

S. No	Terms of Reference
2.1	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 (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is

S. No	Terms of Reference
	carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both

S. No	Terms of Reference
	monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any

S. No	Terms of Reference
	Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

3. Seiaa Specific Conditions :

S. No	Terms of Reference
3.1	The authority noted that the subject was placed in the **609th** SEAC-I meeting held on **26.08.2025**. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant **Terms of Reference (ToR) along with Public Hearing for the quantity of 196205m³ of Rough Stone up to the depth of 65m (40m AGL + 25m BGL)** as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the SEIAA Standard conditions.

4. Seiaa Standard Conditions :

S. No	Terms of Reference
4.1	**<u>Cluster Management Committee</u>** 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

S. No	Terms of Reference
	as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 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. **Forests** 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. **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. 20. Erosion Control measures. 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. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities. 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. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: 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. **Energy** 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change**

S. No	Terms of Reference
	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. 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. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **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 and the scope for achieving SDGs. 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. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **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. **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. 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 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.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given

S. No	Terms of Reference
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee
1.4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the areashould 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)
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics
1.6	Details about the land proposed for mining activities should be givenwith information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large,may also be detailed in the EIA Report
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided
1.9	The study rea will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period
1.10	Land use of the study rea 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
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees

S. No	Terms of Reference
1.13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given
1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlifeand copy furnished
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost
1.19	Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered
1.20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report

S. No	Terms of Reference
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided
1.26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given.The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local

S. No	Terms of Reference
	and native species and the species which are tolerant to pollution
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed
1.36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations
1.37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc
1.44	Besides the above, the below mentioned general points are also to be followed:- a) All documents to be properly referenced with index and continuous page numbering. b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should

S. No	Terms of Reference
	be indicated. c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. d) Where the documents provided are in a language other than English, an English translation should be provided. e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area

PARIVESH
e-Compliance
e-Payments
e-Processing
DSS
CPC GREEN
Nature Protects if She is Protected

STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The

proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from

the Standing Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should

also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The

location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

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

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the

proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed: -

    a) Executive Summary of the EIA/EMP Report
    b) All documents to be properly referenced with index and continuous page numbering.
    c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
    d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
    e) Where the documents provided are in a language other than English, an English translation should be provided.
    f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
    g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
    h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

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

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 -l1013/77/2004-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.

Annexure - II

From

Selvi. A. Aswini M.Sc.,
Assistant Director,
Dept. of Geology and Mining,
Salem - 636 001.

To

M/s. VMI Constructions,
Managing Partner, M. Vasudevan,
No. 1/287, Pudur, Kalpaganur Post,
Attur Taluk,
Salem – 636 109.

Rc.No. 40/2025/Mines-A dated 08.07.2025.

Sub: Mines and Minerals - Minor Mineral - Rough Stone - Salem District – Gangavalli Taluk – Kadambur Village – Government Poramboke land in S.F.No. 219/1A (Part-5) – over an extent of 2.00.0 hectares - Grant of quarry lease through e-Tender cum Auction – M/s. VMI Constructions, Attur declared as Successful Bidder (H1 Bidder) – Precise Area Communicated - Mining Plan Approved - Details of Existing, Expired Proposed and Abandoned quarries within 500 m radius from the subject site requested – furnished.

Ref :
1. Salem District Extra-Ordinary Gazette No.16 dated 03.12.2024.
2. Precise Area Communication in letter Rc.No. 40/2025/Mines-A dated 07.05.2025.
3. This office letter Rc.No. 40/2025/Mines-A dated 07.07.2025 (Mining Plan Approval).
4. Letter from the applicant, M/s. VMI Constructions, Attur dated 09.06.2025.

****

In the reference 2nd cited, precise area communication letter was issued to successful bidder, M/s. VMI Constructions, Managing Partner, M. Vasudevan, Attur in the e-Auction conducted on 08.01.2025 in TN Tenders Portal for the grant of quarry lease for quarrying Roughstone in Government Poramboke land in S.F.No. 219/1A (Part-5) over an extent of 2.00.0 hectares of Kadambur Village, Gangavalli Taluk, Salem District, for a period of 10 years, with a direction to submit the Mining Plan with the duly approval of the Assistant Director of Geology and Mining, Salem and Environmental Clearances obtained from the State Level Environmental Impact Assessment Authority–Tamil Nadu, Chennai for grant of quarry lease.

For VMI CONSTRUCTIONS

MANAGING PARTNER

2. In this regard, the applicant, M/s. VMI Constructions, Managing Partner, M. Vasudevan, Attur has requested the details of Existing, Expired, Proposed and Abandoned quarries within 500 meter radius from the subject site vide reference 4th cited, for applying for Environmental Clearance.

3. As requested, the details of Existing, Expired, Proposed and Abandoned quarries within 500 meter radius from the subject proposed quarry site are furnished as follows.

a. Existing Quarries :

Sl. No.	Name of the lessee	Village/ Taluk	S.F. No.	Extent (in ha.)	Lease granting Proceedings	Lease period
1.	S.Mohankumar S/o.Shanmugam	Kadambur Village, Gangavalli Taluk	219/1A(P-4) Govt. Poramboke	1.50.0	District Collector Proc. Rc.No. 88/ 2018/Mines-A dated 19.10.2018	10 Years (19.10.2018 to 18.10.2028)
2.	M.Koteeshwara Muthu, S/o.Muthulingam	Kadambur Village, Gangavalli Taluk	219/1A(P-3) Govt. Poramboke	1.00.0	District Collector Proc. Rc.No. 89/ 2018/Mines-A dated 17.02.2019	10 Years (17.02.2019 to 16.02.2029)

b. Expired Quarries : NIL

c. Proposed Quarries :

Sl. No.	Name of the lessee	Village/ Taluk	S.F. No.	Extent (in ha.)	Remarks
1.	VMI Constructions, Attur (subject area)	Kadambur Village, Gangavalli Taluk	219/1A (P-5) Govt. Poramboke	2.00.0	Mining Plan Approved vide Rc.No. 40/2025/ Mines-A dated 07.07.2025.
2.	M. Sivakumar, S/o. D.Muthulingam	Kadambur Village, Gangavalli Taluk	224/1C (P), 224/2A (P) & 224/2B (P) Patta	1.12.5	Mining Plan Approved vide Rc.No. 15/2025/ Mines-A dated 23.06.2025.

d. Abandoned Quarries : NIL

08/7/25

Assistant Director,
Dept. of Geology and Mining,
Salem.

08/07/25

For VMI CONSTRUCTIONS

MANAGING PARTNER

Annexure - III

From

Selvi. A.Aswini M.Sc.,
Assistant Director,
Dept. of Geology and Mining,
Salem - 636 001.

To

M/s. VMI Constructions,
Managing Partner, M. Vasudevan,
No. 1/287, Pudur, Kalpaganur
Post, Attur Taluk,
Salem – 636 109.

Rc.No. 40/2025/Mines-A dated 07.07.2025.

Sub: Mines and Minerals – Minor Mineral - Rough Stone - Salem District – Gangavalli Taluk – Kadambur Village – Government Poramboke land in S.F.No. 219/1A (Part-5) – over an extent of 2.00.0 hectares - Grant of quarry lease through e-Tender cum Auction – M/s. VMI Constructions, Attur declared as Successful Bidder (H1 Bidder) – Precise Area Communicated - Draft Mining plan submitted – Approved – Reg.

Ref: 1. Salem District Extra-Ordinary Gazette No.16 dated 03.12.2024.
2. Precise Area Communication in letter Rc.No. 40/2025/Mines-A dated 07.05.2025.
3. Mining Plan submitted by M/s. VMI Constructions, Attur dated 09.06.2025.

****

The e-Tender cum Auction conducted on 08.01.2025 through TN Tenders Portal for the grant of quarry lease for quarrying Roughstone in Government Poramboke lands in Salem District including in S.F.No. 219/1A (Part-5) over an extent of 2.00.0 hectares of Kadambur Village, Gangavalli Taluk, Salem District for a period of 10 years. One M/s. VMI Constructions, Managing Partner, M. Vasudevan, Attur emerged as Successful Bidder (H1 Bidder) in the TN Tenders Portal to the subject area after remitting the highest lease amount of Rs. 4,42,00,000/- (Rupees Four crore Forty two lakhs only) to the Government account, the precise area communication letter issued to successful bidder M/s. VMI Constructions vide reference 2nd cited with a direction to submit the Mining Plan with the duly approval of the Assistant Director of Geology and Mining, Salem and Environmental Clearances obtained from the State Level Environmental Impact Assessment Authority – Tamil Nadu, Chennai

...2..

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

for grant of quarry lease required under Rules 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959.

2. In this regard, in the reference 3rd cited, the successful bidder M/s. VMI Constructions, Managing Partner, M. Vasudevan, Attur has prepared and submitted 3 copies of draft Mining Plan with a request to approve the same.

3. The draft Mining Plan has been scrutinized in accordance with the Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959 and found that, the plan contains Geological, Geomorphological, Topographical, Environmental Management Plan, Progressive Quarry Closure Plan etc., and other related features were incorporated and also incorporated the conditions imposed in the Precise Area Communication found correct.

4. It is ascertained that, the total Geological resources and Mineable resources available in the Precise Area to an ultimate depth of maximum of 65 meter (40m AGL + 25m BGL) at 100% recovery and the total mineable reserves of Rough stone is arrived as 1,96,205 m^3/ 5,39,564 T and Top-soil as 16,425 m^3/ 32,850 T for the period of 10 years. The year wise production proposed for the period of first 5 years is as follows.

Sl. No.	Year	Recoverable Resources			
		Rough stone (in m^3)	Rough stone (in T)	Topsoil (in m^3)	Topsoil (in T)
1.	1st	21660	59565	16425	32850
2.	2nd	23445	64474	-	-
3.	3rd	30380	83545	-	-
4.	4th	26190	72023	-	-
5.	5th	24300	66825	-	-
	Total	**1,25,975**	**3,46,432**	**16,425**	**32,850**

...3..

For VMI CONSTRUCTIONS

MANAGING PARTNER

5. Hence, as per the powers delegated under the Rule 41 of the Tamil Nadu Minor Mineral Concession Rules, 1959, the Mining Plan submitted by the applicant firm, M/s. VMI Constructions, Managing Partner, M. Vasudevan, Attur is hereby approved subject to the conditions that,

i. The Mining Plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

ii. This approval of the Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

iii. The Mining Plan is approved without prejudice to any other order or direction from any court of contempt jurisdiction.

iv. Quarrying shall be done as per the Approved Mining Plan and that the mining 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.

Encl: 2 Copies of Approved Mining Plan.

Assistant Director,
Dept. of Geology and Mining,
Salem.

04/07/25

Copy to submitted the Commissioner of Geology and Mining, Guindy, Chennai-600 032.

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ASSISTANT DIRECTOR, DEPARTMENT OF GEOLOGY AND MINING

MINING PLAN

FOR

KADAMBUR VILLAGE ROUGH STONE MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Government Poramboke land /Open Cast-Semi-Mechanized mining/Non- Forest/Non-Captive Use

Lease period 10 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	:	SALEM
TALUK	:	GANGAVALLI
VILLAGE	:	KADAMBUR
S.F. No	:	219/1A (Part-5)
EXTENT	:	2.00.0Hectares

ADDRESS OF THE APPLICANT

M/s.VMI CONSTRUCTIONS,

(BID ID: 1215709),
Managing Partner Mr.M.Vasudevan,
No.1/287, Pudur,
Kalpaganur Post,
Attur Taluk,
Salem District – 636109

PREPARED BY

Dr. S. KARUPPANNAN. M.Sc., Ph.D.
Qualified Person
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, 7010076633
E-mail: info.gtmsdpi@gmail.com ,
Website: www.gtmsind.com

For VMI CONSTRUCTIONS

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING * SALEM-635 007 *

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For VMI CONSTRUCTIONS

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING
SALEM-636 001

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3.	Copy of **FMB** (Field Measurement book)	III
4.	Copy of "A" register	IV
5.	Copy of GST Certificate	V
6.	Copy of Partnership deed document	VI
7.	Photo copy of the applied lease area	VII
8.	Copy of ID Proof of the authorized signatory	VIII
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For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

LIST OF PLATES

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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	Plan 1:1000
8	Geological Sections	IIIA	**Sections** Hor 1:1000 Ver 1:500
9	Conceptual Plan	IV	Plan 1:1000
10	Conceptual Sections	IVA	**Sections** Hor 1:1000 Ver 1:500
11	Mine Layout Plan and Land Use Pattern	V	Plan 1:1000
12	Year wise Development & Production Plan	VI	Plan 1:1000
13	Year wise Development & Production Sections	VIA	**Sections** Hor 1:1000 Ver 1:500

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ASSISTANT DIRECTOR, DEPARTMENT OF GEOLOGY AND MINING, SALEM-636 001

M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.Vasudevan,
No.1/287, Pudur,
Kalpaganur Post,
Attur Taluk,
Salem District – 636109

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of rough stone quarry lease in Government Poramboke land at S.F.No: 219/1A (Part-5), over an extent of 2.00.0 hectares of Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu State has been prepared by

Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Qualified Person)

I request "**The Assistant Director**", Department of Geology and Mining, Salem District to make further correspondence regarding modifications of the Mining Plan with the said Qualified Person on this following address,

Dr. S. KARUPPANNAN. M.Sc., Ph.D.
(Qualified Person)
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 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.

For VMI CONSTRUCTIONS

Managing Partner

Place: Salem, TN.
Date: 12.5.2025

Signature of the applicant
(M/s.VMI CONSTRUCTIONS)

For VMI CONSTRUCTIONS

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING
SALEM-636 001

M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.Vasudevan,
No.1/287, Pudur,
Kalpaganur Post,
Attur Taluk,
Salem District – 636109

DECLARATION

The Mining Plan in respect of rough stone quarry lease in Government Poramboke at S.F.No: 219/1A (Part-5), over an extent of 2.00.0 hectares of Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

For VMI CONSTRUCTIONS

Managing Partner

Place: Salem, TN.

Date: 12.5.2025

Signature of the applicant

(M/s.VMI CONSTRUCTIONS)

For VMI CONSTRUCTIONS

MANAGING PARTNER

Dr. S. KARUPPANNAN. M.Sc., Ph.D.
(Qualified Person)
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

CERTIFICATE

This is to certify that, the provisions of 8(1) Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone quarry lease at S.F.No: 219/1A (Part-5), over an extent of 2.00.0 hectares of Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu State granted to **M/s.VMI CONSTRUCTIONS,** Salem District.

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: 06/06/2025

Signature of the Qualified Person
Dr.S.KARUPPANNAN,M.Sc,Ph.D.,
Qualified Person
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

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

Dr. S. KARUPPANNAN. M.Sc., Ph.D.
(Qualified Person)
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

CERTIFICATE

I certify that, in preparation of Mining Plan for rough stone quarry lease at S.F.No: 219/1A (Part-5), over an extent of 2.00.0 hectares of Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu State prepared to **M/s.VMI CONSTRUCTIONS,** Salem District 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: 06/06/2025

Signature of the Qualified Person

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

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-635 001

MINING PLAN

FOR KADAMBUR VILLAGE ROUGH STONE MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Government Poramboke land / Open cast-Semi-Mechanized ssmining/Non-forest/Non-Captive Use

Lease period 10 Years from the date of lease execution

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

INTRODUCTORY NOTES:

a) **Introduction:** The Mining plan with progressive quarry closure plan is prepared for **M/s.VMI CONSTRUCTIONS**, (BID ID: 1215709), Managing Partner Mr.M.Vasudevan, No.1/287, Pudur, Kalpaganur Post, Attur Taluk, Salem District – 636109, Tamilnadu State. The applicant emerged as successful Bidder (H1 Bidder) in the e-Auction conducted for the grand of quarry lease for Rough stone in S.F.No.219/1A (Part-5), over an extent of 2.00.0hectares of Kadambur Village, Gangavalli Taluk, Salem District, Tamil Nadu State. The e-Tender Auction Notification of 6 Roughstone areas in Salem District was Published in TN Tender Portal in Tender ID No.2024-CGAM-507755-1 on 06.12.2024, and Published via Salem District Extra Ordinary Gazette Notification No.16 Dated:03.12.2024.

Thereafter electronic auction for the 6 Roughstone bearing area were held on 08.01.2025 in Tamil Nadu Tenders Portal, including the subject area in Gangavalli Taluk, Kadambur Village, S.F.No. 219/1A (Part-5), over an extent of 2.00.0hectares.

In the electronic auction for the said quarry, as the amount quoted by M/s.VMI CONSTRUCTIONS, Managing Partner Mr.M.Vasudevan for the quarry was more than those quoted by others and the bid was confirmed to the said H1 Bidder for Rs.4,42,00,000/- and declared as the successful bidder.

b) **The Precise area communication letter:** The Assistant Director, Department of Geology and Mining, Salem has directed to the applicant M/s.VMI CONSTRUCTIONS, through his precise area communication letter vide Roc.No.40/2025/Mines-A Dated: 07.05.2025, for the grant of quarrying lease rough stone in Tamil Nadu State, Salem District, Gangavalli Taluk, Kadambur Village in S.F.No. 219/1A (Part-5), over an extent of 2.00.0 hectares, recommended for a period of Ten (10) years under Rule 8(1) Tamil Nadu Minor Mineral concession rules, 1959.

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

For VMI CONSTRUCTIONS

MANAGING PARTNER

conditions mentioned in the precise area communication letter **Roc.No.40/2025/Mines-A Dated: 07.05.2025.**

d) **Geological resources and Mineable reserves:** Geological resource of estimated as **730487m³** or **1991923MT** including the resources of safety zone, topsoil etc. Of which, rough stone resources of about **707932m³** or **1946813MT** and topsoil is **22555m³** or **45110MT** up to a depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m). The total mineable reserve is estimated to be **212630m³** or **572414MT** by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about **196205m³** or **539564MT** and topsoil is **16425m³** or **32850MT** up to a depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m) (Refer Plate No. IIIA & IVA).

e) **Proposed Production Schedule:** Total proposed production of rough stone is **196205m³** or **539564MT** and topsoil is **16425m³** or **32850MT** up to a depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m) for ten years plan period. (Refer Plate No. VIA).

- Proposed production for first five years of rough rough stone is **125975m³** or **346432MT** and topsoil is **16425m³** or **32850MT** up to a depth of 45m (40m above ground level + 5m below ground level) (R.L 335m-290m)

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

i). **Interstate boundary:** There is no Interstate boundary situated around 10km radius from the lease area.

ii). **Wildlife Sanctuaries any:** There are no notified wildlife sanctuaries within the radius of 10km from the project site under the wildlife (Protection) Act, 1972.

iii). **Forest (conservation) Act, 1980:** No forest land granted for quarrying and there is no reserve forest within the radius of 60m.

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

h) **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.

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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.

1.0 GENERAL:

a.	Name of the Applicant	:	**M/s.VMI CONSTRUCTIONS**
	Applicant address	:	(BID ID: 1215709), Managing Partner Mr.M.Vasudevan, No.1/287, Pudur, Kalpaganur Post, Attur Taluk,
	District	:	Salem
	State	:	Tamilnadu
	Pin code	:	636109
	Phone	:	9047017837
	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
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 Ten (10) years.

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	Name of the QP 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 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
	Fax	:	Nil
	e-mail	:	info.gtmsdpi@gmail.com
	Telex	:	Nil
	Registration number	:	Nil
	Date of grant/renewal	:	Nil
	Valid upto	:	Nil
f.	Name of the prospecting agency	:	**Geo Technical Mining Solutions** GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.
	Address	:	No: 1/213-B, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter issued by the Assistant Director, Department Geology and Mining, Salem vide **Roc.No.40/2025/Mines-A Dated: 07.05.2025**

2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: IA & IB
	District & State	:	Salem, Tamil Nadu
	Taluk	:	Gangavalli
	Village	:	Kadambur

Khasra No./ Plot No./ Block Range/ Felling Series etc.:

Survey No.	Sub division	Total Extent in Hect	Patta No.	Ownership / Occupancy
219	1A (Part-5)	2.00.0	---	Govt Poramboke land
Total		**2.00.0**		

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Lease area (hectares)	:	2.00.0 Hectares
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	It is a Government Poramboke Land
Ownership / Occupancy	:	Government of Tamil Nadu
Existence of Public Road / Railway line if any nearby and approximate distance	:	✓ Exploited quarry materials will be transported through the approach road is situated on the North side of the lease area. ✓ There is MDR - 455 road situated about 3.8km radius away on southern side of the lease area. ✓ There is no SH road situated around 5km radius from the lease area. ✓ There is NH-136 road situated about 5.3km radius away on northwest side of the lease area. ✓ There is no railway line situated around 5km radius from the lease area.
Toposheet No. with latitude and longitude	:	Toposheet No. **58 I/10** Latitude: From 11°30'42.05"N to 11°30'49.92"N Longitude: From 78°36'22.74"E to 78°36'27.14"E

Geo-Coordinates of the lease boundary:

PILLAR ID	LATITUDE	LONGITUDE
1	11°30'49.92"N	78°36'26.54"E
2	11°30'45.79"N	78°36'25.68"E
3	11°30'43.77"N	78°36'27.14"E
4	11°30'42.05"N	78°36'23.81"E
5	11°30'45.19"N	78°36'22.78"E
6	11°30'47.14"N	78°36'22.74"E
7	11°30'49.90"N	78°36'24.71"E

Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	:	It is an barren and Ryotwari land.

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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	Gangavalli	5.0Km	East
b.	Nearest police station	Gangavalli	4.2km	East
c.	Nearest fire station	Udayarpalayam	9.9km	North
d.	Nearest medical facility	Gangavalli	3.9Km	East
e.	Nearest school	Manjini	5.3km	North
f.	Nearest railway station	Attur	9.1km	North
g.	Nearest port facility	Chennai	254km	Northeast
h.	Nearest airport	Salem (Omalur)	66.5km	Northwest
i.	Nearest DSP office	Attur	10.0km	North
j.	Nearest villages	Pudur	1.7km	North
		Gangavalli	3.6km	East
		Kadambur	1.0Km	South
		Ramanathapuram	2.3km	West

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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 is an elevated terrain . The average elevation is 40m above ground level. The maximum elevation (335m) was observed southwest side of the lease area and minimum Elevation (295m) was observed northeast side of the site. The slope is towards north side and falls in Toposheet no. **58 I/10**

(ii) **General Geology of the District:**

Crystalline rocks of Archaean to late Proterozoic age occupy over 80% of the area of the state of Tamilnadu, while the rest is covered by Phanerozoic sedimentary rocks mainly along the coastal belt and in a few inland River valleys. The hard rock terrain comprises predominantly of Charnockite and Khondalite groups and their migmatitic derivatives, supracrustal sequences of Sathyamangalam and Kolar groups and Peninsular Gneissic Complex (Bhavani Group), intruded by ultramafic-mafic complexes, basic dykes, Granites and Syenites. The sedimentary rocks of the coastal belt include fluviatile, fluvio-marine and marine sequences, such as Gondwana Supergroup (Carboniferous to Permian and Upper Jurassic to Lower Cretaceous), marine sediments of Cauvery basin (Lower Cretaceous to Paleogene), Cuddalore /Pannambarai Formation (Mio-Pliocene) and sediments ofQuaternary and Recent age.

The Charnockites and the Migmatites (Gneiss) occurring as massive bodies are used as building stones and road metal. Usually the chrnockites occur as residual hills and mounds with positive topography. The Gneiss generally occupy the plains as it easily weathers and erodes due to the fissile nature. The basic dykes mainly Dolerite (Black Granite) occurring as dykes is used as building stones and decorative/ ornamental stones.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Recent to Sub recent	----	Residual Gravel (1m Thick)
Archean to Lower	Migmatite	Pegmatite and Quartz/veins

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		Proterozoic	complex	Dolerite dyke Peninsular gneisses and Migmatites
		Archean	Charnockite Group	Charnockite, Garnetiferous quartzo-feldspathic, Biotite gneisses

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

Topography of the proposed lease area:

The proposed lease area is an elevated terrain. The average elevation of 40m above ground level. The maximum elevation (335m) was observed southwest side of the lease area and minimum elevation (295m) was observed northwest side of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss.

The topsoil is obtained the average of 0-1.0m and a rough stone starts from 1.0m to 65m (R.L335m-270m). The Surface plan showing elevation, contour, accessibility road and Geological map was prepared the proposed lease area.

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.

Physiography of the rocks:

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

Chemical composition of rocks:

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

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Recent to Sub recent	----	Top soil
Archaean	Charnockite Group	Charnockites.

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(iv)	Drainage Pattern	:	There is no major river or water bodies found within 50m radius. The drainage in the area is sub-dendritic in nature.

(b)	***The topographic plan of the lease area prepared on a scale of 1 :1000 or 1 : 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan:***		
	a. Present status:	:	The QP examined the surface features during survey. It is a fresh quarry lease.
	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)	***Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below:-*** 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 two longitudinal and two transverse section to calculate the volume of material up to the depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m) for ten years plan period. (Refer Plate No. IIIA). The two longitudinal and two transverse cross section were assigned XY-AB & X1Y1-CD as respectively. Using the cross-sectional method, total reserve is estimated to be **730487m^3** or **1991923Ts** including the resources of safety zone, and topsoil,

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etc. Of which, rough stone resources of about **707932m³** or **1946813Ts** and topsoil is **22555m³** or **45110Ts.**

GEOLOGICAL RESERVES										
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
XY-AB	I	139	93	1	12927	.....	12927	2	.....	25854
	I	24	18	4	1728	1728	.....	2.75	4752	.....
	II	21	36	5	3780	3780	.....	2.75	10395	.....
	III	124	69	5	42780	42780	.....	2.75	117645	.....
	IV	138	89	5	61410	61410	.....	2.75	168878	.....
	V	138	89	5	61410	61410	.....	2.75	168878	.....
	VI	138	89	5	61410	61410	.....	2.75	168878	.....
	VII	138	89	5	61410	61410	.....	2.75	168878	.....
	VIII	138	89	5	61410	61410	.....	2.75	168878	.....
TOTAL					**368265**	**355338**	**12927**	.....	**977180**	**25854**
X1Y1-CD	I	83	116	1	9628	.....	9628	2	.....	19256
	I	47	13	4	2444	2444	.....	2.75	6721	.....
	II	58	24	5	6960	6960	.....	2.75	19140	.....
	III	63	34	5	10710	10710	.....	2.75	29453	.....
	IV	66	49	5	16170	16170	.....	2.75	44468	.....
	V	69	60	5	20700	20700	.....	2.75	56925	.....
	VI	82	73	5	29930	29930	.....	2.75	82308	.....
	VII	82	84	5	34440	34440	.....	2.75	94710	.....
	VIII	82	94	5	38540	38540	.....	2.75	105985	.....
	IX	82	94	5	38540	38540	.....	2.75	105985	.....
	X	82	94	5	38540	38540	.....	2.75	105985	.....
	XI	82	94	5	38540	38540	.....	2.75	105985	.....
	XII	82	94	5	38540	38540	.....	2.75	105985	.....
	XIII	82	94	5	38540	38540	.....	2.75	105985	.....
TOTAL					**362222**	**352594**	**9628**	.....	**969634**	**19256**
GRAND TOTAL					**730487**	**707932**	**22555**	.....	**1946813**	**45110**

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

The mineable reserve is estimated to be **212630m³** or **572414Ts** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m). Of which, rough stone is about **196205m³** or **539564Ts** and topsoil is **16425m³** or **32850Ts**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no's. IVA).

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MINEABLE RESERVES

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
	I	10	8	4	320	320	.....	2.75	880	.....
	II	21	21	5	2205	2205	.....	2.75	6064	.....
	III	124	49	5	30380	30380	.....	2.75	83545	.....
	IV	128	54	5	34560	34560	.....	2.75	95040	.....
	V	123	44	5	27060	27060	.....	2.75	74415	.....
	VI	118	34	5	20060	20060	.....	2.75	55165	.....
	VII	108	24	5	12960	12960	.....	2.75	35640	.....
	VIII	98	14	5	6860	6860	.....	2.75	18865	.....
TOTAL					**143822**	**134405**	**9417**	.....	**369614**	**18834**
X1Y1-CD	I	73	96	1	7008	.....	7008	2	.....	14016
	I	20	6	4	480	480	.....	2.75	1320	.....
	II	24	9	5	1080	1080	.....	2.75	2970	.....
	III	28	14	5	1960	1960	.....	2.75	5390	.....
	IV	32	24	5	3840	3840	.....	2.75	10560	.....
	V	59	30	5	8850	8850	.....	2.75	24338	.....
	VI	67	38	5	12730	12730	.....	2.75	35008	.....
	VII	62	44	5	13640	13640	.....	2.75	37510	.....
	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
	IX	52	24	5	6240	6240	.....	2.75	17160	.....
	X	47	14	5	3290	3290	.....	2.75	9048	.....
TOTAL					**68808**	**61800**	**7008**	.....	**169950**	**14016**
GRAND TOTAL					**212630**	**196205**	**16425**	.....	**539564**	**32850**

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 6m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.

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

Total proposed production for ten years of rough stone is about **196205m³** or **539564Ts** and topsoil is **16425m³** or **32850Ts** up to a depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m). Refer Plate No's. VIA).

Year	Pit No.(s)	Topsoil/ Overburden (m^3)	ROM (m^3)	Saleable rough stone (m^3) @ 100%	Saleable rough stone (Ts) @ 100%	Sub grade/ Weathered rock (m^3)	Saleable Gravel (m^3)	Topsoil in (Ts)	Rough stone to waste ratio
I	I	16425	38085	21660	59565	...	..	32850	...
II	I	...	23445	23445	64474	...	...	...	...
III	I	...	30380	30380	83545	...	...	...	...
IV	I	...	26190	26190	72023	...	...	...	...
V	I	...	24300	24300	66825	...	...	...	...
VI	I	...	14950	14950	41112	...	...	...	...
VII	I	...	15400	15400	42350	...	...	...	...
VIII	I	...	20060	20060	55165	...	...	...	...
IX	I	...	12960	12960	35640	...	...	...	...
X	I	...	6860	6860	18865	...	...	...	...
Grand Total		**16425**	**212630**	**196205**	**539564**	**...**	**...**	**32850**	...

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

YEARWISE PRODUCTION RESERVES

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
I	XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
		I	10	8	4	320	320	.....	2.75	880	.....
	X1Y1-CD	I	73	96	1	7008	.....	7008	2	.....	14016
		I	20	6	4	480	480	.....	2.75	1320	.....
		II	24	9	5	1080	1080	.....	2.75	2970	.....
		III	28	14	5	1960	1960	.....	2.75	5390	.....
		IV	32	24	5	3840	3840	.....	2.75	10560	.....
		V	59	30	5	8850	8850	.....	2.75	24338	.....
		VI	27	38	5	5130	5130	.....	2.75	14107	.....
TOTAL						**38085**	**21660**	**16425**	.....	**59565**	**32850**

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II	XY-AB	II	21	21	5	2205	2205	.....	2.75	6064	.....
	X1Y1-CD	VI	40	38	5	7600	7600	.....	2.75	20900	.....
		VII	62	44	5	13640	13640	.....	2.75	37510	.....
TOTAL						**23445**	**23445**	**0**	.....	**64474**	**0**
III	XY-AB	III	124	49	5	30380	30380	.....	2.75	83545	.....
TOTAL						**30380**	**30380**	**0**	.....	**83545**	**0**
IV	XY-AB	IV	38	54	5	10260	10260	.....	2.75	28215	.....
	X1Y1-CD	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
		IX	52	24	5	6240	6240	.....	2.75	17160	.....
TOTAL						**26190**	**26190**	**0**	.....	**72023**	**0**
V	XY-AB	IV	90	54	5	24300	24300	.....	2.75	66825	.....
TOTAL						**24300**	**24300**	**0**	.....	**66825**	**0**
VI	X1Y1-CD	X	47	14	5	3290	3290	.....	2.75	9047	.....
	XY-AB	V	53	44	5	11660	11660	.....	2.75	32065	.....
TOTAL						**14950**	**14950**	**0**	.....	**41112**	**0**
VII	XY-AB	V	70	44	5	15400	15400	.....	2.75	42350	.....
TOTAL						**15400**	**15400**	**0**	.....	**42350**	**0**
VIII	XY-AB	VI	118	34	5	20060	20060	.....	2.75	55165	.....
TOTAL						**20060**	**20060**	**0**	.....	**55165**	**0**
IX	XY-AB	VII	108	24	5	12960	12960	.....	2.75	35640	.....
TOTAL						**12960**	**12960**	**0**	.....	**35640**	**0**
X	XY-AB	VIII	98	14	5	6860	6860	.....	2.75	18865	.....
TOTAL						**6860**	**6860**	**0**	.....	**18865**	**0**
GRAND TOTAL						**212630**	**196205**	**16425**	.....	**539564**	**32850**

FIRST FIVE YEARWISE PRODUCTION RESERVES

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M3	Rough Stone in M3	Residual Top soil in M3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
I	XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
		I	10	8	4	320	320	.....	2.75	880	.....
	X1Y1-CD	I	73	96	1	7008	.....	7008	2	.....	14016
		I	20	6	4	480	480	.....	2.75	1320	.....
		II	24	9	5	1080	1080	.....	2.75	2970	.....
		III	28	14	5	1960	1960	.....	2.75	5390	.....
		IV	32	24	5	3840	3840	.....	2.75	10560	.....
		V	59	30	5	8850	8850	.....	2.75	24338	.....
		VI	27	38	5	5130	5130	.....	2.75	14107	.....
TOTAL						**38085**	**21660**	**16425**	.....	**59565**	**32850**
II	XY-AB	II	21	21	5	2205	2205	.....	2.75	6064	.....
	X1Y1-CD	VI	40	38	5	7600	7600	.....	2.75	20900	.....
		VII	62	44	5	13640	13640	.....	2.75	37510	.....
TOTAL						**23445**	**23445**	**0**	.....	**64474**	**0**
III	XY-AB	III	124	49	5	30380	30380	.....	2.75	83545	.....

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TOTAL						**30380**	**30380**	**0**	**.....**	**83545**	**0**
IV	XY-AB	IV	38	54	5	10260	10260	.....	2.75	28215	.....
	X1Y1-CD	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
		IX	52	24	5	6240	6240	.....	2.75	17160	.....
TOTAL						**26190**	**26190**	**0**	**.....**	**72023**	**0**
V	XY-AB	IV	90	54	5	24300	24300	.....	2.75	66825	.....
TOTAL						**24300**	**24300**	**0**	**.....**	**66825**	**0**
GRAND TOTAL						**142400**	**125975**	**16425**	**.....**	**346432**	**32850**

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

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 (10 Years) = **196205m³** or **539564MT**

First five years production reserves of rough stone = **80066m³** or **220181MT**

Annual Peak production = **30380m³** or **83545MT**

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 65m (40m above ground level + 25m 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 10 years.

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

SECTION XY-AB						
Bench	**R.L**	**Period**	**Overburden/ Mineral**	**L (m)**	**W (m)**	**D (m)**
I	R.L 310m – 305m	Ten years plan Period	Topsoil	129	73	1
			Rough stone	10	8	4
II	R.L 305m – 300m			21	21	5
III	R.L 300m – 295m			124	49	5
IV	R.L 295m – 290m			128	54	5
V	R.L 290m – 285m			123	44	5

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VI	R.L 285m – 280m			118	34	5
VII	R.L 280m – 275m			108	24	5
VIII	R.L 275m – 270m			98	14	5
					Total Depth	**40**

SECTION XY-CD

Bench	R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L 335m – 330m	Ten years plan Period	Topsoil	73	96	1
			Rough stone	20	6	4
II	R.L 330m – 325m			24	9	5
III	R.L 325m – 320m			28	14	5
IV	R.L 320m – 315m			32	24	5
V	R.L 315m – 310m			59	30	5
VI	R.L 310m – 305m			67	38	5
VII	R.L 305m – 300m			62	44	5
VIII	R.L 300m – 295m			57	34	5
IX	R.L 295m – 290m			52	24	5
X	R.L 290m – 285m			47	14	5
					Total Depth	**50**

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%. There is no waste rock will be proposed in this lease area.
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 for storage of rain water and may be converted in to dumping yards for solid waste by adopting suitable technologies.
g)	Open cast mining		
i)	Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)	:	It is a fresh quarry lease. The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all opencast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 6m and the bench width should not less than the bench height. The slope of the benches should not exceed 45°

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			from horizontal.
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		There is a topsoil of 16425m^3 will be removed.
	b. Rough Stone waste and side burden waste:-		The recovery of rough stone in this quarry is 100%. There is no rough stone waste or side burden will be removed.
H	Underground Mining		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.

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	--

(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 lease hold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	7	--	--	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.

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	i) Ore transported by: own trucks / hired trucks	:	Hired trucks for initially production purposes
	ii) 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

a) Details of hauling / transport equipment:

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

4) **(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.

5. **BLASTING:**

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

Blasting pattern:

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

Rough stone production for 10 years = **196205m^3** or **539564Ts**

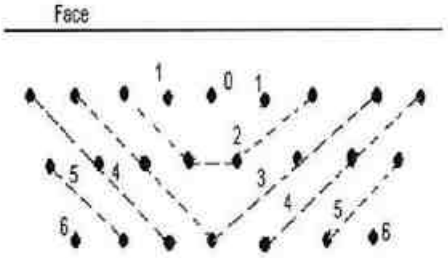
BLAST DESIGN	
Blasthole Diameter (D) in mm	32
Burden (B) in m	1.2
Spacing (S) in m	1.38
Subdrill in m	0.5
Charge length (C) in m	0.70
Stemming	0.5

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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	70
Number of blast holes/day	17
Number of blast round/day	1
Blasthole pattern	Staggered
Mass of explosive /day in kg	7.41
Powder factor in kg/m^3	0.11
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL



Stagged method of mining

b) Type of explosives used / to be used:

Following explosives are recommended for efficient blasting with safe practice.

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

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

The control blasting measures is being adopted for minimizing ground vibration and fly rock.

Shallow depths jack hammer 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

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		No of holes	:	17 holes
		Yield	:	$70m^3$
		Total explosive required	:	7.41kg-Slurry explosives
		Charge per hole	:	0.5kg
		Blasting at day time only	:	12.0p.m-1.0p.m
c)	Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.11kg per hole of explosives	
d)	Whether secondary blasting is needed, if so describe it briefly	:	There is no secondary blasting involved.	
e)	Storage of explosives (like capacity and type of explosive magazine)	:	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 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 65m in summer and 58m in rainy season from the below 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 65m (40m above ground level + 25m 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 L pm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The	

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			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 years: No other wastes are removed during years.		
b).	Land chosen for disposal of waste with proposed justification	:	There is a topsoil of 16425m^3 will be removed.
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.	:	The recovery of rough stone in this quarry is 100%. 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 parties, captive consumption, export, industrial use)	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc
b).	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone (charnockite) 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.

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9.	***OTHERS***		
	Describe briefly the following a) Site services	:	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 our quarry laborers.

b) Employment potential:

As per Mines safety under the provisions of Metalliferous Mines Rules, 1961 under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision.

The following man power is proposed for quarrying stone material during the five years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.

1.	Highly Skilled	Mines Manager	1No.
		Mine Engineer	1No.
		Mine Geologist	--
		Blaster	1No
2.	Unskilled	Musdoor / Labours	17 No's
		Total =	**20No's**

10	**MINERAL PROCESSING/BENEFICIATIONS:**		
(a)	If processing / beneficiations of the ore or minerals mined is planned to be conducted on site 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.	:	Excavated rough stone minerals directly will be used by the applicant for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose. The recovery of rough stone in this quarry is 100%.

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(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.	:	Not applicable.
(d)	Specify quantity and type of chemicals to be used in the processing plant.	:	Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	:	Not applicable
(f)	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and of recycling.	:	Drinking is 0.3KLD, utilized water is 0.7KLD, Dust suppression is 1.0KLD and Green Belt is 1.0KLD. Minimum quantity of water 3.0KLD per day. 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 0.9KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.

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PART – B

11.0 ENVIRONMENTAL MANAGEMENT PLAN:

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

11.1 Fresh lease 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.

Sl. No.	Land Use	Present area (Hect.)
1.	Area under Mining	Nil
2	Infrastructure	Nil
3	Roads	Nil
4	Unutilized	2.00.0
5	Green belt	Nil
6	Settling Tank & Drainage	Nil
	Grand Total	**2.00.0**

11.2	Water Regime	:	Water table in this area is noticed at a depth of 65m in summer and 58m in rainy season from the below ground level and presently the quarrying of rough stone is ultimate up to a depth of 65m (40m above ground level + 25m below ground level). 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

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			explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.

11.5 Climatic conditions:

Salem, India weather forecasted for the maximum temperature of 29°C / 84°F. Min temperature will be 18°C/64°F. Most precipitation falling will be 8.20mm/0.32inch. Windiest day is expected to see wind of upto 17kmph/ 11mph.

11.6 Human Settlement:

The nearest villages are found in the buffer zone with population as per 2011 census.

S.No	Village	Direction	Distance in Kms	Population
1	Pudur	North	1.7km	897
2	Gangavalli	East	3.6km	12015
3	Kadambur	South	1.0Km	6504
4	Ramanathapuram	West	2.3km	512

11.7	Public buildings, places of worship and monuments	:	No infrastructure like residential building, are found within radius of 300m. The places of special interest like archeological monuments, Sanctuaries, etc., are found around 10km radius.
11.8	Attach plans showing the locations of sampling stations	:	The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
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

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

i) ***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	1.40.3
2	Infrastructure	0.02.0
3	Roads	0.05.0
4	Green Belt	0.39.0
5	Un-Utilized Area	0.08.0
6	Drainage & Settling Tank	0.05.7
	Grand Total	**2.00.0**

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 Notification 2006 and also covering DGMS norms.

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vi).	Water regime		No major river or any odai track are found around 50m radius.
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 500m radius.

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

i).	temporary storage and utilization of topsoil	:	There is a topsoil of 16425m^3 will be removed.
ii).	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during 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 65m (40m above ground level + 25m below ground level) has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
iii).	***Programme of afforestation, Yearwise for the initial ten 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, nearby school area and Nearest Panchayat approach Roads has been identified to be utilized for Greenbelt appropriate native species of		

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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	3900	450	80%	@100 Rs Per sapling	45,000/-
Second	Approach road and Nearby Village Road	--	300	80%		30,000/-
Third	Schools	--	300	80%		30,000/-
					Total	**1,05,000/-**

iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the five years (and upto conceptual plan period for 'A' category mines).	:	No waste or rejects shall be proposed.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There is no major dumps are stabilize 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.
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.

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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.	:	Present mining is proposed to depth of 65m (40m above ground level + 25m below ground level). 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 450 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	The quarry lease is a fresh mining lease, no mitigation measures observed.
12.4	Mine closure activity	:	The mining plan is proposed to depth of 65m (40m above ground level + 25m below ground level) has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear

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			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 quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	:	A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	:	During the ten 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 Proposed Financial Estimate / Budget for (EMP) Environment Management:

A	**Fixed Asset Cost**:		
	1. Land Cost (Tender cost)	:	Rs. 4,42,00,000
	2. Labour Shed		Rs. 1,00,000/-
	3. Sanitary Facility	:	Rs. 1,00,000/-
	4. Fencing	:	Rs. 2,50,000/-
	5. Other expenses (Security guard, dust bin, etc)	:	Rs. 4,00,000/-
	Total	:	**Rs. 4,50,50,000/-**

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

B	**B. Machinery cost**	:	**Rs. 25,00,000/-** (Hire Basis)
C	**Total Expenditure of EMP cost** (for ten years)		
	1. Drinking Water Facility	:	Rs. 1,00,000/-
	2. Sanitary facility & Maintenance	:	Rs. 1,50,000/-
	3. Permanent water sprinkler	:	Rs. 1,50,000/-
	4. Afforestation and its maintenance	:	Rs. 1,05,000/-
	5. Safety Kits	:	Rs. 50,000/-
	6. Provision of tyre washing facility	:	Rs. 1,50,000/-
	7. Blasting materials with blast mat cost	:	Rs. 10,00,000/-
	8. Settling Tank for Drainage (0.05.7Hects or 570Sq.m x 400)	:	Rs. 2,28,000/-
	9. Environment monitoring	:	Rs. 5,00,000/-
	Total	:	**Rs. 24,33,000/-**
D	**Total Project Cost (A+B+C)**	:	**Rs. 4,99,83,000/-**

13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small "B" rough stone quarry.

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

(i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.

(ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.

(iii) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Assistant Director, Department of Geology and Mining, Salem vide letter **Roc.No.40/2025/Mines-A Dated: 07.05.2025.**

(iv) Total proposed production rough stone is **196205m^3** or **539564Ts** and topsoil is **16425m^3** or **32850Ts** up to a depth of 65m (40m above ground level + 25m below ground level) (R.L 335m-270m) for ten years plan period.

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

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: 06/06/2025

Signature of the Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,
Qualified Person
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 / Stipulation & Indicated in the Mining Plan Approval Letter No: Rc.No. 40/2025/Mines A dt 07.07.25 Office of the A D. Geology & Mining Salem.

This Mining Plan is approved based on the Incorporation of the particulars specified in the letter of the Commissioner of Geology and Mining, Chennai ... Rc.No.3060/MC/2012 Dated:19-11-2013 and subject to further fulfilment of the conditions laid down in the Tamilnadu Minor Mineral Conc... Rules

07/7/25

ASSISTANT DIRECTOR
Dept. of Geology and Mining
SALEM.

07/07/25

For VML CONSTRUCTIONS

MANAGING PARTNER

ANNEXURE - 1

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

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GOVERNMENT OF TAMIL NADU
2024

Registered No. M–3

SALEM DISTRICT GAZETTE

EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 16]

SALEM, DECEMBER 3, 2024

[Krodhi, Karthigai 18 – Thiruvalluvar Aandu 2055]

NOTIFICATION BY THE COLLECTOR

[Rc.No. 200/2023/(Mines-A), Dated : 02.12.2024]

E–mail: (ddminessim@gmail.com)

Notice Inviting Tender (NIT)

"Inviting Application for Grant of Roughstone Quarry Leases in Government Lands"

In exercise of the power conferred by Section 15 of Mines and Minerals (Development & Regulation) Act, 1957 and in accordance with the Rule 8 of the Tamil Nadu Minor Mineral Concession Rules, 1959 read with G.O. Ms. No.21, Natural Resources (MMC.1) dated 31st July, 2024, as amended from time to time notified thereunder, the District Administration of Salem District, Tamil Nadu has identified **6 (six)** areas in Salem District for grant of leases to quarry **Roughstone** mineral through electronic tender/auction (e–Tender / Auction).

e–Tender with forward bidding will be conducted through online electronic platform in e–Tender portal with URL address **https://tntenders.gov.in**, by the District Collector, Salem District for the grant of quarry lease in Government Lands for quarrying **"Roughstone"** mineral available in Salem District as tabulated.

Prospective bidders are advised to get themselves registered at Tamil Nadu Tender portal, obtain **'Login ID'** & **'Password'** and go through the instructions available in the Home page after logging in to the Tamil Nadu Tenders Portal **https://tntenders.gov.in**. They should also obtain **Digital Signature Certificate (DSC)** in parallel which is essentially required for the submission of their application.

The terms and conditions of the e–auction process, details of application fee and bid security amount, detailed information regarding the notified areas, model affidavits to be uploaded in the technical bid are available in the detailed tender document, that can be downloaded free of cost in the portal **https://tntenders.gov.in**.

136/12 (S) Ex.No.16.

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

Aspiring bidders may download and go through the tender document. The URL for online bid submission in e-Tender is https://tntenders.gov.in/nicgep/app. Bidders Manual Kit in the portal https://tntenders.gov.in provides with all requisite illustrations guiding through various stages of the e-Auction process. Bidders are advised to visit the mentioned site regularly till closing date of e-auction for any corrigendum / addendum / amendment.

Sale of Tender Documents will commence on website of e-Auction portal provider, from 06.12.2024.

Application Fee – Rs.5,000/- (Non-refundable)

Bid submission start date : 06.12.2024 from 10:00 hrs

Bid Submission end date : 24.12.2024 upto 16:00 hrs

DETAILS OF LOCATION OF ROUGHSTONE QUARRIES TO BE LEASED OUT UNDER E-TENDER CUM E-AUCTION IN SALEM DISTRICT.

Sl. No	*District*	*Taluk*	*Name of the Village*	*SF.No & Extent*	*Approx. Reserve estimated in m^3*	*Land classification*	*Period of lease proposed*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
1	Salem	Salem	Gajjalnaickenpatti	102/6(P-5), 3.20.40 ha.	3,67,005	Kallankuthu	5 Years
2	Salem	Salem	Gajjalnaickenpatti	102/6(P-8), 1.00.00 ha.	1,10,908	Kallankuthu	10 Years
3	Salem	Kadayampatti	Gundukkal	345(P), 1.50.00 ha.	1,04,861	Kundru	5 Years
4	Salem	Kadayampatti	Vepplai	411(P), 1.50.00 ha.	1,29,916	Tharisu	10 Years
5	Salem	Valapady	Minnampalli	58/3(P-3), 1.50.00 ha.	1,72,025	Paral	10 Years
6	Salem	Gangavalli	Kadambur	219/1A(P-5), 2.00.00 ha.	1,96,205	Karadu	10 Years

Salem,
02.12.2024.

R. BRINDHA DEVI,
DISTRICT COLLECTOR,
SALEM DISTRICT.

PRINTED BY THE COMMISSIONER OF STATIONERY AND PRINTING AT THE GOVERNMENT BRANCH PRESS, SALEM
AND PUBLISHED BY THE COLLECTOR OF THE DISTRICT.

Signature Not Verified
Digitally signed by JAYANTHI R
Date: 2024.12.06 16:19:52 IST
Location: Tamil Nadu-TN

For VMI CONSTRUCTIONS

MANAGING PARTNER

ANNEXURE -II



ந.க.எண்.40/2025/கனிமம்–அ

புவியியல் மற்றும் சுரங்கத்துறை,
மாவட்ட ஆட்சியர் அலுவலகம்,
சேலம்.
நாள்: 07.05.2025.

அறிவிப்பு

பொருள்: கனிமங்களும் குவாரிகளும் – சிறுகனிமம் – சாதாரண கற்கள் – சேலம் மாவட்டம் – கெங்வல்லி வட்டம் – கூடம்பூர் கிராமம் – அரசு புறம்போக்கு புல எண்.219/1A (பாகம்–5) விஸ்தீரணம் 2.00.0 ஹெக்டேர் பரப்பில் சாதாரணகற்கள் குவாரி செய்து எடுத்துச்செல்ல 10 வருடங்களுக்கு குத்தகை உரிமம் வழங்க Tamil Nadu Tender Portal–ல் மின்னணு ஏலம் (e-Auction) நடத்தப்பட்டது – ஏலத்தில் அதிக தொகை கோரிய தி/ள்.VMI Constructions, ஆத்தூர் என்பவரை வெற்றி பெற்ற ஏலதாரராக செய்யப்பட்டது – ஏலத்தொகை முழுவதும் ஏலதாரரால் செலுத்தப்பட்டது – குத்தகை உரிமம் வழங்க தகுதி வாய்ந்த புலமாக கருதி ஒப்புதல் பெற்ற சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மைச் சான்று பெற்று சமர்ப்பிக்க அறிவிப்பு செய்தல் – தொடர்பாக.

பார்வை:
1. அரசாணை எண்.21, இயற்கை வளங்கள் (எம்எம்சி.1) துறை நாள் 31.07.2024.
2. சேலம் மாவட்ட அரசிதழ் சிறப்பு வெளியீடு எண்.16, நாள் 03.12.2024.
3. தினசரி செய்தி நாளிதழ் விளம்பரம் நாள் 07.12.2024.
4. Tamil Nadu Tender Portal Tender ID No. 2024_CGAM_507755_1 நாள் 06.12.2024.
5. தி/ள்.VMI Constructions, ஆத்தூர் என்பவரது மின்னணு ஒப்பந்தபுள்ளி எண்.1215709.
6. மின்னணு ஏல தொழில்நுட்ப மதிப்பீட்டு குழு அறிக்கை நாள் 04.01.2025.
7. மின்னணு ஏலம் (e-Auction) நடைப்பெற்ற நாள் 08.01.2025.
8. இவ்வலுவலக அறிவிப்பு ந.க.எண்.200/2023–6/கனிமம்/அ நாள் 08.01.2025 (வெற்றி பெற்ற ஏலதாரராக அறிவிப்பு செய்யப்பட்டது).
9. தி/ள்.VMI Constructions, ஆத்தூர் என்பவரது கடிதம் நாள் 10.01.2025.
10. இவ்வலுவலக அறிவிப்பு ந.க.எண்.200/2023–6/கனிமம்/அ நாள் 13.01.2025.
11. தி/ள்.VMI Constructions, ஆத்தூர் கடித நாள் 10.02.2025.

சேலம் மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் அமைந்துள்ள தகுதி வாய்ந்த கற்குவாரிகளிலிருந்து சாதாரணகற்கள் குவாரி செய்ய Tamil Nadu Tender Portal–ல் மின்னணு ஏலமுறையில் (e-Auction) குவாரி குத்தகை உரிமம் வழங்க விண்ணப்பங்கள் வரவேற்க பார்வை (1)–ல் கண்ட மாவட்ட அரசிதழ் சிறப்பு வெளியீட்டில் அறிவிக்கை செய்யப்பட்டது.

For VMI CONSTRUCTIONS

MANAGING PARTNER

2) அரசிதழில், மின்னணு ஒப்பந்தப்புள்ளி விண்ணப்பங்கள் பெற 24.12.2024 காலை 11.00 மணி வரை எனவும் விண்ணப்பங்களை தொழில்நுட்ப கேட்புகளுக்காக திறக்கும் நாள் 24.12.2025 மாலை 04.00 மணி வரை எனவும் நிர்ணயம் செய்யப்பட்டது. அதன்படி, வரப்பெற்ற மின்னணு ஒப்பந்தப்புள்ளிகளின் ஆவணங்களை தொழில் நுட்ப குழு மூலம் பரிசீலனை மேற்கொள்ளப்பட்டு ஏற்றுக்கொள்ளப்பட்டது.

3) அதன் பின்னர் Tamil Nadu Tender Portal -ல் 08.01.2025 அன்று மாவட்ட அரசிதழ் வரிசை எண்.6-ல் கண்ட கெங்கவல்லி வட்டம், கடம்பூர் கிராமம், அரசு புறம்போக்கு புல எண்.219/1A (பாகம்-5) விஸ்தீரணம் 2.00.0 ஹெக்டேரில் உள்ள கற்குவாரிக்கு மின்னணு ஏலம் நடத்தப்பட்டு 2 மின்னணு ஒப்பந்த புள்ளிகள் வரப்பெற்றன். அதன் விவரம் பின்வருமாறு.

வ. எண்	மின்னணு ஒப்பந்தபுள்ளி எண்.	ஒப்பந்தபுள்ளதாரரது பெயர்	கோரப்பட்ட அதிகபட்ச ஏலத்தொகை (ரூ.)
1	1215709	VMI Constructions	4,42,00,000
2	1215574	சுந்தரராஜன் S	4,41,00,000

4) மேற்கண்ட குவாரிக்கான மின்னணு ஏலத்தில் தி/ள்.VMI Constructions, ஆத்தூர் என்ற நிறுவனத்தினரால் கோரப்பட்ட தொகையானது அரசின் குறுமத்தொகையைக் காட்டிலும் கூடுதலாக இருந்ததால், (H1) மேற்படியாருக்கு ஏலம் உறுதி செய்யப்பட்டு, பார்வை 8-ன்படி வெற்றி பெற்ற ஏலதாரராக அறிவிப்பு செய்து ஏலத்தொகையில் 10 சதவீத தொகையினை தமிழ்நாடு சிறுகனிமச்சலுகை விதிகள் 1959, விதி 8(16)(ii)(D)-ன்படி செலுத்த அறிவுறுத்தப்பட்டது. அதன்படி, ஏலதாரர் தி/ள்.VMI Constructions, ஆத்தூர் என்ற நிறுவனத்தினர் பார்வை (9)-ல் கண்டுள்ளவாறு 10 சதவீத ஏலத்தொகையான ரூ.44,20,000/-ஐ இ-சலான் எண்கள்.20250109009563 நாள் 09.01.2025 மூலம் உரிய அரசு கணக்கு தலைப்பின்கீழ் செலுத்தி வரவு வைக்கப்பட்டுள்ளது.

5) இதனைத்தொடர்ந்து, ஏலத்தொகையான ரூ.4,42,00,000/-ல் பிணைவைப்பு தொகையான ரூ.10,00,000/- மற்றும் 10 சதவீத ஏலத்தொகையான ரூ.44,20,000/-நீக்கி மீதி தொகையான ரூ.3,87,80,000/- மற்றும் அசையா சொத்துக்குண்டான செல்வ நிலைச் சான்றிதழ் (Solvency Certificate) ஆகியவற்றை தமிழ்நாடு சிறுகனிமச்சலுகை விதிகள் 1959, விதி 8(16)(ii)(H) மற்றும் (I) ஆகியவற்றின்படி 30 தினங்களுக்குள் செலுத்த பார்வை (10)-ல் காணும் இவ்வலுவலக குறிப்பாணையின் மூலம் அறிவுறுத்தப்பட்டது.

6) மேற்படி அறிவிப்பின்படி, வெற்றி பெற்ற ஏலதாரர் தி/ள்.VMI Constructions, ஆத்தூர் என்ற நிறுவனத்தினர் ஏலத்தொகையில் எஞ்சிய தொகையான ரூ.3,87,80,000/-ஐ இ-சலான் மூலம் உரிய அரசு கணக்கு தலைப்பின்கீழ் வரவு வைக்கப்பட்டு பார்வை (11)-ன்படி அசல் சலான்களை பின்வருமாறு சமர்ப்பித்துள்ளார்.

For VMI CONSTRUCTIONS

MANAGING PARTNER

வ. எண்.	நாள்	இ–சலான் எண்.	தொகை (ரூ)
1.	07.02.2025	20250207010966	90,00,000
2.	07.02.2025	20250207011131	90,00,000
3.	10.02.2025	20250210007827	90,00,000
4.	10.02.2025	20250210007958	90,00,000
5.	10.02.2025	20250210008127	27,80,000
		மொத்தம்	3,87,80,000

7) எனவே, ஏலத்தொகையான ரூ.3,87,80,000/–ஐ முழுவதும் வெற்றி பெற்ற ஏலதாரர் தி/ள்.VMI Constructions, ஆத்தூர் என்ற நிறுவனத்தினரால் உரிய காலவரையறைக்குள் செலுத்தியதையடுத்து மாவட்ட அரசிதழ் வரிசை எண். 6–ல் காணும் கெங்கவல்லி வட்டம், கடம்பூர் கிராமம், அரசு புறம்போக்கு புல எண்.219/1A (பாகம்–5) விஸ்தீரணம் 2.00.0 ஹெக்டேர் பரப்பளவில் உள்ள கற்குவாரியினை தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959–ன் விதி 8(1)-ன்படி 10 ஆண்டுகளுக்கு சாதாரணகற்கள் குவாரி செய்ய குத்தகை உரிமம் வழங்க உகந்த புலம் என ஏலதாரருக்கு அறிவிப்பு செய்து குத்தகை உரிமம் வழங்க ஏதுவாக தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959, விதிகள் 41 மற்றும் 42–ன்படி ஒப்புதல் பெற்ற சுரங்கத்திட்ட அறிக்கை மற்றும் மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மைச் சான்று ஆகியவற்றை பெற்று சமர்ப்பிக்க அறிவிறுத்தப்படுகிறது.

மேலும், ஏலதாரர் தி/ள்.VMI Constructions, ஆத்தூர் என்ற நிறுவனத்தினர் இவ்வறிப்பு கிடைக்கப்பெற்ற 90 தினங்களுக்குள் வரைவு சுரங்கத்திட்டம் தயார் செய்து உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சேலம் அவர்களிடம் ஒப்புதலுக்கு சமர்ப்பிக்குமாறு தெரிவிக்கப்படுகிறது.

இணைப்பு: புலவரைபடம்.

உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
சேலம்.

07/05/25

பெறுதல்:-
தி/ள்.VMI Constructions
(BID ID:1215709)
மேலாண்மை பங்குதாரர் திரு.M.வாசுதேவன்,
எண்.1/287, புதூர்,
கல்பகனூர் அஞ்சல்,
ஆத்தூர் வட்டம்,
சேலம்–636 109.

For VMI CONSTRUCTIONS

MANAGING PARTNER

ANNEXURE - II

LABEL	LONGITUDE	LATITUDE
1	78° 36' 23.8056" E	11° 30' 42.0468" N
2	78° 36' 22.7789" E	11° 30' 45.1873" N
3	78° 36' 22.7363" E	11° 30' 47.1387" N
4	78° 36' 24.7132" E	11° 30' 49.9011" N
5	78° 36' 26.5383" E	11° 30' 49.9175" N
6	78° 36' 25.6801" E	11° 30' 45.7894" N
7	78° 36' 27.1365" E	11° 30' 43.7604" N
	WGS 1984 DATUM	

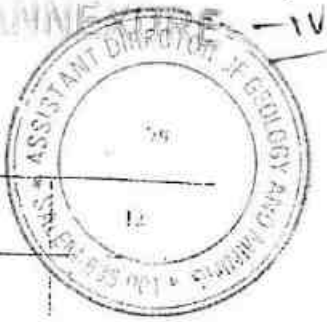
Signature Not Verified
Digitally signed by JAYANTHI R
Date: 2024.12.06 16:15:29 IST
Location: Tamil Nadu-TN

For VMI CONSTRUCTIONS

MANAGING PARTNER

Scanned with CamScanner

ANNEXURE - IV



கி. எண். 75. டம்பூர்.

1	2	3	4	5	6	7	8	9	10	11	12
							ரூ. பை.	ஹெ. ஏர்ஸ்.	ரூ. பை.		
1	218-1	ஏ	பு	...	S-2	6	3 85	0 93·5	3 60	710 வீ. குப்புசாமி நாயுடு (1), வீ. ராஜீ நாயுடு (2).	
2	-2	ஏ	பு	...	S-2	6	3 85	1 01·5	3 92	261 ல. தியாகராஜன்.	
3	-3	ஏ	பு	...	S-2	6	3 85	0 54·0	2 07	1073 வீ. ராஜீநாயுடு மற்றும் ஆறு பேர்களும்.	
4A	-4	ஏ	பு	...	S-2	6	3 85	0 26·5	1 02	711 கு. ராஜகோபால் (1), ரா. பத்ம ஜோதி அம்மாள் (2).	
4B	-4	ஏ	பு	...	S-2	6	3 85	0 30·0	1 16	711 கு. ராஜகோபால் (1), ரா. பத்ம ஜோதி அம்மாள் (2).	
5A	-5	ஏ	பு	...	S-2	6	3 85	0 41·5	1 59	711 கு. ராஜகோபால் (1), ரா. பத்ம ஜோதி அம்மாள் (1).	புஞ்சை
5B	-5	ஏ	பு	...	S-2	6	3 85	0 28·5	1 11	711 கு. ராஜகோபால் (1), ரா. பத்ம ஜோதி அம்மாள் (2).	
								3 75·5	14 47		
1A	219-1	அ	தீ.ஏ.த	...	...	...	.....	30 62·5	...	...	வரி.
1B	-1	அ	பு	...	S-3	9	1 24	0 18·0	0 22	...	தரிசு.
1C	-1	ஏ	பு	...	S-3	9	1 24	0 31·5	1 22	1126 அங்கமுத்து கவுண்டர்.	
1D	-1	ஏ	பு	...	S-3	9	1 24	0 34·5	0 53	1127 பெரியம்மாள்.	
1E	-1	ஏ	பு	...	S-3	9	1 24	0 48·0	1 86	1109 மா. அங்கமுத்து.	
1F	-1	ஏ	பு	...	S-3	9	1 24	0 20·0	0 76	1128 ஜானகிஅம்மாள்	
1G	-1	ஏ	பு	...	S-3	9	1 24	0 25·0	0 97	1129 அருணாசல முப்பர்.	
1H	-1	ஏ	பு	...	S-3	9	1 24	0 31·5	1 22	1110 அ. அங்கம்மாள்.	
2	-1	அ	பு	...	S-2	6	3 09	0 06·5	0 22	...	தரிசு.
2	-2	அ	பு	...	S-3	9	1 53	0 43·5	0 67	[illegible]	தரிசு.
2	-3	அ	பு	...	S-2	6	3 85	0 65·0	2 50	[illegible]	
2	-4	ஏ	பு	...	S-2	6	3 85	0 41·5	1 59	420. வெள்ளையன் தபாற் செட்டி மகளாலி பொன்னம்மாள்.	
3	-5	ஏ	பு	...	S-2	6	3 85	0 28·5	1 11	696 க. வெள்ளையன் (1), க. [illegible] (2)	

[illegible] அலுவலர்
மற்றும் பிறப்பு இறப்பு பதிவாளர்
டம்பூர் கிராமம்
[illegible] (வ), வேலம்பாடி - 636

[illegible] வட்டாட்சியர்
கொல்லேஷ்வர்

[illegible] வேர்ப்பட்டியைப் புள்ளத்தில்

[illegible] ...TIONS

253

MANAGING PARTNER

-269-

ANNEXURE -V

(Amended)

सत्यमेव जयते

Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number :33AAGFV4463L1ZU

1.	Legal Name	V M I CONSTRUCTIONS			
2.	Trade Name, if any	V.M.I.CONSTRUCTIONS			
3.	Additional trade names, if any				
4.	Constitution of Business	Partnership			
5.	Address of Principal Place of Business	1/287, PUDUR, KALPAGANUR POST, ATTUR TK, Salem, Tamil Nadu, 636109			
6.	Date of Liability	01/07/2017			
7.	Date of Validity	From	01/07/2017	To	Not Applicable
8.	Type of Registration	Regular			
9	Particulars of Approving Authority	Under the Goods and Services Tax Act, 2017			
Signature					

Signature Not Verified

Digitally signed by GST GOODS AND SERVICES TAX NETWORK(4)
Date: 2022.09.14 18:00:53 IST

Name	RADHAKRISHNAN BOOBALAN
Designation	Commercial Tax Officer
Jurisdictional Office	ATTUR (RURAL)
9. Date of issue of Certificate	14/09/2022
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 14/09/2022 by the jurisdictional authority.

For VMI CONSTRUCTIONS

MANAGING PARTNER

सत्यमेव जयते

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

Annexure A

Details of Additional Place of Business(s)

GSTIN	33AAGFV4463L1ZU
Legal Name	V M I CONSTRUCTIONS
Trade Name, if any	V.M.I.CONSTRUCTIONS
Additional trade names, if any	

Total Number of Additional Places of Business(s) in the State 2

Sr. No.	Address
1	242/3, GEETHALAYA THIRUMANA MANDABAM BACK SIDE, KALPAGANUR POST, ATTUR TK, Salem, Tamil Nadu, 636109
2	NH-44, WORK SITE, NEAR PUNJAI PUGALUR, THAVITTUPALAYAM, KARUR, Karur, Tamil Nadu, 639113

For V[illegible]CTIONS

MANAGING PARTNER

सत्यमेव जयते

Annexure B

GSTIN	33AAGFV4463L1ZU
Legal Name	V M I CONSTRUCTIONS
Trade Name, if any	V.M.I.CONSTRUCTIONS
Additional trade names, if any	

Details of Managing / Authorized Partners

1		Name	VASUDEVAN
		Designation/Status	MANAGING PARTNER
		Resident of State	Tamil Nadu
2		Name	SANJAIGANDHI SATHYA
		Designation/Status	PARTNER
		Resident of State	Tamil Nadu
3		Name	KAMALA
		Designation/Status	PARTNER
		Resident of State	Tamil Nadu
4		Name	RAMACHANDIRAN SANJAIGANDHI
		Designation/Status	MANAGING PARTNER
		Resident of State	Tamil Nadu
5		Name	RAMACHANDRAN SASIKALA
		Designation/Status	PARTNER
		Resident of State	Tamil Nadu

For VMI CONSTRUCTIONS

MANAGING PARTNER

ANNEXURE -VI



தமிழ்நாடு तमिलनाडु TAMILNADU - 5 SEP 2022 Rs100/- CR 005754

K.சீனிவாசன்
முத்திரைத்தாள் விற்பனையாளர்
ஆத்தூர் பதிவு (தமிழ்நாடு)
உரிமம் எண் : 12/SLM/E12015

VMI CONSTRUCTIONS
KALPAGANUR

VMI CONSTRUCTIONS
1/287, Pudhur, Kalpaganur (Po)
Attur (TK), Salem (DT) - 636109.

RECONSTITUTION OF PARTNERSHIP DEED

This Deed of reconstituted partnership executed on this 5th day of September 2022 by and between;

1) **Mrs. R. KAMALA** w/o Ramachandran aged about 63, years, 1/287, Pudhur, Kalpaganur (po) Attur Taluk, Salem District (hereinafter described as the First party) of the First part;

2) **Mrs. S. SATHYA** w/o R.Sanjai Gandhi aged about 37, years, Residing at 1/287A, Pudhur, Kalpaganur (po) Attur Taluk Salem District (hereinafter described as the Second party) of the Second part;

3) **Mr. M. VASUDEVAN**s/o Mahadevan aged about 37 years, residing at 623,Kudi street, Umaiyalpuram (po) Attur Taluk, Salem District (hereinafter described as the Third party) of the Third part; and

1) R. KAMALA 2) S. Sathya 3)

4) 5)

T. SUBBARAYAN, B.A., B.L.
ADVOCATE & NOTARY PUBLIC
250, Gandhi Nagar
ATTUR Town, Salem (Dt).
Cell: 9865834084.

ATTESTED BY

NOTARY (2/9/2022

MANAGING PARTNER



தமிழ்நாடு तमिलनाडु TAMILNADU 5 SEP 2022 Rs100/ CR 005755

VMI CONSTRUCTIONS
KALPAGANUR

K. Sr
K.சீனிவாசன்
முத்திரைத்தாள் விற்பனையாளர்
ஆத்தூர் டவுன் (தமிழ்நாடு)
உரிமம் எண் : 12/SLM(E)2015

4) **Mrs. R. SASIKALA** D/o Ramachandran aged about 47 years, residing at 1/287A, Pudhur, Kalapaganur (po) Attur Taluk, Salem District (hereinafter described as the Fourth party) of the Fourth part; and

5) **Mr. R. SANJAI GANDHI** s/o Ramachandran aged about 50 years, residing at 1/287A, Pudhur,Kalpaganur (po) Attur Taluk, Salem District (hereinafter described as the Fifth party) of the Fifth part; and

Witnesses as follows:

Whereas the above mentioned First, Second and Third parties have been carrying on Business under the firm Name **"VMI CONSTRUCTIONS"** vide duly executed Partnership Deed last of which is dated 31.12.2016.

1) கோவை. 2) S. Sathya 3)

4) 5)

T. SUBBARAYAN, B.A., B.L.
ADVOCATE & NOTARY (Retd.)
250, Gandhi Nagar
ATTUR Town, Salem (Dt.)
Cell: 98[illegible]

For VMI CONSTRUCTIONS

MANAGING PARTNER

NOTARY 12/9/2022



தமிழ்நாடு तमिलनाडु TAMILNADU = 5 SEP 2022 Rs100/- CR 005756

VMI CONSTRUCTIONS
KALPAGANUR

K.சின்னாசன்
முத்திரைத்தாள் விற்பனையாளர்
ஆத்தூர் டவுன் (தமிழ்நாடு)
உரிமம் எண் : 12/SLM(E)2015

Whereas the above mentioned party of the Fourth and Fifth part Namely **Mrs. R. SASIKALA and Mr. R. SANJAI GANDHI** (Hereinafter called as New Partners) express their Willingness to join the Partnership and where as the parties of First to Third parts (hereinafter called as Existing partners') agreed to take the 'new partners' into the partnership with effect from 05.09.2022 for which all the parties agreed to enter into this reconstituted Partnership, the terms and conditions of the reconstituted partnership are hereby agreed to as follows:

Whereas the above mentioned parties have agreed to enter into a Partnership Business in undertaking and executing of all types of Workscontracts services and such other business or businesses as the partners may decide upon from time to time.

1) 2) 3)

4) 5)

T. SUBBARAYALU, B.A.
ADVOCATE & NOTARY PUBLIC
For VMI CONSTRUCTIONS
ATTUR Town, Salem (Dt)
Cell: 9865834084
MANAGING PARTNER

ATTESTED BY
NOTARY 13/9/2022

(6) Bank accounts shall be opened in the name of the firm and it is mutually agreed among the partners that, the party of the Second and Third part namely **Mrs. S. SATHYA (OR) Mr. M. VASUDEVAN** shall operate all Bank accounts (Overdraft / Cash Credit, Current A/c) **INDIVIDUALLY**on behalf of the firm.

(7) That all the books of accounts shall be kept at the place of the firm and shall not be removed from that place without the consent of all the partners and also they shall be open for inspection in the usual working time by the partners who shall be entitled to take extracts or copies thereof.

(8) That no partner shall engage himself in any business or any trade which may directly or indirectly compete with the business of the firm.

(9) That the partner's capital shall carry interest at a maximum rate of 12% per annum.

(10) That the party of the Third Part namely **Mr. M. VASUDEVAN (AND)** the party of the Fifth Part namely **Mr. R. SANJAI GANDHI** shall be the Managing Partners, party of the Second part to this deed namely **Mrs. S. SATHYA** shall be the working partner, who are actively engaged in conducting the affairs of the business of this partnership. In consideration of the above the working partner and the Managing Partners shall be entitled to a remuneration of Rs.25,000/- per month.

The above remuneration shall be payable by the firm with effect from 05.09.2022. and the same shall be charged to the profit & loss account in arriving at the final net profit or loss of the firm and such remuneration shall be adjusted and credited to the respective capital or drawings account of the working partners at the end of each financial year i.e. on 31st march of each year on which date the final accounts of the firm's business towards profit & loss account and balance sheet are to be determined.

The quantum of remuneration or the mode of calculation of the remuneration payable to the working partners may be or modified or changed whenever felt necessary as may be mutually agreed upon by the parties hereto from time to time and the same can be evidenced by a suitable instruments or documents as may be found necessary.

1) 2) 3)

4) 5)

For VMI CONSTRUCTIONS

MANAGING PARTNER

T. SUBBARAYAN, B.A., B.L.,
ADVOCATE & NOTARY PUBLIC
250, Gandhi Nagar
ATTUR Town, Salem (Dt).
Cell: 98[illegible]4074.

ATTESTED BY

NOTARY 12/9/2022

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

(11) The annual final statement towards the determination of the resultant net profit or losses of this partnership together with the balance sheet shall be struck on 31st day of march every year and such Net profit or losses arrived at there in shall be divided equally by the partners.

The shares of the net profit or losses of the partners determined for each year as above shall be adjusted to their respective capital or drawings account at the end of each accounting year as stated above.

If any partner is desirous of retiring from the partnership he shall do so by giving three months notice in writing and shall retire from the firm. The retiring partner is entitled to receive only the amount standing to the credit of his Capital / current account at the time of his retirement.

(13) Any borrowings from outside in the name of the firm shall bind all the partners and borrowal in the individual name of the partners shall not bind the firm or any other partner. It is mutually agreed that, all the partners are jointly and individually liable for borrowings in the name of Partnership from Banks and financial Institutions and agreed to stand as guarantors for such Loans.

(14) That the party of the Third Part namely **M. VASUDEVAN (OR)** the party of the Fifth Part namely **Mr. R. SANJAI GANDHI** is **INDIVIDUALLY** authorized to sign, receive or respond any documents, communication or correspondences in respect of Income Tax, GST, Firm Registration and other related documents registered letters etc.. on behalf of the firm. authorized to apply and sign all the tenders and related documents on behalf of the firm, towards securing / applying for Government / Private contracts if any.

(15) Any dispute arising between the partners in the conduct of the affairsof the business than the same shall be settled by arbitration in terms of the Indian arbitration Act.

1) 2) 3)

4) 5)

T. SUBBARAYAN, B.A., B.L.
ADVOCATE & NOTARY PUBLIC
250, Gandhi Nagar
ATTUR Town, Salem (Dt).
Cell: 9865834084.

ATTESTED BY

NOTARY 12/4/2023

For VMI CONSTRUCTIONS

MANAGING PARTNER

ASSISTANT DIRECTOR OF GEOLOGY AND MINING * SALEM-635 001 *

And whereas the parties hereto are desirous of reducing the term of partnership in writing:

NOW THIS DEED WITNESSETH AS UNDER:

(1) That the parties aforesaid mutually agreed to be the partners of the firm on the terms and conditions appearing hereinafter.

(2) That the partnership business shall be that of undertaking and executing of all types of Works contracts, Construction of Roads, Bridges, etc with all Government and Other Authoritiesand such other business or businesses as the partners may decide upon from time to time and it shall be carried on in the same name and style of **VMI CONSTRUCTIONS** at 1/287, Pudhur, Kalpaganur (Po) Attur (Tk) Salem District and having a **B.O** at 242/3, Geethalaya Thirumana Mandabam Backside, Kalpaganur Post, Attur TK, Salem Dt or at such other places as the partners may agree upon from time to time.

(3) That the partnership business shall bedeemed to commence with effect from 05.09.2022.

(4) The duration of this partnership shall be 'AT WILL

(5) That the balance in capital accounts of the parties of First to Third part shall continue as their capital contribution to the firm, party of the Fourth & Fifth part shall bring in Rs. 10,00,000/- each as their Initial Capital to the Firm and all the partners agreed to bring additional capital as and when required by the Firm, and share the profit or loss of the firm, in the following ratios:

	SHARE
1. R. Kamala	05%
2. S. Sathya	20%
3. M.Vasudevan	45%
4. R. Sasikala	05%
5. R. Sanjai Gandhi	25%
	---
	100 %
	---

1) 2) 3)

4) 5)

For VMI CONSTRUCTIONS

MANAGING PARTNER

T. SUBBARAYAN, B.A.,B.L.
ADVOCATE & NOTARY PUBLIC
250, Gandhi Nagar
ATTUR Town, Salem (Dt).
Cell: 9865824084

ATTESTED BY

NOTARY 12/9/2022

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

(16) In all other matters, the provisions of the Indian partnership act, shall apply. This original shall be in the office and the partners shall have Xerox copies of the same.

In witness where of the parties hereto have set their hands on this 5th day of September 2022 hereinbefore written in the presence in the presence of.

Parties to this Deed

1. [signature]
2. [signature]
3. [signature]
4. [signature]
5. [signature]

Witnesses:

1. [signature]
R. RAGU GURU S/O RAMACHANDRAN KALPAGANUR

2. [signature]
M. JAI GANESH S/O MAYAKANNAN THANDANUR.

NOTARIAL NOTARIAL

T. SUBBARAYAN, B.A. B.L.
ADVOCATE & NOTARY PUBLIC
250, Gandhi Nagar
ATTUR Town, Salem (Dt).
Cell: 9865834084.

ATTESTED
[signature]
NOTARY 12/9/2022

For VMI CONSTRUCTIONS

[signature]
MANAGING PARTNER

ANNEXURE VII

PHOTOCOPY OF THE PROPOSED LEASE AREA

Site photos in respect of rough stone quarry lease in S.F.No. 219/1A (Part-5) – Government land - over an extent of 2.00.0 Hectare – Kadambur Village – Gangavalli Taluk – Salem District - Tamil Nadu State in belongs to **M/s.VMI CONSTRUCTIONS.**





For **VMI CONSTRUCTIONS**

MANAGING PARTNER

ANNEXURE - VIII

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-635 001

भारत सरकार
Government of India



Issue Date : 02/09/2013

வாசுதேவன் மகாதேவன்
Vasudevan Magadevan
பிறந்த நாள் / DOB : 20/06/1983
ஆண் / Male



आधार पहचान का प्रमाण है, नागरिकता का नहीं।
Aadhaar is a proof of identity, not of citizenship.



8043 7607 4311

मेरा आधार, मेरी पहचान

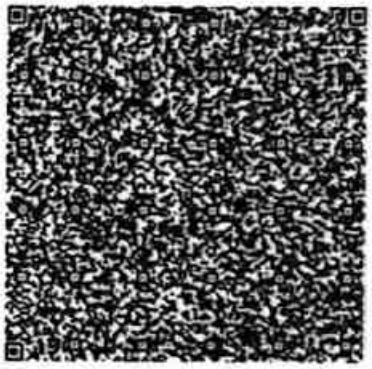
भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India

AADHAAR

முகவரி: S/O மகாதேவன், கதவுஎண் 1/287(2), கல்பகனுர்புதூர், கல்பகனூர் அஞ்சல், ஆத்தூர்வட்டம், கல்பகனூர், சேலம், தமிழ்நாடு, 636109

Print Date : 14/08/2023

Address: S/O Magadevan, 1/287, KALPAGANURPUTHUR, KALPAGANUR-POST, ATTUR-THALUK, Kalpaganur, Salem, Tamil Nadu, 636109



8043 7607 4311

1947 help@uidai.gov.in www.uidai.gov.in

For VMI CONSTRUCTIONS

MANAGING PARTNER

आयकर विभाग भारत सरकार

INCOME TAX DEPARTMENT GOVT. OF INDIA

M VASUDEVAN

MAHADEVAN

20/06/1983

Permanent Account Number

AIJPV3670N

Signature



18022009

For VMI CONSTRUCTIONS

MANAGING PARTNER



ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

For VMI CONSTRUCTIONS

MANAGING PARTNER

ANNEXURE - IX

ASSISTANT DIRECTOR OF GEOLOGY AND MINING
No. 62450
SALEM-635 001

Reg. No. 03BBB1007
Col Code 013 / 106

பெரியார் பல்கலைக்கழகம்
Periyar University

அறிவியல் புலம்
FACULTY OF SCIENCE

பெரியார் பல்கலைக்கழக ஆட்சிக்குழு **2005** ஆம் ஆண்டு ஏப்ரல் மாதம் நடந்த பயன்பாட்டு புவியமைப்பியல் தேர்வில்

S கருப்பண்ணன் என்பவர்

தனிச்சிறப்புடன் முதல் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க தேர்வாளர்கள் சான்றளித்தபடி **அறிவியல் நிறைஞர்**

என்னும் பட்டத்தை அவருக்குப் பல்கலைக்கழக இலச்சினையுடன் வழங்குகிறது.

The Syndicate of the **Periyar University** *hereby makes known that* **KARUPPANNAN S** *has been admitted to the* **DEGREE OF MASTER OF SCIENCE** *in* **APPLIED GEOLOGY**

he / she having been certified by duly appointed Examiners to be qualified to receive the same and was placed in the **FIRST CLASS WITH DISTINCTION** *at the Examination held in* **APR-2005**

Given under the seal of this university

For VMI CONSTRUCTIONS

MANAGING PARTNER

IAC. No. 142 / TNGST. No. 2702141
CST. No. 704829 / SLM / Dt. 7-4-99

ASSISTANT DIRECTOR OF GEOLOGY AND MINING 2400594 SALEM-636 001

BALAJI MINES

Proprietor : E. SANTHARAMAN,
PURITY LIME STONE SUPPLIERS,
5/88, CHINNAGOLLAPATTI, KANNANKURICHI P. O.,
SALEM-636 008. Tamil Nadu.

Mines : Devar Malai Village, Kulithalai Tk., KARUR Dt. (Via) Kerur to Palayam.

Date 15-10-2010

EXPERIENCE CERTIFICATE

I E.SANTHARAMAN being the Managing Director of BALAJI MINES do hereby certify that Thiru. S.KARUPPANNAN, son of T.SUNDARAM (Whose signature is appended) worked as a Geologist in Balaji Mine, Devar malai village, kulithalai Taluk, Karur District, from 01.06.2005 to 10.10.2010. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved his continuous attendance at the mine, and have been efficiently performed by him.

I believe him to be of good character and a fit and proper person to be examined for Certificate of Competency.

E. Santharaman

(Signature with date and official Seal)

TIN No:33852702141
CST No:704829 / 7-4-99
BALAJI MINES
5/88, Chinnagollapatty,
Kannankurichi (P.O), SALEM-8.

(Signature of Candidate)

For **VMI CONSTRUCTIONS**

MANAGING PARTNER

K.P.RAMAN
Cell: 94876 33359

K.P.LAKSHMANAN
Cell: 9443234075
04348-234321

ASSTT. DIRECTOR OF GEOLOGY AND MINING * SALEM-635 001 *

SRI RAMAJAYAM
GRANITES

731, Krishnagiri Main Road, Opp. E.B.Office, MATHUR - 635 203.
email : sriramajayamgranites@gmail.com

Date 13.10.2011

EXPERIENCE CERTIFICATE

This is to certify that **Mr.Karuppannan Sundaram** has been worked as a **"Senior Geologist"** in our company from **11th October 2010 to 11th October 2011.** During this period, he has been involved in the Quality Control for Granite block extraction from quarry. Involvement of his work is highly appreciated and have been efficiently worked in our company. The duties connected with his work have been continuous attendance at the quarry.

I wish him all the best in all his future endeavors.

For SRI RAMAJEYAM GRANITES

K.P.

Proprietor

11/10/2011

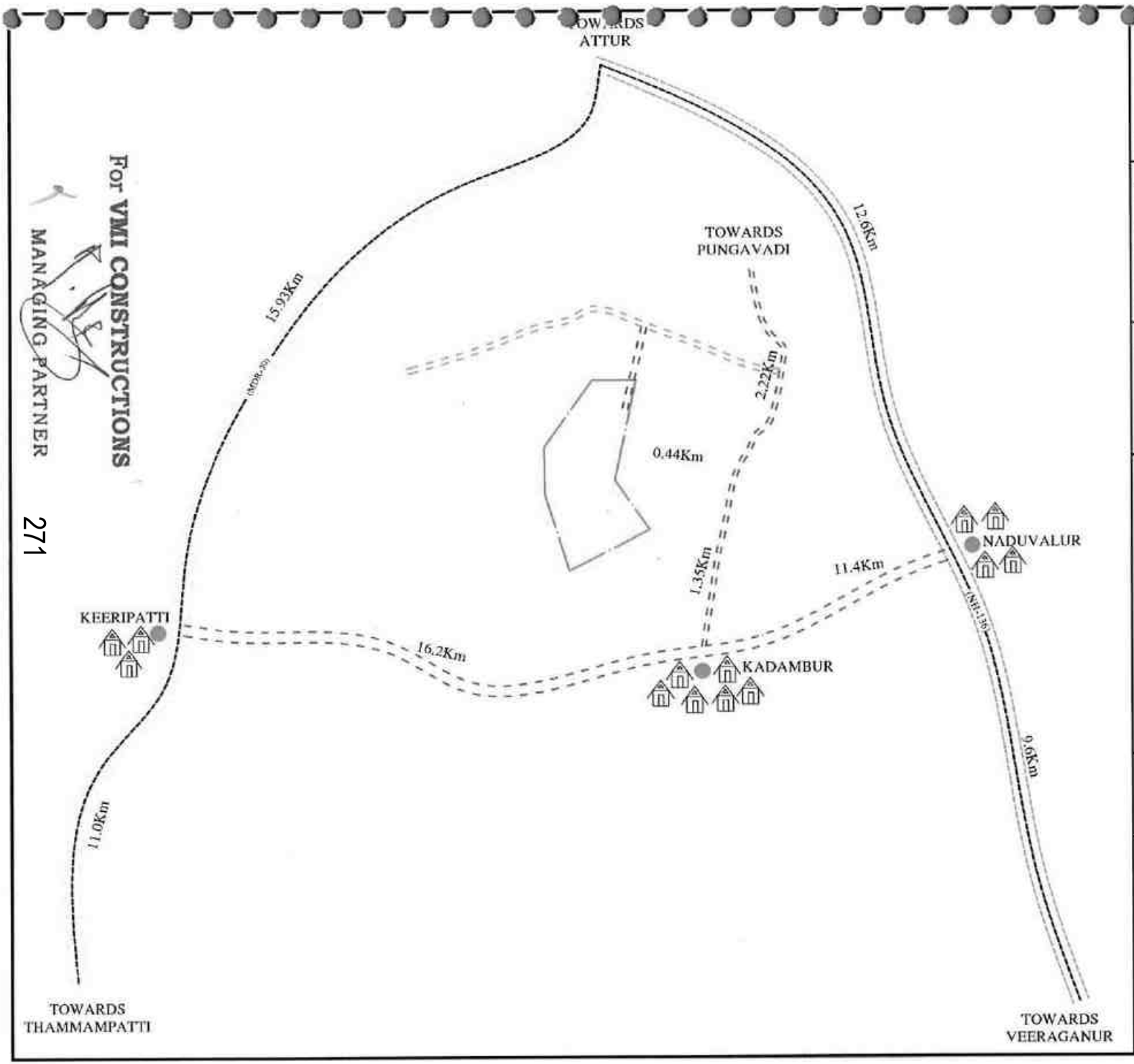
/Attested/

18/4/2020

DEPUTY DIRECTOR
DEPARTMENT OF GEOLOGY AND MINING
DHARMAPURI

For VMI CONSTRUCTIONS

MANAGING PARTNER



For VMI CONSTRUCTIONS

MANAGING PARTNER

271

PLATE No-I

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:

S.F.No	: 219/1A (Part-5)
EXTENT	: 2.00.0Hect
VILLAGE	: KADAMBUR
TALUK	: GANGAVALLI
DISTRICT	: SALEM

INDEX

- MINE LEASE AREA
- APPROACH ROAD
- CART ROAD
- VILLAGE ROAD
- MDR-30 ROAD
- NH - 136 ROAD
- HABITATION

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

ASSISTANT DIRECTOR OF GEOLOGY AND MINING

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



ASSISTANT DIRECTOR OF GEOLOGY AND MINING * SALEM-636 001 *

N

PLATE No-IA

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

INDEX

MINE LEASE AREA :

TOPO SHEET NO : 58-I/10

LATITUDE : 11°30'42.05"N to 11°30'49.92"N

LONGITUDE : 78°36'22.74"E to 78°36'27.14"E

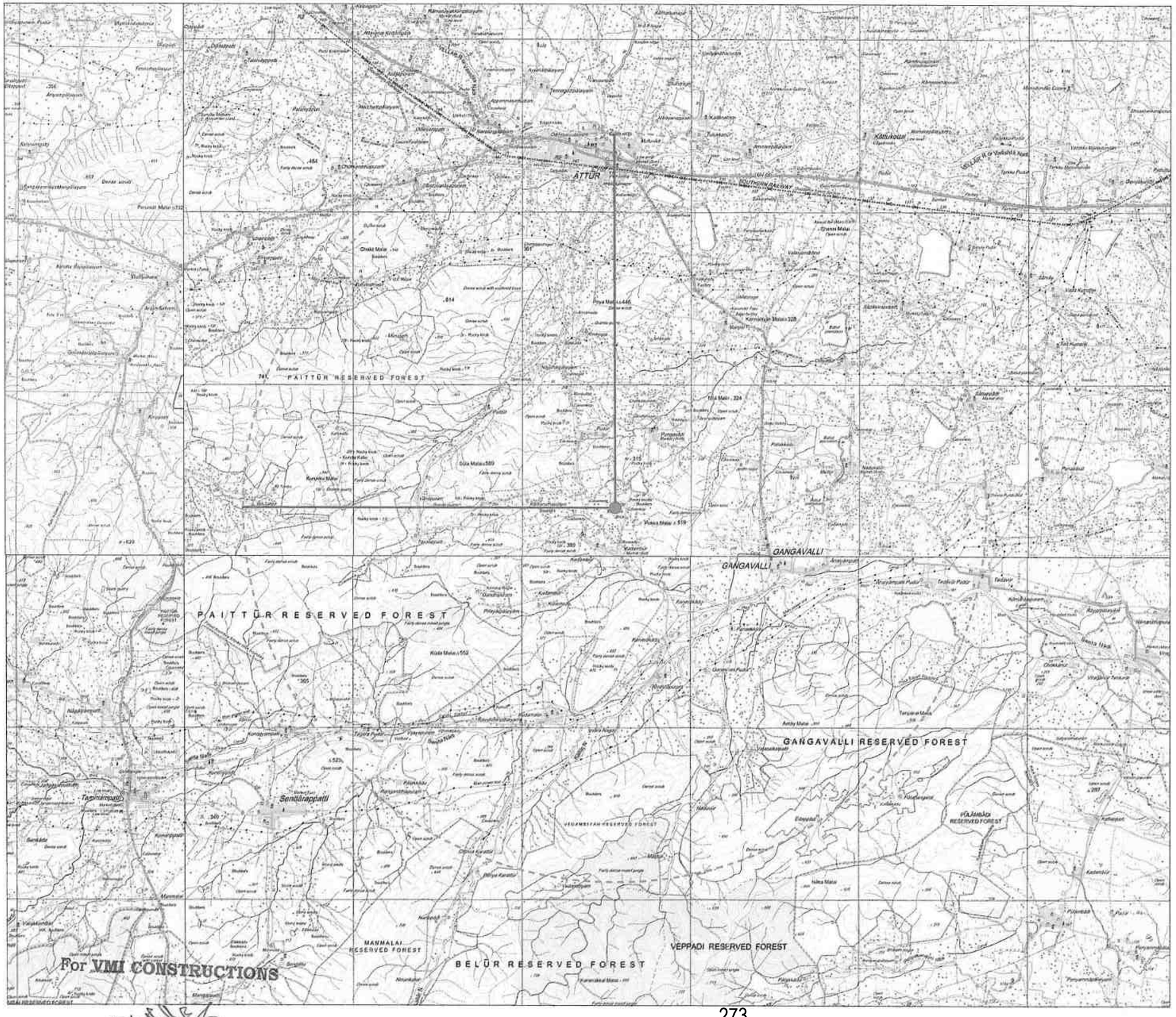
LOCATION PLAN
NOT TO SCALE

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.
QUALIFIED PERSON

11°30'49.92"N

78°36'22.74"E



N

PLATE No-IB

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:

S.F.No	: 219/1A (Part-5)
EXTENT	: 2.00.0Hect
VILLAGE	: KADAMBUR
TALUK	: GANGAVALLI
DISTRICT	: SALEM

TOPO SHEET NO : 58-I/10

LATITUDE : 11°30'42.05"N to 11°30'49.92"N

LONGITUDE : 78°36'22.74"E to 78°36'27.14"E

MINE LEASE AREA

10KM RADIUS

CONVENTIONAL SYMBOLS

TOPOSHEET MAP
SCALE– 1:1,00,000

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.
QUALIFIED PERSON

11°30'49.92"N



78°36'22.74"E

N

ASSISTANT DIRECTOR OF GEOLOGY AND MINING SALEM-636 001

PLATE No-IC

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:

S.F.No	: 219/1A (Part-5)
EXTENT	: 2.00.0Hect
VILLAGE	: KADAMBUR
TALUK	: GANGAVALLI
DISTRICT	: SALEM

INDEX

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

TOPO SHEET NO : 58-I/10

LATITUDE : 11°30'42.05"N to 11°30'49.92"N

LONGITUDE : 78°36'22.74"E to 78°36'27.14"E

SATELITE IMAGERY MAP
SCALE– 1:5000

Prepared By:

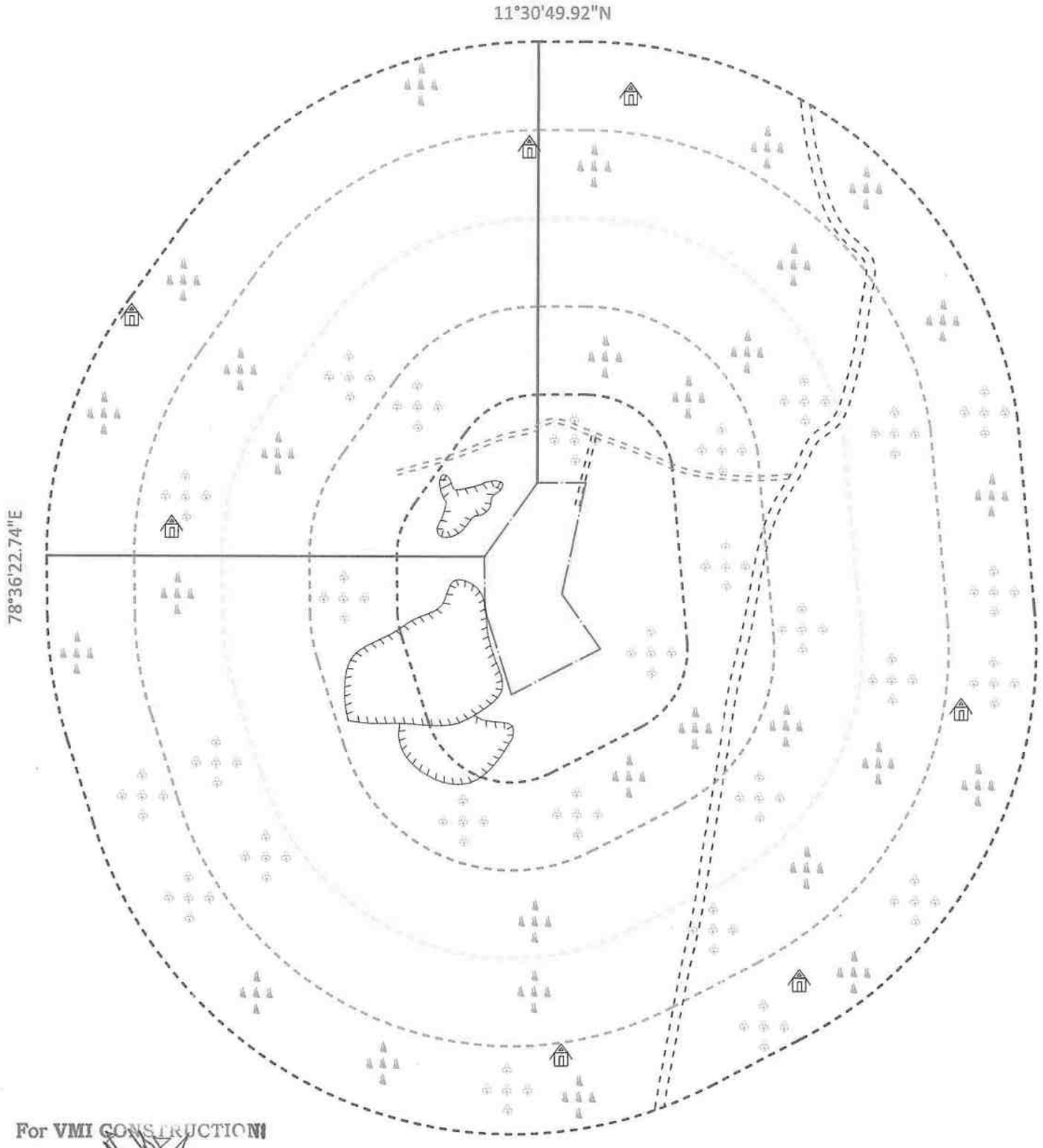
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

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

For VMI CONSTRUCTIONS

MANAGING PARTNER

OCTOBER TO DECEMBER



JULY TO SEPTEMBER

For VMI CONSTRUCTIONS

MANAGING PARTNER

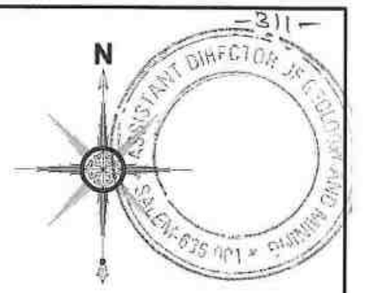


PLATE No-ID

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:

S.F.No	: 219/1A (Part-5)
EXTENT	: 2.00.0Hect
VILLAGE	: KADAMBUR
TALUK	: GANGAVALLI
DISTRICT	: SALEM

INDEX

- MINE LEASE AREA
- APPROACH ROAD
- CART ROAD
- VILLAGE ROAD
- 100m RADIUS
- 200m RADIUS
- 300m RADIUS
- 400m RADIUS
- 500m RADIUS
- EXISTING PIT
- SHRUBS & TREES
- HABITATION

TOPO SHEET NO : 58-I/10

LATITUDE : 11°30'42.05"N to 11°30'49.92"N

LONGITUDE : 78°36'22.74"E to 78°36'27.14"E

ENVIRONMENTAL PLAN
SCALE– 1:5000

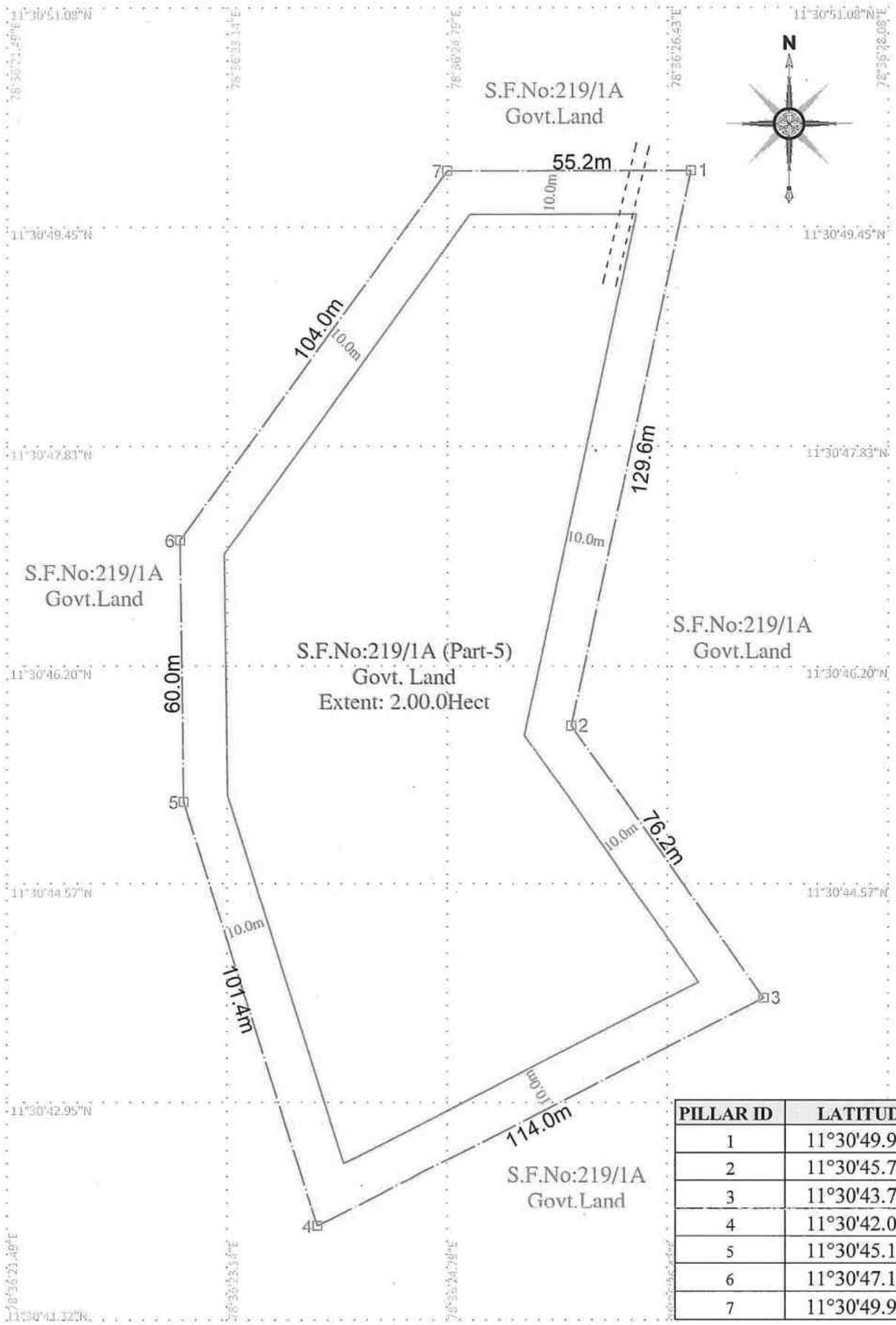
Prepared By:

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

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

For VMI CONSTRUCTIONS

MANAGING PARTNER



PILLAR ID	LATITUDE	LONGITUDE
1	11°30'49.92"N	78°36'26.54"E
2	11°30'45.79"N	78°36'25.68"E
3	11°30'43.77"N	78°36'27.14"E
4	11°30'42.05"N	78°36'23.81"E
5	11°30'45.19"N	78°36'22.78"E
6	11°30'47.14"N	78°36'22.74"E
7	11°30'49.90"N	78°36'24.71"E

INDEX

MINE LEASE BOUNDARY

SAFETY BOUNDARY

APPROACH ROAD

BOUNDARY PILLAR STONES □1 □2

MINE LEASE PLAN
SCALE 1 : 1000

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

PLATE No- II

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

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.
QUALIFIED PERSON

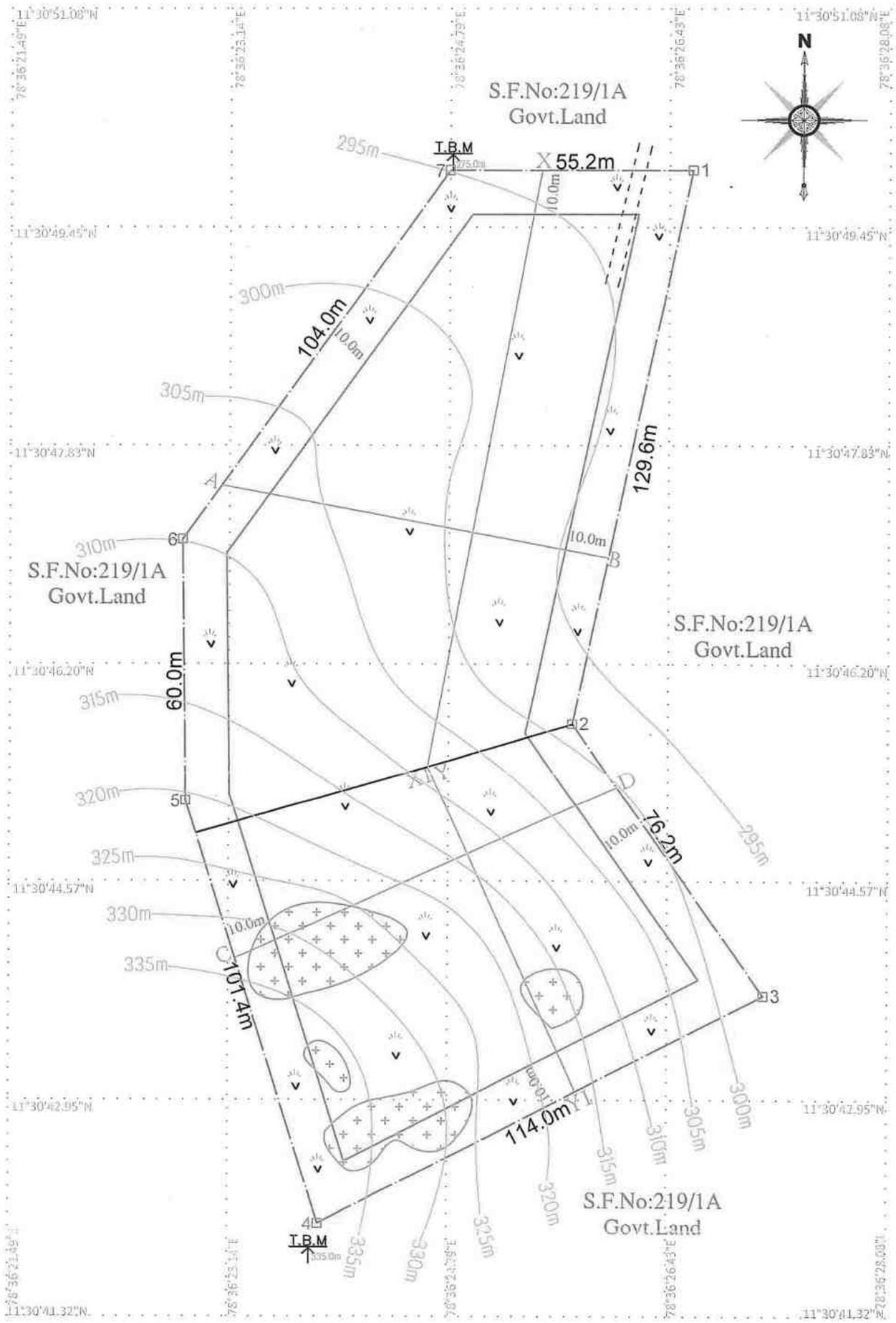
276

1/3/1

For VMI CONSTRUCTIONS

MANAGING PARTNER

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MINE LEASE AREA	
SAFETY AREA	
APPROACH ROAD	
BOUNDARY PILLAR STONES	1
CONTOUR LINE	335m
TEMPORARY BENCH MARKS	T.B.M
RESIDUAL TOP SOIL	V V
SHRUBS	
OUT CROP	

SURFACE & GEOLOGICAL PLAN
PLAN SCALE 1: 1000

PLATE No- III

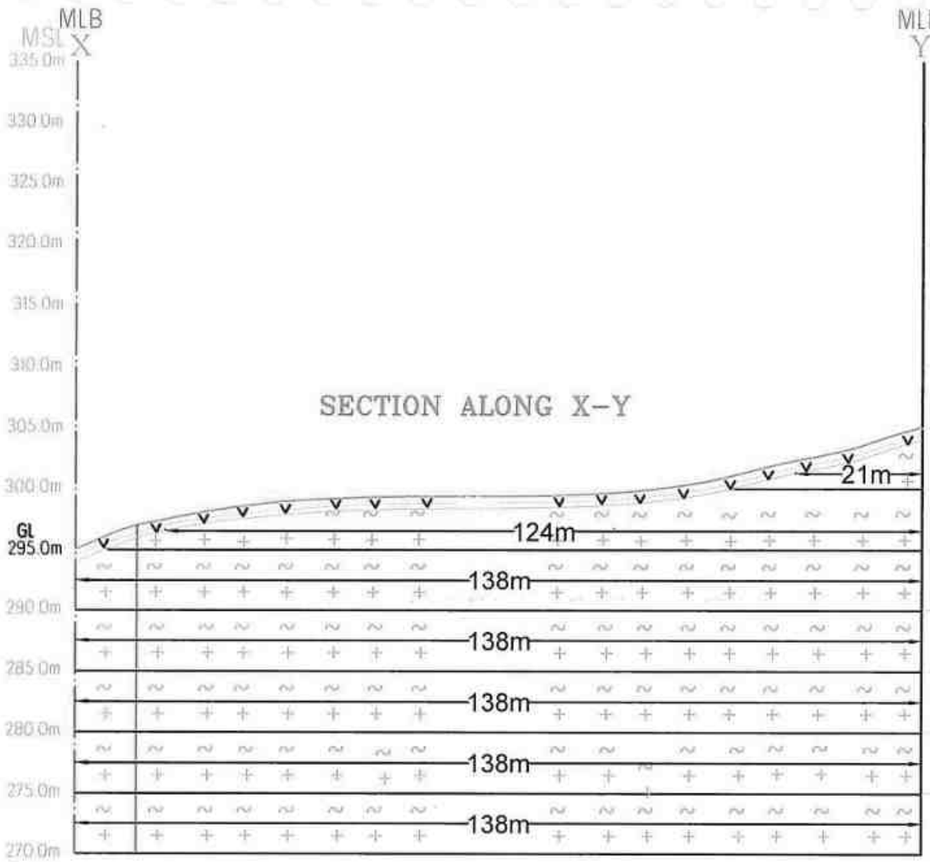
APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

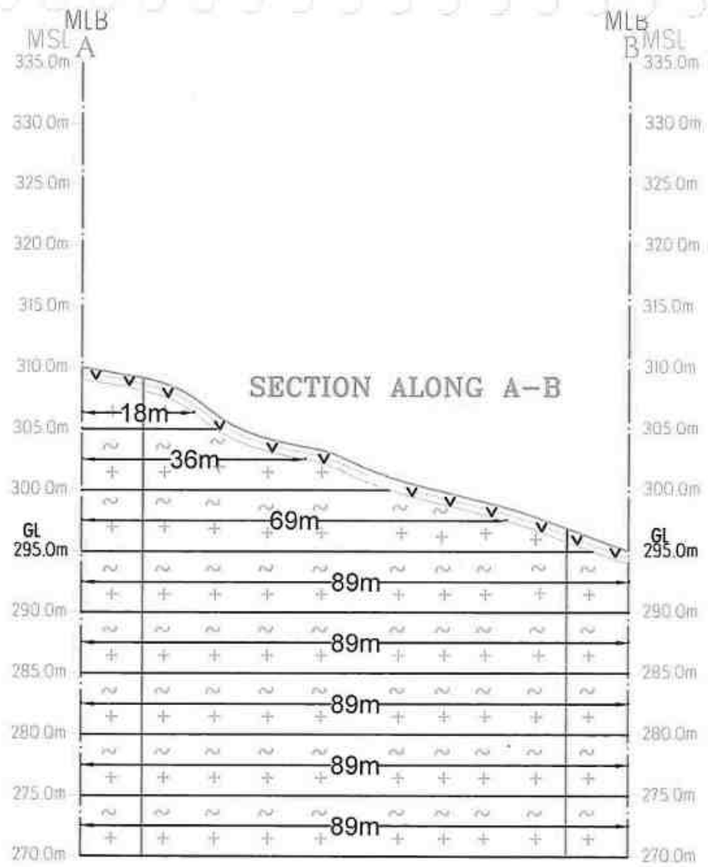
LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

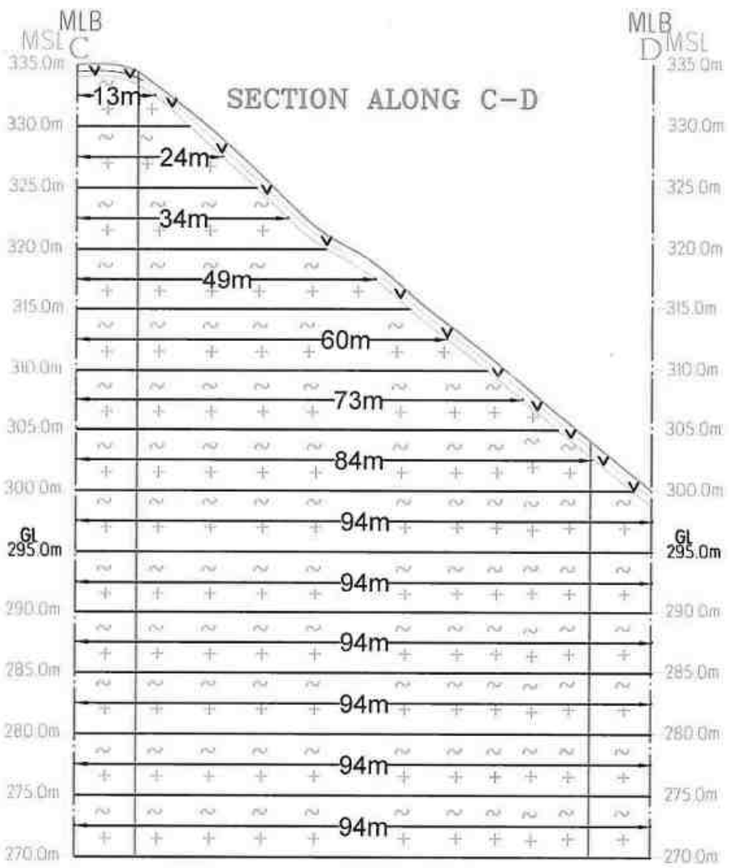
Prepared By:
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

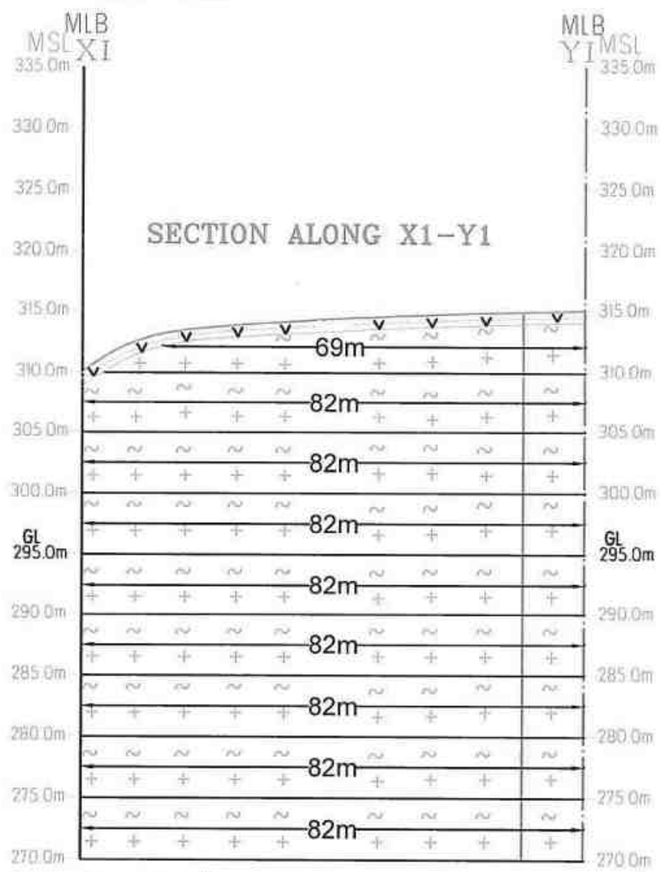
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
QUALIFIED PERSON

-3151-









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GEOLOGICAL RESERVES

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
XY-AB	I	139	93	1	12927	.....	12927	2	.....	25854
	I	24	18	4	1728	1728	.....	2.75	4752	.....
	II	21	36	5	3780	3780	.....	2.75	10395	.....
	III	124	69	5	42780	42780	.....	2.75	117645	.....
	IV	138	89	5	61410	61410	.....	2.75	168878	.....
	V	138	89	5	61410	61410	.....	2.75	168878	.....
	VI	138	89	5	61410	61410	.....	2.75	168878	.....
	VII	138	89	5	61410	61410	.....	2.75	168878	.....
	VIII	138	89	5	61410	61410	.....	2.75	168878	.....
TOTAL					**368265**	**355338**	**12927**	.....	**977180**	**25854**
X1Y1-CD	I	83	116	1	9628	.....	9628	2	.....	19256
	I	47	13	4	2444	2444	.....	2.75	6721	.....
	II	58	24	5	6960	6960	.....	2.75	19140	.....
	III	63	34	5	10710	10710	.....	2.75	29453	.....
	IV	66	49	5	16170	16170	.....	2.75	44468	.....
	V	69	60	5	20700	20700	.....	2.75	56925	.....
	VI	82	73	5	29930	29930	.....	2.75	82308	.....
	VII	82	84	5	34440	34440	.....	2.75	94710	.....
	VIII	82	94	5	38540	38540	.....	2.75	105985	.....
	IX	82	94	5	38540	38540	.....	2.75	105985	.....
	X	82	94	5	38540	38540	.....	2.75	105985	.....
	XI	82	94	5	38540	38540	.....	2.75	105985	.....
	XII	82	94	5	38540	38540	.....	2.75	105985	.....
	XIII	82	94	5	38540	38540	.....	2.75	105985	.....
TOTAL					**362222**	**352594**	**9628**	.....	**969634**	**19256**
GRAND TOTAL					**730487**	**707932**	**22555**	.....	**1946813**	**45110**

For VMI CONSTRUCTIONS
MANAGING PARTNER

INDEX

MINE LEASE AREA

SAFETY AREA

RESIDUAL TOP SOIL

ROUGH STONE

GEOLOGICAL SECTIONS
SCALE - HOR 1 : 1000 & VER 1: 500

PLATE No- IIIA

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

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

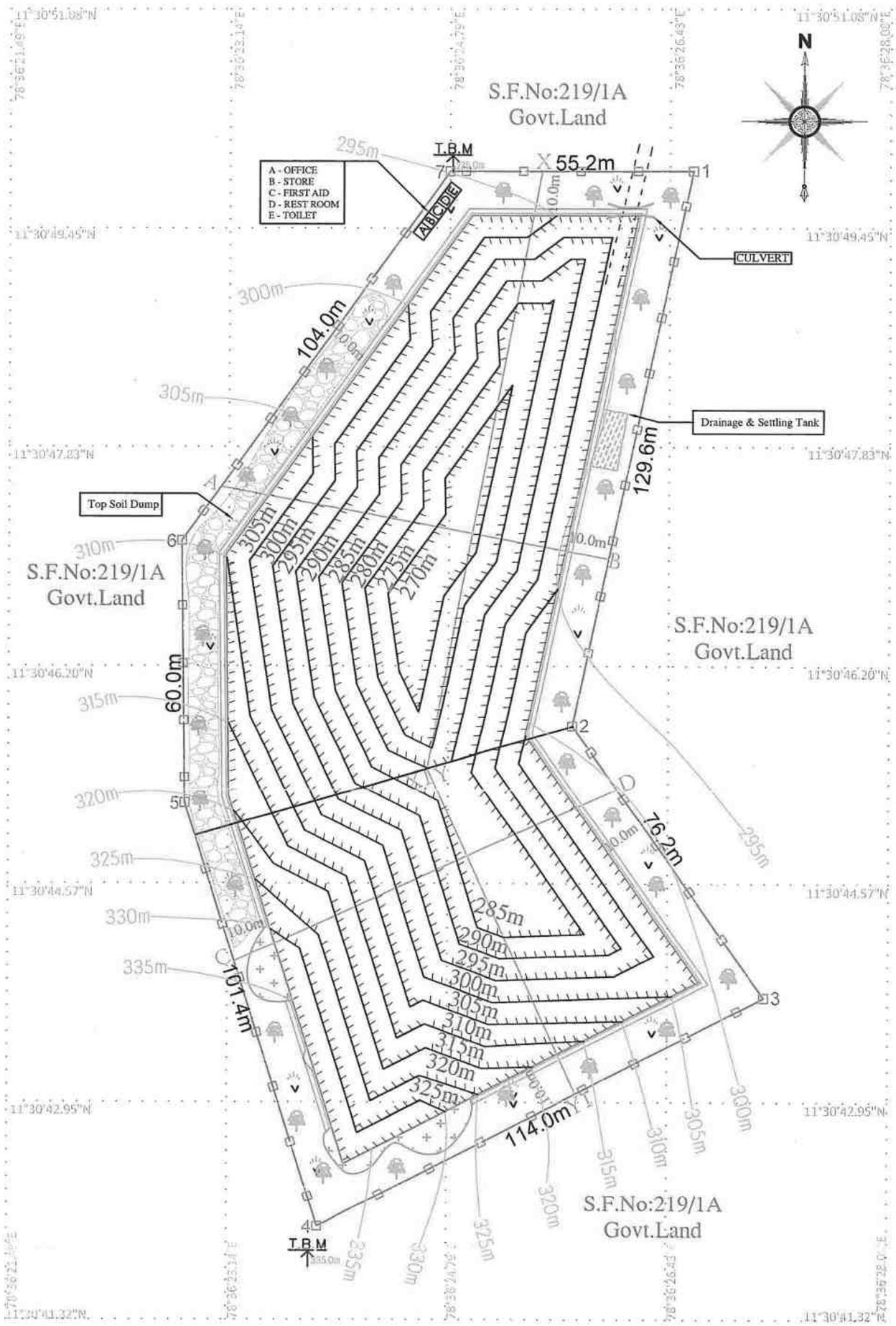
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
QUALIFIED PERSON

317

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For VMI CONSTRUCTIONS

MANAGING PARTNER



INDEX

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONES
- CONTOUR LINE
- TEMPORARY BENCH MARKS
- RESIDUAL TOP SOIL
- SHRUBS
- OUT CROP
- ULTIMATE BENCH
- FENCING

Plantation Proposed for I-Year

CONCEPTUAL PLAN
PLAN SCALE 1: 1000

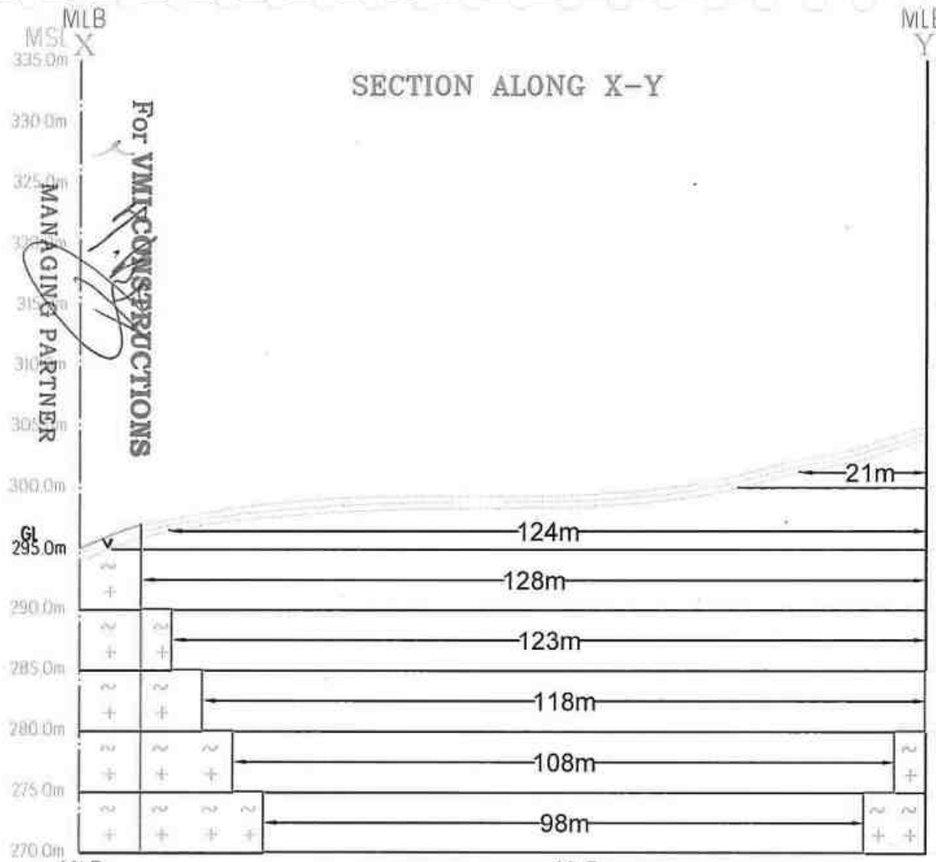
PLATE No- IV

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

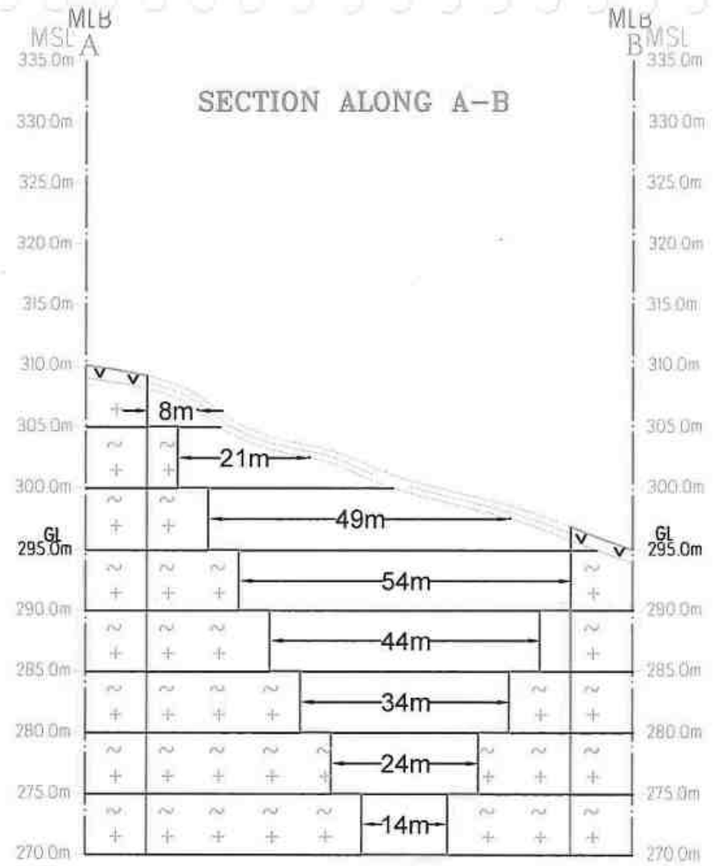
Prepared By:
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

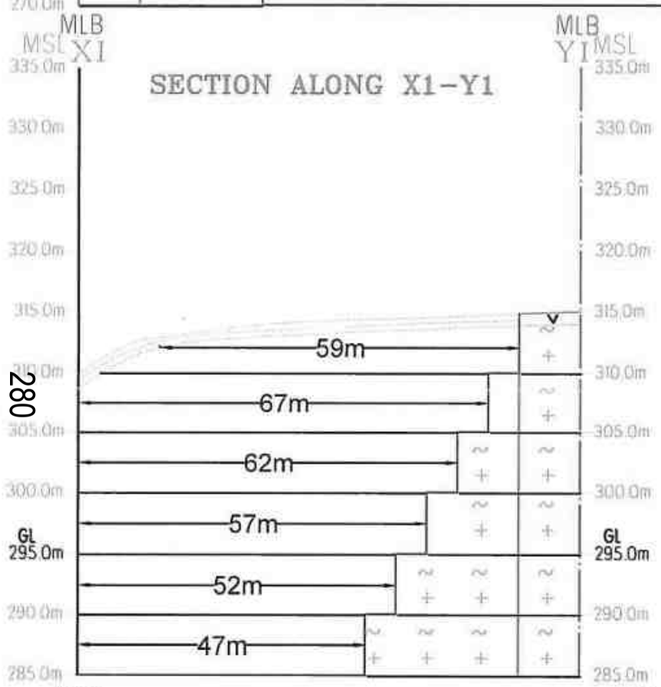
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
QUALIFIED PERSON



For VMI CONSTRUCTIONS

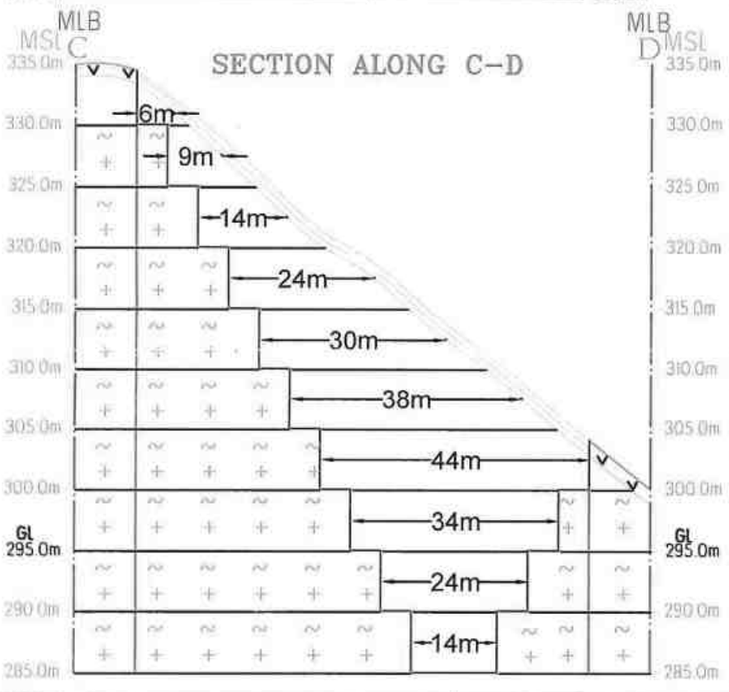
MANAGING PARTNER





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GL – GROUND LEVEL



MINEABLE RESERVES

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
	I	10	8	4	320	320	.....	2.75	880	.....
	II	21	21	5	2205	2205	.....	2.75	6064	.....
	III	124	49	5	30380	30380	.....	2.75	83545	.....
	IV	128	54	5	34560	34560	.....	2.75	95040	.....
	V	123	44	5	27060	27060	.....	2.75	74415	.....
	VI	118	34	5	20060	20060	.....	2.75	55165	.....
	VII	108	24	5	12960	12960	.....	2.75	35640	.....
	VIII	98	14	5	6860	6860	.....	2.75	18865	.....
TOTAL					**143822**	**134405**	**9417**	.....	**369614**	**18834**
X1Y1-CD	I	73	96	1	7008	.....	7008	2	.....	14016
	I	20	6	4	480	480	.....	2.75	1320	.....
	II	24	9	5	1080	1080	.....	2.75	2970	.....
	III	28	14	5	1960	1960	.....	2.75	5390	.....
	IV	32	24	5	3840	3840	.....	2.75	10560	.....
	V	59	30	5	8850	8850	.....	2.75	24338	.....
	VI	67	38	5	12730	12730	.....	2.75	35008	.....
	VII	62	44	5	13640	13640	.....	2.75	37510	.....
	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
	IX	52	24	5	6240	6240	.....	2.75	17160	.....
	X	47	14	5	3290	3290	.....	2.75	9048	.....
TOTAL					**68808**	**61800**	**7008**	.....	**169950**	**14016**
GRAND TOTAL					**212630**	**196205**	**16425**	.....	**539564**	**32850**

INDEX

- MINE LEASE AREA
- SAFETY AREA
- RESIDUAL TOP SOIL
- ROUGH STONE
- ULTIMATE BENCH

CONCEPTUAL SECTIONS
SCALE - HOR 1 : 1000 & VER 1: 500

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

PLATE No- IVA

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

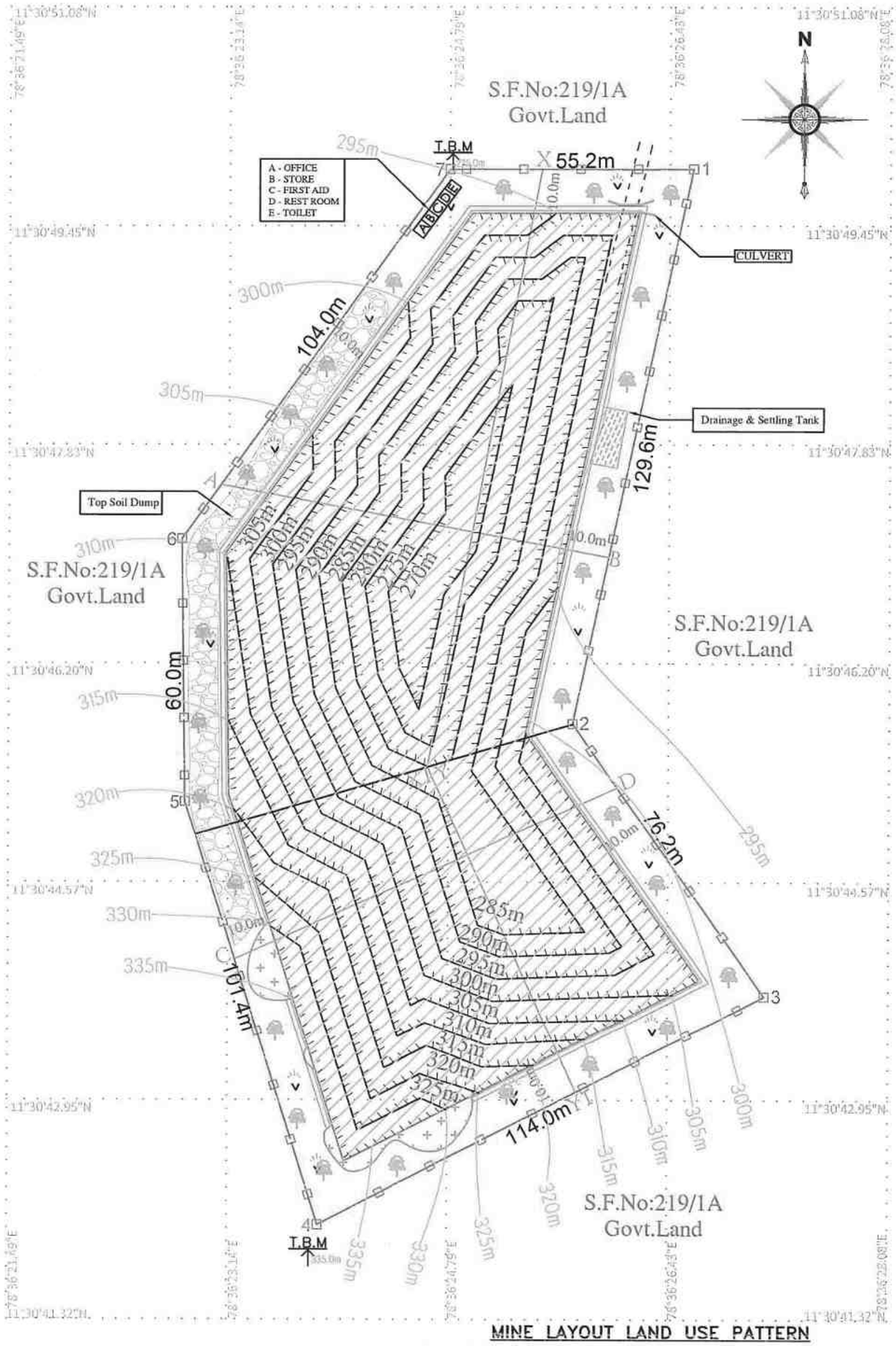
Prepared By:
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Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
QUALIFIED PERSON

For VMI CONSTRUCTIONS

MANAGING PARTNER

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MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	1.40.30	
INFRASTRUCTURE	NIL	0.02.00	ABCDE
ROADS	NIL	0.05.00	
UN-UTILIZED AREA	2.00.00	0.08.00	
GREEN BELT	NIL	0.39.00	
DRAINAGE & SETTLING TANK	NIL	0.05.70	
GRAND TOTAL	2.00.00	2.00.00	

Plantation Proposed for I-Year

INDEX

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONES (1)
- CONTOUR LINE (335m)
- TEMPORARY BENCH MARKS (T.B.M)
- RESIDUAL TOP SOIL
- SHRUBS
- OUT CROP
- PROPOSED BENCH
- FENCING

MINE LAYOUT PLAN & LAND USE PATTERN
SCALE 1 : 1000

PLATE No- V

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

Prepared By:
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Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
QUALIFIED PERSON

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For VMI CONSTRUCTIONS
MANAGING PARTNER

S.F.No:219/1A
Govt.Land

T.B.M
295m

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

A B C D E

55.2m

CULVERT

104.0m

Drainage & Settling Tank

129.6m

Top Soil Dump

S.F.No:219/1A
Govt.Land

S.F.No:219/1A
Govt.Land

60.0m

76.2m

101.4m

114.0m

S.F.No:219/1A
Govt.Land

T.B.M
335m

N

11°30'51.08"N
11°30'49.45"N
11°30'47.83"N
11°30'46.20"N
11°30'44.57"N
11°30'42.95"N
11°30'41.32"N
78°36'21.49"E
78°36'23.14"E
78°36'24.79"E
78°36'26.42"E
78°36'28.08"E

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	
VI - Year Proposed area to be Quarried	
VII - Year Proposed area to be Quarried	
VIII - Year Proposed area to be Quarried	
IX - Year Proposed area to be Quarried	
X - Year Proposed area to be Quarried	

Plantation Proposed for I-Year

INDEX

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONES
- CONTOUR LINE
- TEMPORARY BENCH MARKS
- RESIDUAL TOP SOIL
- SHRUBS
- OUT CROP
- PROPOSED BENCH
- FENCING

YEARWISE DEVELOPMENT & PRODUCTION PLAN
SCALE 1 : 1000

PLATE No- VI

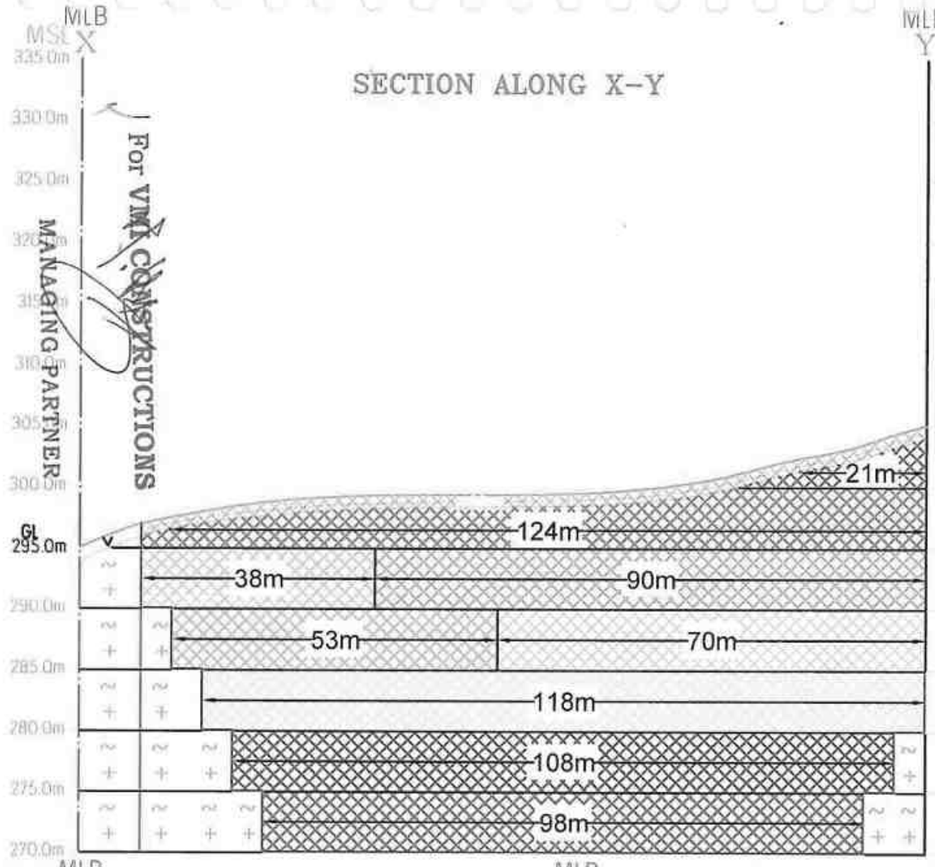
APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

Prepared By:
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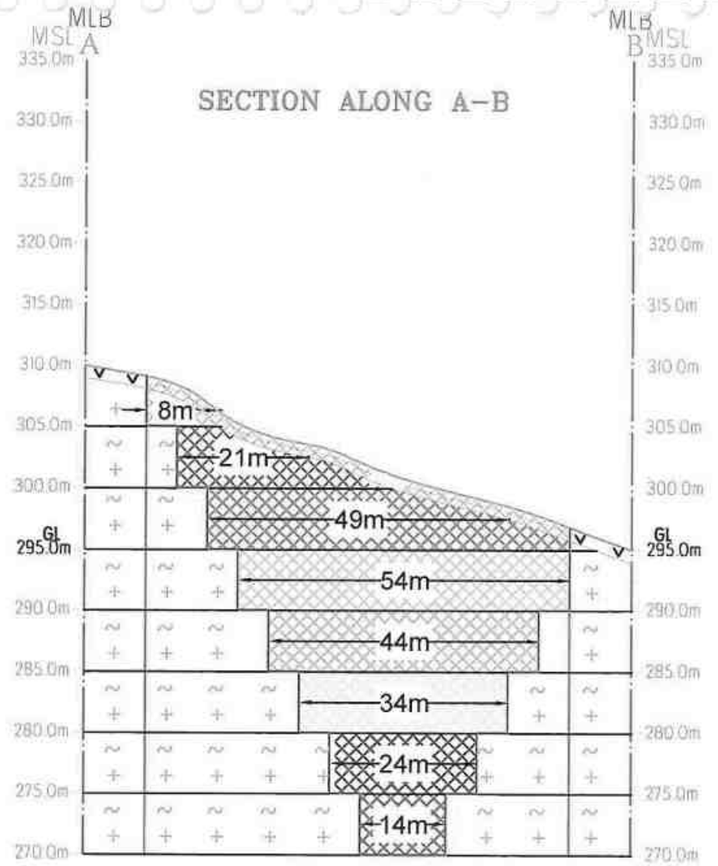
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
QUALIFIED PERSON

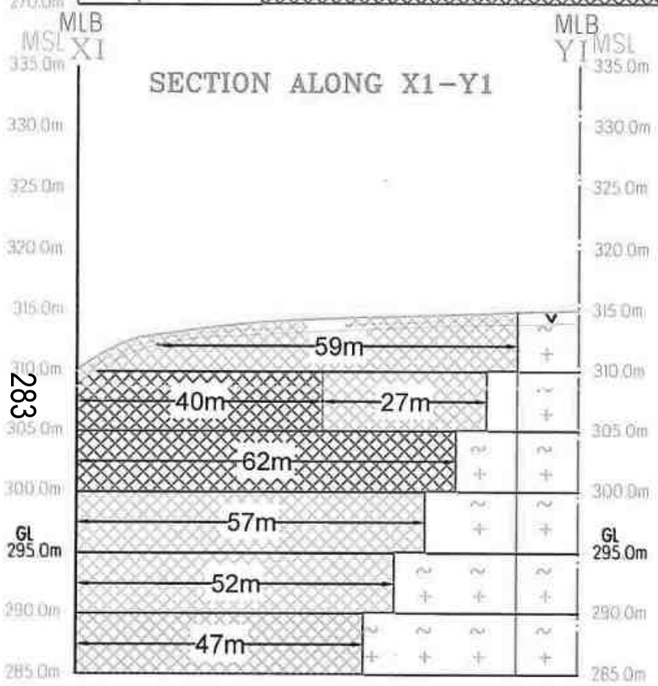
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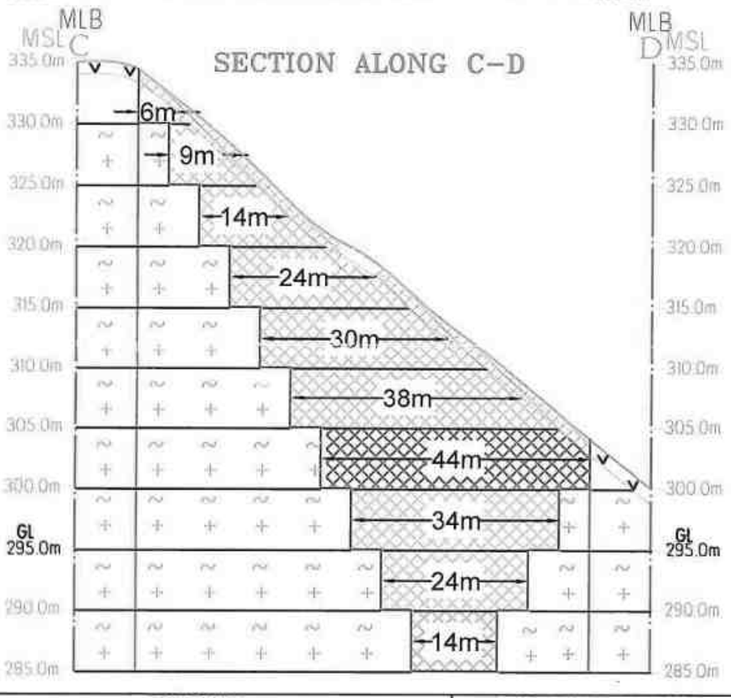
For VMI CONSTRUCTIONS

MANAGING PARTNER





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GL – GROUND LEVEL

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
VI - Year Proposed area to be Quarried
VII - Year Proposed area to be Quarried
VIII - Year Proposed area to be Quarried
IX - Year Proposed area to be Quarried
X - Year Proposed area to be Quarried

YEARWISE PRODUCTION RESERVES

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in M^3	Residual Top soil in M^3	Bulk Density	Rough Stone in (Ts)	Residual Topsoil in (Ts)
I	XY-AB	I	129	73	1	9417	.....	9417	2	.....	18834
		I	10	8	4	320	320	.....	2.75	880	.....
	X1Y1-CD	I	73	96	1	7008	.....	7008	2	.....	14016
		I	20	6	4	480	480	.....	2.75	1320	.....
		II	24	9	5	1080	1080	.....	2.75	2970	.....
		III	28	14	5	1960	1960	.....	2.75	5390	.....
		IV	32	24	5	3840	3840	.....	2.75	10560	.....
		V	59	30	5	8850	8850	.....	2.75	24338	.....
		VI	27	38	5	5130	5130	.....	2.75	14107	.....
TOTAL						**38085**	**21660**	**16425**	.....	**59565**	**32850**
II	XY-AB	II	21	21	5	2205	2205	.....	2.75	6064	.....
	X1Y1-CD	VI	40	38	5	7600	7600	.....	2.75	20900	.....
		VII	62	44	5	13640	13640	.....	2.75	37510	.....
TOTAL						**23445**	**23445**	**0**	.....	**64474**	**0**
III	XY-AB	III	124	49	5	30380	30380	.....	2.75	83545	.....
TOTAL						**30380**	**30380**	**0**	.....	**83545**	**0**
IV	XY-AB	IV	38	54	5	10260	10260	.....	2.75	28215	.....
	X1Y1-CD	VIII	57	34	5	9690	9690	.....	2.75	26648	.....
		IX	52	24	5	6240	6240	.....	2.75	17160	.....
TOTAL						**26190**	**26190**	**0**	.....	**72023**	**0**
V	XY-AB	IV	90	54	5	24300	24300	.....	2.75	66825	.....
TOTAL						**24300**	**24300**	**0**	.....	**66825**	**0**
VI	X1Y1-CD	X	47	14	5	3290	3290	.....	2.75	9047	.....
	XY-AB	V	53	44	5	11660	11660	.....	2.75	32065	.....
TOTAL						**14950**	**14950**	**0**	.....	**41112**	**0**
VII	XY-AB	V	70	44	5	15400	15400	.....	2.75	42350	.....
TOTAL						**15400**	**15400**	**0**	.....	**42350**	**0**
VIII	XY-AB	VI	118	34	5	20060	20060	.....	2.75	55165	.....
TOTAL						**20060**	**20060**	**0**	.....	**55165**	**0**
IX	XY-AB	VII	108	24	5	12960	12960	.....	2.75	35640	.....
TOTAL						**12960**	**12960**	**0**	.....	**35640**	**0**
X	XY-AB	VIII	98	14	5	6860	6860	.....	2.75	18865	.....
TOTAL						**6860**	**6860**	**0**	.....	**18865**	**0**
GRAND TOTAL						**212630**	**196205**	**16425**	.....	**539564**	**32850**

INDEX

- MINE LEASE AREA
- SAFETY AREA
- RESIDUAL TOP SOIL
- ROUGH STONE
- PROPOSED BENCH

YEARWISE DEVELOPMENT & PRODUCTION SECTIONS

SCALE - HOR 1 : 1000 & VER 1: 500

APPLICANT:
M/s.VMI CONSTRUCTIONS,
(BID ID: 1215709),
Managing Partner Mr.M.VASUDEVAN,
NO.1/287, PUDUR,
KALPAGANUR POST, ATTUR TALUK,
SALEM DISTRICT - 636109

PLATE No- VIA

LEASE APPLIED AREA:
S.F.No : 219/1A (Part-5)
EXTENT : 2.00.0Hect
VILLAGE : KADAMBUR
TALUK : GANGAVALLI
DISTRICT : SALEM

Prepared By:

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

கடம்பூர்

25.07.25.

Annexure - V

சான்று

சேலம் மாவட்டம், கெங்கவல்லி வட்டம், கடம்பூர் கிராமம், கிராம ஊ.ல எண் 219/1A பிரதான் மெயின் ரோடு வளாகத்தில் விவசாயம் 30.62.5 ஹெக்டேரில் 2.00.0 ஹெக்டேரில் சாதாரண கற்களை வைத்து மூடி கொள்ள திரு. VMI Constructions என்ற நிறுவனம் அனுமதி கோரி விண்ணப்பம் செய்துள்ளது. மேற்படி இடத்தை சுற்றிலும் 300 மீட்டர் சுற்றளவில் உயர்மின் கோபுரங்கள், நீர்நிலைகள், குடியிருப்பு பகுதிகள், கல்வி நிலையங்கள், கிராத வழிபாட்டுத் தலங்கள், விமான நிலையம் போன்ற எதுவும் இல்லை என சான்று அளிக்கிறேன்.

கிராம நிர்வாக அலுவலர்
மற்றும் பிறப்பு இறப்பு பதிவாளர்
19. கடம்பூர் கிராமம்.
கெங்கவல்லி (வ), சேலம் (மா).

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL® OF INDIA
QCI Creating an Ecosystem for Quality

NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

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.