

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT
AND
ENVIRONMENT MANAGEMENT PLAN**

FOR OBTAINING

**Environmental Clearance under EIA Notification – 2006
Schedule Sl. No. 1 (a) (i): Mining Project**

**“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND
CLUSTER EXTENT = 16.03.0 hectares**

V. KAVITHA ROUGH STONE QUARRY PROJECT

At

Kuppam Village, Pugalur Taluk, Karur District

**ToR issued vide ToR letter No. SEIAA-TN/F.No.9511/ToR-1311/2022
dated 07.12.2022.**

Name and Address	Extent & S.F.No.
V.Kavitha, W/o P.Vadivel, No. 8/42, Nochikattur, Kuppam Village, Pugalur Taluk, Karur District.	1.88.0 ha & 75/1A, 75/1B & 75/2

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



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**NABET ACC. NO: NABET/EIA/2023/IA0067
Valid till : 29th Dec.2023**

ENVIRONMENTAL LAB

**EKDANT ENVIRO SERVICES (P) LIMITED
NABL Accredited & Recognised Laboratory
No.R7/1, AVK Tower, North Main Road,
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Chennai-600 101**

Baseline Study Period – October 2021 to December 2021

TERMS OF REFERENCE (ToR) COMPLIANCE

V.Kavitha

“ToR issued vide Letter No. SEIAA-TN/F.No. 9511/SEAC/ToR-1311/2022 dated 07.12.2022”

SPECIFIC CONDITIONS		
1	The proponent is requested to submit the valid registered lease document during the EIA appraisal after the previous lease granted for the mining operations is legally surrendered (or) lapsed with the consent of the competent authority.	The valid registered lease document will be submitted during the EIA appraisal.
2	The proponent is requested to carry out a survey and enumerate on the structures including the crematory shed located within 100m, 200m, 300m from the boundary of the mine lease area.	There is a burial ground at a distance of about 250 m in South. But the burial ground does not have any crematory shed.
3	The proponent must conduct a survey and furnish the details of habitations which is located within 300 m radius (Nochikattur village) from the proposed mine lease area.	Based on the survey on the nearest habitations, a habitation of Nochikattur Village is located at about 200 m in North of the project site, containing about 12 families. Livelihood of those families depends on rough stone quarries around the area.
4	The proponent must submit certified compliance report obtained from IRO of MoEF & CC as per OM IA3-22/10/2022.IA. III Dated 08 06.2022.	The application to CCR is under process. The CCR will be submitted with the final EIA report.
5	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.	The photographs of fencing and green belt will be added to the final EIA report.
6	The Project Proponent shall conduct the hydrogeological study considering the contour map of	A detailed hydrogeological study involving measurement of water table level of open

	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) 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. Necessary data and documentation in this regard may be provided.	wells and potentiometric surface level of borewells was conducted over the area of more than 1 km radius around the proposed project site during the periods of both post monsoon and pre monsoon. The results of the study are provided in Section 3.2.5, Chapter III, pp.40-48.
7	The proponent shall submit the details regarding the nature of blasting activity which will be carried out.	This proposed project mainly involves a manual open cast mining method. The aim of the project is to excavate rough stone in a preferred dimension. Therefore, the project uses a negligible quantity of explosives and NONEL fuse to create cracks in the massive rock in day-to-day operations.
8	The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.	With respect to the suggestion made in the ToR, an application seeking details on distance of reserve forest & protected areas / Wild life sanctuaries & wild life corridors etc., within 25 km radius has been made to DFO at Karur. The document will be submitted along with the final EIA report.
9	The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.	As per the suggestion made in the ToR, the project proponent will be advised to issue notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.
10	In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry approved in the Mining Plan, the Project	Preparation of the bench realignment plan is under process. The plan will be submitted along with the final EIA report.

	Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC.	
11	The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry indicating the proposed stabilizing measures during the appraisal while obtaining the EC as the depth of the proposed working is extended beyond 30 m below ground level.	As per the approved mining plan, the maximum depth of mining for the five year period is going to be 18 m BGL. Therefore, a conceptual slope stability plan is not prepared for this project.
12	The PP shall furnish the affidavit stating that no blasting operation in the proposed quarry is carried out as it involves only manual means of rock breaking.	An affidavit stating no blasting operation will be attached in the final EIA report.
13	If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation involving line drilling & muffle blasting and Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.	This proposed project mainly involves a manual open cast mining method. The aim of the project is to excavate rough stone in a preferred dimension. To achieve the preferred dimension, the project will use a negligible quantity of explosives and NONEL fuse to create cracks in the massive rock in day-to-day operations. Therefore, the blasting operation will produce feeble ground vibrations.
14	Details of Green belt & fencing shall be included in the EIA Report.	Details of existing green belt and fencing will be provided in the final EIA report.
15	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	The video and photographic evidences will be attached in the final EIA/EMP report.

	photographic evidences.	
16	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:	
a)	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	As it is an existing quarry, all the relevant documents will be submitted along with the final EIA report.
b)	Quantity of minerals mined out.	
c)	Highest production achieved in any one year	
d)	Detail of approved depth of mining	
e)	Actual depth of the mining achieved earlier	
f)	Name of the person already mined in that leases area.	
g)	If EC and CTO already obtained, the copy of the same shall be submitted.	
h)	Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
17	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/ Toposheet, topographic sheet, geomorphology. lithology and geology of the mining lease area should be provided. Such an imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area are shown in Figure 2.3, p.12 and geology and geomorphology of the lease area is shown in Figures 2.4 and 2.5, respectively, pp.13 and 14.
18	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	Drone video coverage will be submitted in the final EIA report.
19	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 details of mineral reserves have been discussed in Section 2.5 under chapter II, p.16. The anticipated impact of mining on land, air, noise, water, soil, biology, and socio-economy is discussed under Chapter IV, pp.95-120.

20	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Employment details of the proposed project are provided in Table 2.13 under Chapter II, p.26.
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, and traffic and the results have been discussed under Chapter III, pp. 27-94.
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.	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.133-141.
23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	The rainwater harvesting management plan will be submitted with the final EIA report.
24	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1.1, p.29 under Chapter III. The details of

	phases and submitted. impact, if any, of change of land use should be given,	surrounding sensitive ecological features are provided in Table 3.42 under chapter III, p.93. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7 under Chapter II, p.21.
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.	Not Applicable. No dumps have been proposed outside the lease area.
26	Proximity to Areas declared as ' Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. This project area is involved in the production of rough stone and gravel materials as per the approved mine plan.
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.	Not Applicable. The proposed project area does not involve any water conservation.
28	Impact on local transport infrastructure due to the Project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III, pp.91-93.
29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under chapter-III, pp.67-70.

30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	A conceptual mine closure plan is attached along with the approved mining plan report in the annexure part. The budget details for the mine closure plan are shown in Section 2.8 under Chapter II,p.21.
31	Public Hearing points raised and commitments 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 and to be submitted to SEIAA-/SEAC with regard to the Office Memorandum of MoEF & CC accordingly.	The comments made in public hearing meeting will be updated in the final EIA report after public hearing meeting.
32	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Details of advertisement will be updated in the final EIA report.
33	The PP shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.	The Tamil Version of EIA report, Executive summary and other related information will be incorporated in this report.
34	As a part of the study of flora and fauna around the vicinity of the proposed site, EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	The EIA coordinator and the FAE for ecology and biodiversity visited the study area and instructed the local people about the importance of protecting the biological environment.
35	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 indigenious plant species should be platted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of	A detailed Greenbelt Development Plan has been provided in Tables 4.10 and 4.11 in Section 4.6.2 under chapter IV, pp.111-113.

	native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	
36	Taller/one year old Saplings raised in appropriate size of bags preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.
37	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII, pp.130-133.
38	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII, pp.127-129.
39	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.117- 119.
40	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	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

	along with budgetary allocations.	Chapter VIII, pp.146 & 147.
41	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the Socio-Economic environment by offering employment for 14 people directly as discussed in Section 8.1 under Chapter VIII., p.145
42	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.
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.145-147.
44	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.	The application to the detailed compliance to previous EC conditions is under the process. The compliance report will be submitted at the time of EIA presentation.
45	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 and provided in Table 10.10 under Chapter X, pp.160-165.
46	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal

		provisions in the Environment (Protection) Act, 1986.
	Discussion by SEIAA and the Remarks	
	The proposal was placed in the 557 th meeting of the Authority held on 08.10.2022. The authority noted that the subject was appraised in 312 nd SEAC meeting held on 16.09.2022. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions.	
1	Cluster Management Committee, which must include at the proponents in the cluster as members including the existing as well as proposed quarry.	Cluster Management Committee will be constituted in the near future.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.	The information will be shared to the cluster management committee.
3	The List of members of the committee formed shall be submitted to AD, Mines before the execution of mining lease and the same shall be updated every year to the AD, Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster. The usage of haul roads by the individual quarry in the form of route map and network.	All the information has been provided in Section 2.6 under Chapter II, p.20. The haul road use details have been given in Figure 2.9 under Chapter II, p.22.
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster	It will be informed to the committee.

	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.	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following.	
a)	Soil health & bio-diversity.	The study is in process. The results will be
b)	Climate change leading to Droughts, Floods etc.	
c)	Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.	
d)	Possibilities of water contamination and impact on aquatic ecosystem health.	

e)	Agriculture, Forestry & Traditional practices.	updated in the final EIA report.
f)	Hydrothermal/Geothermal effect due to destruction in the Environment.	
g)	Bio-geochemical processes and its foot prints including environmental stress.	
h)	Sediment geochemistry in the surface streams.	
11	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.
12	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The fire safety and evacuation plan will be submitted by the committed to the corresponding authority.
13	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures to control water, air, and noise pollution due to dust have been provided respectively in Sections 4.3, 4.4, and 4.5 under Chapter IV, pp.97-110.
14	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.	The vegetation details have been provided in Section 3.5, pp.65-85 under chapter III. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
15	Impact on surrounding agricultural fields around the proposed mining Area.	As the proposed lease area is dominantly surrounded by mining land, barren land, and fallow land, the impact on the surrounding agricultural fields, if present, will be low. With proper mitigation measures, the project will be carried out to

		reduce the impact further to the level of negligence.
16	Erosion Control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV, pp.97 and 98.
17	Impact on soil flora & vegetation around the project site.	The vegetation details have been provided in section 3.5.6-3.5.7, pp.65-85 under chapter III. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
18	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.95-120.
19	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads. water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	The VAO certificate of 300 m radius will be attached with the final EIA report.
20	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 and all the activities proposed will be updated in the final EIA report.
21	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the	Greenbelt development plan as discussed in Section 4.6.2 -4.6.6, pp.111-116 under

	measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	Chapter IV has been designed to reduce the impact of carbon emission on the environment.
22	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III, pp.65-85.
23	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The FAE of ecology and biodiversity has advised the project proponent that replantation work, particularly for the project area where plants of 4 years old exist should be carried out in the vacant areas available.
24	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 is under process and report will be added to the final EIA report.
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, p.96.
26	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV, pp.110-116.
27	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV, pp.110-116.
28	The Environmental Impact Assessment should study on wetlands, water bodies, streams, lakes	The impacts on water bodies, streams, lakes have been discussed in Section 4.3

	and farmer sites.	under Chapter IV, pp.97 & 98.
29	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 prepared and provided in Table 10.10 under Chapter X, pp.160-165.
30	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The information will be included in the final EIA report.
31	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	There are no Protected Areas, National Parks, Corridors and Wildlife pathways near project site. The list of reserve forests within 10 km radius has been provided in Section 3.5.1 under chapter III, p.80.
32	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, pp.95 & 96.
33	The project proponent shall study and furnish the details on potential fragmentation impact of natural environment by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp.95-120.
34	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 4.6.4 under Chapter IV, pp.114-116.
35	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	The matter on plastic waste management has been given in Section 7.5 under Chapter VII, p.141.

	investigated and reported.	
36	The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site among other environmental protection measures.
37	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 I km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2.5 under Chapter III, pp.40-48.
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/unfavorable accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.130-133.
39	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII, pp.127-129.
40	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	A conceptual mine closure plan is attached along with the approved mining plan report in the annexure part. The budget details for the mine closure plan are shown in Section

		2.8 under Chapter II,p.21.
41	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 in Table 10.10 under Chapter X, pp.160-165.
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 not a violation category project. This proposal falls under B1 category.
2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	The proposed site for quarrying is a patta land. A copy of the ownership document has been enclosed along with the approved mining plan in Annexure III.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents related to mining plan, EIA and public hearing are compatible to each other and have been provided in the annexure part.
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).	The google earth image showing lease area with all corner coordinates, geology, and geomorphology maps have been given in Figures 2.3, 2.4, and 2.5, respectively in Chapter II, p.12,14, and 15, respectively.
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	Geology and geomorphology maps have been given in Figures 2.4, and 2.5, respectively in chapter II, p.14, and 15,

	the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	respectively.
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 applied 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 proponent has framed Environmental Policy and the same has been discussed in section 10.1 under Chapter X, p.149.
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 ⁰ bench angles. Quarrying activities will be carried out

		<p>under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate.</p> <p>Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.</p>
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 10 km radius and all data contained in the EIA report such as waste generation etc., is for the life of the mine / lease period.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	<p>Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.27-35.</p> <p>Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7, under Chapter II, p.26.</p>
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	<p>It is not applicable as no dumps have been proposed outside the lease area.</p> <p>The entire quarried out rough stone will be transported to the needy customers.</p>
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	It is not applicable as there is no forest land involved within the proposed project area and the proposed project area is a patta land. The details have been discussed in Table 3.42 under Chapter III, p.94.

	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 area does not involve any forest land.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project, p.94 under Chapter III.
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 study area. Information regarding the distance to reserve forest has been given in Table 3.42 under Chapter III, pp.93 & 94.
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	There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the distance to wildlife has been given in

	area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	Table 3.42 under Chapter III, pp.93 & 94.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 KM of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	There are no National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.42 under Chapter III, pp.93 & 94.
18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under Chapter III., pp.65-85.
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	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not

	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.	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 aspects should be discussed in the Report.	Not Applicable. There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project Affected People (PAP) are not provided.
22.	One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter	Baseline data were collected for the period of October 2021 - December 2021 as per CPCB notification and MoEF & CC

	<p>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.</p>	<p>Guidelines. Primary baseline data and the results have been included in sections 3.0-3.5, under Chapter III. pp. 27-85.</p>
23.	<p>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.</p>	<p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD. The model results have been given in section 4.4, under the Chapter IV, pp.98-107.</p>
24.	<p>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.</p>	<p>The water requirement for the project, its availability and source have been provided in Table 2.10 under chapter II, p.23.</p>

25.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in section 4.3, under Chapter IV, pp. 97-98.
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	Not Applicable. The ground water table is found at the depth of 50-60 m below ground level. The ultimate depth of quarry is 18 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2.5.5 under Chapter III, p.48.

	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.	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 162 m AMSL. Ultimate depth of the mine is 18 m BGL. Depth to the water level in the area is 50-60 m BGL.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up 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.	Greenbelt development plan has been given in section 4.6.2.1 under Chapter IV., pp.111-113.
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	Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and

	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.	it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III, pp.91-93.
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 and the same has been discussed in Section 2.6.6 under Chapter II, pp.21-22.
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 2.6.3 under chapter II, pp.20-21.
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.117-118.
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 CER and CSR have been discussed in 8.6-8.7 under Chapter VIII, pp.146-147.
37.	Measures of socio-economic significance and	No negative impact on socio-economic

	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.	environment of the study area is anticipated and this project shall benefit the Socio-Economic environment by offering employment for 14 people directly, as discussed in Section 8.1 under Chapter VIII, p.145.
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.	Detailed environment management plan for the project to mitigate the anticipated impacts has been discussed under Chapter X, pp.149-165.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be updated in the final EIA/EMP report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs. 13,80,000/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs.1868000 as capital cost and recurring cost as Rs.1110270 as recurring cost is proposed considering present market scenario for the proposed project in Table 10.10 under Chapter X, pp.160-165.
42.	A disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details regarding disaster management plan have been provided in Section 7.3 under Chapter VII, pp.130-133.

43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.145 – 147.
44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project	Original Baseline monitoring reports will be submitted in the final EIA report during appraisal.
e)	Where the documents provided are in a language other than English, an English translation should be provided.	Not Applicable.
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 enclosed along with final EIA/EMP report.
g)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009 have been followed while preparing the EIA report.
h)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the	Not applicable

	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.	The certified compliance report will be attached with final EIA report.
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 have been included in Annexure III. Conceptual mine closure plan and sections have been included in Annexures III.

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CHAPTER I

INTRODUCTION

1.0 PREAMBLE

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

In compliance with ToR obtained vide letter No. SEIAA-TN/F.No.9511/ToR-1311/2022 dated 07.12.2022, this EIA report has been prepared for the project proponent, Mrs. V. Kavitha applied for rough stone quarry lease in the patta land falling in S. F. No. 75/1A, 75/1B, 75/2 over an extent of 1.88.0 ha in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains six proposed projects, known as P1, P2, P3, P4, P5 and P6. one expired project, known as EX1, and one existing project, known as E1. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016. The total extent of all the quarries is 16.03.0 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1

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

Proposed Quarries				
Code	Name of the Owner	S.F.Nos/Village	Extent (ha)	Lease Period/ Remarks
P1	V. Kavitha	75/1A,75/1B& 75/2 Kuppam	1.88.0	Proposed Area
P2	Tvl. NTC Blue Metals LLP	76/1(p) Kuppam	0.63.0	Proposed Area
P3	Thiru. S. Sadhasivam	211/1, 211/2 Kuppam	1.54.0	
P4	K. Nallasamy	226/1(p) Kuppam	2.89.0	
P5	K. Shanmugam	76/2 Kuppam	0.73.5	
P6	Tvl. NTC Blue Metals LLP	362/2(p) Kuppam	2.19.0	
Existing Quarries				
E1	Tvl. venkatachalapathi	213/1,214/2A, 214/2B,214/2C, 220/3P,221/P Kuppam	4.05.0	23.06.2017 To 22.06.2022
Expired Quarries				
EX1	Thiru. P. Marappan	74 75/3B Kuppam	2.11.5	14.10.2016 To 13.10.2021
Total Cluster Extent			16.03.0	

Source:

- i. DD Letter-Rc.No.311/Mines/2021, Dated:16.09.202
- ii. DD Letter-Rc.No.619/Mines/2020, Dated:22.06.2021
- iii. DD Letter-Rc.No.387/Mines/2021, Dated:28.09.2022
- iv. DD Letter-Rc.No.407/Mines/2021, Dated:20.07.2022
- v. DD Letter-Rc.No.100/Mines/2021, Dated:22.06.2021

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

1.1 PURPOSE OF THE REPORT

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **October-December 2021** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015 to analyse impacts and provide mitigation measures.

1.2 ENVIRONMENTAL CLEARANCE

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

1.2.1 Screening

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/ MIN/ 402665/2022, dated 10.10.2022) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 13.10.2022.

1.2.2 Scoping

During scoping, the SEAC framed a comprehensive Terms of Reference (ToR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued ToR to the proponent vide letter No. SEIAA-TN/F.No.9511/SEAC/ToR-1311/2022 dated 07.12.2022 for the preparation of an EIA report.

1.2.3 Public Consultation

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

1.2.4 Appraisal

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

1.3 TERMS OF REFERENCE (ToR)

- ❖ Compliance to ToR issued vide ToR letter No. SEIAA-TN/F.No.9511/ToR-1311/2022 dated 07.12.2022.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

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

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

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written “no objection” by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period (EIA Guidance Manual for Mining of Minerals, 2010).

1.6 GENERIC STRUCTURE OF EIA DOCUMENT

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. The generic structure of the EIA document should be as under:

- ❖ Introduction
- ❖ Project Description
- ❖ Description of the Environment
- ❖ Anticipated Environmental Impact & Mitigation Measures
- ❖ Analysis of Alternatives (Technology & Site)
- ❖ Environmental Monitoring Program
- ❖ Additional Studies
- ❖ Project Benefits
- ❖ Environmental Cost Benefit Analysis
- ❖ Environmental Management Plan (EMP)
- ❖ Summary & Conclusion
- ❖ Disclosure of Consultants engaged.

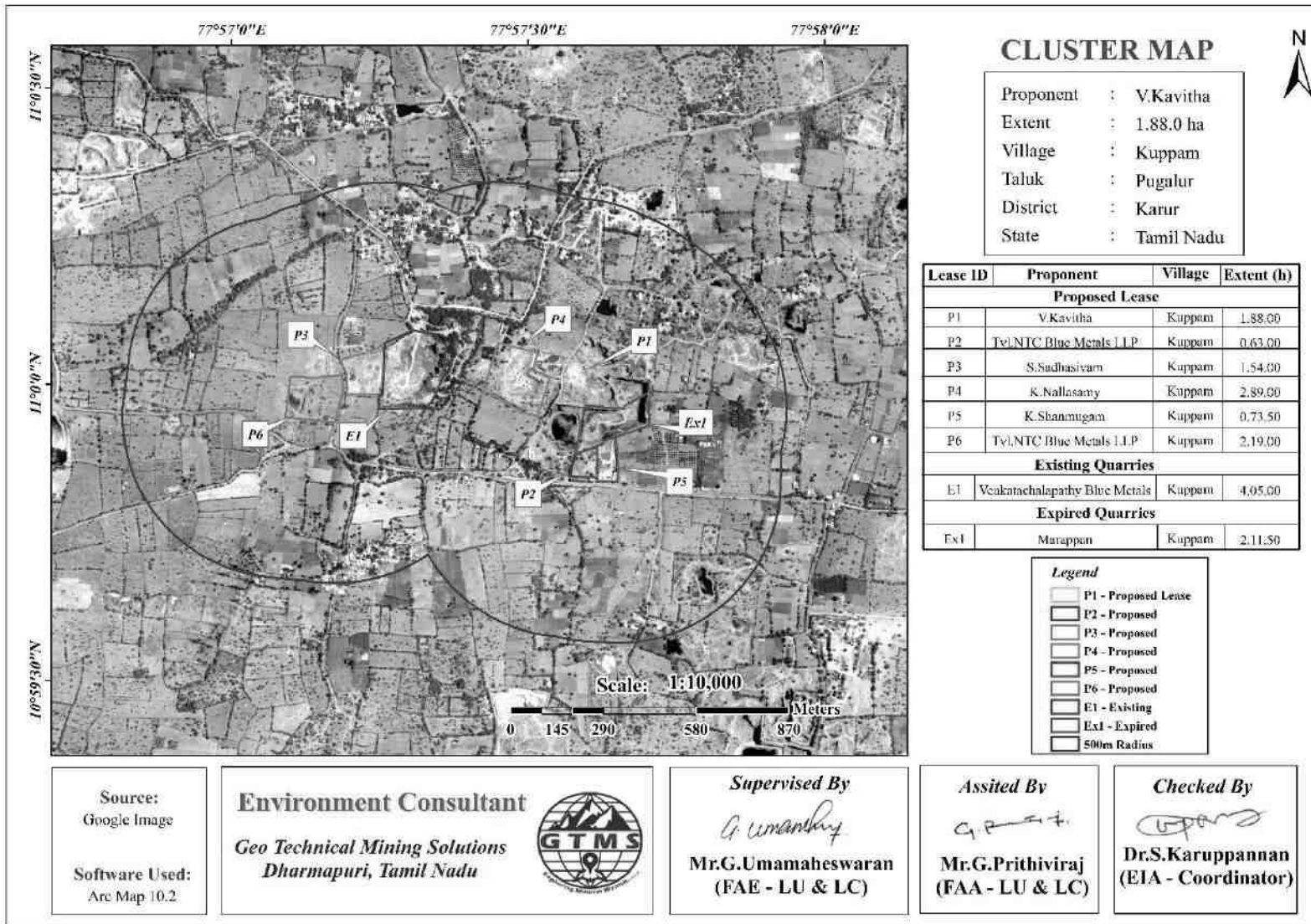


Figure 1.1 Location of The Proposed and Existing Rough Stone Quarries in the Cluster of 500 m Radius

1.7 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.

1.2 Details of Project Proponent

Name of the Project Proponent	V. Kavitha
Address	W/o P. Vadivel Door No. 8/42, Nochikattur, Kuppam Village, Pugalur Taluk. Karur District.
Status	Proprietor

1.8 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone which is primarily used in construction projects. The method adopted for rough stone excavation is open cast manual method of mining involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Kuppam Village, Pugalur Taluk, Karur District, and Tamilnadu State. Some of the important features of the proposed project have been provided in Table 1.2.

Table 1.3 Salient Features of Proposed Project

Name of the Quarry	V.Kavitha Roughstone Quarry	
Type of Land	Patta land	
Extent	1.88.0 ha	
S.F. No.	75/1A, 75/1B, 75/2	
Toposheet No.	58-E/16 & 58-F/13	
Latitude	10°59'57.47"N to 11°00'02'56"N	
Longitude	77°57'32.82"E to 77°57'39.69"E	
Ultimate Depth	18 m BGL	
Existing Pit Dimension	Pit 1: 124 m(L) X 43 m(W) X 13 m(D) Pit 2: 108m(L) X 81 m(W) X 5 m(D)	
Geological Resources	Rough stone (m ³)	Top soil(m ³)
	3,37,160	1,697
Mineable Reserves	1,58,939	1,697
Proposed production for 5 years	22,500	1,697
Method of Mining	Open cast manual method	
Topography	Undulated	
Machinery proposed	Hand Jack hammer	3
	Compressor	1
	Tipper	1

Blasting Method	As the proposed project is intended for producing dimension stone, the project will use a small quantity of slurry explosives and NONEL fuse to create fractures in the massive rock.
Proposed Manpower Deployment	14 persons
Project Cost	Rs. 46,30,000/-

1.9 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **October-December 2021** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

1.10 REFERENCES

The report has been prepared using the following references:

- ❖ Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- ❖ EIA Notification, 14th September, 2006
- ❖ Terms of Reference (ToR) issued by SEIAA.
- ❖ Approved Mining Plan of this Project.
- ❖ The Water (Prevention and Control of Pollution) Act, 1974
- ❖ The Air (Prevention and Control of Pollution) Act, 1981
- ❖ The Environment (Protection) Act, 1986
- ❖ The Forest (Conservation) Act, 1988
- ❖ The Wildlife (Protection) Act, 1972.

Note: *As per the OM vide F.No.IA3-22/10/22-IA.III(E177258), the baseline monitoring data were collected during the period of **October-December 2021** and utilized for preparation of this EIA report.*

CHAPTER II

PROJECT DESCRIPTION

2.0 GENERAL INTRODUCTION

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

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

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

2.1 DESCRIPTION OF THE PROJECT

The proponent, **V.Kavitha** is involved in the undertaking of establishment, construction, development, and closure of open cast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone. Therefore, the proponent had applied for quarry lease on 08.09.2021 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.387/mineral/2021, dated 12.08.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur (R.c. No.387/Mines/2021 dated 22.09.2022). The overall view of the project site is shown in Figure 2.1.



Figure 2.1 Overall View of Proposed Project Site

2.2 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in Kuppam Village, Pugalur Taluk and Karur District, as shown in Figure 2.2. The area lies between Latitudes from $10^{\circ}59'57.47''\text{N}$ to $11^{\circ}00'02.56''\text{N}$ and Longitudes from $77^{\circ}57'32.82''\text{E}$ to $77^{\circ}57'39.69''\text{E}$. The maximum altitude of the project area is 162 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

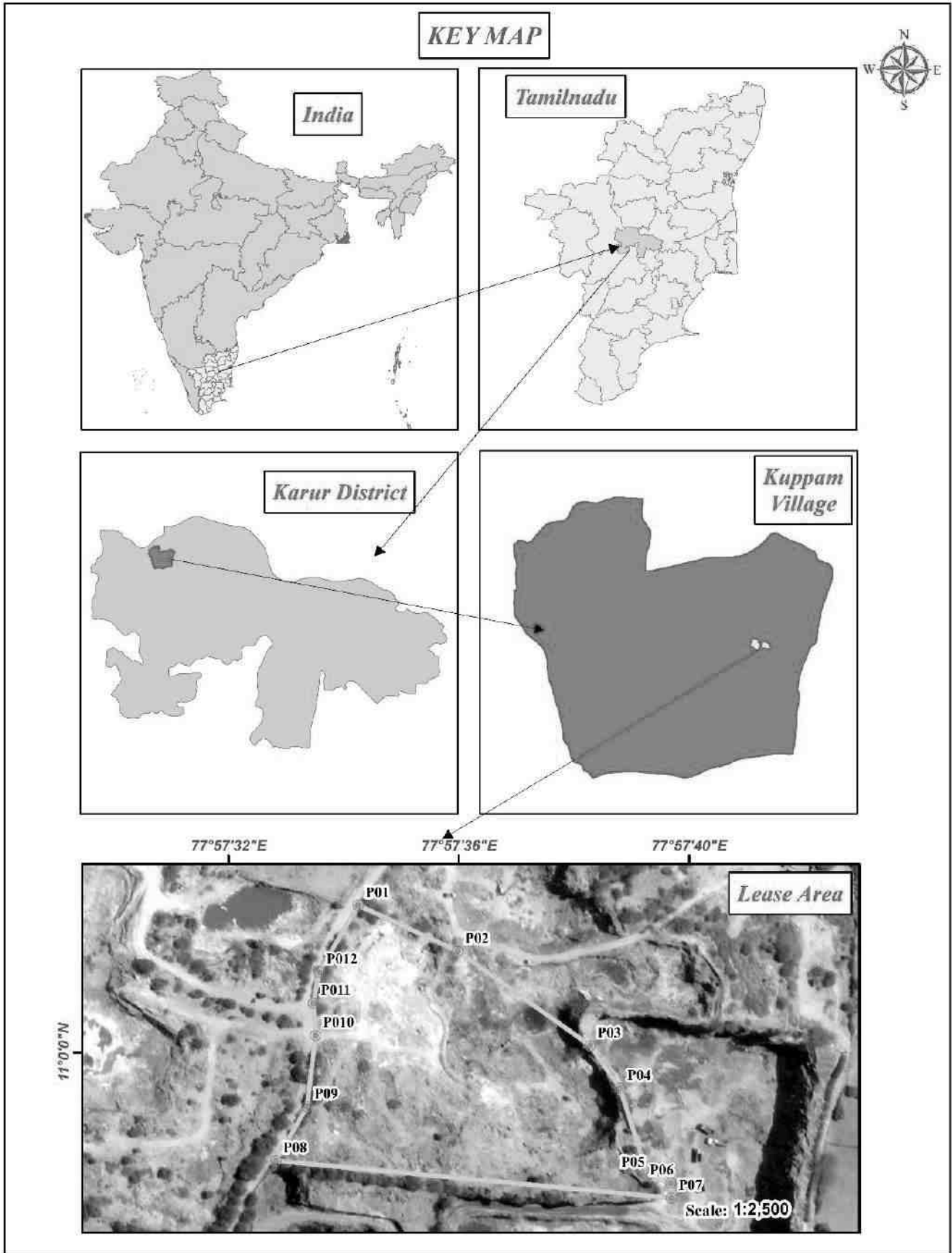


Figure 2.2 Key Map Showing Location of the Project Site

Table 2.1 Site Connectivity to the Project Area

Nearest Roadways	Erode-Karur (SH-84)	2.2km NE
	Karur-Vellakoil (NH-81)	2.22 km W
Nearest Rail Head	Pugalur	6.7 Km NE
Nearest Port Facility	Tuticorin	248 Km S
Nearest Airport	Coimbatore	100 Km W
Nearest Town	Karur	17 Km SE

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 1.88.0 ha.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

2.3.1 Corner Coordinates

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

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude
1	11° 0'2.56"N	77°57'34.25"E
2	11° 0'1.76"N	77°57'35.98"E
3	11° 0'0.12"N	77°57'38.28"E
4	10° 59'59.38"N	77°57'38.80"E
5	10°59'57.87"N	77°57'39.28"E
6	10°59'57.73"N	77°57'39.68"E
7	10°59'57.47"N	77°57'39.69"E
8	10°59'58.12"N	77°57'32.82"E
9	10°59'59.06"N	77°57'33.36"E
10	11°0'0.30"N	77°57'33.51"E
11	11°0'0.86"N	77°57'33.47"E
12	11°0'1.40"N	77°57'33.57"E

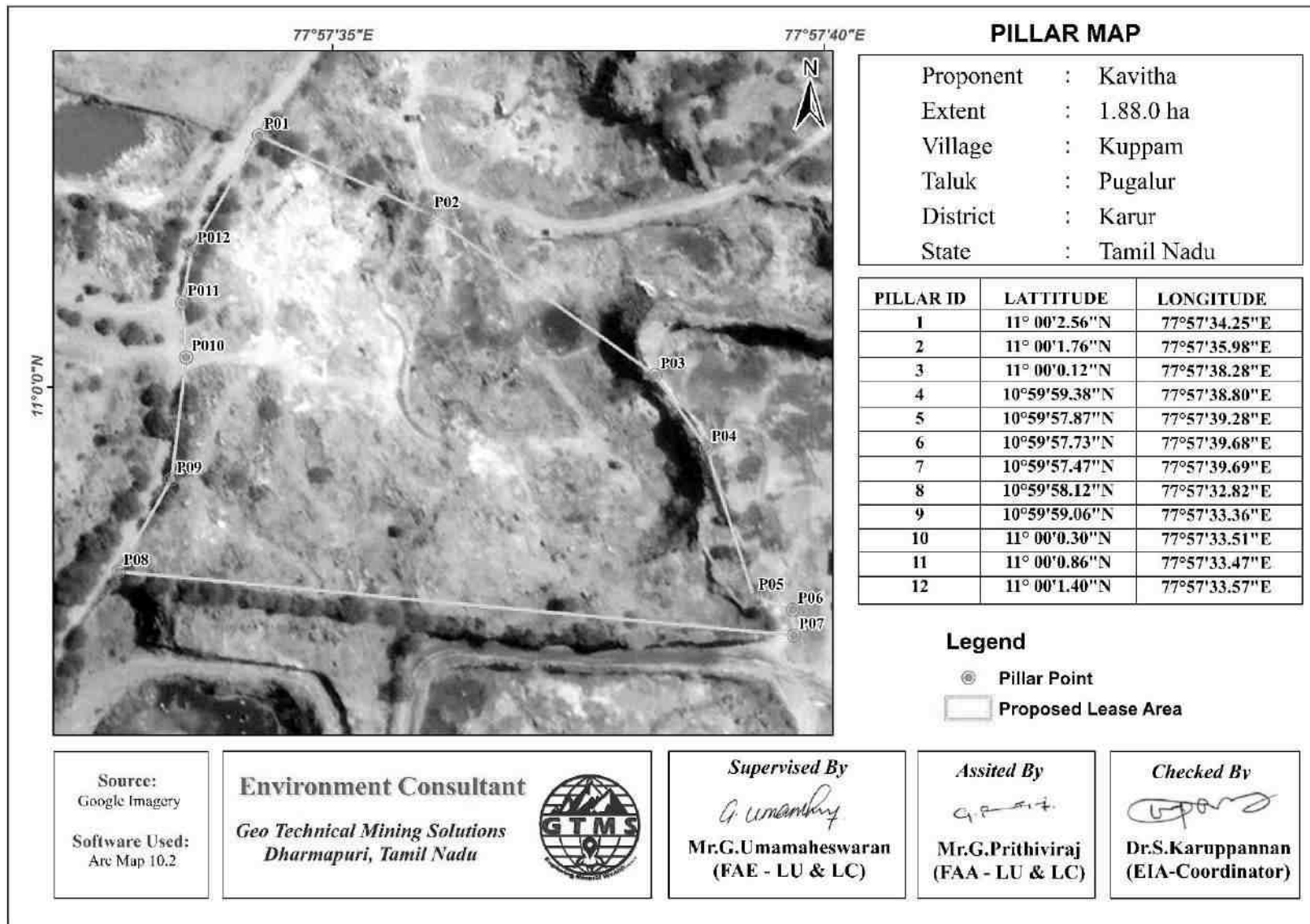


Figure 2.3 Google Earth Image Showing Lease Area with Pillars

2.4 GEOLOGY AND GEOMORPHOLOGY

This section discusses about the geology and geomorphology of the study area of 10 km radius, as given below.

Geology

Geologically, the entire district can be classified into hard rock and sedimentary formations. Hard rock Formation: - More than 90 percent of the district is underlain by hard rock of Archaean age. The gneissic type of rock formation is the major among the various types of rocks. Charnockite is a latter intrusive rock forming after the Archean rocks in the Karur and Aravakurichi areas. Sedimentary Formation: - Recent alluvial deposits such as sand, silt, clay, gravel etc. which are transported sediments occur along Cauvery River beds in Karur, Krishnarayapuram and Kulithalai blocks. The prominent geology units identified in the study area of 10 km are peninsular gneiss (Charnockite) varieties, shown in Figure 2.4.

Geomorphology

The entire area of the district is a pediplain. The Rangamalai hills and Kadavur hills occurring in the southern side of the district constitutes the remnants of the much-denuded Eastern Ghats and rise to heights of over 1031m above mean sea level. There are numerous small residual hills represented by Ayyarmalai, Thanthonimalai and Velayuthampalayam hills. The general elevation of the area is ranging between 100 m and 200m above mean sea level. The prominent geomorphic units identified in the study area 10km Radius through interpretation of Satellite imagery are 1) Shallow Weathered, Shallow Buried Pediplain 2) Pediplain canal command and 2) Pediments/valley floor,3) Moderately Weathered/Moderately Buried Pediplain 4) Shallow Flood Plain 5) linear Ridge/dyke an overall appraisal of geomorphology details is given in Figure 2.5

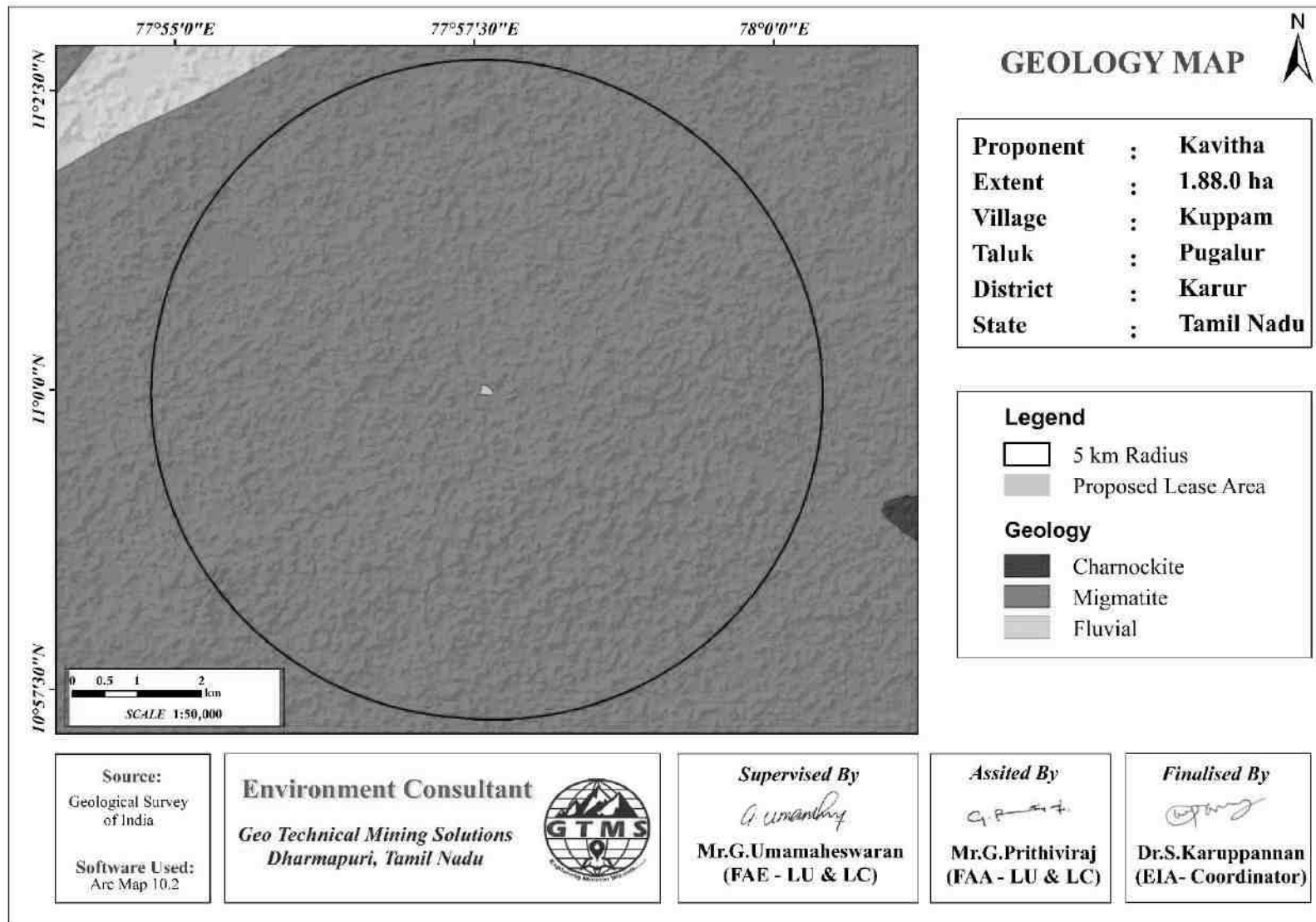


Figure 2.4 Geology Map of 10 km Radius from the Proposed Project Site

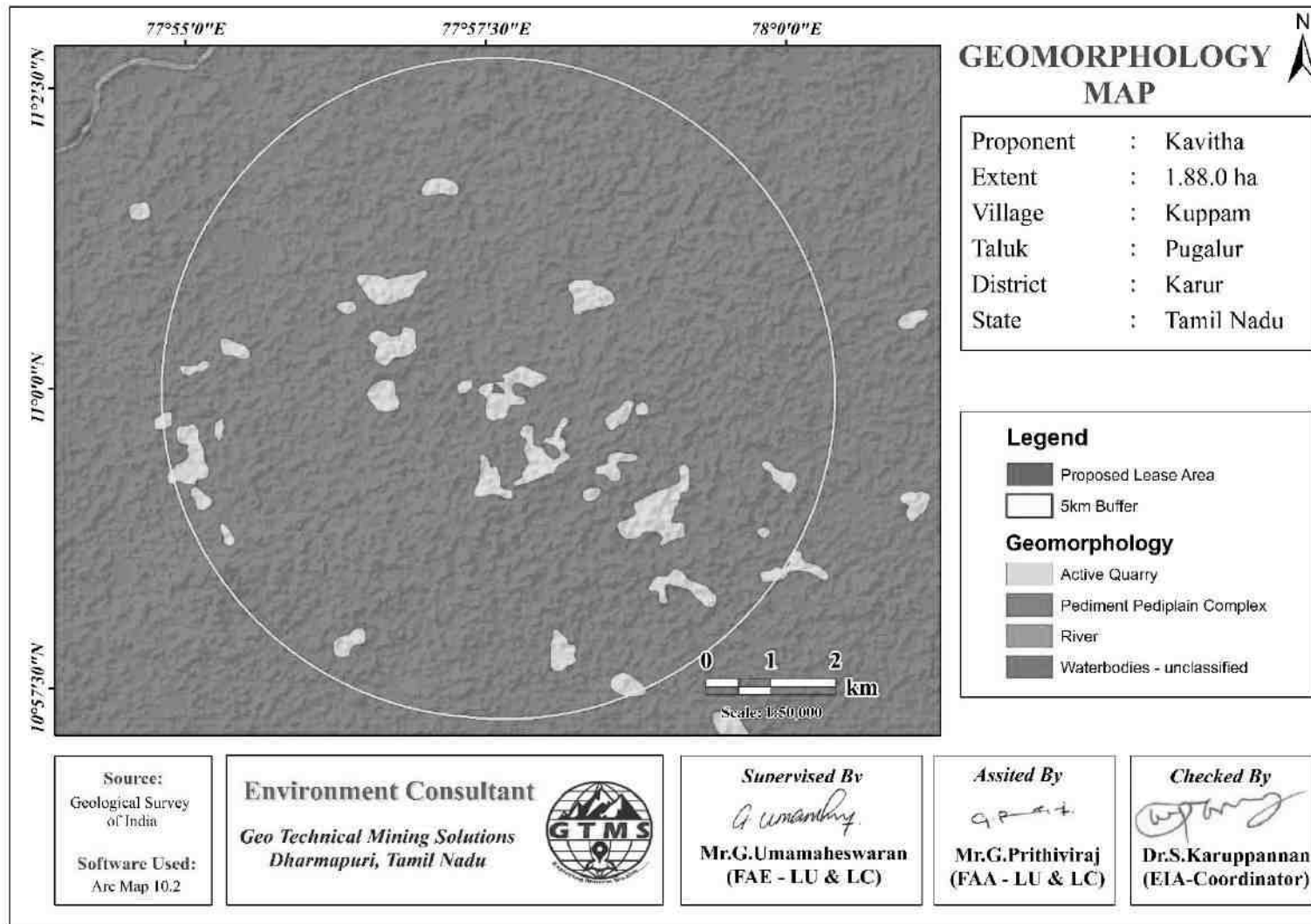


Figure 2.5 Geomorphology Map of 10km Radius from the Proposed Project Site

2.5 QUANTITY OF RESERVES

The resources and reserves of rough stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 18 m considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.7 and 2.8 results of geological resources and reserves have been shown in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone in m³	Top Soil in m³
Geological Resource in m ³	3,37,160	1697
Mineable Reserves in m ³	1,58,939	--

Based on the year wise development and production plan and sections, the year wise production results are given in Table 2.4.

Table 2.4 Year-Wise Production Details

Year	Rough Stone (m³)
I	4500
II	4500
III	4500
IV	4500
V	4500
Total	22500

Source: Approved Mining Plan & ToR

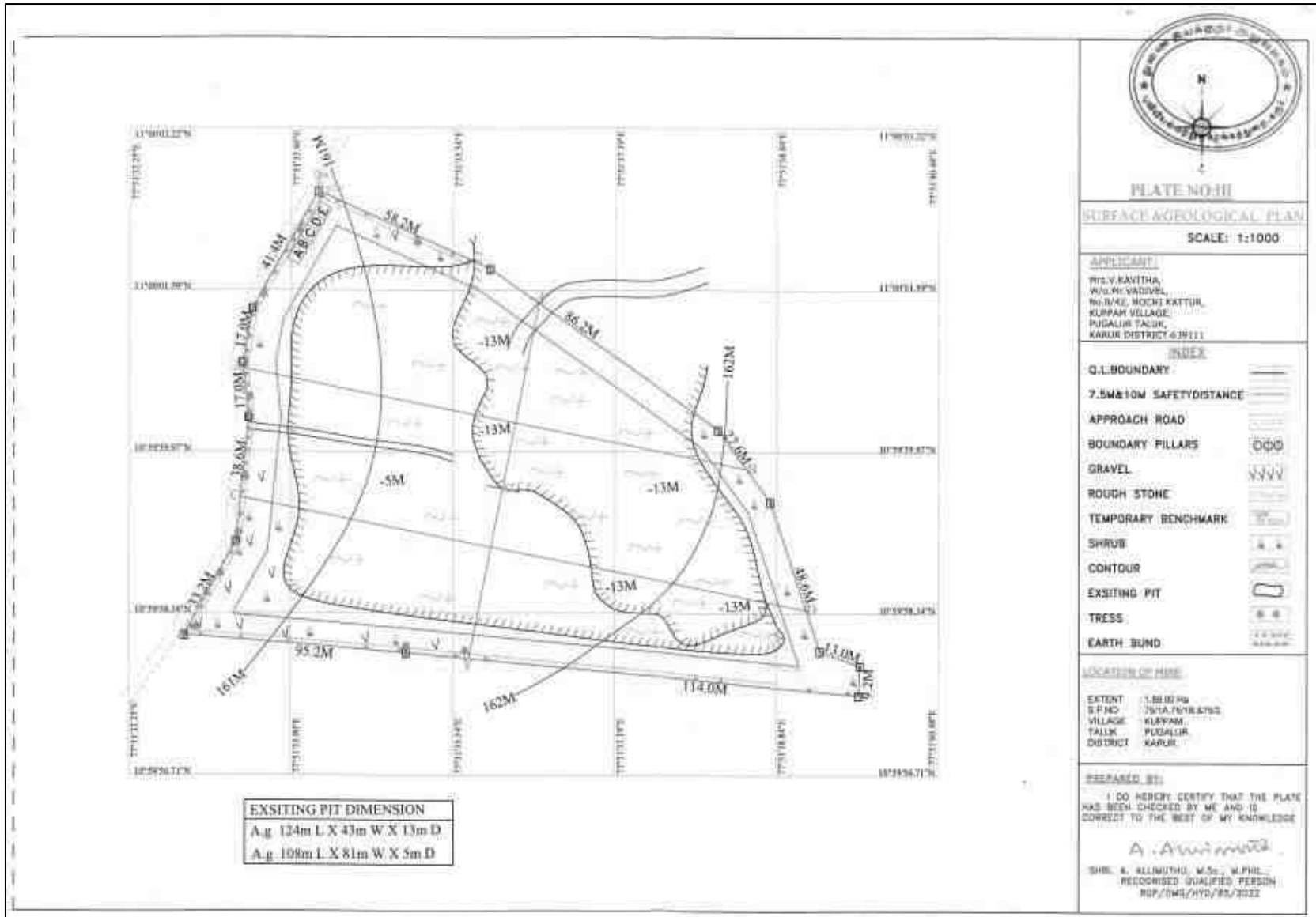


Figure 2.6 Mine Lease Plan

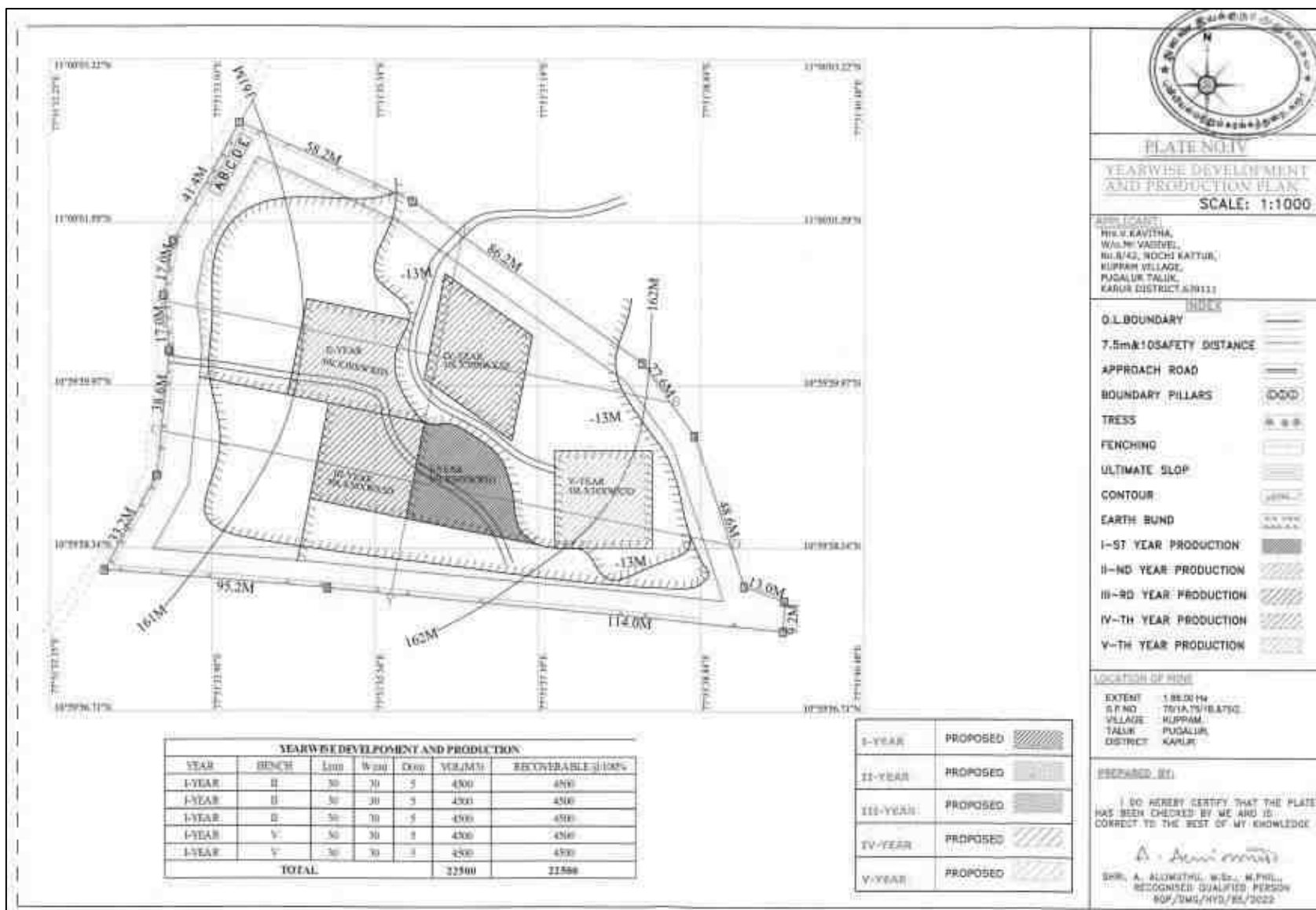


Figure 2.7 Yearwise Development and Production Plan

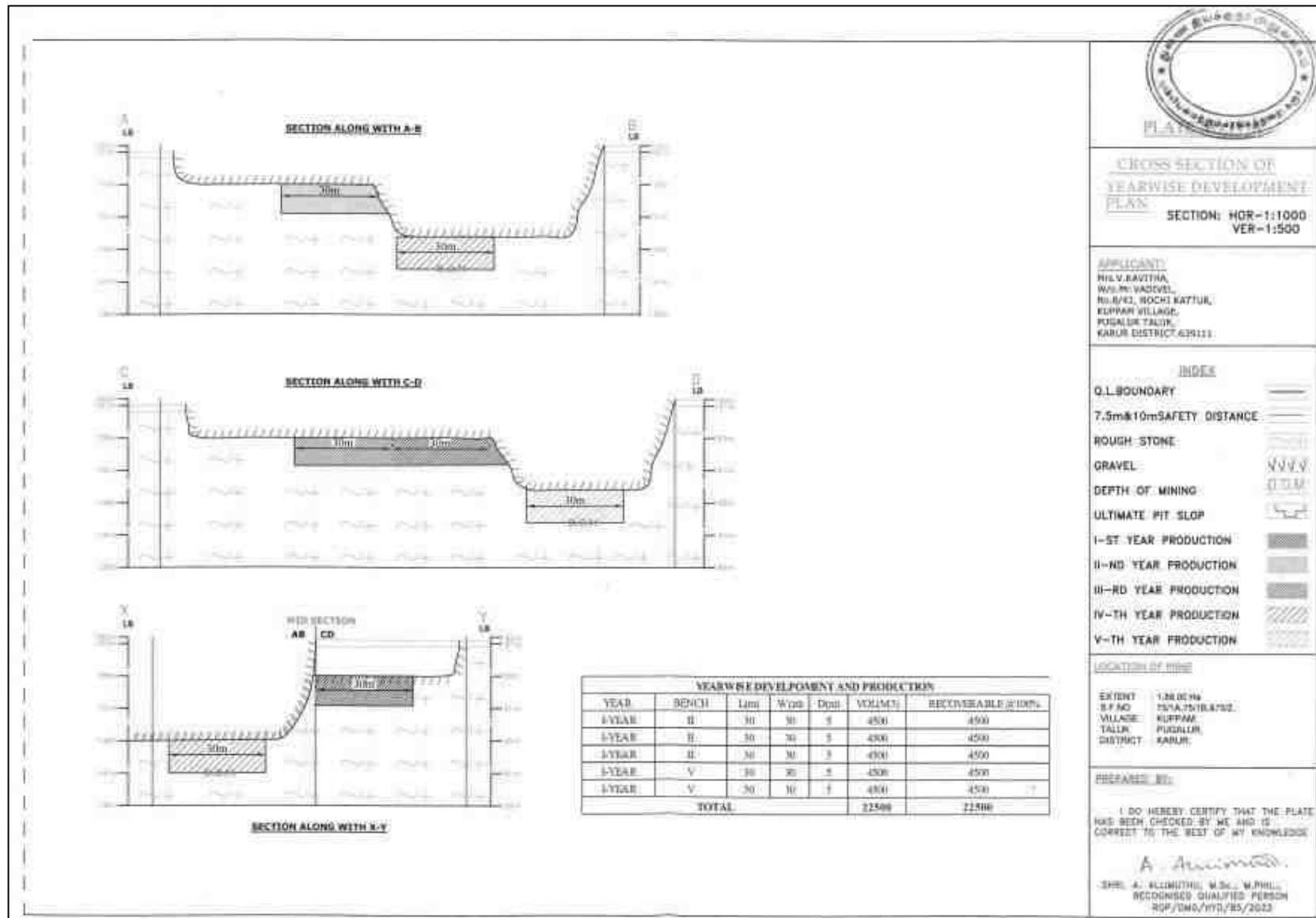


Figure 2.8 Yearwise Development and Production Sections

2.6 MINING METHOD

The quarrying operation is proposed to be carried out by opencast Manual mining method with the bench height and width of 5 m each. The open cast mining manual method involving drilling operation using tractor mounted compressor attached with jack hammers and dimension stone blasting/secondary blasting is proposed to extract rough stone. The extracted rough stone will be loaded manually to the trucks for dispatch to the customers. Opencast manual mining offers several benefits to the proponent when compared to the more complex underground mining methods. The most important benefits include relatively smaller capital and operating costs, lesser safety hazards, ease of use for mass production, small closure costs, no restrictions on the use of heavy machinery if required, and easy drainage of subsurface water.

2.6.1 Magnitude of Operation

Based on the results of estimated production for the 5 years, details about the size of operation have been provided in Table 2.5.

Table 2.5 Operational Details for Proposed Project

	Rough Stone
Number of Working Days /Annum	300
Production of /Day (m ³)	15
No. of Lorry Loads	3

2.6.2 Extent of Mechanization

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

Table 2.6 Machinery Details

S. No.	Type	No. of Unit	Día. of Hole (mm)	Size/Capacity	Make	Motive Power	H.P
1	Hand Jack Hammer	3	32mm	Hand held	-	Diesel	--
2	Excavator	1	--	--	-	Diesel Drive	--
3	Compressor	1	--	Air	--	Diesel Drive	--
4	Tipper	1	--	30 MT	TATA	Diesel Drive	--
5	Shovel, Picas	10	--	--	--	-	--

2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows present and future land use statistics. According to the land use results, as shown in Table 2.7, about 1.33.0 ha of land is used for quarrying; about 0.03.0 ha of land for forming roads; about 0.10.0ha will be used for mineral reject dump and about 0.42.0 ha of land is unutilized. Whereas, at the end of the mine life, about 0.46.50 ha of land will have been quarried; about 0.20.0 ha of land will be

used for green belt development; about 0.10.0ha will be used for mineral reject dump; about 1.05.50 ha of land will be left unutilized; and the rest will be used for roads and infrastructures.

Table 2.7 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	1.33.00	0.46.50
Infrastructure	Nil	0.02.00
Roads	0.03.0	0.04.00
Mineral Reject Dump	0.10.0	0.10.00
Green Belt	Nil	0.20.00
Unutilized area	0.42.00	1.05.50
Total	1.88.00	1.88.00

2.6.4 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 2.8.

Table 2.8 Mine Closure Budget

Activity	Capital Cost	Recurring Cost/Annum
376 plants inside the lease area	75200	11280
564 plants outside the lease area	169200	16920
Wire Fencing	376000	18800
Renovation of Garland Drain	18800	9400
Total	639200	56400

Source: Environment Management Plan

2.6.5 Conceptual Mining Plan

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc. Details of ultimate pit dimensions have been derived from Figure. 2.10, 2.11 and given in Table 2.9.

Table 2.9 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth(m)
I	117	49	18

Source: Approved Mining Plan & ToR

2.6.6 Infrastructures

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

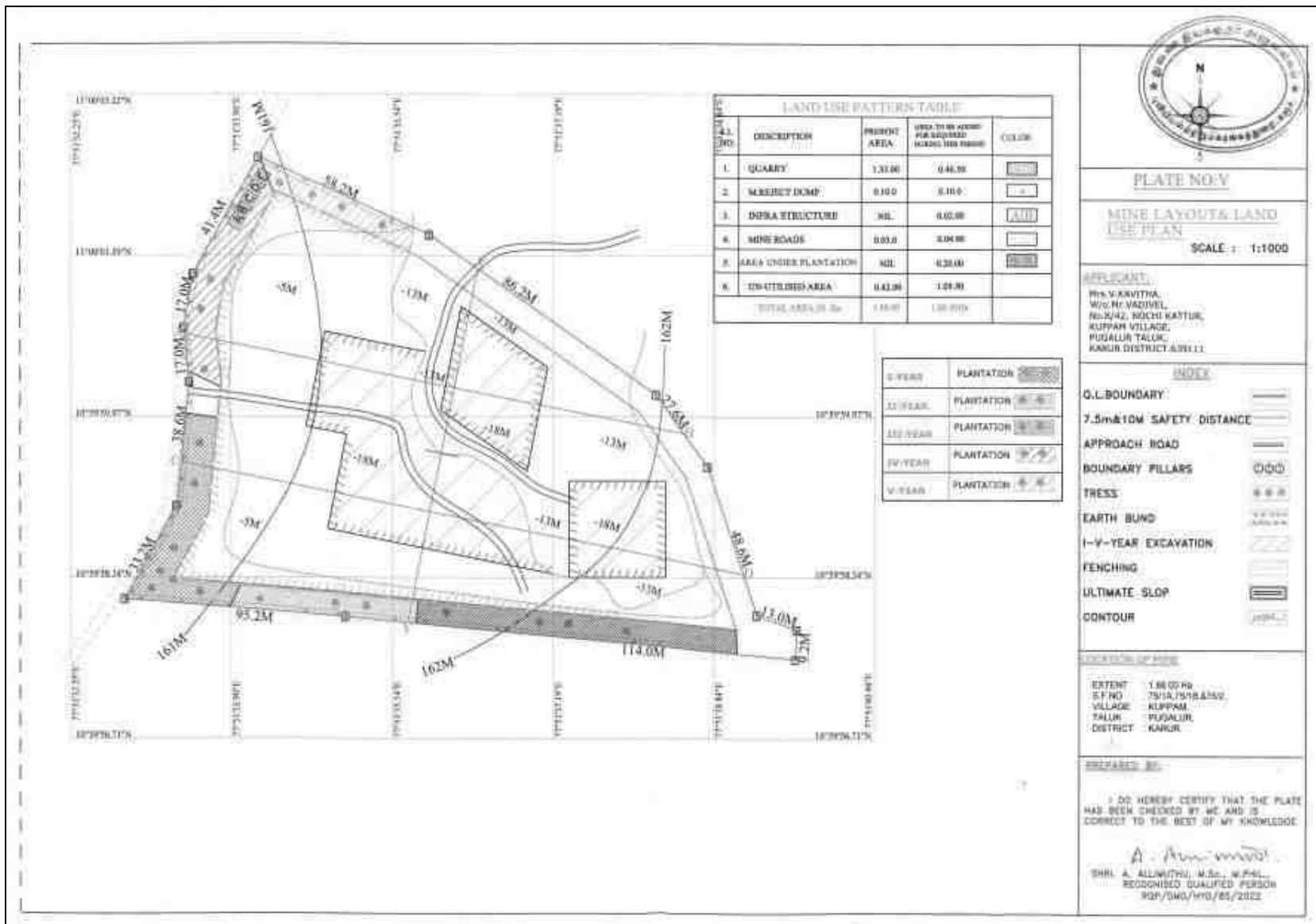


Figure 2.9 Mine Layout Plan

2.6.6.1 Other Infrastructure Requirement

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

2.6.7 Water Requirement

Detail of water requirement in KLD is given in Table 2.10.

Table 2.10 Water Requirement for the Project

Purpose	Quantity	Source
Dust Suppression	1.0 KLD	Existing bore wells nearby the lease area
Green Belt development	1.0 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.0 KLD	Existing bore wells and approved water vendors
Total	3.0 KLD	

Source: Prefeasibility Report

2.6.8 Energy Requirement

As per the data shown in Table 2.11, High speed Diesel (HSD) will be used for quarrying machineries. Around 18000 litres of HSD will be used for rough stone removal for during this 5-year plan period. The diesel will be brought to the site from nearby diesel pumps.

Table 2.11 Fuel Requirement Details

	Rough Stone
Quantity of material to be quarried out in five years in m ³	22,500
Average rate of fuel consumption for an excavator in litres/hour	16
Capacity of the excavator in m ³ / hour	20
Time required in hours	1125
Total diesel consumption in litres	18,000

2.6.9 Capital Requirement

The project proponent will invest Rs. 13,80,000 to the project. The breakup summary of the investment has been given in Table 2.12.

Table 2.12 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Operational Cost	5,00,000
2	EMP Cost	8,80,000
Total Project Cost		13,80,000

Source: Approved Mining Plan

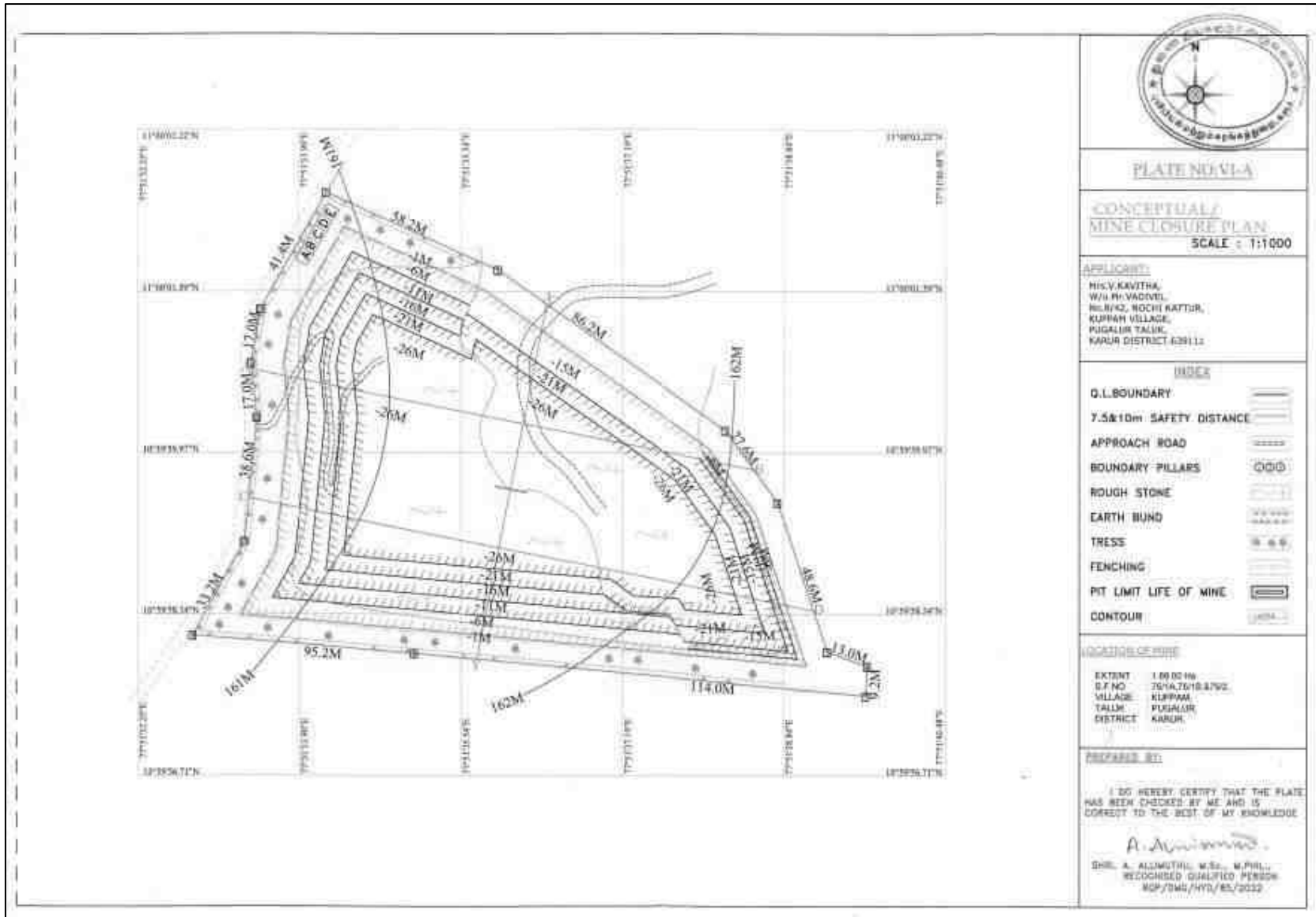


Figure 2.10 Mine Closure Plan

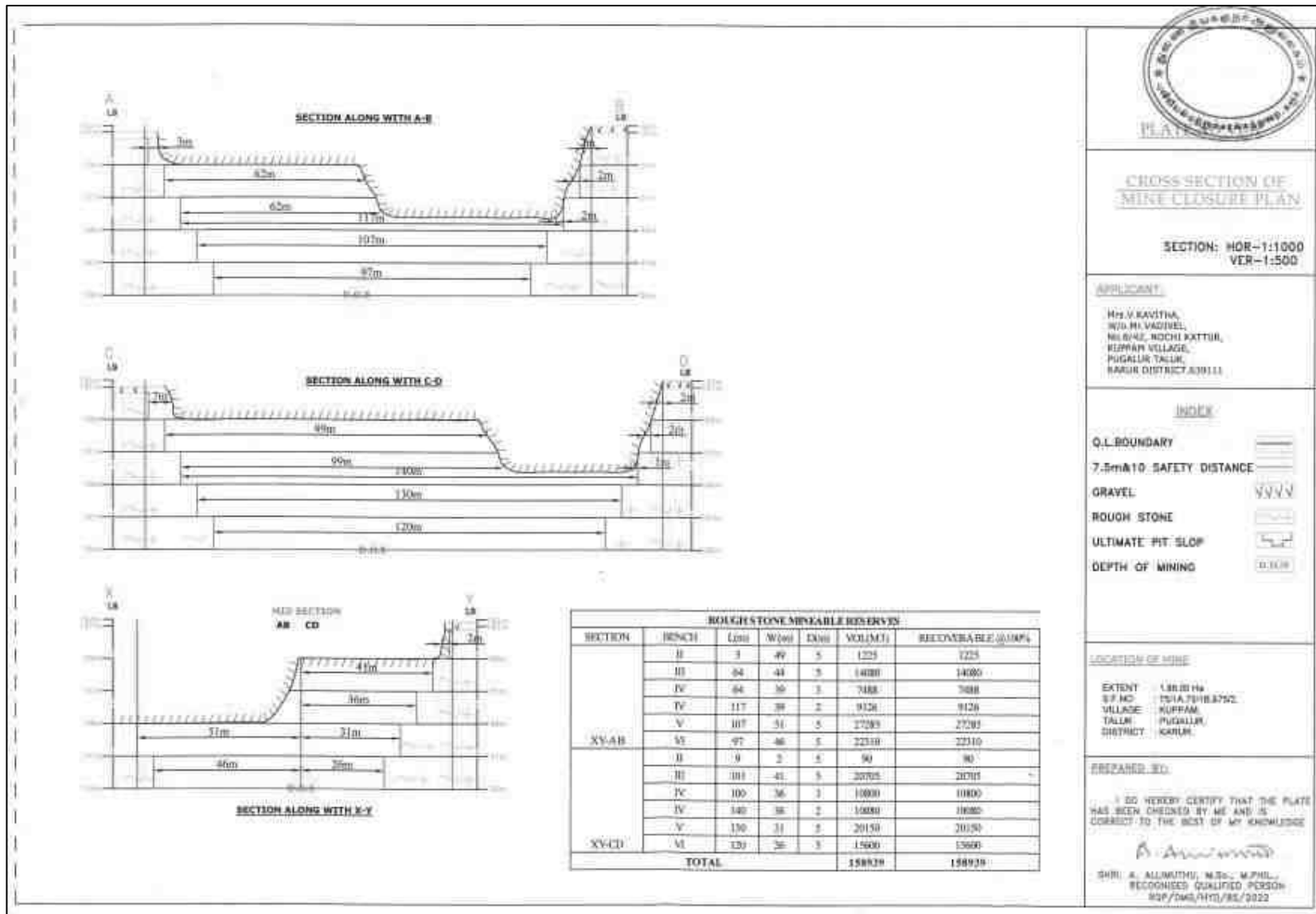


Figure 2.11. Mine Closure Sections

2.7 MANPOWER REQUIREMENT

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community. Number of employees required for this project have been provided in Table 2.13.

Table 2.13 Employment Potential for the proposed project

1.	Highly Skilled	Quarry Manger	1
		Mines Forman	--
		Mechanical Engineer/Geologist	-
		Account cum & admin	1
2.	Skilled	Earth moving Operator	--
		Driver	1
		Mechanic	--
		Blaster/Mat	--
3.	Semi – skilled	Helpers, Greaser's	--
4.	Unskilled	Musdoor / Labours	10
		Cleaners	--
		Attendant's	1
Total =			14

Source: Approved Mining Plan

2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the Tamil Nadu State Pollution Control Board. The conditions imposed during the environmental clearance will be compiled before the start of mining operation. Expected time schedule for the quarrying operation is given Table 2.14.

Table 2.14 Expected Time Schedule

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

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

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering October, November, and December 2021 with CPCB guidelines. Environmental data have been collected with reference to cluster quarries by **Ekdant Enviro Services (P) Ltd**, ISO 9001: 2015 and OHSAS 18001: 2007 certified & MoEF notified laboratory for the below attributes:

- ❖ Land
- ❖ Water
- ❖ Air
- ❖ Noise
- ❖ Biological
- ❖ Socio-economic status

Study Area

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

3.1 LAND ENVIRONMENT

The main objective of this section is to provide a baseline status of the study area covering 10 km radius around the proposed mine site so that temporal changes in the surroundings due to the mining activities can be assessed in future.

Table 3.1 Monitoring Attributes and Frequency of Monitoring

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land Use/ Land Cover	Land-use Pattern within 10 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	10 (1 core & 9 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	8 (8 ground 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 Fugitive dust	24 hours, twice a week (October – December 2021)	8 (1 core & 7 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	8 (1 core & 7 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrant & 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.

Source: On-site monitoring/sampling by *Ekdant Enviro Services* in association with GTMS

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

3.1.1 Land Use/ Land Cover

Land use pattern of the study area was studied using Sentinel II image. Seven LULC types are given in both Figure 3.1 and Table 3.2.

Table 3.2 LULC Statistics of the Study Area

S. No.	Classification	Area(ha)	Area in %
1	Crop land	25434	84
2	Dense forest	653	2
3	Fallow land	361	1
4	Mining/Industrial land	371	1
5	Plantations	2146	7
6	Settlement	167	1
7	Water bodies	1049	3
	Total	30181	100

Source: Sentinel II Satellite Imagery

From the land use/land cover analysis, it is known that the majority of the land in the study area is crop land covering 84% of the total land area, followed by plantations (7%), water bodies (3%), dense forest (2%), fallow land and settlement (1% each). The total mining area within the study area is 371 ha (1%) among other LULC types. The cluster area of 16.03 ha contributes only 0.04 % to the study area. This small percentage of mining activities shall not have any significant impact on the environment.

3.1.2 Topography

The proposed project area is situated over a terrain of undulated nature.

3.1.3 Drainage Pattern of the Area

The project site falls within the area showing dendritic pattern, as shown in Figure 3.2.

3.1.4 Seismic Sensitivity

The proposed project site falls in the seismic zone II, low damage risk zone as per BMTPC, as shown in Vulnerability Atlas of Seismic zone of India IS: 1893 – 2002 as the project area falls in the hard rock terrain on the peninsular shield of south India which is highly stable (Source: https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf).

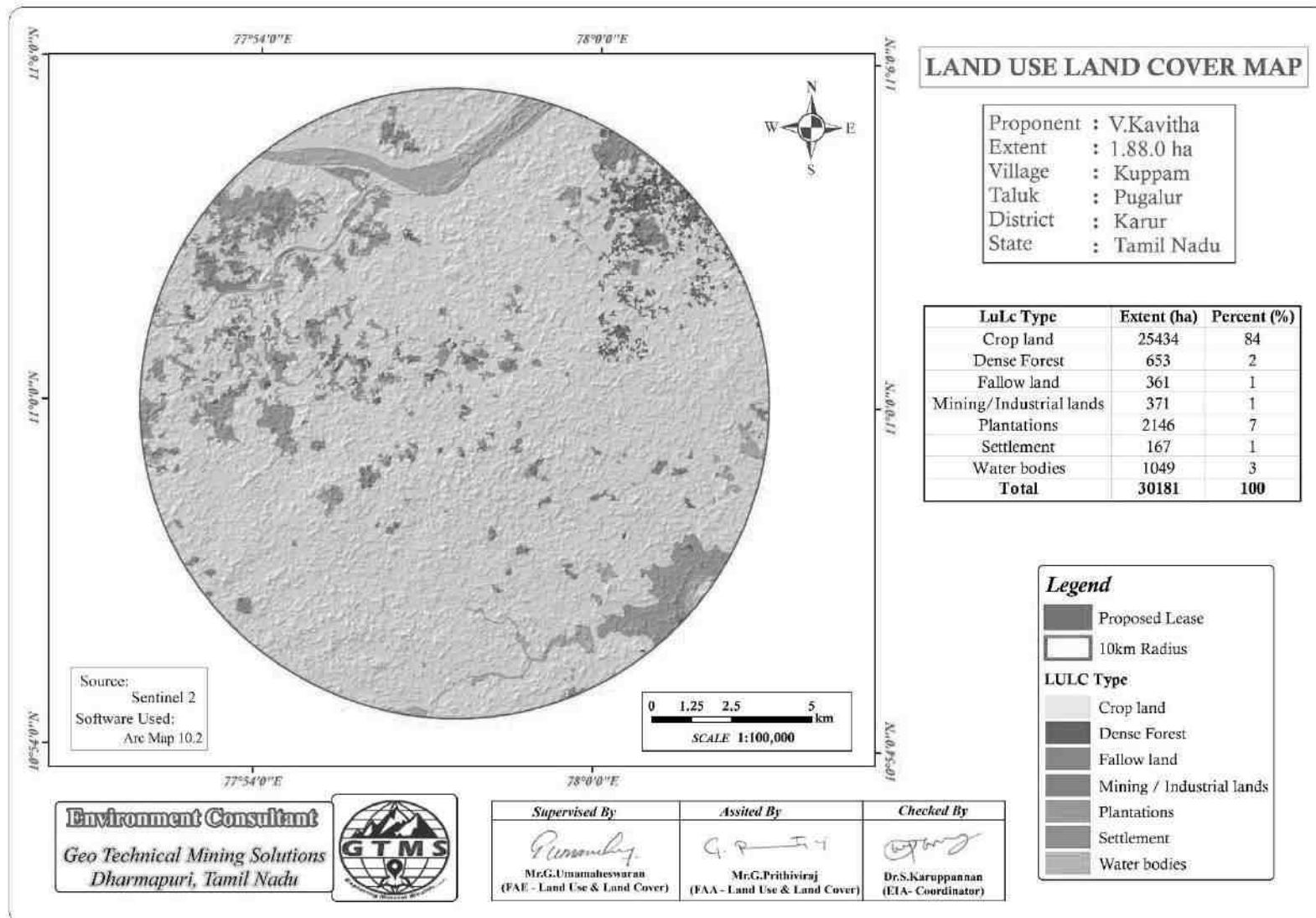


Figure 3.1 LULC Map of 10 km Radius from the Proposed Project Site

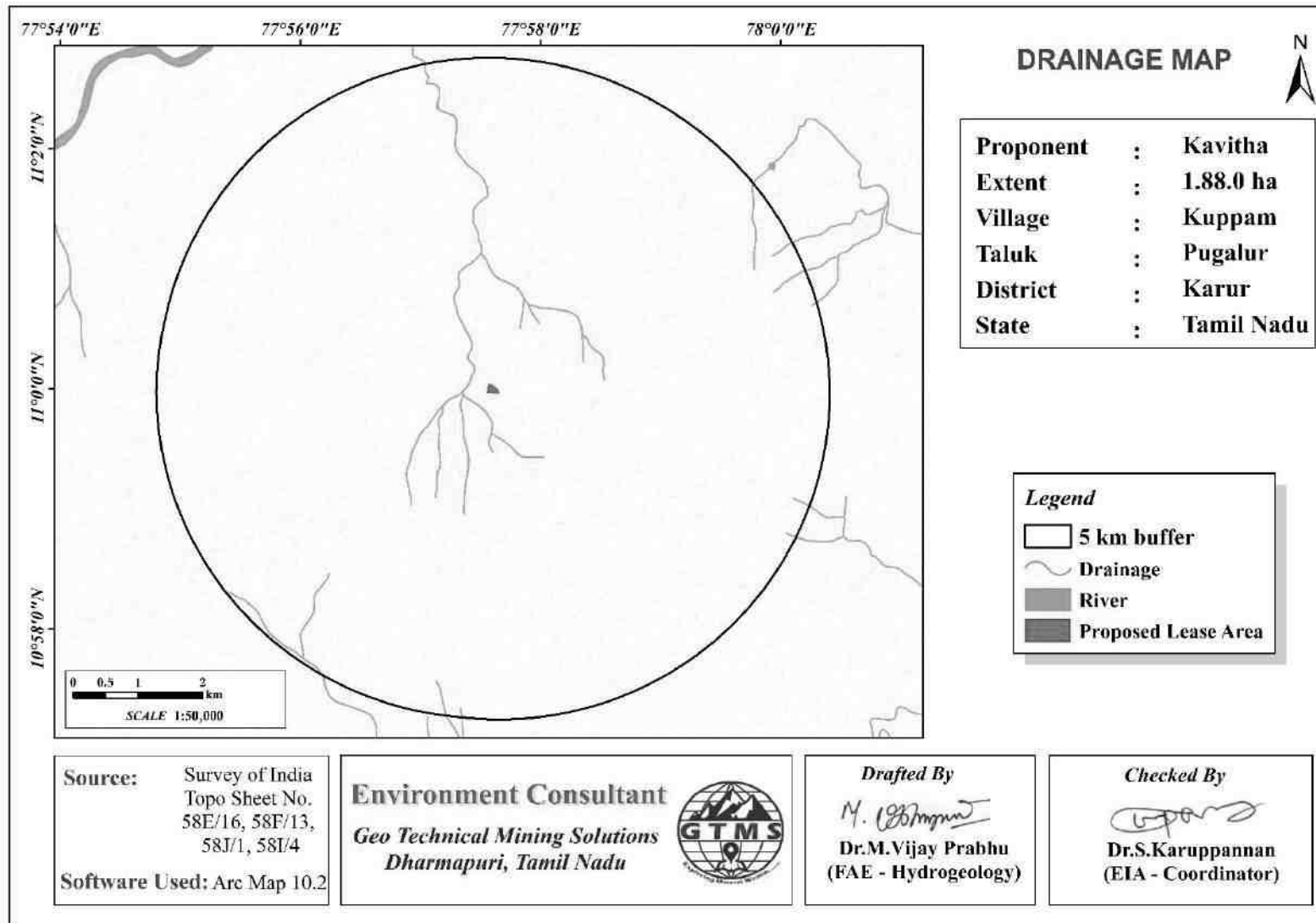


Figure 3.2 Drainage Map of 5 km Radius from the Proposed Project Site

3.1.5 Soil Characteristics

Soil quality of the study area is one of the important components of the land environment. The composite soil samples were collected from the study area and analysed for different parameters. The locations of the monitoring sites are shown in Table 3.4 and Figure 3.3. The objective of the soil sampling is:

- ❖ to determine the baseline soil characteristics of the study area
- ❖ to study the impact of proposed activity on soil characteristics and
- ❖ to study the impact on agriculture production

3.1.5.1 Methodology

- ❖ For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the project site representing various land use conditions. The samples were collected up to 90 cm depth. Ten (10) locations were selected for soil sampling on the basis of soil types, vegetative cover, industrial & residential activities including infrastructure facilities, which would accord an overall idea of the soil characteristics. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology are given in Table 3.3. The samples were sent to laboratory for analysis.
- ❖ The samples were analysed for physical and chemical characteristics as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The important properties analysed for soil pH and organic matter, water content, nitrogen, phosphorous and potassium. The physico-chemical characteristics of the soil & test results in Table 3.5.

Table 3.3 Details of Soil Sampling Methodology

Particulars	Details
Frequency	One grab sample from each station-once during the study period
Methodology	Composite grab samples of the topsoil were collected from 3 depth levels and mixed to provide a representative sample for analysis. They were stored in airtight polythene bags and analysed at the laboratory.

Table 3.4 Soil Sampling Locations

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	S01	NTC76 Lease	0.16	N	10°59'52.45"N,77°57'36.40"E
2	S02	NTC362 Lease	0.68	E	10°59'57.54"N 77°57'10.31"E
3	S03	Suriyampalaiyam	4.97	S	10°57'25.64"N,77°57'47.86"E
4	S04	Ponniyakavundanpudur	3.99	NE	11° 1'26.20"N, 77°59'14.56"E
5	S05	Kuppam	4.12	NW	11° 0'45.84"N 77°55'23.83"E
6	S06	Panaippalayam	4.22	SW	10°58'1.34"N 77°56'9.91"E
7	S07	Punnam	4.72	SSE	10°59'20.30" N 78° 0'9.3" E
8	S08	Nallasamy	0.20	SSE	11° 0'3.60"N 77°57'27.66"E
9	S09	Shanmugam Lease	0.11	S	10°59'53.75"N 77°57'38.55"E
10	S10	Core Zone	---	---	10°59'59.38"N 77°57'33.65"E

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Ltd in association with GTMS

3.1.5.2 Results and Discussion

Physical Characteristics

- ❖ The soil texture found in the study area is clay loam and sandy loam.
- ❖ pH of the soil varies from 6.09 to 7.26 indicating slightly alkaline nature.
- ❖ Electrical conductivity of the soil varies from 399 to 476 $\mu\text{s}/\text{cm}$ and
- ❖ The water content varies from 2.18 to 3.80 %.

Chemical Characteristics

- ❖ Nitrogen ranges between 76 and 141 mg/kg.
- ❖ Phosphorus ranges between 0.89 and 1.90 mg/kg.
- ❖ Potassium ranges between 240.3 and 334.9 mg/kg.
- ❖ Calcium ranges between 124 and 182 mg/kg; Magnesium ranges between 20.7 and 34.0 mg/kg.
- ❖ Sodium ranges between 322 and 538 mg/kg.
- ❖ Dry matter content ranges between 1.01 and 2.97.

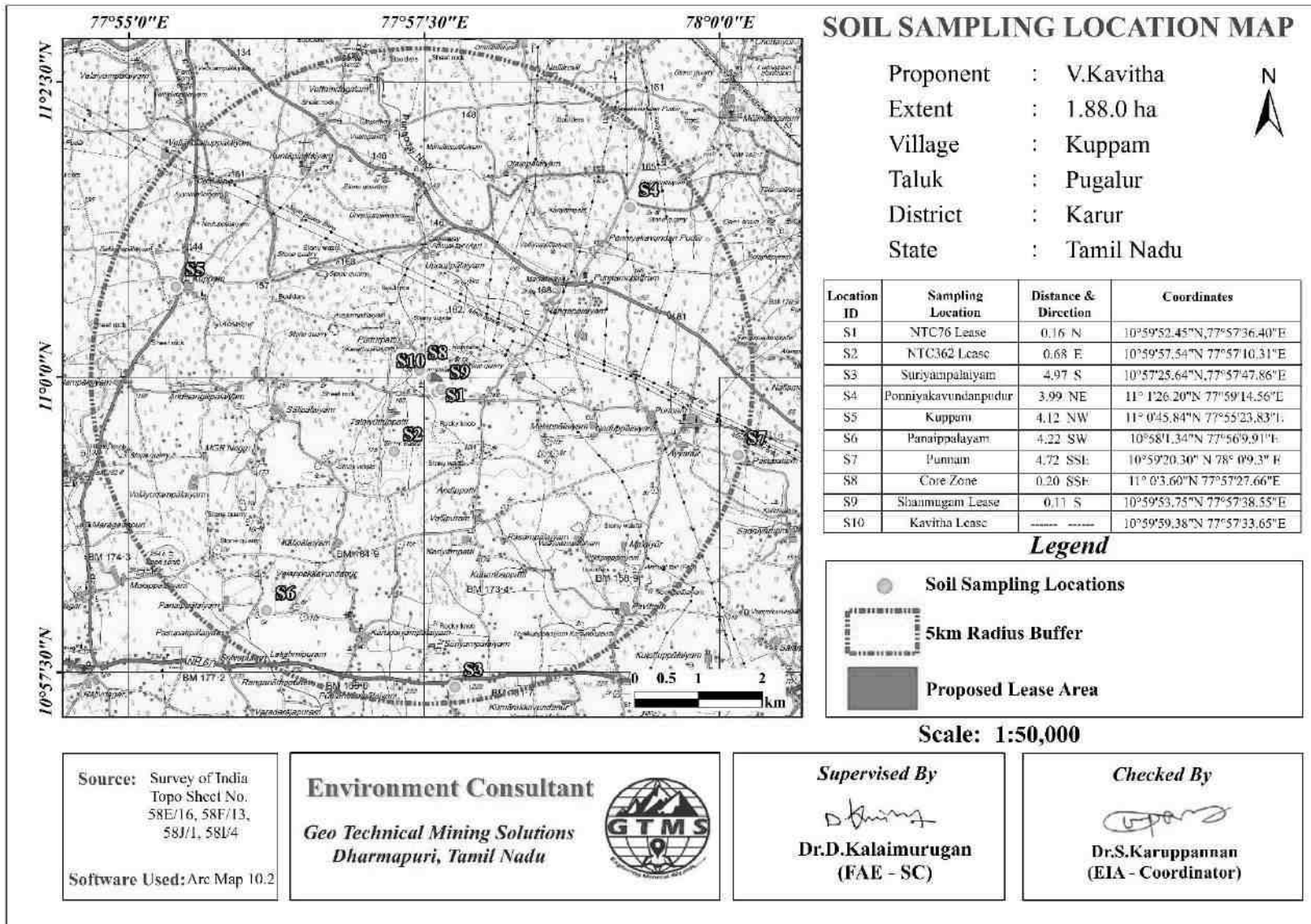


Figure 3.3 Toposheet Showing Soil Sampling Locations within 5 km Radius around the Proposed Project Site

Table 3.5 Soil Quality of the Study Area

S.No.	Parameters	Units	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
1	pH@27°C	-	7.31	7.11	7.65	8.01	7.82	7.34	7.21	7.56	8.03	6.98
2	Electrical Conductivity@25°C	µs/cm	408	432	428	418	419	423	417	399	476	412
3	Texture	-	Clay Loam	sandy Loam	Clay Loam	Clay Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Clay Loam	Sandy Loam
4	Sand	%	31.5	65.30	35.60	33.70	61.40	63.56	59.76	57.45	37.53	61.53
5	Slit	%	33.8	18.20	28.0	42.90	21.90	23.15	33.14	34.16	25.51	22.57
6	Clay	%	34.7	16.50	36.40	23.40	16.70	13.29	07.1	8.39	36.96	15.90
7	Water Content	%	3.71	3.80	3.08	2.92	2.18	2.96	3.12	2.76	2.84	3.01
8	Bulk Density	g/cc	0.96	1.48	1.50	1.10	1.42	1.42	1.43	1.56	1.75	1.34
9	Alkalinity	mg/kg	88.0	92.30	76.80	80.40	82.01	75.12	78.15	56.79	89.23	98.13
10	Nitrogen	mg/kg	130	121	136	132	124	111	098	076	141	117
11	Phosphorus	mg/Kg	1.24	0.89	1.33	1.90	0.97	1.18	1.09	1.15	1.12	1.19
12	Calcium (as Ca)	mg/Kg	152	124	139	182	146	136	144	156	147	132
13	Magnesium (as Mg)	mg/Kg	20.70	26.20	28	34.0	33.0	31.9	33.12	24.67	23.69	31.96
14	Sodium as Na	mg/Kg	322	441	538	332	426	378	353	479	478	324
15	Water Holding Capacity	%	44.9	28.20	34.0	42.40	40.80	23.12	29.3	32.4	56.13	29.7
16	Chloride (as Cl)	mg/Kg	132	128.3	138	142	144	135	144	167	144	169
17	Potassium (as K)	mg/Kg	330.8	240.3	334.9	334.6	240.9	256.1	257.9	293.1	332.1	296.3
18	Total Iron	mg/Kg	1.30	1.54	1.61	1.64	1.15	1.56	0.73	0.45	0.91	0.12
19	Organic Matter	%	2.90	1.20	2.80	2.10	09.80	1.23	1.01	1.45	2.97	1.74

Source: Sampling Results by Ekdant Enviro Services (P) Ltd.

3.2 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the critical water quality parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity.

3.2.1 Surface Water

There are no surface water bodies present within the study area. Hence, data on surface water bodies are not collected for this project.

3.2.2 Ground Water

The occurrence and behaviour of groundwater are controlled by rainfall, topography, geomorphology, geology, structures etc. Groundwater occurs in the crystalline rocks of Achaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. The diameter of the dug well is in the range of 7 to 10 m and depths of dug wells range from 9 to 15 m below ground level. The dug wells yield up to 1 lps in summer months and few wells remains dry. The yield is adequate for irrigating one or two crops in the monsoon period.

3.2.3 Methodology

Reconnaissance survey was undertaken and monitoring locations were finalized based on:

- ❖ Drainage pattern
- ❖ Location of residential areas /likely impact areas
- ❖ Likely areas which can represent baseline conditions

Eight bore well water samples were collected from the study area and the samples are analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess the effect of mining and other activities on ground water. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA). The list of water sampling locations has been given in Table 3.6 and the spatial occurrence of water sampling locations in Figure 3.4.

Table 3.6 Water Sampling Locations

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	BW01	Thalaiyuttupatti	0.68	SW	10°59'43.91"N,77°57'15.01"E
2	BW02	Velayuthampalayam	3.57	SW	10°58'50.44"N,77°55'53.77"E
3	BW03	Sankarampalayam	1.16	E	11° 0'0.62"N, 77°58'16.77"E
4	BW04	Karudaiyampalaiyam	4.01	SSW	10°57'48.19"N,77°56'57.89"E
5	BW05	Velayuthampalaiyam	2.80	SE	10°58'57.13"N,77°58'50.47"E
6	BW06	Kuppam	4.09	NW	11° 0'46.79"N, 77°55'28.05"E
7	BW07	Vadugapatti	3.99	N	11° 2'5.46"N, 77°57'11.21"E
8	BW08	Punnamchattram	2.81	NE	11° 0'49.51"N, 77°58'47.71"E

Source: On-site monitoring/sampling by **Ekdant Enviro Services** in association with GTMS.

3.2.4 Results and Discussion

Results of important ground water quality parameters have been shown in Tables 3.7 and the results are discussed below

Ground Water

- ❖ The pH of the water samples ranges from 7.10 to 8.10.
- ❖ TDS are found in the range between 214 and 469 mg/l.
- ❖ The total hardness varies between 176 and 370 mg/l.
- ❖ Calcium varies from 39 to 63 mg/l and magnesium from 16 to 44 mg/l.
- ❖ Sodium varies from 111 to 265 mg/l.
- ❖ Potassium from 01 to 10 mg/l.
- ❖ Bicarbonate varies from 156 to 360 mg/l.
- ❖ Nitrate varies from 10 to 39 mg/l.
- ❖ Chloride varies from 123 to 405 mg/l; sulphate from 66 to 107 mg/l; and fluoride from 0.2 to 1.0 mg/l.
- ❖ When speaking about microbiological parameters, the water samples from all the locations meet the requirement.

When compared to IS 10500:2012 all the parameters thus analysed fall within the prescribed limits.

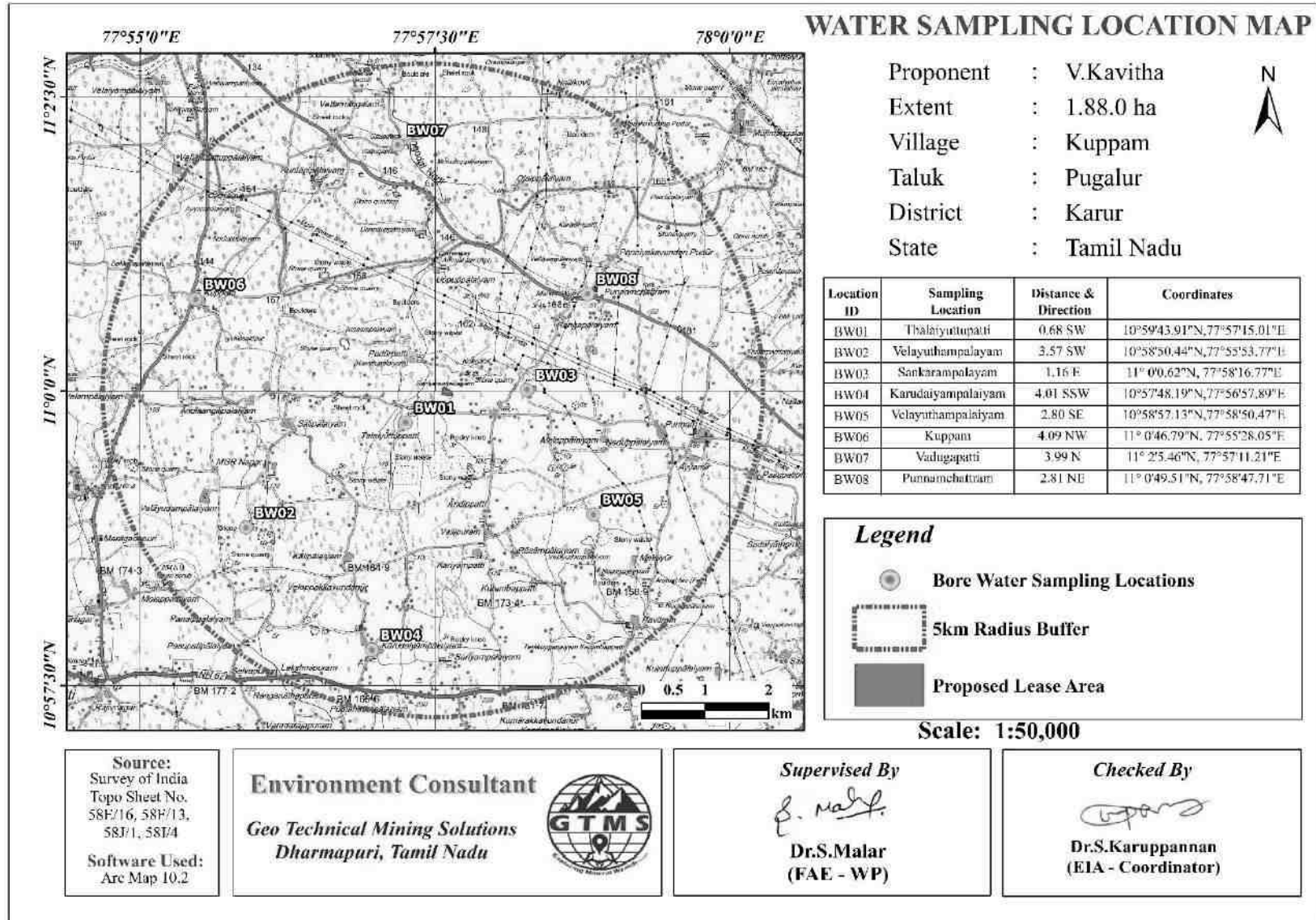


Figure 3.4 Toposheet Showing Water Sampling Locations within 5 km Radius around the Proposed Project Site

Table 3.7 Ground Water Sampling Quality Results

S. No.	Parameters	Units	Results								Standards as Per IS 10500: 2012	
			GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8	Acceptable limit	Permissible limit
I	Physical Parameters											
1	Color	Hazen	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	5	15
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity	NTU	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	1	5
4	EC @ 25°C	µs/cm	1250	1351	1193	648	1127	1453	1553	1153	Not specified	Not specified
5	TDS	mg/l	450	467	548	314	469	385	502	454	500	2000
II	Chemical Parameters											
6	pH@ 25°C	-	7.4	7.2	7.9	7.1	8.0	7.9	8.1	7.6	6.5 – 8.5	6.5 – 8.5
7	Total Hardness	mg/l	324	253	279	176	286	352	370	289	200	600
8	Calcium (Ca)	mg/l	39	46	34	42	54	63	52	40	75	200
9	Magnesium (Mg)	mg/l	16	25	23	26	41	32	44	27	30	100
10	Sodium (Na)	mg/l	176	136	232	113	172	154	265	111	50(WHO)	200
11	Potassium (K)	mg/l	05	01	07	04	06	09	10	04	12(WHO)	12
12	Bicarbonate (HCO ₃)	mg/l	341	231	156	243	356	351	360	194	50(WHO)	400
13	Sulphate (SO ₄)	mg/l	71	66	86	66	96	86	107	94	200	200
14	Chloride (Cl)	mg/l	312	311	234	123	282	323	405	350	250	1000
15	Nitrates (NO ₃)	mg/l	11	39	10	22	14	28	35	11	45	45
16	Fluoride (F)	mg/l	0.6	1.0	0.2	0.7	0.4	0.9	0.6	0.7	1	1.5
III	Biological Parameters											
17	Total Coliform	MPN/ 100ml	-	-	-	-	-	-	-	-	Shall not be detectable in any 100 ml water	Shall not be detectable in any 100 ml water
18	E-Coli	MPN/ 100ml	-	-	-	-	-	-	-	-	Shall not be detectable in any 100 ml water	Shall not be detectable in any 100 ml water

* IS: 10500:2012-Drinking Water Standards; # within the permissible limit as per the WHO Standard. The water can be used for drinking purpose in the absence of alternate sources. Note: WW- Open well Water, BW – Bore well Water

3.2.5 Hydrogeological Studies

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

3.2.5.1 Groundwater Levels and Flow Direction

As the groundwater moves from the points of highest static groundwater elevation to the points of lowest static groundwater elevation under the influence of gravity, data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from October through December, 2021 (Post-Monsoon) and March through May -2022 (Pre-Monsoon) season. The dug well data thus collected onsite are provided in Tables 3.8 and 3.8a. According to the data, average depths to the static water table in open wells range from 14.4 to 17.2 m BGL in post monsoon and from 10.6 to 14.1 m BGL in pre monsoon.

The bore well data thus collected onsite are provided in Tables 3.9 and 3.9a. The average depths to static potentiometric surface in borewells for the period of March through Oct-2021 through Dec-2021 (Post Monsoon Season) is 63.4 to 70.7 m and for the period of March through May-2022 (Pre-Monsoon Season) is 62.3 to 67.3 m. The depths to static water table and potentiometric surface data were used to calculate static groundwater table and potentiometric surface elevations for open wells and borewells, respectively to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

The maps thus produced are shown in Figures 3.6-3.9. From the maps of groundwater flow direction, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 7 located in NW of the proposed project sites and that most of the borewell groundwater for the two monsoon seasons flows towards the bore well number 2 located in N of the proposed project sites. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

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

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2021	Nov-2021	Dec-2021	Average		
DW01	10.4	11.9	12.5	15.7	11°00'09.19"N	77°57'21.43"E
DW02	11.5	12.8	13.4	15.7	11°00'05.12"N	77°57'12.82"E
DW03	10.2	11.5	12.2	17.1	10°59'37.58"N	77°57'22.04"E
DW04	12.4	13.5	14.5	15.8	10°59'47.33"N	77°57'54.37"E
DW05	11.5	12.4	13.7	14.4	10°59'59.19"N	77°58'11.10"E
DW06	13.7	14.5	15.5	16	11°00'38.56"N	77°58'11.58"E
DW07	14.7	15.5	16.7	17.2	11°00'39.89"N	77°57'14.82"E
DW08	15.6	16.9	17.4	16.7	11°00'06.95"N	77°56'55.96"E
DW09	14.7	15.5	16.9	16.9	10°59'10.03"N	77°57'21.46"E

Source: Onsite monitoring data

Table 3.8a Pre-Monsoon Water Level of Dug Wells within 2 km Radius

Station Code	Depth to Static Water Table BGL(m)				Latitude	Longitude
	March -2022	April -2022	May-2022	Average		
DW01	9.5	10.9	11.5	10.6	11° 0'9.19"N	77°57'21.43"E
DW02	10.5	11.7	12.5	11.5	11° 0'5.12"N	77°57'12.82"E
DW03	9.7	10.9	11.5	10.7	10°59'37.58"N	77°57'22.04"E
DW04	11.0	12.5	13.5	12.3	10°59'47.33"N	77°57'54.37"E
DW05	10.5	11.7	12.9	11.7	10°59'59.19"N	77°58'11.10"E
DW06	12.7	13.0	13.5	13.0	11° 0'38.56"N	77°58'11.58"E
DW07	13.0	14.5	15.0	14.1	11° 0'39.89"N	77°57'14.82"E
DW08	10.6	11.9	12.4	11.6	11° 0'6.95"N	77°56'55.96"E
DW09	12.7	13.5	14.5	13.5	10°59'10.03"N	77°57'21.46"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2021	Nov-2021	Dec-2021	Average		
BW01	67.2	68.5	69.7	68.4	11° 0'7.86"N	77°57'44.93"E
BW02	65.5	66.7	67.5	66.5	11° 0'24.89"N	77°57'24.02"E
BW03	66.2	77.2	68.9	70.7	11° 0'52.29"N	77°57'39.58"E
BW04	67.2	68.2	69.7	68.3	10°59'40.40"N	77°57'9.97"E
BW05	67	68	69.5	68.1	10°59'19.29"N	77°56'48.66"E
BW06	62.2	63.5	64.7	63.4	10°59'37.06"N	77°57'41.18"E
BW07	65.5	66.7	67.9	66.7	10°59'30.07"N	77°58'17.41"E
BW08	66.3	67.5	68.7	67.5	11° 0'0.72"N	77°56'48.56"E
BW09	67.5	68.9	69.7	68.7	10°59'2.18"N	77°57'43.38"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	March -2022	April-2022	May- 2022	Average		
BW01	65.0	66.5	67.0	66.1	11° 0'7.86"N	77°57'44.93"E
BW02	64.5	65.7	66.5	65.6	11° 0'24.89"N	77°57'24.02"E
BW03	65.0	66.2	67.5	66.2	11° 0'52.29"N	77°57'39.58"E
BW04	66.2	67.0	68.0	67.0	10°59'40.40"N	77°57'9.97"E
BW05	66.0	67.5	68.5	67.3	10°59'19.29"N	77°56'48.66"E
BW06	61.0	62.5	63.5	62.3	10°59'37.06"N	77°57'41.18"E
BW07	64.5	65.0	66.0	65.1	10°59'30.07"N	77°58'17.41"E
BW08	65.3	66.5	67.5	66.4	11° 0'0.72"N	77°56'48.56"E
BW09	66.5	67.0	68.5	67.3	10°59'2.18"N	77°57'43.38"E

3.2.5.2 Electrical Resistivity Investigation

For understanding subsurface hydrogeological conditions geophysical investigation is carried out. The geophysical investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. Electric resistivity method is one of the well-known geophysical methods for delineating lateral as well vertical discontinuities in the resistivities of the earth’s subsurface layers. It is mainly applied to locate aquifers in the field of hydrogeology. The present study makes use of vertical electric sounding (VES) to delineate earth’s subsurface layers. The electrical resistivity investigation used four electrodes collinear set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference, as shown in Figures 3.5

3.2.5.3 Methodology and Data Acquisition

The present study uses Schlumberger array for making vertical electrical sounding measurements since it is least influenced by lateral inhomogeneities and is capable of providing higher depth of investigation. The main goal of the present study is to search the vertical inhomogeneities that is consistent with the measured data.

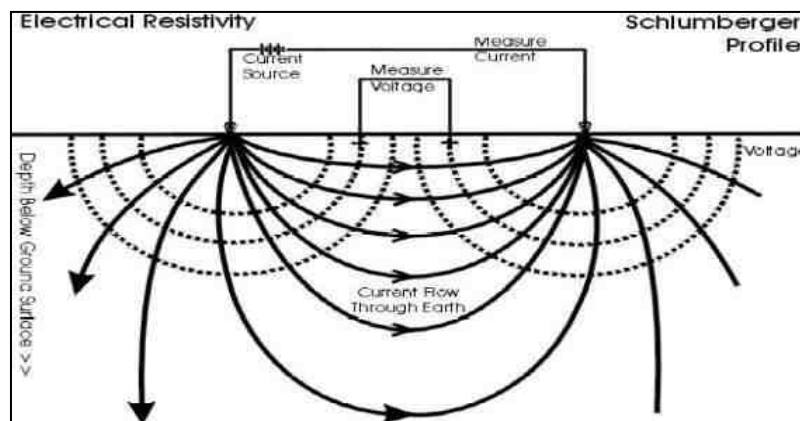


Figure 3.5 Principle of Electrical Resistivity Investigation

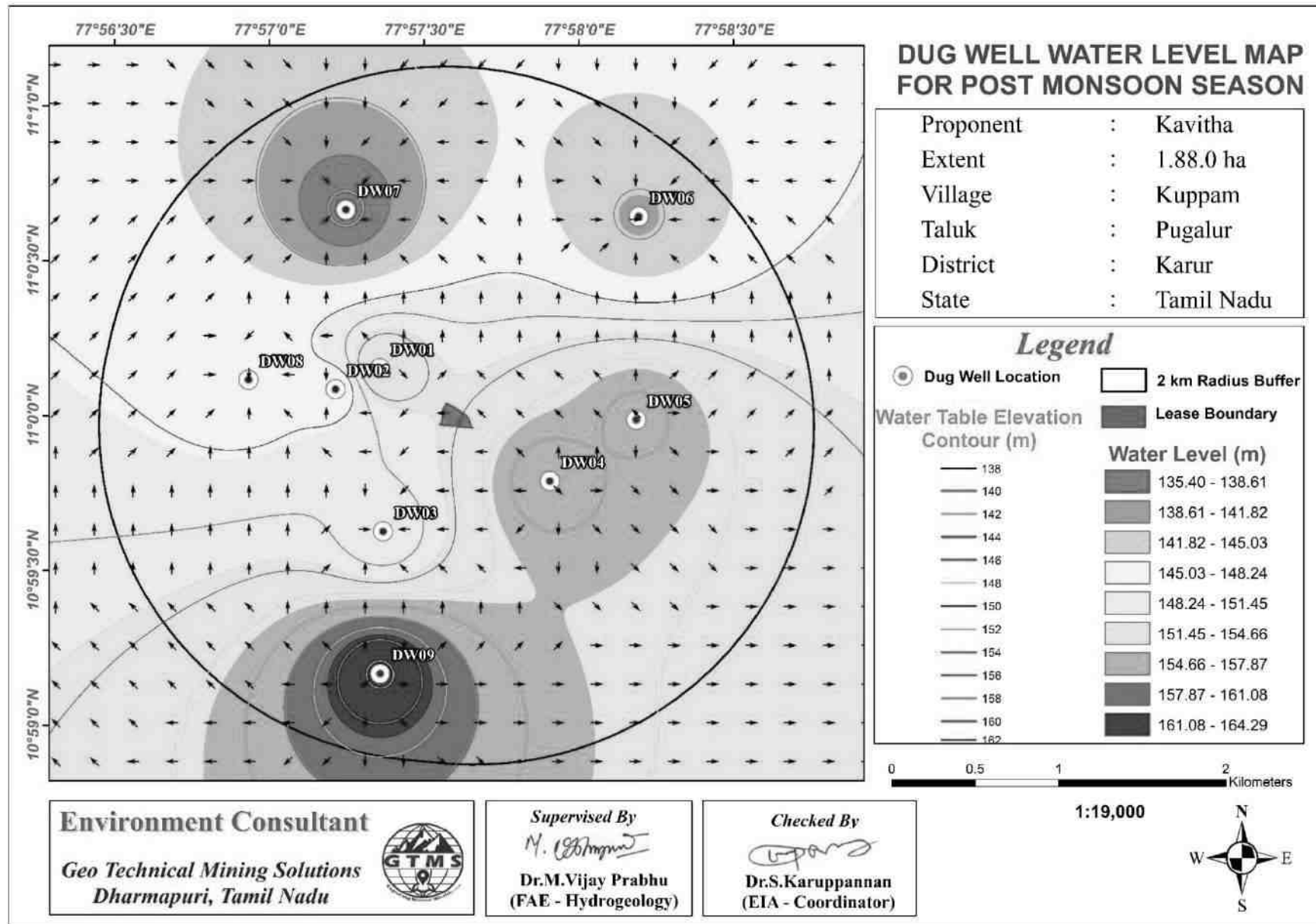


Figure 3.6 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Post-Monsoon Season

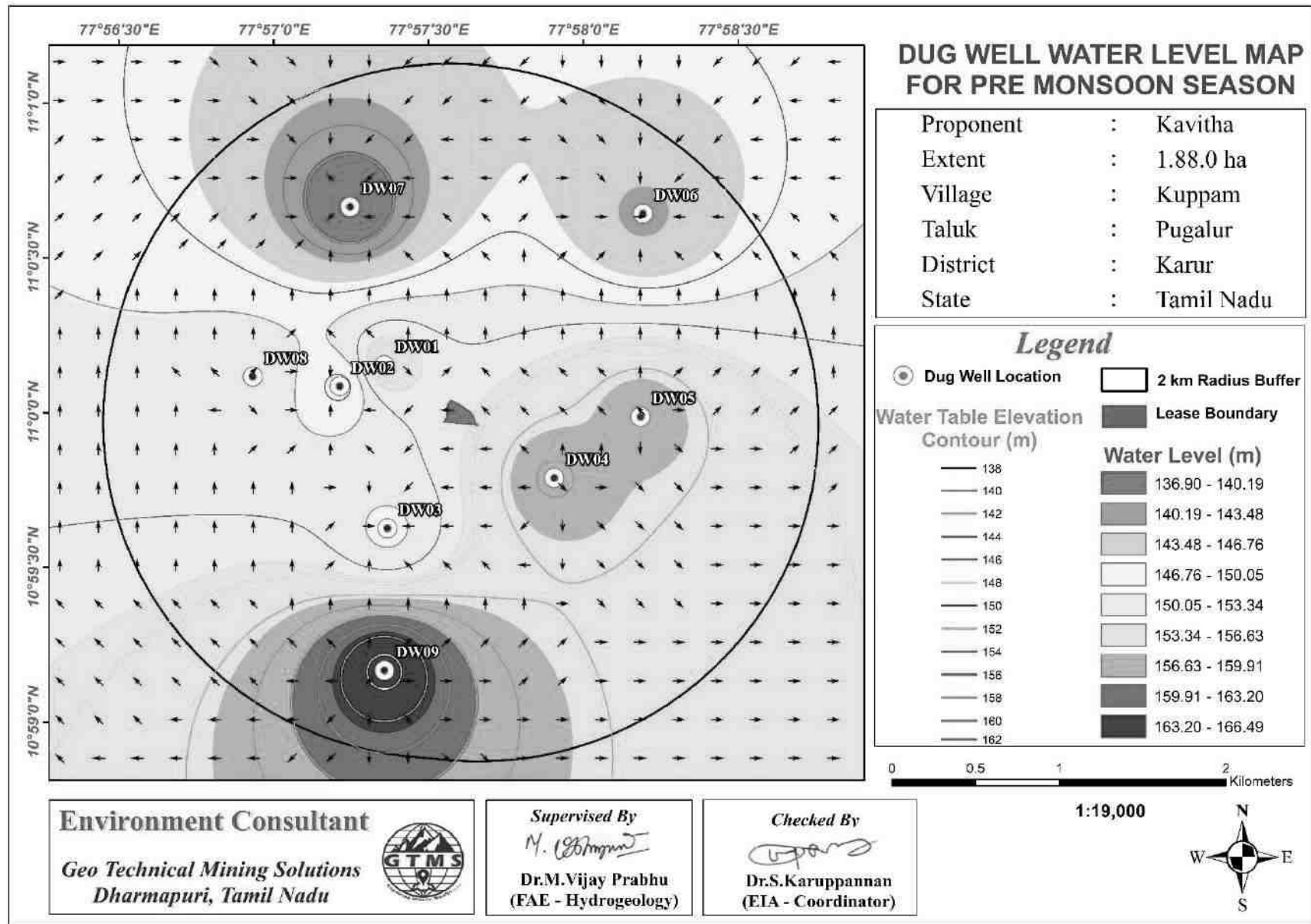


Figure 3.7 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Pre-Monsoon Season

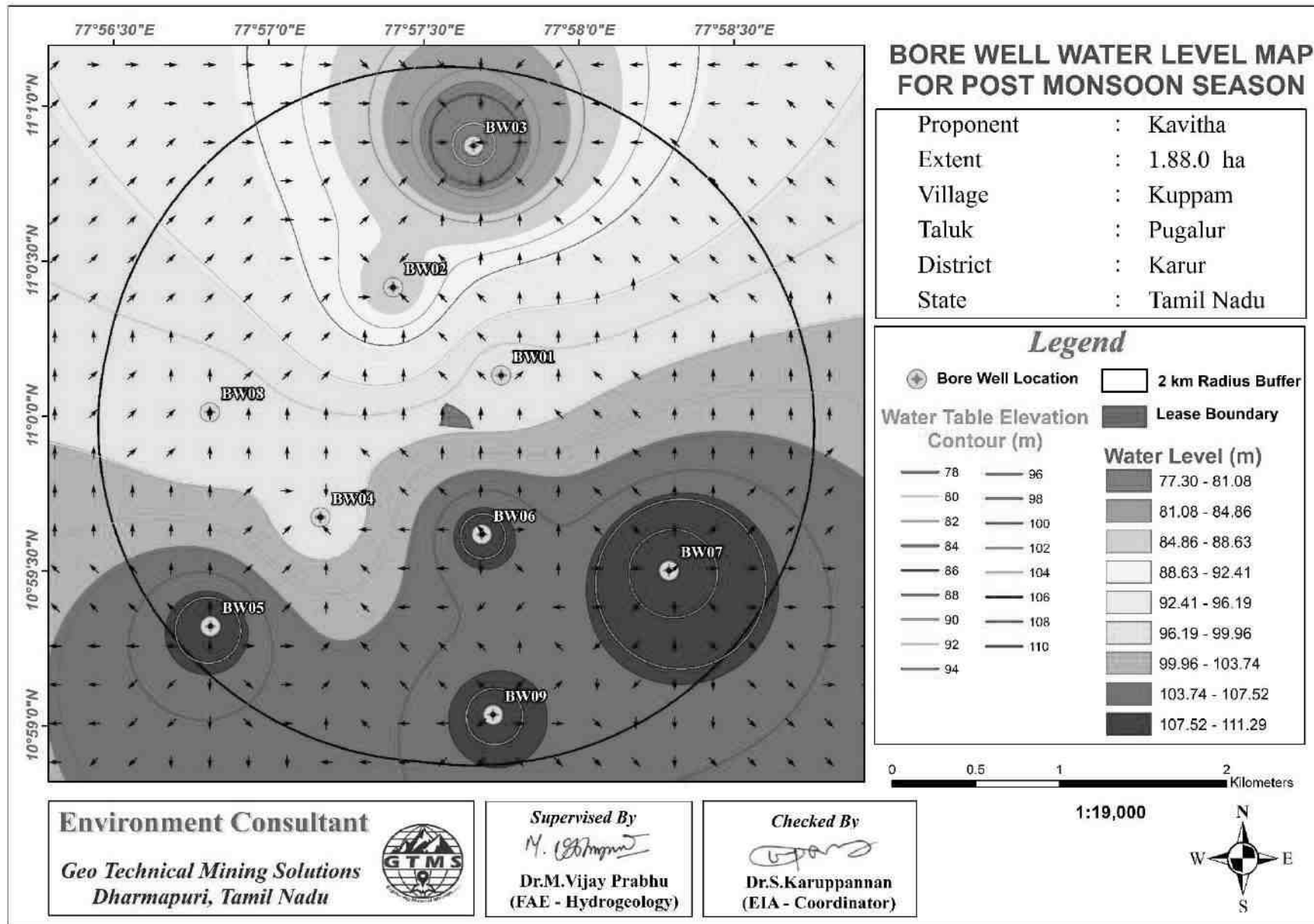


Figure 3.8 Bore Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Post-Monsoon Season

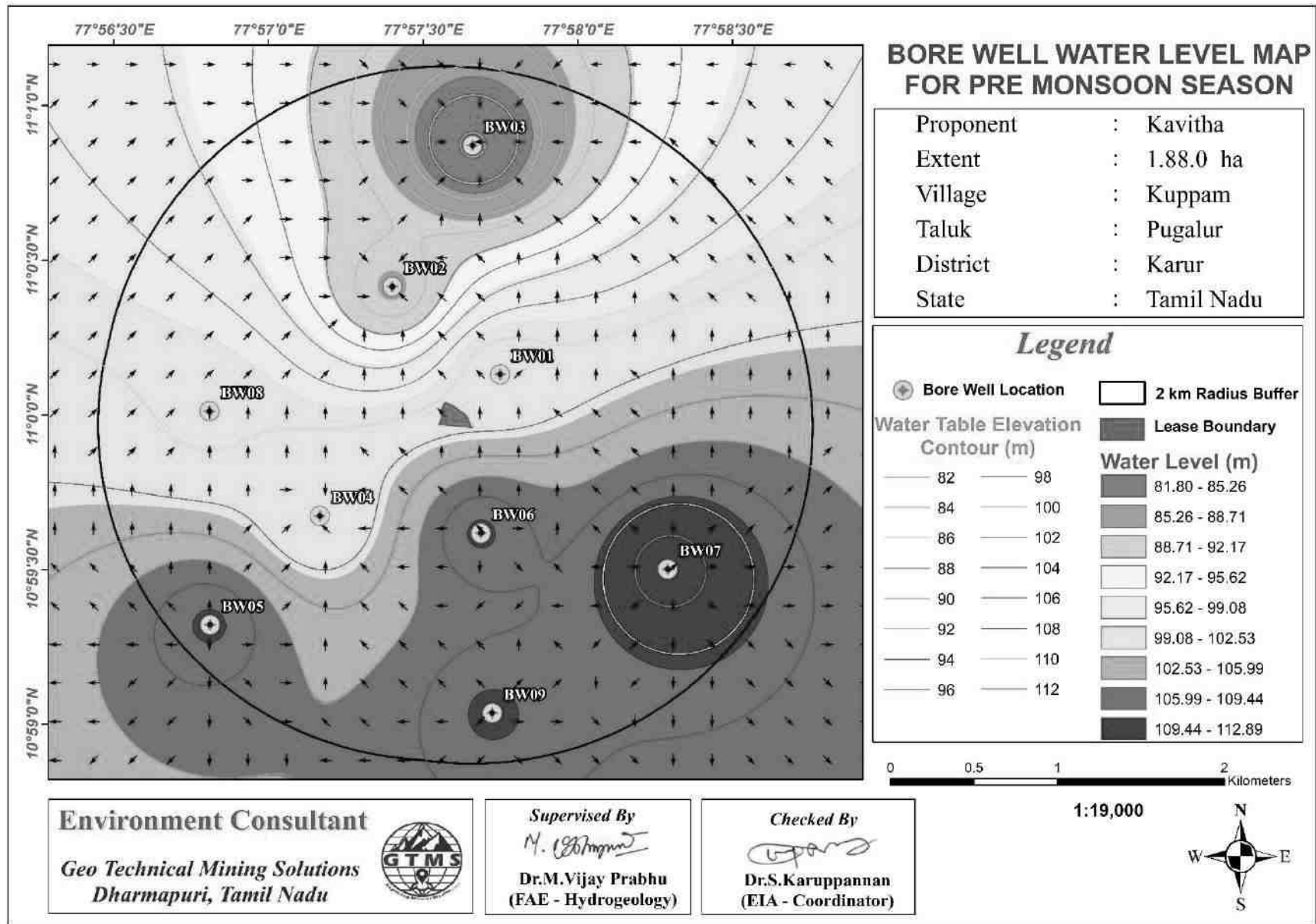


Figure 3.9 Bore Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Pre-Monsoon Season

The field equipment deployed for the study is a deep resistivity meter with a model of SSR – MP – ATS. This Signal Stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for earth resistivity measurements. For more information about the instrument, refer to the manufacturer’s manual.

3.2.5.4 Data Presentation

The Geophysical VES data obtained from the project site have been shown in Table 3.10. The field data obtained from a detailed geophysical investigation were plotted using EXCEL spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.10.

Table 3.10 Vertical Electrical Sounding Data

Location Coordinates - 10°59'58.08"N 77°57'28.56"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in Ω	Apparent Resistivity in Ωm
1	2	0.5	11.78	13.248	156
2	4	0.5	49.46	6.127	303
3	6	0.5	112.26	3.937	442
4	8	0.5	200.18	2.798	560
5	10	2	75.36	8.997	678
6	15	2	173.49	5.188	900
7	20	2	310.86	3.558	1106
8	25	2	487.49	2.603	1269
9	30	5	274.75	5.001	1374
10	35	5	376.80	3.883	1463
11	40	5	494.55	3.160	1563
12	45	5	628.00	2.683	1685
13	50	5	777.15	1.943	1510
14	60	10	549.50	2.915	1602
15	70	10	753.60	3.213	2421
16	80	10	989.10	2.651	2622
17	90	10	1256.00	2.196	2758
18	100	10	1554.30	1.846	2870

3.2.5.5 Geophysical Data Interpretation

The rock formation of low resistivity values indicates occurrence of water at the depth of about 55-60 m below ground level. The maximum depth proposed for the proposed project is 18 m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

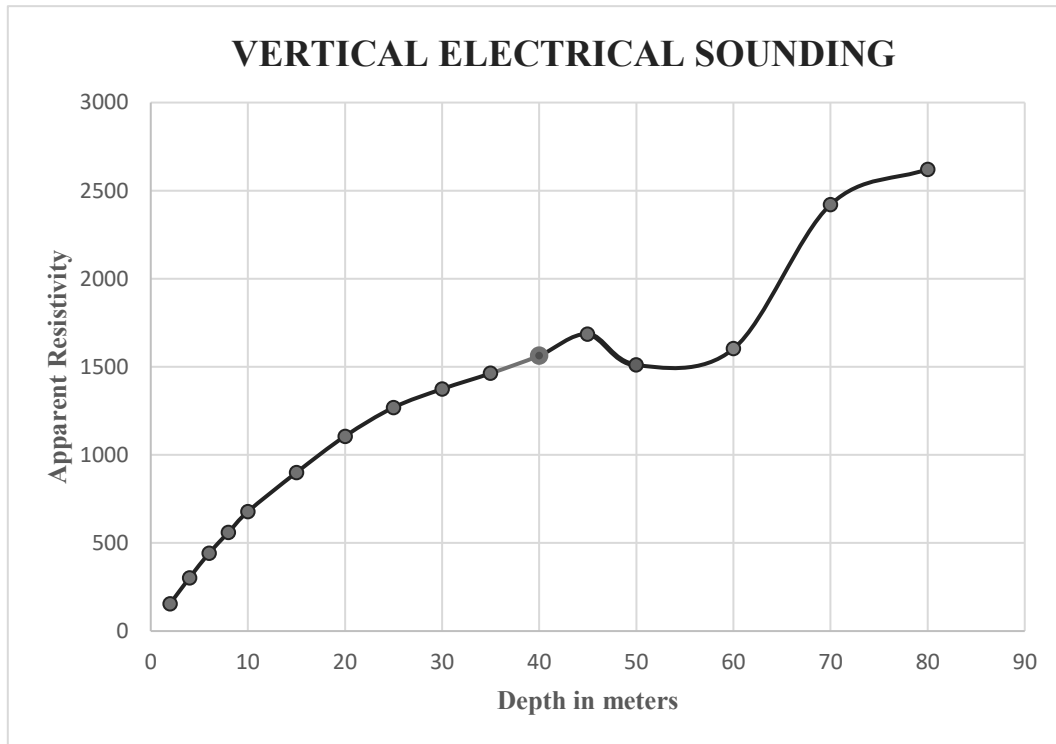


Figure 3.10 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth Range of 50 m Below Ground Level in Proposed Project

3.3 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality.

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 5 km radius around the cluster forms the baseline information. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed project in cluster.

This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

3.3.1 Meteorology

Meteorology is the key to understand the air quality. The essential relationship between meteorological condition and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time accomplish dispersion and strongly influence other processes associated with them. A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.11.

According to the onsite data, the temperature in October, 2021 varied from 21.48 to 32.81⁰C with the average of 26.21⁰C; in November, 2021 from 20.62 to 30.03⁰C with the average of 24.53⁰C; and in December, 2021 from 14.0 to 30.33⁰C with the average of 23.14⁰C. In October, 2021, relative humidity ranged from 52.12 to 98.31 % with the average of 83.78%; in November, 2021, from 60.25 to 99.88 % with the average of 89.74 %; and in December,2021, from 54.94 to 100 % with the average of 85.44 %. The wind speed in October, 2021 varied from 0.05 to 7.05 m/s with the average of 2.31 m/s; in November, 2021 from 0.08 to 7.75 m/s with the average of 2.52 m/s; and in December, 2021 from 0.07 to 6.66 m/s with the average of 2.75 m/s. In October,2021, wind direction varied from 0.07 to 358.30⁰ with the average of 183.04⁰; in November, 2021, from 0.70 to 359.62⁰ with the average of 168.01⁰; and in December, 2021, from 1.50 to 359.63⁰ with the average of 86.37⁰. In October,2021, surface pressure varied from 97.51 to 98.97 kPa with the average of 98.35 kPa; in November, 2021, from 97.53 to 98.88 kPa with the average of 98.39 kPa; and in December, 2022, from 98.30 to 99.26 kPa with the average of 98.80 kPa.

Table 3.11 Onsite Meteorological Data

S. No.	Parameters		OCT, 2021	NOV,2021	DEC,2021
1	Temperature (⁰ C)	Min	21.48	20.62	14.00
		Max	32.81	30.03	30.33
		Avg	26.21	24.53	23.14
2	Relative Humidity (%)	Min	52.12	60.25	54.94
		Max	98.31	99.88	100.00
		Avg	83.78	89.74	85.44
3	Wind Speed (m/s)	Min	0.05	0.08	0.07
		Max	7.05	7.75	6.66

		Avg	2.31	2.52	2.75
4	Wind	Min	0.00	0.70	1.50
	Direction (degree)	Max	358.30	359.62	359.63
		Avg	183.04	168.01	86.37
5	Surface Pressure(kPa)	Min	97.51	97.53	98.30
		Max	98.97	98.88	99.26
		Avg	98.35	98.39	98.80

Source: On-site monitoring/sampling by Ekdant Enviro Services in association with GTMS.

3.3.1.1 Climate

The Karur has a tropical climate. In winter, there is much less rainfall in summer in Karur. In Karur, the average annual temperature is 28.2 °C, 82.7 °F.

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 2021, shown in Figure 3.11. The Figure 3.11 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in September through November of 2021 is higher than the previous years.

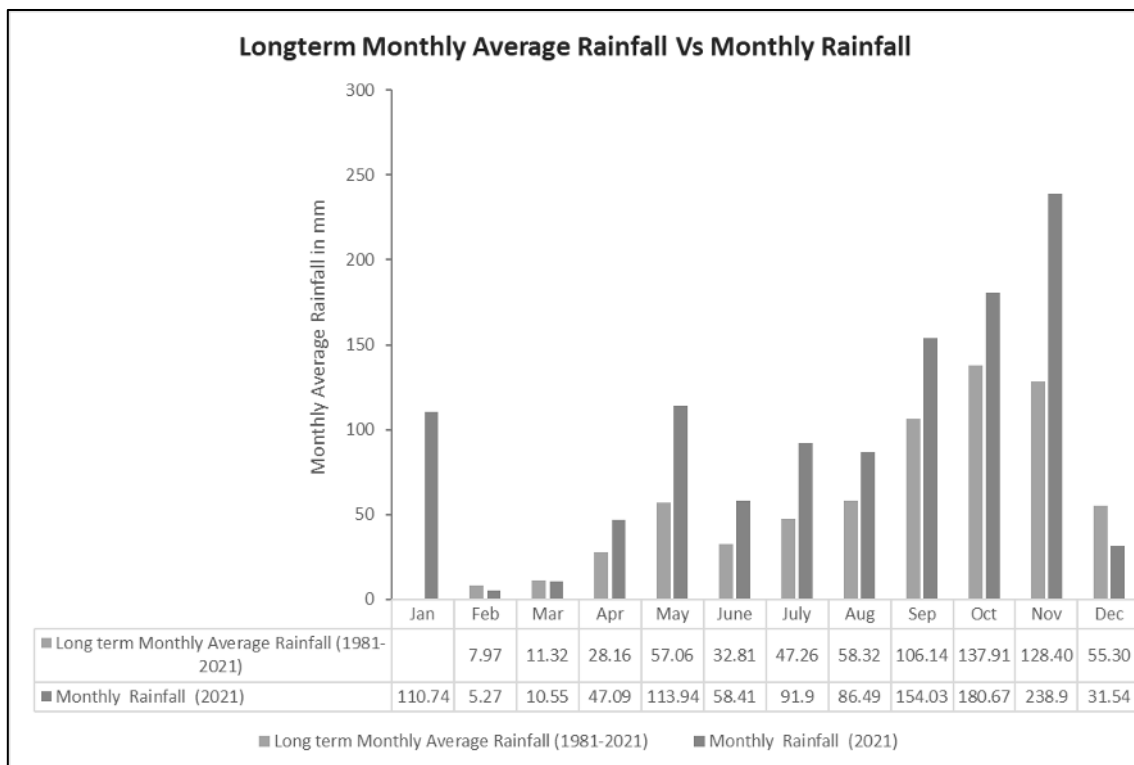


Figure 3.11 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.3.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of October through December of the years from 2017 to 2020 and the seasonal wind rose for the study period of October through December 2021. The wind rose diagrams thus produced are shown in Figures 3.12-3.12a. Figure 3.13 reveals that:

- ❖ The measured average wind velocity during the study period is 2.52m/s
- ❖ Predominant wind was dominant in the directions ranging from northeast to southwest.
- ❖ Representatives of regional background air quality for obtaining baseline status
- ❖ Location of residential areas representing different activities
- ❖ Accessibility and power availability

3.3.2 Methodology and Objectives

The prime objective of the ambient air quality study is to assess the existing air quality of the study area and its conformity to NAAQS. The observed sources of air pollution in the study area are industrial, traffic and domestic activities. The baseline status of the ambient air quality has been established 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

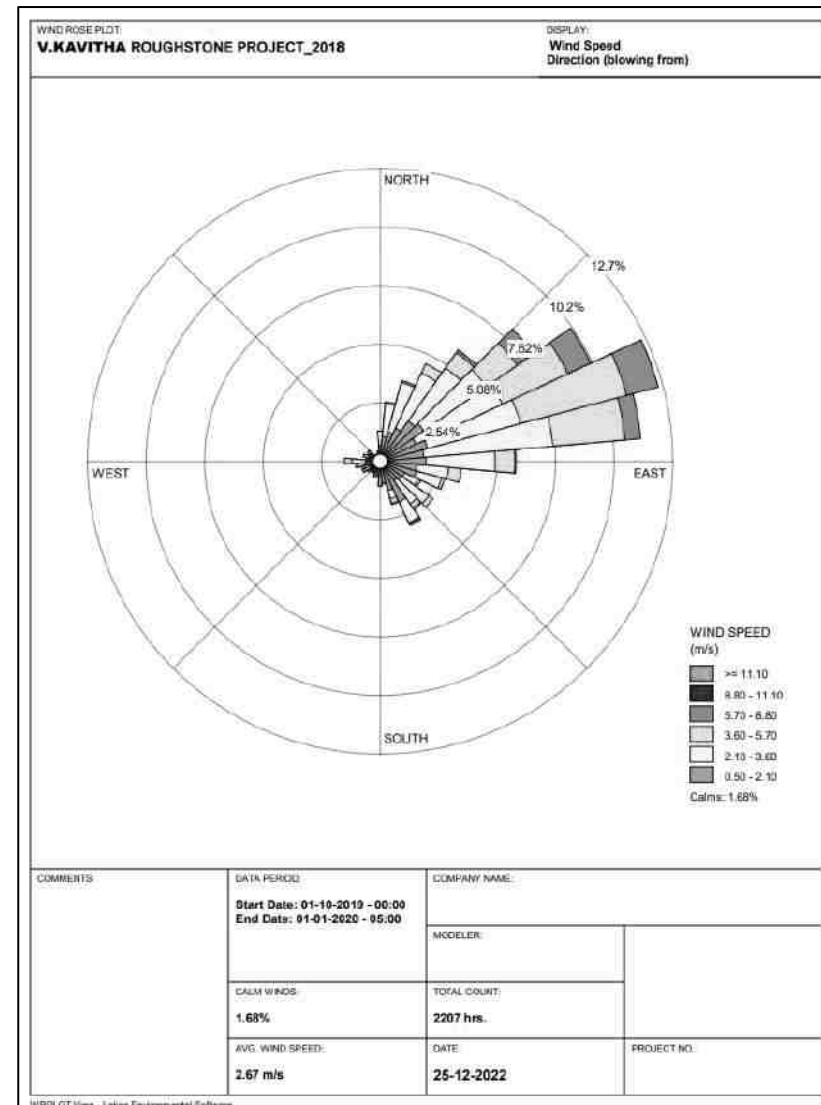
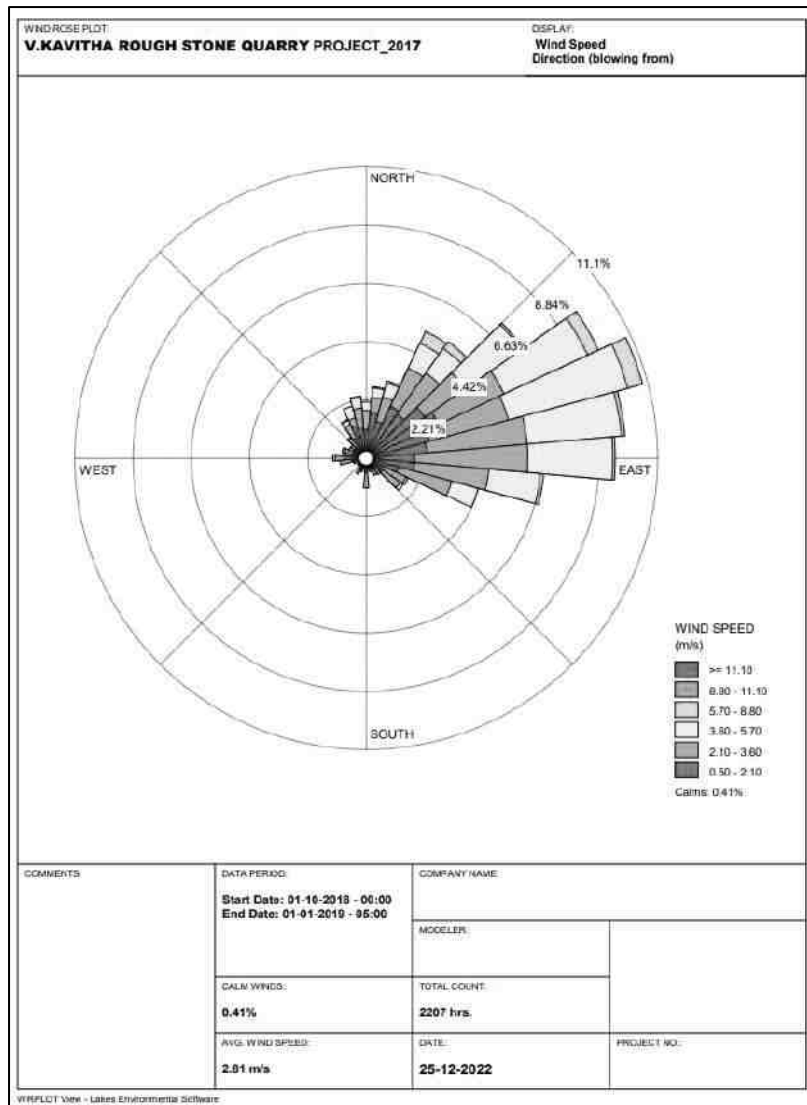


Figure 3.12 Windrose Diagram for 2017 and 2018 (October to December)

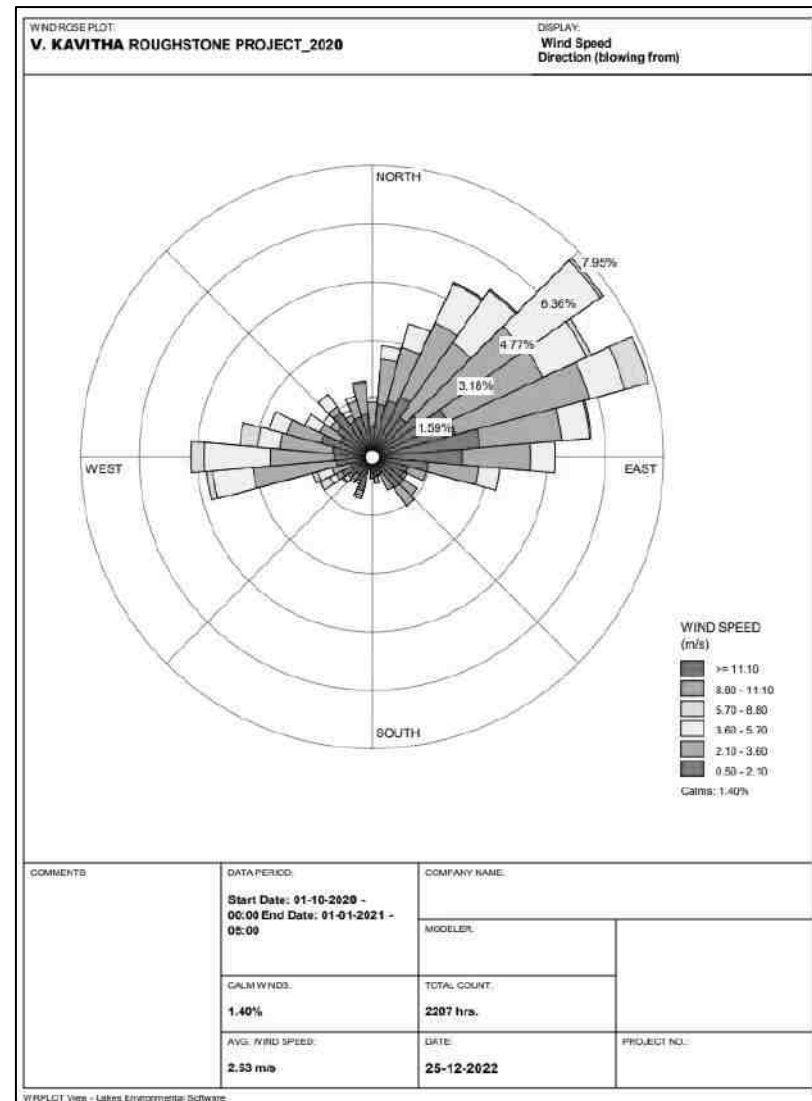
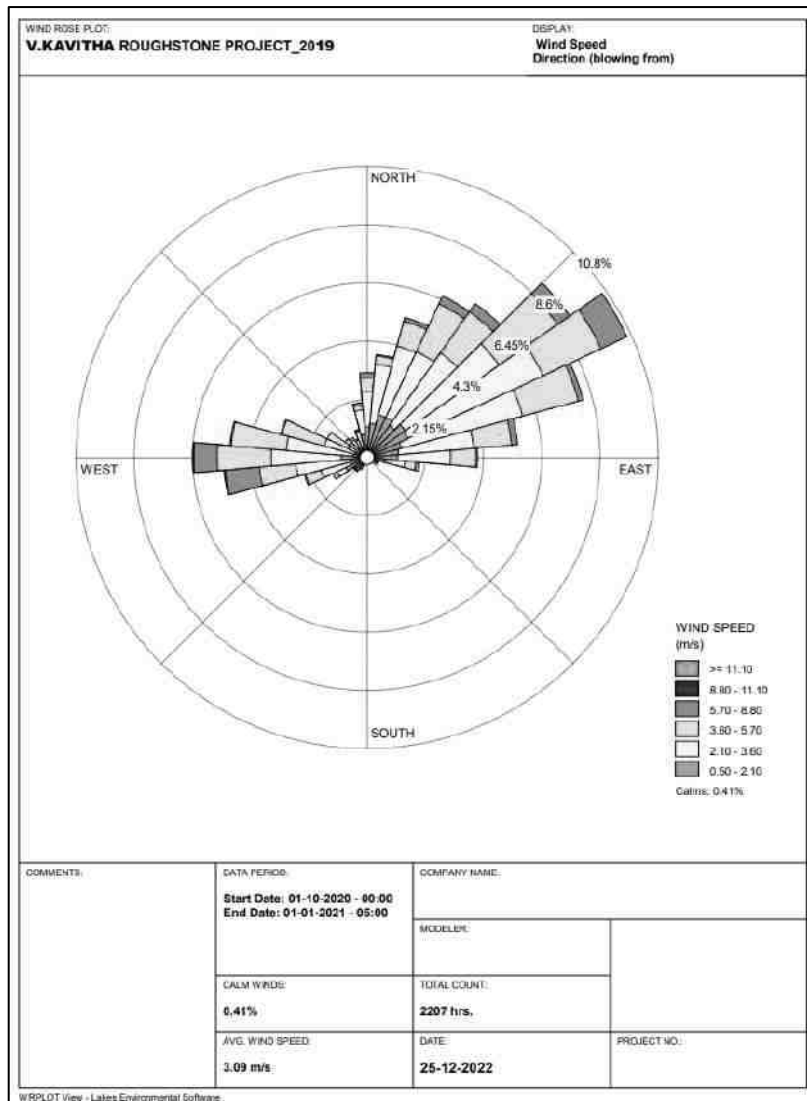


Figure 3.12(A) Windrose Diagram for 2019 and 2020 (October to December)

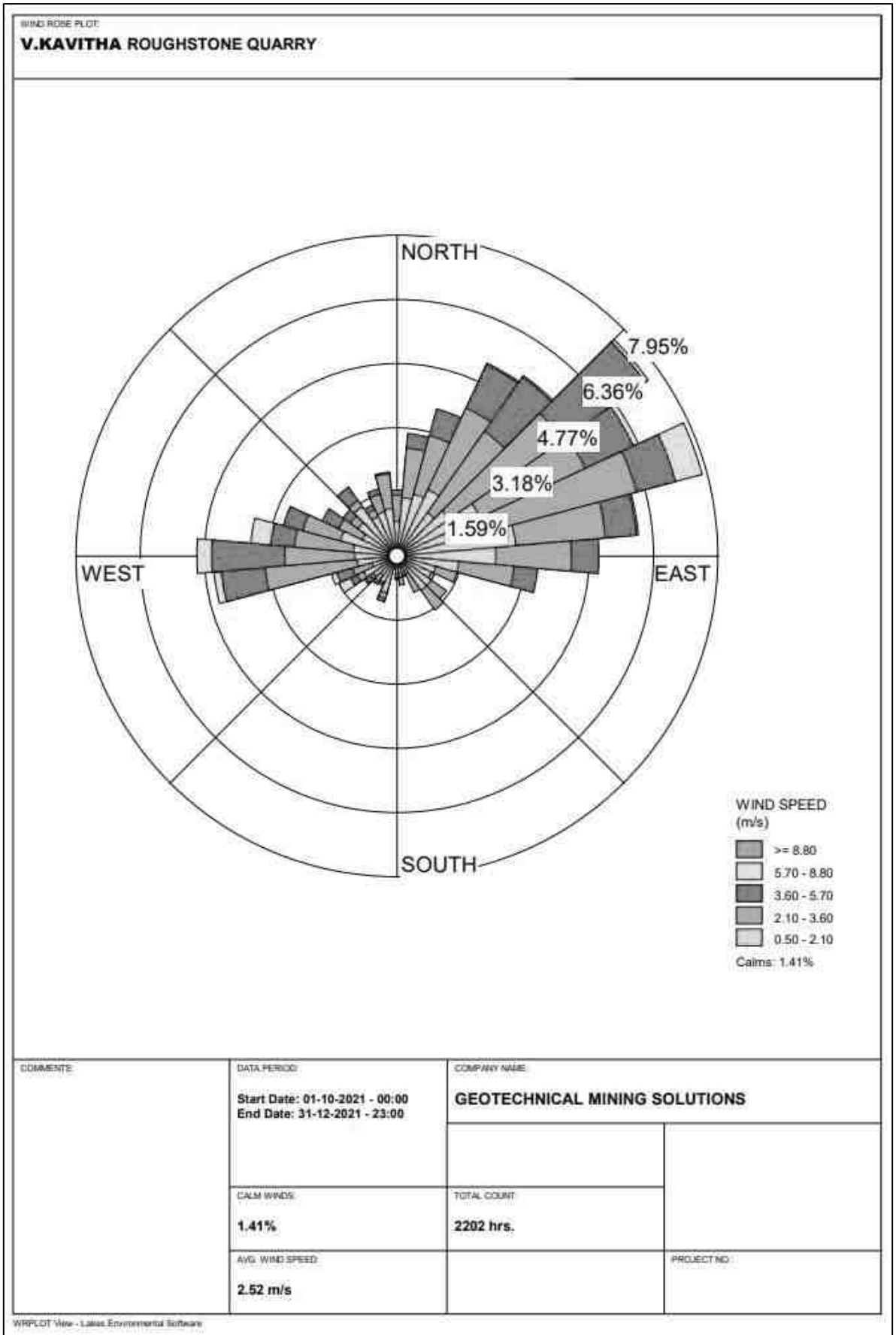


Figure 3.13 Onsite Wind Rose Diagram

3.3.3 Sampling and Analytical Techniques

Table 3.12 Methodology and Instrument Used for AAQ Analysis

Parameter	Method	Instrument
PM _{2.5}	Gravimetric method Beta attenuation method	Fine Particulate Sampler Make – Thermo Environmental Instruments – TEI 121
PM ₁₀	Gravimetric method Beta attenuation method	Respirable Dust Sampler Make –Thermo Environmental Instruments – TEI 108
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 on *Ekdant Enviro Services (P) Ltd & CPCB Notification*.

Table 3.13 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	Sulphur Dioxide (µg/m ³)	Annual Avg.*	50.0	20.0
		24 hours**	80.0	80.0
2	Nitrogen Dioxide (µg/m ³)	Annual Avg.	40.0	30.0
		24 hours	80.0	80.0
3	Particulate matter (size less than 10µm) PM10 (µg/m ³)	Annual Avg.	60.0	60.0
		24 hours	100.0	10°0
4	Particulate matter (size less than 2.5 µm) PM _{2.5} (µg/m ³)	Annual Avg.	40.0	40.0
		24 hours	60.0	60.0

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

3.3.4 Frequency and Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at eight locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October – December 2021. Monitoring has been carried out as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least $3 \pm 0.5\text{m}$ above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at dug space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

3.3.5 Ambient Air Quality Monitoring Stations

Eight monitoring stations were set up in the study area as depicted in Figure 3.14 for the assessment of the existing ambient air quality. The sampling locations and concentrations of air pollutants measured from the proposed project site have been given in Tables 3.14-3.16

Table 3.14 Ambient Air Quality (AAQ) Monitoring Locations

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates
1	AAQ-1	Core Zone	0.1	---	10°59'52.87"N 77°57'27.50"E
2	AAQ-2	Kuppam	4.0	NW	11°00'45.46"N 77°55'29.07"E
3	AAQ-3	Punnam Chatram	2.65	NE	11°00'49.36"N 77°58'49.56"E
4	AAQ-4	Thalaiyeethupatti	0.79	SW	10°59'43.30"N 77°57'11.78"E
5	AAQ-5	Salipalayam	2.40	SW	10°59'41.05"N 77°56'15.55"E
6	AAQ-6	Velayudampalayam	3.95	SW	10°59'05.85"N 77°55'33.22"E
7	AAQ-7	Karudaiyampalayam	4.15	S	10°57'46.42"N 77°56'59.02"E
8	AAQ-8	Punnam	3.80	E	10°59'37.59"N 77°59'41.83"E

Source: Sampling methodology based on Ekdant Enviro Services (P) Ltd & CPCB Notification.

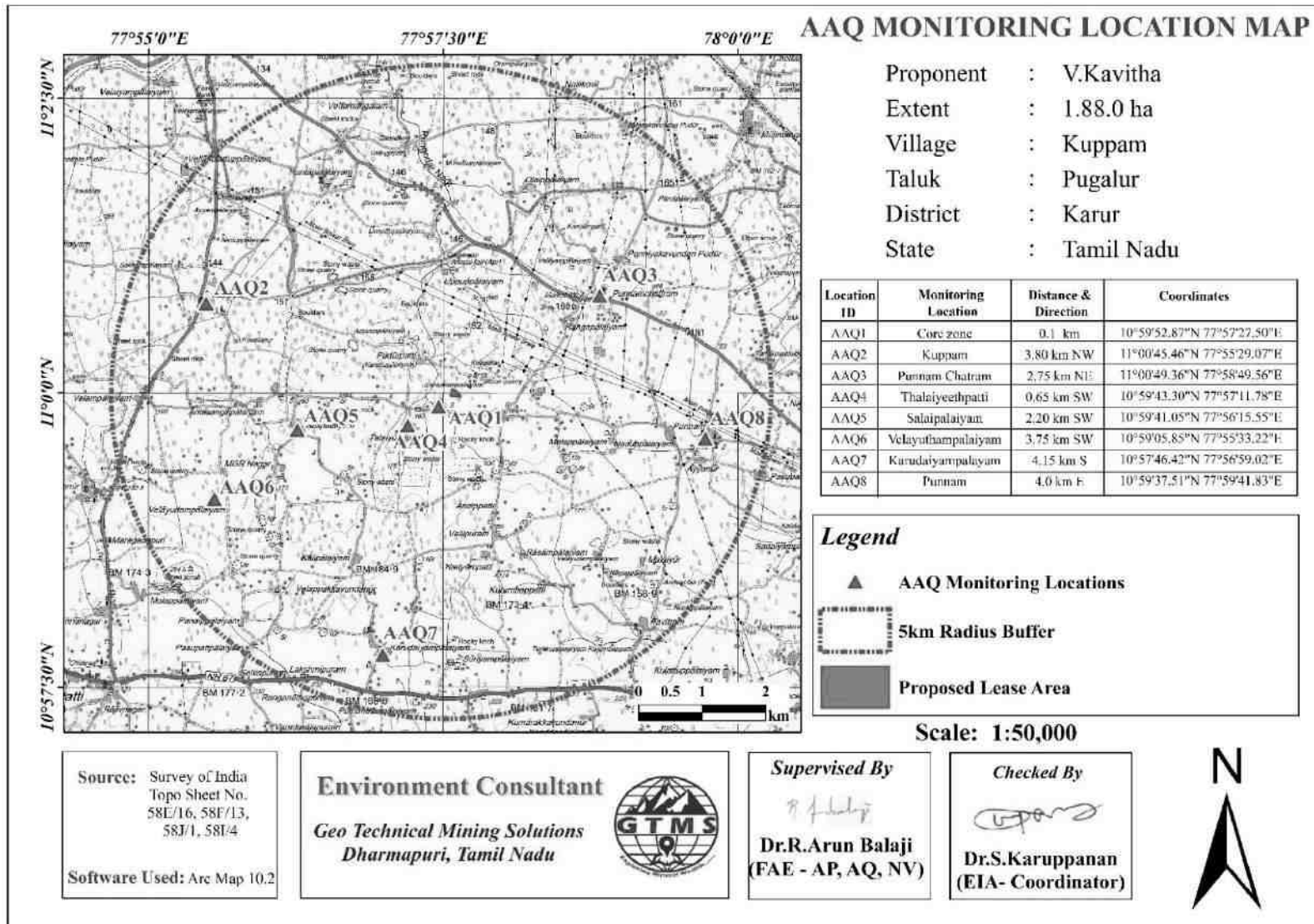


Figure 3.14 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from The Proposed Project Site

Table 3.15 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Min	Mean	98 th Percentile	Max	Min	Mean	98 th Percentile
AAQ1	25.6	22.5	23.95	25.55	47.9	43.1	45.19	47.85
AAQ2	21.9	18.2	20.02	21.55	41.7	38.2	40.00	41.60
AAQ3	26.7	24.1	25.25	26.65	47.9	45.2	46.74	47.80
AAQ4	22.9	19.8	20.96	22.60	43.9	40.2	41.98	43.40
AAQ5	23.7	21	22.14	23.65	45.8	42.2	43.74	45.71
AAQ6	21.6	18.1	19.34	21.23	42.8	38.7	41.02	42.75
AAQ7	24.3	22.1	23.07	24.08	45.9	43.2	44.98	45.90
AAQ8	21.9	19.5	20.67	21.86	43.9	40.1	41.50	43.75
SO ₂					NO ₂			
AAQ1	9.9	7.5	8.57	9.80	26.9	24.2	25.88	26.90
AAQ2	9.7	7.3	8.40	9.65	26.8	24.7	25.86	26.80
AAQ3	9.8	8.3	9.07	9.75	27.6	25.3	26.58	27.60
AAQ4	7.9	5.7	6.97	7.90	26.8	24.1	25.61	26.75
AAQ5	6.8	5.1	5.69	6.60	27.9	25.1	26.43	27.70
AAQ6	6.8	5.1	5.74	6.75	27.9	24.1	25.76	27.75
AAQ7	6.9	4.2	5.73	6.85	26.4	23.1	24.72	25.50
AAQ8	5.9	5.1	5.49	5.90	26.8	22.3	25.10	26.75

Table 3.16 Maximum, Minimum, Average and 98th Percentile of Average Air Pollutant Concentrations over the Study Area

S. No.	Parameter	Pollutant Concentration, µg/m ³			
		PM _{2.5}	PM ₁₀	SO ₂	NO ₂
1	Maximum	23.58	44.98	7.96	27.14
2	Minimum	20.66	41.36	6.04	24.11
3	Average	21.93	43.14	6.96	25.74
4	98 th percentile	23.40	44.85	7.90	26.97
5	NAAQ Norms	60	100	80	80

3.3.6 Results & Discussion

As per the monitoring data, PM_{2.5} ranges from 20.66 µg/m³ to 23.58 µg/m³; PM₁₀ from 41.36 µg/m³ to 44.98 µg/m³; SO₂ from 6.04 µg/m³ to 7.96 µg/m³; NO₂ from 24.11 µg/m³ to 27.14 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

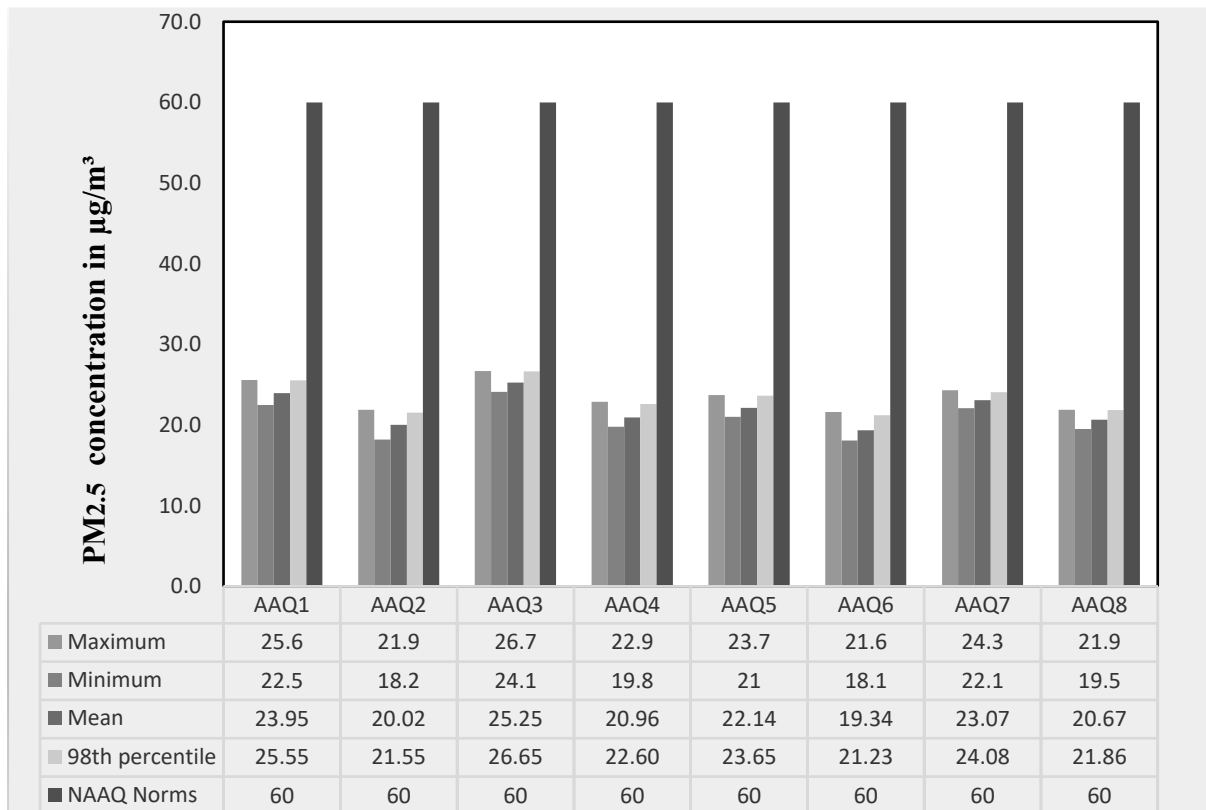


Figure 3.15 Maximum, Minimum, and the Average Concentrations of PM_{2.5} Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

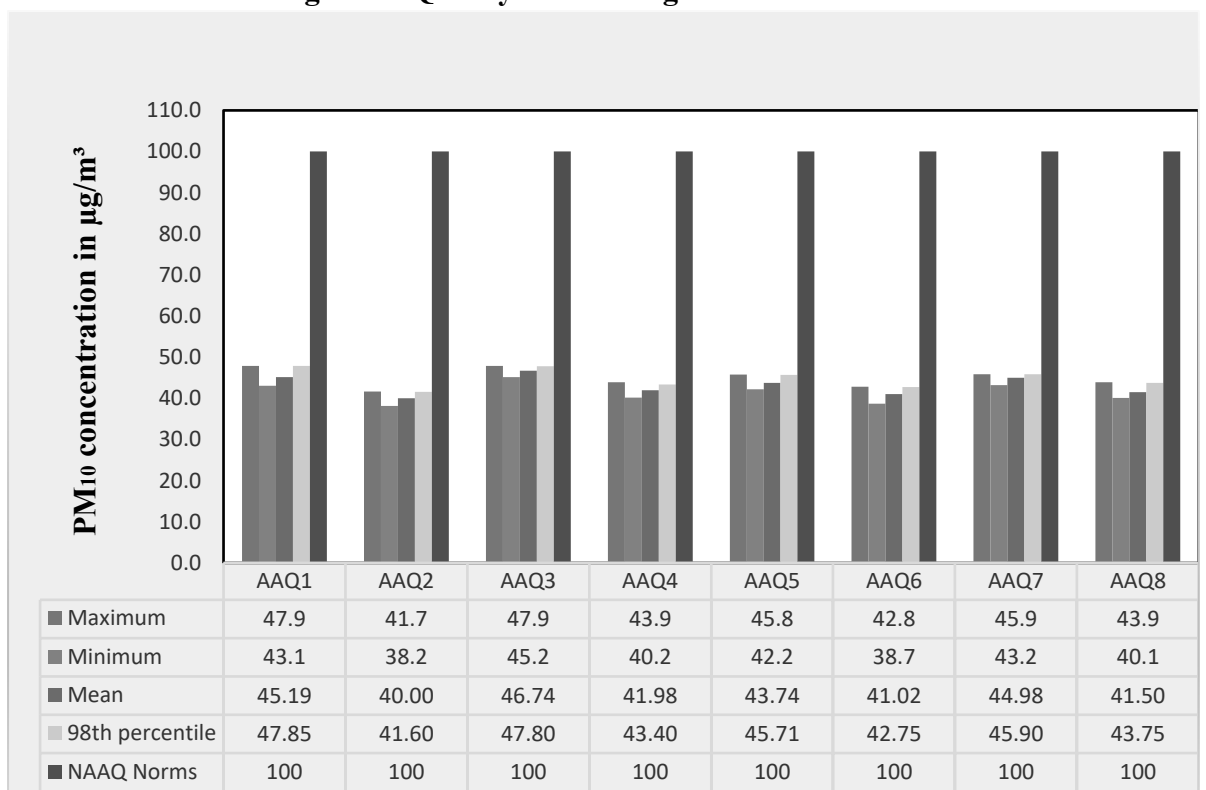


Figure 3.16 Maximum, Minimum, and the Average Concentrations of PM₁₀ Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

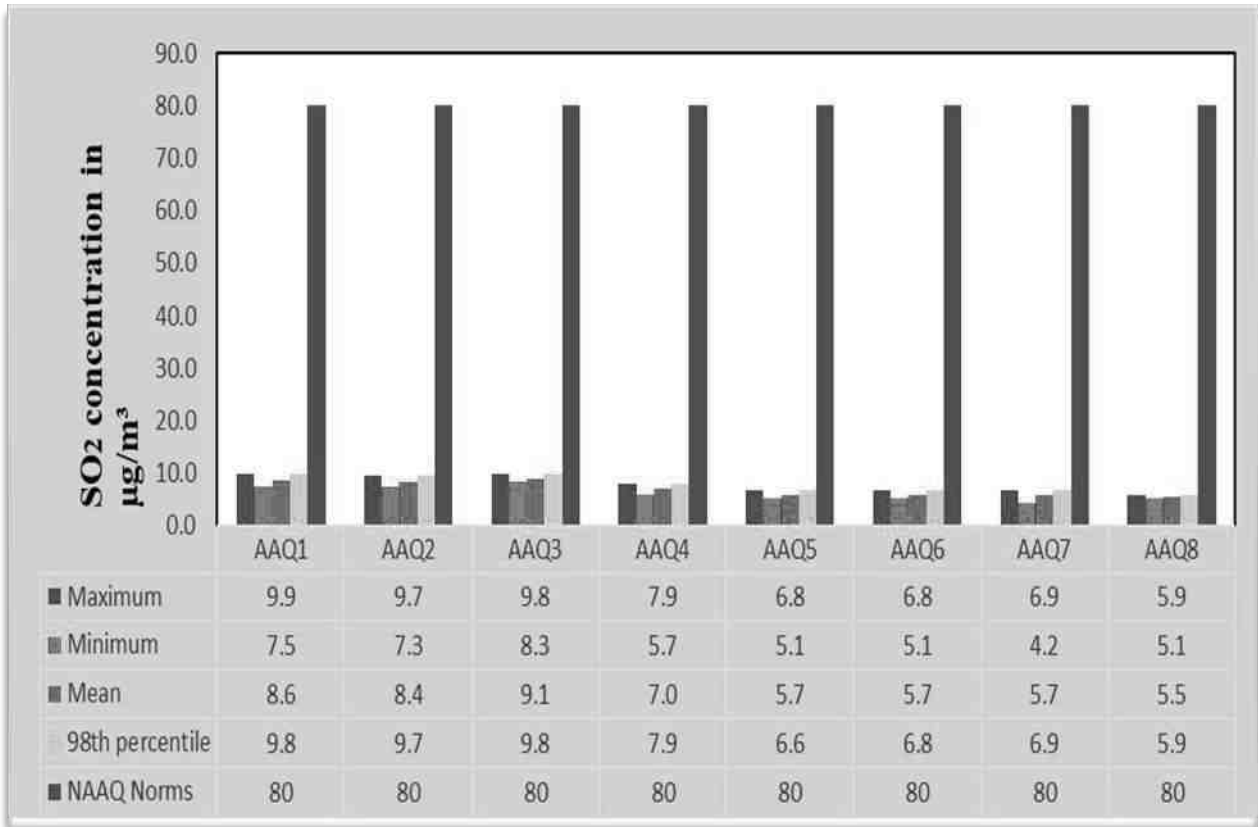


Figure 3.17 Maximum, Minimum, and the Average Concentrations of SO₂ Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

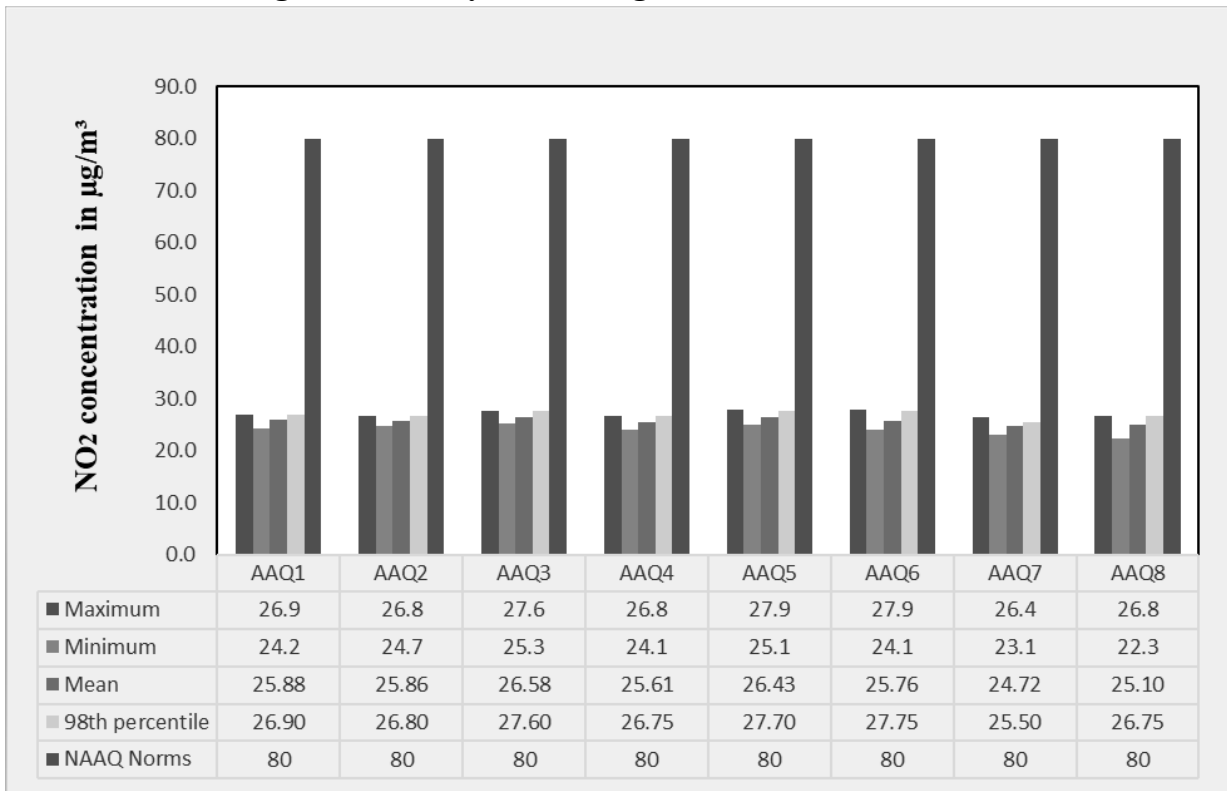


Figure 3.18 Maximum, Minimum, and the Average Concentrations of NO₂ Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

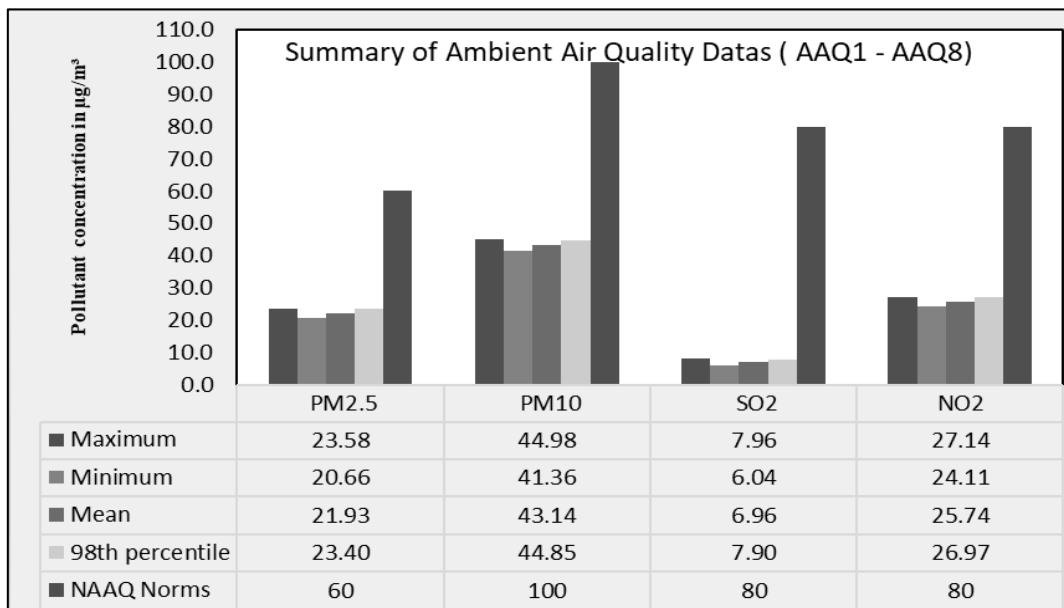


Figure 3.19 Maximum, Minimum, and the Average Concentrations of Pollutants in the Atmosphere within 5km Radius

3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area, the environmental assessment of noise from the mining activity and vehicular traffic can be undertaken by taking into consideration various factors like potential damage to hearing, physiological responses, and annoyance and general community responses.

The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site.

3.4.1 Identification of Sampling Locations

In order to assess the ambient noise levels within the study area, noise monitoring was carried out at eight (08) locations covering commercial, residential, rural areas within the radius of 5 km. A suitable noise monitoring methodology was chosen to meet the purpose and objectives of the study.

Table 3.17 Details of Noise Monitoring Locations

S. No.	Location ID	Monitoring Locations	Distance (km)	Direction	Coordinates
1	N-1	Core Zone	0.1	---	10°59'58.70"N 77°57'32.53"E
2	N-2	Nochikattur	0.31	NE	11° 00'8.51"N 77°57'44.28"E
3	N-3	Punnam Chatram	2.55	NE	11° 0'47.20"N 77°58'47.43"E
4	N-4	Thalaiyeethupatti	0.85	SW	10°59'40.57"N 77°57'11.05"E
5	N-5	Salipalaiyam	2.45	SW	10°59'38.75"N 77°56'14.16"E
6	N-6	Velayudampalaiyam	4.00	SW	10°59'04.38"N 77°55'32.94"E

7	N-7	Karudaiyampalaiyam	4.15	S	10°57'45.36"N77°56'57.76"E
8	N-8	Pavitram	4.60	SW	10°57'58.81"N77°59'12.69"E

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Ltd in association with GTMS

3.4.2 Method of Monitoring

Digital Sound Level Meter was used for the study. All reading was taken on the 'A-Weighting' frequency network at a height of 1.5 meters from ground level. The sound level meter does not give a steady and consistent reading and it is quite difficult to assess the actual sound level over the entire monitoring period. To mitigate this shortcoming, the Continuous Equivalent Sound level indicated by Leq, is used. Equivalent sound level, 'Leq', can be obtained from variable sound pressure level, 'L', over a time period by using following equation. The equivalent noise level is defined mathematically as below:

$$Leq = 10 \log L / T \sum (10L_n/10)$$

Where L = Sound pressure level at function of time dB (A), T = Time interval of observation

Measured noise levels, displayed as a function of time, is useful for describing the acoustical climate of the community. Noise levels recorded at each station with a time interval of about 60 minutes are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels.

3.4.3 Analysis of Ambient Noise Level in the Study Area

The Digital Sound pressure level has been measured by a sound level meter (Model: HTC SL-1352). An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in below Table 3.18.

Table 3.18 Ambient Noise Quality Result

S. No.	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time (6AM-10 PM)	Night Time (10 PM-6 AM)	
1	Core Zone	46.0	39.1	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Nochikattur	40.2	38.9	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
3	Punnam Chatram	46.8	36.9	
4	Thalaiyeethupatti	47.0	36.5	
5	Salipalaiyam	46.8	36.9	
6	Velayudampalaiyam	47.2	39.3	
7	Karudaiyampalaiyam	40.1	38.6	
8	Pavitram	46.3	38.5	

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Ltd in association with GTMS

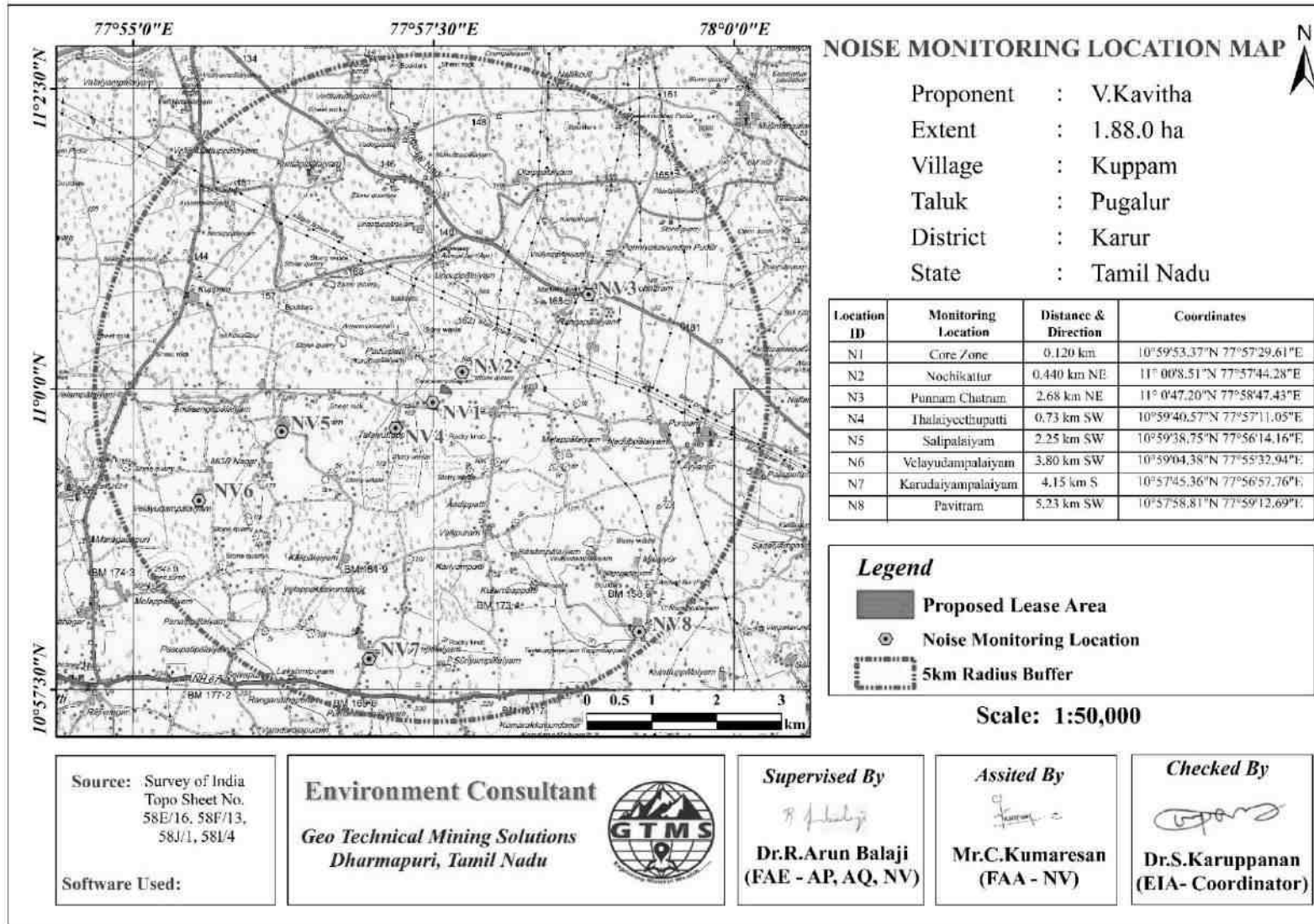


Figure 3.20 Toposheet Showing Noise Level Monitoring Station Locations around 5 km Radius from the Proposed Project Site

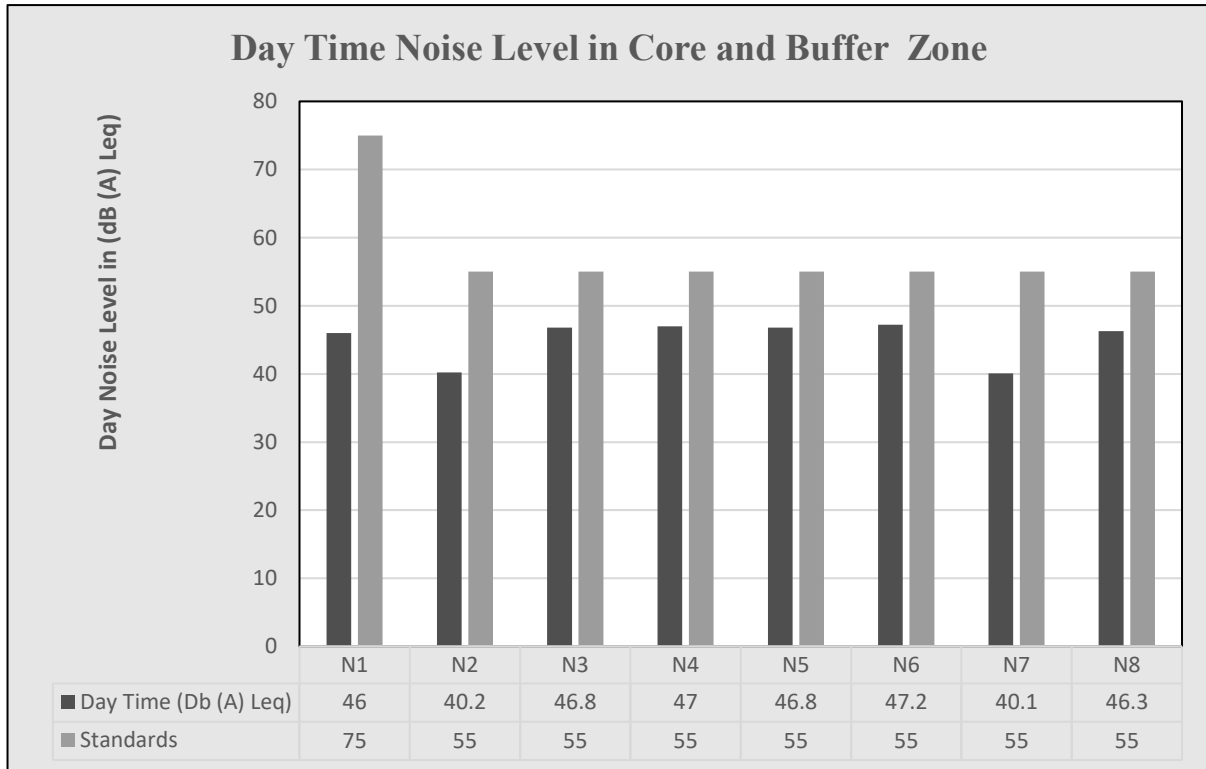


Figure 3.21 Day Time Noise Levels Measured in Core and Buffer Zones

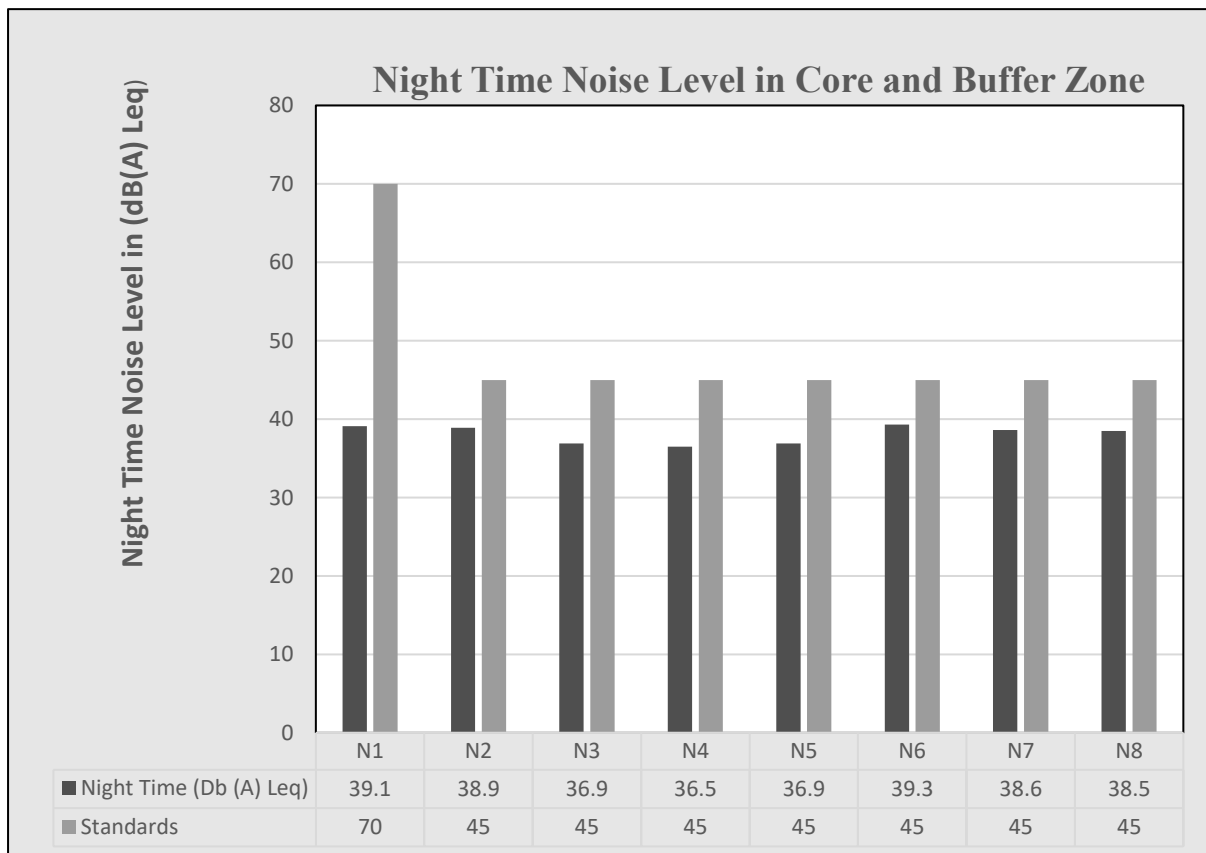


Figure 3.22 Night Time Noise Levels Measured in Core and Buffer Zones

3.4.4 Results & Discussion

Ambient noise levels were measured at 08 locations around the proposed project area. The noise level results in Table 3.18 show that noise levels in core zone was 46.0 dB (A) Leq. during day time and 39.1 dB (A) Leq. during night time and that noise levels in buffer zone varied from 40.1 to 47.2 dB (A) Leq. during day time and from 36.5 to 39.3 dB (A) Leq. during night time. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.5 BIOLOGICAL ENVIRONMENT

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

Methodology

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



Figure 3.23 Quadrates Sampling Methods of Flora

Phyto-Sociological Studies

Phyto sociological parameters, such as *Density, Frequency, Abundance and Importance Value Index* of individual species were determined in randomly placed quadrat of different sizes in the study area, as shown in Table 3.19. Relative frequency, and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, *Density, Frequency, Relative Density &*

Relative Frequency were found. Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 10 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

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

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

Shannon – Wiener Index, Evenness and Richness

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

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

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

3.5.1 Flora

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

Crop Patterns in Pugalur taluk

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

Flora in mine lease area

There are no trees in the quarry lease area. In the 7.5 m conservation area there are two species of *Albizia amara* and *Wrightia tinctoria*. They are protected from any impact during quarrying.

The Flora in 300 m radius zone

Vegetation species within mine lease area and 300 meters radius around the lease area. It is an arid landscape. There is no agricultural land nearby. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. Among them are 6 Trees (18%), 6 Shrubs (18%), 22 Herbs (64%). Details of flora with the scientific name and diversity of species, Richness index were mentioned in Tables 3.21-3.23 and figure 3.24. There is no threat to the Flora species in 300 meter radius.

Flora in 10 km radius buffer zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because nearby agriculture land was found to dominate mostly in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of species belonging to 38 families have been recorded from the buffer zone. Totally, 75 floral species were identified during the survey. Among them are 35 Trees (46%), 15 Shrubs (15%), 25 Herbs, Climbers, Creeper, Grass & Cactus (39%). Details of flora with the scientific name details of diversity species Richness index were mentioned in Tables 3.24-3.26 and Figure 3.24.

Table 3.21 Details of Flora within 300 m Radius

S.No.	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Tree													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4	3	5	0.8	60.0	1.3	17.4	15.8	33.2	Not Listed
2	Palm tree	<i>Borassus flabellifer</i>	Fabaceae	2	2	5	0.4	40.0	1.0	8.7	10.5	19.2	Not Listed
3	Vembu	<i>Azadirachta indica</i>	Meliaceae	4	4	5	0.8	80.0	1.0	17.4	21.1	38.4	Not Listed
4	Vealli vealan	<i>Vachellia leucophloea</i>	Babesiae	4	3	5	0.8	60.0	1.3	17.4	15.8	33.2	Not Listed
5	Unjai maram	<i>Albizia amara</i>	Fabaceae	5	4	5	1.0	80.0	1.3	21.7	21.1	42.8	Not Listed
6	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	4	3	5	0.8	60.0	1.3	17.4	15.8	33.2	Not Listed
Shrubs													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	6	5	10	0.6	50.0	1.2	15.8	15.6	31.4	Not Listed
2	Uumaththai	<i>Datura metel</i>	Solanaceae	7	6	10	0.7	60.0	1.2	18.4	18.8	37.2	Not Listed
3	Thuthi	<i>Abutilon indicum</i>	Meliaceae	5	4	10	0.5	40.0	1.3	13.2	12.5	25.7	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	8	7	10	0.8	70.0	1.1	21.1	21.9	42.9	Not Listed
5	Unichadi	<i>Lantana camara</i>	Verbenaceae	7	6	10	0.7	60.0	1.2	18.4	18.8	37.2	Not Listed
6	suraimullu	<i>Zizyphus Oenoplia</i>	Rhamnaceae	5	4	10	0.5	40.0	1.3	13.2	12.5	25.7	Not Listed
Herbs													

1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	
3	pill	<i>Cenchrus ciliaris</i>	Poaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
5	kapok bush	<i>Aerva javani</i>	Amaranthaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
6	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
7	Yanai neariji	<i>pedalium murex</i>	Pedaliaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
8	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
9	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
10	Umathai	<i>Datura metel</i>	Solanaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
11	Sethamutti	<i>Sida cordata</i>	Malvaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
12	Annam	<i>Iva annua</i>	Asteraceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
13	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
14	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
15	Ishappukol Vitai	<i>Plantago coronopus</i>	Plantaginaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
16	vealiparuthi	<i>Pergularia daemia</i>	Apocynaceae	9	8	15	0.6	53.3	1.1	6.0	6.3	12.3	Not Listed
17	Seppu nerinji	<i>Indigofera linnaei</i> Ali	Fabaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
18	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
19	Pal kodi	<i>Cynanchum viminalis</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
20	Ilia perandai	<i>Cissus rotundifolia</i>	Vitaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
21	Katralai	<i>Aloe vera</i>	Asphodelaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
22	Seammulli	<i>Barleria prionitis</i>	Acanthaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed

Table 3.22 Calculation of Species Diversity in 300 m radius

S.No	Common Name	Scientific Name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Tree						
1	Karuvealan	<i>Prosopis juliflora</i>	4	0.17	-1.75	-0.30
2	Palm tree	<i>Borassus flabellifer</i>	2	0.09	-2.44	-0.21
3	Vembu	<i>Azadirachta indica</i>	4	0.17	-1.75	-0.30
4	Vealli vealan	<i>Vachellia leucophloea</i>	4	0.17	-1.75	-0.30
5	Unjai maram	<i>Albizia amara</i>	5	0.22	-1.53	-0.33
6	Vetpalai	<i>Wrightia tinctoria</i>	4	0.17	-1.75	-0.30
H (Shannon Diversity Index) =1.76						
Shrubs						
1	Erukku	<i>Calotropis gigantea</i>	6	0.16	-1.85	-0.29
2	Umaththai	<i>Datura metel</i>	7	0.18	-1.69	-0.31
3	Thuthi	<i>Abutilon indicum</i>	5	0.13	-2.03	-0.27
4	Avarai	<i>Senna auriculata</i>	8	0.21	-1.56	-0.33
5	Unichadi	<i>Lantana camara</i>	7	0.18	-1.69	-0.31
6	suraimullu	<i>Zizyphus Oenopia</i>	5	0.13	-2.03	-0.27
H (Shannon Diversity Index) =1.78						
Herbs						
1	Nayuruv	<i>Achyranthes aspera</i>	5	0.03	-3.43	-0.11
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	7	0.05	-3.09	-0.14
3	pill	<i>Cenchrus ciliaris</i>	6	0.04	-3.25	-0.13
4	pulapoo	<i>Aerva lanata</i>	8	0.05	-2.96	-0.15
5	kapok bush	<i>Aerva javani</i>	5	0.03	-3.43	-0.11
6	Rail poondu	<i>Croton bonplandianus</i>	7	0.05	-3.09	-0.14
7	mookuthi poondu	<i>pedalium murex</i>	6	0.04	-3.25	-0.13
8	Perandai	<i>Cissus quadrangularis</i>	8	0.05	-2.96	-0.15
9	Thumbai chadi	<i>Leucas aspera</i>	6	0.04	-3.25	-0.13
10	Umathai	<i>Datura metel</i>	7	0.05	-3.09	-0.14
11	Sethamutti	<i>Sida cordata</i>	5	0.03	-3.43	-0.11
12	Annam	<i>Iva annua</i>	8	0.05	-2.96	-0.15
13	Kolunji	<i>Tephrosia purpurea</i>	6	0.04	-3.25	-0.13
14	Nayuruvi	<i>Achyranthes aspera</i>	7	0.05	-3.09	-0.14
15	Ishappukol Vitai	<i>Plantago coronopus</i>	8	0.05	-2.96	-0.15
16	vealiparuthi	<i>Pergularia daemia</i>	9	0.06	-2.84	-0.17
17	Seppu nerinji	<i>Indigofera linnaei</i> Ali	7	0.05	-3.09	-0.14
18	Sapathikalli	<i>Opuntia ficus-indica</i>	6	0.04	-3.25	-0.13
19	Pal kodi	<i>Cynanchum viminale</i>	7	0.05	-3.09	-0.14
20	Ilia perandai	<i>Cissus rotundifolia</i>	8	0.05	-2.96	-0.15
21	Katralai	<i>Aloe vera</i>	6	0.04	-3.25	-0.13
22	Seammulli	<i>Barleria prionitis</i>	7	0.05	-3.09	-0.14
H (Shannon Diversity Index) =3.12						

Table 3.23 Species Richness (Index) in 300 m radius

Details	H	H max	Evenness	Species Richness
Tree	1.76	1.79	0.98	1.59
Shrubs	1.78	1.79	0.99	1.37
Herbs	3.12	3.09	1.01	4.17

Table 3.24 Flora in Buffer Zone

S.No.	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Trees													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
2	Thekku	<i>Tectona grandis</i>	Verbenaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
3	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
5	Manga	<i>Mangifera indica</i>	Anacardiaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
7	Vadanarayani	<i>Delonix elata</i>	Fabaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
8	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
9	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
10	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
11	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
12	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
13	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
14	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
16	Navalmaram	<i>Syzygium cumini</i>	Myrtaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
18	Vazhaimaram	<i>Musa</i>	Musaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
19	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
20	Nelli	<i>Embllica officinalis</i>	Phyllanthaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed

21	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
22	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
23	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
24	Karungali	<i>Acacia sundra</i>	Legumes	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
25	Nochi	<i>Vitex negundo</i>	Lamiaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
26	Karimurungai	<i>Moringa olefera</i>	Moraginaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
28	Poovarasu	<i>Thespesia populnea</i>	Malvaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
29	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
30	Vilvam	<i>Aegle marmelos</i>	Rutaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
31	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
32	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
33	Koyya	<i>Psidium guajava</i>	Myrtaceae	4	3	10	0.4	30.0	1.3	2.9	2.9	5.7	Not Listed
34	Seethapazham	<i>Annona reticulata</i>	Annonaceae	5	4	10	0.5	40.0	1.3	3.6	3.8	7.4	Not Listed
35	Savukku	<i>Casuarina L.</i>	Casuarinaceae	3	2	10	0.3	20.0	1.5	2.1	1.9	4.0	Not Listed
Shrubs													
1	Avarai	<i>Senna auriculata</i>	Fabaceae	8	7	15	0.5	46.7	1.1	7.1	7.2	14.4	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	9	8	15	0.6	53.3	1.1	8.0	8.2	16.3	Not Listed
3	Puramuttai	<i>Chrozophora rottleri</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.4	5.2	10.5	Not Listed
4	Arali	<i>Nerium indicum</i>	Apocynaceae	9	8	15	0.6	53.3	1.1	8.0	8.2	16.3	Not Listed
5	Seemaigaththi	<i>Cassia alata</i>	Caesalpinaceae	7	6	15	0.5	40.0	1.2	6.3	6.2	12.4	Not Listed
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	8	7	15	0.5	46.7	1.1	7.1	7.2	14.4	Not Listed
7	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.4	5.2	10.5	Not Listed
8	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	7	6	15	0.5	40.0	1.2	6.3	6.2	12.4	Not Listed
9	Idlipoo	<i>xoracoc cinea</i>	Rubiaceae	8	7	15	0.5	46.7	1.1	7.1	7.2	14.4	Not Listed
10	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7	6	15	0.5	40.0	1.2	6.3	6.2	12.4	Not Listed
11	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae	6	5	15	0.4	33.3	1.2	5.4	5.2	10.5	Not Listed
12	Uumaththai	<i>Datura metel</i>	Solanaceae	8	7	15	0.5	46.7	1.1	7.1	7.2	14.4	Not Listed
13	Kundumani	<i>Abrus precatorius</i>	Fabaceae	7	6	15	0.5	40.0	1.2	6.3	6.2	12.4	Not Listed
14	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	9	8	15	0.6	53.3	1.1	8.0	8.2	16.3	Not Listed

15	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	7	6	15	0.5	40.0	1.2	6.3	6.2	12.4	Not Listed
Herbs&Climber &Creeper &Grasses													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	25	0.3	24.0	1.2	3.7	3.7	7.4	Not Listed
2	Veetukaayapoondur	<i>Tridax procumbens</i>	Asteraceae	6	5	25	0.2	20.0	1.2	3.2	3.1	6.3	Not Listed
3	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	5	4	25	0.2	16.0	1.3	2.7	2.5	5.1	Not Listed
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	9	8	25	0.4	32.0	1.1	4.8	4.9	9.7	Not Listed
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	8	7	25	0.3	28.0	1.1	4.3	4.3	8.5	Not Listed
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae	6	5	25	0.2	20.0	1.2	3.2	3.1	6.3	Not Listed
7	Thumbai	<i>Leucas aspera</i>	Lamiaceae	7	6	25	0.3	24.0	1.2	3.7	3.7	7.4	Not Listed
8	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	8	7	25	0.3	28.0	1.1	4.3	4.3	8.5	Not Listed
9	Partiniyam	<i>Parthenium hysterophorus</i>	Asteraceae	6	5	25	0.2	20.0	1.2	3.2	3.1	6.3	Not Listed
10	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	10	9	25	0.4	36.0	1.1	5.3	5.5	10.8	Not Listed
11	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	25	0.4	40.0	1.1	5.9	6.1	12.0	Not Listed
12	Thoiya keerai	<i>Digeria muricata</i>	Amaranthaceae	6	5	25	0.2	20.0	1.2	3.2	3.1	6.3	Not Listed
13	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	7	6	25	0.3	24.0	1.2	3.7	3.7	7.4	Not Listed
14	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	25	0.4	32.0	1.1	4.8	4.9	9.7	Not Listed
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	7	6	25	0.3	24.0	1.2	3.7	3.7	7.4	Not Listed
16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	8	7	25	0.3	28.0	1.1	4.3	4.3	8.5	Not Listed
17	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae	9	8	25	0.4	32.0	1.1	4.8	4.9	9.7	Not Listed
18	Sangupoo	<i>Clitoria ternatea</i>	Fabaceae	8	7	25	0.3	28.0	1.1	4.3	4.3	8.5	Not Listed
19	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	6	5	25	0.2	20.0	1.2	3.2	3.1	6.3	Not Listed
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	9	8	25	0.4	32.0	1.1	4.8	4.9	9.7	Not Listed
21	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae	7	6	25	0.3	24.0	1.2	3.7	3.7	7.4	Not Listed
22	mookuthi poondur	<i>Wedelia trilobata</i>	Asteraceae	8	7	25	0.3	28.0	1.1	4.3	4.3	8.5	Not Listed
23	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae	6	5	25	0.2	20.0	1.2	3.2	3.1	6.3	Not Listed
24	Musthakasu	<i>Kyllinga brevifolia</i>	Cyperaceae	8	7	25	0.3	28.0	1.1	4.3	4.3	8.5	Not Listed
25	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	7	6	25	0.3	24.0	1.2	3.7	3.7	7.4	Not Listed

Table 3.25 Calculation of Species Diversity in Buffer Zone

S.No.	Common Name	Scientific Name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Trees						
1	Vembu	<i>Azadirachta indica</i>	4	0.03	-3.56	-0.10
2	Thekku	<i>Tectona grandis</i>	3	0.02	-3.84	-0.08
3	Pongam oiltree	<i>Pongamia pinnata</i>	4	0.03	-3.56	-0.10
4	Thennai maram	<i>Cocos nucifera</i>	5	0.04	-3.33	-0.12
5	Manga	<i>Mangifera indica</i>	4	0.03	-3.56	-0.10
6	Puliyamaram	<i>Tamarindus indica</i>	3	0.02	-3.84	-0.08
7	Vadanarayani	<i>Delonix elata</i>	4	0.03	-3.56	-0.10
8	Thenpazham	<i>Muntingia calabura</i>	5	0.04	-3.33	-0.12
9	Punnai	<i>Calophyllu inophyllum</i>	3	0.02	-3.84	-0.08
10	Ilanthai	<i>Ziziphus jujubha</i>	4	0.03	-3.56	-0.10
11	Karuvelam	<i>Acacia nilotica</i>	5	0.04	-3.33	-0.12
12	Nettilinkam	<i>Polyalthia longifolia</i>	4	0.03	-3.56	-0.10
13	Arai nelli	<i>Phyllanthus acidus</i>	3	0.02	-3.84	-0.08
14	Panai maram	<i>Borassus flabellifer</i>	4	0.03	-3.56	-0.10
15	Sapota	<i>Manilkara zapota</i>	5	0.04	-3.33	-0.12
16	Navalmaram	<i>Sygygium cumini</i>	4	0.03	-3.56	-0.10
17	Alamaram	<i>Ficus benghalensis</i>	3	0.02	-3.84	-0.08
18	Vazhaimaram	<i>Musa</i>	5	0.04	-3.33	-0.12
19	Karuvelam maram	<i>Vachellia nilotica</i>	4	0.03	-3.56	-0.10
20	Nelli	<i>Emblica officinalis</i>	3	0.02	-3.84	-0.08
21	Eucalyptus	<i>Eucalyptus globules</i>	5	0.04	-3.33	-0.12
22	Maramalli	<i>Millingtonia hortensis</i>	4	0.03	-3.56	-0.10
23	Kuduka puli	<i>Pithecellobium dulce</i>	5	0.04	-3.33	-0.12
24	Karungali	<i>Acacia sundra</i>	4	0.03	-3.56	-0.10
25	Nochi	<i>Vitex negundo</i>	3	0.02	-3.84	-0.08
26	Karimurungai	<i>Moringa olefera</i>	5	0.04	-3.33	-0.12
27	Pappali maram	<i>Carica papaya L</i>	4	0.03	-3.56	-0.10
28	Poovarasu	<i>Thespesia populnea</i>	3	0.02	-3.84	-0.08
29	Arasanmaram	<i>Ficus religiosa</i>	4	0.03	-3.56	-0.10
30	Vilvam	<i>Aegle marmelos</i>	3	0.02	-3.84	-0.08
31	Nuna maram	<i>Morinda citrifolia</i>	4	0.03	-3.56	-0.10
32	Nettilingam	<i>Polyalthia longifolia</i>	5	0.04	-3.33	-0.12
33	Koyya	<i>Psidium guajava</i>	4	0.03	-3.56	-0.10
34	Seethapazham	<i>Annona reticulata</i>	5	0.04	-3.33	-0.12
35	Savukku	<i>Casuarina L.</i>	3	0.02	-3.84	-0.08
H (Shannon Diversity Index) =3.54						
Shrubs						
1	Avarai	<i>Senna auriculata</i>	8	0.07	-2.64	-0.19
2	Sundaika	<i>Solanum torvum</i>	9	0.08	-2.52	-0.20

3	Puramuttai	<i>Chrozophora rotleri</i>	6	0.05	-2.93	-0.16
4	Arali	<i>Nerium indicum</i>	9	0.08	-2.52	-0.20
5	Seemaigaththi	<i>Cassia alata</i>	7	0.06	-2.77	-0.17
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	8	0.07	-2.64	-0.19
7	Kattamanakku	<i>Jatropha curcas</i>	6	0.05	-2.93	-0.16
8	Chaturakalli	<i>Euphorbia antiquorum</i>	7	0.06	-2.77	-0.17
9	Idlipoo	<i>xoracoc cinea</i>	8	0.07	-2.64	-0.19
10	Thuthi	<i>Abutilon indicum</i>	7	0.06	-2.77	-0.17
11	Nithyakalyani	<i>Cathranthus roseus</i>	6	0.05	-2.93	-0.16
12	Uumaththai	<i>Datura metel</i>	8	0.07	-2.64	-0.19
13	Kundumani	<i>Abrus precatorius</i>	7	0.06	-2.77	-0.17
14	Erukku	<i>Calotropis gigantea</i>	9	0.08	-2.52	-0.20
15	Neermulli	<i>Hydrophila auriculata</i>	7	0.06	-2.77	-0.17

H (Shannon Diversity Index) =2.70

Herbs, Climber, Creeper &Grasses

1	Nayuruv	<i>Achyranthes aspera</i>	7	0.04	-3.29	-0.12
2	Veetukaayapoondu	<i>Tridax procumbens</i>	6	0.03	-3.44	-0.11
3	Mukkirattai	<i>Boerhaavia diffusa</i>	5	0.03	-3.63	-0.10
4	Kuppaimeni	<i>Acalypha indica</i>	9	0.05	-3.04	-0.15
5	Karisilanganni	<i>Eclipta prostrata</i>	8	0.04	-3.16	-0.13
6	Korai	<i>Cyperus rotundus</i>	6	0.03	-3.44	-0.11
7	Thumbai	<i>Leucas aspera</i>	7	0.04	-3.29	-0.12
8	Nai kadugu	<i>Celome viscosa</i>	8	0.04	-3.16	-0.13
9	Parttiniyam	<i>Parthenium hysterophorus</i>	6	0.03	-3.44	-0.11
10	Thulasi	<i>Ocimum tenuiflorum</i>	10	0.05	-2.93	-0.16
11	Arugampul	<i>Cynodon dactylon</i>	11	0.06	-2.84	-0.17
12	Thoiya keerai	<i>Digeria muricata</i>	6	0.03	-3.44	-0.11
13	Kovai	<i>Coccinia grandis</i>	7	0.04	-3.29	-0.12
14	Perandai	<i>Cissus quadrangularis</i>	9	0.05	-3.04	-0.15
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	7	0.04	-3.29	-0.12
16	Karkakartum	<i>Clitoria ternatea</i>	8	0.04	-3.16	-0.13
17	Kovakkai	<i>Trichosanthes dioica</i>	9	0.05	-3.04	-0.15
18	Sangupoo	<i>Clitoriaternatia</i>	8	0.04	-3.16	-0.13
19	Siru puladi	<i>Desmodium triflorum</i>	6	0.03	-3.44	-0.11
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	9	0.05	-3.04	-0.15
21	Thumattikai	<i>Cucumis callosus</i>	7	0.04	-3.29	-0.12
22	mookuthi poondu	<i>Wedelia trilobata</i>	8	0.04	-3.16	-0.13
23	Kattu kanchippul	<i>Apluda mutica</i>	6	0.03	-3.44	-0.11
24	Musthakasu	<i>Kyllinga brevifolia</i>	8	0.04	-3.16	-0.13
25	Nagathali	<i>Opuntia dillenii</i>	7	0.04	-3.29	-0.12

H (Shannon Diversity Index) =3.20

Table 3.26 Species Richness (Index) in Buffer Zone

Details	H	H max	Evenness	Species Richness
Tree	3.54	3.56	0.99	6.88
Shrubs	2.70	2.71	1.00	2.97
Herbs	3.20	3.22	0.99	4.58

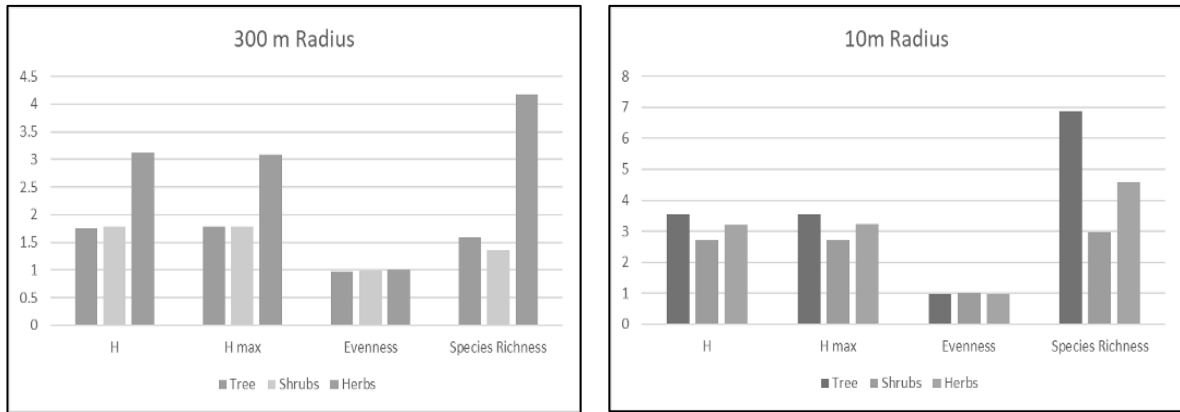


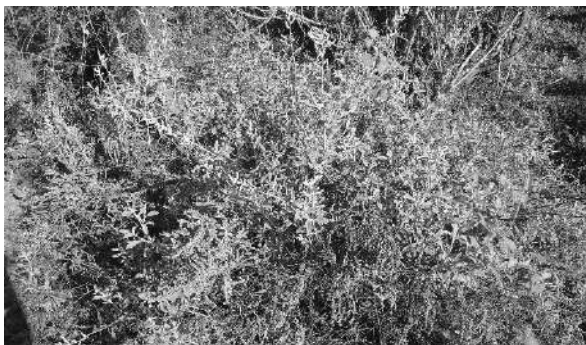
Figure 3.24 Floral Species Diversity and Richness (Index) in Buffer Zone and 300 m Radius



Albizia amara



Aerva lanata



Aerva javanica



Escontria chiotilla



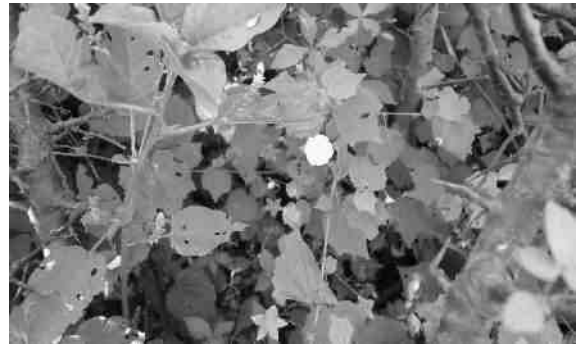
Datura metel



Leucas aspera



Calotropis gigantea



Sida cordata



Iva annua



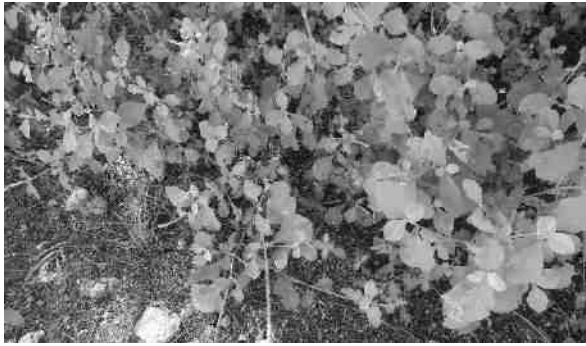
Cyanthillium cinereum



Tephrosia purpurea



Acalypha indica



Achyranthes aspera



Prosopis juliflora



Pergularia daemia



Plantago coronopus



Cenchrus polystachios



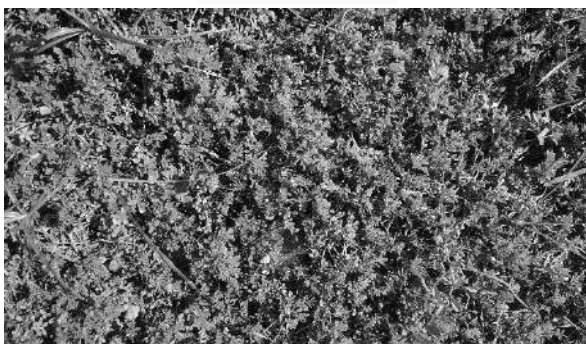
Vachellia leucophloea



Azadirachta indica



Indigofera linnaei Ali



Pedalium murex



Opuntia ficus-indica



Wrightia tinctoria



Cynanchum viminalis



Cissus rotundifolia



Borassus flabellifer



Casuarina



Zizyphus Oenoplia



Eucalyptus obliqua



Ailanthus excelsa



Aloe vera



Croton bonplandianus



Barleria prionitis

Figure 3.25 Photographs Showing Flora in Core and buffer Area

Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. The list of aquatic plants observed in the study area is given in Table 3.27

Table 3.27 Aquatic Vegetation

S.No.	Scientific name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Eichornia crassipe</i>	Water hyacinth	Agayatamarai	NA
2	<i>Aponogeton natans</i>	Floating lace plant	Kottikizhnagu	NA
3	<i>Carex cruciata</i>	Cross Grass	Koraipullu	NA
4	<i>Cynodon dactylon</i>	Scutch grass	Arugampul	LC

*LC- Least Concern, NA-Not yet assessed

Forest Vegetation

There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Thathampalayam R.F. located on 8.67 km South-eastern side of the lease area. There are few plants and no endangered species in Thampalayam reserve forest. the *Azadirachta indica*, *Vachellia leucophloea*, *albizia amara* these three types of plants are abundant in thampalayam reserve forest. the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive.

Endangered and endemic species as per the IUCN Red List

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

3.5.2 Fauna

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

Survey Methodology

The assessment of fauna was done on the basis of primary data collected from the lease area. The presence was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area. In addition, officials, local people were another source of information for studying the fauna of the area. Field activities are physical/active search, covering rocks, burrows, hollow inspection and location of nesting sites and habitat assessment etc. Taxonomical identification was done by the field guide book and wildlife ENVIS data base ([wiienvis.nic.in/Database/Schedule Species Database](http://wiienvis.nic.in/Database/Schedule%20Species%20Database)) and Zoological Survey of India (ZSI). Detailed fauna is mentioned in the Table 3.28 and 3.29

Survey and Monitoring of Mammals

Intensive survey has been done by line transect methods (Walking and in vehicle) for all major habitats for surveying of mammals by direct and indirect evidence. Indirect methods such as faecal matter (i.e., scat) and pug mark by establishing 10 × 100 m linear transects depending on the habitat (i.e., existing wildlife game routes/forest trails used). Direct observation technique has been used for surveying large and medium sized mammals. But this technique is perfectly suitable for surveying of diurnal mammals; however, good photographs were also taken for species identification.

Survey and Monitoring of Birds

Birds are sampled by using point count methods, and opportunistic bird sightings. By the bird vocal sounds and photographs, the species were identified in consultation with village local people. Point count: in these methods, the observer will stand in a randomly chosen point and birds seen or heard in 50 m radius are recorded for 5 min. This observation is repeated in another point at least 30m from the first point. We have enumerated 20-point counts in each quartile, which constitute a total of 80-point counts (20 x 4) within 10 km radius area. Opportunistic bird sightings: while traveling in study area, many bird species will be detected in survey time. Such species are recoded by their appearance or by their call.

Survey and monitoring of reptiles

Several survey techniques such as standard walk transect visual encounter survey methods were used to sampling reptiles in each and every habitat of the study area. While doing this survey, photographs were taken for identification of species. Species identification was done by using standard field guides in consultation with village people expert. The butterfly was enumerated by 2 linear transects of 10 × 100 m were laid within each quartile at minimum interval of 1 km. Further, amphibians and fishes documented in existing literature and secondary information in consultation with local people and wildlife experts.

Fauna in Core Zone

A total of 21 varieties of species observed in the Core zone Among them numbers of Insects 8 (41%), Reptiles 3 (14%), Mammals 1 (4%) and Avian 9 (41%). A total of 21 species belonging to 15 families have been recorded from the core zone. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and eight species are under schedule IV according to Indian wild life Act 1972. Eight bird species were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table 3.28.

Table 3.28 Fauna in Core Zone

S. No.	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
Insects					
1	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	NL	NL
2	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
3	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
4	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
5	Stick insect	Lonchodidae	<i>carausius morosus</i>	NL	LC
6	Mottled emigrant	Peridae	<i>Catopsilia pyranthe</i>	NL	LC
7	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	Acraea violae	Nymphalidae	<i>Acraea violae</i>	NL	LC
Reptiles					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
Mammals					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
Aves					
1	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
2	Koel	Cuculidae	<i>Eudynamys</i>	Schedule IV	LC
3	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
4	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
5	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
6	Koel	Cuculidae	<i>Eudynamys scolopaceus</i>	Schedule IV	LC
7	Crow Pheasant	Cuculidae	<i>Centropus sinensis</i>	Schedule IV	LC
8	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
9	Grey drongo	Dicruridae	<i>Dicrurus leucophaeus</i>	Schedule IV	LC

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

Fauna in Buffer Zone

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (40%), followed by Insects 15 (31%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed. List of fauna in the buffer zone is provided in Table 3.29.

Table 3.29 Fauna in Buffer Zone

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
Insects					
1	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
4	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
7	Lime butterfly	Papilionidae	<i>Papilio demoleus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
10	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
11	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
12	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
13	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
14	Lesser grass blue	Lycaenidae	<i>Zizina Otis indica</i>	Schedule IV	LC
15	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA
Reptiles					
16	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
17	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
18	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
19	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC

20	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
21	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
22	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
Mammals					
23	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
24	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
25	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
26	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
Aves					
27	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
28	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
29	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
30	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
31	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
32	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
33	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
34	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
35	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
36	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
37	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
38	Indian golden oriole	Oriolidae	<i>Oriolus kundoo</i>	Schedule IV	LC
39	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameria</i>	NL	LC
40	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
41	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
42	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
Amphibians					

45	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
46	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
47	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

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

Results

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

3.6 SOCIO-ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as features like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. It is expected that the socio-economic status of the area will substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of their standard of living.

3.6.1 Objectives of the Study

The objectives of the socio-economic study are as follows:

- ❖ To study the socio-economic status of the people living in the study area of the proposed mining project
- ❖ To assess the impact of the project on quality of life of the people in the study area
- ❖ To recommend community development measures to be taken up in the study area

3.6.2 Scope of Work

- ❖ To study the socio-economic environment of the area from the secondary sources
- ❖ Data Collection & Analysis

- ❖ Prediction of project impact
- ❖ Mitigation Measures

3.6.3 District Profile

Karur District consists of two Revenue Divisions viz., Karur and Kulithalai, Seven Taluks viz., Karur, Aravakurichi, Manmangalam, Pugalur, Kulithalai, Krishnarayapuram and Kadavur, comprising of 203 Revenue Villages. The District has Eight blocks viz. Karur, Thanthoni, Aravakurichi, K.Paramathi, Kulithalai, Krishnarayapuram, Kadavur, and Thogamalai comprising of 157 Village Panchayats. There are two Municipalities viz. Karur & Kulithalai and Eleven Town Panchayats viz. Aravakurichi, Krishnarayapuram, Marudur, Nangavaram, Palaya Jeyamkonda Cholapuram, Pallappatty, Puliur, Punjai Thottakurichi, Punjai Pugalur, TNPL Pugalur, Uppidamangalam.

3.6.4 Socio-Economic Status of Study area

Kuppam is a large village located in Aravakurichi Taluk of Karur district, Tamil Nadu with total 1120 families residing. The Kuppam village has population of 3503 of which 1697 are males while 1806 are females as per Population Census 2011. In Kuppam village population of children with age 0-6 is 264 which makes up 7.54 % of total population of village. Average Sex Ratio of Kuppam village is 1064 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the Kuppam as per census is 1079, higher than Tamil Nadu average of 943. Kuppam Village with Census of India Village-code 635497 is located in Aravakurichi Taluk of Karur district in Tamil Nadu, India.

Table 3.30 Kuppam village Population Facts

Kuppam Village	
Number of Households	1,120
Population	3,503
Male Population	1,697
Female Population	1,806
Children Population	264
Sex-ratio	1064
Literacy	60.11%
Male Literacy	72.80%
Female Literacy	48.17%
Scheduled Tribes (ST) %	0
Scheduled Caste (SC) %	17.13%

Source: <https://www.census2011.co.in/data/village/635497-kuppam-tamil-nadu.html>

Table 3.31 Demographics Population of Kuppam village

Kuppam Village		
Total Population	Male Population	Female Population
3,503	1697	1806

Source: <https://villageinfo.in/tamil-nadu/karur/aravakurichi/kuppam.html>

Sex Ratio According to Census 2011

Average Sex Ratio of Kuppam village is 1064 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the Kuppam as per census is 1079 higher than Tamil Nadu average of 943.

3.6.4.1 Literacy of Kuppam Village

Kuppam village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Kuppam village was 60.11 % compared to 80.09 % of Tamil Nadu. In Kuppam Male literacy stands at 72.80 % while female literacy rate was 48.17 %.

3.6.4.2 Worker's Profile of Kuppam village

In Kuppam village out of total population, 2246 were engaged in work activities. 86.42 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 13.58 % were involved in Marginal activity providing livelihood for less than 6 months. Of 2246 workers engaged in Main Work, 822 were cultivators (owner or co-owner) while 529 were Agricultural labourers.

Table 3.32 Kuppam Village Working Population

Kuppam Village	Total	Male	Female
Total Workers	2246	1198	1048
Main Workers	1941	1049	892
Main Workers Cultivators	822	452	370
Agriculture Laborer	529	227	302
Household Workers	18	6	12
Other Workers	35	18	17
Marginal Workers	305	149	156
Non-Working Persons	1257	499	758

Source: <https://www.census2011.co.in/data/village/635497-kuppam-tamil-nadu.html>

Table 3.33 Population and Literacy Data of Study Area

S.No.	Village Name	No of House Holds	Total Population	Male	Female	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate
1	Athipalayam	730	2062	1014	1048	1271	757	514	791	257	534
2	K.Paramathi	1093	3488	1709	1779	2554	1380	1174	934	329	605
3	Karudayampalayam	577	2347	1211	1136	1614	977	637	733	234	499
4	Kuppam	1120	3503	1697	1806	1947	1143	804	1556	554	1002
5	Munnur	826	2582	1289	1293	1649	980	669	933	309	624
6	Nedungur	403	1190	586	604	800	469	331	390	117	273
7	Pavithiram	1799	5881	2862	3019	3738	2165	1573	2143	697	1446
8	Punnam	1452	5446	2839	2607	3679	2208	1471	1767	631	1136
9	Vettamangalam (East)	807	2657	1310	1347	1521	900	621	1136	410	726
10	Vettamangalam (west)	1827	5882	2887	2995	3953	2225	1728	1929	662	1267

Table 3.34 Workers Profile of Study Area

S.No.	Village Name	Total Workers Population	Male Workers	Female Workers	Total Main Workers	Main Workers Male	Main Workers Female	Main Cultivation Workers	Main Agriculture Workers	Main Other Workers	Non-Worker Population
1	Athipalayam	1372	713	659	1309	701	608	442	551	281	690
2	K.Paramathi	1782	1118	664	1723	1108	615	315	448	938	1706
3	Karudayampalayam	1176	646	530	847	501	346	301	265	251	1171
4	Kuppam	2246	1198	1048	1941	1049	892	822	529	565	1257
5	Munnur	1577	882	695	1434	805	629	420	638	355	1005
6	Nedungur	753	432	321	734	418	316	409	241	81	437

7	Punnam	2718	1531	1187	2665	1504	1161	731	632	1269	2728
8	Vettamangalam (East)	1609	894	715	1593	886	707	419	940	210	1048
9	Vettamangalam (west)	3541	1966	1575	3455	1920	1535	1268	1410	729	2341
10	Pavithiram	3293	1875	1418	2879	1682	1197	747	829	1242	2588

Table 3.35 Communication & Transport Facilities in the Study Area

S.No.	Village Name	PO	SPO	PTO	T	PCO	MP	IC /CSC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	NWR	FP
1	Athipalayam	2	1	2	1	1	1	2	2	2	1	2	2	2	1	1	1	2	1
2	K.Paramathi	2	1	2	1	1	1	2	2	1	1	2	2	1	1	1	1	2	1
3	Karudayampalayam	2	1	2	1	1	1	2	2	1	1	2	1	2	2	1	1	2	1
4	Kuppam	2	1	2	1	2	1	2	2	1	1	2	2	1	1	1	1	2	1
5	Munnur	2	1	2	1	1	1	2	2	1	1	2	2	2	1	1	1	2	1
6	Nedungur	2	2	2	1	2	1	2	2	1	1	2	1	2	2	1	1	2	1
7	Pavithiram	2	1	2	1	1	1	2	2	1	1	2	1	1	1	1	1	2	1
8	Punnam	2	2	2	1	1	1	2	2	1	1	2	2	1	2	1	1	2	1
9	Vettamangalam (East)	2	2	2	1	2	1	2	2	1	1	2	2	2	1	1	1	2	1
10	Vettamangalam (west)	2	1	2	1	1	1	2	2	1	2	2	1	1	1	1	1	2	1

Source: www.censusindia.gov.in - Tamil Nādu Census of India – 2011

Abbreviations: PO - Post Office; MP - Mobile Phone Coverage; RS - Railway Station; GR - Gravel Roads; SPO - Sub Post Office; IC / CSC - Internet Cafe/Common Service Centre; NH - National Highways; NWR - Navigate waterways River; PTO - Post & Telegraph office; PCF - Private Courier Facility; SH - State Highways; FP - Foot path; T- Telephone (Landline); BS - Public Bus Service; MDR - Major District Road; PCO - Public call office / Mobile; PBS - Private Bus Service; BTR - Black Topped (Pucca Roads). Note: 1 - Available within the village 2 - Not available

Table 3.36 Water & Drainage Facilities in the Study Area

S.No.	Village Name	TP	CW	UCW	HP	TW/BH	S	R/C	T/P/L	CD	OD	CT
1	Athipalayam	1	2	1	2	1	2	2	2	1	1	1
2	K.Paramathi	1	1	1	1	1	2	2	2	1	1	2
3	Karudayampalayam	1	2	1	2	1	2	2	2	1	1	2
4	Kuppam	1	1	1	1	1	2	2	2	1	1	1
5	Munnur	1	1	1	2	1	2	2	2	1	1	1
6	Nedungur	1	2	1	1	1	2	2	2	1	1	1
7	Pavithiram	1	1	1	1	1	2	1	2	1	1	1
8	Punnam	1	1	1	1	1	1	1	1	1	1	1
9	Vettamangalam (East)	1	1	1	1	1	2	1	2	1	1	2
10	Vettamangalam (west)	1	1	1	1	1	2	1	2	1	1	1

Table 3.37 Other Facilities in the Study Area

S.No.	Village Name	ATM	CB	COB	ACS	SHG	PDS	RM	AMS	NC	NC-AC	CC	SF	PL	APS	BDRO	PS
1	Athipalayam	2	2	2	2	1	1	2	2	1	1	1	1	2	1	1	1
2	K.Paramathi	2	1	1	1	1	1	2	1	1	1	2	2	1	1	1	1
3	Karudayampalayam	1	2	1	2	1	1	2	2	1	1	1	1	2	1	1	1
4	Kuppam	2	2	1	2	1	1	2	2	1	1	1	1	2	1	1	1
5	Munnur	2	2	2	2	1	1	2	2	1	1	2	2	2	1	1	1
6	Nedungur	2	2	2	2	1	1	2	2	1	1	1	1	2	1	1	1
7	Pavithiram	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1
8	Punnam	2	2	2	1	1	1	2	2	1	1	1	1	2	1	1	1
9	Vettamangalam (East)	2	2	2	1	1	1	2	2	1	1	1	1	2	1	1	1
10	Vettamangalam (west)	2	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1

Abbreviations: ATM - Automatic Teller Machine; PDS - Public Distribution System (Shop); CB - Commerical Bank; RM - Regular Market; COB - Co-operative Bank; AMS - Agricultural Market Society; ACS - Agricultural Credit Societies; NC - Nutritional Centres; SHG - Self Help Group; NC-AC - Nutritional Centres - Anganwadi Centre; DBRO - Birth & Death Registration Office; PS - Power Supply Note – 1 - Available within the village; 2 - Not available

3.6.5 Recommendation and Suggestion

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

3.6.6 Summary & Conclusion

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

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the rough stone is proposed to be transported mainly through Village Road to K.Paramathi to Karur Road (NH-81) and Punnamchatram to Noyyal (SH) as shown in Table 3.38 and in Figure 3.26. Traffic density measurements were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. The results are provided in Tables 3.39-3.41. 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 3.38 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.30 km SW	Village Road
TS2	K.Paramathi to Karur Road (NH-81)	5050 km SW	K.Paramathi to Karur Road (NH-81)
TS3	Punnamchatram to Noyyal (SH)	2.38 km NE	Punnamchatram to Noyyal (SH)

Source: On-site monitoring by GTMS FAE & TM

Table 3.39 Existing Traffic Volume

Station Code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	35	105	38	38	68	34	177
TS2	181	543	55	55	117	59	657
TS3	114	342	45	45	101	51	438

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 3.40 Rough Stone Transportation Requirement

Transportation of Rough Stone & Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	37	9

Source: Approved Mining Plan

Table 3.41 Summary of Traffic Volume

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Village Road	177	9	186	1200
K.Paramathi to Karur Road (NH-81)	657	9	666	1500
Punnamchatram to Noyyal Road (SH)	438	9	447	1500

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

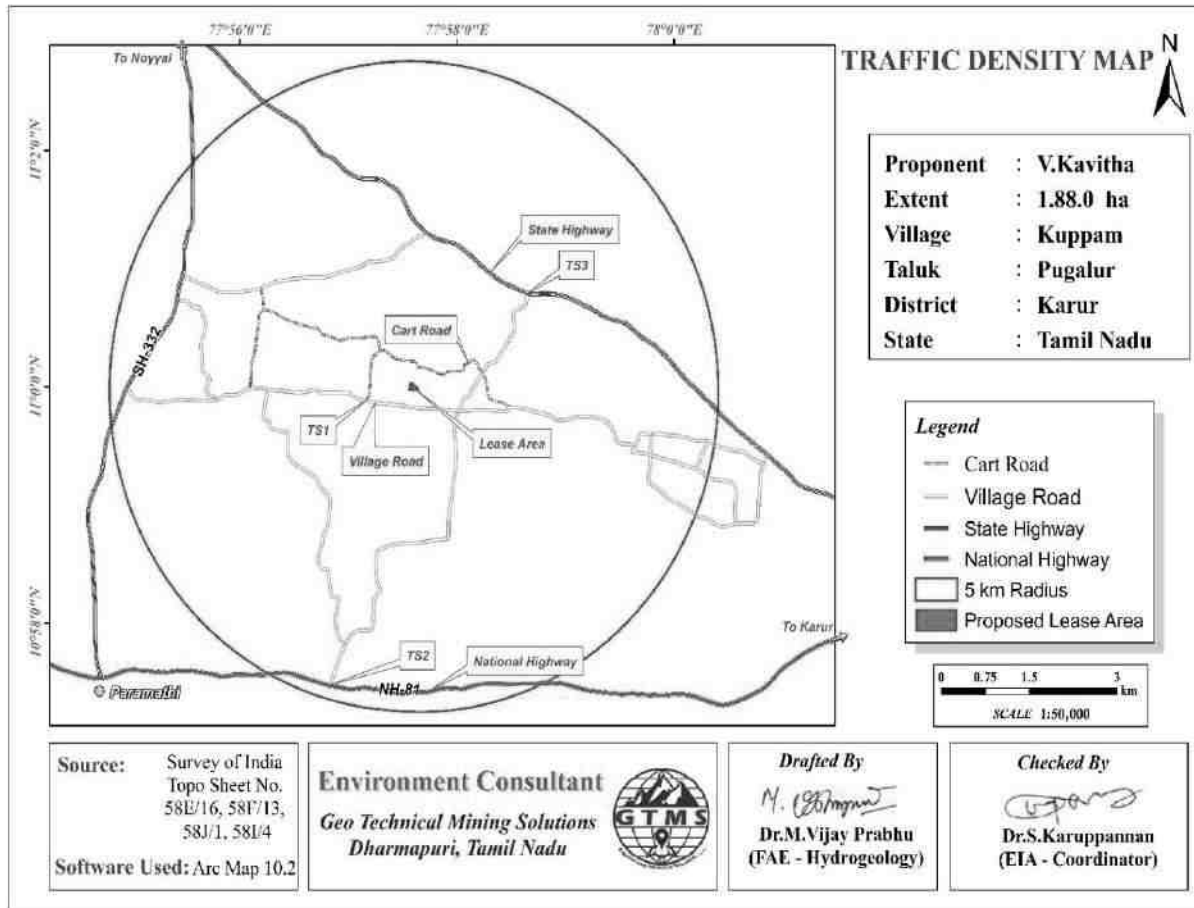


Figure 3.26 Traffic Density Map

- 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.

3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, National Park and Archaeological monuments within the project area. No Protected and Reserved Forest area is located within the project area. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environment sensitivity around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.42.

Table 3.42 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
2	Reserve Forest	Thathampalayam R.F.	8.67 km SE

3	Lakes/Reservoirs/ Dams/Streams/Rivers	Odai	0.12 km West
		Cauvery river	6.8 km North
		Noyyal river	6.6 km NW
		Amaravathi river	9.3 km SE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Notified Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	TNPL Paper Mill	7.2 km NE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

Environmental impacts both direct and indirect on various environmental attributes due to proposed mining activity will be created in the surrounding environment, during the operational and post-operational phases. The occurrence of mineral deposits, being site specific, their exploitation, often, does not allow for any choice except adoption of eco-friendly operation. The methods are required to be selected in such a manner, so as to maintain environmental equilibrium ensuring sustainable development.

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

Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause-and-effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a particular situation, predictions have been arrived at based on logical reasoning / consultation / extrapolation.

The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail:

- ❖ Land environment
- ❖ Soil environment
- ❖ Water Environment
- ❖ Air Environment
- ❖ Noise Environment
- ❖ Socio economic environment
- ❖ Biological Environment

Based on the baseline environmental status at the project site, the environmental factors that are likely to be affected are identified, quantified and assessed.

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

- ❖ Permanent impact on mineral resources due to removal of 22500 m³ of rough stone.
- ❖ Permanent or temporary change on land use and land cover.

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

4.1.2 Common Mitigation Measures from Proposed Project

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

4.2 SOIL ENVIRONMENT

4.2.1 Anticipated Impact on Soil Environment

This project does not result in any impact on the soil of the project site, as topsoil is neither removed from the project site nor preserved in the safety margin area. However, some of the common mitigation measures have been discussed in the following sections to protect the immediate soil environment surrounding the lease area.

4.2.2 Common Mitigation Measures from proposed project

- ❖ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into

vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.

- ❖ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ❖ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

4.3.1 Anticipated Impact

- ❖ As the water required for the mining operations, as given in Table 2.10 is obtained from the approved water supplying agency, the project does not develop any abstraction structures in the lease area. Therefore, no impact responsible for the water table declination is anticipated.
- ❖ Surface and ground water resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste from washing of machineries. To address this impact, some of the important mitigation measures is provided as below.

4.3.2 Common Mitigation Measures for the Proposed Project

- ❖ Garland drainage system and settling tank will be constructed along the proposed mining lease area. The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- ❖ Rainwater from the mining pits will be collected in sump and will be allowed to store and pumped out to surface settling tank of 15 m x 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
- ❖ Benches will be provided with inner slopes and through a system of drains and channels, rain water will be allowed to descent into surrounding drains to minimize the effects of erosion and water logging arising out of uncontrolled descent of water

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

4.4 AIR ENVIRONMENT

4.4.1 Anticipated Impact from proposed project

- ❖ 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, drilling, blasting and transportation of materials. The rate of emission and the incremental concentration of pollutants is estimated in the following sections before providing mitigation measures.

4.4.1.1 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauhya et al.,2001. The equations used for SPM, SO₂, and NO_x emission estimation have been given in Table 4.1.

Table 4.1 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E = [u^{0.4} a^{0.2} \{9.7 + 0.01p + b / (4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission

				rate(g/s).
Overall Mine	SO ₂	Area	$E=a0.14\{u/(1.83+0.93u)\} [\{p/(0.48+0.57p)\} + \{b/(14.37+1.15b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	NO _x	Area	$E=a0.25\{u/(4.3+32.5u)\} [1.5p+ \{b/(0.06+0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b= Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM₁₀ keeping in mind that proper control measures are followed. It is important to note that PM₁₀ emission rate is derived from the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM₁₀, SO₂ and NO_x emission results have been given in Table 4.2.

Table 4.2 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m ²	Calculated Value (g/s/m ²)
Overall Mine	PM _{2.5}	0.00648997	18800	3.45211E-07
Overall Mine	PM ₁₀	0.00866998	18800	4.61169E-07
Overall Mine	SO _x	0.00411172	18800	2.18709E-07
Overall Mine	NO _x	0.00442572	18800	2.35411E-07

4.4.1.2 Frame work of Computation and Model Details

By using the above-mentioned inputs, Ground Level Concentrations (GLC) due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The model was used to predict the impact on the ambient air environment at each receptor at various localities within 5 km radius around the project site and the maximum incremental GLC at the project site. All the prediction models in Figures 4.1-

4.4 shows the maximum concentrations of PM_{2.5}, PM₁₀, SO₂ and NO_x, close to the proposed project site due to low to moderate wind speeds.

4.4.1.3 Modelling of Incremental Concentration

The air borne particulate matter such as PM₁₀ and PM_{2.5} generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) due to excavation and loading equipment and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area. Anticipated incremental concentration and net increase in emissions due to quarrying activities is predicted by AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants.

4.4.1.4 Model Results

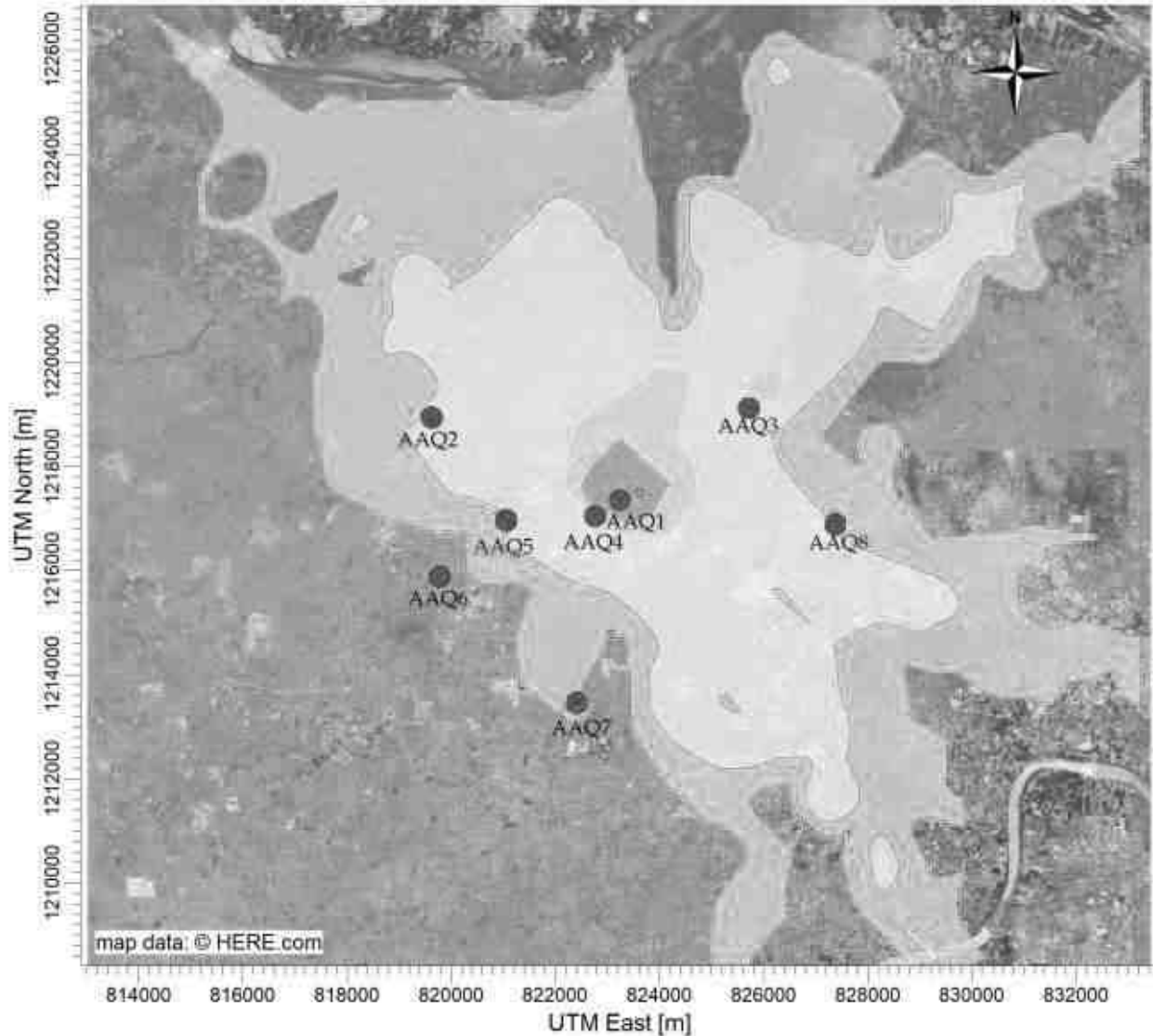
The post project resultant concentrations of PM₁₀, PM_{2.5}, SO₂& NO_x (GLC) is given in Tables 4.3 - 4.6 and in Figures 4.1-4.4.

Table 4.3 Incremental & Resultant GLC of PM_{2.5}

Station ID	Distance to core area (km)	Direction	PM _{2.5} concentrations (µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	0.1	---	23.95	5.32	29.27	Below standard	22.21	Not significant
AAQ2	4.0	NW	20.02	0.5	20.52	Below standard	2.50	Not significant
AAQ3	2.65	NE	25.25	1	26.25	Below standard	3.96	Not significant
AAQ4	0.79	SW	20.96	1	21.96	Below standard	4.77	Not significant
AAQ5	2.40	SW	22.14	0.5	22.64	Below standard	2.26	Not significant
AAQ6	3.95	SW	19.34	0	19.34	Below standard	0.00	Not significant
AAQ7	4.15	S	23.07	0	23.07	Below standard	0.00	Not significant
AAQ8	3.80	E	20.67	0.5	21.17	Below standard	2.42	Not significant

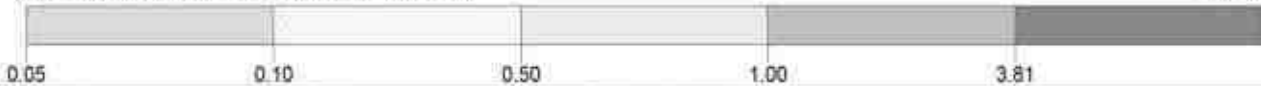
PROJECT TITLE:

V.KAVITHA ROUGHSTONE QUARRY PROJECT -PM2.5



Max: 3.81 [ug/m³] at (823241.37, 1217639.41)

ug/m³



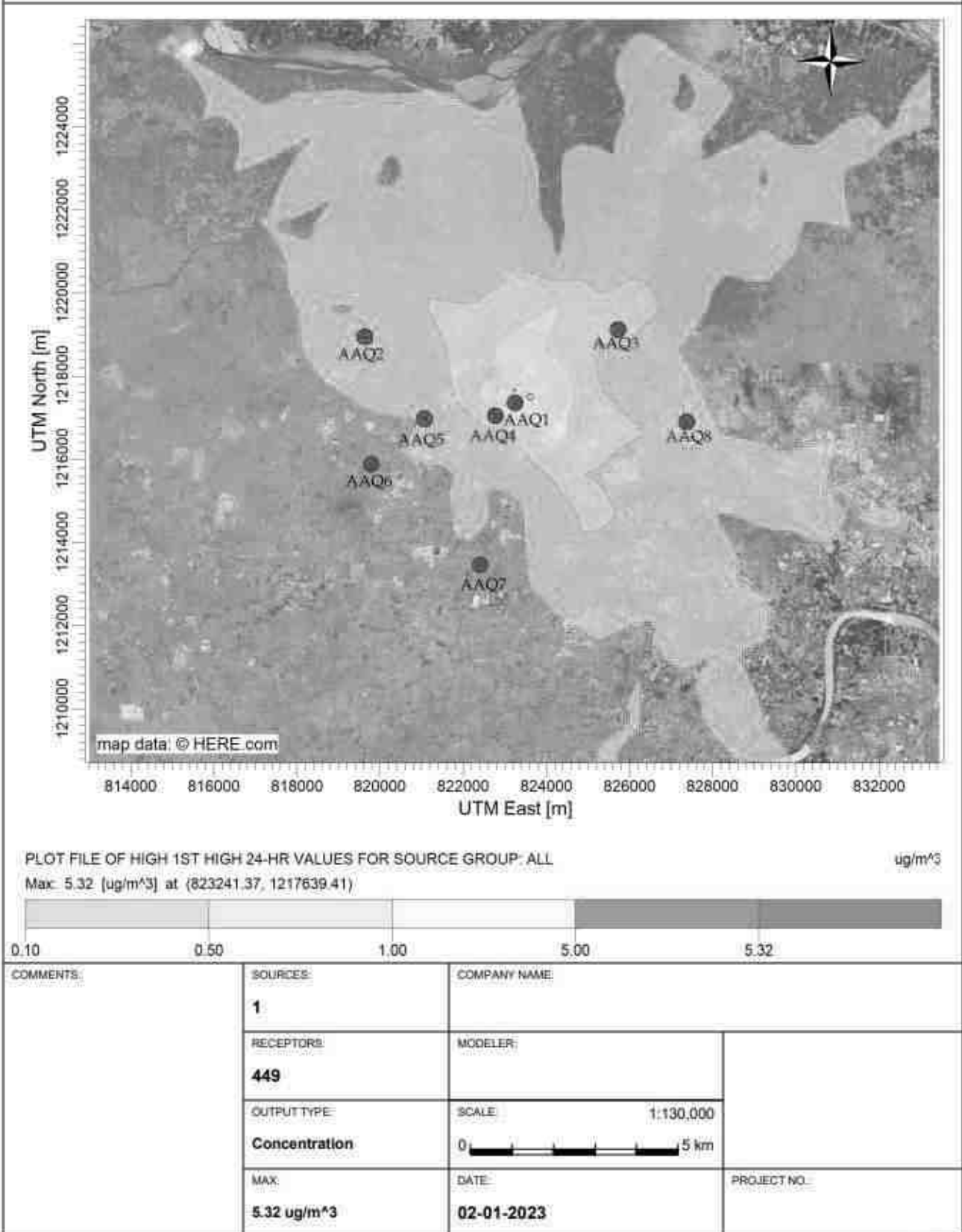
COMMENTS:	SOURCES:	COMPANY NAME:	
	RECEPTORS:	MODELER:	
	OUTPUT TYPE:	SCALE:	1:130,000
	MAX:	DATE:	PROJECT NO.:
	1		
	449		
	Concentration	0 5 km	
	3.81 ug/m ³	02-01-2023	

AERMOD View - Lakes Environmental Consultants TMS\Desktop\Nallasamy airmode\NALLASAMY ROUGHSTONE AND GRAVEL PM2\NALLASAMY ROUGHSTONE AND GRAVEL PM2.issc

Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

PROJECT TITLE

V.KAVITHA ROUGHSTONE QUARRY PROJECT -PM10

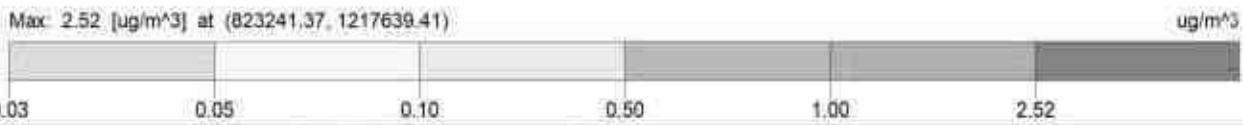
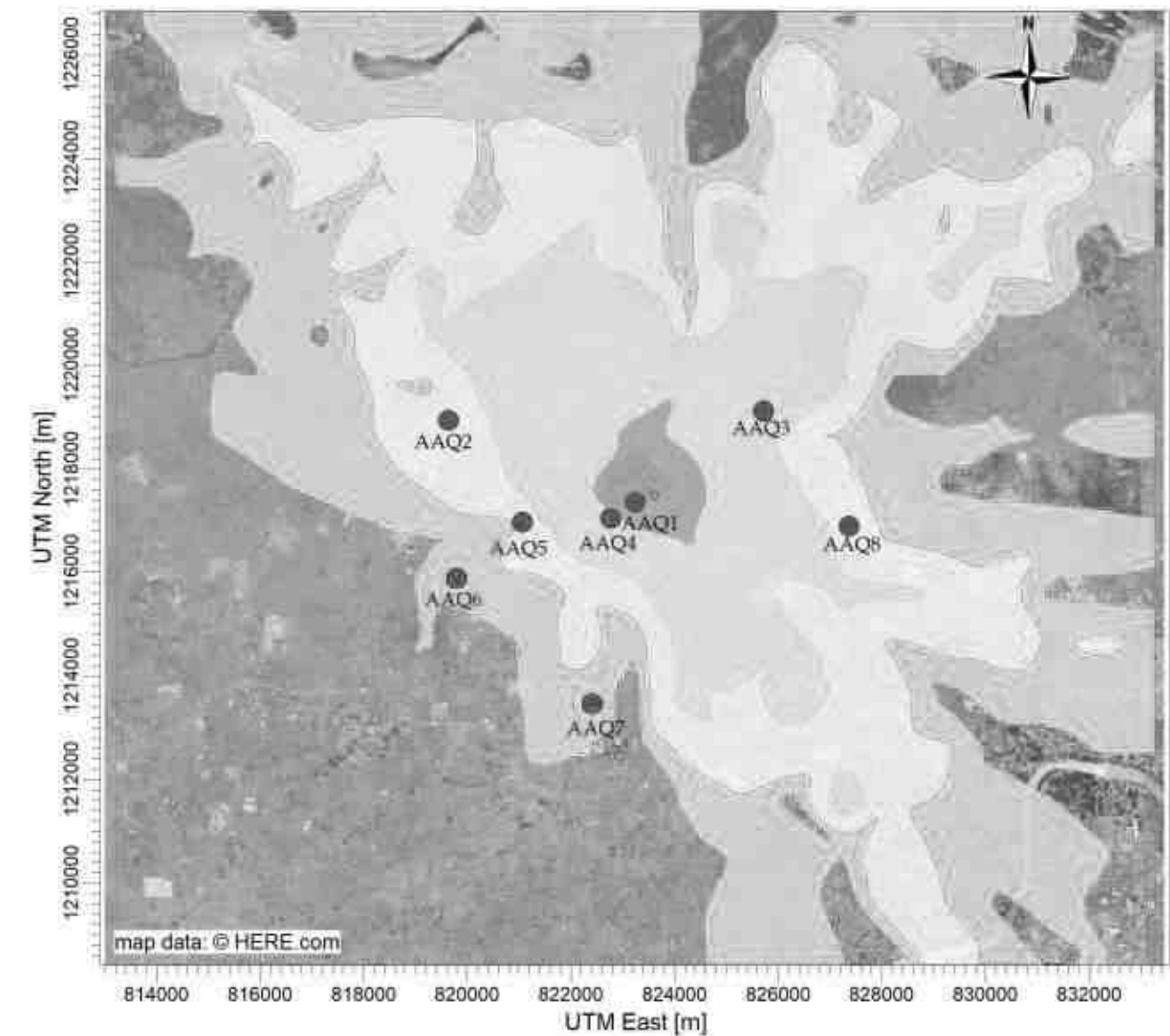


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Figure 4.2 Predicted Incremental Concentration of PM10

PROJECT TITLE
V.KAVITHA ROUGHSTONE QUARRY PROJECT -SO2



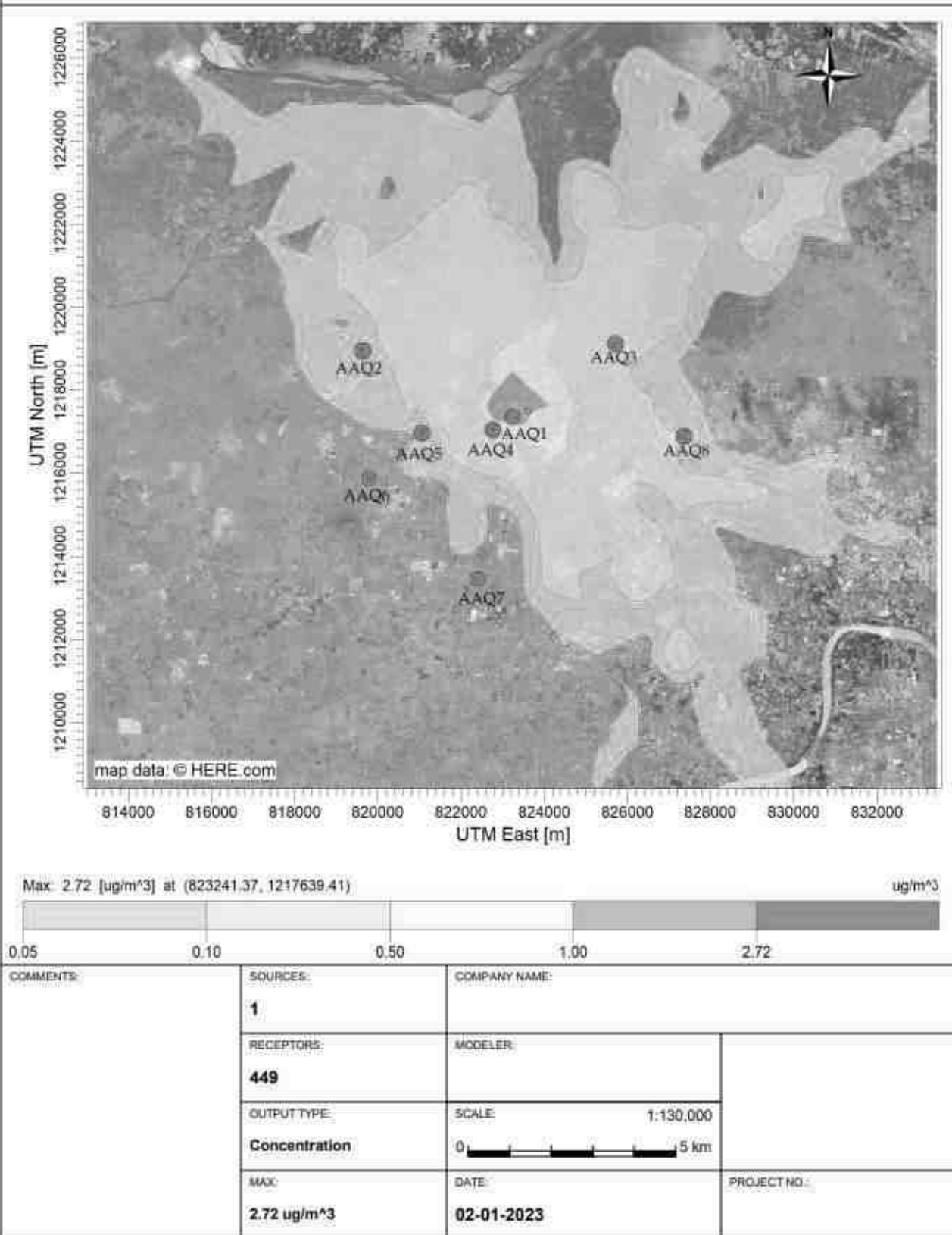
COMMENTS:	SOURCES:	COMPANY NAME:	
	1		
	RECEPTORS:	MODELER:	
	449		
OUTPUT TYPE:	SCALE:	1:130,000	
Concentration			
MAX:	DATE:	PROJECT NO.:	
2.52 ug/m³	02-01-2023		

AERMOD View - Lakes Environmental Software

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Figure 4.3 Predicted Incremental Concentration of SO₂

PROJECT TITLE
V.KAVITHA ROUGHSTONE QUARRY PROJECT -NO2



AERMOD View - Lakes Environmental Software

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Figure 4.4 Predicted Incremental Concentration of NO_x

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station ID	Distance to core area (km)	Direction	PM ₁₀ concentrations(µg/m ³)			Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.1	---	45.19	3.81	49	Below standard	8.43	Not significant
AAQ2	4.0	NW	40.00	0.5	40.5	Below standard	1.25	Not significant
AAQ3	2.65	NE	46.74	1	47.74	Below standard	2.14	Not significant
AAQ4	0.79	SW	41.98	1	42.98	Below standard	2.38	Not significant
AAQ5	2.40	SW	43.74	0.5	44.24	Below standard	1.14	Not significant
AAQ6	3.95	SW	41.02	0	41.02	Below standard	0.00	Not significant
AAQ7	4.15	S	44.98	0.1	45.08	Below standard	0.22	Not significant
AAQ8	3.80	E	41.50	0.1	41.6	Below standard	0.24	Not significant

Table 4.5 Incremental & Resultant GLC of SO₂

Station ID	Distance to core area (km)	Direction	SO ₂ concentrations (µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.1	---	8.57	2.52	11.09	Below standard	29.40	Not significant
AAQ2	4.0	NW	8.40	0.8	9.20	Below standard	9.52	Not significant
AAQ3	2.65	NE	9.07	0.5	9.57	Below standard	5.51	Not significant
AAQ4	0.79	SW	6.97	0.5	7.47	Below standard	7.17	Not significant
AAQ5	2.40	SW	5.69	0	5.69	Below standard	0.00	Not significant
AAQ6	3.95	SW	5.74	0	5.74	Below standard	0.00	Not significant
AAQ7	4.15	S	5.73	0	5.73	Below standard	0.00	Not significant
AAQ8	3.80	E	5.49	0.05	5.54	Below standard	0.91	Not significant

Table 4.6 Incremental & Resultant GLC of NO_x

Station ID	Distance to core area (km)	Direction	NO _x concentrations (µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.1	---	25.88	2.72	28.6	Below standard	10.51	Not significant
AAQ2	4.0	NW	25.86	0.1	25.96	Below standard	0.39	Not significant
AAQ3	2.65	NE	26.58	0.5	27.08	Below standard	1.88	Not significant
AAQ4	0.79	SW	25.61	0.5	26.11	Below standard	1.95	Not significant
AAQ5	2.40	SW	26.43	0.1	26.53	Below standard	0.38	Not significant
AAQ6	3.95	SW	25.76	0.02	25.78	Below standard	0.08	Not significant
AAQ7	4.15	S	24.72	0.02	24.74	Below standard	0.08	Not significant
AAQ8	3.80	E	25.10	0.1	25.2	Below standard	0.40	Not significant

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

4.4.3 Common Mitigation Measures

Drilling

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

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-metalled haul roads will be compacted weekly before being put into use.
- ❖ Overloading of tippers will be avoided to prevent spillage.
- ❖ It will be ensured that all transportation vehicles carry a valid PUC certificate.
- ❖ Haul roads and service roads will be graded to clear accumulation of loose materials.

Green Belt

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

Occupational Health

- ❖ Dust mask will be provided to the workers and their use will be strictly monitored.
- ❖ Annual medical checkups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers and tipper drivers.
- ❖ Ambient air quality monitoring will be conducted every six months to assess effectiveness of mitigation measures proposed.

4.5 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the project area. Noise modelling has been carried out considering compressor operation (drilling) and transportation activities.

Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources. Noise modelling has been carried out to assess the impact on surrounding ambient noise levels.

Basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves which are propagated outwards from the source through the air at a speed of 1, 100 ft/sec with the first wave making an ever-increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of the sphere. The assumption of the model is based on point source relationship i.e., for every doubling of the distance the noise levels are decreased by 6 dB (A).

For hemispherical sound wave propagation through homogeneous loss free medium, one can estimate noise levels at various locations at different sources using a mathematical model based on first principle.

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

Where,

Lp_1 & Lp_2 are sound levels at points located at distances r_1 and r_2 from the source

$Ae_{1,2}$ is the excess attenuation due to environmental conditions.

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

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

4.5.1 Anticipated Impact

Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are:

- Source data
- Receptor data
- Attenuation factor

Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.7.

Table 4.7 Activity and Noise Level Produced by Machinery

S.No.	Machinery / Activity	Impact on Environment	Noise Produced in dB(A) at 50 ft from source*
1	Jack Hammer	Yes	88
2	Compressor	No	81
3	Excavator	No	85
4	Tipper	No	84
Total Noise Produced			91.22

*50 feet from source = 15.24 meters

Source: U.S. Department of Transportation (Federal Highway Administration) – Construction Noise Handbook

The total noise to be produced by mining activity is calculated to be 91.22 dB (A). Therefore, we have considered equipment and operation noise levels (max) to be approx. 91.22 dB (A) for noise prediction modelling. The results of noise prediction modelling are shown in Table 4.8.

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 Zone	100	46.0	39.38	46.86
Nochikattur	310	40.2	29.55	40.56
Punnam Chatram	2550	46.8	11.25	46.80
Thalaiyeethupatti	850	47.0	20.79	47.01
Salipalaiyam	2450	46.8	11.60	46.80
Velayudampalaiyam	4000	47.2	7.34	47.20
Karudaiyampalaiyam	4150	40.1	7.02	40.10
Pavitrarn	4600	46.3	6.12	46.30
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

The incremental noise level is found to be 39.38 dB (A) in core zone and ranges between 6.12 and 29.55 dB (A) in buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000(The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E),dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986.).

4.5.2 Common Mitigation Measures

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

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise
- ❖ 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
- ❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness
- ❖ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

The impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics, mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the faunal and floral status of the project area. However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved. Impact prediction is the main footstep in impact evaluation and identifies project actions that are likely to bring significant changes in the project environment. The present study was carried out to predict the likely impacts of the proposed project at Kuppam village and the surrounding environment with special reference to biological attributes covering habitats/ecosystems and associated biodiversity.

The proposed mining activities include removal of some scattered bushes and other thorny species. Although impacts on key habitat elements will occur on a local scale, but on a regional scale they would not be critical for the life cycle needs of the species observed or expected. Moreover, during conceptual stage, the mined-out areas on the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time. Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Wild life is not commonly found in the project area and its immediate environs because of lack of vegetal cover and surface water. Except few domestic animals, reptiles, hares and some common birds are observed in the study area.

- I. None of the plants will be cut during operational phase of the mine

- II. 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
- III. 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.

4.6.2 Common Mitigation Measures for the Proposed Project

Keeping all this in mind the mitigations have been suggested under environmental management plan. With the understanding of the role of plant species as bio-filter to control air pollution, appropriate plant species (mainly tree species) have been suggested considering the area/site requirements and needed performance of specific species. The details of year wise proposed plantation program are given in Table 4.9.

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 in the areas falling in the cluster as per Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone.

The objectives of the green belt cover will cover the following:

- ❖ Noise abatement
- ❖ Ecological restoration
- ❖ Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

4.6.2.1. Species Recommendation for Plantation Granted in the District

Following points have been considered while recommending the species for plantation:

- ❖ Natural growth of existing species and survival rate of various species.
- ❖ Suitability of a particular plant species for a particular type of area.
- ❖ Creating of biodiversity.
- ❖ Fast growing, thick canopy copy, perennial and evergreen large leaf area.
- ❖ Efficient in absorbing pollutants without major effects of natural growth.
- ❖ The following species, as shown in Table 4.10 may be considered primarily for plantation, which are best suited for the prevailing climate condition in the area.

Table 4.9 Recommended Species for Greenbelt Development Plan

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

The 7.5m safety distance along the boundary has been identified to be utilized for subsequent Afforestation. However, the afforestation should always be carried out in a systematic and scientific manner. Regional trees like *Azadirachta indica*, *Albizia lebbek* and *Tectona grandis* will be planted along the lease boundary and avenue plantation will be carried out in respective proposed project. The rate of survival expected to be 80% in this area. Afforestation Plan is given in Table 4.10 and budget of green belt development plan are given in Table 4.11.

Table 4.10 Greenbelt Development Plan

	No. of trees proposed for plantation	Survival %	Area to be covered(m ²)	Name of the species	No. of trees expected to be grown
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area			<i>Azadirachta indica</i> , <i>Albizia lebbek</i> , <i>Delonix regia</i> , <i>Tectona grandis</i> , etc.,	301
	376	80%	3384		
	Number of plants outside the mine lease area			<i>Azadirachta indica</i> , <i>Albizia lebbek</i> , <i>Delonix regia</i> , <i>Tectona grandis</i> , etc.,	451
	564	80%	5076		

Table 4.11 Budget for Greenbelt Development Plan

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost/ annum
Plantation inside the mine lease area (in safety margins)	376	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)"	75200	11280
Plantation outside the area	564	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	169200	16920
Total			244400	28200

Source: EMP budget

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

4.6.3. Anticipated Impact on Fauna

- ❖ There is no Wildlife Sanctuary and Biosphere Reserve within 10 km radius of the project site.
- ❖ No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice scientific method of mining with proper Environmental Management Plan including pollution control measures especially for air and noise, to avoid any adverse impact on the surrounding wildlife.
- ❖ Fencing around all the proposed mine lease areas will be constructed to restrict the entry of stray animals
- ❖ Green belt development will be carried out which will help in minimizing adverse impact on the flora found in the area.

4.6.3.1. Measures for Protection and Conservation of Wildlife Species

- ❖ Undertaking mitigative measures for conducive environment to the flora and fauna in consultation with Forest Department.
- ❖ Dust suppression system will be installed within mine and periphery of mine for proposed project
- ❖ Plantation around mine area will help in creating habitats for small faunal species and to create better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

4.6.3.2. Mitigation Measures

- ❖ All the preventive measures will be taken for growth & development of fauna.
- ❖ Creating and development awareness for nature and wildlife in the adjoin villages.
- ❖ The workers shall be trained to not harm any wildlife, should it come near the project site. No work shall be carried out after 6.00 pm.

4.6.4. Impact on Aquatic Biodiversity

Mining activities will not disturb the existing aquatic ecology as there is no effluent discharge proposed from the rough stone 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.

4.6.5. Impact Assessment on Biological Environment

Details of impact and assessments was mentioned in Tables 4.12 and 4.13.

Table 4.12 Ecological Impact Assessments

SI. No	Attributes	Assessment
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in mining lease site. The fauna sighted mostly migrated from buffer area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species sighted in core mining lease area.
3	Proximity to national park/wildlife Sanctuary/mangroves/coastline/estuary/sea	No national park or eco-sensitive zone and around 10km radius.
4	Proposed project restricts access to waterholes for wildlife	No
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal sighted regularly core in core area.

6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management such as drains is constructed properly so there will be no siltation affect in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	No
8	The project release effluents into a water body that also supplies water to a wildlife	No water body near to core zone so chances of water become polluted is low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	No
10	Project likely to affect migration routes	No migration route observed during monitoring period.
11	Project likely to affect flora of an area, which have medicinal value	No
12	Forestland is to be diverted, has carbon high sequestration	There was no forest land diverted.
13	The project likely to affect wetlands, Fish breeding grounds, marine ecology	Wetland was not present in near core Mining lease area. No breeding and nesting ground present in core mining area.

Table 4.13 Anticipated Impact of Ecology and Biodiversity

S. No	Aspect Description	Likely Impacts on Ecology and Biodiversity (EB)	Impact Consequence - Probability Description / Justification	Significance	Mitigation Measures
Pre-Mining Phase					
1	Uprooting of vegetation of lease area	Site specific loss of common floral diversity (Direct impact)	Site possesses common floral (not trees) species. Clearance of these species will not result in loss of flora	Less severe	No immediate action required. However, Greenbelt /plantation will be developed in project site and in periphery of the project boundary, which will
		Site specific loss of associated	Site supports only common species, which use wide		

		faunal diversity (Partial impact)	variety of habitats of the buffer zone reserve forest area. So, there is no threat of faunal diversity.		improve flora and fauna diversity of the project area.
		-Loss of Habitat (Direct impact)	Site does not form Unique / critical habitat structure for unique flora or fauna.		
Mining Phase					
2	Excavation of mineral using machine and labours, Transportation activities will generate noise.	Site-specific disturbance to normal faunal movements at the site due to noise. (Partial impact)	Site does not form unique / critical habitat structure for unique flora or fauna.	Less severe	Mining activity should not be operated after 5PM. Excavation of dump and transportation work should stop before 7PM.
3	Vehicular Movement for transportation of materials will result in generation of dust (SPM) due to haul roads and emission of SO ₂ , NO ₂ , CO etc.	Impact on surrounding agriculture and associated fauna due to deposition of dust and Emission of CO. (Indirect impact)	Impact is less as the agricultural land far from core area.	Less severe	All vehicles will be certified for appropriate Emission levels. More plantation has been suggested. Upgrade the vehicles with alternative fuel such biodiesel, methanol and biofuel around the mining area.

4.7 SOCIO ECONOMIC ENVIRONMENT

4.7.1 Anticipated Impact from Proposed and Existing Projects

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

4.7.2 Common Mitigation Measures for Proposed Project

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

4.8 OCCUPATIONAL HEALTH AND SAFETY

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

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

4.8.1 Respiratory Hazards

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

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

4.8.2 Noise

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

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

4.8.3 Physical Hazards

The following measures are proposed for control of physical hazards

- ❖ Specific personnel training on work-site safety management will be taken up.
- ❖ Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide.
- ❖ 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 discharge 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 areas.
- 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 III, 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

Mechanized open cast mining operation with drilling and blasting method will be used to extract rough stone in the area. The proposed mining lease areas have following advantages:

- ❖ As the mineral deposition is homogeneous and batholith formation, therefore opencast method of working is preferred over underground method.
- ❖ The material will be loaded with the help of excavators into tractors / trippers and transported to the need by customers.
- ❖ Blasting and availability of drills along with controlled blasting technology gives desired fragmentation so that the mineral is handled safely and used without secondary blasting.
- ❖ 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.

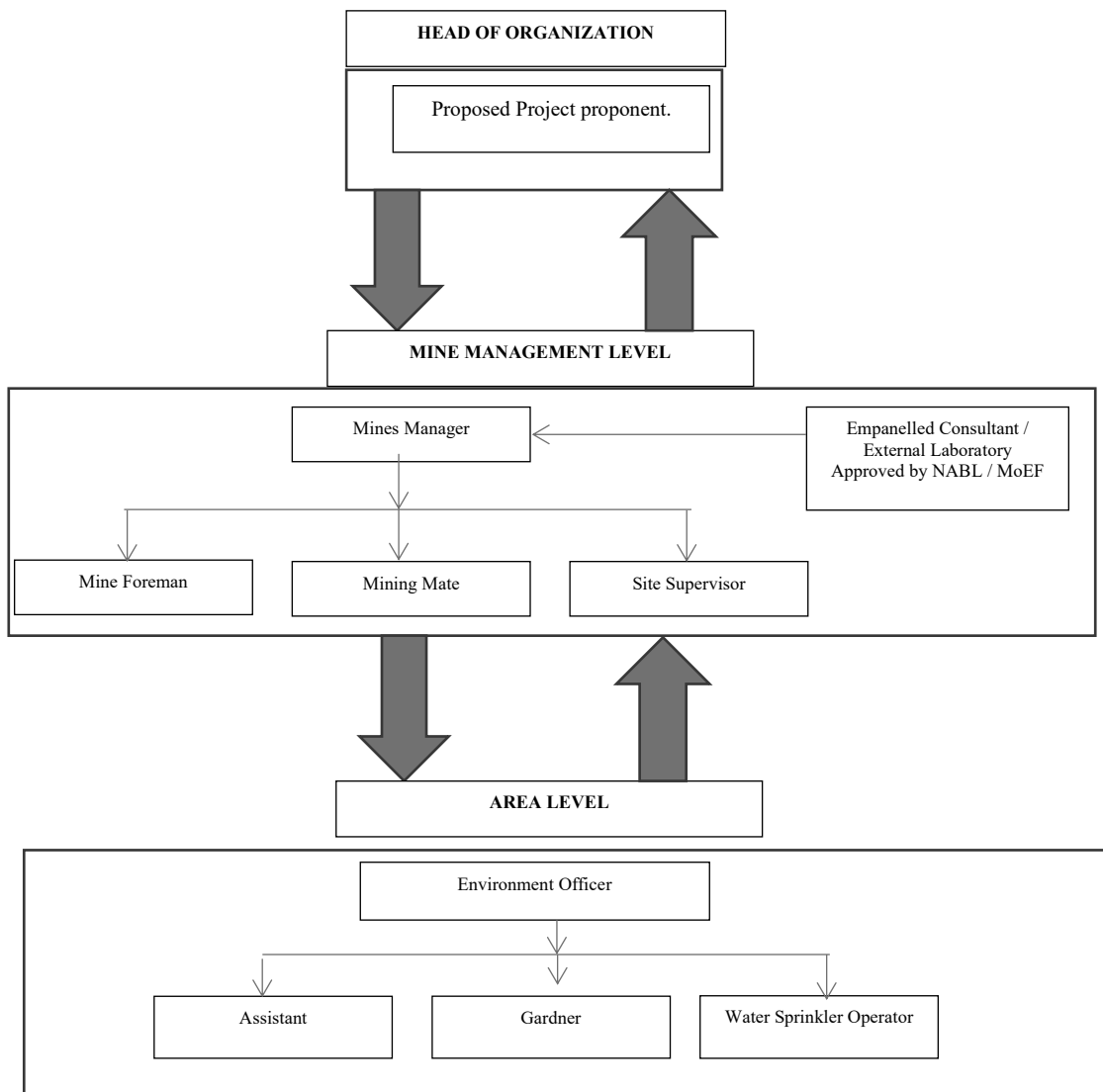


Figure 6.1 Proposed environmental monitoring chart

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:

- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Cumulative Impact Study
- ❖ Plastic Waste Management
- ❖ Post-COVID Health Management Plan

7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

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

7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

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

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

Table 7.1 Risk Assessment& Control Measures for Proposed Project

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries.	Improper handling and unsafe working practice	<ul style="list-style-type: none"> ✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations. ✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited. ✓ Fire-fighting and first-aid provisions in the mine office complex and mining area. ✓ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use. ✓ Working of quarry, as per approved plans and regularly updating the mine plans. ✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut. ✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager. ✓ Maintenance and testing of all mining equipment as per manufacturer’s guidelines.
2	Drilling	Improper and unsafe practices; Due to high pressure of compressed air, hoses may burst; Drill Rod may break;	<ul style="list-style-type: none"> ✓ Safe operating procedure established for drilling (SOP) will be strictly followed. ✓ Only trained operators will be deployed. ✓ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places,

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

Source: Analysed and Proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone III. 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.

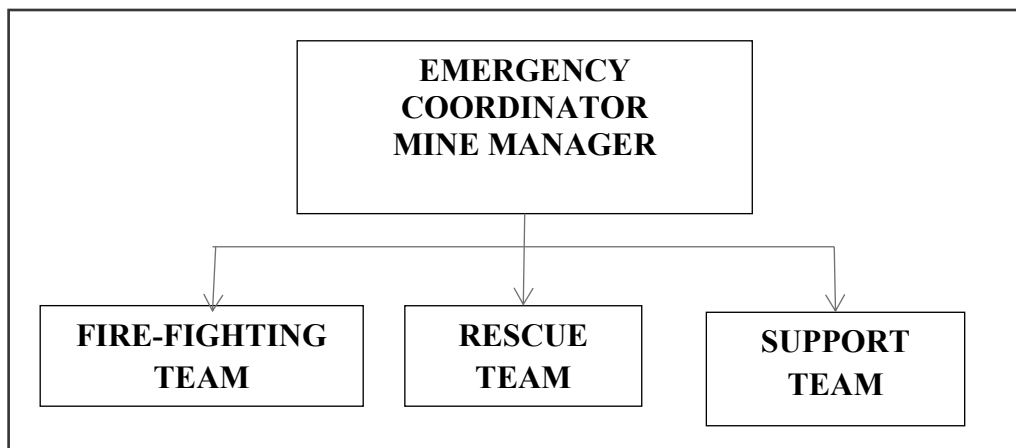


Figure 7.1 Disaster management team layout for proposed project

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. The proposed composition of the teams is given in Table 7.2.

Table 7.2 Proposed Teams for Emergency Situation

Designation	Qualification
Fire-Fighting Team	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member	Mines Foreman
Team Member	Mining Mate
Rescue Team	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member/ Incident Controller (IC)	Environment Officer
Team Member	Mining Foreman
Support Team	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Assistant Team Leader	Environment Officer
Team Member	Mining Mate
Security Team Leader/ Emergency Security Controller	Mines Foreman

Once the mine becomes operational, the above table along with names of personnel will be prepared and made easily available to workers for respective proposed quarries. A mobile communication network and wireless shall connect Mine Emergency Control Room (MECR) to control various departments of the mine, fire station and neighbouring industrial units/mines.

7.3.1 Roles and Responsibilities of Emergency Team

(a) Emergency coordinator (EC)

The emergency coordinator shall assume absolute control of site and shall be located at MECR.

(b) Incident controller (IC)

Incident controller shall be a person who shall go to the scene of emergency and supervise the action plan to overcome or contain the emergency. Shift supervisor or Environmental Officer shall assume the charge of IC.

(c) Communication and advisory team

The advisory and communication team shall consist of heads of Mining Departments i.e., Mines Manager

(d) Roll call coordinator

The Mine Foreman shall be Roll Call Coordinator. The roll call coordinator will conduct the roll call and will evacuate the mine personnel to assembly point. His prime function shall be to account for all personnel on duty.

(e) Search and rescue team

There shall be a group of people trained and equipped to carry out rescue operation of trapped personnel. The people trained in first aid and fire-fighting shall be included in search and rescue team.

(f) Emergency security controller

Emergency Security Controller shall be senior most security person located at main gate office and directing the outside agencies e.g., fire brigade, police, doctor and media men etc.,

7.3.2 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

7.3.3 Proposed Fire Extinguishers

The following type of fire extinguishers has been proposed at strategic locations within the mine, as shown in Table 7.3.

Table 7.3 Proposed Fire Extinguishers at Different Locations

Location	Type of Fire Extinguishers
Electrical Equipment	CO ₂ type, foam type, dry chemical powder type
Fuel Storage Area	CO ₂ type, foam type, dry chemical powder type, Sand bucket
Office Area	Dry chemical type, foam type

7.3.4 Alarm System

On receiving the message of disaster from Site Controller, fire-fighting team, the mine control room attendant will sound siren wailing for 5 minutes. Incident controller will arrange to broadcast disaster message through public address system. On receiving the message of "Emergency Over" from Incident Controller the emergency control room attendant will give "All Clear Signal", by sounding alarm straight for 2 minutes.

The features of alarm system will be explained to one and all to avoid panic or misunderstanding during disaster. In order to prevent or take care of hazard / disasters if any the following control measures have been adopted.

- ❖ Fire-fighting and first-aid provisions in the mines office complex and mining area are provided.
- ❖ Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring.
- ❖ Training and refresher courses for all the employees working in hazardous premises.
- ❖ Working of mine, as per approved plans and regularly updating the mine plans.
- ❖ Cleaning of mine faces is regularly done.
- ❖ Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- ❖ Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.

7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, six proposed projects, known as P1, P2 P3, P4, P5 and P6 were taken into consideration. The details of P1 have been given in Table 1.2 and the details of P2 to P6 in Table 7.4.&7.8.

Table 7.4 Salient Features of Proposed Project Site “P2”

Name of the Quarry	Tvl. NTC Blue Metals LLP Rough stone and gravel Quarry	
Toposheet No	58E/06	
Latitude between	10°59'50.56” N to 10°59'53.69”N	
Longitude between	77°57'34.30” E to 77°57'36.99”E	
Highest Elevation	165 m AMSL	
Proposed Depth of Mining	25 m BGL	
Geological Resources	Roughstone in m ³	gravel in m ³
	1,45,084	12,616
Mineable Reserves	Roughstone in m ³	gravel in m ³
	42,712	7,888
Existing Pit Dimension	100m (L) x 50m (W) x 12m (D)	
Ultimate Pit Dimension (Proposed)	68m (L) x 58m (W) x 25m (D)	
Water Level in the surrounding area	60 m BGL	
Method of Mining	Opencast Semi mechanized mining	
Topography	The lease applied area is a slightly elevated terrain. The area has gentle slope towards South-eastern side. The altitude of the area is 165-163m (max) from mean sea level.	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Hydraulic Excavator	2
	Tippers	2
Blasting Method	Controlled blasting involving shot-holes and slurry explosives of 25 mm diameter.	
Proposed Water Requirement	5.0 KLD	

Source: Approved Mining Plan & obtained ToR

Table 7.5 Salient Features of Proposed Project Site “P3”

Name of the Quarry	Thiru S. Sadhasivam Roughstone and Gravel Quarry	
Toposheet No	58E/06	
Latitude between	10°59'58.89” N to 11°00'04.13”N	
Longitude between	77°57'11.01” E to 77°57'15.51”E	
Highest Elevation	172 m AMSL	
Proposed Depth of Mining	7m BGL	

Geological Resources	Roughstone in m ³	Gravel in m ³
	77,000	30,800
Mineable Reserves	Roughstone in m ³	Gravel in m ³
	35,230	16,270
Production	28,430	16,270
Ultimate Pit Dimension (Proposed)	121m (L) x 76m (W) x 7m (D)	
Water Level in the surrounding area	60 m BGL	
Method of Mining	Opencast manual method of mining	
Topography	The lease applied area is exhibits plain topography. The area has gentle slope towards South-eastern side. The altitude of the area is 172m (max) from mean sea level.	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Hydraulic Excavator	2
	Tippers	1
Blasting Method	As the proposed project is intended for producing dimension stone, the project will use a small quantity of slurry explosives and NONEL fuse to create fractures in the massive rock.	
Proposed Water Requirement	3.0 KLD	

Table 7.6 Salient Features of Proposed Project Site “P4”

Name of the Quarry	K.Nallasamy Rough Stone and Gravel quarry	
Type of Land	Patta land	
Extent	2.89.0 ha	
S.F. No.	226/1(part)	
Toposheet No.	58-E/16 & 58-F/13	
Highest Elevation	162m AMSL	
Latitude	10°59'56.71"N to 11°0'4.19"N	
Longitude	77°57'25.46"E to 77°57'32.25"E	
Ultimate Depth of Mining	12 m BGL	
Existing Pit Dimension	Pit 1: 50 m(L) X 19 m(W) X 1 m(D) Pit 2: 48 m(L) X 25 m(W) X 3 m(D) Pit 3: 112 m(L) X 90 m(W) X 9 m(D)	
Geological Resources	Rough stone (m ³)	Gravel (m ³)

	2,17,506	3,870
Mineable Reserves	41,392	292
Proposed production for 5 years	41,392	292
Total No. of Lorry Loads	28 loads of rough stone/day	
Method of Mining	Open cast manual method	
Topography	Undulated	
Machinery proposed	Hand Jack hammer	2
	Compressor	1
	Excavator	1
	Shovel	10
	Picas	10
Blasting Method	As the proposed project is intended for producing dimension stone, the project will use a small quantity of slurry explosives and NONEL fuse to create fractures in the massive rock.	
Proposed Water Requirement	1.7 KLD	

Table 7.7 Salient Features of Proposed Project Site “P5”

Name of the Quarry	Thiru S. Shanmugam Roughstone and Gravel Quarry	
Toposheet No	58F/13	
Latitude between	10°59'50.08” N to 10°59'54.61” N	
Longitude between	77°57'36.96” E to 77°57'39.16” E	
Highest Elevation	164m AMSL	
Proposed Depth of Mining	20m BGL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	1,24,440	21,960
Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	25,585	9,315
Production	22,660	9,315
Ultimate Pit Dimension (Proposed)	69m (L) x 45m (W) x 20m (D)	
Water Level in the surrounding area	55-60 m BGL	
Method of Mining	Opencast Semi mechanized method of mining	
Topography	The lease applied area is exhibits plain topography. The area has gentle slope towards Southwestern side. The altitude of the area is 165m (max) from mean sea level.	

Machinery proposed	Jack Hammer	2
	Compressor	1
	Hydraulic Excavator	2
	Tippers	2
Blasting Method	As the proposed project is intended for producing dimension stone, the project will use a small quantity of slurry explosives and NONEL fuse to create fractures in the massive rock.	
Proposed Water Requirement	2.7 KLD	

Table 7.8 Salient Features of Proposed Project Site “P6”

Name of the Quarry	TVL.NTC Blue metal Roughstone and Gravel Quarry	
Toposheet No	58F/13, 58E/16	
Latitude between	10°59'56.13” N to 11°00'95” N	
Longitude between	77°57'05.47” E to 77°57'11.31” E	
Highest Elevation	166m AMSL	
Proposed Depth of Mining	40m BGL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	7,99,516	19,836
Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	2,14,845	8,064
Production	2,14,845	8,064
Ultimate Pit Dimension (Proposed)	99m (L) x 107m (W) x 40m (D)	
Water Level in the surrounding area	55-60 m BGL	
Method of Mining	Opencast Semi mechanized method of mining	
Topography	The lease applied area is exhibits flat topography. The area has gentle slope towards eastern side. The altitude of the area is 166m (max) from mean sea level.	
Machinery proposed	Jack Hammer	3
	Compressor	1
	Hydraulic Excavator	1
	Tippers	4
Blasting Method	Controlled blasting involving shot-holes and slurry explosives of 25 mm diameter.	
Proposed Water Requirement	5 KLD	

7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from the 6 proposed projects have been given in Tables 7.4 and 7.8.

Table 7.9 Cumulative Production Load of Rough Stone

Proposed Production Details				
Quarry	5 Years in m³	Per Year in m³	Per Day in m³	Number of Lorry Load Per Day
P1	22500	4500	15	3
P2	42712	8542	29	5
P3	28430	5686	19	3
P4	41392	8278	28	5
P5	22660	4532	15	3
P6	214845	42969	143	24
Grand Total	372539	74507	249	43

Table 7.10 Cumulative Production Load of Gravel

Quarry	Production for 3 Years (m³)	Yearly Production (m³)	Daily Production (m³)	Number of Lorry Loads Per Day
P1	-	-	-	-
P2	7888	7888	26	4
P3	16270	5423	18	3
P4	292	292	1	1
P5	9315	9315	31	6
P6	8064	8064	27	5
Grand Total	41829	30982	103	19

The cumulative study shows that the overall production of rough stone from the six quarries is 249m³ per day with a capacity of 43 trips of rough stone per day and that production of gravel from the 6proposed quarry is 103m³ per day accounting for 19 trips/day.

7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 6 proposed projects on air environment of the cluster have been provided in Table 7.8. The cumulative values resulting from the 6 projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.11 Cumulative Impact Results from the 6 proposed projects

Pollutants	Baseline Data($\mu\text{g}/\text{m}^3$)	Incremental Values($\mu\text{g}/\text{m}^3$)						Cumulative Value ($\mu\text{g}/\text{m}^3$)
		P1	P2	P3	P4	P5	P6	
PM _{2.5}	23.95	3.81	6.10	3.81	7.00	3.83	9.54	58.04
PM ₁₀	45.19	5.32	9.64	6.28	12.18	5.84	12.24	96.69
SO ₂	8.57	2.52	4.79	3.19	4.64	2.54	6.60	32.85
NO ₂	25.88	2.72	5.16	3.43	5.00	2.74	11.56	56.49

7.4.2 Noise Environment

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

Table 7.12 Predicted Noise Incremental Values from Cluster

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	310 m	NE	40.2	29.5	40.5	55
Habitation Near P2	530m	N	40.2	42.6	44.6	
Habitation Near P3	880m	E	40.2	20.4	40.2	
Habitation Near P4	440m	NE	40.2	26.5	45.7	
Habitation Near P5	560m	N	40.2	42.1	44.3	
Habitation Near P6	1120m	NE	40.2	36.1	41.6	
Cumulative Noise (dB(A))					49.4	

The cumulative analysis of noise due to 6 proposed projects shows that habitation near P1, P2, P3, P4, P5, and P6 will receive about 49.4 dB (A), as shown in Table 7.8. The cumulative results for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.

Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the all the 3 mines have been shown in Table 7.13.

Table 7.13 Ground Vibrations at 6 Mines

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	--	450m	--
P2	9.5	530m	0.30
P3	--	880m	--
P4	--	440 m	--
P5	5.0	560m	0.16
P6	47.74	1120m	0.33
Total Vibration			0.79

Source: Blasting Calculations

From the above table, the charge per blast is considered as maximum in each mine and the resultant cumulative PPV is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

7.4.3 Socio Economic Environment

Socio Economic benefits of the 6 proposed projects were calculated and the results have been shown in Table 7.14 the six projects together will contribute Rs.5,39,370 towards CER fund.

Table 7.14 Socio Economic Benefits from 6 Mines

Location ID	Project Cost	CER
P1	Rs.46,30,000/-	Rs. 5,00,000
P2	Rs.31,94,000/-	Rs. 5,00,000
P3	Rs.25,78,000/-	Rs. 5,00,000
P4	Rs. 56,65,000	Rs. 5,00,000
P5	Rs.42,99,500/-	Rs. 5,00,000
P6	Rs.65,95,000/-	Rs. 5,00,000
Grand Total	Rs. 2,69,61,500/-	Rs. 30,00,000

Table 7.15 Employment Benefits from 6 Mines

Location ID	Employment
P1	14
P2	27
P3	23
P4	25
P5	14
P6	27
Grand Total	130

A total of 130 people will get employment due to 6 proposed mines in cluster

7.4.5 Ecological Environment

Table 7.16 Greenbelt Development Benefits From 6 Mines

Code	Number of Trees proposed	Area to be covered (m ²)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	940	8460	752	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	315	2900	252	
P3	770	7000	616	
P4	1445	13000	1156	
P5	368	3300	294	
P6	1095	9900	876	
Total	4933	44560	3946	

Cumulative studies show that the six proposed projects will plant about 4933 native tree species like Neem, Teak, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 3946 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 7.17.

Table 7.17 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

7.6 POST COVID HEALTH MANAGEMENT PLAN FOR PROPOSED PROJECT

COVID – 19 diseases caused by SARS-CoV-2 Coronavirus is relatively a new disease, with fresh information being known on a dynamic basis about the natural history of the disease, especially in terms of post-recovery events.

After acute COVID-19 illness, recovered patients may continue to report wide variety of signs and symptoms including fatigue, body ache, cough, sore throat, difficulty in breathing, etc. As of now there is limited evidence of post-COVID sequelae and further research is

required and is being actively pursued. A holistic approach is required for follow up care and well-being of all post COVID recovering patients.

7.6.1 Post-COVID Follow Up Protocol

- ❖ Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing).
- ❖ Drink adequate amount of warm water (if not contra-indicated).
- ❖ Make sure your workplaces are clean and hygienic
- ❖ Surfaces (e.g., desks and tables) and objects (e.g., telephones, helmet) need to be wiped with disinfectant regularly
- ❖ Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
- ❖ Display posters promoting hand-washing
- ❖ Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
- ❖ Display posters promoting respiratory hygiene.
- ❖ Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3°C or more) need to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection
- ❖ Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- ❖ Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
- ❖ Could the meeting or event be scaled down so that fewer people attend?
- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.

- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O₂ < 95%, unexplained chest pain, new onset of confusion, focal weakness.
- ❖ Avoid smoking and consumption of alcohol.
- ❖ Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g., paracetamol, ibuprofen) which may mask the symptoms
- ❖ The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or due to illness.

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

The proposed project at Kuppam Village aims to produce **22500 m³** of rough stone over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 14 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 12 persons in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

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

- ❖ 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 10 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation
- ❖ CSR activities will be taken up in the Kuppam village mainly contributing to education, health, training of women self-help groups and contribution to infrastructure etc., CSR budget is allocated as 2.5% of the profit.

8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & capital investment is \leq 100 crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund with reference to 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

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 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 drive 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/ wastewater 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, wastewater 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 LAND ENVIRONMENT MANAGEMENT

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (unutilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. Aesthetic of the environment will not be affected. There is no major vegetation in the project area. During the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development program. A detailed land environment management plan has been provided in Table 10.1.

Table 10.1 Proposed Controls for Land Environment

Control	Responsibility
Design vehicle wash-down areas so that all runoff water is captured and passed through oil water separators and sediment catchment devices.	Mines Manager
Refueling to be undertaken in a safe location away from vehicle movement pathways & 100m away of any watercourse. Refueling activity to be under visual observation at all times. Drainage of refueling areas to sumps with oil/water separation.	Mine Foreman & Mining Mate
Soil and groundwater testing as required following up a particular incident of contamination.	Mines Manager
At conceptual stage, the mining pits will be converted into Rain Water	Mines Manager

Harvesting. Remaining area will be converted into greenbelt area.	
No external dumping i.e., outside the project area.	Mine Foreman
Garland drains with catch pits / settlement traps to be provided all around the project area to prevent run off affecting the surrounding lands.	Mines Manager
The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier.	Mines Manager

Source: Proposed by FAEs & EIA Coordinator

10.3 SOIL MANAGEMENT

A detailed soil environment management plan has been provided in Table 10.2.

Table 10.2 Proposed Controls for Soil Management

Control	Responsibility
Surface run-off from the project boundary will be diverted to the mine pits via garland drains.	Mine Foreman & Mining Mate
Haul roads and other access roads will be designed along with drainage systems to minimize concentration of flow and erosion risk	Mines Manager
Sediments from sediment traps will be removed; garland drain system will be maintained periodically.	Mines Manager
Test soils for pH, EC, chloride, size & water holding capacity	Manager Mines

Source: Proposed by FAEs & EIA Coordinator

10.4 WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash and domestic sewage from mines office is anticipated. The quarrying operation is proposed up to a depth of 18 m. The water table in the area is at 60 m below ground level. Hence, the proposed project will not intersect the ground water table during entire quarry period. A detailed water environment management plan has been provided in Table 10.3.

Table 10.3 Proposed Controls for Water Environment

Control	Responsibility
To maximize the reuse of pit water for water supply	Mines Foreman
Temporary and permanent garland drain will be constructed to contain the catchments of the mining area and to divert runoff from undisturbed areas through the mining areas	Mines Manager
Natural drains/nallahs/brooklets outside the project area should not be	Mines Manager

disturbed at any point of mining operations	
Ensure there is no process effluent generation or discharge from the project area into water bodies	Mines Foreman
Domestic sewage generated from the project area will be disposed in septic tank and soak pit system	Mines Foreman
Monthly or after rainfall, inspection for performance of water management structures and systems	Mines Manager
Conduct ground water and surface water monitoring for parameters specified by CPCB	Manager Mines

Source: Proposed by FAEs & EIA Coordinator

10.5 AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations in the ambient air. Daily water sprinkling on the haul roads, approach roads in the vicinity will be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements. A detailed ambient air environment management plan has been provided in Table 10.4.

Table 10.4 Proposed Controls for Air Environment

Control	Responsibility
Generation of dust during excavation is minimized by daily (twice) water sprinkling on working face and daily (twice) water sprinkling on haul road	Mines Manager
Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself is implemented	Mines Manager
Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution	Mines Manager
Ambient Air Quality Monitoring carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted air pollution control measures	Mines Manager
Provision of Dust Mask to all workers	Mines Manager
Greenbelt development all along the periphery of the project area	Mines Manager

Source: Proposed by FAEs & EIA Coordinator

10.6 NOISE POLLUTION CONTROL

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time. A detailed noise environment management plan has been provided in Table 10.5.

Table 10.5 Proposed Controls for Noise Environment

Control	Responsibility
Development of thick greenbelt all along the Buffer Zone (7.5 meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Foreman
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Mines Manager
Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Mining Mate
Provision of effective silencers for mining machinery and transport vehicles	Mines Manager
Provision of sound proof AC operator cabins to HEMM	Mines Manager
Sharp drill bits are used to minimize noise from drilling	Mines Foreman
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Mines Manager
Reduce maximum instantaneous charge using delays while blasting	Mining Mate
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise or vibration monitoring	Mines Manager

Source: Proposed by FAEs & EIA Coordinator

10.7 GROUND VIBRATION AND FLY ROCK CONTROL

The Rough stone quarry operation creates vibration due to the blasting and movement of Heavy Earth moving machineries, fly rocks due to the blasting. A detailed ground vibration management plan has been provided in Table 10.6.

Table 10.6 Proposed Controls for Ground Vibrations & Fly Rock

Control	Responsibility
Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8Hz) well within the prescribed standards of DGMS	Mines Manager
Drilling and blasting will be carried under the supervision of qualified persons	Mines Manager
Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting	Mines Manager
Suitable spacing and burden will be maintained to avoid misfire / fly rocks	Manager Mines
Number of blast holes will be restricted to control ground vibrations	Manager Mines
Blasting will be carried out only during noon time	Mining Mate
Undertake noise or vibration monitoring	Mines Manager
ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material	Mines Foreman

Source: Proposed by FAEs & EIA Coordinator

10.8 BIOLOGICAL ENVIRONMENT MANAGEMENT

The proponent will take all necessary steps to avoid the impact on the ecology of the area by adopting suitable management measures in the planning and implementation stage. During mining, thick plantation will be carried out around the project periphery, on safety barrier zone, on top benches of quarried out area etc. Following control measures are proposed for its management and will be the responsibility of the Mines Manager.

- ❖ Greenbelt development all along the safety barrier of the project area.
- ❖ It is also proposed to implement the greenbelt development program and post plantation status will be regularly checked for every season.
- ❖ The main attributes that retard the survival of sapling is fugitive dust, this fugitive dust can be controlled by water sprinkling on the haul roads and installing a sprinkler unit near the newly planted area.
- ❖ Year wise greenbelt development will be recorded and monitored based on:

- ❖ the area of plantation
 - ❖ Period of plantation
 - ❖ Type of plantation
 - ❖ Spacing between the plants
 - ❖ Type of manuring and fertilizers and its periods
 - ❖ Lopping period, interval of watering
 - ❖ Survival rate
 - ❖ Density of plantation
- ❖ The ultimate reclamation planned leaves a congenial environment for development of flora & immigration of small fauna through green belt and water reservoir. The green belt and water reservoir developed within the Project at the end of mine life will attract the birds and animals towards the project area in the post mining period.

10.8.1 Green Belt Development Plan

About 940 saplings are proposed to be planted in and around the lease area. Of the total saplings, about 80% of the saplings is expected to survive in the environment. The main objectives of the greenbelt development plan are to:

- ❖ Combat the dispersal of dust in the adjoining areas.
 - ❖ Protect the erosion of the soil and conserve moisture of the soil.
 - ❖ Increase the rate of recharge of ground water.
- ❖ Restore the ecology of the area, restore aesthetic beauty of the locality and meet the requirement of fodder, fuel and timber of the local community. The proposed green belt development plan has been given in Table 10.7.

Table 10.7 Proposed Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	376	301	3384
	Number of plants outside the mine lease area		
	564	451	5076
Total	940	752	8460

Source: Proposed by FAEs & EIA Coordinator

A well-planned green belt of trees with long canopy leaves shall be developed with dense plantations around the boundary and haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

10.9 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

Occupational safety and health are very closely related to productivity and good employer-employee relationship. The main factors of occupational health impact in quarries are fugitive dust and noise. Safety of employees during quarrying operation and maintenance of mining equipment will be taken care as per Mines Act 1952 and Rule 29 of Mines Rules 1955. To avoid any adverse effect on the health of workers due to dust, noise and vibration sufficient measures have been provided.

10.9.1 Medical Surveillance and Examinations

- ❖ Identifying workers with conditions that may be aggravated by exposure to dust & noise and establishing baseline measures for determining changes in health.
- ❖ Evaluating the effect of noise on workers.
- ❖ Enabling corrective actions to be taken when necessary.
- ❖ Providing health education.

The health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detail medical examination at the time of employment. The medical examination covers the following tests under mines act 1952.

- ❖ General Physical Examination and Blood Pressure.
- ❖ X-ray Chest and ECG.
- ❖ Sputum Test, Sperm Count Test.
- ❖ Detailed Routine Blood and Urine Examination.

The medical histories of all employees will be maintained in a standard format annually. Thereafter, the employees will be subject to medical examination annually. The below tests (Table 10.8) keep upgrading the database of medical history of the employees.

Table 10.8 Medical Examination Schedule

S. No.	Activities	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1	Initial Medical Examination (Mine Workers)					
A	Physical Check-up					
B	Psychological Test					

C	Audiometric Test					
D	Respiratory Test					
2	Periodical Medical Examination (Mine Workers)					
A	Physical Check – up					
B	Audiometric Test					
C	Eye Check – up					
D	Respiratory Test					
3	Medical Camp (Mine Workers & Nearby Villagers)					
4	Training (Mine Workers)					
Medical Follow ups: Work force will be divided into three targeted groups age wise as follows:						
Age Group		PME as per Mines Rules 1955			Special Examination	
Less than 25 years		Once in a Three Years			In case of emergencies	
Between 25 to 40 Years		Once in a Three Years			In case of emergencies	
Above 40 Years		Once in a Three Years			In case of emergencies	
Medical help on top priority immediately after diagnosis/ accident is the essence of preventive aspects.						

10.9.2 Proposed Occupational Health and Safety Measures

- ❖ The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- ❖ Lightweight and loose-fitting clothes having light color will be preferred to wear.
- ❖ Noise exposure measurements will be taken to determine the need for noise control strategies.
- ❖ The personal protective equipment will be provided for mine workers.
- ❖ Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment.
- ❖ At noisy working activity, exposure time will be minimized.
- ❖ Dust generating sources will be identified and proper control measure will be adopted.
- ❖ Periodic medical examinations will be provided for all workers.
- ❖ Strict observance of the provisions of DGMS Acts, Rules and Regulations in respect of safety both by management and the workers.
- ❖ The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.

- ❖ In respect of contract work, safety code for contractors and workers will be implemented. They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centers. All personal protective equipment's will be provided to them.
- ❖ A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- ❖ Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.



Figure 10.1 Personal Protective Equipment to the Mine Workers

10.9.3 Health and Safety Training Program

The Proponents will provide special induction program along with machinery manufacturers for the operators and co-operators to run and maintain the machinery effectively and efficiently. The training program for the supervisors and office staffs will be arranged in the group vocational training centers in the State and engage Environmental

Consultants to provide periodical training to all the employees to carry out the mining operation in and eco-friendly manner, as shown in Table 10.9.

Table 10.9 List of Periodical Trainings Proposed for Employees

Course	Personnel	Frequency	Duration	Instruction
New-Employee Training	All new employees exposed to mine hazards	Once	One week	<ul style="list-style-type: none"> ✓ Employee rights, ✓ Supervisor responsibilities ✓ Self-rescue ✓ Respiratory devices ✓ Transportation controls ✓ Communication systems ✓ Escape and emergency evacuation ✓ Ground control hazards ✓ Occupational health hazards ✓ Electrical hazards and First aid Explosives
Task Training Like Drilling, Blasting, Stemming, safety, Slope stability, Dewatering, Haul Road maintenance.	Employees assigned to new work tasks	Before new Assignments	Variable	<ul style="list-style-type: none"> ✓ Task-specific health & safety procedures and SOP for various mining activity ✓ Supervised practice in assigned work tasks.
Refresher Training	All employees who received new-hire training	Yearly	One week	<ul style="list-style-type: none"> ✓ Required health and safety standards ✓ Transportation

				controls ✓ Communication systems ✓ Escape ways, emergency evacuations ✓ Fire warning ✓ Ground control hazards ✓ First aid on electrical hazards ✓ Accident prevention ✓ Explosives ✓ Respirator devices
Hazard Training	All employees exposed to mine hazards	Once	Variable	✓ Hazard recognition and avoidance ✓ Emergency evacuation procedures ✓ Health standards ✓ Safety rules ✓ Respiratory devices

Source: Proposed by FAEs & EIA Coordinator as per DGMS Norms

10.9.4 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the company for execution of environmental management plan. The Table 10.10 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measure.

Table 10.10 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.	18800	18800

		10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare		
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	75000	75000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	5000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	1250

	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual)	0	20000
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Noise Environment	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0

	Provision for Portable blaster shed	Installation of portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	0
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	18800	9400
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).	18800	9400
		Installation of dust bins	25000	20000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	5000	2000
Implementation of EC, Mining Plan & DGMS Condition Occupational Health and Safety	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	10000	1000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	56000	14000

	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	7520
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisironed.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs.10,000/- per annum	376000	18800
	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	94000	18800
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 st Class / 2 nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
Developme nt of Green Belt	Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the	75200	11280

		lease area and @ 30 per plant maintenance (recurring))"		
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	169200	16920
Mine Closure Activity	Closure includes Greenbelt development, wire fencing, drains	Provision made in Closure Cost	0	0
Total EMP Budget			1868000	1110270

Table 10.11 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation

I st Year	II nd Year	III rd Year	IV th Year	V th Year	Total
2978270	1165784	1224073	1285276	1349540	8002943

In order to implement the environmental protection measures, an amount of **Rs.18,68,000** as capital cost and recurring cost as **Rs.11,10,270** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs. 80,02,943**, as shown in Table 10.11.

10.10 CONCLUSION

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

CHAPTER XI
SUMMARY AND CONCLUSION

11.0 INTRODUCTION

This EIA report is prepared by considering cumulative load of six proposed quarries, one existing and one expired quarries with the total extent of 16.03.0 hectares in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu State, calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016. This EIA Report was prepared in compliance with ToR obtained vide letter No. SEIAA-TN/F.No.9511/ToR-1311/2022 dated 07.12.2022. And the baseline monitoring study was carried out during the period of October – December 2021.

11.1 PROJECT DESCRIPTION

Table 11.1 Salient Features – Proposed Quarry (P1)

Name of the Quarry	V.Kavitha Roughstone Quarry	
Type of Land	Patta land	
Extent	1.88.0 ha	
S.F. Nos.	75/1A, 75/1B, 75/2	
Toposheet No.	58-E/16 & 58-F/13	
Latitude	10°59'57.47"N to 11°00'02'56"N	
Longitude	77°57'32.82"E to 77°57'39.69"E	
Ultimate Depth of Mining	18 m BGL	
Existing Pit Dimension	Pit 1: 124 m(L) X 43 m(W) X 13 m(D) Pit 2: 108m(L) X 81 m(W) X 5 m(D)	
Geological Resources	Rough stone (m ³)	Top soil(m ³)
	337160	1697
Mineable Reserves	158939	1697
Proposed production for 5 years	22500	1697
Total No. of Lorry Loads	2.5 loads of rough stone/day	
Method of Mining	Open cast manual method	
Topography	Undulated	
Machinery proposed	Hand Jack hammer	3
	Compressor	1
	Tipper	1
Blasting Method	Quarrying operation will be carried out tractor mounted compressor attached with Jack hammers is proposed to drilling and without any blasting the rocks.	
Proposed Manpower Deployment	14 persons	
Project Cost	Rs. 46,30,000/-	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	3.0 KLD	

Source: Approved Mining Plan and Survey of India Toposheet

Table 11.2 Land Use Pattern of the Proposed Project

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	1.33.00	0.46.50
Infrastructure	Nil	0.02.00
Roads	0.03.0	0.04.00
Mineral Reject Dump	0.10.0	0.10.00
Green Belt	Nil	0.20.00
Unutilized area	0.42.00	1.05.50
Total	1.88.00	1.88.00

Source: Approved Mining plan

Table 11.3 Resources and Reserves of Proposed Project

Resource Type	Rough Stone in m ³	Top Soil in m ³
Geological Resource in m ³	337160	1697
Mineable Reserves in m ³	158939	--

Source: ToR

Table 11.4 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth(m)
I	124	43	13
II	108	81	5

Source: ToR

Table 11.5 Water Requirement of the Proposed Project

Purpose	Quantity	Source
Dust Suppression	1.0 KLD	Existing bore wells nearby the lease area
Green Belt development	1.0 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.0 KLD	Existing bore wells and approved water vendors
Total	3.0 KLD	

Source: Prefeasibility report

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline monitoring study was carried out during October 2021– December 2021 to assess the existing environmental scenario in the area. For the purpose of EIA studies, project area was considered as the core zone and area outside the project area up to 10km radius from the periphery of the project site was considered as buffer zone.

Baseline Environmental data has been collected with reference to proposed mines for:

- a) Land
- b) Water
- c) Air
- d) Noise

- e) Biological
- f) Socio-economic status

11.2.1 Land Environment

Land use pattern of the study area was studied using Sentinel II image. Seven LULC types are given in Table 11.6.

Table 11.6 Land Use / Land Cover Statistics for 10 Km Radius

S. No.	Classification	Area(ha)	Area in %
1	Crop land	25434	84
2	Dense forest	653	2
3	Fallow land	361	1
4	Mining/Industrial land	371	1
5	Plantations	2146	7
6	Settlement	167	1
7	Water bodies	1049	3
	Total	30181	100

Source: Sentinel II Satellite Imagery

From the land use/land cover analysis, it is known that the majority of the land in the study area is crop land covering 84% of the total land area, followed by plantations (7%), water bodies (3%), dense forest (2%), fallow land and settlement (1% each). The total mining area within the study area is 371 ha (1%) among other LULC types. The cluster area of 16.03 ha contributes only 0.04 % to the study area. This small percentage of mining activities shall not have any significant impact on the environment.

11.3 SOIL CHARACTERISTICS

11.3.1 Physical Characteristics

- ❖ The soil texture found in the study area is clay loam and sandy loam.
- ❖ pH of the soil varies from 6.09 to 7.26 indicating slightly alkaline nature.
- ❖ Electrical conductivity of the soil varies from 399 to 476 $\mu\text{s}/\text{cm}$ and
- ❖ The water content varies from 2.18 to 3.80 %.

11.3.2 Chemical Characteristics

- ❖ Nitrogen ranges between 76 and 141 mg/kg.
- ❖ Phosphorus ranges between 0.89 and 1.90 mg/kg.
- ❖ Potassium ranges between 240.3 and 334.9 mg/kg.
- ❖ Calcium ranges between 124 and 182 mg/kg.
- ❖ Magnesium ranges between 20.7 and 34.0 mg/kg.
- ❖ Sodium ranges between 322 and 538 mg/kg.
- ❖ Dry matter content ranges between 1.01 and 2.97.

11.4 WATER ENVIRONMENT

11.4.1 Ground Water

- ❖ pH of the water samples ranges from 7.10 to 8.10.
- ❖ TDS are found in the range between 214 and 469 mg/l.
- ❖ The total hardness varies between 176 and 370 mg/l.
- ❖ Calcium varies from 39 to 63 mg/l and magnesium from 16 to 44 mg/l.
- ❖ Sodium varies from 111 to 265 mg/l.
- ❖ Potassium from 01 to 10 mg/l.
- ❖ Bicarbonate varies from 156 to 360 mg/l.
- ❖ Nitrate varies from 10 to 39 mg/l.
- ❖ Chloride varies from 123 to 405 mg/l; sulphate from 66 to 107 mg/l; and fluoride from 0.2 to 1.0 mg/l.
- ❖ When speaking about microbiological parameters, the water samples from all the locations meet the requirement.

When compared to IS 10500:2012 all the parameters fall within the prescribed limits.

11.5 AIR ENVIRONMENT

11.5.1 Site Specific Meteorology

Site specific meteorology during the study period was recorded by an automated weather station.

Table 11.7 Meteorological Data Recorded at Site

S. No.	Parameters		OCT, 2021	NOV,2021	DEC,2021
1	Temperature (°C)	Min	21.48	20.62	14.00
		Max	32.81	30.03	30.33
		Avg	26.21	24.53	23.14
2	Relative Humidity (%)	Min	52.12	60.25	54.94
		Max	98.31	99.88	100.00
		Avg	83.78	89.74	85.44
3	Wind Speed (m/s)	Min	0.05	0.08	0.07
		Max	7.05	7.75	6.66
		Avg	2.31	2.52	2.75
4	Wind Direction (degree)	Min	0.00	0.70	1.50
		Max	358.30	359.62	359.63
		Avg	183.04	168.01	86.37
5	Surface Pressure (kPa)	Min	97.51	97.53	98.30
		Max	98.97	98.88	99.26
		Avg	98.35	98.39	98.80

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Limited in association with GTMS

11.5.2 Ambient Air Quality Results

As per the monitoring data, PM_{2.5} ranges from 20.66 µg/m³ to 23.58 µg/m³; PM₁₀ from 41.36 µg/m³ to 44.98 µg/m³; SO₂ from 6.04 µg/m³ to 7.96 µg/m³; NO₂ from 24.11 µg/m³ to 27.14 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

11.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 08 locations around the proposed project area. The noise level results show that noise levels in core zone was 46.0 dB (A) Leq. during day time and 39.1 dB (A) Leq. during night time and that noise levels in buffer zone varied from 40.1 to 47.2 dB (A) Leq. during day time and from 36.5 to 39.3 dB (A) Leq. during night time. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.7 BIOLOGICAL ENVIRONMENT

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 and no species in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna. The study involved assessment of general habitat type, vegetation pattern, preparation of inventory of flora and fauna of terrestrial ecosystem within 10 km radius from the boundary of the proposed quarry site. Biological assessment of the site was done to identify ecologically sensitive areas and whether there are any rare, endangered, endemic or threatened (REET) species of flora & fauna in the core area as well its buffer zone to be impacted. The study has also been designed to suggest suitable mitigation measures, if necessary, for protection of wildlife habitats and conservation of REET species if any.

11.8 SOCIO-ECONOMIC ENVIRONMENT

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

11.9 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The summary of anticipated adverse environmental impacts due to the proposed project and mitigation measures are given below:

Table 11.8 Anticipated Impacts & Mitigation Measures

Impact	Mitigation Measure
Land Environment	
<ul style="list-style-type: none"> ❖ Destruction of natural landscapes ❖ Changes in soil characteristics ❖ Soil erosion and slope instability 	<ul style="list-style-type: none"> ❖ Mining will be carried out as per approved mine plan in scientific and systematic way ❖ Safety Zone or Buffer area will be maintained and will not be mined and instead plantation will be carried out in the safety zone ❖ Barbed wire fencing will be provided all along the proposed mine boundary ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir ❖ Construction of garland ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
Water Environment	
<ul style="list-style-type: none"> ❖ Decrease in aquifer recharge and increase in surface runoff; ❖ Disturbance to land drainage, overload and erosion of watercourses; ❖ Changes to the surface over which water flows; ❖ Changes to surface and groundwater resources quantity and quality due to 	<ul style="list-style-type: none"> ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area ❖ De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons

<p>stream blockage and contamination by particulate matter or waste;</p> <ul style="list-style-type: none"> ❖ Contamination of aquifers due to removal of the natural filter medium. 	<ul style="list-style-type: none"> ❖ Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system. ❖ Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development.
Air Environment	
<ul style="list-style-type: none"> ❖ Generation of Fugitive Dust ❖ Dust will be generated mainly during excavation, loading & unloading activities. ❖ Gaseous pollutants will be generated mostly by the traffic. ❖ Reduction in visibility due to dust plumes. ❖ Coating of surfaces leading to annoyance and loss of amenity. ❖ Physical and/or chemical contamination and corrosion. ❖ Increase in the concentration of suspended particles in runoff water. ❖ Coating of vegetation leading to reduced photosynthesis, ❖ Inhibited growth, destroying of foliage, degradation of crops; ❖ Increase in health hazards due to inhalation of dust. 	<ul style="list-style-type: none"> ❖ Haul roads will be well maintained by sprinkling water twice a day ❖ The access road will be cleaned and brushed to ensure that mud and dust deposits do not accumulate. ❖ To ensure that dust and debris is minimised on the access road, all the tipper drivers will be instructed to use water spray system on all the tyres and spray water on the loaded material that is provided at the compound area before leaving the site ❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road. ❖ Weekly inspections of the condition of the access road by competent person employed, and immediate action will be taken to address any potholes or damage to the road surface. ❖ Dust wetting agents can be mixed with the water applied to haul roads during hot, dry weather conditions to increase the duration that the road surface remains damp. ❖ Personal Protective Equipment's will be provided to all workers ❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole. ❖ Wet gunny bags will be used as a cover while drilling.

	<ul style="list-style-type: none"> ❖ The blast zone will be kept damp by the application of water from the rain gun fitted to the water tanker prior to each blast to control any fugitive dust emissions that could arise from the surface during detonation. ❖ A daily visual inspection shall be conducted by the site manager who will keep a daily log of all process operations and site activities and note any malfunctions which could lead to abnormal emissions from the quarry operations. ❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation ❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation. ❖ Air filters are renewed after every 10⁰ hours of use, unless otherwise indicated by an on-board computer system. ❖ All site machineries & tippers will be serviced and maintained 6 months once and drivers will report any defects immediately to the site manager to enable repairs to be carried out promptly.
Noise & Vibration	
<ul style="list-style-type: none"> ❖ Annoyance and deterioration of the quality of life; 	<ul style="list-style-type: none"> ❖ Usage of sharp drill bits while drilling which will help in reducing noise; ❖ 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; ❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise; ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and

	persons working near HEMM and their use will be ensured through training and awareness.
Biological Environment	
<ul style="list-style-type: none"> ❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats; ❖ Indirect impacts include habitat degradation due to noise, dust, and human activity. 	<ul style="list-style-type: none"> ❖ Only some common herbs, shrubs and grass will be cleared. So, there will be no impact on the biodiversity. ❖ Green belt development with suitable species will enhance the biodiversity of the project area. ❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.
Socio-Economic Environment	
<ul style="list-style-type: none"> ❖ Health and safety of workers and the general public; ❖ Increase in traffic volumes and sizes of road vehicles; ❖ Economic issues, including the increase in employment opportunities; 	<ul style="list-style-type: none"> ❖ The mining activity puts negligible change in the socio-economic profile. ❖ Around 88 local workers will get employment opportunities along with periodical training to generate local skills. ❖ New patterns of indirect employment/ income will generate. ❖ Regular health check-up camp. ❖ Assistance to schools and scholarship to children will be provided.
Occupational Health & Safety	
<ul style="list-style-type: none"> ❖ Exposure to Dust ❖ Noise and Vibration Exposure ❖ Physical Hazards ❖ Respiratory hazards due to Dust exposure 	<ul style="list-style-type: none"> ❖ Provision of rest shelters for mine workers with amenities like drinking water etc. ❖ All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc. ❖ Training of employees for use of safety appliances and first aid in vocational training centre. ❖ Weekly maintenance and testing of all equipment as per manufacturers' guidelines.

	<ul style="list-style-type: none"> ❖ Pre placement and Yearly Medical Examination of all workers by a medical Officer ❖ First Aid facility will be provided at the mine site. ❖ Close surveillance of the factors in working environment and work practices which may affect environment and worker's health by the mine's manager employed. ❖ Working of mine as per approved mining plan and environmental plans
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11.10 ANALYSIS OF ALTERNATIVES

There are no alternatives suggested as the proposed mining area has the following advantages:

11.11 ENVIRONMENTAL MONITORING PROGRAM

Environmental Monitoring program will be conducted for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

Table 11.9 Post Project Monitoring Program for Proposed Project

S. No.	Activity	Schedule
Air Pollution Monitoring		
1	Ambient Air Monitoring of parameters specified by TNPCB/SEIAA in their CTO/EC Order within the Applied Area	Once in every Six Months
2	Ambient Air Monitoring of parameters specified by TNPCB/SEIAA in their CTO/EC Order outside the Applied Area	Once in every Six Months
Water Quality Monitoring		
3	Monitoring water quality of rain water collected in mine pit area. Rain water will be used for plantation purpose.	Once in every Six Months
4	Monitoring of samples of tube well and open well or Surface Water bodies in nearby location. Parameters as per IS: 10500:1991	Once in every Six Months
5	Monitoring of water spray units	Log-sheet of water spray will be maintained on daily basis

Noise Quality Monitoring		
6	Noise in the ambient atmosphere within and outside the applied area	Once in every Six Months
Greenbelt Maintenance		
7	Monitor schedule for Greenbelt development as per approved mining plan	Once in every Six Months
Soil Quality Monitoring		
8	Grab Samples within and around the applied area	Once in every Six Months

11.12 ADDITIONAL STUDIES

11.12.1 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 is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

11.12.2 Risk Analysis & Disaster Management Plan for proposed project

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31stDecember, and 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 time table are recorded along with pinpointed responsibilities.

In the unlikely event that a consequence has occurred, disaster management kicks in. This includes instituting procedures pertaining to a number of issues such as communication, rescue, and rehabilitation. These are addressed in the disaster management plan. Both, the RA and DMP, are living documents and need to be updated whenever there are changes in operations, equipment, or procedures Assessment is all about preventing accidents and taking necessary steps to prevent it from happening.

The Disaster Management Plan (DMP) is a guide, giving general considerations, directions, and procedures for handling emergencies likely to arise from planned operations. The DMP has been prepared on the basis of the Risk Assessment and related findings covered in the report.

11.13 PROJECT BENEFITS FOR PROPOSED PROJECT

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

- ❖ Improved road communication
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development Programme
- ❖ Skill development & capacity building like vocational training
- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,

11.14 ENVIRONMENTAL MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of Rs.18,68,000 as capital cost and recurring cost as Rs.11,10,270 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs. 80,02,943.

11.15 CONCLUSION

EIA study was performed as per the approved ToR and Standard ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP has been dynamic, flexible and subject to periodic review. CER activities were identified and for its time bound implementation, fund has been allocated.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local community. The green belt development programme will help in increasing the green cover in the area. Thus, the proposed project is not likely to affect the environment or adjacent ecosystem in an adverse way.

The Mines Management will be responsible for the project 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 XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **V.Kavitha** has engaged **GeoTechnical 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.

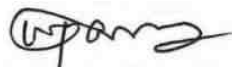
The accredited experts and associated members who were engaged in this EIA study is given below:

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

Team Members					
18.	Dr.R. Arunbalaji	In-house, FAE	1(a)(i)	TM for EC	B
19.	M.Saravanan	In-house	1(a)(i)	TM for HG & LU	B
20.	R.Revathy	In-house	1(a)(i)	TM for WP, SHW, & RHW	B
21.	M.Jalandar	In-house	1(a)(i)	TM for SE	B
22.	Dr.D.Kalaimurugan	In-house	1(a)(i)	TM for EB	B
Abbreviations					
EC	EIA Coordinator	NV	Noise and Vibration		
FAE	Functional Area Expert	SE	Socio Economics		
FAA	Functional Area Associates	HG	Hydrology, ground water and water conservation		
TM	Team Member	SC	Soil conservation		
GEO	Geology	RH	Risk assessment and hazard management		
WP	Water pollution monitoring, prevention and control	SHW	Solid and hazardous wastes		
AP	Air pollution monitoring, prevention and control	MSW	Municipal Solid Wastes		
LU	Land Use	ISW	Industrial Solid Wastes		
AQ	Meteorology, air quality modeling, and prediction	HW	Hazardous Wastes		
EB	Ecology and bio-diversity	GIS	Geographical Information System		

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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

Signature : 

Date : 11.02.2023

Name : **Dr. S. Karuppanan**






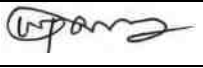



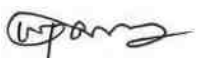

Designation : EIA Coordinator



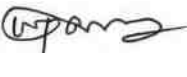



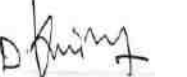
Name of the EIA Consultant Organization : Geo Technical Mining Solutions


Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **V. Kavitha** roughstone quarry project situated in the cluster with the extent of 16.03.00 ha in Kuppam Village of Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our knowledge.







List of Functional Area Experts Engaged in this Project

S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity	J.N. Manikandan	
		○ Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	
2	WP	○ 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 mitigation measures. ○ Analysis and description of aquifer Characteristics	Dr.M. Vijay Prabhu	
			G. Uma Maheswaran	
			Dr.S. Karuppannan	
4	GEO	○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	G.Gopala Krishnan	
			G.Uma Maheswaran	
			Dr.M. Vijay Prabhu	
			Dr.S. Karuppannan	
5	SE	○ Revision in secondary data as per Census of India, 2011. ○ Impact Assessment & Preventive Management Plan ○ Corporate Environment Responsibility.	Dr. G. Prabhakaran	

6	EB	<ul style="list-style-type: none"> ○ Collection of Baseline data of Flora and Fauna. ○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list. ○ Impact of the project on flora and fauna. ○ Suggesting species for greenbelt development. 	Dr.J. Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> ○ Identification of hazards and hazardous substances ○ Risks and consequences analysis ○ Vulnerability assessment ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety. 	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> ○ Construction of Land use Map ○ Impact of project on surrounding land use ○ Suggesting post closure sustainable land use and mitigative measures. 	Dr.S. Karuppannan	
9	NV	<ul style="list-style-type: none"> ○ Identify impacts due to noise and vibrations ○ Suggesting appropriate mitigation measures for EMP. 	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> ○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ○ Recommending mitigations measures for EMP 	Dr.R. ArunBalaji	
11	SC	<ul style="list-style-type: none"> ○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr.J. Rajarajeshwari	
			Dr. D.Kalaimurugan	

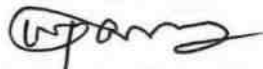
12	SHW	<ul style="list-style-type: none"> ○ Identify source of generation of non-hazardous solid waste and hazardous waste. ○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled. 	J.N. Manikandan	
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List of Functional Area Associate Engaged in this Project

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithviraj	LU, HG	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG 	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling 	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> ○ Field visit along with FAE ○ Assistance to FAE in both primary and secondary data collection 	
4	S.Vasugi	AQ	<ul style="list-style-type: none"> ○ Field visit along with FAE ○ Assistance to FAE in both primary and secondary data collection 	
5	P.Dhatchayini	AQ	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data 	
6	V.Malavika	NV, SHW	<ul style="list-style-type: none"> ○ Site visit along with FAE ○ Assistance in report preparation 	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT
ORGANIZATION

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for **V. Kavitha** roughstone quarry project located within the cluster of 16.03.00 ha in Kuppam Village of Pugalur Taluk, Karur District of Tamil Nadu and also certify that information furnished in the EIA report is true and correct to the best of my knowledge.

Signature : 

Date : 11.02.2023

Name : **S. Karuppannan M.Sc., Ph.D.**

Designation : Managing Partner

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : NABET/EIA/2023/IA0067 & March 30,2021

Validity : Valid till 29.12.2023

FIELD PHOTOS







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

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.9511/ToR-1311/2022 Dated: 07.12.2022.

To

V.Kavitha
W/o P.Vadivel
No.8/42, Nochi kattur, Kuppam Village,
Pugalur Taluk,
Karur District


Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the proposed Rough stone quarry lease in Patta Land S.F.No 75/1A, 75/1B & 75/2 located over an extent of 1.88.0 Hectares Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu by Tmt. V.Kavitha - under project category – “B1” and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

- Ref:**
1. Online proposal No.SIA/TN/MIN/402665/2022, dated: 10.10.2022.
 2. Your application submitted for Terms of Reference dated: 13.10.2022.
 3. Minutes of the 331st SEAC meeting held on 24.11.2022.
 4. Minutes of the 576th Authority meeting held on 07.12.2022.

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

The proponent, Tmt. V.Kavitha has submitted application for Terms of Reference (ToR) with public Hearing on 13.10.2022, for the proposed Rough stone quarry lease in Patta Land S.F.No 75/1A,


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75/1B & 75/2 located over an extent of 1.88.0 Hectares Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Rough stone Quarry lease over an extent of 1.88.0 Ha at S.F.Nos. 75/1A, 75/1B & 75/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu by Tmt.V.Kavitha- For Terms of Reference.

The proposal was placed in 331st SEAC meeting held on 24.11.2022. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent, Tmt. V.Kavitha has applied for Terms of Reference for the Proposed Rough stone Quarry lease over an extent of 1.88.0 Ha at S.F.Nos. 75/1A, 75/1B & 75/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The lease period is 5 years and the mining for the entire period of five years should not exceed 22,500 cu. m of Rough Stone. The annual peak production is 4,500 cu. m of Rough Stone (1st year). The ultimate depth of mining is 18m (13m – Existing pit depth and 5m proposed depth).
4. The proponent has planned to carry out by adopting the manual means of hand breaking of stone. Based on the presentation made by the proponent SEAC recommended grant of Terms of Reference (TOR) with Public Hearing, subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:


1. The proponent is requested to submit the valid registered lease document during the EIA appraisal after the previous lease granted for the mining operations is legally surrendered (or) lapsed with the consent of the competent authority.
2. The proponent is requested to carry out a survey and enumerate on the structures including the crematory shed located within 100m, 200m, 300m from the boundary of the mine lease area.
3. The proponent must conduct a survey and furnish the details of habitations which is located within 300m radius (Nochikattur village) from the proposed mine lease area.
4. The proponent must submit certified compliance report obtained from IRO of MoEF&CC as per OM IA3-22/10/2022-IA.III Dated 08.06.2022.
5. 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.
6. The Project Proponent shall conduct the 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) 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. Necessary data and documentation in this regard may be provided.
 7. The proponent shall submit the details regarding the nature of blasting activity which will be carried out.
 8. The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.
 9. The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.
 10. In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry approved in the Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC.
 11. The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry indicating the proposed stabilizing measures during the appraisal while obtaining the EC, as the depth of the proposed working is extended beyond 30 m below ground level.
 12. The PP shall furnish the affidavit stating that no blasting operation in the proposed quarry is carried out as it involves only manual means of rock breaking.
 13. **If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation involving line drilling & muffle blasting and Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.**
 14. Details of Green belt & fencing shall be included in the EIA Report.


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15. 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.
16. 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,
- What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
 - 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.
17. 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).
18. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
19. 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.
20. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
22. The Proponent shall carry out the Cumulative impact study due to mining operations carried

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


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- circulated vernacular daily.
33. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
 34. 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.
 35. 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.
 36. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/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
 37. 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.
 38. 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.
 39. 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.
 40. 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.
 41. 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.
42. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
 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. 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.
 45. 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.
 46. 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.

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 576th Authority meeting held on 07.12.2022. The authority noted that the subject was appraised in 331st SEAC meeting held on 24.11.2022.

Based on the presentation made by the proponent SEAC decided to recommend for grant of Terms of Reference (TOR) with Public Hearing. After detailed deliberations, the Authority accepted the recommendations of SEAC and decided to grant Terms of Reference subject to the conditions as recommended by SEAC in addition to the following conditions and conditions stated therein vide Annexure 'B':

1. The proponent shall submit a letter obtained from AD/Mines regarding the working methodology of the proposed mine.
2. The proponent shall submit the details regarding the working efficiency of the individual labours and per day quantity that will be achieved shall be submitted.
3. The proponent shall submit the number of labours employed in the mining activity including male and female.
4. The proponent shall submit the list of Labours to be employed.
 - (i) The proponent shall submit the details regarding the project cost which shall include the cost for Health measurements for the labours.


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Annexure 'B'

1. Cluster Management Committee, 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 management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & bio-diversity.
 - b) Climate change leading to Droughts, Floods etc.
 - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - d) Possibilities of water contamination and impact on aquatic ecosystem health.
 - e) Agriculture, Forestry & Traditional practices.
 - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g) Bio-geochemical processes and its foot prints including environmental stress.

- h) Sediment geochemistry in the surface streams.
11. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
 12. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.
 13. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.
 14. 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.
 15. Impact on surrounding agricultural fields around the proposed mining Area.
 16. Erosion Control measures.
 17. Impact on soil flora & vegetation around the project site.
 18. 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.
 19. 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.
 20. 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.
 21. 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.
 22. 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.
 23. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
 24. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.


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26. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
27. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
28. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.
29. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
31. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.
32. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.
33. The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.
34. 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.
35. 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.
36. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
37. 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.

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.
39. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.
40. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.
41. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.

A. STANDARD TERMS OF REFERENCE

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



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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


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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


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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 submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there


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- 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 its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
 18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
 19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
 20. Likely impact of the project on air, water, land, flora-fauna and nearby population
 21. Emergency preparedness plan in case of natural or in plant emergencies
 22. Issues raised during public hearing (if applicable) and response given
 23. CER plan with proposed expenditure.
 24. Occupational Health Measures
 25. Post project monitoring plan
 26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
 27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
 28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.

29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 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.


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- 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.


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Copy to:

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

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

To
Tmt.V.Kavitha,
W/o.P.Vadivel,
Nochikattur,
Kuppam Village,
Pugalur Taluk,
Karur District.

Rc.No.387/Mines/2021, Dated:28.09.2022

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District - Pugalur Taluk - Kuppam Village - S.F.Nos.75/1A(0.49.50 hect), 75/1B(0.47.50 hect), 75/2(0.91.00 hect) Over an extant 1.88.00 hectares - Quarry lease application - Rough stone and Gravel - preferred by Tmt.V.Kavitha - Mining Plan approved - Existing/ proposed/ abandoned quarries situated within 500 mts radial distance - details furnished - Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel preferred by Tmt.V.Kavitha, W/o.P.Vadivel, Nochikattur, Kuppam Village, Pugalur Taluk, Karur District - 639 136, dated: 13.08.2021 this office received dated:08.09.2021.
2. Pricise Area Communication Notice Rc.No.387/Mines/2021, Dated: 12.08.2022.
3. Mining Plan submitted by Tmt.V.Kavitha, Letter dated: 22.08.2022.
4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter No. 387/Mines/2021, dated: .09.2022
5. Tmt.V.Kavitha letter dated: 27.09.2022

In the reference 1st cited, Tmt.V.Kavitha has applied quarry lease for quarrying Rough stone and Gravel lease in patta land of S.F.Nos.75/1A(0.49.50 hect), 75/1B(0.47.50 hect), 75/2(0.91.00 hect), Over an extant 1.88.00 hectares of Kuppam Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur has issued precise area for the applied area vide ref. 2nd cited.

Accordingly, the applicant has submitted Mining Plan and it was approved by the Deputy Director, Geology and Mining, Karur vide ref. 4th cited.

2. Details of Existing, Proposed and abandoned quarries located within 500 meters radial distance from subject area is furnished below as requested by the applicant for want of Environmental Clearance vide reference 5th cited.

I. Existing Other Quarries: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
1	---- Nil----				

II. Proposed Area: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
1	Tmt.V.Kavitha, W/o.P.Vadivel, Nochikattur, Kuppam Village, Pugalur Taluk, Karur District 639 136	75/1A, 75/1B &75/2	1.88.0	Proposed Area	
2	Thiru.K.Nallasamy, S/o.Krishnan, Door No.4/71, R.G.Nagar, VTC Punnam Post, Punnamchatram, Pugalur Taluk, Karur District	226/1(P)	2.89.0	Applied Area	
3	Tvl.NTC Blue Metals LLP, Prop.of.Mr.S.Muthusamy, Rasampalayam, Keelsathambur village, Namakkal District - 637 207	76/1(P)	0.63.0		
4	Thiru.K.Shanmugam, S/o.Karumanagounder, Opp To V.S.T. Petrol Bunk, Punnamchathiram, Pugalur Taluk, Karur District	76/2	0.73.50	Applied Area	

III. Lease Expired and abandoned Area: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
1	N.Sakthivel s/o.Nallappa gounder Andipatti Karudayampalayam Aravakurichi	75/3A 76/1	2.17.0	5.5.2006 to 4.5.2011	----
2	Thiru.P.Marappan S/o.Palaniyappan Andipatti Kuppam Village AravkurichiTlauk Karur District.	74 75/3B	2.11.5	14.10.2016 to 13.10.2021	----
3	Tvl.Venkatachalapathi Blue Metals, S.F.No.233/1, Puthurpatti, Kuppam Post, Aravakurichi Taluk, Karur District.	213/1 214/2A 214/2B 214/2C 220/3P 221/P	4.05.0	23.6.2017 to 22.6.2022	----

[Signature]
28/09/22
Deputy Director,
Geology and Mining,
Karur.

[Signature]
28/09/2022

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

To
Tmt.V.Kavitha,
W/o.P.Vadivel,
Nochikattur,
Kuppam Village,
Pugalur Taluk,
Karur District.

Rc.No.387/Mines/2021, Dated:22.09.2022

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Kuppam Village - S.F.Nos.75/1A(0.49.50 hect), 75/1B(0.47.50 hect), 75/2(0.91.00 hect) Over an extant 1.88.00 hectares - Quarry lease application for Rough Stone- Preferred by Tmt.V.Kavitha - Precise area communicated - mining plan submitted for approval – Approved – Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by Tmt.V.Kavitha, W/o.P.Vadivel, Nochikattur, Kuppam Village, Pugalur Taluk, Karur District - 639 136, dated: 13.08.2021 this office received dated:08.09.2021.
 2. Order of the Hon'ble Supreme Court of India in I.A.Nos.12-13/2011 in SLP (C) No.19628-19629/2009, dt: 27.02.2012.
 3. Government of India, Ministry of Environment and Forest Office Memorandum, Dated:18.05.2012.
 4. The Chairman, State Level Environment Impact Assessment Authority, Tamil Nadu D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated: 17.09.2012.
 5. The Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dt: 19.11.2012.
 6. Deputy Director, Geology and Mining, Karur Notice Rc.No.387/Mines/2021, Dated: 12.08.2022.
 7. Mining Plan submitted by Tmt.V.Kavitha, letter Dated: 24.08.2022.

Tmt.V.Kavitha applied for quarry lease to quarry Rough Stone vide in the reference 1st cited and Precise area communicated to the applicant regarding to submit the mining plan for approval as per rule 41 and also

submit the Environmental Clearance as per Rule 42 of Tamil Nadu Minor Mineral Concession Rules.

Accordingly Tmt.V.Kavitha have submitted three copies of draft mining plan for approval in respect of Rough stone quarry lease applied areas, over an extent of 1.88.00 hectares of patta land in S.F.Nos.75/1A(0.49.50 hect), 75/1B(0.47.50 hect), 75/2(0.91.00 hect) of Kuppam Village, Pugalur Taluk, Karur District in the reference 7th cited.

The above submitted mining plan for the grant of Rough stone quarry lease in S.F.Nos.75/1A(0.49.50 hect), 75/1B(0.47.50 hect), 75/2(0.91.00 hect) Over an extant 1.88.00 hectares of patta land in Kuppam Village, Pugalur Taluk, Karur District has been examined in detail.

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

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

- (III) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (IV) As per the Deputy Director, Geology and Mining, Karur notice in Rc.No.387/Mines/2021, Dated:12.08.2022 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப விண்ணப்ப புலங்களுக்கு மேற்கு பகுதியில் புல எண்.225-இல் தென்வடலாக செல்லும் நடைபாதைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு வடகிழக்கில் 300 மீட்டர் தொலைவிற்குள் 12 பண்ணை வீடுகள் உள்ளது. மேற்படி பண்ணை வீட்டின் உரிமையாளர்கள் பண்ணை வீடுகளுக்கு பாதிப்பின்றி குவாரிப்பணி செய்ய சம்மத கடிதம் அளித்துள்ளனர். எனவே, மேற்படி வீடுகளுக்கு எவ்வித பாதிப்பின்றி குவாரிப்பணி செய்ய வேண்டும்.
3. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
4. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
6. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.

- (V) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

- (VI) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

Encl: Two copies of Approved Mining Plan.

[Handwritten Signature]
22/9/22
Deputy Director,
Geology and Mining,
Karur.

Copy to:

Thiru.A.Allimuthu, M.Sc., M.Phil.,
RQP/DMG/HYD/85/2022,
D.No.1/231, Pattakaranavalavu,
Chinnamuthiyampatti,
Pudupalayam Post,
Edipaddi Taluk, Salem District.

[Handwritten Signature]
22/09/22

MINING PLAN



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

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

Lease period 5 Years from the date of lease execution

(Prepared under rule 19 (i) & 41 (3) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959)

LOCATION OF THE LEASE AREA

STATE : TAMILNADU
DISTRICT : KARUR
TALUK : PUGALUR
VILLAGE : KUPPAM
S.F.NO'S : 75/1A, 75/1B & 75/2
EXTENT : 1.88.0 HECTARES

ADDRESS OF THE APPLICANT

Mrs. V.KAVITHA

W/o. Mr.P.Vadivel,

No.8/42, Nochi kattur, Kuppam Village,

Pugalur Taluk, Karur District,

Tamilnadu State. Pin code – 639 111.

This Mining Plan is approved subject
to the conditions/stipulations
indicated in the Mining Plan approval
Letter No: 387/Mines/2021
Dated: 22/09/2022

PREPARED BY

A.ALLIMUTHU., M.Sc., M.Phil.,

RQP/DMG/HYD/85/2022

D.No.1/231, Pattakaranavalavu, Chinnamuthiyampatti , Puduppalayam -Post,
Edapaddi Taluk, Salem District, Tamil Nadu State, India

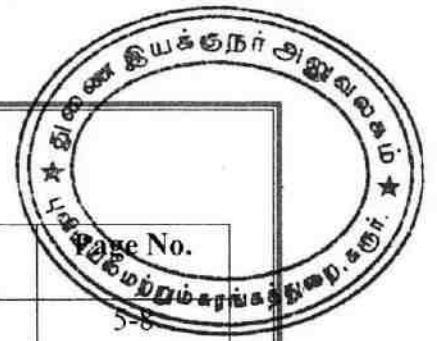
Pincode -636306

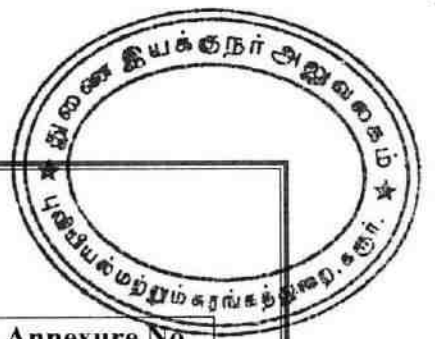
Mob.No.+919788636242, 8870254313

Email Id : allimuthu1973@gmail.com

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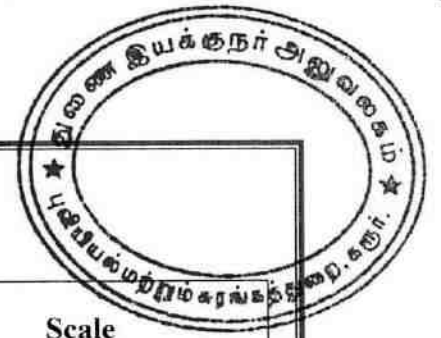




ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of previous lease particulars a) Copy of environmental clearance b) Copy of proceedings c) Lease execution deed	II
3.	Copy of the FMB (Field Measurement Book)	III
4.	Copy of Village Map	IV
5.	Copy of "A" Register	V
6.	Copy of computer chitta	VI
7.	Copy of consent letter	VII
8.	Photo copy of the lease area	VIII
9.	Copy of explosive license, Agreement from Explosive license holder & Blaster certificate	IX
10.	Copy of ID proof of the authorized signatory	X
11.	Copy of RQP certificate	XI

LIST OF PLATES



Sl. No.	Description	Plate No.	Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	1:1,00,000
4.	Satellite imagery map	I-C	1: 5,000
5	Environmental plan	I-D	1: 5,000
6	Mine lease plan	II	1:1000
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V.KAVITHA

W/o. Mr.P.Vadivel,
No.8/42, Nochi kattur, Kuppam Village,
Pugalur Taluk, Karur District. Tamilnadu State.
Pin code – 639 111.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan for rough stone quarry lease in S.F.No's: 75/1A, 75/1B and 75/2 of patta land, over an extent of 1.88.0 hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

A.Allimuthu., M.Sc., M.Phil., Regn. No. RQP/DMG/HYD/85/2022

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

A. Allimuthu., M.Sc., M.Phil.,
RQP/DMG/HYD/85/2022

D.No.1/231, Pattakaranavalavu, Chinnamuthiyampatti, Pudukkottai District, Tamil Nadu State, India
Edapaddi Taluk, Salem District, Tamil Nadu State, India
Pin code -636306
Mob.No.+919788636242, 8870254313

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

Place: Karur, TN

Date:


Signature of the applicant
(V. KAVITHA)



V.KAVITHA

W/o. Mr.P.Vadivel,
No.8/42, Nochi kattur, Kuppam Village,
Pugalur Taluk, Karur District. Tamilnadu State.
Pin code – 639 111.

DECLARATION

The Mining Plan of rough stone quarry lease in S.F.No's: 75/1A, 75/1B and 75/2 of patta land, over an extent of 1.88.0 hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Karur, TN

Date:

V.கவிதா

Signature of the applicant
(V. KAVITHA)



A. Allimuthu., M.Sc., M.Phil.,

RQP/DMG/HYD/85/2022

D.No.1/231, Pattakaranavalavu, Chinnamuthiyampatti, Puduppalayam-Post,

Edapaddi Taluk, Salem District, Tamil Nadu State, India

Pin code -636306

Mob.No.+919788636242, 8870254313

CERTIFICATE

This is to certify that the provisions of 19(1), 20 and 22 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone quarry lease in S.F.No's: 75/1A, 75/1B and 75/2 of patta land, over an extent of 1.88.0 hectares, Kuppam Village, Pugalur Taluk, Karur District, TamilNadu State applied to **Mrs.V.Kavitha**, Karur District, Tamilnadu State.

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.

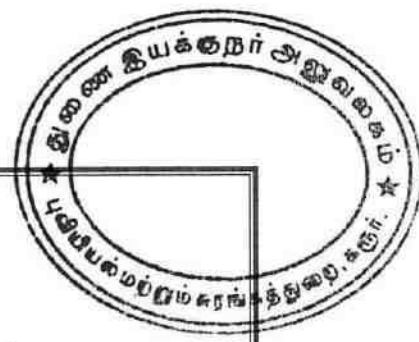
Place: Salem, TN

Date: 22.8.2022

A. Allimuthu.

Signature of the Recognized Qualified Person

A.ALLIMUTHU, M.Sc.,M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/85/2022



A. Allimuthu., M.Sc., M.Phil.,

RQP/DMG/HYD/85/2022

D.No.1/231, Pattakaranavalavu, Chinnamuthiyampatti, Puduppalayam-Post,

Edapaddi Taluk, Salem District, Tamil Nadu State, India

Pin code -636306

Mob.No.+919788636242, 8870254313

CERTIFICATE

I certified that the preparation of Mining Plan for rough stone quarry lease in S.F.No's: 75/1A, 75/1B and 75/2 of patta land, over an extent of 1.88.0 hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State prepared to **Mrs.V.Kavitha**, Karur District, Tamilnadu covers all the provisions of Mines Act, Rules and Regulations etc. made there in and if any specific permission is required the applicant will approach "**The Director General of Mines Safety**", Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

Place: Salem, TN

Date: 22.8.2022

A. Allimuthu.

Signature of the Recognized Qualified Person

A.ALLIMUTHU, M.Sc.,M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/85/2022

MINING PLAN

FOR KUPPAM VILLAGE ROUGH STONE MINING LEASE WITH PROGRESSIVE

QUARRY CLOSURE PLAN

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

Lease period 5 Years from the date of lease execution

(Prepared under rule 19(i) & 41 (3) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959)

INTRODUCTORY NOTES:

- a) **Introduction:** The applicant **Mrs.V.Kavitha**, W/o. Mr.P.Vadivel have residing at No.8/42, Nochi Kattur, Kuppam Village, Pugalur Taluk, Karur District, Tamilnadu State and filed with renewal lease application for the proposal has submitted to the Deputy Director of Geology and Mining, Karur dated 08.09.2021 and had requested to grant the quarry lease for rough stone in S.F.No's.75/1A, 75/1B and 75/2, over an extent of 1.88.0 hectares of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State.
- b) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, District Collectorate, Karur has directed to the applicant **Mrs.V.Kavitha** through his precise area communication letter **Re.No.387/ Mines/2021, Dated 12.08.2022**, before execution of lease deed should submit the mining plan for approval and obtain environmental clearance from the competent authority of State Level Environment Impact Assessment Authority-TamilNadu (SEIAA) as per EIA Notification 2006 and S.O.3977 (E), dated 14th August 2018 and MoEF & CC office memorandum vide F.No.22-1/2019-IA.III [E116917] dated 15th December, 2021 for quarrying lease rough stone in Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No's: 75/1A, 75/1B and 75/2, patta land, over an area of 1.88.0 hectares has recommended as following conditions for a period of 5 years under Rule 19 (i) , 20 & 22 of Tamil Nadu Minor Mineral Concession Rules, 1959.
1. There is foot path passing on north south direction situated in S.F.No.225 on western side of the applied lease area and 10metres safety distance should be left out and without any damage while properly quarrying operation.

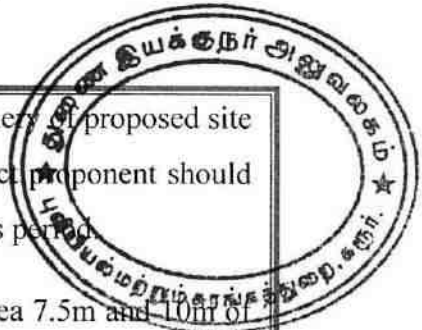
~~This Mining Plan is approved subject~~

to the conditions/stipulations

indicated in the Mining Plan approval

Letter No: 387 / mines / 2021

Dated: 22 / 09 / 2022

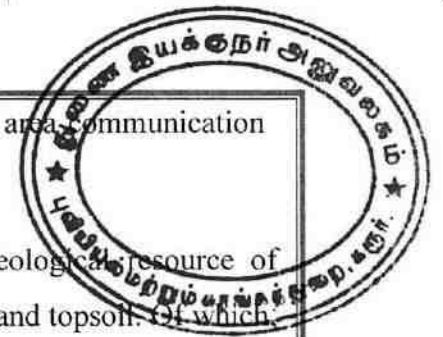
- 
2. The 12 form houses are situated on 300m radius of periphery of proposed site and all the form house owners gave consent to the project. Proponent should not cause any damage while quarrying operation activities period.
 3. A safety distance should be left out nearby the applied area 7.5m and 10m of patta and poramboke lands as respectively while quarrying activities.
 4. Quarrying operation to be carried out with controlled blasting techniques viz, hand-hack-Hammer, Driller for drilling shot holes and use mild explosives substance for blasting the rocks.
 5. To ensure the safety of quarry workers as per Metalliferous Mines acts should formed wide, safe benches. Inside the quarry in safe manner vehicles come and go, do the quarry work ensuring the safety of the quarry workers.
 6. To provide quarrying lease by the deputy director, Karur, approved mining plan, obtain Environmental Clearance from the State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and no objection certificate for Tamil Nadu Pollution Control Board (TNPCB) should be submitted.

(c) The previous lease particulars: The proposed lease area was previously granted to quarrying of rough stone in favor of **Tmt.V.Kavitha w/o P.Vadivel** by the District Collector, Karur Lease deed vide Collr. Ref. No.821/Mines/2013, dated 05.08.2016 in S.F.No's. 75/1A (0.49.5Hect), 75/1B (0.47.5Hect) and 75/2 (0.91.0Hect) Total Extent of 1.88.0Hect. The lease was executed on 05.08.2016 to 04.08.2021 for a period of 5years. There is existing pit was noticed with an average pit dimension as given under the table and the existing pit marked in the surface plan (Ref Plate No: III).

Existing pit details				
Pit no's	Pit level	Length (m)	Width (m)	Depth(m)
1	Level-I	124	43	13
2	Level-II	108	81	5

(d) Preparation and Submission of Mining Plan: The Mining Plan with progressive quarry mine closure has been prepared under rule 19(1) and 41 (1) (i) and submission under rule 41, 42 of Tamil Nadu Minor Mineral Concession Rules, 1959

for a mining lease as per conditions mentioned in the precise area communication letter Rc.No.387/ Mines/2021, dated 12.08.2022.



(e) **Geological resources and Mineable reserves:** Updated Geological resource of estimated as 338857m^3 including the resources of safety zone, and topsoil. Of which, rough stone resources of about 337160m^3 and topsoil is 1697m^3 . The updated mineable reserve is estimated to be 158939m^3 by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 26m (which is 13m existing pit depth and 13m proposed depth) below the ground level (R.L.162m-136m) (Refer Plate No's. VI & VIA).

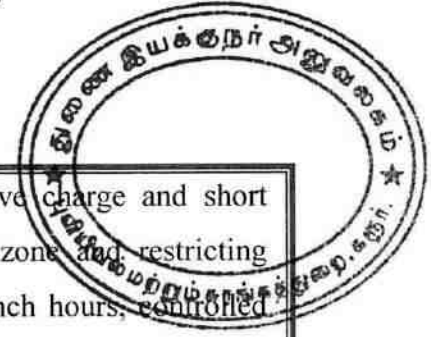
(f) **Proposed production schedule:** Total proposed production of 22500m^3 . Of which, rough stone resources of about 22500m^3 up to a depth of 18m (which is 13m existing pit depth and 5m proposed depth) below the ground level (R.L.162m-144m) for five years plan period. Average production is 4500m^3 of rough stone per year. (Refer Plate No's. IV & IVA).

(g) **Environmental Sensitivity of the proposed lease area: -**

- i. **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
- ii. **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.
- iii. **Indian Reserve Forest Act, 1980:** No reserved forest within the 1.0Km radius. The Nearest Reserve Forest is
 1. Thathapalayam R.F = 7.95km -SE
 2. Vangal R.F = 18.32km-NE
 3. Kattalai R.F = 23.41km-East
- iv. **CRZ Notification, 1991:** There is no sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 1991.

(h) **Environmental measures to be adopted shall be during the ongoing activity period,**

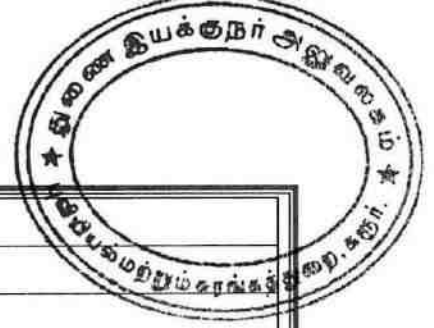
- a. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.



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

1.0 GENERAL:

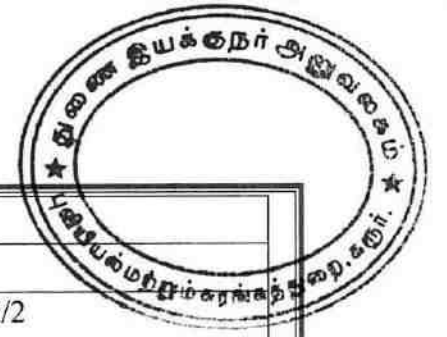
a.	Name of the Applicant	:	Mrs.V.KAVITHA
	Applicant address	:	W/o. Mr.P.Vadivel, No.8/42, Nochi kattur, Kuppam Village, Pugalur Taluk,
	District	:	Karur
	State	:	Tamilnadu
	Pin code	:	639111
	Phone	:	---
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	.....
b.	Status of the Applicant		
	Private individual	:	Private individual
	Cooperative Association	:	---
	Private company	:	---
	Public Company	:	---



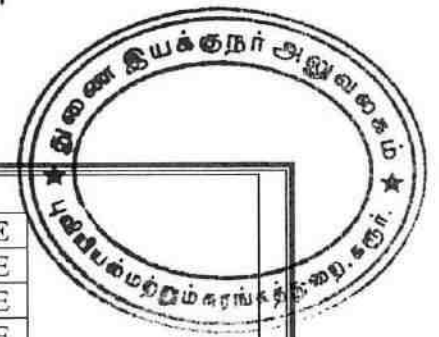
	Public Sector Undertaking	:	---
	Joint Sector Undertaking	:	---
	Other (pl. specify)	:	---
c.	Mineral(s) which are occurring in the area and which the applicant intends to mine	:	Rough Stone quarry lease
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of five years.
e.	Name of the RQP preparing the Mining Plan	:	A. ALLIMUTHU., M.Sc., M.Phil., RQP/DMG/HYD/85/2022
	Address	:	D.No.1/231, Pattakaranavalavu, Chinnamuthiyampatti, Pudukkottai District, Edapaddi Taluk, Salem District, Tamil Nadu State, India Pin code -636306
	Phone	:	+919788636242, 8870254313
	Fax	:	Nil
	e-mail	:	allimuthu1973@gmail.com
	Telex	:	Nil
	Registration Number	:	RQP/DMG/HYD/85/2022
	Date of grant/renewal	:	16.12.2014
	Valid upto	:	15.12.2024
f.	Name of the prospecting agency	:	The commissioner, Department of Geology and Mining
	Address	:	Department of Geology and Mining, Thiru Ve Ka Industrial Estate, Guindy, Chennai.
	Phone	:	044-22501874
g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, Karur Vide Rc.No.387/Mines/2021, dated 12.08.2022.

2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: IA & IB
	District & State	:	Karur, Tamil Nadu



Taluk	:	Pugalur
Village	:	Kuppam
Khasra No./ Plot No./ Block Range/ Felling Series etc.	:	75/1A, 75/1B & 75/2
Lease area (hectares)	:	1.88.0 hectares
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	No, forest is involved. This is recorded patta land.
Ownership / Occupancy	:	This is a patta land S.F.No. 75/1A & 75/2 is registered on the name of Mrs.V,Kavitha W/o Mr.P.Vadivel vide Patta No.1389 and S.F.No. 75/1B is registered on the name of Mr.P.Vadivel S/o. Mr.Palanisamy vide Patta No.1375. The pattadhar has gave to the consent to the applicant (Ref. Annex. No:V)
Existence of public road / railway line if any nearby and approximate distance	:	<ul style="list-style-type: none"> ✓ Exploited materials shall be transported through the village road on the northern side of the lease area. ✓ There is a SH-84 is situated on the northeastern side about 2.2km which is connecting Erode-Karur road. ✓ There is a NH-81 road situated on the western side about 4.8km which is connecting Karur – Vellakoil. ✓ No railway line situated around 5km radius.
Toposheet no. with latitude and longitude	:	<p>Toposheet No. 58-E/16 & 58-F/13</p> <p>Latitude : From 10°59'57.47"N to 11°00'02.56"N</p> <p>Longitude: From 77°57'32.82"E to 77°57'39.69"E</p>



Geo-Coordinates of the lease boundary:

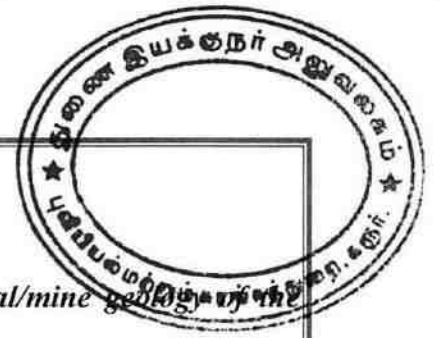
PILLAR ID	LATITUDE	LONGITUDE
1	11° 0'2.56"N	77°57'34.25"E
2	11° 0'1.76"N	77°57'35.98"E
3	11° 0'0.12"N	77°57'38.28"E
4	10°59'59.38"N	77°57'38.80"E
5	10°59'57.87"N	77°57'39.28"E
6	10°59'57.73"N	77°57'39.68"E
7	10°59'57.47"N	77°57'39.69"E
8	10°59'58.12"N	77°57'32.82"E
9	10°59'59.06"N	77°57'33.36"E
10	11° 0'0.30"N	77°57'33.51"E
11	11° 0'0.86"N	77°57'33.47"E
12	11° 0'1.40"N	77°57'33.57"E

Land use pattern (Forest, Agricultural, Grazing, Barren etc.) : It is an existing and renewed quarry lease

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

c) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Kuppam	4.15Km	West
b.	Nearest police station	K.Paramathi	7.1km	SW
c.	Nearest fire station	Velayuthampalayam	9.0km	NE
d.	Nearest Medical facility	Punnam	3.7Km	East
e.	Nearest school	Uppupalayam	2.0Km	North
f.	Nearest Rail Head	Pugalur	6.7km	NE
g.	Nearest port facility	Tuticorin	248km	South
h.	Nearest Airport	Coimbatore	100.0km	West
i.	Nearest DSP office	Karur	17.0km	SE
j.	Nearest Villages	Pudurpatti	0.56km	North
		Talaiyuttuppati	0.85km	South
		Pullaiyampalayam	1.3km	East
		Salipalayam	2.5km	West



PART – A

3.0 GEOLOGY AND MINERAL RESERVES:

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

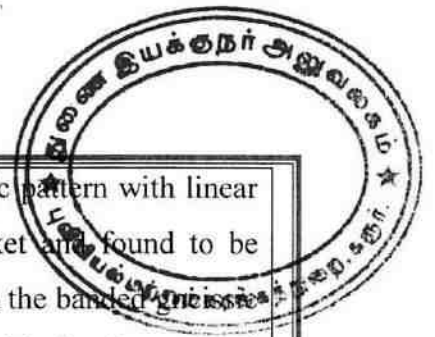
(i)	Topography	: The proposed lease area is exhibits flat terrain and situated at an average altitude of about 161.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (162m) was observed in Eastern side of the site, while the minimum elevation(161m) was observed Western side of the site. There is previously exploited in this lease area with a reached depth of level is 3-13m. The slope is towards eastern side and falls in Toposheet no. 58-E/16 & 58-F/13.
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(ii) General Geology of the District:

a) Geology:

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

The Granite gneiss rocks are found to occur in K.Paramathi, Athur, Thennilai, Punnam, Kuppam, Munnur, Karudayampalayam, Anjur villages in Karur and Aravakurichi Taluk are exploited to produce building materials and road metal (Jelly) and over burden soil appear as gray to reddish in colour called as gravel. The commercially known “Coloumbo Zubrana” the unique type in the Multi coloured granite / Granite gneiss category is occurring in Thogamalai, Naganur and Kazhugur Villages in Kulithalai Taluk. These rock type belong to minor mineral category. The arrangement of alternate layers of felsic and mafic minerals in linear pattern and exhibits wavy pattern in the rock and giving very



good structure for the rock type. The well-developed gneissic pattern with linear arrangement, the rock type have attracted the granite market and found to be suitable for the exploitation of granite blocks. But in this area the banded gneiss rock has many fractures and foliation in it. So, this is not viable for dimensional stone. **Order of superposition of the proposed lease area,**

Age	Group	Rock Formation
Recent to Sub recent	----	Topsoil (1-2m thick),
Proterozoic	Acid intrusive	Pink medium grained granite/ Granite gneiss
Archaean	Charnockite Group	Pyroxene Granulite, Charnockite (acid to intermediate) / Crystalline limestone / Quartzite

(iii) Local / Mine Geology of the mineral deposit:

a) Topography of the proposed lease area:

The proposed lease area is exhibits flat terrain and situated at an average altitude of about 161.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (162m) was observed in Eastern side of the site, while the minimum elevation(161m) was observed Western side of the site. There is previously exploited in this lease area with a reached depth of level is 3-13m. The Charnockite rocks are well exposed in the existing pit in the proposed lease area. Contour lines survey and Geological map were done in the proposed lease area.

b) Mode of origin:

The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. The constituents of the rock suggest of its origin in particularly dry and high temperature conditions which is deduced to have an important bearing in explicating prehistoric crustal development of the earth.

c) Physiography of the rocks:

General characteristics of the rocks of this series has recorded that the rocks are in general gray or light in colour and extremely fresh in appearance with medium to coarse grained texture.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Recent to Sub recent	----	Red Soil (0-2m thick)
Archaean	Charnockite	Charnockite rock

(iv) Drainage Pattern : There is no major river located within a radius of 500m radius. The drainage is dendritic in nature.

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

a. Present status: : The RQP examined the surface features during survey. During this, previously rough stone was excavated in this proposed lease area and there is existing pit's was noticed with an average pit dimensions are Pit level-1 is L124m X W43m X D13m & Pit level-2 is L108m X W81m X D5m.

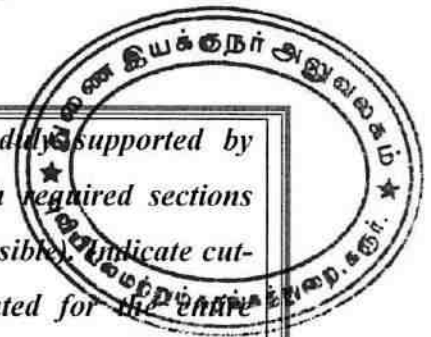
b. Surface Plan : Surface plan showing elevation contour, existing pit, rock exposure and accessibility road were prepared at the scale of 1: 1000, as shown in Plate No. III.

(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 Year wise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below: -*

Year	No.of boreholes	Total meterage	No.of Pits and Dimensions	No.of Trenches and Dimensions
First	N.A	---	---	N.A
Second	N.A	---	---	N.A
Third	N.A	---	---	N.A
Fourth	N.A	---	---	N.A
Fifth	N.A	---	---	N.A

No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.



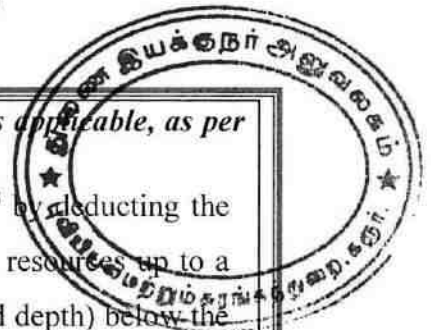
(e) *Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e. proved, probable, possible), indicate cut-off grade. Availability of resources should also be indicated for the leasehold.*

The updated 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 sections (one longitudinal and two transverse) to calculate the volume of material up to the depth of 26m (which is 13m existing pit depth and 13m proposed depth) below ground level. The longitudinal and transverse cross sections were assigned XY-AB and XY-CD as respectively. Using the cross-sectional method, total reserve is estimated to be **338857m³** including the resources of safety zone, and top soil. Of which, rough stone is about **337160m³** and top soil resource of about **1697m³**.

The top soil is obtained 1m (R.L.162-161m) and a rough stone starts from 2 to 26m (R.L.161-136m) from below the surface level (Refer plate no's. III & IIIA)

ROUGH STONE GEOLOGICAL RESERVES				
SECTION	L(m)	W(m)	D(m)	VOL(M ³)
XY-AB	27	58	5	7830
	95	58	5	27550
	103	58	3	17922
	158	58	2	18328
	158	58	5	45820
	158	58	5	45820
	29	8	4	928
XY-CD	130	54	5	35100
	139	54	3	22518
	178	54	2	19224
	178	54	5	48060
	178	54	5	48060
				337160

TOP SOIL GEOLOGICAL RESERVES				
SECTION	L(m)	W(m)	D(m)	VOL(M ³)
XY-AB	26	58	1	1508
XY-AB	27	7	1	189
				1697



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

The updated mineable reserve is estimated to be **158939m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 26m (which is 13m existing pit depth and 13m proposed depth) below the ground level (R.L.162m-136m). Plan has been prepared on 1: 1000 scale and sections are prepared in scale of 1:1000 in horizontal axis, 1:500 in vertical axis (Plate No's. VI & VIA).

UPDATED ROUGH STONE MINEABLE RESERVES						
SECTION	BENCH	L(m)	W(m)	D(m)	VOL(M3)	RECOVERABLE @100%
XY-AB	II	5	49	5	1225	1225
	III	64	44	5	14080	14080
	IV	64	39	3	7488	7488
	IV	117	39	2	9126	9126
	V	107	51	5	27285	27285
	VI	97	46	5	22310	22310
XY-CD	II	9	2	5	90	90
	III	101	41	5	20705	20705
	IV	100	36	3	10800	10800
	IV	140	36	2	10080	10080
	V	130	31	5	20150	20150
	VI	120	26	5	15600	15600
TOTAL					158939	158939

4.0 MINING:

a.	Briefly describe the existing / proposed method for developing / working the deposit with all design parameters. (Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)	:	It is a open cast manual /Semi-Mechanized method of mining is adopted and the mining method doesn't change in this mining plan period. Under the regulation 106 (2) (a) of the Metalliferous Mines Regulations, 1961, in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.
----	---	---	---



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

Total proposed production of **22500m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 18m (which is 13m existing pit depth and 5m proposed depth) below ground level (R.L.162-144m) for five years plan period. Average production is **4500m³** of rough stone per year (Refer Plate No's. IV & IVA).

Year	Pit No.(s)	Topsoil/Overburden (m ³)	ROM (m ³)	Saleable rough stone (m ³) @ 100%	Rough stone rejects(m ³)	Sub grade/ Weathered rock in (m ³)	Saleable Gravel (m ³)	Rough stone to overburden ratio
First	I	...	4500	4500	...	...	...	...
Second	I	...	4500	4500	...	...	...	...
Third	I	...	4500	4500	...	...	...	...
Fourth	I	...	4500	4500	...	...	...	...
Fifth	I	...	4500	4500	...	...	...	...
Total	---	...	22500	22500	...	...	...	...

c. *Attach-individual year wise plan and sections (In case of 'A' class mines):* : Not applicable. It is a "B" class mines

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

YEARWISE DEVELOPMENT AND PRODUCTION						
YEAR	BENCH	L(m)	W(m)	D(m)	VOL(M3)	ROUGH STONE @100%
I-YEAR	II	30	30	5	4500	4500
I-YEAR	II	30	30	5	4500	4500
I-YEAR	II	30	30	5	4500	4500
I-YEAR	V	30	30	5	4500	4500
I-YEAR	V	30	30	5	4500	4500
TOTAL					22500	22500

d. *Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.* : It's a B2 category. The composite plan and section are not prepared



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 for periods and production details are given as below: -

Rough stone:

- Mineable reserves of rough stone = 158939m³
- Five years production = 22500m³
- Monthly production of rough stone = 375m³

The regular working of the quarry and its production depends upon the demand from the market. The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production.

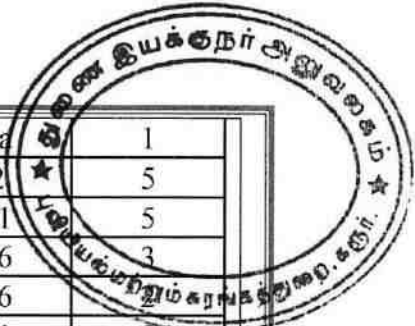
f. *Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and up to the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:*

i) Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame: : Considering the indefinite depth persistence of the rough stone deposit is proved beyond the workable limits about up to a depth of 26m below ground level (R.L.162m-136m) from the petrogenetic character of the Charnockite rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 5 years.

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

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

ULTIMATE PIT LIMIT					
Section	Bench R.L	Overburden / Mineral	length in (m)	Width in (m)	Depth in (m)
XY-AB	R.L.162-161m	Topsoil	Exploited area		1
	R.L.161-156m	Rough stone	5	49	5
	R.L.156-151m	Rough stone	64	44	5
	R.L.151-146m	Rough stone	64	39	3
	R.L.151-146m	Rough stone	117	39	2
	R.L.146-141m	Rough stone	107	51	5
	R.L.141-136m	Rough stone	97	46	5
Total depth					26



XY-CD	R.L.162-161m	Topsoil	Exploited area		1
	R.L.161-156m	Rough stone	9	2	5
	R.L.156-151m	Rough stone	101	41	5
	R.L.151-146m	Rough stone	100	36	3
	R.L.151-146m	Rough stone	140	36	
	R.L.146-141m	Rough stone	130	31	5
	R.L.141-136m	Rough stone	120	26	5
Total depth					26

- 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 storage of rain water reservoir used for irrigation purposes.

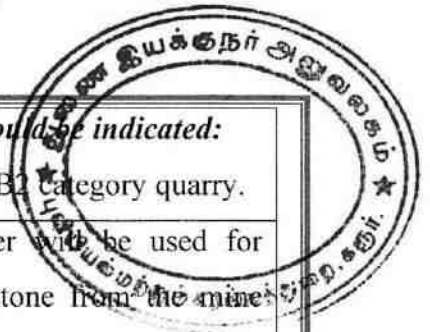
g. Open cast Mines:

- (i) Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)
: The mining operation is open-cast, Manual/ semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 (2) (a) of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.

Machineries like Tractor mounted compressor attached with Jack hammers is

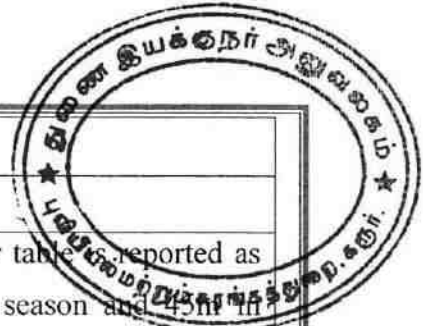


		proposed to drilling.																																	
(ii)	Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	<p>The rough stone is proposed to quarry at 5m bench height & width conventional open cast manual method. It is a manual/Semi-mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers and waste are removal of manually.</p> <p>Bench height = 5mts. Bench width = 5mts.</p>																																	
	a. Details of Topsoil/Overburden	There is no topsoil																																	
	b. Rough Stone waste and side burden waste:-	The recovery of rough stone in this quarry is 100%. There is no waste or side burden will be proposed.																																	
h.	Underground Mines:	Not applicable																																	
i.	<p>Extent of mechanization:</p> <p>Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.</p> <p>(1) Drilling machines:</p> <p>Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P</th> </tr> </thead> <tbody> <tr> <td>Jack Hammer</td> <td>3</td> <td>32 mm</td> <td>Hand held</td> <td>---</td> <td>Diesel</td> <td>--</td> </tr> <tr> <td>Compressor</td> <td>1</td> <td>---</td> <td>Air</td> <td>---</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> <p>(2) Loading equipment:</p> <p>The rough stone will be loaded manually to the tractors/tippers for dispatch to needed to the customers. The weathered rock will be removed by manual loaded into the trucks and will be dumped on the safety barrier.</p> <p>(3) Haulage and Transport equipment</p> <p>(a) Haulage within the mining leasehold:</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>1</td> <td>---</td> <td>---</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>		Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Jack Hammer	3	32 mm	Hand held	---	Diesel	--	Compressor	1	---	Air	---	Diesel	--	Type	Nos	Size / Capacity	Make	Motive power	H.P.	Tipper	1	---	---	Diesel	--
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Tipper	1	---	---	Diesel	--																														



Whether the dumpers are fitted with exhaust conditioner should be indicated:
 The dumpers are not used in this quarry; hence it's a small B2 category quarry.

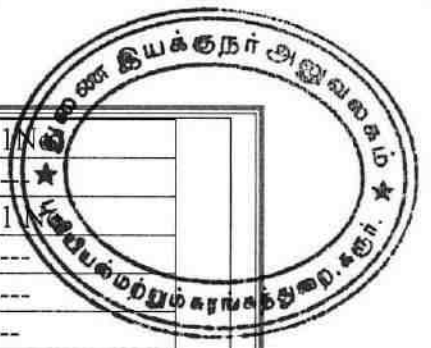
(b) Transport from mine head to the destination	:	The tractors/tipper will be used for transport rough stone from the mine head to needy customer.												
(c) Describe briefly the transport system (please specify)	:	---												
(d) Ore transported by : own trucks / hired trucks	:	---												
(e) Main destination to which ore is transported (giving to and from distance)	:	The excavated stone materials will be supplied to the consumers like Pillar stone, Building stone, etc.,												
(f) Details of hauling/transport equipment:														
<table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>			Type	Nos	Size / Capacity	Make	Motive power	H.P.	--	--	--	--	--	--
Type	Nos	Size / Capacity	Make	Motive power	H.P.									
--	--	--	--	--	--									
(4). Miscellaneous:														
Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.														
(A) Operations	:	The mining operation is open-cost, manual 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.												
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.													
	<u>Blasting pattern:</u> Eco-friendly quarry operation is proposed in this quarry lease area. Tractor mounted compressor attached with Jack hammers is proposed to drilling.													
(b)	Powder factor in ore and overburden / waste / development heading / stope	: Not applicable												
(c)	Whether secondary blasting is needed, if so describe it briefly	: Not applicable												
(e)	Storage of explosives (like capacity	: 1. First Aid Box will be keeping ready												



	and type of explosive magazine)		at all the time.
6.	MINE DRAINAGE		
(a)	Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table reported as of 40m in rainy season and summer from the general ground level in the adjacent bore wells of the area.
(b)	Workings expected to be _____ m. above / reach below water table by the year _____.	:	Proposed depth of mining is 18m bgl. Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.
(c)	Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 Lpm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor.
7.	STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:		
(a)	Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years: No topsoil to remove this lease area		
(b)	Land chosen for disposal of waste with proposed justification	:	There is no waste are proposed.
(c)	Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise.	:	There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.
8.	USE OF MINERAL:		
(a)	Describe briefly the end-use of the mineral (sale to intermediary parties,	:	The excavated stone materials will be supplied to the consumers like stone



	captive consumption, export, industrial use)		pillar, sized stone, etc.						
(b)	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone and the same are used for building stone, pillar stone, sized stone materials only, so there are no chemical specifications are specified. Only physical specifications are involved.						
(c)	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	:	No blending process is involved, after excavated the rough stone will be directly loaded to the needy customer.						
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 quarry laborers. No manual mining shall be proposed. Approach road is available from nearby the site.						
	b) Employment potential : As per Mines safety under the provisions of 42 Metalliferous Mines Regulations, 1961, whenever the workers are employed more than 10, it is preferred to have a qualified Mining mate/Geologist to keep all the production workers directly under his control and supervision. The following man power is proposed for quarrying rough stone during the five years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.								
	1. Highly Skilled		<table border="1"> <tr> <td>Quarry Manger</td> <td>1No.</td> </tr> <tr> <td>Mines Forman</td> <td>---</td> </tr> <tr> <td>Mechanical Engineer</td> <td>---</td> </tr> </table>	Quarry Manger	1No.	Mines Forman	---	Mechanical Engineer	---
Quarry Manger	1No.								
Mines Forman	---								
Mechanical Engineer	---								



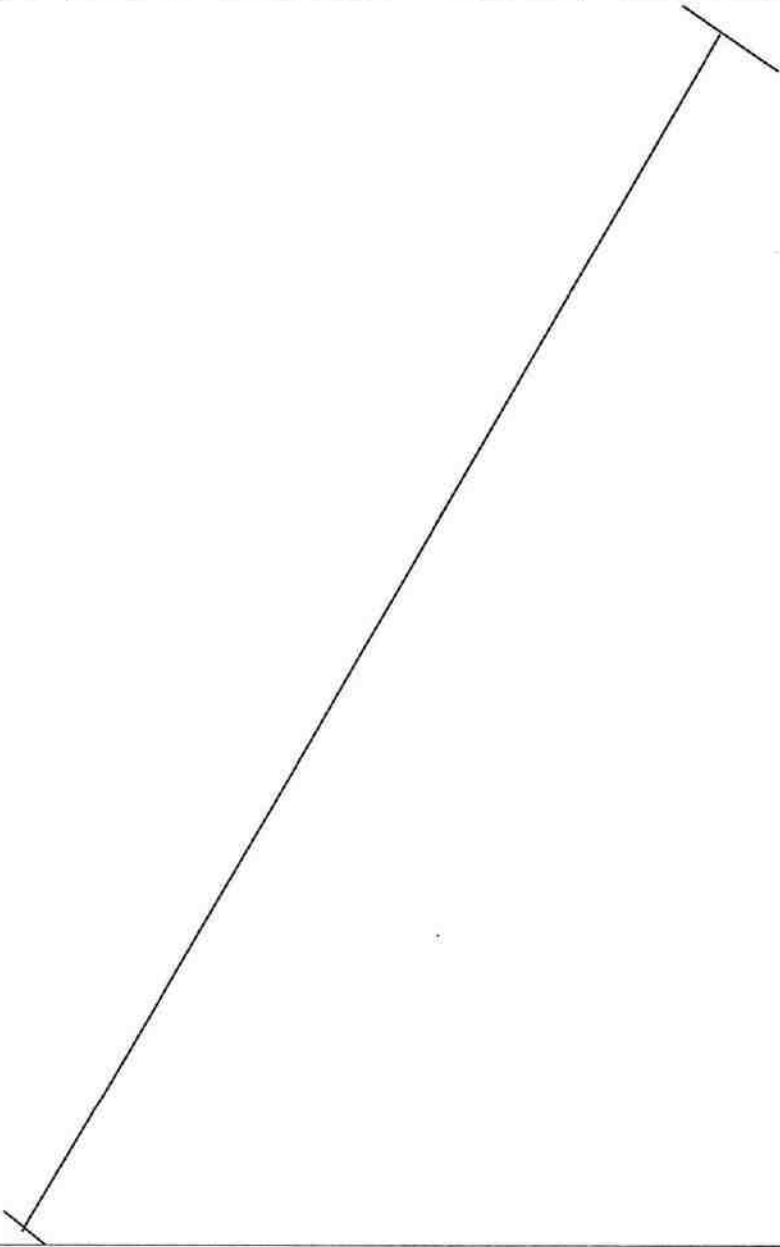
		Account cum & admin	1No
2.	Skilled	Earth moving operator	---
		Driver	1
		Mechanic	---
		Blaster/Mat	---
3.	Semi – skilled	Helpers, Greaser's	--
4.	Unskilled	Musdoor / Labours	10Nos
		Cleaners	--
		Attendant's	1No
Total =			14Nos

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 materials shall be directly sale to the needy customer. No processing / beneficiations are proposed
(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 used for processing plant. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the SPM in a pit before passing the water in to natural system.
(c)	A flow sheet or schematic diagram of the processing procedure should be attached.	:	Not applicable.
(d)	Specify quantity and type of chemicals to be used in the processing plant.	:	Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	:	Not applicable
(f)	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of	:	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 has



recycling.	<p>to be maintained as per the Metalliferous Mines Regulations, 1961. Drinking water will be bought to authorized vendor of the nearby village. The dust suppression and green belt development will be bought to water tanker.</p> <p>The sewage water to a tune of 0.7KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.</p>
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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	Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Sl. No.</th> <th style="width: 60%;">Land use</th> <th style="width: 30%;">Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.</td> <td>Area under quarrying pit</td> <td style="text-align: center;">1.33.00</td> </tr> <tr> <td style="text-align: center;">2.</td> <td>Infrastructure</td> <td style="text-align: center;">Nil</td> </tr> <tr> <td style="text-align: center;">3.</td> <td>Mineral Reject Dump</td> <td style="text-align: center;">0.10.0</td> </tr> <tr> <td style="text-align: center;">4.</td> <td>Mine Roads</td> <td style="text-align: center;">0.03.00</td> </tr> <tr> <td style="text-align: center;">5.</td> <td>Green Belt</td> <td style="text-align: center;">---</td> </tr> <tr> <td style="text-align: center;">6.</td> <td>Unutilized</td> <td style="text-align: center;">0.42.00</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total</td> <td style="text-align: center;">1.88.00</td> </tr> </tbody> </table>	Sl. No.	Land use	Present area (Hect.)	1.	Area under quarrying pit	1.33.00	2.	Infrastructure	Nil	3.	Mineral Reject Dump	0.10.0	4.	Mine Roads	0.03.00	5.	Green Belt	---	6.	Unutilized	0.42.00	Total		1.88.00	
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11.2	Water Regime	: Water table in this area is noticed at a depth of 40m in summer and 45m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 18m bgl. Hence, it will not affect the ground water depletion of this area																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except acacia bushes, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																								
11.4	Quality of air, ambient noise level and water	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and 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:
Climate:
 The district receives the rain under the influence of both Southwest and Northeast monsoons. The Northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The Southwest monsoon rainfall is highly erratic and summer rains are negligible. The average annual rainfall over the district varies from about 620 mm to 745 mm.
Rainfall:
 The annual rainfall normal (1970-2000) of Karur district is 742 mm.4 Projections of rainfall over Karur for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively

11.6 Human Settlement:
 The nearest villages are found in the buffer zone with population as per 2011 census. Kuppam Village 1120 houses of 3503 people male (1697) female (1806) as respectively.

S. N	Village	Direction	Distance in Kms	Population
1	Pudurpatti	North	0.56km	841
2	Talaiyuttuppati	South	0.85km	1190
3	Pullaiyampalayam	East	1.3km	760
4	Salipalaiyam	West	2.5km	2462

11.7 Public buildings, places of worship and monuments : No infrastructure like residential building, places of special interest like archeological monuments, sanctuaries etc., are found around 10km radius.

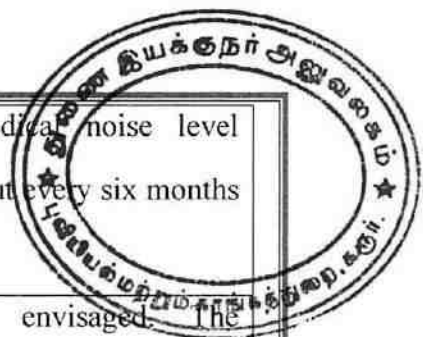
11.8 Attach plans showing the locations of sampling stations : The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.



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:	<p>Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period is shown in the tabular form:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 10%;">Sl. No.</th> <th style="width: 50%;">Land use</th> <th style="width: 40%;">Area in use during the quarrying period (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area Under quarrying</td> <td>0.46.50</td> </tr> <tr> <td>2.</td> <td>Infrastructure</td> <td>0.02.00</td> </tr> <tr> <td>3.</td> <td>Roads</td> <td>0.04.00</td> </tr> <tr> <td>4.</td> <td>Green Belt</td> <td>0.20.00</td> </tr> <tr> <td>5.</td> <td>Mineral Reject dump</td> <td>0.10.00</td> </tr> <tr> <td>6.</td> <td>Unutilized</td> <td>1.05.50</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total</td> <td>1.88.00</td> </tr> </tbody> </table>	Sl. No.	Land use	Area in use during the quarrying period (Hect.)	1.	Area Under quarrying	0.46.50	2.	Infrastructure	0.02.00	3.	Roads	0.04.00	4.	Green Belt	0.20.00	5.	Mineral Reject dump	0.10.00	6.	Unutilized	1.05.50	Total		1.88.00
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ii).	Air quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc..., will be suppressed by periodical wetting of land by water spraying and transportation of material will be carried out during day time and material will be covered with tarpaulin.																								
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 hence, noise will be very																								



		minimum. However, periodic 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. 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.
vi).	Water regime	No major water bodies like rivers, pond, lake etc., located within a radius of 500m.
vii).	Socio-economics	1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km radius.

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

(i)	Temporary storage and utilization of topsoil	:	There is no topsoil removed
(ii)	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case	:	The present mining is proposed to an average depth of 18m (which is 13m existing pit depth and 5m proposed depth) below the 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.



abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.

(iii) **Programme of afforestation, Yearwise for the initial five years indicating the number of plants with name of species to be afforested under different areas in hectares.**

Green Belt Development:

7.5m safety barrier, school and nearest panchayat roads has been utilized for Greenbelt appropriate native species of Neem, Pungan and other regional trees will be planted in a phased manner as described below

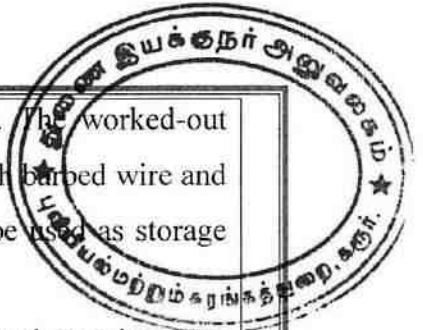
Year	Place	Type of trees	No. of plants	Rate of survival
First	Panchayat Roads Nearby School & Villages	Neem, Pungan, Casuarinas and other regional trees	100	80%
Second			100	80%
Third			100	80%
Fourth			100	80%
Fifth			100	80%

(iv) Stabilization and vegetation of dumps along with waste dump management year wise for the first five years (and up to conceptual plan period for 'A' category mines). : No waste or rejects removed in this lease area.

(v) Measures to control erosion / sedimentation of water courses. : Not applicable. There are no major dumps are stabilized in this lease area.

(vi) Treatment and disposal of water from mine. : Not applicable. There are no major dumps are stabilized in this lease area.

(vii) Measures for minimizing adverse effects on water regime. : There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime



		surrounding the quarry. The worked-out pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit. The open pit will be used as rain water storage structure to augment groundwater levels which improve the mine environment.
(viii)	Protective measures for ground vibrations / air blast caused by blasting,	: It is a B2 category open cast, Manual/ semi mechanized mining and no heavy machinery shall be used.
(ix)	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	: No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
(x)	Socioeconomic benefits arising out of mining.	: The nearest villages are will get employment benefits.

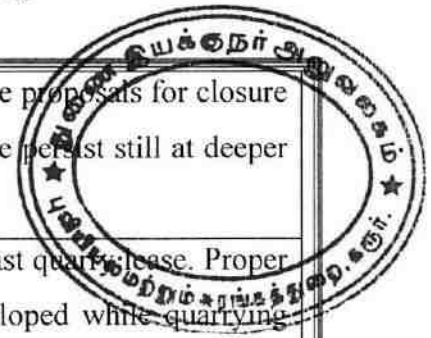
d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (for 'A' category mines only)

Not applicable. It is B2 category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The present mining is proposed to an average depth of 18m (which is 13m existing pit depth and 5m proposed depth) bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	: Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 100 trees per year will be

			proposed. 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	:	It is an existing open cast quarry lease. Proper bench parameters developed while quarrying operation. No mitigation measures adopted.
12.4	Mine closure activity	:	The present mining plan is proposed to depth of 18m (which is 13m existing pit depth and 5m proposed depth) bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mines Regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a manual 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 five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 14 labors will be improved.
12.9	Reclamation and Rehabilitation	: Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes

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

A	Fixed Asset Cost:	
	1. Land Cost	: Rs. 25,00,000/-
	2. Labour Shed	: Rs. 1,50,000/-
	3. Sanitary Facility	: Rs. 1,00,000/-
	4. Fencing	: Rs. 2,00,000/-
	5. Other expenses (Security guard, etc)	: Rs. 3,00,000/-
	Total	: Rs. 32,50,000/-
B	B. Machinery cost	: Rs. 5,00,000/- (Hire Basis)



C	Total Expenditure of EMP cost (for five years)	
	1. Drinking Water Facility	: Rs. 1,00,000/-
	2. Sanitary facility & Maintenance	: Rs. 50,000/-
	3. Permanent water sprinkler	: Rs. 50,000/-
	4. Afforestation and its maintenance	: Rs. 80,000/-
	5. Safety Kits	: Rs. 50,000/-
	6. Provision of tyre washing facility	: Rs. 50,000/-
	7. Surface runoff management structures like garland drain, settling pond & Bund	: Nil
	8. Blasting materials with blast mat cost	: Nil
	9. Environment monitoring	: Rs. 5, 00,000/-
	Total	: Rs. 8,80,000/-
D	Total Project Cost (A+B+C)	: Rs. 46,30,000/-

13.0 FINANCIAL ASSURANCE:

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

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Deputy Director of Geology and Mining, Karur vide letter no **Rc.No.387/Mines/2021, dated 12.08.2022.**
- (iv) Total proposed production of **22500m³**. Of which, rough stone resources of about **22500m³** to a depth of 18m (which is 13m existing pit and 5m proposed depth) below the ground level (R.L.162m-144m) for five years plan period. Average production is **4500m³** of rough stone per year.



17.0 CSR Expenditure:

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

Place: Salem, TN

Date:

A. Arin...
Signature of the Recognized Qualified Person
A. ALL B.Sc., M.Sc., M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/85/2022

This Mining Plan is approved based on Incorporation of the particulars specified in clause 7 (iv) of the Commissioner of Geology and Mining Chennai Lr No 3868 / LC / 2012 dt 19-11-2012 and Draft Minor Mineral Conservation & Development Rules 2010

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 387 / Mines / 2021 Dated: 22/09/2022

[Handwritten signature]
22/9/22

Deputy Director of Geology and Mining
Karur District

[Handwritten signature]
22/09/22



ந.க.எண். 387/கனிமம்/2021

மாவட்ட ஆட்சியர் அலுவலகம்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்

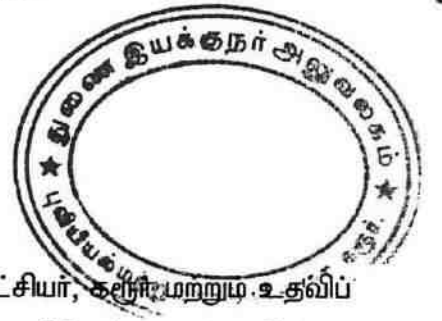
நாள்.12.08.2022.

குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - குப்பம் கிராமம் - பட்டா புல எண்கள். 75/1A(0.49.50 ஹெக்டேர்), 75/1B (0.47.50 ஹெக்டேர்), மற்றும் 75/2 (0.91.00 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.88.00 ஹெக்டேர்ஸ் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி திருமதி.வ.கவிதா என்பவர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை:**
1. திருமதி.வ.கவிதா, க/பெ.வடிவேல், நொச்சிகாட்டுர், குப்பம் கிராமம், புகளூர் வட்டம், கரூர் மாவட்டம் என்பவரின் விண்ணப்ப நாள்: 13.08.2021, இவ்வலுவலத்திற்கு விண்ணப்பம் வரப்பெற்ற நாள்:08.09.2021.
 2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் அறிக்கை ந.க.எண். அ1/3795/2021, நாள்:03.02.2022
 3. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:02.08.2022.
 4. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்.எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள். 75/1A(0.49.50 ஹெக்டேர்), 75/1B (0.47.50 ஹெக்டேர்), மற்றும் 75/2 (0.91.00 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.88.00 ஹெக்டேர்ஸ் பரப்பிலிருந்து ஐந்து வருடங்களுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க குத்தகை உரிமம் வழங்க கோரி கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், நொச்சிக்காட்டுர் என்ற முகவரியில் வசிக்கும் திருமதி.வ.கவிதா என்பவர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளார்.



மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள். 75/1A(0.49.50 ஹெக்டேர்), 75/1B (0.47.50 ஹெக்டேர்), மற்றும் 75/2 (0.91.00 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.88.00 ஹெக்டேர்ஸ் பரப்பில் மட்டும் தமிழ்நாடு சிறு கனிமச்சலுகை விதிகளில் விதி எண்கள்.19-(1), 20 மற்றும் 33-இன் கீழ் திருமதி.வ.கவிதா என்பவருக்கு சாதாரணக்கல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு ஐந்து ஆண்டுகளுக்கு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புலங்களுக்கு மேற்கு பகுதியில் புல எண்.225-இல் தென்வடலாக செல்லும் நடைபாதைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு வடகிழக்கில் 300 மீட்டர் தொலைவிற்குள் 12 பண்ணை வீடுகள் உள்ளது. மேற்படி பண்ணை வீட்டின் உரிமையாளர்கள் பண்ணை வீடுகளுக்கு பாதிப்பின்றி குவாரிப்பணி செய்ய சம்மத கடிதம் அளித்துள்ளனர். எனவே, மேற்படி வீடுகளுக்கு எவ்வித பாதிப்பமின்றி குவாரிப்பணி செய்ய வேண்டும்.
3. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
4. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிடும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettaliiferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
6. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.



எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள். 75/1A(0.49.50 ஹெக்டேர்), 75/1B (0.47.50 ஹெக்டேர்), மற்றும் 75/2 (0.91.00 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.88.00 ஹெக்டேர்ஸ் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண். 19(1), 20 மற்றும் 33-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 5 (ஐந்து) வருட காலத்திற்கு திருமதி.வ.கவிதா என்பவருக்கு சாதாரணக்கல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு திருமதி.வ.கவிதா என்பவர் கேட்டுக்கொள்ளப்படுகிறார். மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ஆம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-இன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

[Handwritten Signature]
12/8/22

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்.

பெறுநர்
திருமதி.வ.கவிதா,
க/பெ.வடிவேல்,
நொச்சிகாட்டுர்,
குப்பம் கிராமம்,
புகளூர் வட்டம்,
கரூர் மாவட்டம்.

நகல்:-

1. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை.

12/08/2022



From

Thiru.G.Govindaraj, I.A.S.,
District Collector,
Karur District
Karur

To

The Sub Registrar,
Joint II Sub Registrar Office,
Karur District.

Rc.No.821/Mines/2013, Dated :08.8.2016

Sir,

Sub: Mines and Minerals - Minor Minerals - Rough Stone
- Karur District - Aravakurichi Taluk - Kuppam
Village - S.F.Nos.75/1A (0.49.5 hecets), 75/1B
(0.47.5 hecets) and 75/2 (0.91.0 hecets) over an extent
of 1.88.0 Hect. - Rough Stone quarry lease granted
to Tmt.V.Kavitha - Registration of lease deed -
Regarding.

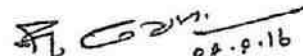
Ref: Karur District Collector's Proceedings
No.821/Mines/2013, Dated:05.8.2016.

Tmt.V.Kavitha, S/o.P.Vadivel, Nochikattur, Kuppam Post,
Aravakurichi Taluk, Karu District have been granted a lease to Quarry
Rough stone in S.F.Nos.75/1A (0.49.5 hecets), 75/1B (0.47.5 hecets) and
75/2 (0.91.0 hecets) over an extent of 1.88.0 hecets of Kuppam Village,
Aravakurichi Taluk for a period of 5 (Five) Years from **05.8.2016 to**
04.8.2021. The lease deed having pages from 1 to 11 is herewith sent.

1. Anticipated seigniorage fee for the
entire lease period of 5 years : Rs. 16,14,825/-
2. Area Assessment @ Rs. 100/- per Hect. : Rs. 940/-
3. Security Deposit paid by way of Chalan : Rs. 5,000/-

The District Collector is exempted from appearing in person
under section 88(1) of the Registration Act. I request you to register the
lease deed and return the document through the lessee.

Encl:- Lease deed pages (1 to 11).


08.8.16
For Collector
Karur.

Copy to:-

Tmt.V.Kavitha, S/o.P.Vadivel, Nochikattur, Kuppam Post, Aravakurichi
Taluk, Karu District - (is requested to register the lease deed at their
own expenses and return the original document).





தமிழ்நாடு தமில்நாடு TAMILNADU ரூ. 5000

U 610652

10582 Karur

2 AUG 2016

Om... ..

S. Ramamurthy, S.V.



S.RAMAMURTHY, S.V
KARUR-639 001.
L.No: 05/1992

APPENDIX - V
(See Rule 19 (1) and 33)
(Collr. Ref. No.821/ Mines / 2013)

FORM OF JOINT AGREEMENT FOR QUARRYING AND CARRYING AWAY MINOR MINERALS BY LESSEE IN RYOTWARI LANDS IN WHICH THE MINERALS BELONG TO GOVERNMENT

THIS AGREEMENT MADE the 05th day of August 2016 between Thiru.P.Vadivel, S/o.Palanisamy, Nochikattur, Kuppam Village, Aravakurichi Taluk, Karur District (hereinafter referred to as "the registered holder" which expression shall where the context so admits, include their heirs, executors, administrators legal representatives and assigns) of the first part and Tmt.V.Kavitha, S/o.P.Vadivel, Nochikattur, Kuppam Post, Aravakurichi Taluk, Karur District (hereinafter referred to as "registered holder / lessee" which expression shall where the context so admits shall include his heirs, executors, administrators, legal representatives and assigns) of the second part and the Governor of Tamil Nadu (hereinafter referred to as the Government which expression shall where the context so admits shall include also his successors in office and assigns) of the third part.

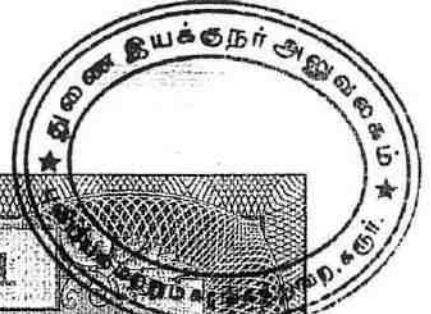
WHEREAS, the registered holders holds the lands described in the schedule hereto and intended to lease out to the lessee of the said lands for the purpose of quarrying Rough

P. Vadivel
REGISTERED HOLDER

254

S. Ramamurthy
DISTRICT COLLECTOR,
KARUR.

3/3



தமிழ்நாடு தமில்நாடு TAMILNADU ரூ. 5000

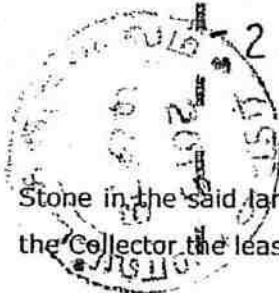
U 610653

10583 V. Ramani

2 AUG 2016

சுற்றுலா மற்றும் கலாச்சாரத்துறை

S.RAMAMURTHY, S.V
KARUR-639001.
L.No: 05/1992



Stone in the said lands and to deposit mining waste in the said lands and has lodged with the Collector the lease and accurate map or sketch of the said lands.

AND WHEREAS, the lessee or tenant of the registered holders have made application to the Collector of District of Karur (herein after referred to as "the Collector") seeking grant of quarrying lease for quarrying Rough Stone in the said lands and to deposit mining waste in the said lands and has lodged with the Collector an accurate map or sketch of the said lands.

AND WHEREAS, the Collector acting for and on behalf of the Government has granted a quarrying lease to the lessee or tenant of the registered holders and allowed them to commence quarrying operations for Rough Stone in the said land to deposit mining waste thereon by lessee or tenant of the registered holders.

AND WHEREAS, the Collector is prepared to allow the said lessee to commence mining operations and to deposit mining waste in or on the said lands described in the schedule for a term of five years period from 05.8.2016 To 04.8.2021 upon the registered holders and the lessees entering into the agreement herein contained.



சுற்றுலா மற்றும் கலாச்சாரத்துறை

255

V. Ramani
REGISTERED HOLDER / LESSEE

[Signature]
DISTRICT COLLECTOR,
KARUR.

4/13



भारतीय गैर न्यायिक INDIA NON JUDICIAL

₹. 5000

Rs. 5000

पांच हजार रुपये

FIVE THOUSAND RUPEES

सत्यमेव जयते

INDIA

தமிழ்நாடு தமில்நாடு TAMILNADU

U 610654

10584

V. S. S. S. S. S.

2 AUG 2016

Handwritten signature

S. RAMAMURTHY, S.V
KARUR-639 001.
L.No: 05/1992

AND WHEREAS, the tenant of registered holder has deposited with the Collector, the sum of Rs.5000/- Challan No.24, Dated:03.8.2016, State Bank of India, Thanthoni as security for the due performance of the covenants, agreements and provisos or damage which may be incurred by the Government by reason of any of the said lands described in the schedule hereto being rendered unfit for cultivation by the mining operations therein or by the deposit of mining waste thereon by either the registered holders or the lessees.

AND WHEREAS, the lessee has at the request of the registered holders and in consideration of such approval by the Collector of the mining operations as herein before recited agreed to join in these presents for the purpose of entering into covenants, agreements and provisos hereinafter contained as surety for the registered holders.

I. NOW THESE PRESENTS WITNESS and registered holders and the lessee do hereby jointly and severally and each of them doth individually hereby covenants and agree with the Government as follows:-

01. To carry on mining operations during the said term in a proper and workman like manner and to deposit mining waste on the lands described in the schedule hereto and to answer and to account at all reasonable times to Government for all acts and defaults



REGISTERED HOLDER

256

V. S. S. S. S.

DISTRICT COLLECTOR, KARUR.

5/13



தமிழ்நாடு தமில்நாடு TAMILNADU ரூ. 1000

AK 595060

10585 V. Ramani
2 AUG 2016
S. RAMAMURTHY, S.V
KARUR-639 001.
L.No:05/1992



committed by any servants, agents or workmen employed by the registered holders or lessee in carrying on such operations or in making such deposits.

02. To pay into Treasury/State Bank of India at Karur to the credit of the Government in addition to the land assessment for the time being payable in respect of the said lands seigniorage on the minerals mined at the rates prescribed by the Government from time to time.

03. To abide by the rules prescribed by the Government from time to time regarding quarrying of minor minerals.

04. To keep correct accounts in such form as the Collector shall from time to time require and direct showing the quantities and other particulars of all minerals obtained by the registered holders or the lessees from the said lands and also the number or persons employed in carrying on the said mining operations therein and prepare and maintain from time to time when so directed by the said Collector complete and correct plans of all mines and working in the said lands and to allow any officer thereunto authorized by the (Director of Geology and Mining), Tamil Nadu, from time to time and at all times to examine such accounts and any such plans and to supply and furnish when so required



P. Ramani

257

V. Ramani

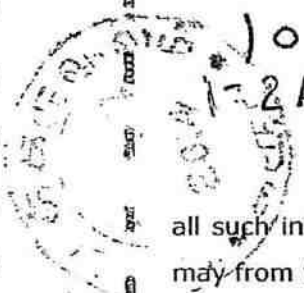
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DISTRICT COLLECTOR,
KARUR.

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தமிழ்நாடு தமில்நாடு TAMILNADU ரூ.500

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10586 V. Ramamurthy
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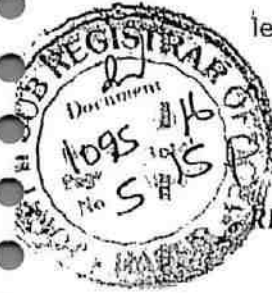
S. RAMAMURTHY, S.V
KARUR-639 001.
L.No:05/1992

all such information and returns all or any of the matters aforesaid as the Government may from time to time required and direct.

- 05. To allow any officer authorized by the (Director of Geology and Mining), Tamil Nadu in that behalf from time to time and at all times to enter upon any part of the said lands where mining operations may be carried on for the purpose or inspecting the same.
- 06. To Forthwith send to the Collector a report of any accident which may occur at or in the said land and also of the discovery therein of any minerals other than Rough Stone.
- 07. Not to claim any remission of assessment in respect of any of the said lands which shall be rendered unfit for surface cultivation by the carrying on of any mining operations or by the deposit of mining waste unless thirty times of the assessment thereon has been deducted under provisos 2 hereunder.

II. PROVIDED ALWAYS and it is hereby further agreed by and between the parties as follows:

- 01. That it shall be lawful for the registered holders or lessees as the case may be at any time to cease mining operations under these provided the registered holders or lessees shall pay the Government or the Collector the land assessment, cess and

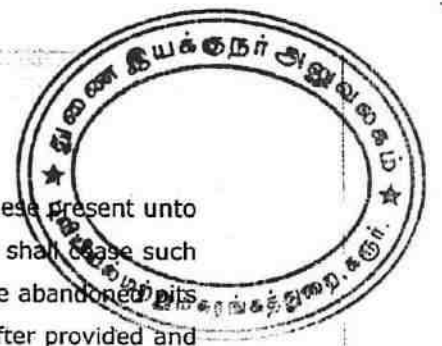


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seigniorage payable by the registered holders or the lessee under these presents unto to the end of the year in which the registered holders or the lessee shall cease such mining operations and shall restore the said lands fence or fill in the abandoned pits and excavations therein if required by the Collector as next hereinafter provided and upon, the registered holders or the lessee so doing these presents shall cease and determine.

02. That in case the registered holders shall relinquish the whole or part of the said lands in case of the expiry or sooner determination of this agreement then and in any such case, the registered holders in the case of relinquishment and the registered holders and the lessees in other cases shall restore said lands or the area relinquished or so much thereof as the Collector shall required to be restored to a state fit for cultivation and shall securely and permanently fence or fill in all abandoned pits and excavation therein as the Collector shall require to be fenced or filled in and incase the registered holders or the lessees shall fail, or neglect any such lands with the registered holders or the lessees be required to restore to a state fit for cultivation or to so fence or fill in any such abandoned pit or excavation which the registered holders or the lessees shall be required to so fence or fill them and in any such case it shall be lawful for the Collector to so restore any such lands or as the case may be so fence or fill in any pit excavation at the expense of the registered holders or lessees and to apply and said sum of Rs. 5000/- so deposited in or towards the cost of so doing and to deduct from amount of the said deposit and retain on behalf of the Government a sum equal to thirty times the assessment of the said lands which shall have been rendered unfit for cultivation. If however the amount of deposit is not sufficient to cover the cost of such restoration or fencing or filling as the case may be or to meet thirty times the assessment of the area rendered uncultivated, it shall be lawful for the Government to recover the balance by resort to Civil court.
03. That all land assessment, cesses and seignior age payable under these presents shall be recoverable under the provisions of the Tamil Nadu Revenue Recovery Act, 1864 or any subsisting statutory modification thereof, as if the same were arrear of land revenue.
04. That in the event of any breach of the registered holders of any of the conditions of these presents it shall be lawful for the Government to levy enhanced seignior age subject to the maximum of five times the normal rate or for the Collector to give notice in writing to the registered holders of his intention to cancel these presents whereupon the same shall stand cancelled but without prejudice to any rights which the Government may have against the registered holders in respect of any antecedent claim or breach of covenant or condition.

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05. That any notice to be given to registered holders may be addressed to their known place of abode and where notice has been so addressed it shall be deemed to have been duly served for the purpose of these presents.
06. Should any question or dispute arise regarding an agreement executed in pursuance of these rules or any matter or thing connected therewith or the powers of the registered holders there under, the amount or payment of the seigniorage fee or area assessment made payable thereby, the matter in issue shall be decided by the Director of Geology and Mining. In case the registered holders/lessees are not satisfied with decision of the Director of Geology & Mining, the matter shall be referred to the State Government.
07. The registered holder shall abide by the conditions laid down in the Payment of Wages Act, 1936 (Central Act IV of 1936), the Mines Act, 1952 (Central Act XXXV of 1952) and the Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under.

நிபந்தனைகள்:-

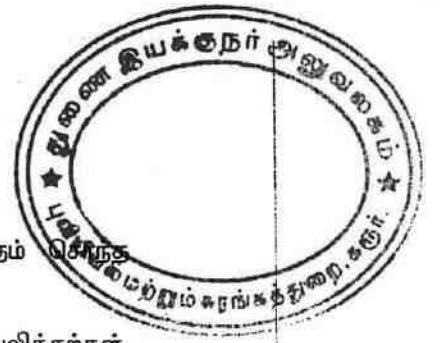
1. குத்தகை புலத்தினை அடுத்துள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.
2. பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமும் இன்றி பாதுகாப்பான முறையில் குவாரிப்பணி செய்ய வேண்டும்.
3. பொதுமக்களின் நலன் கருதி பாதுகாப்பான முறையில் குறைந்த அழுத்தமுள்ள வெடிபொருட்கள் பயன்படுத்தியும், கைத்துளைப்பான் கருவி கொண்டு துளையிட்டும், தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய பாதுகாப்பானதும், அகலமான Benches அமைத்து குவாரிப்பணி செய்ய வேண்டும்.
4. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் பரிந்துரை கடிதம் SEIAA, TN/F.No.2950/EC/1(a)/3191/2015 நாள்:27.4.2016ல் கண்ட சிறப்பு நிபந்தனைகளை முறையாக கடைபிடித்து குவாரிப்பணி செய்வதுடன், சிறப்பு நிபந்தனை 4 (i) ல் கண்டவாறு குவாரிப் பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் தடையின்மை சான்று பெற்று அதன் பின்னரே குவாரிப்பணி துவங்க வேண்டும். மாசுக்கட்டுப்பாட்டு வாரிய தடையின்மை சான்றினை குறித்த காலங்களில் புதுப்பிக்க வேண்டும்.
5. குத்தகைதாரர் தனக்கு அளிக்கப்பட்ட குத்தகை பகுதியின் எல்லைகளை தெளிவாக காட்டும் வகையில் கல் நட்டு வண்ணம் இட்டு குத்தகை காலம் முழுமைக்கும் பராமரிக்க வேண்டும்.
6. குத்தகைதாரர் குவாரியின் அருகே குத்தகைதாரர் பெயர், கிராமத்தின் பெயர், வட்டத்தின் பெயர், புல எண். பரப்பு, குத்தகை ஆணை எண். குத்தகை காலம், கனிமத்தின் பெயர், போன்ற விபரங்கள் குறிக்கப்பட்ட தகவல் பலகையை தமது சொந்த செலவில் வைத்து நன்கு பராமரிக்க வேண்டும்.



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7. குவாரிக்கு சென்றுவரும் பாதை வசதிகள் குத்தகைதாரர்கள் அவர் தம் பொறுப்பிலேயே அமைத்துக் கொள்ள வேண்டும்.
8. குத்தகை வழங்கப்பட்ட பாறையில் குண்டுக்கல், ஜல்லி, அரணை கல், வேலிக்கற்கள், போன்ற சிறுகனிமங்கள் உடைத்தெடுக்க மட்டுமே அனுமதியுண்டு. வெளிநாடுகளுக்கு ஏற்றுமதியாகும் மெருகூட்டும் கனவடிவ கற்கள் வெட்டி எடுக்கக் கூடாது.
9. குவாரியிலிருந்து கொண்டு செல்லப்படும் மேற்கண்ட வகை கற்களுக்கு 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் பின் இணைப்பு 2ல் கண்டுள்ளவாறு உரிமவரி செலுத்த வேண்டும். அரசு அவ்வப்போது அறிவிக்கும் உரிமவரி மாற்றங்களுக்கு ஏற்ப எவ்வித ஆட்சேபணை இன்றி செலுத்துதல் வேண்டும்.
10. குத்தகை அனுமதி வழங்கப்பட்ட நிலத்திலிருந்து கொண்டு செல்லப்பட்ட கற்களுக்கு முறையான கணக்குகளும், குழிவாயில் பதிவேடும் முறையாக பராமரித்தல் வேண்டும். அவற்றை சம்பந்தப்பட்ட அலுவலர்கள் தணிக்கைக்கு ஆஜர்படுத்த கோரினால் தவறாது சமர்ப்பிக்க வேண்டும்.
11. உதவி இயக்குநர் (புவியியல் மற்றும் சுரங்கத்துறை)-ன் அலுவலக முத்திரை, கையொப்ப முத்திரையுடன் கூடிய உரிய அனுப்புகைச் சீட்டை வாகனங்களுக்கு கொடுக்கப்படும் போது அனுப்புகைச் சீட்டில் வாகன எண், தேதி, புறப்படும் நேரம், செலுத்துமிடம் ஆகியவற்றை முறையாகக் குறிப்பிட்டு கையொப்பம் இட்ட பின்னரே, குத்தகைதாரரோ அல்லது அவரது அனுமதி பெற்ற நபரோ கொடுக்க வேண்டும். மேற்கண்டவாறு குறிப்பிடுவதில் ஏதேனும் தவறுகள் இருந்தாலோ, கலங்கள் பூர்த்தி செய்யப்படாமல் இருந்தாலோ முறையற்ற வகையில் கனிமம் எடுத்துச் செல்வதாகக் கருதப்பட்டு வாகனத்தை கைப்பற்றி அபராதம் விதிப்பதோடு, அதற்கு குத்தகைதாரரை பொறுப்பாக்கி கனிம விதிகளின் படி மேல் நடவடிக்கை எடுக்கப்படும்.
12. இந்த ஆணையில் குத்தகை அனுமதி வழங்கப்பட்ட புலத்ததை முழுமையாகவோ, பகுதியாகவோ எவருக்கும் உள் குத்தகைக்கு விடுவதோ அல்லது கிரையம் செய்வதோ கூடாது.
13. குத்தகைதாரர் ஒவ்வொரு நாளும் குவாரியில் இருந்து எவ்வளவு சிறுகனிமங்கள் எடுக்கப்பட்டது என்பதையும் எந்த அளவு கனிமங்கள் லாரி/ வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விபரத்தையும் காட்டும் பதிவேட்டினைப் பராமரித்து வரவேண்டும்.
14. குத்தகைதாரர், தமக்கு குத்தகை வழங்கப்பட்ட பகுதிக்கு அருகில் உள்ள பட்டா நிலத்திற்கு எவ்வித இடையூறும் இல்லாமல் குவாரிப் பணி செய்யப்பட வேண்டும்.
15. வண்டிப்பாதை மற்றும் நடைபாதைகளில் இருந்து 10 மீட்டர் தூரம் தள்ளி குவாரி செய்ய வேண்டும். ரோடுகள், புகைவண்டிப்பாதை, பொதுப்பணித்துறை, வாய்க்கால், பொதுமக்கள் உபயோகத்திற்கான பகுதிகள், மின்சாரம் மற்றும் தொலைபேசி கம்பி செல்லும் பகுதிகள், வழிபாட்டு இடங்கள் மற்றும் பழங்கால சின்னங்கள் உள்ள பகுதிகள் ஆகியவற்றில் இருந்து 50 மீட்டர் பாதுகாப்பு தூரம் விட்டு குவாரி செய்ய வேண்டும்.
16. குத்தகைக்கு விடப்பட்டுள்ள விஸ்தீரணத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். அதற்கான கூடுதலான விஸ்தீரணத்தில் குவாரி செய்வது தெரியவந்தால் அபராத நடவடிக்கை மேற்கொள்வதுடன் குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.
17. குத்தகை நிபந்தனை மீறப்பட்டால் குத்தகை இரத்து செய்யவோ, செய்யப்பட்ட தவறுதலுக்கு அபராத நடவடிக்கை எடுத்து தண்டம் விதிக்கவோ அல்லது கிரிமினல்



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வழக்குத் தொடுக்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகை ரத்து செய்யப்பட்டால் காப்புத் தொகை உட்பட அனைத்து தொகைகளும் அரசுக்கு ஆதாயமாக்கப்படும்.

18. குத்தகைதாரர் தமிழ்நாடு சிறுவகைக்கனிம சலுகை விதிகள் 1959ல் கண்டுள்ள விதிகளுக்கும் மற்றும் அரசு அவ்வப்போது அறிவிக்கும் சட்டதிட்டங்களுக்கும் உட்பட்டு குவாரிப்பணிகள் செய்ய வேண்டும்.
19. குவாரி குத்தகை உரிமம் காலாவதியான பின்பு எக்காரணத்தை முன்னிட்டும் மீண்டும் புதுப்பிக்கவோ அல்லது கால நீட்டிப்போ செய்து தரப்பட மாட்டாது.
20. வெடிபொருள் சட்டம் 1884ல் தெரிவிக்கப்பட்ட சரத்துக்கள்படி குறைந்த அளவு வெடிபொருளை உபயோகித்து கற்கள் வெளியே சிதறாமலும், சத்தம் அதிகம் ஏற்படாமலும், பொதுமக்களுக்கும், கால்நடைகளுக்கும், எவ்வித பாதிப்பும் இன்றியும் கல்குவாரி பணி செய்யப்பட வேண்டும்.
21. வெடிபொருள்கள் அரசு உரிமம் பெற்ற விற்பனைதாரரிடம் மட்டுமே பெற்று வெடிப்பதற்கு உரிமம் / அங்கீகாரம் பெற்ற வெடிப்பாளர்களை (Blaster / Mines mate) கொண்டு கல்குவாரியில் வெடி வைக்க வேண்டும்.
22. குழந்தை தொழிலாளர்கள் எவரையும் வேலைக்கு அமர்த்துதல் கூடாது.
23. Any other conditions stipulated by other Statutory / Government authorities shall be complied.
24. If any illicit quarrying is found in the area in S.F.Nos.75/1A, 75/1B and 75/2 of Kuppam Village, Aravakurichi Taluk, Karur District before the date of execution of lease deed this lease deed is liable to be cancelled and criminal action will be initiated.

சிறப்பு நிபந்தனைகள்:-

- 1) விண்ணப்ப புலங்களுக்கு மேற்குப் பகுதியில் புல எண்.225ல் தென்வடலாக செல்லும் பஞ்சாயத்து சாலைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளியிட்டு குவாரி பணி செய்ய வேண்டும்.

மேற்கூறப்பட்ட நிபந்தனைகள், சிறப்பு நிபந்தனைகள் மற்றும் கனிம சட்டம் விதிகளை மீறியுள்ளது உறுதிபடும் தருணத்தில் விதிமுறைகளுக்கு உட்பட்டு குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும். மேற்கண்ட நிபந்தனைகள் ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள், மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் 1959-ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் ஆகியவற்றின் அடிப்படையில் குத்தகைதாரர் குவாரிப் பணி புரிய வேண்டும்.

As per Approved Mining Plan, the total production of Roughstone for five years lease period is 35,885 cubic meter. Hence, based on the approved Mining Plan, for the purpose of calculating stamp duty the anticipated seigniorage fee is Rs.16,14,825/- (Rupees Sixteen Lakhs Fourteen Thousand Eight Hundred and Twenty Five Only) for the entire lease period of 5 years.

P. 24 உலர்
REGISTERED HOLDER



DISTRICT COLLECTOR,
KARUR.

11/13

V. கமலா,
REGISTERED HOLDER LESSEE



THE SCHEDULE

1. Name of the District : Karur
2. Name of the Taluk : Aravakurichi
3. Name of the Village : Kuppam
4. Name of the Sub Registration District : Joint II Sub Registrar Office, Karur
5. Lease Period : 5 years (05.8.2016 to 04.8.2021)

Survey Number	Total Extent Hects.	Area Assessment Rs.	BOUNDARIES			
			North By SF No.	East by SF No.	South by SF No.	West by SF No.
75/1A	0.49.5	Rs.940/- (Rs.100/- per hect, per year)	73/A1B	75/1B	75/2	225
75/1B	0.47.5		73/A1B, 73/A2	73/A2	75/2	75/1A
75/2	0.91.0		75/1A, 75/1B	73/A2, 74	75/3A, 75/3B	225
Total	1.88.0					

IN WITNESS Thiru.P.Vadivel, S/o.Palanisamy, Nochikattur, Kuppam Village, Aravakurichi Taluk, Karur District 'the registered holder' and Tmt.V.Kavitha, S/o.P.Vadivel, Nochikattur, Kuppam Post, Aravakurichi Taluk, Karur District 'registered holder / lessee' and Thiru.G.Govindaraj, I.A.S., District Collector, Karur acting for and on behalf of and by the order and direction of the Governor of Tamil Nadu have hereunto set their hands.



[Signature]
DISTRICT COLLECTOR,
KARUR.

12/13

[Signature]
REGISTERED HOLDER

[Signature]
REGISTERED HOLDER / LESSEE

Signed by the above named
In the presence of

- [Signature]*
1. CP. CHANDRA JOHANN
4. B. Mahalingam Purnam (Sgt)
Karur P.O. 629102.
J. Shiva San Karan
L.143, T. N. H. P.
Gandhi Gramam
Karur. T. K.
2. Karun. D. P.
Pun: 629 004.



Signed by the above named
In the presence of

1. *[Signature]*
(Dr. S. VEDIAPPAN)
ASSISTANT DIRECTOR,
GEOLOGY AND MINING,
KARUR.

[Signature]
(Dr. S. VEDIAPPAN)
27/11/2016
27/11/2016
429/2016/1095

ATTESTED BY *[Signature]* 263 *[Signature]* KARUR
L No A1177/KAR/13



பெயர்: சிவசுப்ரமணியன்
 பெயர்: சிவசுப்ரமணியன்

400 ஏக்கர், 75

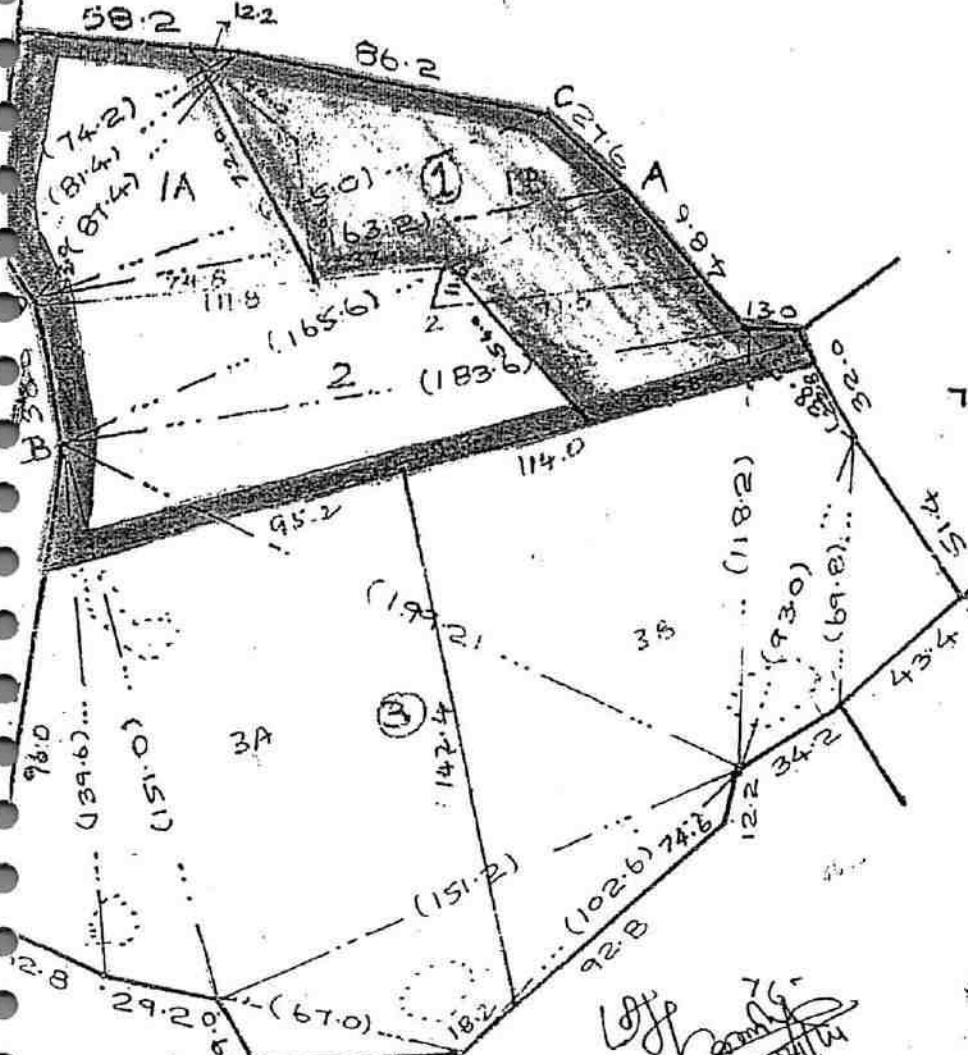
பரப்பு: 6000 சது. மீ. 4 ஏ. 68.0

Subdivisions 1A and 1B Plotted by me as per T.L. BA 39/1410 Dt 8.11.2000

Sub Division 3A, 3B Plotted by me as per T.L. BA 140/1411 Dt 1.12.01.

Lease Area
 Safety Zone 73

P. Selvarajam
 6.12.01
 P.S(CP)



DISTRICT COLLECTOR,
 KARUR.

ASSISTANT DIRECTOR
 GEOLOGY AND MINING
 KARUR.

VILLAGE ADMINISTRATIVE OFFICER
 13, Kuppam Village,
 Aravakurichi Taluk, Karur District.

TAHSILDAR,
 ARAVAKURICHI

REGISTERED HOLDER

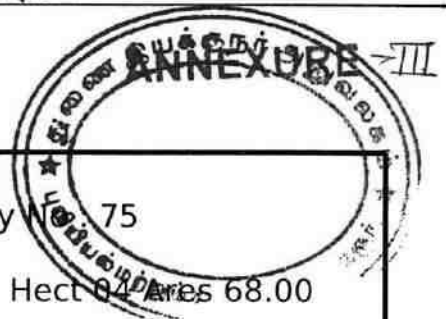
Subdivisions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

D	(1450)		
B	666	15.6	3
C			
B	(1656)		
2	6.0	61.2	
		52.8	Line 1
A			

அளவு: 1:2000

பெயர்: சிவசுப்ரமணியன்

12/4/01



District : Karur

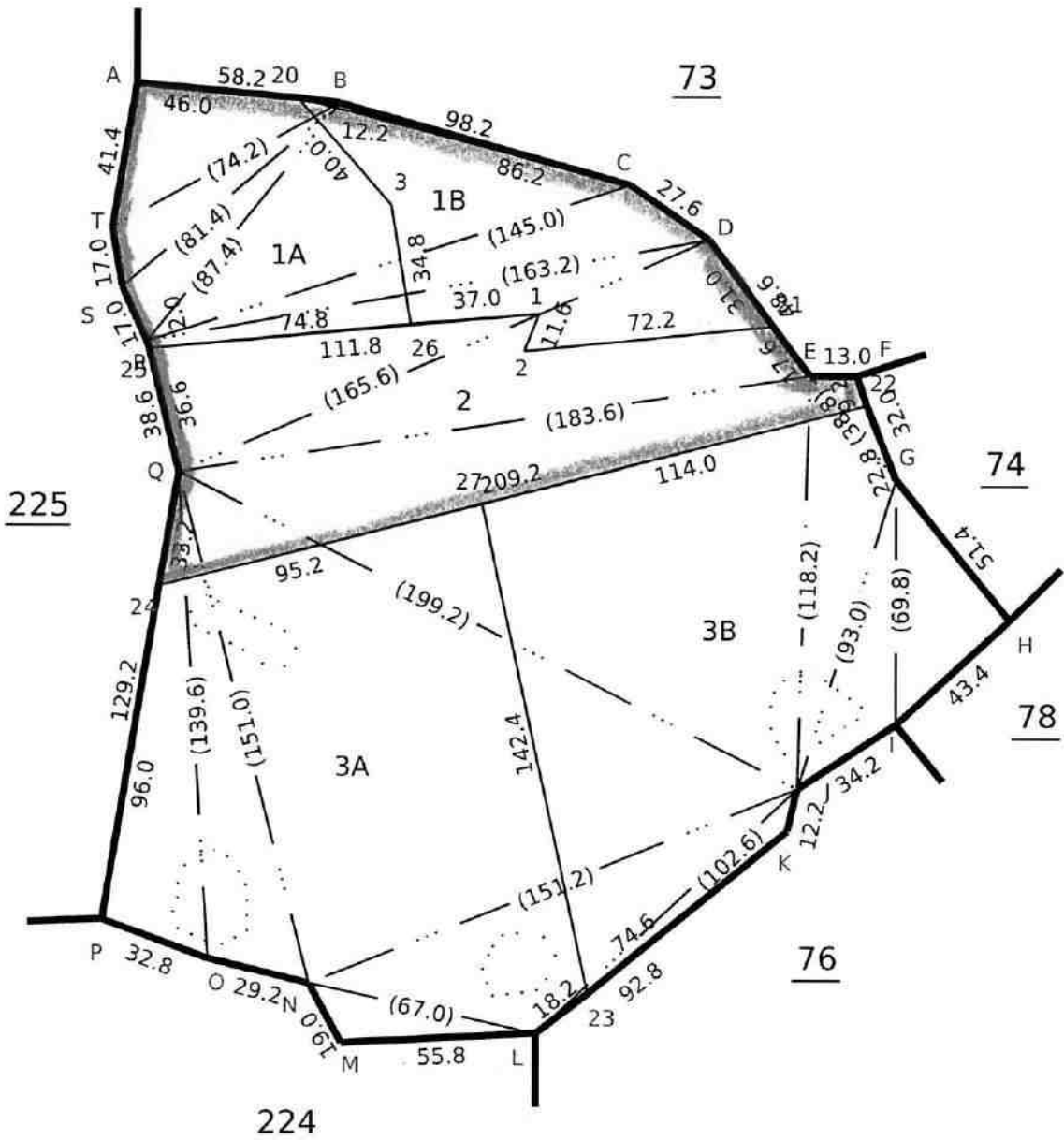
Survey No 75

Taluk : PUGALUR

Area : Hectares 68.00

Village : KUPPAM [18]

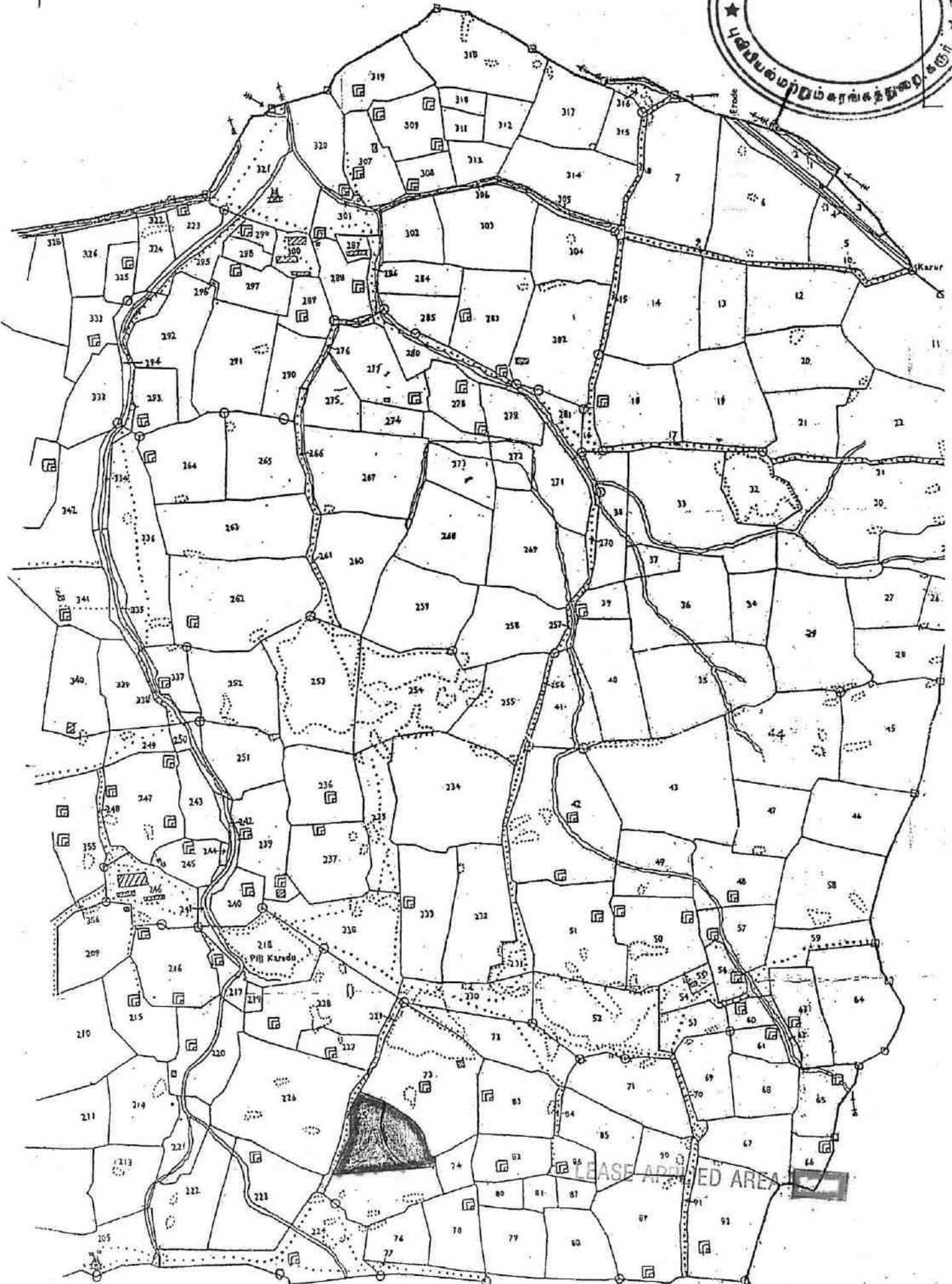
Scale : 1 : 2000



LEASE APPLIED AREA



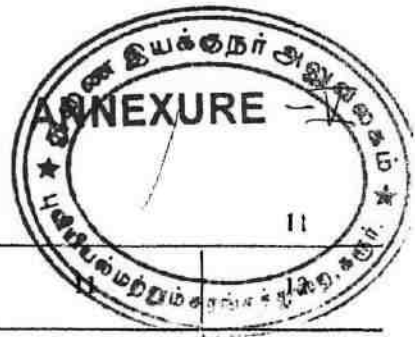
VILLAGE NAME : KUPPAM.



கிழக்கு மதுரை மாவட்டம்
பட்டினத்தேர் கிழக்கு மதுரை மாவட்டம்
No. 9
KUPPAM PART 2

→ SF NO. 75/267 சரி செய்து கொடுக்கப்பட்ட பகுதி - ரூ. 27,61,00.00 மட்டும்
→ SF NO. 75/10, 75/18, 75/2-ஐ சரி செய்து கொடுத்த பகுதி - மட்டும் 0.88 டி. மீட்டர்
மட்டும் 1.88 மட்டும்

சு. குமார்
10.8.70
10/8/70



7 13

கி. எண் 9 குப்பம்.

1	2	3	4	5	6	7	8	9	10		
							ரு.பை.	ஹெ.ஏர்ஸ்	ரு.பை.		
6	69-பா	ர	4	...	8-3	5	2 00	0 04.0	0 08	93 சி. காளியப்ப கவுண்டர்.	
								2 05.0	4 11		
70	70	அ	4	...	...	...	...	0 33.5	...	.....	கால் பாதை.
71	71-A	ர	4	...	8-3	5	2 00	1 62.0	3 24	214 மு. செல்வராஜ்.	
	71-B	ர	4	...	8-3	5	2 00	1 62.0	3 24	826 ப. பிச்ச முத்து (1), சி. வேலப்ப கவுண்டர் (2), வீ. கருமண கவுண்டர் (3).	
								3 24.0	6 48		
72	72	அ	4	...	...	...	...	2 70.5	...	.....	தீர்வை ஏற்படாத தரிசு.
73	73-A	ர	4	...	8-3	5	2 00	4 67.0	9 35	615 செ. சங்கரப்ப கவுண்டர் (1), செ. வேலப்ப கவுண்டர் (2).	சதுரக் கிணறு.
	73-B	ர	4	...	8-3	5	2 00	0 71.0	1 43	615 செ. சங்கரப்ப கவுண்டர் (1), செ. வேலப்ப கவுண்டர் (2).	
								5 38.0	10 78		
74	74	ர	4	...	8-2	4	2 77	0 74.5	2 06	615 செ. சங்கரப்ப கவுண்டர் (1), செ. வேலப்ப கவுண்டர் (2).	
75	75	ர	4	...	8-2	4	2 77	4 68.0	12 95	615 செ. சங்கரப்ப கவுண்டர் (1), செ. வேலப்ப கவுண்டர் (2).	
76	76	ர	4	...	8-2	4	2 77	1 47.5	4 09	616 ர. வீரப்ப கவுண்டர் (1), ர. முத்துசாமி கவுண்டர் (2).	
77	77	அ	4	...	...	...	...	0 56.6	...	.....	வண்டிப் பாதை.
	78	ர	4	...	8-2	4	2 77	1 88.5	5 22	617 ந. கருமண கவுண்டர் (1), ந. அங்கம் மார் (2).	சதுரக் கிணறு.

கிராம நிர்வாக அலுவலர்
கிராமம்



அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

கிராமம் : குப்பம்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	8 - 2
2. உட்பிரிவு எண்	1A	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்	75-1	11. தீர்வை (ரூ - ஹெ)	2.77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 49.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.40
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	1389
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	1	16. பெயர்	1.கவிதா

குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70861 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.



அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்
வட்டம் : புகளூர்
கிராமம் : குப்பம்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	8 - 2
2. உட்பிரிவு எண்	1B	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்	75 ,	11. தீர்வை (ரூ - ஹெ)	2.77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 47.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.30
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	1375
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.வடிவேல்

குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70826 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.



அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

கிராமம் : குப்பம்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	8 - 2
2. உட்பிரிவு எண்	2	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்	75	11. தீர்வை (ரூ - ஹெ)	2.77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 91.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	2.52
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	1389
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.கனிதா

குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70861 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

நில வரித் திட்டத்தின்படி உள்ள நிலங்களின் விவரம்.	பெயர்	பெரிய நிலம்	சிறிய நிலம்	மொத்த நிலம்	பெயர்	முதல் போகம்.													
						(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		
75/A	14	14	14	14	289	289	கவிதா	வசா											
1B	14	130	1375	1505	ப.வாழ்கை	வசா													
2	14	138	138	276	கவிதா	வசா													
273					தண்ணீர் கால்														
					கிராம நிர்வாக அலுவலர்														
					18, குட்டம் கிராமம்														
					புகளூர் வட்டம்														
					சுதூர் மாவட்டம்														

இலக்கம்	பெயர்	பெரிய நிலம்	சிறிய நிலம்	மொத்த நிலம்	பெயர்	முதல் போகம்.													
						(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)					
75/A	14	14	14	14	289	289	கவிதா	வசா											
1B	14	130	1375	1505	ப.வாழ்கை	வசா													
2	14	138	138	276	கவிதா	வசா													
273					தண்ணீர் கால்														
					கிராம நிர்வாக அலுவலர்														
					18, குட்டம் கிராமம்														
					புகளூர் வட்டம்														
					சுதூர் மாவட்டம்														





தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 1389

உரிமையாளர்கள் பெயர்

புல எண்	உட்பிரிவு	வடிவேல்		மனைவி		கவிதா		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
75	1A	0 - 49.50	1.40	--	--	--	--	----- 11-10-2014
75	2	0 - 91.00	2.52	--	--	--	--	570/1414--- 01-09-2004
		1 - 40.50	3.92					

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/01389/10861 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 10-08-2021 அன்று 01:28:32 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode புடிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 1375

உரிமையாளர்கள் பெயர்

1. பழனிசாமி

மகன்

வடிவேல்



புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
73	A1B	3 - 28.50	6.58	--	--	--	--	1095/1415-80/1415 -- 06-06-2006
75	1B	0 - 47.50	1.30	--	--	--	--	SK852/1414--- -- 08-06-2005
		3 - 76.00	7.88					

குறிப்பு 2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/01375/10826 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 10-08-2021 அன்று 01:30:59 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

ANNEXURE



தமிழ்நாடு தமிழ்நாடு TAMIL NADU

ரூ. 20 93AB 624375

P. சுவாமிநாதன்
சுமார்

S.RAMAMURTHY, S.V
L.No:05/1992
KARUR.

சம்மதக்கடிதம்

கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், நொச்சிகாட்டுர் என்ற முகவரியில் வசிக்கும் பழனிச்சாமி அவர்கள் குமாரர் P.வடிவேல் ஆகிய நான் எழுதிக்கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால், கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், புல எண்கள் 73/A1Bல் 3.28.50 பரப்பளவும், 75/1Bல் 0.47.50 பரப்பளவும், மொத்தம் 3.76.00 பரப்பளவுள்ள புஞ்சை நிலம் எனக்கு பாத்தியப்பட்டது. இதில் புல எண்.75/1Bல் 0.47.50 ஏர்ஸ் பரப்பளவுள்ள புஞ்சை நிலத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், நொச்சிகாட்டுர் என்ற முகவரியில் வசிக்கும் வடிவேல் அவர்கள் மனைவி V.கவிதா என்பவருக்கு சாதாரண கற்கள் வெட்டியெடுக்க அரசு அனுமதி பெற்று கல்குவாரி பணி செய்வதற்கு எனக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறேன். கல்குவாரி குத்தகை உரிமம் வழங்க என்னுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறேன்.

பிரமாணதாரர்.

P.சுவாமிநாதன்

12/18/12
Cell: 99944 45789

K. KANMANI, B.A.B.L.,
Advocate & Notary Public
Govt of India Regd No. 6877/08
Pudur, Anjan Kovil Post
KARUR - 639 008, T.N.





276

1095/2016/BK1



கடைசி துணை அளிப்புக்கானவர் அமுலாக்கப்பட்டது 08/09/2016 அன்ற 1-2 மணிக்குள் கிடைக்காத புகாரைப் பற்றி
தமிழ்நாடு சட்ட அமைப்பு, 20225 செலுத்தியவர்



1 இடது பெரு விரல்



P. அனனி
மேல் விவரம் ஆவண வாசகப்படி



எழுதிக் கொடுத்ததாக ஒப்புக்கொண்டவர்

1 இடது பெரு விரல்



P. அனனி
மேல் விவரம் ஆவண வாசகப்படி

2 இடது பெரு விரல்



V கய்யா
மேல் விவரம் ஆவண வாசகப்படி




எழுதி அளிப்பதாக ஒப்புக் கொண்டவர்




தொடர்பு வணிகத்தை எழுதிக் கொடுத்த / வாங்கிய திருவாளர் District Collector, Karur பதிவு செய்து (1) -ன் படி நேரில் ஆஜராவதிலிருந்து விலக்களிக்கப்பட்டுள்ளார் என மனநிறைவைடுத்து சான்றளிக்கிறேன்.


பதிவு அலுவலர்,
கரையேற்பகுதி.

இன்னாரென்றுருபித்தவர்

1  பெயர் : சண்முகம் க த/பெ கருமண கவுண்டர்

வள்ளிபுரம்
காருடையாம்பாளையம்
அஞ்சல், அரவக்குறிச்சி
கரூர்

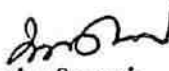
2  பெயர் : சேகர் ரா த/பெ ராமசாமி

புள்ளக்கவுண்டன்புதூர்
மின்னம்பள்ளி அஞ்சல்,
மண்மங்கலம் கரூர்

2016.ம் ஆண்டு ஆகஸ்டு திங்கள் 8 ம் நாள்


சார்பதிவாளர் கரூர் 2நி இசாப

1 புத்தகம் 2016 ம் ஆண்டு 1095 ம் எண்ணாக பதிவு செய்யப்பட்டது

நாள் : 08/08/2016 
சார்பதிவாளர்
கரூர் 2நி இசாப

(க. அனிரா)





இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

பதிவு அடையாளம் / Enrollment No.: 1189/55818/01002



இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

பதிவு அடையாளம் / Enrollment No.: 1189/55818/01004

To
ப.வடிவேல்
P.Vadivel
S/O Palanisamy
8/42
nochl kattur kuppam Aravakurichi
Kuppam Karur
Tamil Nadu 639111

16640094



UG168490949IN



To
வ.கவிதா
V.Kavitha
W/O Vadivel
8/42
nochl kattur kuppam Aravakurichi
Kuppam Karur
Tamil Nadu 639111

2509817



UG250981876IN



உங்கள் ஆதார் எண் / Your Aadhaar No. :

9430 7871 2121

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

உங்கள் ஆதார் எண் / Your Aadhaar No. :

8158 8521 7614

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



ப.வடிவேல்
P.Vadivel
பிறந்தவகுடம் / Year of Birth : 1968
ஆண்பால் / Male

9430 7871 2121



ஆதார் - சாதாரண மனிதனின் அதிகாரம்



வ.கவிதா
V.Kavitha
பிறந்தவகுடம் / Year of Birth : 1978
பெண்பால் / Female

8158 8521 7614

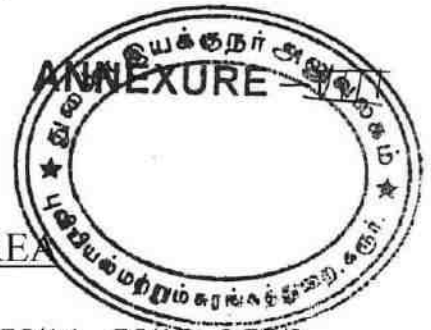


ஆதார் - சாதாரண மனிதனின் அதிகாரம்

P. 24825

V.கவிதா





PHOTOCOPY OF THE APPLIED LEASE AREA

Applied site photos in respect of rough stone lease in S.F.No: 75/1A, 75/1B & 75/2 Patta land, over an extent of 1.88.0 hectare, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State in belonging to Mrs.V.KAVITHA.





தமிழ்நாடு தமில்நாடு TAMIL NADU 24.8.2022 Rs.20/- 10AC 811020

PRABHU A-MINING SERVICE
KARUR

K. SIVASAMY,
S.V. 10-A, PHS ST.,
L.No: 1/97, KARUR,
KARUR.

BLASTING OR CONTRACT AGREEMENT

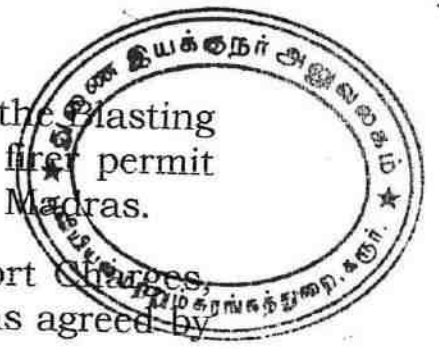
M.PRABHU m/s PRABHU-A-MINING SERVICE, Uppidamangalam West Village, having Explosive License No. E/SC/TN/22/711(E102787) and Explosive Magazine Situated at Uppidamangalam west Village here in after referred as part 1 entered into an Blasting agreement with

V. KAVITHA
w/o VADIVEL,
NOCHIKATTUR,
KUPPAM VILLAGE
PUGALUR(Tk)
Karur- Dt.

Having their mines/ quarry in S.F.No: **75/1A(0.49.50Hects), 75/1B (0.47.50Hects),75/2(0.91.00Hects)** Kuppam Village, Pugalur taluk, Karur District herein after referred as party 2 on and both the parties agreed for the followings:

For V. KAVITHA
V. Kavitha

For PRABHU-A-MINING SERVICE



- a) Party 1 has to use his Explosives and he has to do the Blasting work, in the mines/quarry with an authorized shot fire permit holder which is issued by the Explosives Department, Madras.
- b) Party 2 has to pay the cost of Explosives, transport charges, and other expenses incidental to blasting to party 1 as agreed by both the parties 1 and 2.
- c) Party 2 has to make his own arrangement to remove all the broken materials at his own cost.
- d) This agreement is valid from the date of signing by both the parties till the Completion of Blasting contract work from party 2 by giving in writing for clearing the agreement.

PARTY - 1

M. Prabhu

M.PRABHU M/S PRABHU-A-MINING SERVICE
EXPLOSIVES DEALERS
KARUR.

PARTY-2

V. Kavitha

For V.KAVITHA
KARUR.

WITNESS:

1. *R. [Signature]* R. [Signature], S/o [Signature]

2. *F. [Signature]* S/o [Signature]



भारत सरकार Government of India
 वाणिज्य और उद्योग मंत्रालय Ministry of Commerce & Industry
 पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पिसी) Petroleum & Explosives Safety Organisation
 पूर्व नाम- विस्फोटक विभाग Formerly- Department of Explosives
 A और D- विंग ब्लॉक 1-8, दूसरा तल, शास्त्री भवन: A & D - Wing, Block 1-8, 2nd Floor, Shastrri Bhavan
 26 हड्डास रोड, नूंगमिस्कातम चेन्नई 600006 26 Haddas Road, Nungambakkam Chennai 600006
 फोन (Phone) - 28281623 फैक्स (Fax) - 28283448



संख्या (No.) : E/SC/TN/22/711(E102787)

दिनांक (Date) : 24/09/2021

शुद्धि : To

M/s.Prabhu A Mining Service,
 No.1008 NN 17 Heera Avenue, NRMP Street, Covai Road, Cinnuripuram, Town Village - Karur Town
 District-KARUR, State-Tamil Nadu, Pincode - 639002

विषय Survey No.SF No.1006/1 ग्राम Uppidimangalam West Village, जिला KARUR, राज्य Tamil Nadu में मेसर्स M/s.Prabhu A Mining Service द्वारा विस्फोटक के मैगजीन में उपयोग के लिए कब्जा हेतु विस्फोटक नियम, 2008 के अंतर्गत LE-3 में जारी अनुज्ञप्ति सं E/SC/TN/22/711(E102787) के संशोधन संदर्भ (विस्फोटक की मात्रा / मासिक खरीद सीमा में परिवर्तन)
Subject: Possession for Use of Explosives from magazine situated at Survey No.:SF No.1006/1, Uppidimangalam West Village, Dist. KARUR, Tamil Nadu - Licence No.: E/SC/TN/22/711(E102787) granted in Form LE-3 of Explosives Rules, 2008 - (Amendment of Quantity of Explosives/Monthly Purchase Limit).

महोदय Sir,

आपका उपरोक्त विषय पर वर संख्या X दिनांक 24/09/2021 का संदर्भ ग्रहण करें।
 Please refer to your letter no. X dated 24.09.2021.

अनुज्ञप्ति संख्या E/SC/TN/22/711(E102787) विस्फोटक की मात्रा / मासिक खरीद सीमा में परिवर्तन हेतु।
 The Licence No.: E/SC/TN/22/711(E102787) is forwarded herewith duly amended in respect of followings :
Quantity of Explosives/Monthly Purchase Limit

किसी भी एक समय में लाइसेंस क्षमता निर्धारित की गई तथा मात्रा से अधिक नहीं होगी।
 The license capacity at any one time shall not exceed the kinds and quantities mentioned below :

संख्या No	विस्फोटक Explosive(s)	वर्ग Class	प्रभाग Div	उप-प्रभाग Sub Div	क्षमता Capacity	इकाई Unit
1	Nitrate Mixture				1700	Kg
2	Detonating Fuse	2	0	0	10000	Mtrs
3	Electric and/or Ordinary Detonators	6	2	0	44000	No.
4	Safety Fuse	6	3	0	10000	Mtrs
		6	1	0		

किरी एक कलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा (अनुच्छेद 3 (ख) और (ग) के अधीन अनुज्ञप्ति के लिए लागू) 15 गुना
 Quantity of explosives to be purchased in a calendar month [applicable for licence under article 3(b) and (c)] 15 times as above.

यह अनुज्ञप्ति दिनांक 31 मार्च 2025 तक प्रवृत्त रहेगी।
 This Licence shall remain valid till 31st day of March 2025.

अनुज्ञप्ति के आगामी नवीकरण हेतु कृपया विस्फोटक नियम, 2008 के नियम 112 के अंतर्गत प्रक्रिया का पालन करें। कृपया यावत दें।
 For further revalidation (if required), please follow the procedure under Rule 112 of Explosives Rules, 2008. Receipt of this letter may please be acknowledged.

भवदीय / Yours faithfully

(डा.टी.एस.थनुसिंगम) : Dr. T. L. THANE LINGAM
 उप मुख्य विस्फोटक नियंत्रक : Deputy Chief Controller of Explosives
 कृते संयुक्त मुख्य विस्फोटक नियंत्रक : For Joint Chief Controller of Explosives
 दक्षिणोत्तर क्षेत्र : South Circle, Chennai

प्रतिलिपि प्राप्त। Copy Forwarded to:

- District Magistrate, KARUR, Tamil Nadu with reference to his No. RC NO.D2 1071E.2918 Dated: 28.06.2019
- Superintendent of Police, KARUR, Tamil Nadu.

कृते संयुक्त मुख्य विस्फोटक नियंत्रक : For Joint Chief Controller of Explosives
 दक्षिणोत्तर क्षेत्र : South Circle, Chennai

(अधिक जानकारी जैसे आवेदन को स्थिति सुनिश्चित करने के लिए कृपया वेबसाइट <http://peso.gov.in> देखें।)
 (For more information regarding status, fee and other details please visit our website <http://peso.gov.in>)

Note :- This is system generated document does not require physical signature stamp.
Applicant may take printout for their records.

अनुज्ञापित प्ररूप एल. ई.-3 | LICENCE FORM LE-3
(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) से (घ) देखिए।)
(See article 3(a) to (d) of Part 1 of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने के लिए।
Licence to possess - (c) for use explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine



अनुज्ञापित सं. (Licence No.): E/SC/TN/22/711(E102787)
वार्षिक फीस रूपए (Annual Fee Rs): 5600/-

Licence is hereby granted to

M/s. Prabhu A Mining Service (अधिभोगी / Occupier : M.PRABHU), No.1008/88/17 Heera Avenue, NRMP Street, Covai Road, Gowripuram, Town/Village - Karur Town, District-KARUR, State-Tamil Nadu, Pincode - 639002

को अनुज्ञापित अनुदत्त को जाती है।

2. अनुज्ञापितधारी की प्रास्थिति | Status of licensee : Partnership Firm

3. अनुज्ञापित निम्नलिखित प्रयोजनों के लिए विधिमाम्य है।
Licence is valid only for the following purpose.

4. अनुज्ञापित विस्फोटकों के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमाम्य है।
Licence is valid for the following kinds and quantity of explosives: -- (क) (a)

क्र. सं.	नाम और विवरण	वर्ग और प्रभाग	उप-प्रभाग	मात्रा किसी एक समय में
Sr. No.	Name and Description	Class & Division	Sub-division	Quantity at any one time
1.	Nitrate Mixture	2, 0	0	1700 Kg.
2.	Detonating Fuse	6, 2	0	10000 Mtrs
3.	Electric and/or Ordinary Detonators	6, 3	0	44000 Nos.
4.	Safety Fuse	6, 1	0	10000 Mtrs

(ख) किसी एक कैलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा | अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञापित के लिए
(b) Quantity of explosives to be purchased in a calendar month (applicable for licence under article 3(b) and (c)) :

5. निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञापित परिसर की पुष्टि होती है।
The licensed premises shall conform to the following drawing(s)

रेखाचित्र क्र. (Drawing No.) E/SC/TN/22/711(E102787)
दिनांक (Dated) 29/09/2021

6. अनुज्ञापित परिसर निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:
Survey No. SF No.1006/1, ग्राम (Town/Village): Uppidimangalam West Village

पुलिस थाना (Police Station) : Villiyandi
624802

ज़िला (District) KARUR राज्य (State) Tamil Nadu
दूरभाष (Phone) ई-मेल (E-Mail)

पिनकोड (Pincode)
फैक्स (Fax)

7. अनुज्ञापित परिसर में निम्नलिखित सुविधाएं अंतर्विष्ट हैं।
The licensed premises consist of following facilities.

RCC Building

8. अनुज्ञापित समय - समय पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2004 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित उपबंधों के अधीन रहते हुए अनुदत्त की जाती है।

The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexures.

- उपर्युक्त क्रम सं. 5 में यथा कथित रेखाचित्र (स्थान, सन्निर्माण संबंधी और अन्य विवरण दर्शित करते हुए)।
Drawings (showing site, constructional and other details) as stated in serial No. 5 above.
- अनुज्ञापित प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापित की शर्तों और अतिरिक्त शर्तों।
Conditions and Additional Conditions of this licence signed by the licensing authority.
- दूरी प्ररूप DE-2 | Distance Form DE-2.

9. यह अनुज्ञापित तारीख 31 मार्च 2020 तक विधिमाम्य रहेगी। This licence shall remain valid till 31st day of March 2020.

यह अनुज्ञापित, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट-VII के अधीन तथा उपबर्णित इस अनुज्ञापित की शर्तों का अधिकरण करने या यदि अनुज्ञापित परिसर योजना या उससे संलग्न उपबंध में दर्शित विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिसंहत की जा सकती है, जहां वह लागू हो।
This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VIII, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto

तारीख | The Date - 28/08/2017

संयुक्त मुख्य विस्फोटक नियंत्रक / Joint Chief Controller of Explosives
South Circle, Chennai

Amendments :

- Change in Authorized Signatory/Occupier/Partners/Directors dated : 04/03/2020
- Change in Postal Address dated : 21/09/2020
- Change in Authorized Signatory/Occupier/Partners/Directors dated : 21/09/2020
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 02/02/2021
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 29/09/2021

Transfers :

- Change in Licensee Name/Address/Status dated : 23/07/2021

नवीनीकरण के पृष्ठांकन के लिए स्थान
Space for Endorsement of Renewal

नवीकरण की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry	अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature of licensing authority and stamp
09/07/2020	31/03/2025	Sd/- Jt. Chief Controller of Explosives, South Circle, Chennai

कानूनी चेतावनी : विस्फोटकों का गलत ढंग से चलायान या उनका दुरुपयोग विधे के अधीन गंभीर दंडित अपराध होगा।
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

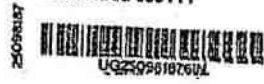
**Note :- This is system generated document does not require physical signature.
Applicant may take printout for their records.**



இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

பதிவு அடையாளம் / Enrollment No.: 1189/55818/01002

To
வ.கவிதா
V.Kavitha
W/O Vadivel
8/42
nochi kattur kuppam Aravakurichi
Kuppam Karur
Tamil Nadu 639111



உங்கள் ஆதார் எண் / Your Aadhaar No. :

8158 8521 7614

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



भारत सरकार
GOVERNMENT OF INDIA
வ.கவிதா
V.Kavitha
பிறந்தவகுடம் / Year of Birth : 1978
பெண்பால் / Female

8158 8521 7614



ஆதார் - சாதாரண மனிதனின் அதிகாரம்

आयकर विभाग
INCOME TAX DEPARTMENT


भारत सरकार
GOVT. OF INDIA

V KAVITHA
SAMIAPPAN

16/09/1978

Permanent Account Number
CHDPK5777L





V Kavitha
 Signature



In case this card is lost / found, kindly inform / return to:
 Income Tax PAN Services Unit, IITTSI
 Plot No. 3, Sector 11, CHD Belapur,
 Navi Mumbai - 400 614.

இசு காட் கெட்/பிளெபா கடுபயா சூசித கர்/லிடார:
 आयकर पैन सेवा युनिट, पुटीभाई आइटीएसएयू
 प्लॉट नं. ३, सेक्टर ११, सी.डी.बेलपुर,
 नवी मुंबई-४०० ६१४.



GOVERNMENT OF TELANGANA
DEPARTMENT OF MINES AND GEOLOGY

**CERTIFICATE OF REGISTRATION
AS RECOGNIZED QUALIFIED PERSON
TO PREPARE MINING PLAN**

[Under Rule 14(2) of Granite Conservation and Development Rules 1999 & Rule 7(B) of Telangana State Minor Mineral Concession Rules, 1966]

Sri A. Allimuthu, S/o Arumugam, D.No.1/231, Pattakarnavalavu, Chinnamuthiyampatti, Puduppalayam Post, Edapaddi Taluk, Salem District, Tamil Nadu-636306 whose photograph and signature is affixed herein above, having given evidence of his qualification and experience is hereby granted recognition under Rule 14(2) of Granite Conservation & Development Rules, 1999 and Rule 7(B) of Telangana State Minor Mineral Concession Rules, 1966 as Recognized Qualified Person (RQP) to prepare Mining Plan.

Registration Number :

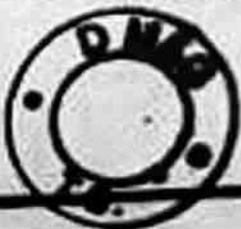
RQP/DMG/HYD/85/2022

This Recognition is valid for period of (10) years with effect from 26.04.2022.

This certificate will liable to be withdrawn/cancelled in the event of furnishing the wrong information/documents in the Mining Plan submitted by the Recognized Qualified Person.

Place: Hyderabad,

Date: 26.04.2022.



DIRECTOR OF MINES AND GEOLOGY

PLATE NO-I






APPLICANT:

Mrs. V.KAVITHA,
W/o. V.ADIVEL,
NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.

LEASE APPLIED AREA:

S.F.NO : 75/1A, 75/1B & 75/2,
EXTENT : 1.88.0Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

INDEX

- MINE LEASE AREA 
- APPROACH ROAD 
- CART ROAD 
- VILLAGE ROAD 
- SH - 84 ROAD 

KEY MAP

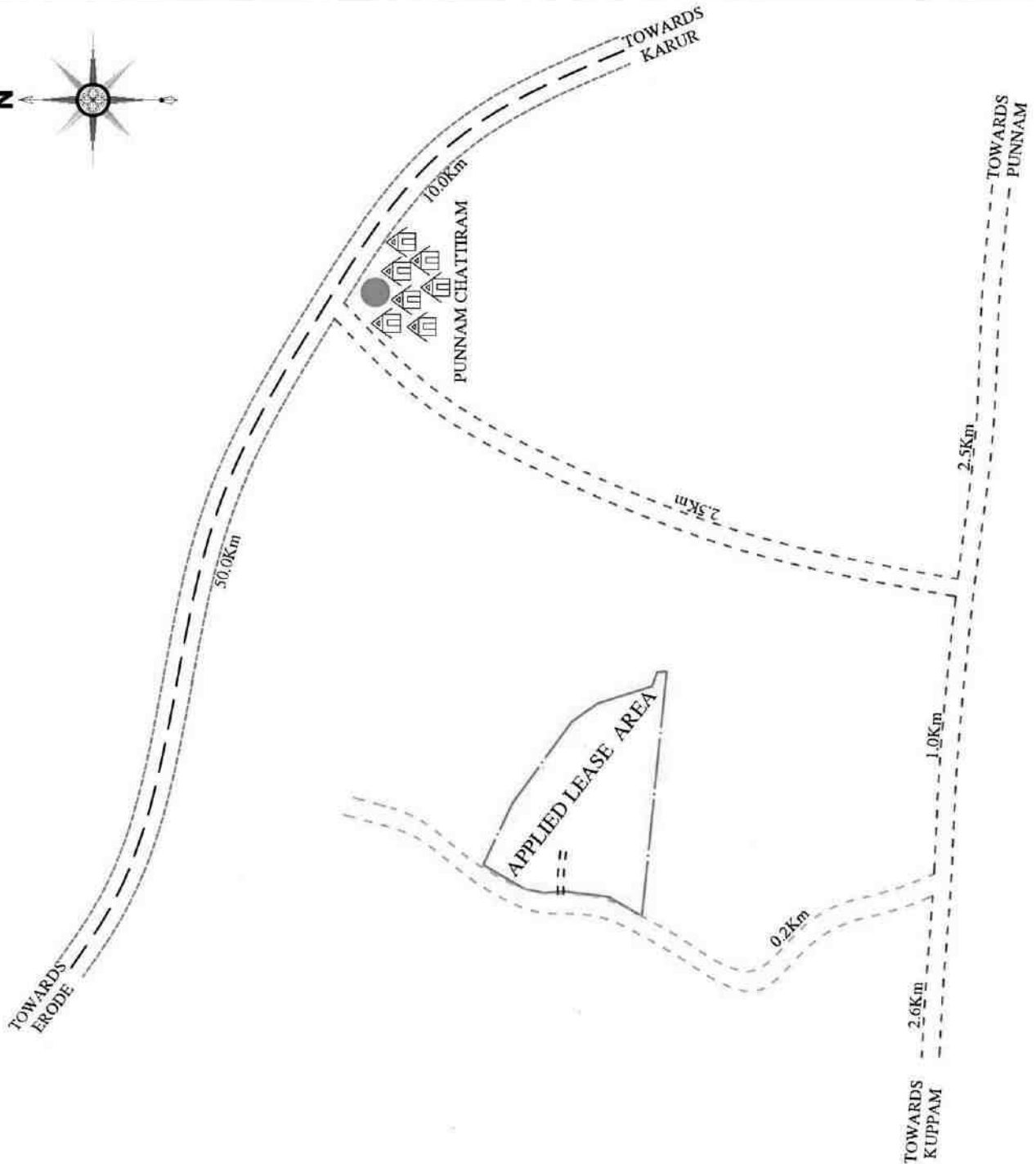
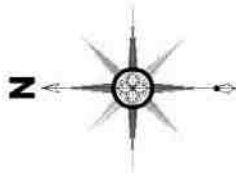
Not to Scale

Prepared By:

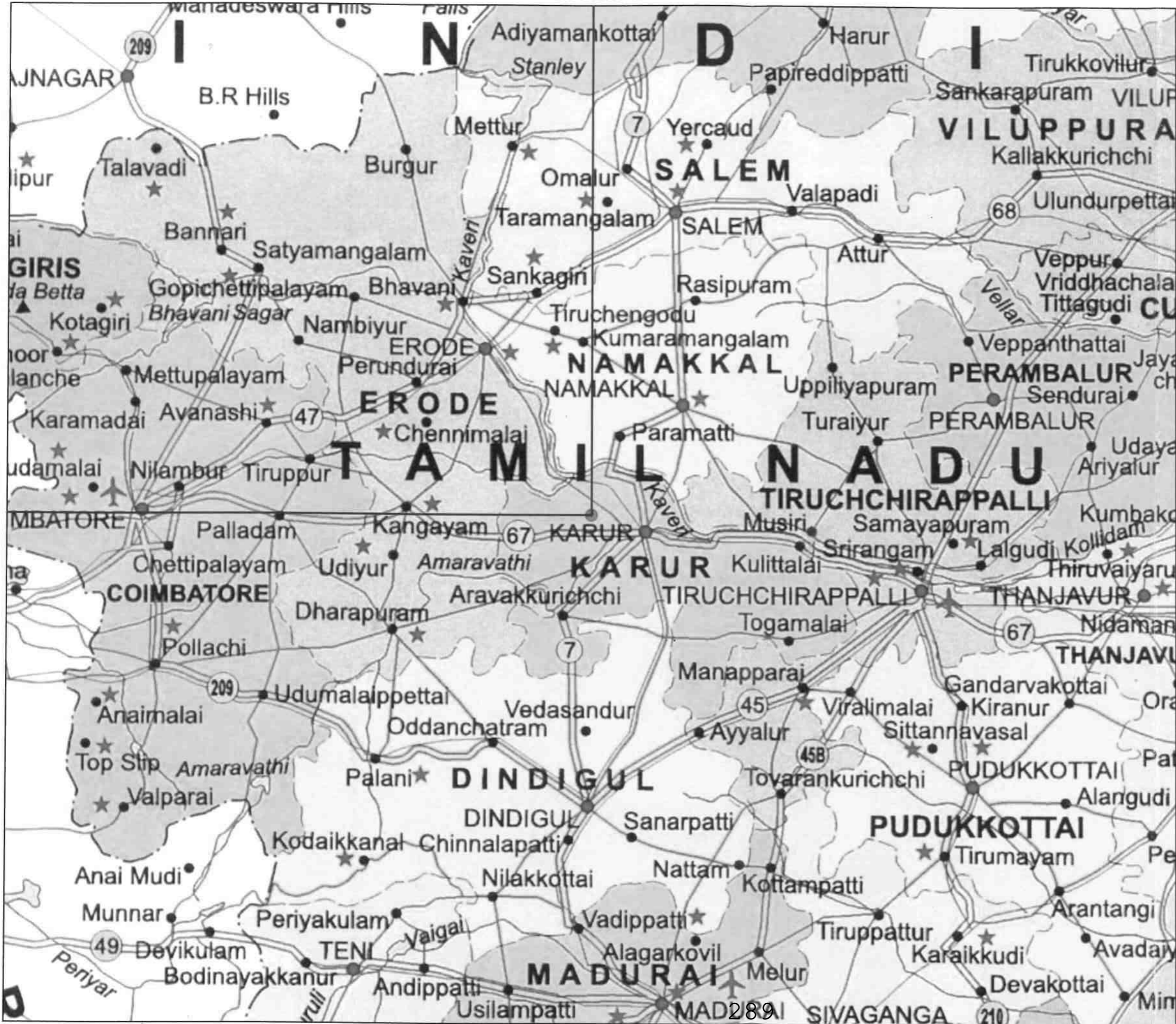
I DO HEREBY CERTIFY THAT THE PLAT
HAS BEEN CHECKED BY ME AND IS
CORRECT TO THE BEST OF MY KNOWLEDGE

A. Anirudh

SHRI. A. ALLMUTHU, M. Sc., M. PHIL.,
RECOGNISED QUANTIFIED PERSON
RQP / DMG / HYD / 867 / 2022



11°0'2.56"N



77°57'32.82"E

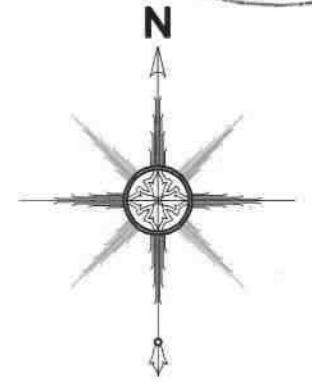


PLATE NO-IA

APPLICANT:
 Mrs.V.KAVITHA,
 W/o.VADIVEL,
 NOCHI KATTUR,
 KUPPAM VILLAGE,
 PUGALUR TALUK,
 KARUR DISTRICT.

LEASE APPLIED AREA:
 S.F.NO : 75/1A, 75/1B & 75/2,
 EXTENT : 1.88.0Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

MINE LEASE AREA: ●
 TOPO SHEET NO : 58-E/16 & 58-F/13
 LATITUDE : 10°59'57.47"N to 11°0'2.56"N
 LONGITUDE: 77°57'32.82"E to 77°57'39.69"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

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
 RECOGNISED QUALIFIED PERSON
 RQP/DMG/HYD/85/2022

11°0'2.56"N

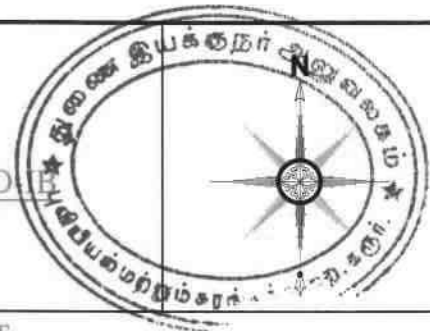


PLATE NO

APPLICANT:
Mrs.V.KAVITHA,
W/o.VADIVEL,
NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.

LEASE APPLIED AREA:
S.F.NO : 75/1A, 75/1B & 75/2,
EXTENT : 1.88.0Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

TOPO SHEET NO : 58-E/16 & 58-F/13

LATITUDE : 10°59'57.47"N to 11°0'2.56"N

LONGITUDE: 77°57'32.82"E to 77°57'39.69"E

MINE LEASE AREA



10KM RADIUS



CONVENTIONAL SYMBOLS

Express highway with toll with bridge with distance stone	[Symbol]
Roads, metalled according to importance	[Symbol]
Unmetalled metalled Cart track, Pucca road with path, Pucca path	[Symbol]
Streams with bank in bar, unobstructed Canal	[Symbol]
Canal crossing or over-bridge overhead tank	[Symbol]
Water dyke with water channel with level 2 m high, Tidal river	[Symbol]
Submerged bank, Small Stream, Puddle	[Symbol]
High level, Canal, Tidal river, Spring, Farm, permanent dyke	[Symbol]
Embankment, road to rail tank, Embankment	[Symbol]
Railway, broad gauge, double, single with station, under construction	[Symbol]
Railway, other gauge, double, single with station along it	[Symbol]
Motor bus or highway, Kin. Carting with tunnel	[Symbol]
Canal with sub-structure, Rocky, Hoop, Dam	[Symbol]
Small reservoir (Tank, Pond, High-mountain) (Under construction)	[Symbol]
Forest of Village, reserved, reserved Forest	[Symbol]
High permanent temporary Tower, Aqueduct	[Symbol]
Tank, Chital, Chital, Mangro, light, Tank, Groves	[Symbol]
Lighthouse, Lighter, Barge, Jetty, wharves, Anchorage	[Symbol]
Mine, View on earth, Cross, Signal	[Symbol]
Point, Station, other, Platform, Control, Sounding, Cross, level	[Symbol]
Forest, undisturbed, Reserved, forest	[Symbol]
Boundary, reservation	[Symbol]
Water, dam, reservoir, undisturbed	[Symbol]
Water, dam, reservoir, undisturbed	[Symbol]
Boundary, reservation	[Symbol]
Highway, unmetalled, station, point, approximate	[Symbol]
Boundary, reservation	[Symbol]
Point, station, other, Platform, Control, Sounding, Cross, level	[Symbol]
Forest, undisturbed, Reserved, forest	[Symbol]
Boundary, reservation	[Symbol]
Highway, unmetalled, station, point, approximate	[Symbol]
Boundary, reservation	[Symbol]
Point, station, other, Platform, Control, Sounding, Cross, level	[Symbol]
Forest, undisturbed, Reserved, forest	[Symbol]
Boundary, reservation	[Symbol]
Highway, unmetalled, station, point, approximate	[Symbol]
Boundary, reservation	[Symbol]
Point, station, other, Platform, Control, Sounding, Cross, level	[Symbol]
Forest, undisturbed, Reserved, forest	[Symbol]
Boundary, reservation	[Symbol]
Highway, unmetalled, station, point, approximate	[Symbol]
Boundary, reservation	[Symbol]
Point, station, other, Platform, Control, Sounding, Cross, level	[Symbol]
Forest, undisturbed, Reserved, forest	[Symbol]
Boundary, reservation	[Symbol]

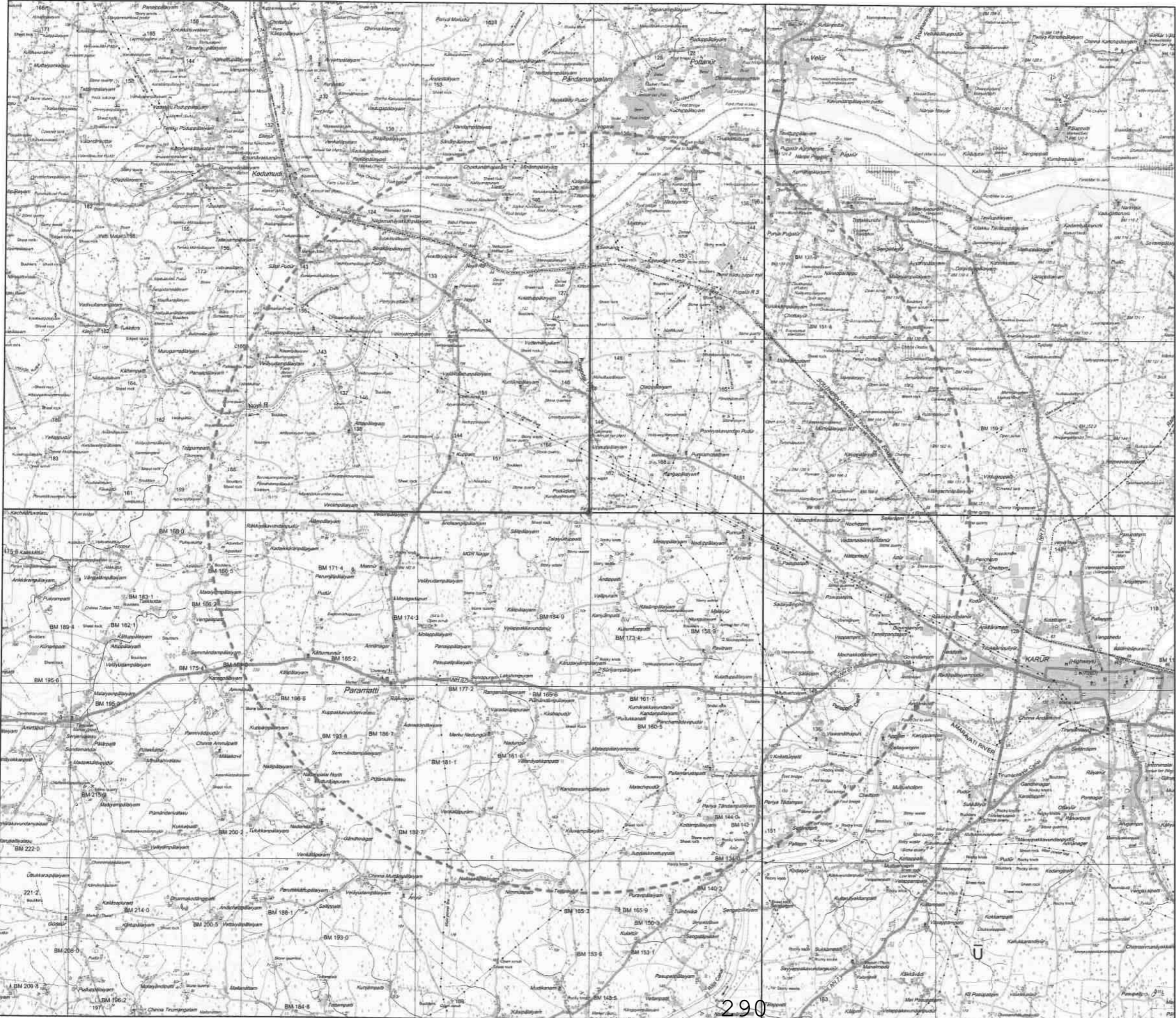
TOPOSHEET MAP
SCALE- 1:1,00,000

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

A. Animathu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022

77°57'32.82"E



11°0'2.56"N



TOWARDS KUPPAM

77°57'32.82"E

TOWARDS KUPPAM

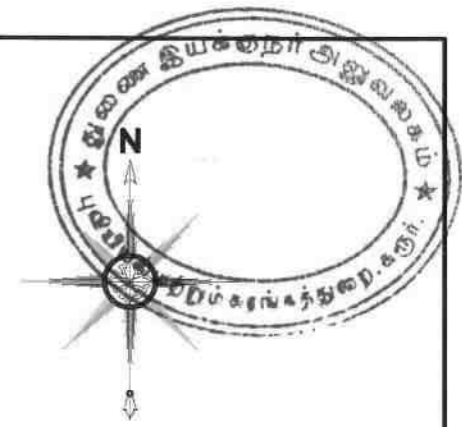










PLATE NO-IC

APPLICANT:
 Mrs.V.KAVITHA,
 W/o.VADIVEL,
 NOCHI KATTUR,
 KUPPAM VILLAGE,
 PUGALUR TALUK,
 KARUR DISTRICT.

LEASE APPLIED AREA:
 S.F.NO : 75/1A, 75/1B & 75/2,
 EXTENT : 1.88.0Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

- MINE LEASE AREA 
- SAFETY DISTANCE 
- APPROACH ROAD 
- CART ROAD 
- 300m RADIUS 
- 500m RADIUS 
- EXISTING QUARRY PIT 
- VILLAGE ROAD 

TOPO SHEET NO : 58-E/16 & 58-F/13
 LATITUDE : 10°59'57.47"N to 11°0'2.56"N
 LONGITUDE: 77°57'32.82"E to 77°57'39.69"E

SATELLITE IMAGERY MAP
 SCALE- 1:5000

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

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
 RECOGNISED QUALIFIED PERSON
 RQP/DMG/HYD/85/2022

OCTOBER TO DECEMBER

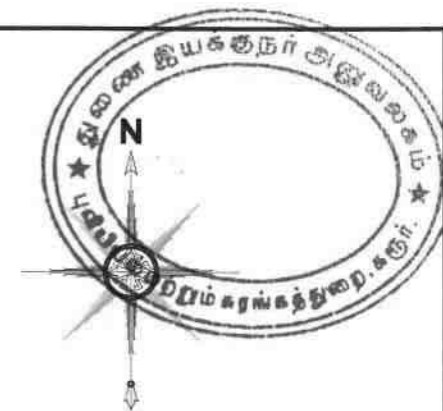







PLATE NO-ID

APPLICANT:
Mrs.V.KAVITHA,
W/o.VADIVEL,
NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.

LEASE APPLIED AREA:
S.F.NO : 75/1A, 75/1B & 75/2,
EXTENT : 1.88.0Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

INDEX

- MINE LEASE AREA 
- SAFETY DISTANCE 
- APPROACH ROAD 
- CART ROAD 
- 300m RADIUS 
- 500m RADIUS 
- EXISTING QUARRY PIT 
- VILLAGE ROAD 

TOPO SHEET NO : 58-E/16 & 58-F/13
LATITUDE : 10°59'57.47"N to 11°0'2.56"N
LONGITUDE: 77°57'32.82"E to 77°57'39.69"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

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022

11°0'29.08"N



TOWARDS
KUPPAM

TOWARDS
PUNNAM

TOWARDS
PUNNAM

TOWARDS
KUPPAM

77°54'21.39"E



JULY TO SEPTEMBER

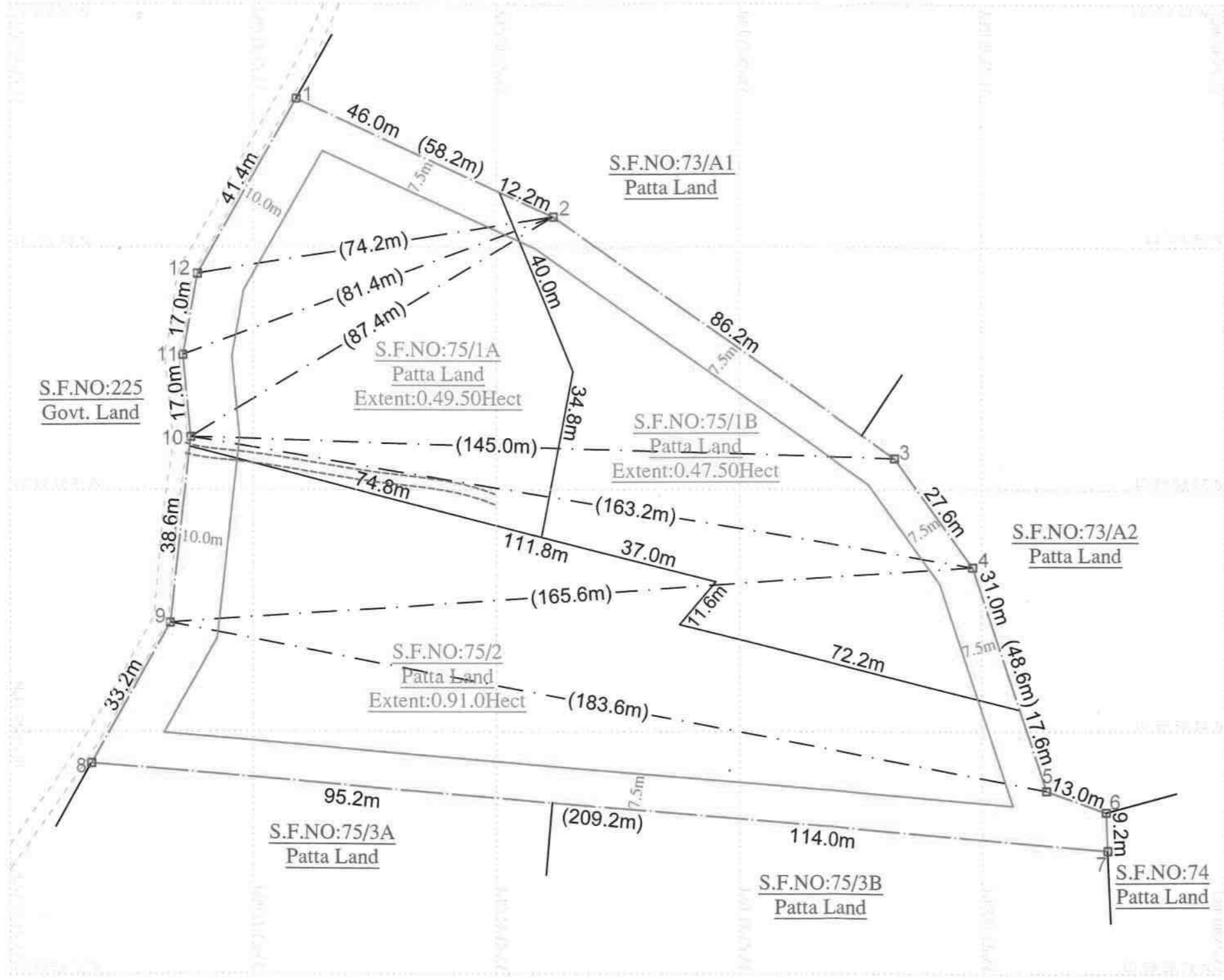
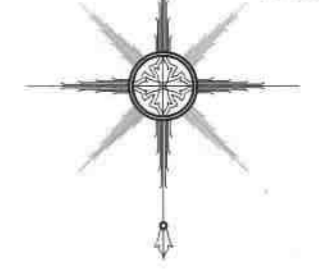


PLATE NO-II

APPLICANT:
 Mrs.V.KAVITHA,
 W/o.VADIVEL,
 NOCHI KATTUR,
 KUPPAM VILLAGE,
 PUGALUR TALUK,
 KARUR DISTRICT.

LEASE APPLIED AREA:
 S.F.NO : 75/1A, 75/1B & 75/2,
 EXTENT : 1.88.0Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

MINE LEASE AREA	
SAFETY BOUNDARY	
APPROACH ROAD	
CART ROAD	
PILLAR STONES	

MINE LEASE PLAN
 SCALE 1: 1000

Prepared By:

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

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
 RECOGNISED QUALIFIED PERSON
 RQP/DMG/HYD/85/2022

PILLAR ID	LATITUDE	LONGITUDE	PILLAR ID	LATITUDE	LONGITUDE
1	11° 0'2.56"N	77°57'34.25"E	7	10°59'57.47"N	77°57'39.69"E
2	11° 0'1.76"N	77°57'35.98"E	8	10°59'58.12"N	77°57'32.82"E
3	11° 0'0.12"N	77°57'38.28"E	9	10°59'59.06"N	77°57'33.36"E
4	10°59'59.38"N	77°57'38.80"E	10	11° 0'0.30"N	77°57'33.51"E
5	10°59'57.87"N	77°57'39.28"E	11	11° 0'0.86"N	77°57'33.47"E
6	10°59'57.73"N	77°57'39.68"E	12	11° 0'1.40"N	77°57'33.57"E

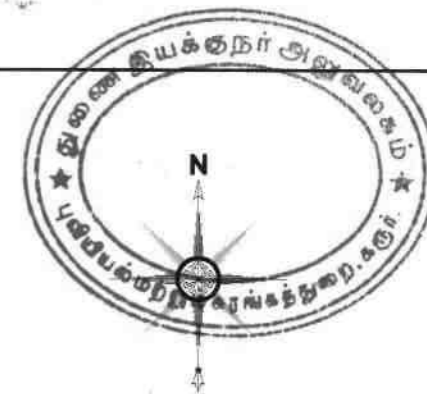


PLATE NO:III

SURFACE & GEOLOGICAL PLAN

SCALE: 1:1000

APPLICANT:

Mrs.V.KAVITHA,
W/o.Mr.VADIVEL,
No.8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.639111

INDEX

Q.L.BOUNDARY	
7.5M&10M SAFETYDISTANCE	
APPROACH ROAD	
BOUNDARY PILLARS	
GRAVEL	
ROUGH STONE	
TEMPORARY BENCHMARK	
SHRUB	
CONTOUR	
EXSITING PIT	
TRESS	
EARTH BUND	

LOCATION OF MINE

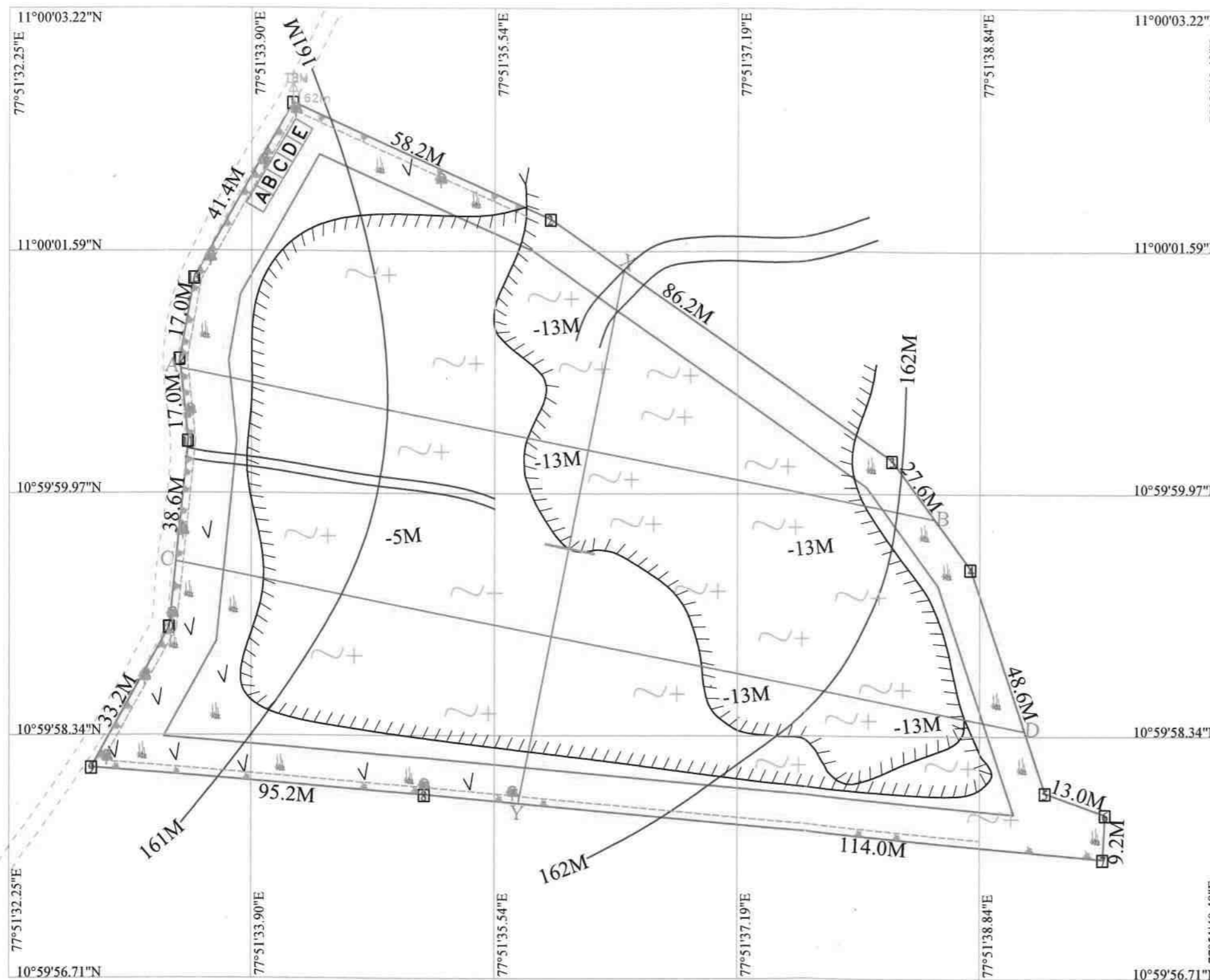
EXTENT : 1.88.00 Ha
S.F.NO : 75/1A,75/1B,&75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

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

A. Amin

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



EXSITING PIT DIMENSION
A.g 124m L X 43m W X 13m D
A.g 108m L X 81m W X 5m D



PLATE NO:III-A







CROSS SECTION OF
GEOLOGICAL PLAN

SECTION: HOR-1:1000
VER-1:500

APPLICANT:

Mrs.V.KAVITHA,
W/o.Mr.VADIVEL,
No.8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.639111

INDEX

- Q.L.BOUNDARY 
- 7.5M SAFETY DISTANCE 
- GRAVEL 
- ROUGH STONE 
- MID POINT 
- DEPTH OF ESTIMATION 

LOCATION OF MINE

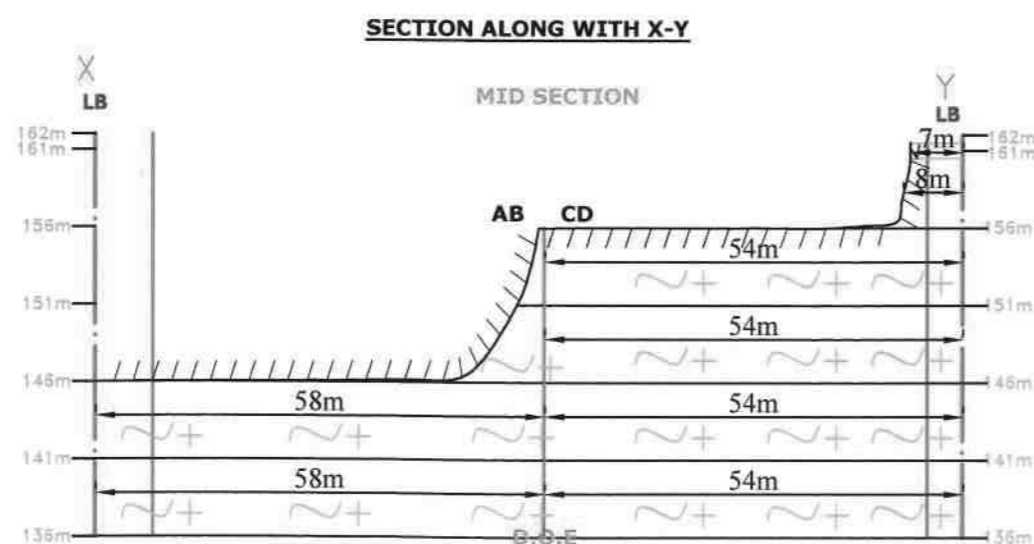
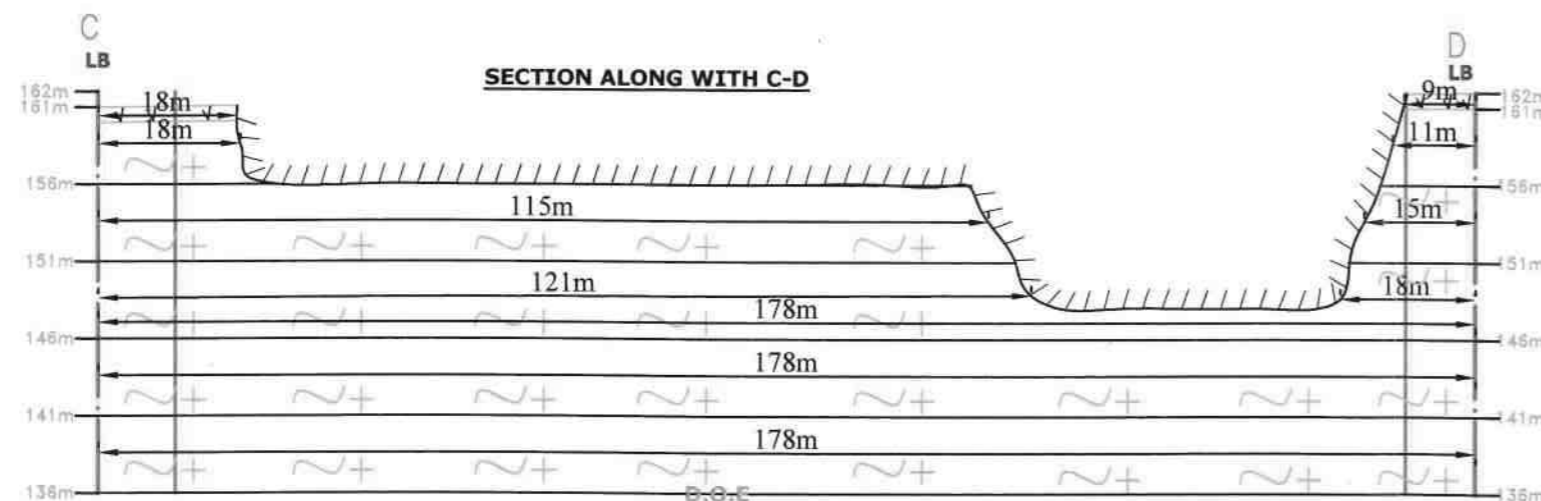
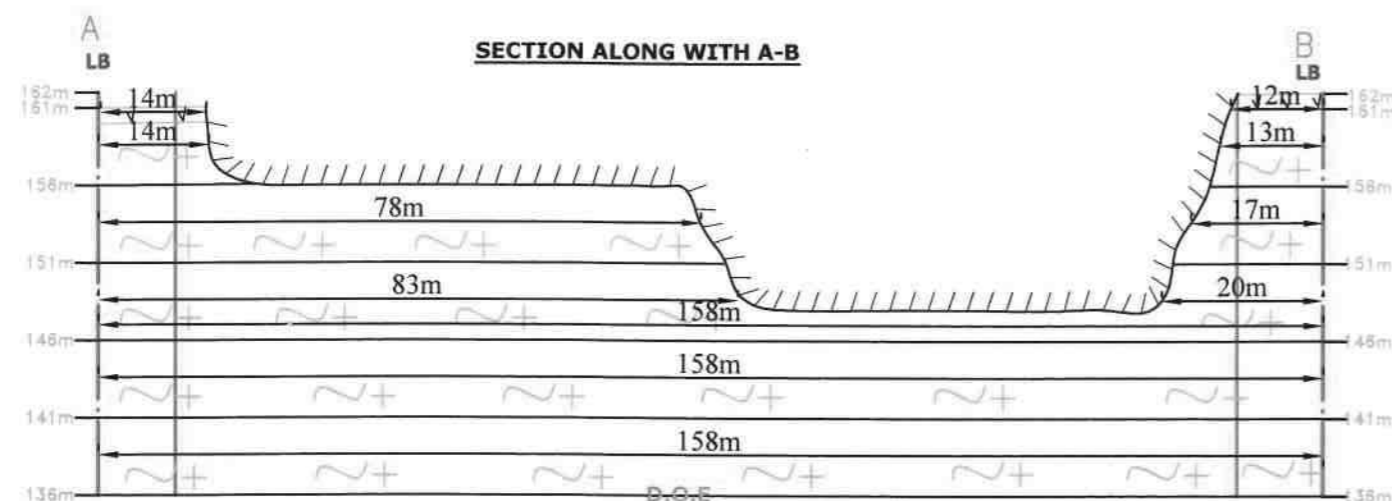
EXTENT : 1.88.00 Ha
S.F.NO : 75/1A,75/1B,&75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

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CORRECT TO THE BEST OF MY KNOWLEDGE

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SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



TOPSOIL GEOLOGICAL RESERVES				
SECTION	L(m)	W(m)	D(m)	VOL(M3)
XY-AB	26	58	1	1508
XY-AB	27	7	1	189
				1697

ROUGH STONE GEOLOGICAL RESERVES				
SECTION	L(m)	W(m)	D(m)	VOL(M3)
XY-AB	27	58	5	7830
	95	58	5	27550
	103	58	3	17922
	158	58	2	18328
	158	58	5	45820
XY-CD	29	8	4	928
	130	54	5	35100
	139	54	3	22518
	178	54	2	19224
	178	54	5	48060
				337160

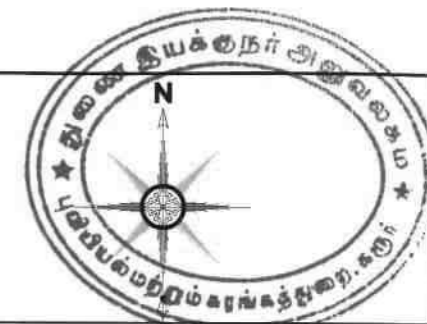


PLATE NO:IV

YEARWISE DEVELOPMENT AND PRODUCTION PLAN

SCALE: 1:1000

APPLICANT:

Mrs.V.KAVITHA,
W/o.Mr.VADIVEL,
No.8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.639111

INDEX

Q.L.BOUNDARY	
7.5m&10SAFETY DISTANCE	
APPROACH ROAD	
BOUNDARY PILLARS	
TRESS	
FENCHING	
ULTIMATE SLOP	
CONTOUR	
EARTH BUND	
I-ST YEAR PRODUCTION	
II-ND YEAR PRODUCTION	
III-RD YEAR PRODUCTION	
IV-TH YEAR PRODUCTION	
V-TH YEAR PRODUCTION	

LOCATION OF MINE

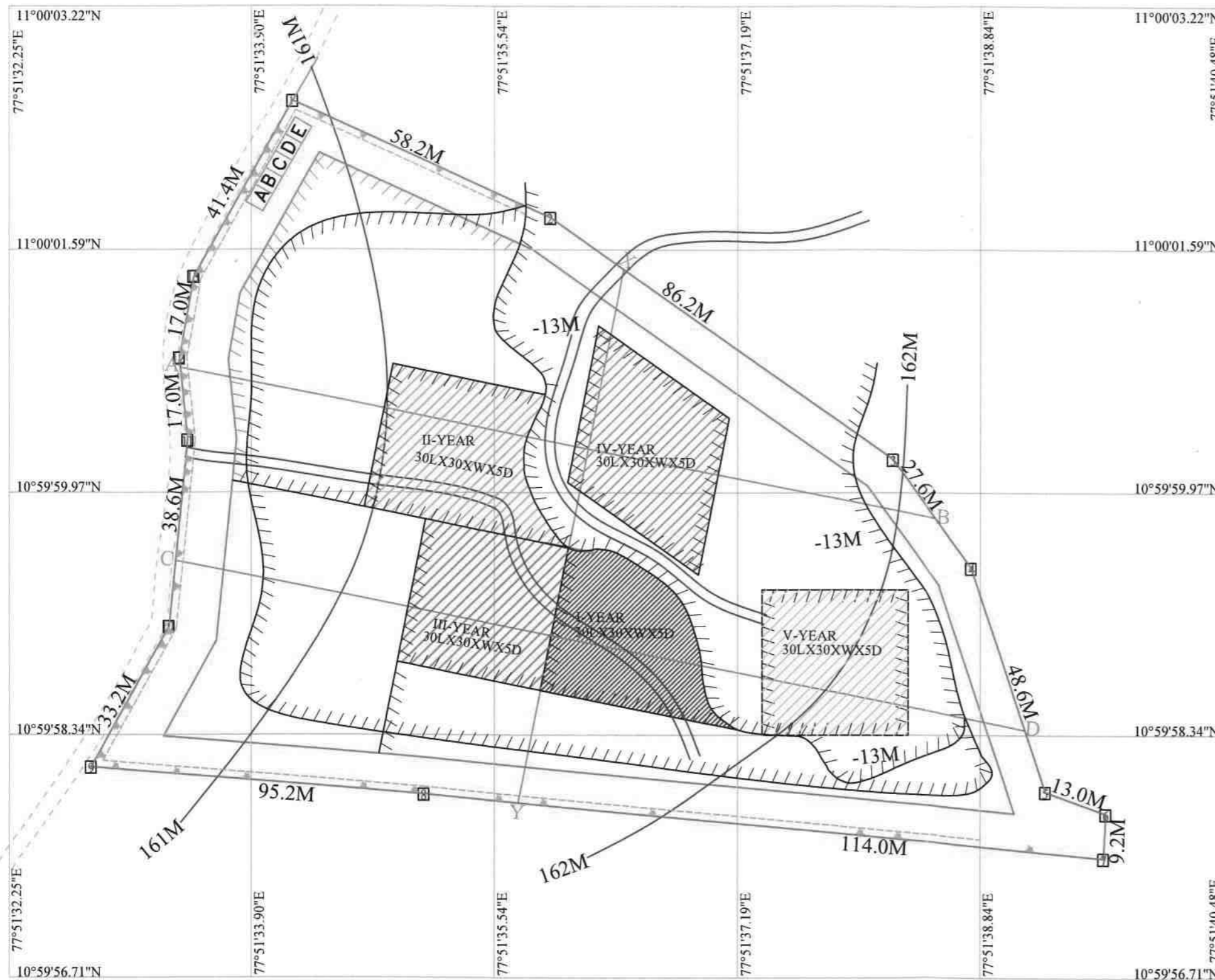
EXTENT : 1.88.00 Ha
S.F.NO : 75/1A,75/1B,&75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

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

A. Allimuthu

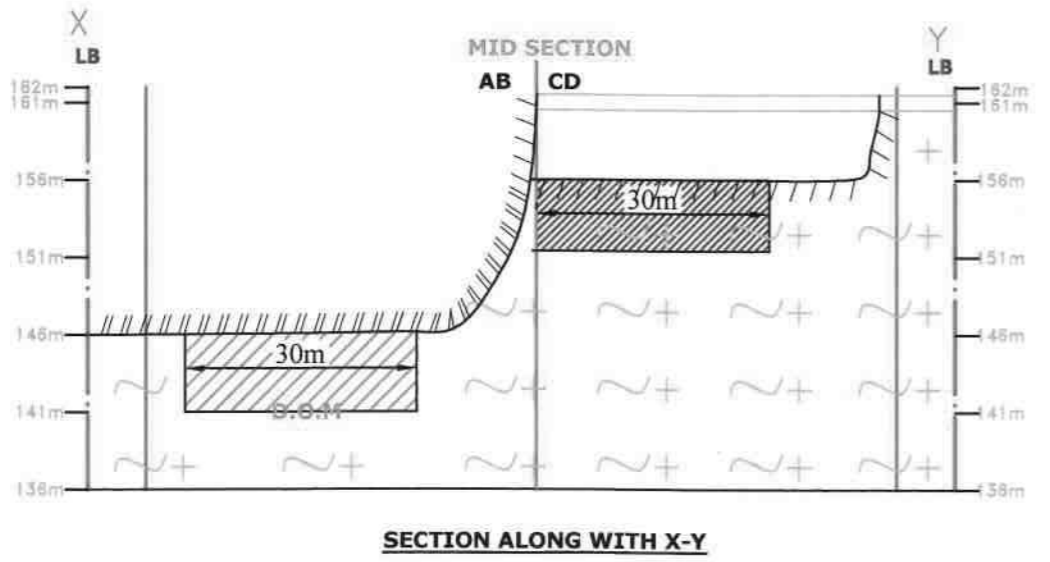
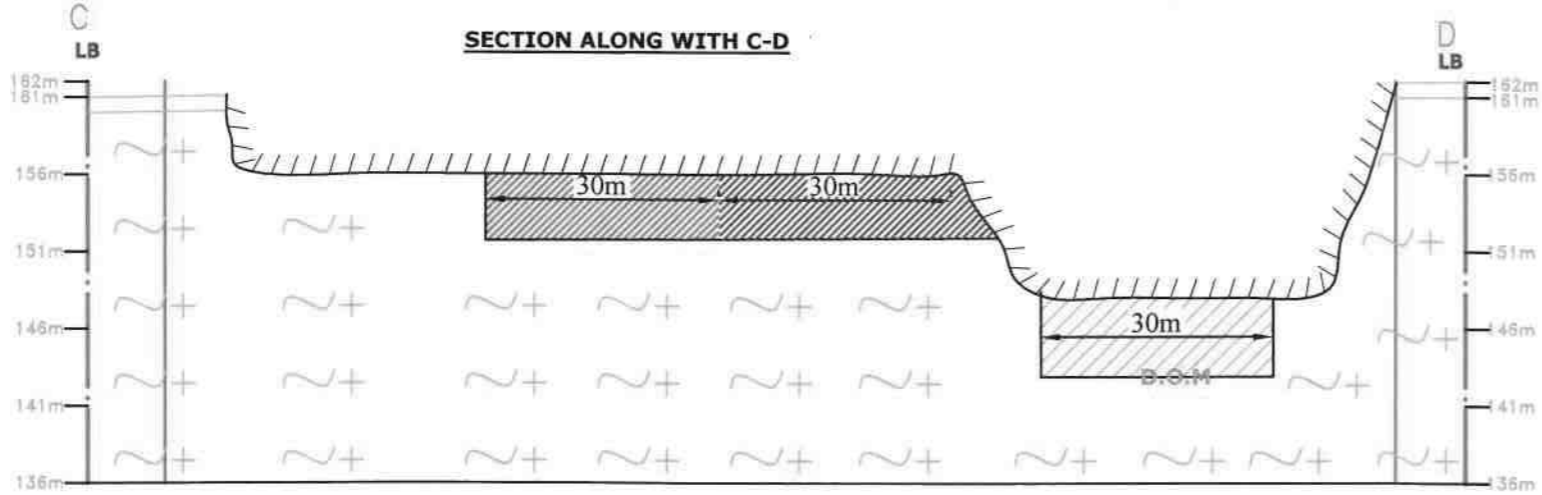
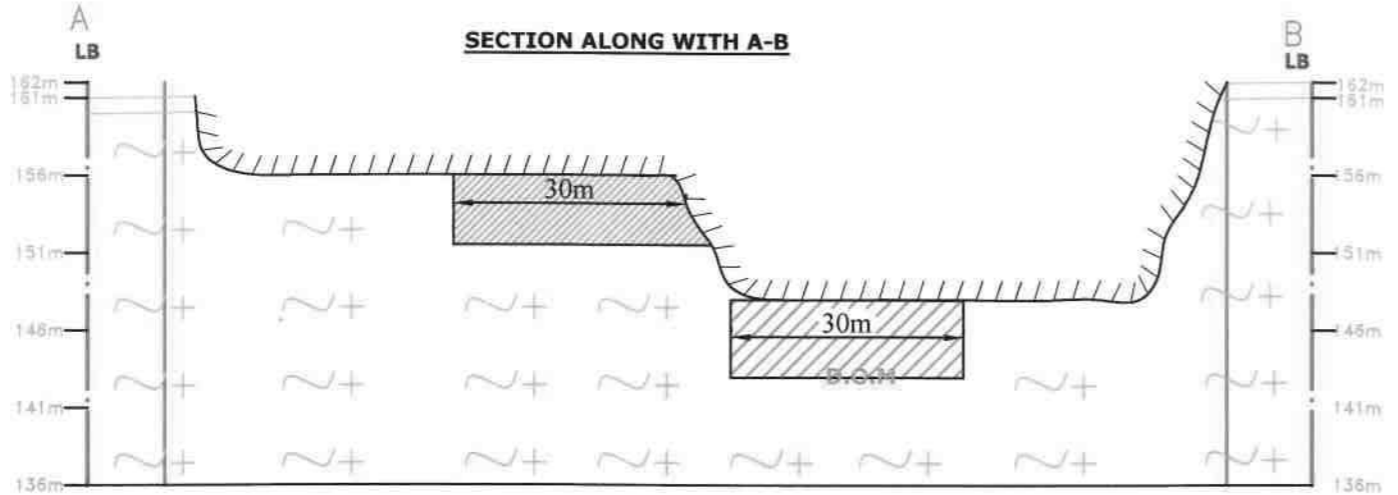
SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



YEARWISE DEVELOPMENT AND PRODUCTION

YEAR	BENCH	L(m)	W(m)	D(m)	VOL(M3)	RECOVERABLE @100%
I-YEAR	II	30	30	5	4500	4500
I-YEAR	II	30	30	5	4500	4500
I-YEAR	II	30	30	5	4500	4500
I-YEAR	V	30	30	5	4500	4500
I-YEAR	V	30	30	5	4500	4500
TOTAL					22500	22500

I-YEAR	PROPOSED	
II-YEAR	PROPOSED	
III-YEAR	PROPOSED	
IV-YEAR	PROPOSED	
V-YEAR	PROPOSED	



YEARWISE DEVELOPMENT AND PRODUCTION						
YEAR	BENCH	L(m)	W(m)	D(m)	VOL(M3)	RECOVERABLE @100%
I-YEAR	II	30	30	5	4500	4500
I-YEAR	II	30	30	5	4500	4500
I-YEAR	II	30	30	5	4500	4500
I-YEAR	V	30	30	5	4500	4500
I-YEAR	V	30	30	5	4500	4500
TOTAL					22500	22500

**CROSS SECTION OF
YEARWISE DEVELOPMENT
PLAN**
SECTION: HOR-1:1000
VER-1:500

APPLICANT:
Mrs.V.KAVITHA,
W/o.Mr.VADIVEL,
No.8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.639111

- INDEX**
- Q.L.BOUNDARY
 - 7.5m&10mSAFETY DISTANCE
 - ROUGH STONE
 - GRAVEL
 - DEPTH OF MINING
 - ULTIMATE PIT SLOP
 - I-ST YEAR PRODUCTION
 - II-ND YEAR PRODUCTION
 - III-RD YEAR PRODUCTION
 - IV-TH YEAR PRODUCTION
 - V-TH YEAR PRODUCTION

LOCATION OF MINE

EXTENT : 1.88.00 Ha
S.F.NO : 75/1A,75/1B,&75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

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

A. Allimuthu
SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022

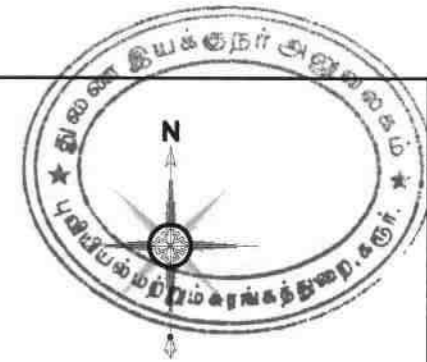


PLATE NO:V

MINE LAYOUT & LAND USE PLAN

SCALE : 1:1000

APPLICANT:

Mrs. V. KAVITHA,
W/o. Mr. VADIVEL,
No. 8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT. 639111

INDEX

- Q.L. BOUNDARY
- 7.5m & 10M SAFETY DISTANCE
- APPROACH ROAD
- BOUNDARY PILLARS
- TRESS
- EARTH BUND
- I-V-YEAR EXCAVATION
- FENCING
- ULTIMATE SLOP
- CONTOUR

LOCATION OF MINE

EXTENT : 1.88.00 Ha
S.F.NO : 75/1A, 75/1B, & 75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

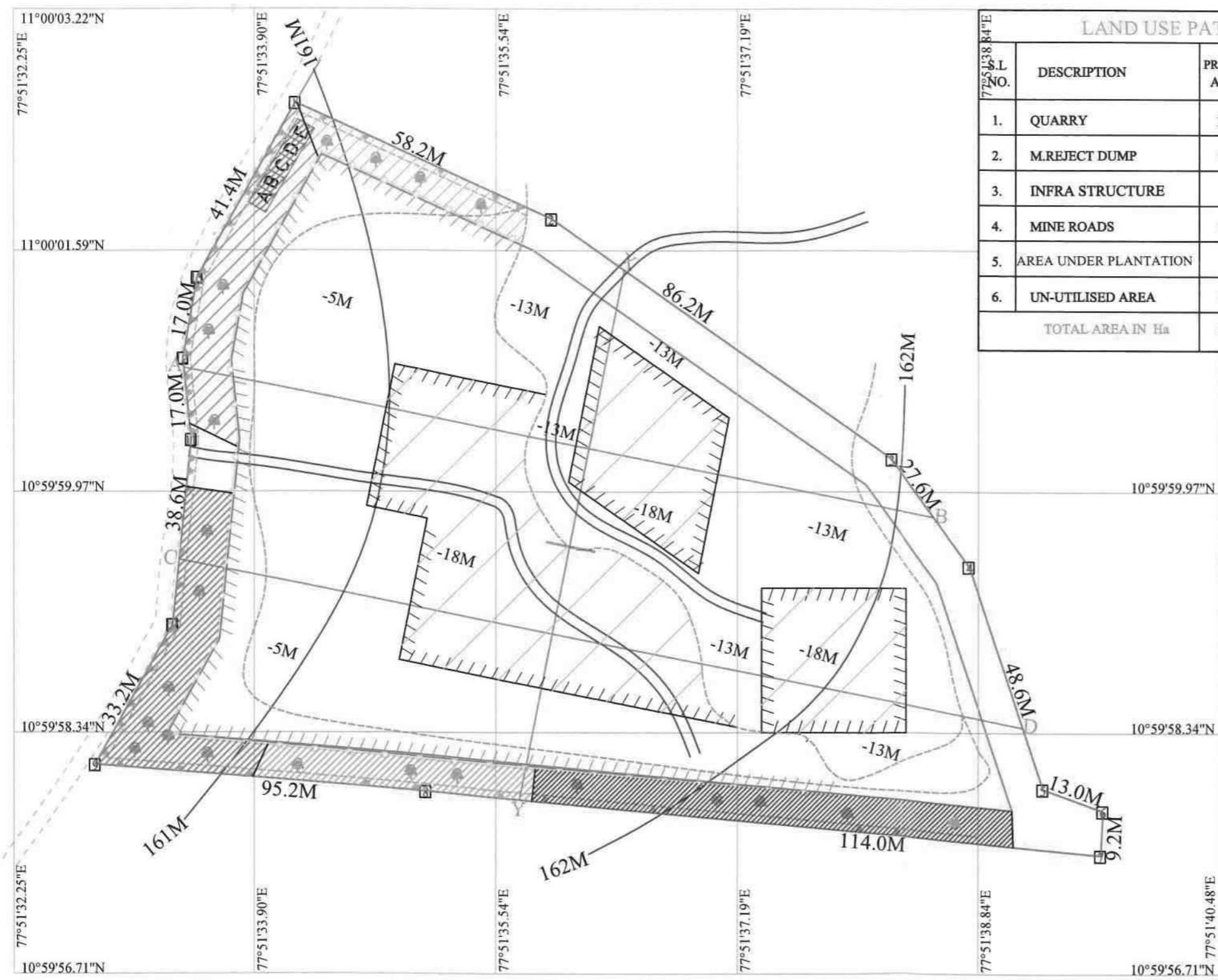
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CORRECT TO THE BEST OF MY KNOWLEDGE

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022

LAND USE PATTERN TABLE				
S.L. NO.	DESCRIPTION	PRESENT AREA	AREA TO BE ADDED FOR REQUIRED DURING THIS PERIOD	COLOR
1.	QUARRY	1.33.00	0.46.50	
2.	M.REJECT DUMP	0.10.0	0.10.0	
3.	INFRA STRUCTURE	NIL	0.02.00	
4.	MINE ROADS	0.03.0	0.04.00	
5.	AREA UNDER PLANTATION	NIL	0.20.00	
6.	UN-UTILISED AREA	0.42.00	1.05.50	
TOTAL AREA IN Ha		1.88.00	1.88.00Ha	

I-YEAR	PLANTATION	
II-YEAR	PLANTATION	
III-YEAR	PLANTATION	
IV-YEAR	PLANTATION	
V-YEAR	PLANTATION	



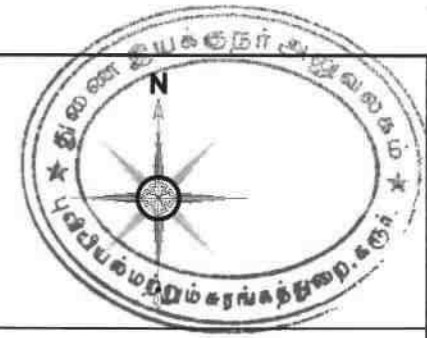


PLATE NO:VI-A

CONCEPTUAL/
MINE CLOSURE PLAN

SCALE : 1:1000

APPLICANT:

Mrs.V.KAVITHA,
W/o.Mr.VADIVEL,
No.8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.639111

INDEX

- Q.L.BOUNDARY
- 7.5&10m SAFETY DISTANCE
- APPROACH ROAD
- BOUNDARY PILLARS
- ROUGH STONE
- EARTH BUND
- TRESS
- FENCHING
- PIT LIMIT LIFE OF MINE
- CONTOUR

LOCATION OF MINE

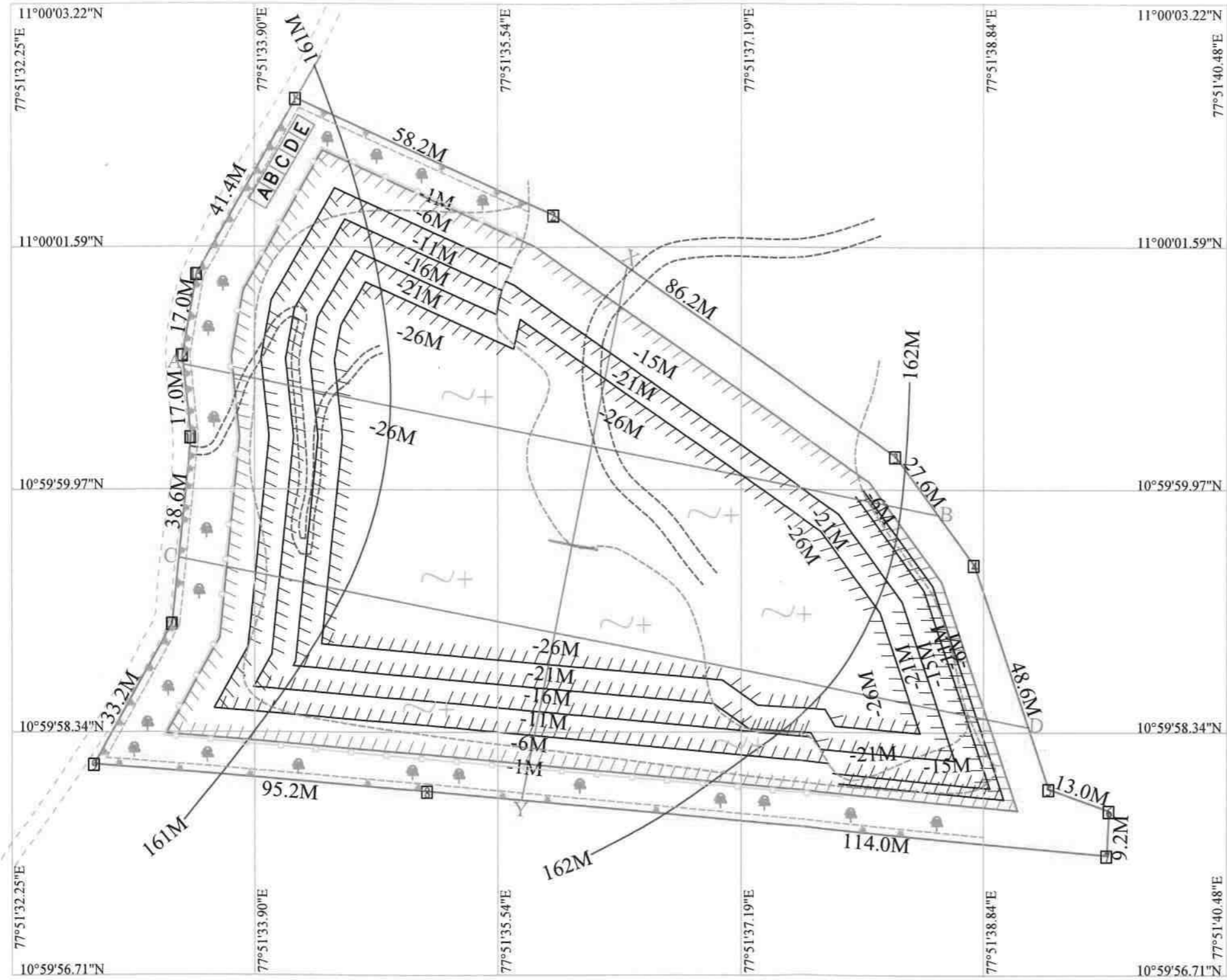
EXTENT : 1.88.00 Ha
S.F.NO : 75/1A,75/1B,&75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

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CORRECT TO THE BEST OF MY KNOWLEDGE

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022





**CROSS SECTION OF
MINE CLOSURE PLAN**

SECTION: HOR-1:1000
VER-1:500

APPLICANT:

Mrs.V.KAVITHA,
W/o.Mr.VADIVEL,
No.8/42, NOCHI KATTUR,
KUPPAM VILLAGE,
PUGALUR TALUK,
KARUR DISTRICT.639111

INDEX

- Q.L.BOUNDARY ———
- 7.5m&10 SAFETY DISTANCE ———
- GRAVEL VVVV
- ROUGH STONE ~+
- ULTIMATE PIT SLOP ┌┐
- DEPTH OF MINING D.O.M

LOCATION OF MINE

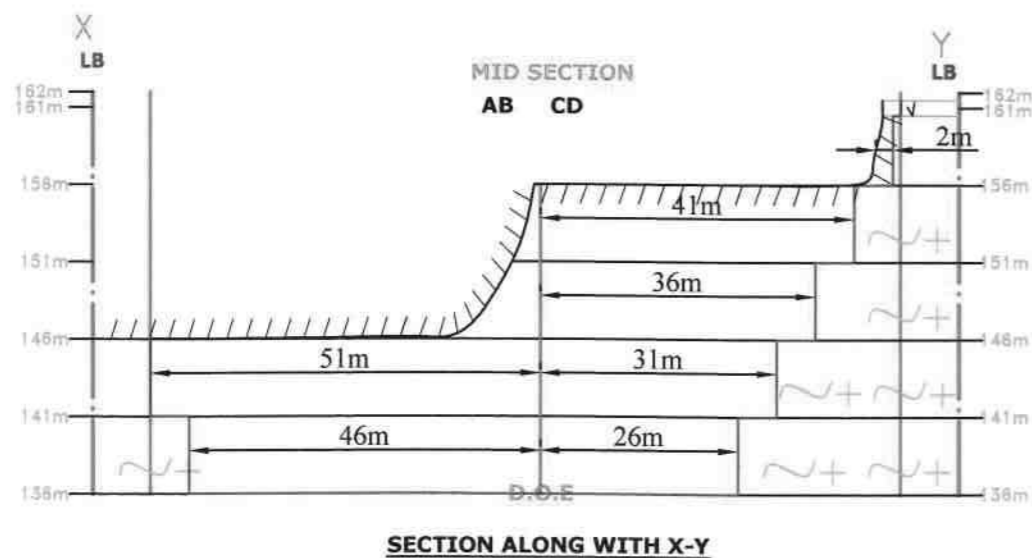
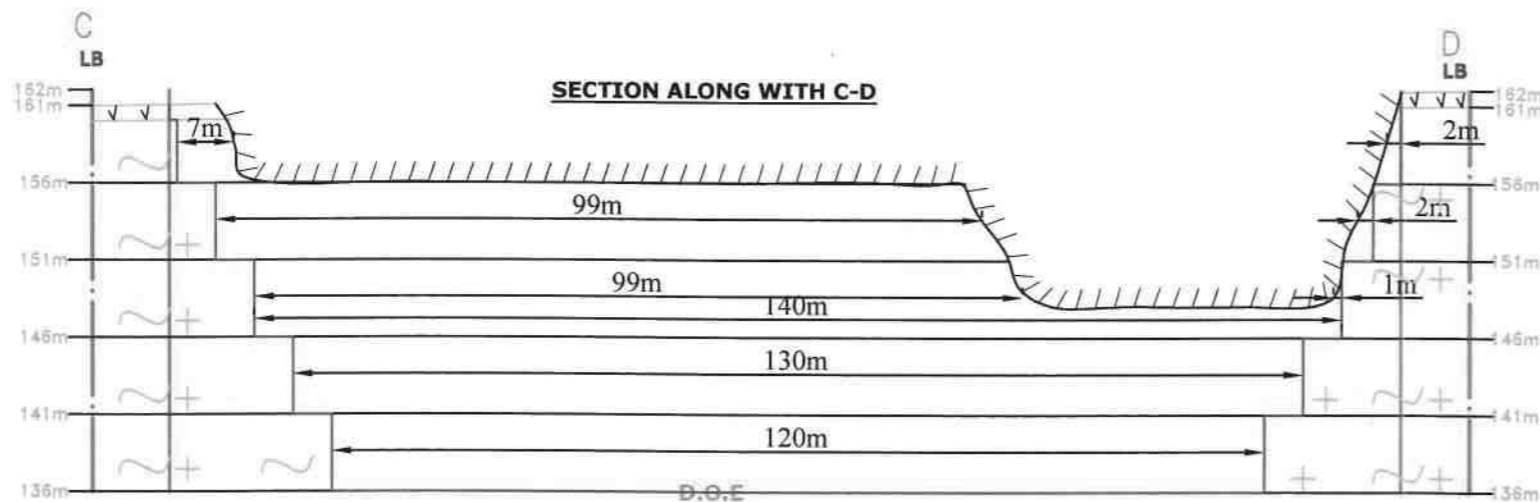
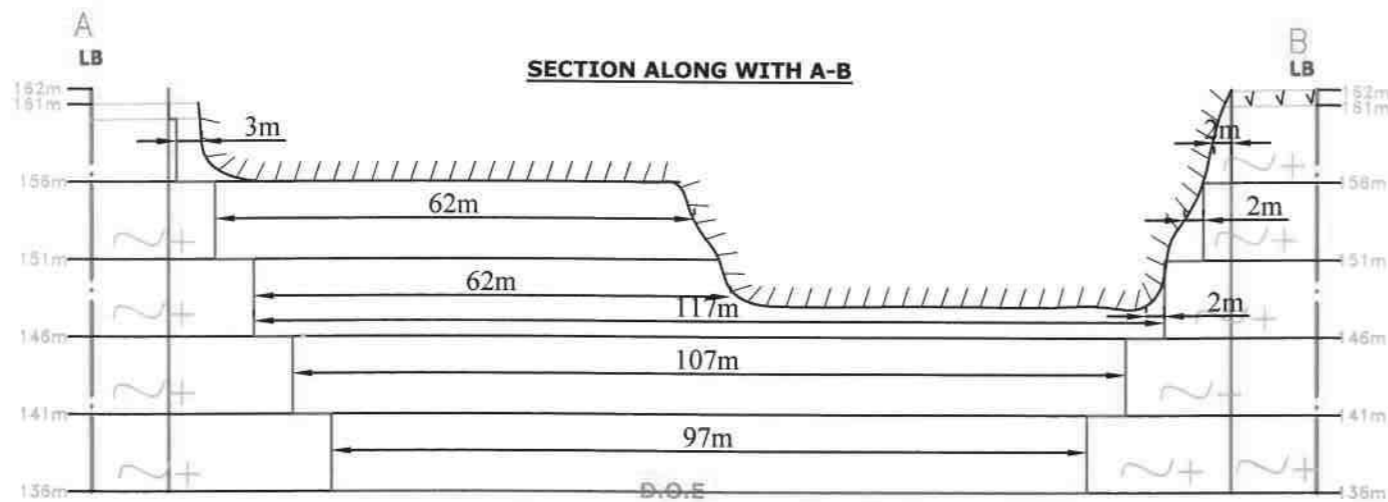
EXTENT : 1.88.00 Ha
S.F.NO : 75/1A,75/1B,&75/2,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

PREPARED BY:

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

A. Allimuthu

SHRI. A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



ROUGH STONE MINEABLE RESERVES						
SECTION	BENCH	L(m)	W(m)	D(m)	VOL(M3)	RECOVERABLE @100%
XY-AB	II	5	49	5	1225	1225
	III	64	44	5	14080	14080
	IV	64	39	3	7488	7488
	IV	117	39	2	9126	9126
	V	107	51	5	27285	27285
	VI	97	46	5	22310	22310
XY-CD	II	9	2	5	90	90
	III	101	41	5	20705	20705
	IV	100	36	3	10800	10800
	IV	140	36	2	10080	10080
	V	130	31	5	20150	20150
	VI	120	26	5	15600	15600
TOTAL					158939	158939

ந.க.எண்.3283/2022 வ

மாவட்ட வன அலுவலகம்,
கரூர் வனக்கோட்டம்,
கரூர்.
நாள்.30.09.2022

பொருள் : கனிமம் - கல்குவாரி - கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமத்தில் உள்ள கல்குவாரிக்கும் காப்புக்காடு பகுதிக்கும் இடைப்பட்ட தூர விபரங்களை தெரிவித்தல் - தொடர்பாக.

- பார்வை :**
1. திருமதி.வ.கவிதா, க/பெ.வடிவேல், கரூர் கடித எண்.இல்லை நாள்.27.09.2022
 2. வனச்சரக அலுவலர், கரூர் வனச்சரகம் கடித எண்.143/2022 நாள்.28.09.2022

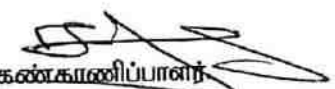
பார்வை 1-ல் காணும் கடிதத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராம புல எண்கள்.75/1A (0.49.50 எக்டேர்), 75/1B (0.47.50 எக்டேர்) மற்றும் 75/2 (0.91.00 எக்டேர்)-ல் மொத்தம் 1.88.00 எக்டேர் பரப்பளவில் திருமதி.வ.கவிதா, க/பெ.வடிவேல் என்பவரின் கல்குவாரியை அமைக்க மாநில சுற்றுச்சூழல் ஆணையத்திற்கு விண்ணப்பித்துள்ளதால், மேற்படி கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் உள்ள காப்புக்காடுகளின் விபரங்களை தெரிவிக்குமாறும் கோரப்பட்டது.

அதன்படி மேற்படி இடமானது கரூர் வனச்சரக அலுவலரால் களத்தணிக்கை செய்யப்பட்டு பார்வை 2-ல் கண்டவாறு சமர்ப்பித்த அறிக்கையின் படி கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராம புல எண்கள்.75/1A (0.49.50 எக்டேர்), 75/1B (0.47.50 எக்டேர்) மற்றும் 75/2 (0.91.00 எக்டேர்)-ல் மொத்தம் 1.88.00 எக்டேர் பரப்பளவில் திருமதி.வ.கவிதா, க/பெ.வடிவேல் என்பவரின் மூலம் அமைக்கப்படவுள்ள கல்குவாரியிலிருந்து 8.67 கிலோமீட்டர் தூரத்தில் தாதம்பாளையம் காப்புக்காடு அமைந்துள்ளது. மேலும் கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் பாதுகாக்கப்பட்ட வனப்பகுதி, புலிகள் காப்பகம் மற்றும் சரணாலயங்கள் ஏதுமில்லை என தெரிவிக்கப்படுகிறது.

ஓம்/- வி.ஏ.சரவணன்,
மாவட்ட வன அலுவலர்,
கரூர் வனக்கோட்டம்,
கரூர்.

பெறுநர்
திருமதி.வ.கவிதா,
க/பெ.வடிவேல்,
8/42, நொச்சிக்காட்டூர்,
குப்பம் கிராமம்,
புகளூர் வட்டம்,
கரூர் மாவட்டம்.

// உ.ந.உ.ப //


கண்காணிப்பாளர்
20.9.22

301 திருமதி



Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation

Geo Technical Mining Solutions

No-1/213-B, Ground Floor, Natesan Complex, Oddapatti,
Collectorate Post office, Dharmapuri, Tamil Nadu-636705

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Sl. No	Sector Description	Sector (as per)		Cat.
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1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IA AC Minutes dated January 29, 2021 on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/1674 dated March 30, 2021. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

Sr. Director, NABET
Dated: March 30, 2021

Certificate No.
NABET/EIA/2023/IA0067

Valid till
December 29, 2023

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