
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT & 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 = 9.16.0 ha
(2 Proposed + 2 Existing Quarries)**

THIRU.M. GUNASEKARAN ROUGH STONE AND GRAVEL QUARRY

At

S.F. Nos.710/3,712/2 Extent – 1.92.5 ha,

Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State.

Project Proponent

THIRU. M.GUNASEKARAN,

S/o Muthusamy,

No 3/37, Karaipalayam, Thirukkatuthurai,

Pugalur Taluk, Karur District,

Tamil Nadu State – 639 117

ToR obtained vide

Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/Dated: 10.02.2023

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS



Old No. 260-B, New No. 17,

Advaitha Ashram Road, Alagapuram,

Salem – 636 004, Tamil Nadu, India



Accredited for sector 1 Category ‘A’, 31 & 38 Category ‘B’

Certificate No: NABET/EIA/2225/RA 0276

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Environmental Lab

EHS 360 LABS PRIVATE LIMITED,

10/2 Ground floor, 50th street, 7th Avenue,

Ashok Nagar, Chennai – 600 083.

Baseline Monitoring Period – MARCH -MAY 2023

JUNE 2023

For easy representation of Proposed and Existing in the Cluster are given unique codes and identifies and studied in this EIA/EMP Report.

PROPOSED QUARRIES				
Code	Name of the Owner	S.F. Nos	Extent (ha)	Status
P1	THIRU. M.GUNASEKARAN, S/o Muthusamy, No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District, Tamil Nadu State – 639 117	710/3,712/2	1.92.50	TOR Obtained: Lr.No. SEIAA- TN/F.No.9576/SEAC/ToR- 1353/Dated: 10.02.2023
Nearby Proposed Quarry				
P2	M/s Annai Blue Metals, S.F.No.451, Kaalipalayam, Kuppam Village, Pugalur Taluk, karur District.	682(P)	1.92.0	TOR Obtained: Lr No.SEIAA- TN/F.No.8693/SEACIToR- 1 0771202 I Dated : 01.03.2022
TOTAL			3.84.5 ha	
EXISTING QUARRIES				
Code	Name of the Owner	S.F. No	Extent (ha)	Status
E1	Tmt. S. Tamilselvi, W/o. Sapapathi, Ganesa Nagar, 1 st Street Enam Karur, Karur Taluk & District.	706 (P)	3.36.0	18.08.2017 To 17.08.2022
E2	Thiru S.K. Krishnamurthy, 1/22 Kavadikaranur, Thangayur village, Edapati Taluk, Karur District.	679,680/1 (P)	1.95.5	04.07.2018 to 03.07.2023
TOTAL			5.31.5 ha	
TOTAL CLUSTER EXTENT			9.16.0 ha	

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

As per above notification S.O.2269(E) dated: 01.07.2016 in para (b) in Appendix XI, - (ii) (5): The lease not operative for three years or more and leases which have got environmental clearance as on 15th January, 2016 shall not be counted for calculating the area of cluster, but shall be included in the Environment Management Plan and the Regional Environmental Management Plan”

TERMS OF REFERENCE (ToR) COMPLIANCE

THIRU. M.GUNASEKARAN,

“ToR_issued_vide_Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/Dated: 10.02.2023”

SPECIFIC CONDITIONS		
1	The project proponent shall submit a certified compliance report for the EC obtained earlier along with the EIA report.	Noted and agreed
2	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m shall be enumerated with details such as dwelling houses with number of occupants' places of worship' industries, factories, sheds, etc and implications of the quarrying operations on it.	Noted and agreed
3	The proponent shall furnish photographs of adequate fencing installed, green belt developed along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Noted and agreed
4	The proponent shall also furnish details/photographs of the garland drains provided.	Noted and agreed
5	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director of Geology and Mining during the time of appraisal for obtaining the EC.	Noted and agreed
6	The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	Noted and agreed
7	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/Ist Class mines manager appointed by the proponent	Noted and agreed
8	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Noted and agreed
9	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 else where in the State with video and photographic evidences.	Noted and agreed
10	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the	The Quarry lease was previously operated in favour of Thiru M.Gunasekaran over an

	<p>proponent shall furnish the following details from AD/DD mines,</p> <p>a) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?</p> <p>b) Quantity of minerals mined out.</p> <p>c) Highest production achieved in any one year</p> <p>d) Derail of approved depth of mining.</p> <p>e) Actual depth of the mining achieved earlier.</p> <p>t) Name of the person already mined in that leases area.</p> <p>g) If EC and CTO already obtained, the copy of the same shall be submitted.</p> <p>h) Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</p>	<p>extent:4.96.5 ha of patta land in S.F.Nos.710/2,710/3 & 712/2 of kuppam village,Pugalur taluk, Karur district.</p> <p>Existing pit dimensions: 90m(L)*63m(W)*3m(D)</p> <p>Lease period - 05.07.2016 to 04.07.2021</p> <p>EC: Lr No SEIAA, TN/F.No.3718/1(a)/E.C.No.3087/2015 Dated 02.03.2015</p>
11	All corner coordinates of the mine lease area, superimposed on a high-resolution Imagery/Toposheet, 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 area).	Noted and agreed
12	The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc	Noted and agreed
13	The PP shall furnish the revised manpower including the statutory & competent persons as required under the provisions of the MMR 1961 for the proposed quarry' based on the volume of rock handled & area of excavation.	Noted and agreed
14	The Project proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology justifications, with the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	Detailed explained in chapter-4
15	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.	Detailed explained in chapter-6
16	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. Based on actual monitored data' it may clearly be	Detailed explained in chapter-3

	shown whether working will intersect groundwater' Necessary data and documentation in this regard may be Provided.	
17	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quantity' air quality' soil quality & flora/fauna including traffic/vehicular movement study	Detailed explained in chapter-3 & 2
18	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.	The Cumulative impact study due to mining operations is explained in chapter – 7
19	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Noted and agreed
20	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 pre operational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3.
21	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
22	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
23	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.	Mine Closure in Chapter -2
24	Impact on local transport infrastructure due to the Project should be indicated.	Transportation details mentioned in Chapter -2
25	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.	Details of the trees in the buffer zone given in Chapter No.3.
26	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Mine closure plan is detailed in Chapter:4.
27	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	Noted and agreed

	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.	
28	The Public hearing advertisement shall be published in one major National daily and onmost circulated vernacular daily.	Public hearing advertisement will be made as per the ToR Recommendations
29	The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing io Tamil Language also.	Noted and agreed
30	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.	Noted and agreed
31	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 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 altemating with shrubs should be planted io a mixed manner.	Species are proposed to plant in the safety barrier as mentioned in the ToR appendix. Proposed species are given in the Chapter No 4
32	Taller/one year old Saplings raised in appropriate size of bags; preferably eco-friendly bags should be planted in proper espacement 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.	Noted & agreed. It is proposed to plant 1200 nos of trees in the 7.5m safety barrier and approach roads
33	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Disaster management Plan details in Chapter-7
34	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.	A Risk Assessment and management Plan Chapter- 7
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 chapter- 10
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed lemedial measures should be detailed along with budgetary allocations.	It is explained in Chapter -3
37	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.	Details are listed in Chapter:3.

38	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
39	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.	Noted and agreed
40	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	It is an Existing lease
41	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.	Noted and agreed
42	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 Reference besides attracting penal provisions in the Environment (Protection) Act, 1986.	Noted and agreed
ADDITIONAL CONDITIONS-Annexure-B		
<i>Cluster Management committee</i>		
1.	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	Details in 7 salient features of quarry with existing 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..	Noted & agreed
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.	Noted & agreed
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.	Transport details in chapter-2
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	Noted & agreed
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.	Noted & agreed
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.	Noted & agreed

8	The committee shall furnish the Emergency Management plan within the cluster.	Details discussed in chapter 7.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	Details discussed in chapter 10.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Noted & agreed
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	Detailed discussed in chapter 7.
Impact study of mining		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following a) Soil health & bio-diversity, physical land chemical features. b) Climate change leading to Droughts, Floods etc. c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature' & Livelihood of the local people. d) Possibilities of water contamination and impact on aquatic ecosystem health' e) Agriculture, Forestry & Traditional practices. 1) 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.	Species Recommended for Plantation in chapter 3&10.
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining Area.	Detailed discussed in chapter 4.
14	Impact on soil flora & vegetation around the project site.	Detailed discussed in chapter 4.
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall be committed mentioned in EMP.	Details in Chapter 2,3 and 7
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	Details in Chapter 3
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	Noted & agreed
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands. Horticulture, Agriculture and livestock.	The project area is bounded by Existing quarries on the East and west side . Proponent proposed to erect green mesh along with fencing on the South side besides, Budgetary allocation given in the Chapter No. 10.
Forest		

19	The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	Noted and agreed, there is no reserve forest and wildlife in the buffer zone.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	Ecology and Biodiversity environment deals in Chapter-3
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	Ecology and Biodiversity environment deals in Chapter-3
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Anticipated Environment Impact and Mitigation measures are detailed in Chapter No.4
	<i>Water Environment</i>	
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	Hydro-geological study considering the contour map of the water table detailing Chapter-3
24	Erosion Control measures.	Noted & agreed
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, water-bodies/ Rivers. & any ecological fragile areas.	Details in Chapter 2
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Details in Chapter 2 and 4 impact of bio diversity
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment by the activities.	Noted & agreed
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	Noted & agreed. Detailed under Chapter 3.
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil, physical, chemical components and microbial components.	Details in Chapter 3 soil environment.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	Nearest agriculture activity is coconut plantation located North side of the project area. Proponent erected fencing in the previous lease period. The same will be reconstructed around the quarry pits
<i>Energy</i>		
31	The measures taken to control Noise. Air, Water. Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	Details in Chapter 3 environmental monitoring details.

Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	Details of carbon emission and mitigation activities are given in the Chapter No.4
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	Details in Chapter-3 for meteorological and climate/weather data representation of graphs.
Mine Closure Plan		
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Details in Chapter 2 mine closure plan
EMP		
35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Detailed under Chapter 10
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	Details in Green belt development in chapter 4
Disaster Management Plan		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/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.	Details study 7.3 Disaster Management Plan in Chapter -7
Others		
39	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations. schools. Archaeological sites. Structures. railway lines, roads. Water bodies such as streams, oday, vaari, canal, channel. river, lake pond, tank etc.	Noted & agreed. Detailed under Chapter 4
40	As per the MoEF & CC office memorandum tr.No.22-651201 7-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.	Noted and agreed
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	Details of carbon emission and mitigation activities are given in the Chapter No.4
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. The project is Not a violation category. This proposal falls under B1 Category (Cluster situation)
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Document is enclosed along with Approved Mining Plan as Annexure Volume 1 for the respective projects.
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	Noted & agreed.

	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/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).	Satellite imagery of the project area along with boundary co-ordinates is given in the Chapter No 1 Figure No .1.1 Geomorphology of the area is given in Chapter No 2 Figure No 2.10. Land use pattern of the project area is tabulated in the Chapter No.2. Table No.2.3 Land use pattern of the Study area is tabulated in the Chapter No.3 Table No 3.2
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Map showing – Geology map of the project area covering 10km radius - Figure No. 2.11. Geomorphology of the area is given in Chapter No 2 Figure No 2.10.
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 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 their Environmental Policy and the same is discussed in the Chapter No 10.1.
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an opencast quarrying operation proposed to operate in Mechanized 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 under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	Noted & agreed. The study area considered for this study is 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.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3.

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	Not Applicable. There is no waste anticipated during this quarry operation. The entire quarried out rough stone will be transported to the needy customers. No Dumps is proposed outside the lease area.
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Not Applicable. There is no Forest Land involved in the proposed project area. The proposed project area is a government land. Approved Mining Plan is enclosed as Annexure Volume 1.
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not Applicable. 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.
15	The vegetation in the RF/PF areas in the study area, with necessary details, should be given.	No Reserve Forest within the Study Area.
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.	Not Applicable. There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
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	Not Applicable. There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
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.	Detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and discussed under Chapter No. 3. There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Detailed in Chapter No. 3.

19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable. The project doesn't attract The C. R. Z. Notification, 2018.
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	Not Applicable. There are no approved habitations within a radius of 300 meters. Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project.
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	Baseline Data were collected for One Season March - May 2023 (Summer Season) as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3.
23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view 9.6.1 Model. Details in Chapter No. 4.
24	The water requirement for the Project, its	Total Water Requirement for this project is given in the

	availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	chapter No 2, Table No 2.13.
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water for dust suppression, greenbelt development and domestic use will be obtained from accumulated rainwater/seepage water in mines pits. Drinking water will be sourced from the approved water vendors, No 2, Table No 2.13.
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.	The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression.
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 Quality discussed in Chapter No. 4.
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.	The ground water table is at 69-65m below ground level. In these projects, ultimate depth is 37m Maximum from the general ground profile. It is inferred the quarrying activities in the Cumulative EIA project (Quarry) will not intersect the Ground water table.
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.	Highest elevation of the project area is 179m AMSL Ultimate depth of the mine is 37m AMSL Water level in the area is 69m BGL to 65m BGL
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.	Progressive greenbelt development plan has been prepared and discussed along with Recommended Species details are given in the Chapter 4, Table No.4.12
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.	Traffic density survey was carried out to analyse the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no much significant impact due to the proposed transportation from the project area. Details in Chapter 2.
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	Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2.

	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.	Discussed in chapter No 2.
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.	Details in Chapter 10.
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 impact and details of the medical examination to the workers given in the Details in Chapter 10.
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.	Details in Chapter No. 4
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.	Details of Socio Economic is given in the Chapter No 3.
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.	Environment Management Plan Chapter 10.
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.	Public hearing points and commitment of the project proponent 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 given in the Chpater No 2, Table No 2.15.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Detailed under Chapter 7
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.	Total Water Requirement for this project is given in the chapter No 2, Table No 2.13.
44	Besides the above, the below mentioned general points are also to be followed: -	
A	Executive Summary of the EIA/EMP Report	Encloses as separate volume
B	All documents to be properly referenced with index and continuous page numbering.	All the documents are 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 are given properly.
D	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC / NABL accredited	Copy of Baseline monitoring reports are enclosed with this draft as annexure

	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.	Not Applicable.
F	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Questionnaire of the project will be submitted in final EIA report after complying the public hearing points.
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 are 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	There is no changes in Form-I, Mining plan and Pre-feasibility report for all the projects.
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.	Not applicable.
J	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Satellite imagery of the project area along with boundary co ordinates is given in the Chapter No 1 Figure No .1.1 Geomorphology of the area is given in Chapter No 2 Figure No 2.10.

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1. INTRODUCTION

1.0 PREAMBLE

Environmental Impact Assessment (EIA) is the management tool to ensure the sustainable development and it is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for any project. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are taken into account during the project designing. It also reduces conflicts by promoting community participation, information, decision makers, and helps in developing the base for environmentally sound project.

Rough Stone & Gravel is the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of M. Gunasekaran Rough Stone & Gravel Quarries Cluster consisting of 2 Proposed and 2 Existing Quarries with total extent of Cluster of 9.16.0 ha in Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State., cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained vide –

☞ Lr. No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/ Dated:10.02.2023 for Proposed Lease area;

The Baseline Monitoring study has been carried out during the period of **March to May 2023** and this EIA /EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) individually to minimize those adverse impacts.

1.1 PURPOSE OF THE REPORT

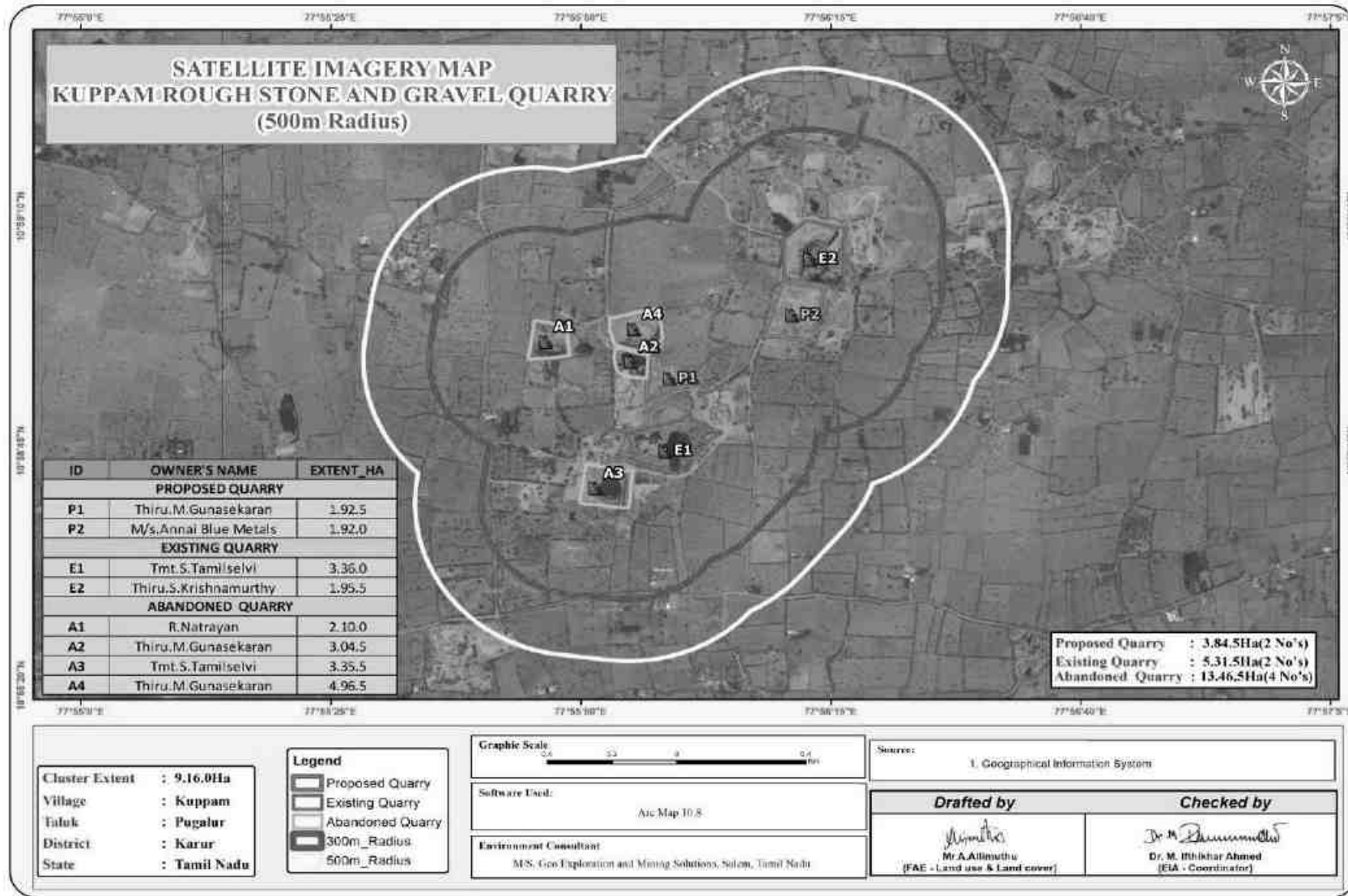
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14th August 2018, Mining Projects are classified under two categories i.e., A (> 100 Ha) and B (\leq 100 Ha), and Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation in Appendix–XI.

Now, as per 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 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed projects are categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance.

“Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”

FIGURE: 1.1 SATELLITE IMAGERY CLUSTER QUARRIES



1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

1.2.1 Identification of Project

TABLE 1.1: SALIENT FEATURES OF THE PROPOSED PROJECTS

PROPOSAL	
Name of the Project	Thiru. M.Gunasekaran Rough stone and Gravel Quarry
S.F. No.	710/3 and 712/2
Extent	1.92.5 ha
Land Type	Patta Land
Village Taluk and District	Kuppam Village, Pugalur Taluk, Karur District

Source: Approved Mining Plan.

1.2.2 Identification of Project PropONENT

TABLE 1.2: DETAILS OF PROJECT PROPONENT

PROPOSAL	
Name of the PropONENT	Thiru. M.Gunasekaran
Address	No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District
Mobile	+91 97879 11811
Status	Proprietor

Source: Approved Mining Plan.

1.3 BRIEF DESCRIPTION OF THE PROJECT

1.3.1 Nature and Size of the Project

The quarrying operation is proposed to be carried out by Opencast Mechanized Mining method with 5.0m bench height and 5.0m bench width by deploying Jack Hammer Drilling & Slurry Explosive during blasting. Hydraulic Excavator and tippers are used for Loading and transportation. Rock Breakers are deployed to avoid secondary blasting.

TABLE 1.3: BRIEF DESCRIPTION OF THE PROJECT

Name of the Quarry	Thiru. M.Gunasekaran Rough Stone & Gravel Quarry	
Toposheet No	58 - F/13	
Latitude between	10°58'49.04"N to 10°58'55.76"N	
Longitude between	77°55'56.49"E to 77°56'02.53"E	
Highest Elevation	179m AMSL	
Proposed Depth of Mining	37m (2m Gravel + 35m Rough Stone)	
Geological Resources	Rough Stone in m ³	Gravel m ³
	7,24,430	29,112
Mineable Reserves	Rough Stone in m ³	Gravel m ³
	1,60,982	11,446
Yearwise production for five years	Rough Stone in m ³	Gravel m ³
	1,40,607	11,446
Ultimate Pit Dimension	170m (L) * 114 m (W) * 37m (D)	
Water Level in the surrounds area	The Water table is found at a depth of 69m in summer and at 65m in rainy seasons.	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards North East side. The altitude of the area is 179m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation. Massive Charnockite which is clearly inferred from the existing quarry pits.	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	

Proposed Manpower Deployment	20 Nos	
Project Cost	Rs.47,30,000/-	
CER Cost	Rs.5,00,000	
Nearest water Bodies	Thathampalayam Lake	8.5Km SE
	Odai	7Km SE
	Odai	6Km NW
	Kaveri Rver	9Km N
Greenbelt Development Plan	Proposed to plant 1200 trees in Safety Zone, approach road and Village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	640m -North	

Source: Approved Mining Plan

1.3.2 Location of the Project

- Proposed quarry projects fall in Kuppam Village, Pugaur Taluk, Karur District, Tamil Nadu State.
- The entire quarry lease area falls in the Patta land, the lease applied area is exhibits plain terrain.
- The Altitude of the area is **179m** (Maximum) AMSL
- The area is mentioned in GSI Topo sheet No. 58 - F/13
- The Latitude between of **10°58'49.04"N to 10°58'55.76"N**
- The Longitude between of **77°55'56.49"E to 77°56'02.53"E** on WGS 1984 datum

FIGURE: 1.2 KEY MAP SHOWING THE LOCATION KEY MAP

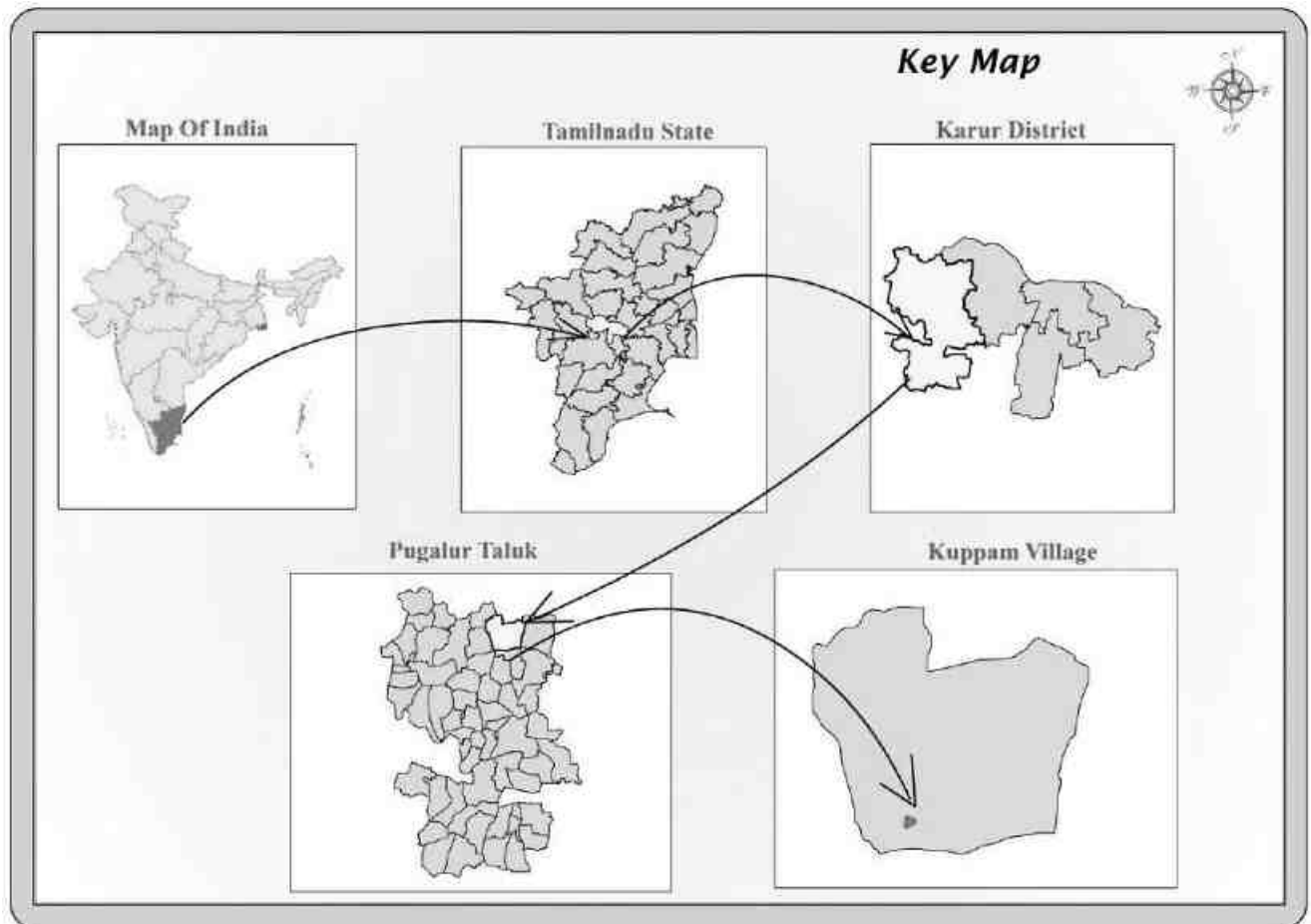


FIGURE 1.3: TOPOSHEET MAP OF THE STUDY AREA 10 KM RADIUS

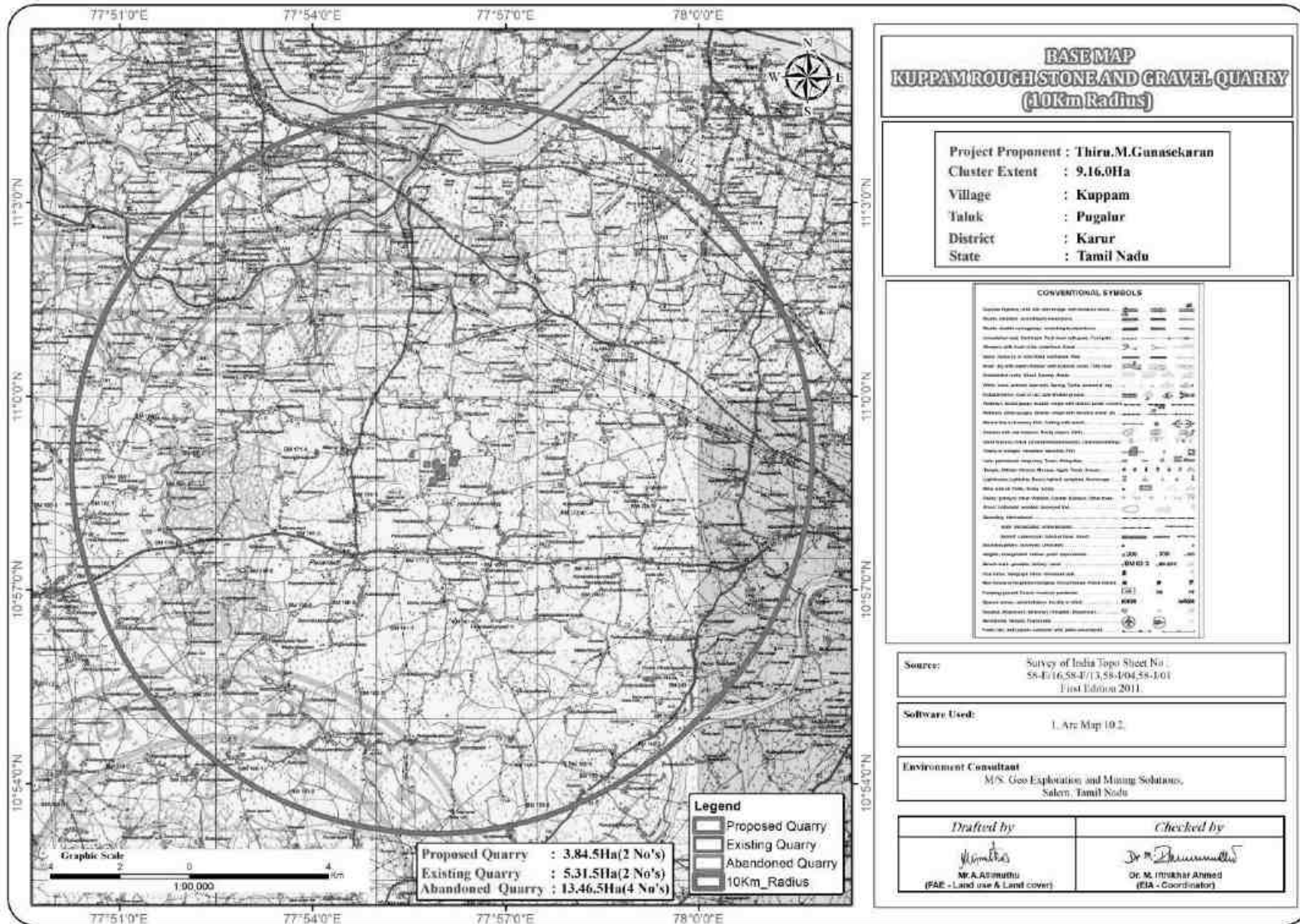
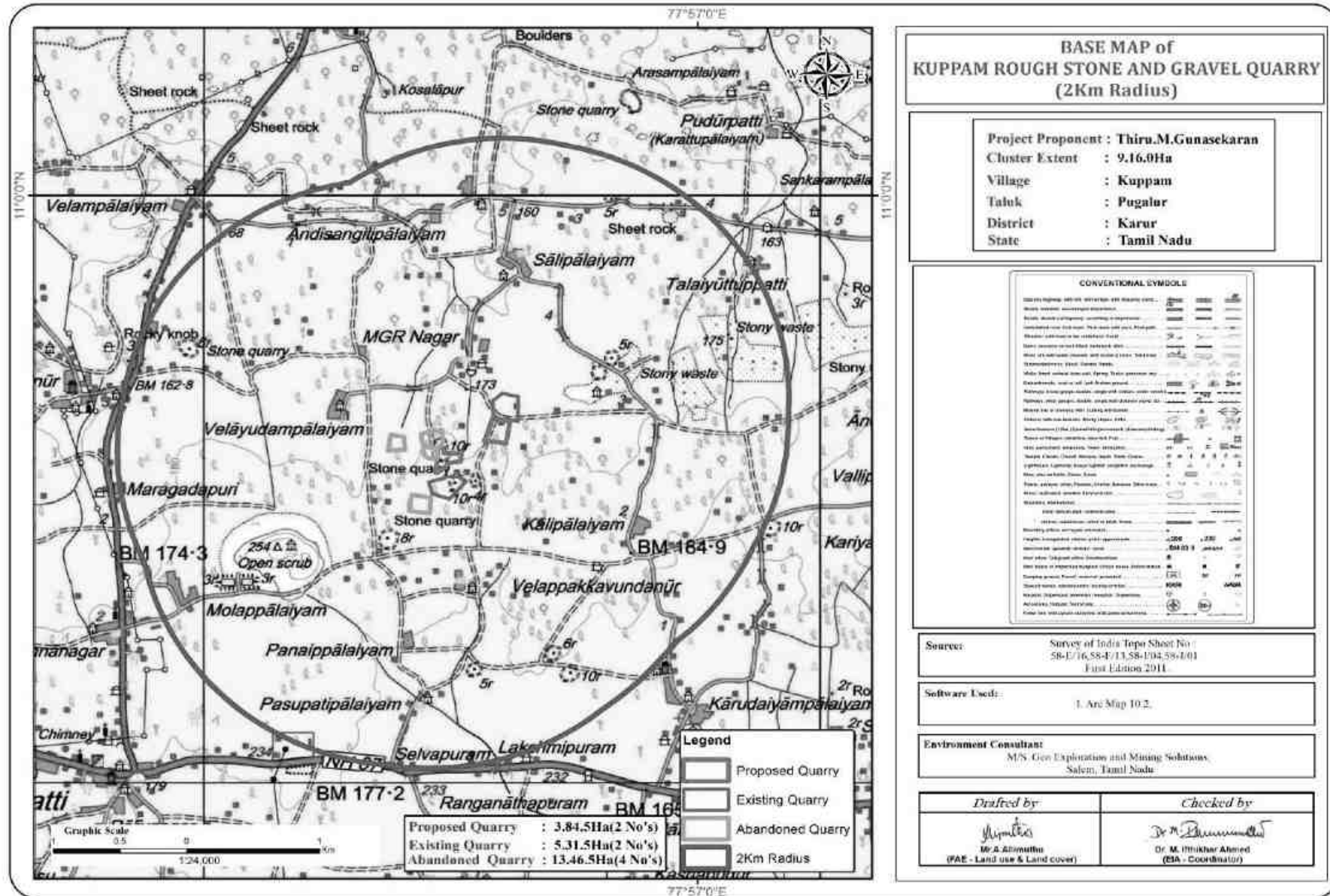


FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2 KM



1.4 ENVIRONMENTAL CLEARANCE

The Environmental Clearance process for the project will comprise of four stages. These stages in sequential order are given below: -

1. Screening,
2. Scoping
3. Public consultation &
4. Appraisal

SCREENING –

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: **23.07.2021**
- Precise Area Communication Letter was issued by the District Collector, Karur **Rc.No.297/Mines/2021, Dated: 04.03.2022**
- The Mining Plan was prepared by Recognized Qualified Person and approved by Deputy Director, Geology and Mining, Karur District, vide **Rc.No.297/Mines/2021, Dated: 27.05.2022.**
- The proposed project falls under “B1” Category as per 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
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/404784/2022, Dated: 03.11.2022

SCOPING –

- The proposal was placed in 346th SEAC meeting held on 12.01.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 591th SEIAA meeting held on 10.02.2023 and issued ToR vide Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/ Dated:10.02.2023

PUBLIC CONSULTATION –

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.

APPRAISAL

Appraisal is the detailed scrutiny by the State Expert Appraisal Committee (SEAC) of the application and other documents like the final EIA & EMP Report, outcome of the Public Consultations including Public Hearing Proceedings, submitted by the proponent to the regulatory authority concerned for grant of environmental clearance. 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, 14thSeptember, 2006
- Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/ Dated:10.02.2023.
- Approved Mining Plan.

1.5 TERMS OF REFERENCE (ToR)

Compliance to ToR issued vide –

- Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/ Dated:10.02.2023 for Proposal.

Are detailed in Page No. I – XLIX.

1.6 POST ENVIRONMENT CLEARANCE MONITORING

The proposed project proponent shall submit a half-yearly compliance report in respect of stipulated Environmental Clearance terms and conditions to MoEF & CC Regional Office & SEIAA after grant of EC on 1st June and 1st December of each calendar year as per MoEF & CC Notification S.O. 5845 (E) Dated: 26.11.2018.

1.7 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.

1.8 THE SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. 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, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the Post monsoon season (March to May 2023) for various environmental components so as 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.

TABLE 1.4: ENVIRONMENT ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	Continuous 24-hourly samples twice a week for three months at 8 locations (2 Core & 6 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 6 locations – 5 Ground water and 1 Surface water samples; once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was collected from the Forest department.
5	Noise levels	Noise levels in dB(A)	8 locations (2Core & 6 Buffer) – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations (1Core & 5 Buffer) during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

Source: Onsite Monitoring Data/Sampling by Laboratories, the data has been collected as per the requirement of the ToR issued by SEIAA – TN.

1.8.1 Regulatory Compliance & Applicable Laws/Regulations for Proposed Quarry

- Application for Quarrying Lease as per Tamil Nadu Minor Mineral Concession Rules, 1959
- Obtained Precise Area Communication Letter as per Tamil Nadu Minor Mineral Concession Rules, 1959 for Preparation of Mining Plan and obtaining Environmental Clearance
- The Mining Plan has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959
- Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/ Dated:10.02.2023 for Proposal.

2. PROJECT DESCRIPTION

2.0 GENERAL

The Proposed Rough Stone and Gravel Quarry require Environmental Clearance. There are One (1) proposed, one nearby proposed and Two (2) existing quarries forming a cluster; calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 9.16.0 ha.

As the extent of cluster are more than 5 ha, the proposal falls under B1 Category 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, and requirement for EIA, EMP and Public Consultation for obtaining Environmental Clearance.

2.1 DESCRIPTION OF THE PROJECT

The proposed project is site specific and there is no additional area required for the project. There is no effluent generation/discharge from the proposed quarries. Method is mining is common for all the proposed quarries in the cluster. Rough Stone and gravel are proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pit head to the needy crushers and rock breakers to avoid secondary blasting.

2.2 LOCATION OF THE PROJECT

- The area is located in S.F.Nos. 710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State.
- The entire quarry lease area falls in the Patta land, the lease applied area is exhibits plain terrain.
- The Altitude of the area is **179m** (Maximum) above MSL
- The area is mentioned in GSI Topo sheet No. 58 - F/13
- The Latitude between of **10°58'49.04"N to 10°58'55.76"N**
- The Longitude between of **77°55'56.49"E to 77°56'02.53"E** on WGS 1984 datum

TABLE 2.1: SITE CONNECTIVITY

Nearest Roadway	NH81 - Coimbatore – Trichy Road - 2.0km-S SH84 - Erode – Karur Road – 6.0km-NE
Nearest Village	Kuppam – 3.0Km - NW
Nearest Town	K. Paramathi – 4.0km-SW
Nearest Railway	Noyal – 8.0km-N
Nearest Airport	Trichy – 86.0km – SE
Seaport	Kochi 216km – SW
Interstate Boundary	Tamilnadu-Karnataka -102km-NW Tamilnadu-Kerala -114km-W

Source: Survey of India *Toposheet*

TABLE 2.2: BOUNDARY CO-ORDINATES OF PROPOSED PROJECT

Boundary Pillar No.	Latitude	Longitude
1	10° 58' 49.04"N	77° 55' 56.49"E
2	10° 58' 55.12"N	77° 55' 56.86"E
3	10° 58' 55.76"N	77° 55' 57.67"E
4	10° 58' 55.33"N	77° 55' 58.29"E
5	10° 58' 54.14"N	77° 55' 58.33"E
6	10° 58' 53.98"N	77° 56' 02.53"E
7	10° 58' 52.11"N	77° 56' 02.43"E
8	10° 58' 51.93"N	77° 56' 01.88"E
9	10° 58' 51.55"N	77° 55' 59.17"E
10	10° 58' 50.48"N	77° 55' 58.84"E
11	10° 58' 49.73"N	77° 55' 57.39"E

Source: Approved Mining Plans

Datum: UTM-WGS84

FIGURE 2.1: GOOGLE IMAGE OF THE PROJECT

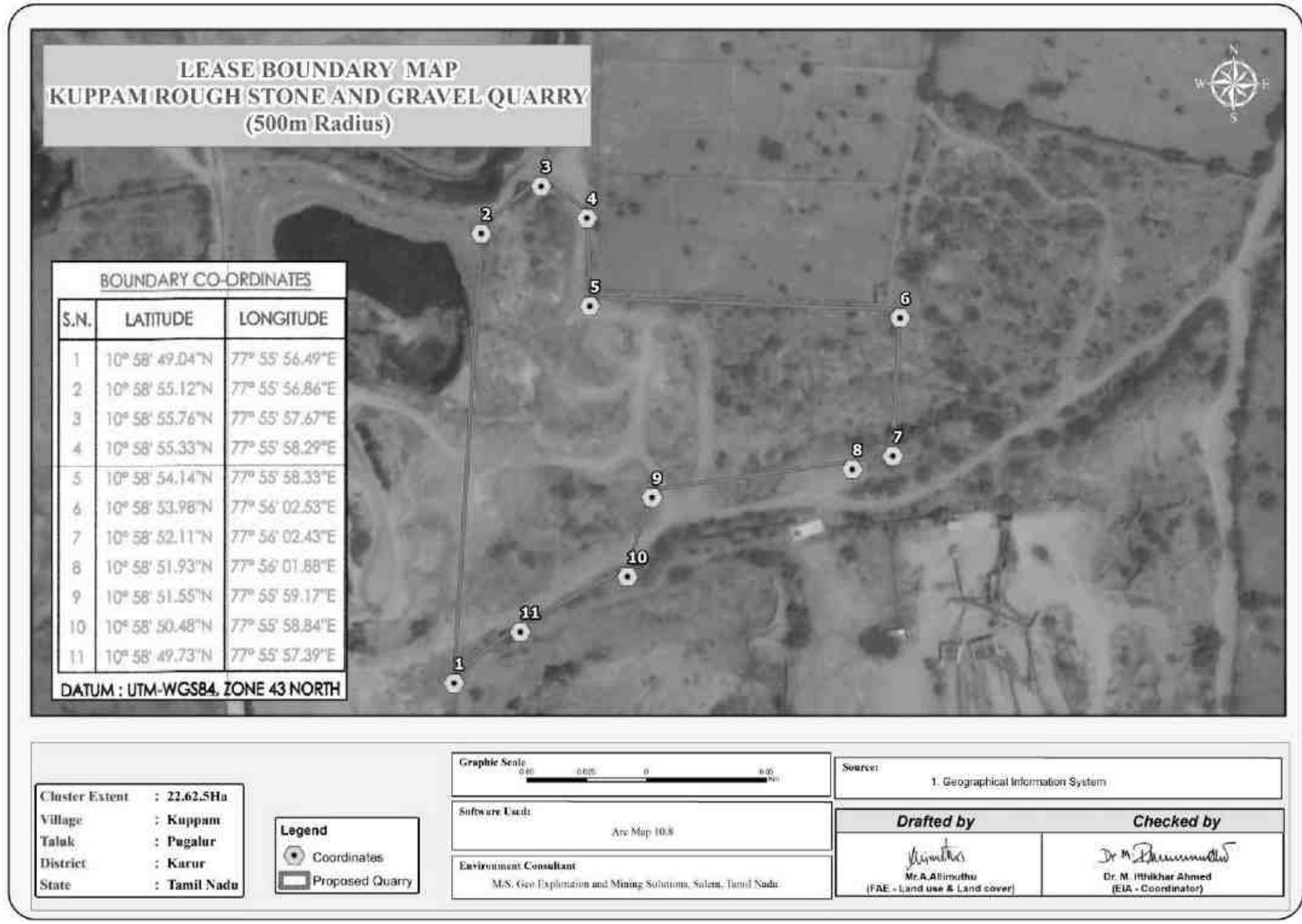


FIGURE 2.2: QUARRY LEASE PLAN / SURFACE PLAN – PROPOSAL

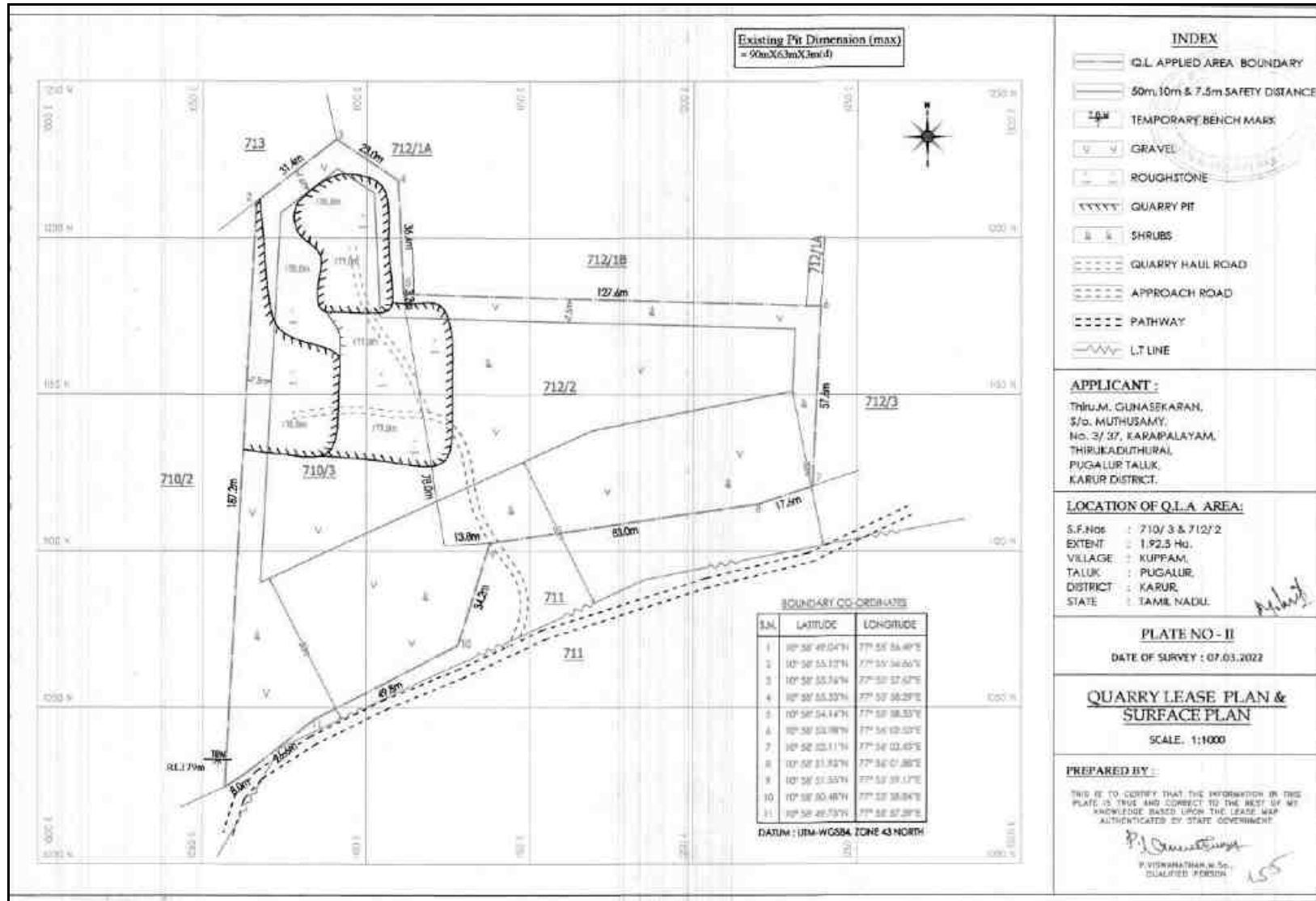


FIGURE 2.3: GOOGLE EARTH IMAGE SHOWING OVERLAY OF CADASTRAL MAP AROUND 500M RADIUS

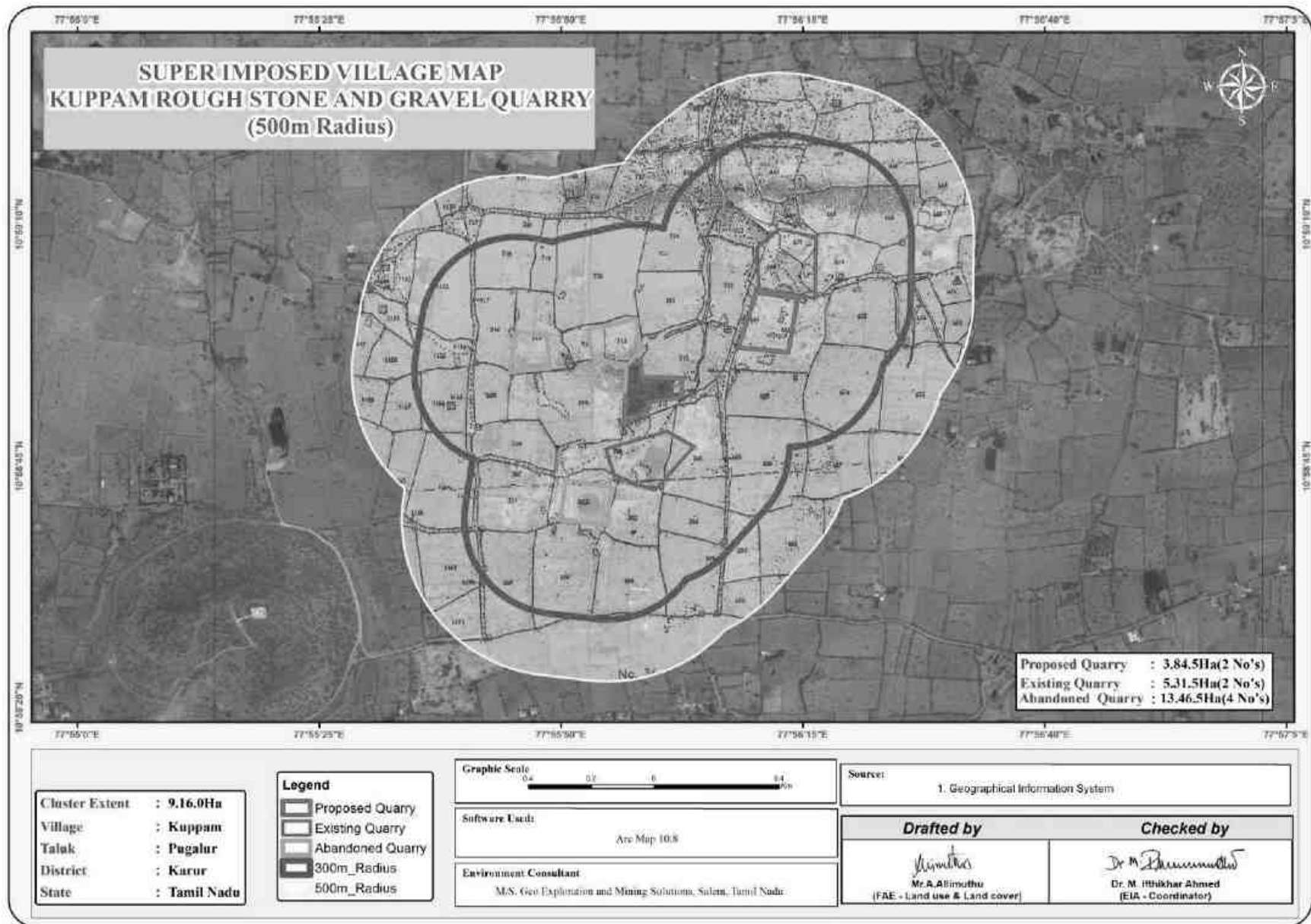


FIGURE 2.4: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS

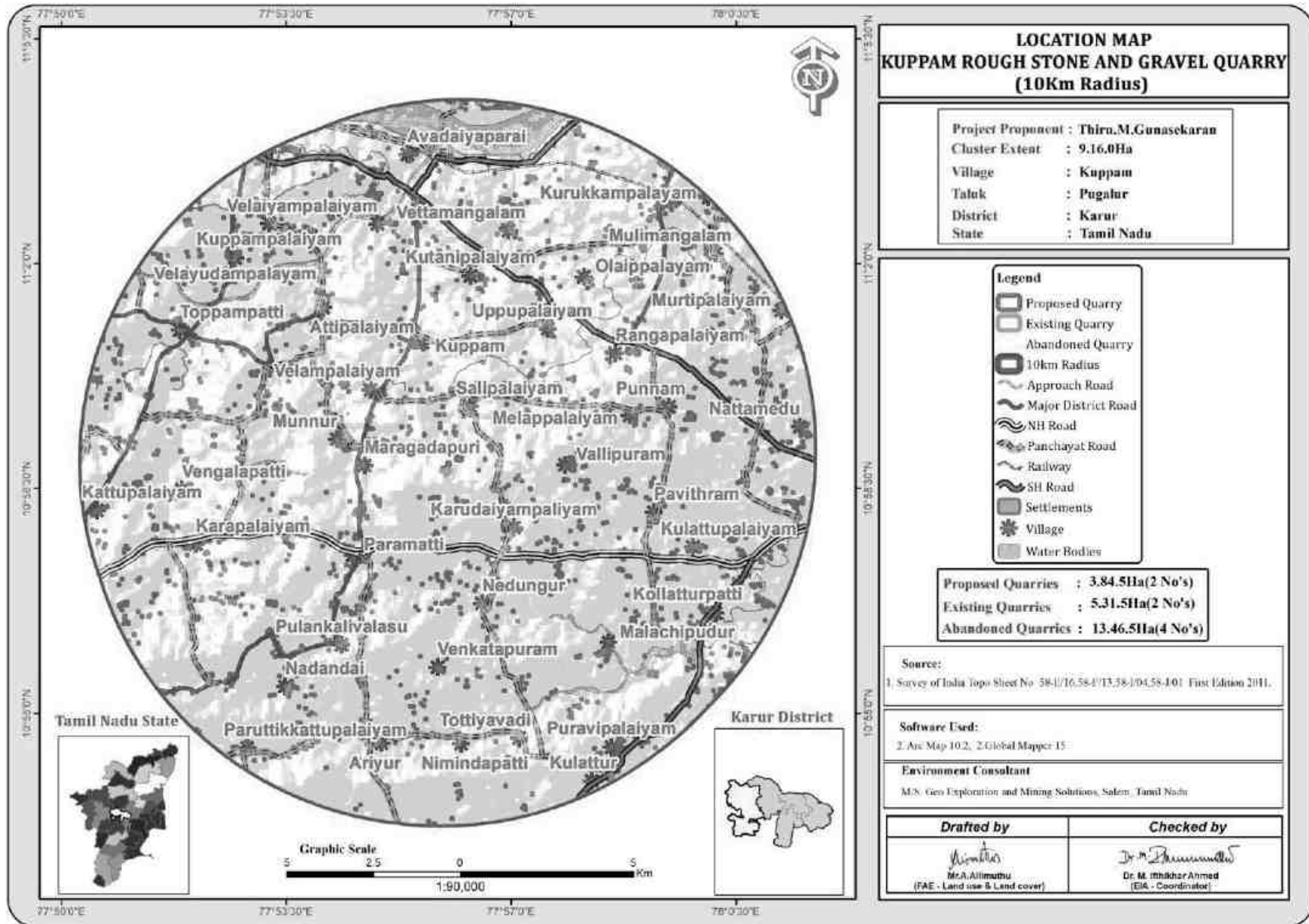


FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 5KM RADIUS

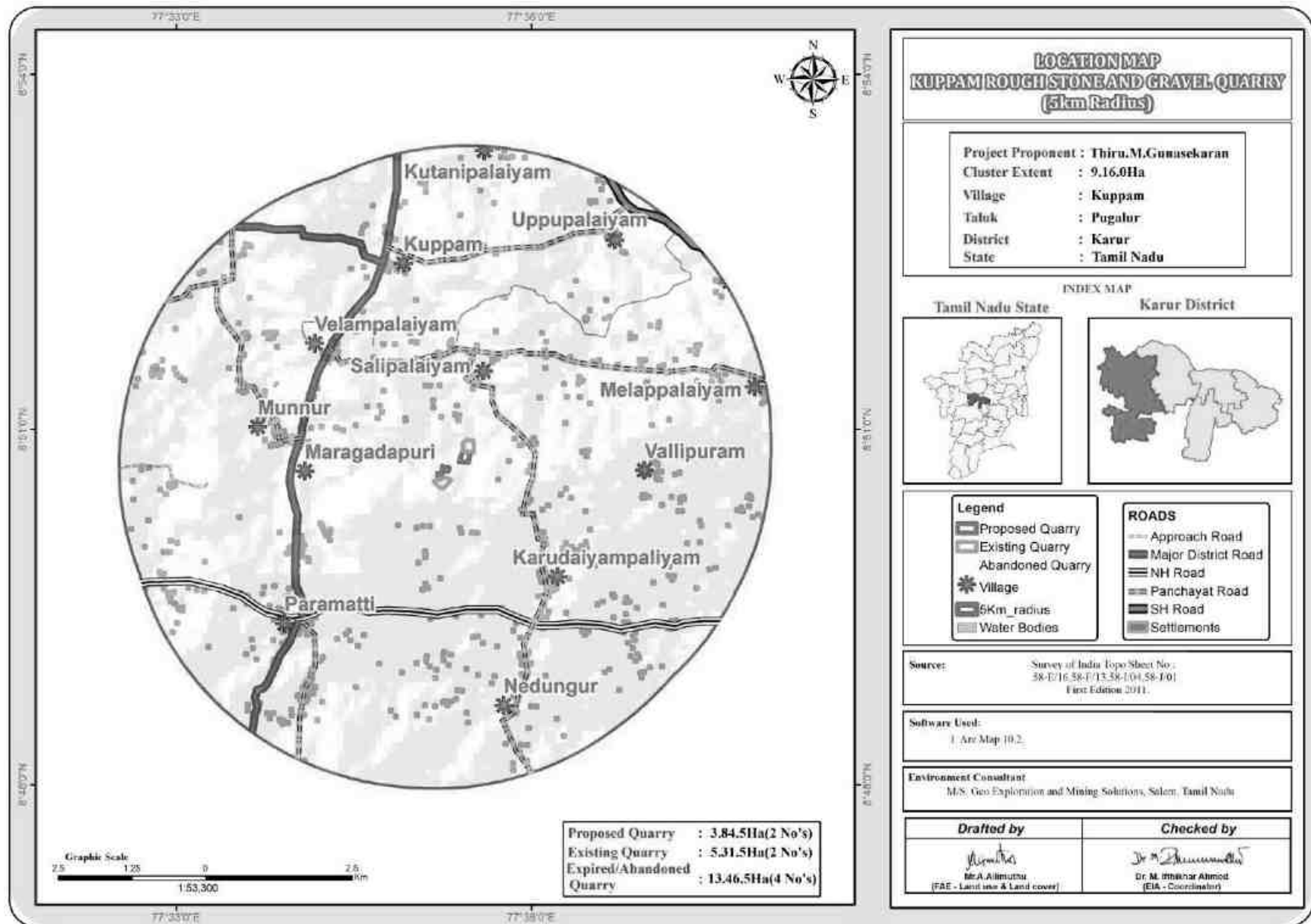
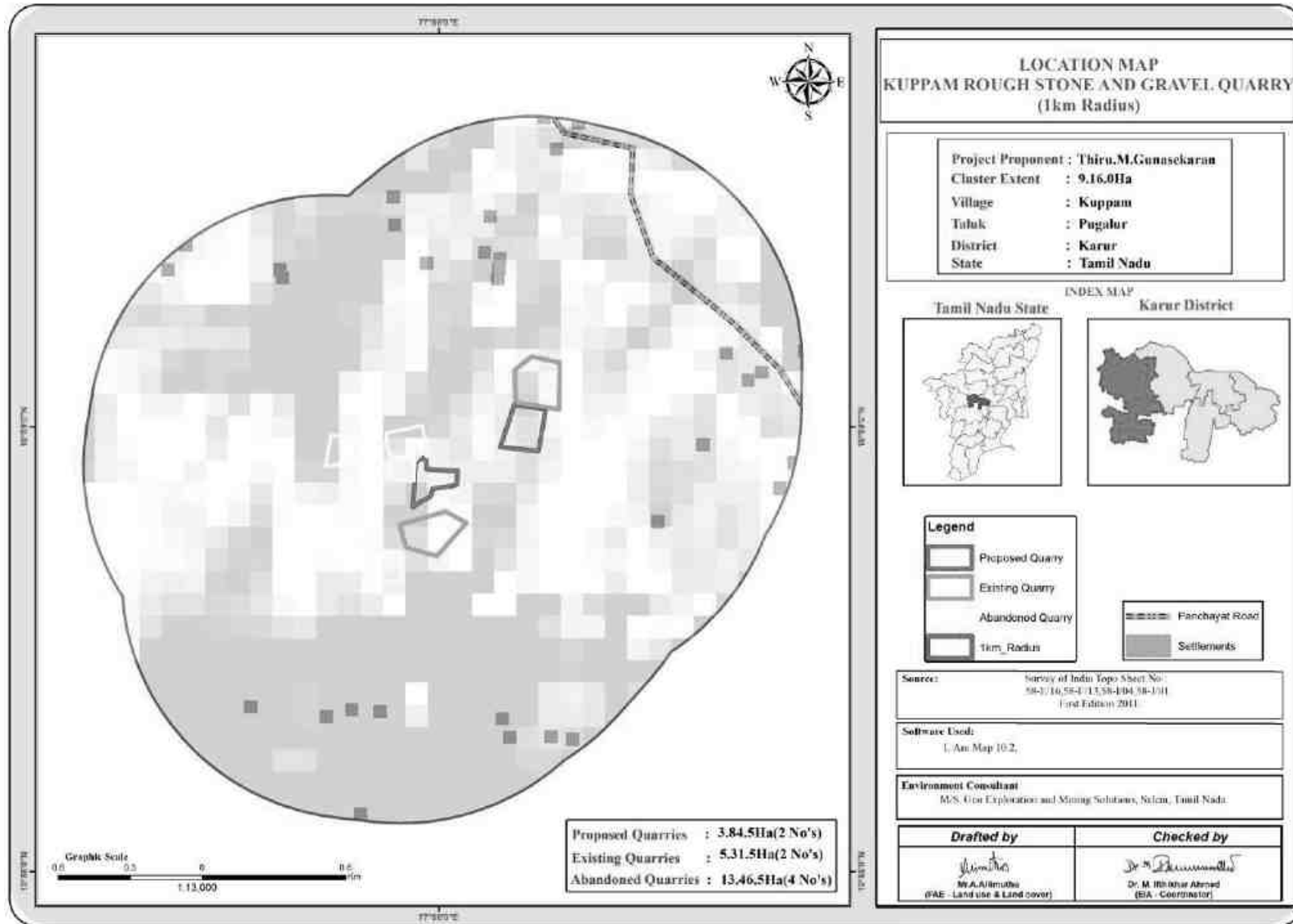


FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS



2.2.1 Project Area

- The Proposed Project is site specific
- There is No beneficiation or processing proposed inside the project area.
- There is no forest land involved in the proposed projects and is devoid of major vegetation and trees.

TABLE 2.3: LAND USE PATTERN OF THE PROPOSED PROJECT

Description	Present area in (ha)	Area at the end of this quarrying period (ha)
Quarrying Pit	0.45.5	0.88.0
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.10.0
Unutilized Area	1.45.0	0.91.5
Grand Total	1.92.5	1.92.5

Source: Approved Mining Plan

2.2.2 Size or Magnitude of Operation

TABLE 2.4: OPERATIONAL DETAILS FOR PROPOSED PROJECT

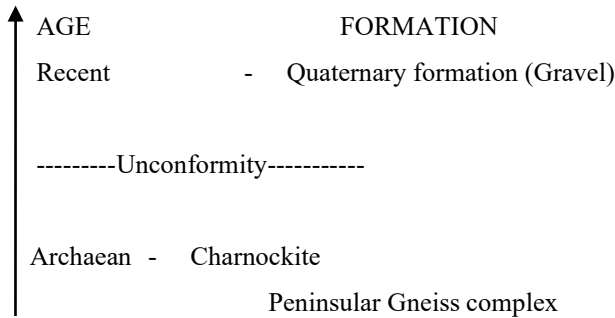
PARTICULARS	DETAILS	
	Rough Stone (5Year Plan period)	Gravel (3 Years Plan period)
Geological Resources in m ³	7,24,430	29,112
Mineable Reserves in m ³	1,60,982	11,446
Yearwise reserves in m ³	1,40,607	11,446
Mining Plan Period	5 Years	
Number of Working Days	300 Days	
Production per day in m ³	94	12
No of Lorry loads (6m ³ per load)	7	1
Total Depth of Mining	37m (2m Gravel + 35m Rough Stone)	

Source:Approved Mining Plan

2.3 GEOLOGY

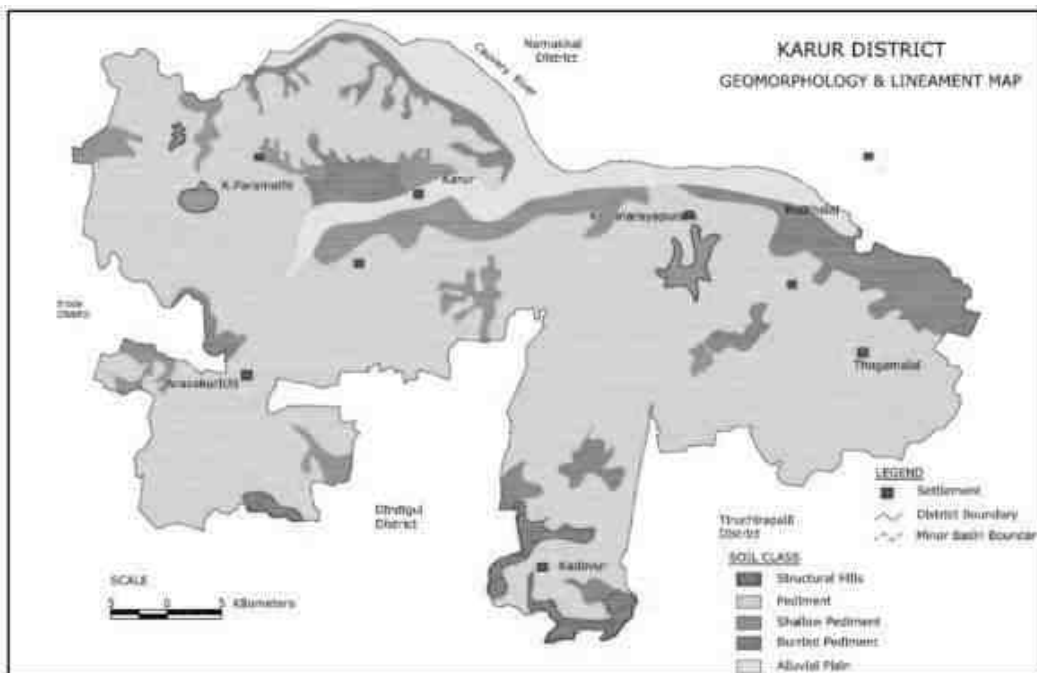
Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale the Charnockite body N30°W – S30°E with dipping towards SW60°.

Regional stratigraphic sequence:



Geomorphology

The entire area of the district is a pediplain. The Rangamalai hills and Kadavurhills 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 generalelevation of the area is ranging between 100 m and 200m above mean sealevel. The prominent geomorphic units identified in the districtthroughinterpretation of Satellite imagery are 1) Structural hill, 2) Pediments, 3) Shallow Pediments, 4) Buried Pediments and 5) Alluvial plain. An overall appraisal of groundwater occurrence in each geomorphic unit and the significance of its hydro geological characters are given, geomorphology and lineament details are given.



2.3.2 Local 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 Formation is the major formation among the various types of hard rocks. Charnockite occurs in this district as pockets in Karur and Pugalurtaluku. Quartzites which are resistant to weathering are also seen as patches in Charnockite and gneissic varieties and the above rock types are shown in Figure 3.5. Sedimentary Formation: - Recent alluvial deposits such as sand, silt, clay, gravel etc. which are transported sediments by river are found on either side of Cauvery river in Karur, Krishnarayapuram and Kulithalaiblocks. These formations are overlying the hard rock.

2.3.3 Hydrogeology

Karur district is underlain entirely by Archaean Crystalline formations with Recent alluvial deposits occurring along the river and streams courses. Weathered, fissured and fractured crystalline rock and these alluvial deposits constitute the important aquifer systems in the district. The hard consolidated crystalline rocks of Archaean age represent weathered, fissured and fractured formations of gneisses, granites, charnockites and other associated rocks. The Specific capacity of large diameter wells tested in crystalline rocks from 31 to 200 lpm / m. of drawdown. The yield characteristics of wells vary considerably depending on the topographic set-up, lithology and the degree of weathering.

Source: <https://karur.nic.in/departments/geology-mining/>

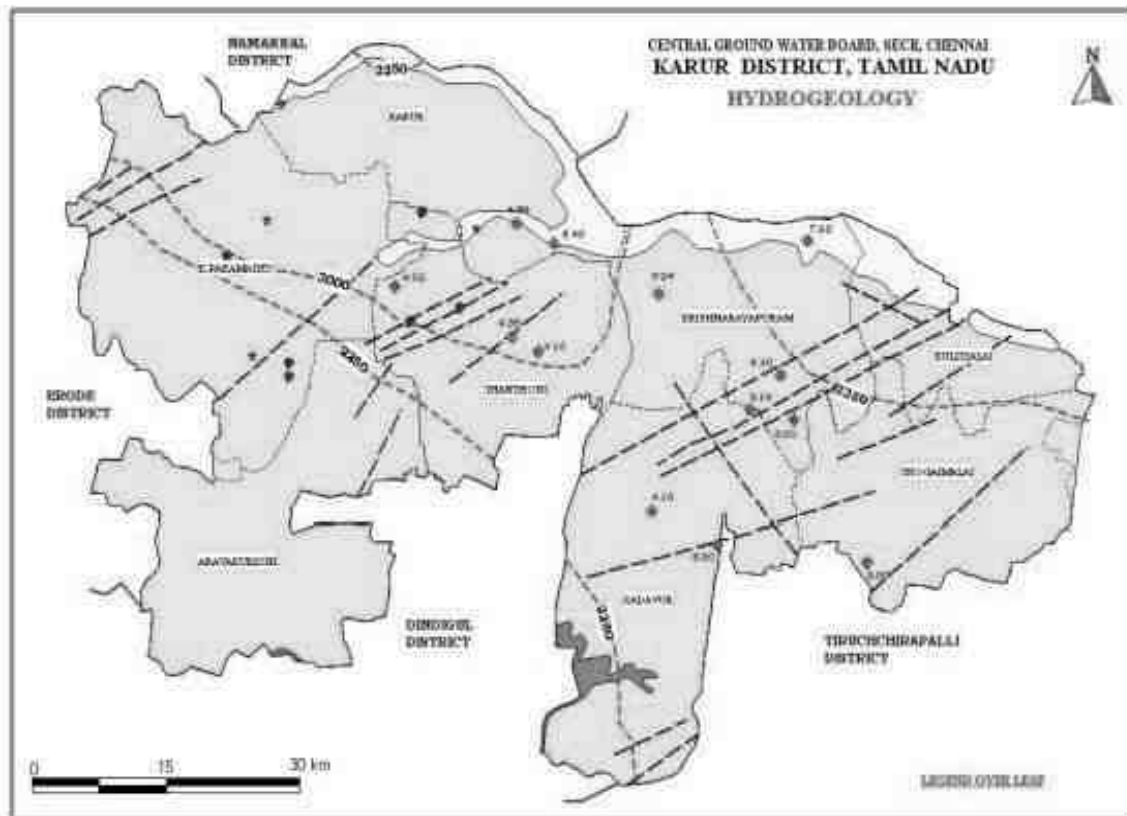


FIGURE 2.7: REGIONAL GEOLOGY MAP

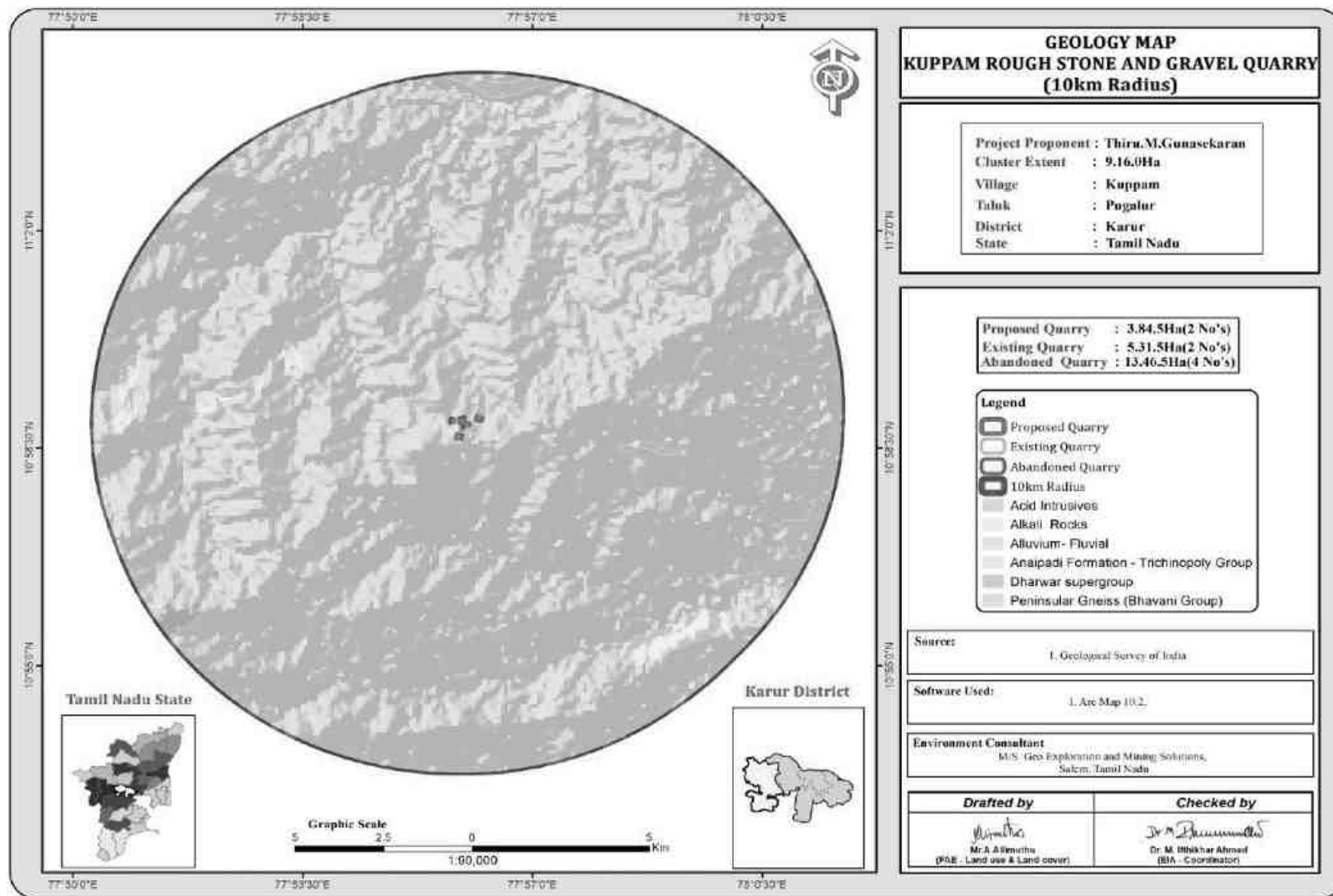


FIGURE 2.8: GEOMORPHOLOGY MAP

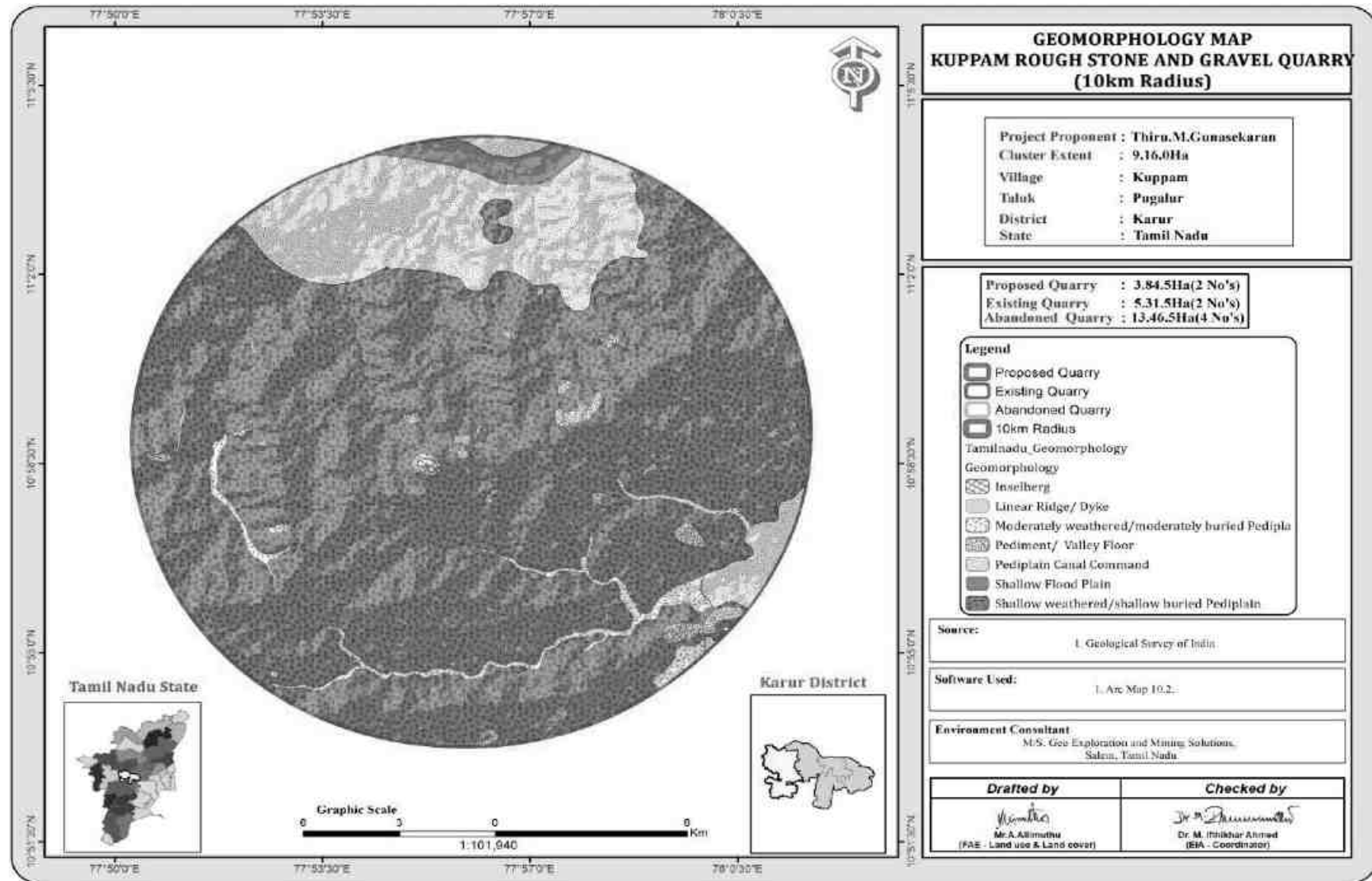


FIGURE 2.9: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS

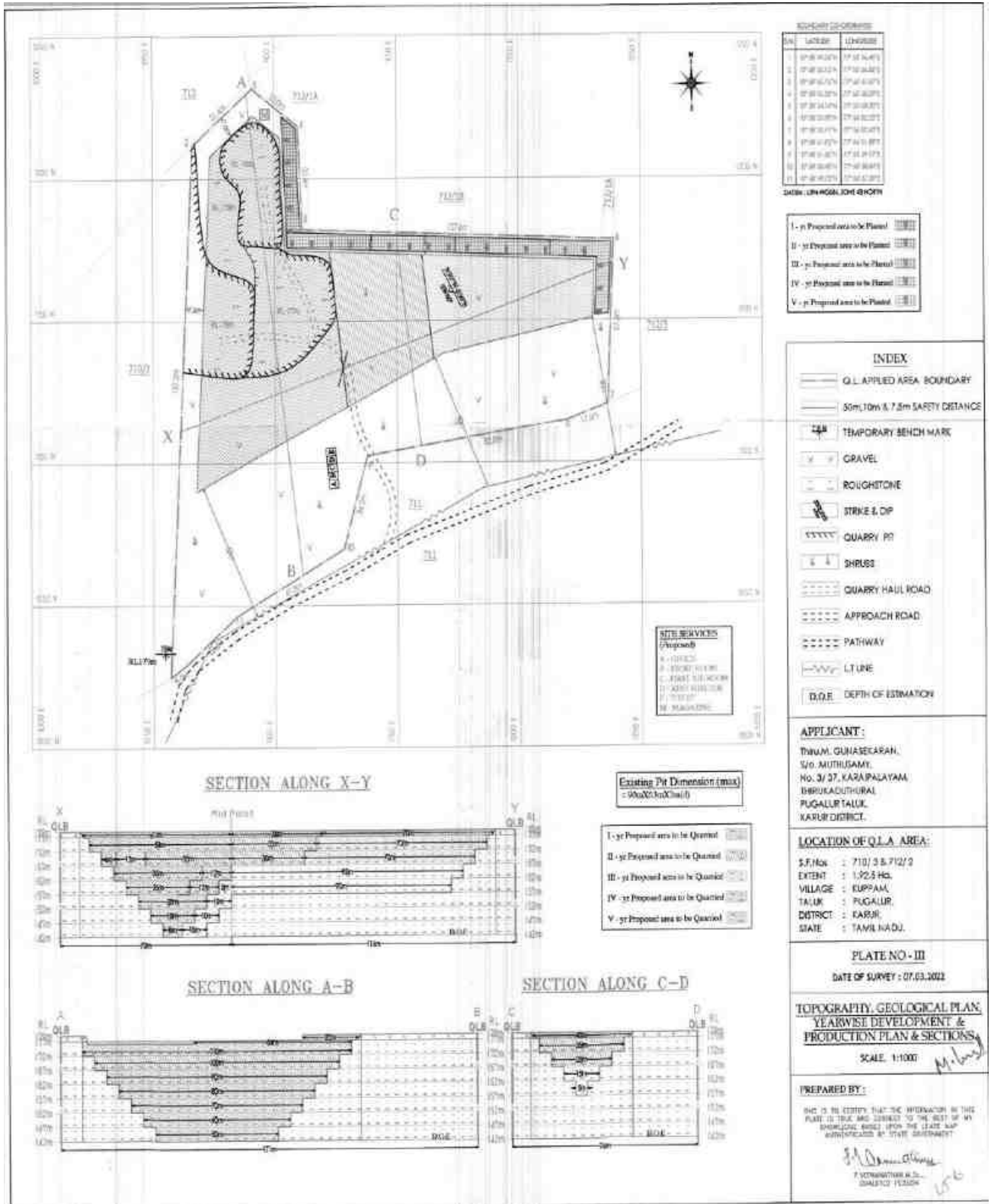
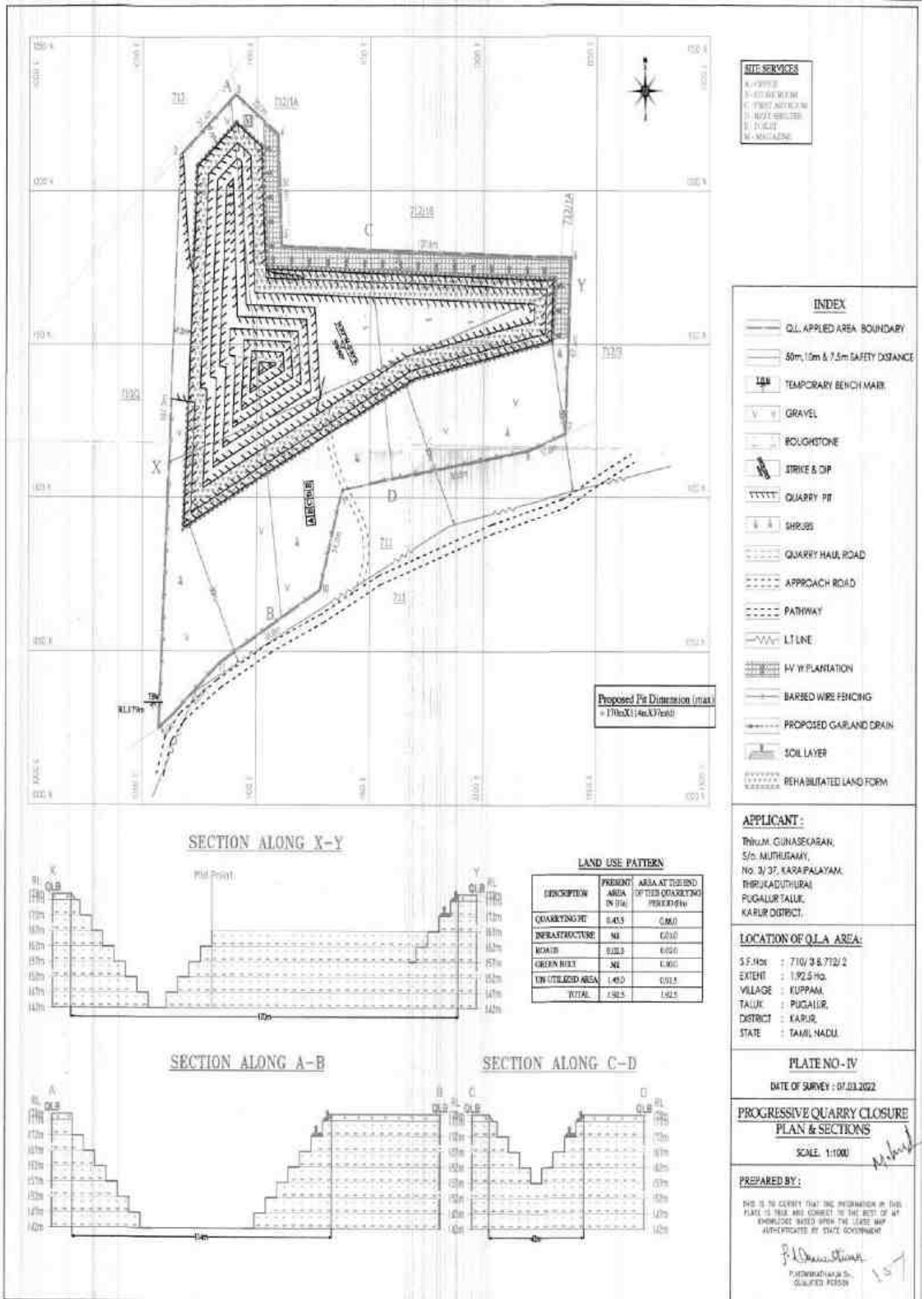


FIGURE 2.10: CLOSURE PLAN AND SECTIONS



2.4 RESOURCES AND RESERVES

The Resources and Reserves of Rough Stone and Gravel were calculated based on Cross-Section Method by plotting sections to cover the maximum lease area for the proposed project.

Based on the availability of Geological Resources the Mineable Reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m (Safety Barrier all around the applied area) and safety distance as per precise area communication letter and deducting the locked up reserves during bench formation (Also called as Bench Loss) and the Mineable Reserves is calculated considering there is no waste / overburden / side burden (100% Recovery Anticipated) for the proposed project.

TABLE 2.6: AVAILABLE GEOLOGICAL RESOURCES OF PROPOSED PROJECT

Description	Rough Stone in m ³	Gravel in m ³
Geological Resource in m ³	7,24,430	29,112
Mineable Resource in m ³	1,60,982	11,446

Source: Approved Mining Plan

TABLE 2.7: YEAR-WISE PRODUCTION PLAN

Year	Rough Stone in m ³	Gravel in m ³
1 st	29,232	2,806
2 nd	27,375	3,040
3 rd	27,000	5,600
4 th	29,600	-
5 th	27,400	-
Total	1,40,607	11,446

Source: Approved Mining Plan

Disposal of Waste

There is no waste anticipated in these Rough Stone quarrying operation. The entire quarried out materials will be utilized (100%). Top layer of Gravel formation will be removed and sold to needy customers directly.

Conceptual Mining Plan/ Final Mine Closure Plan

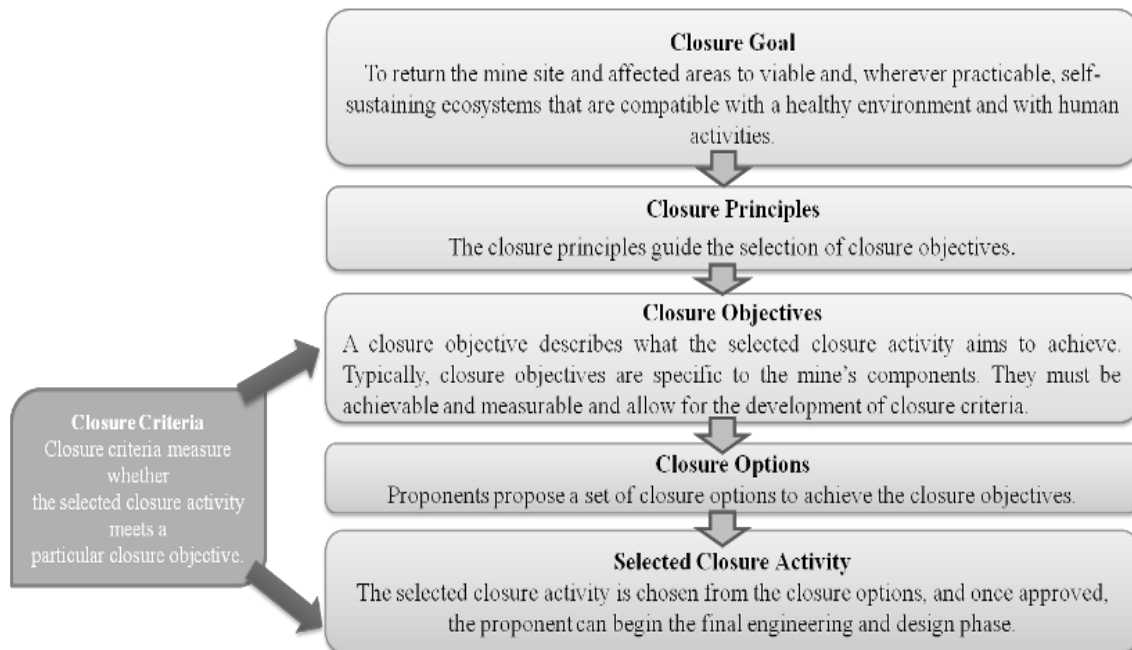
The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

TABLE 2.8: EXISTING PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	170	114	37m bgl

Source: Approved Mining Plan

- At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem
- Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- The principal closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.



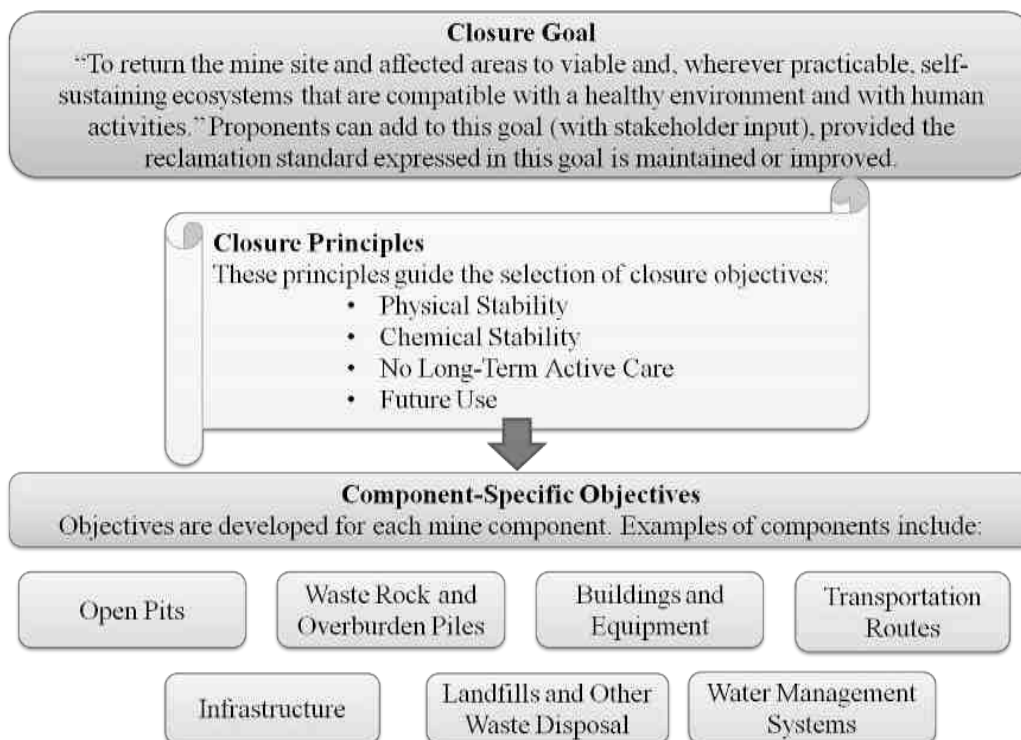
Closure Objectives –

- Access to be limited, for the safety of humans and wildlife.
- The open pit mine workings and pit boundary are physically and geo-technically stable.
- Water quality in flooded pits is safe for humans, aquatic life, and wildlife.
- Discharge of contaminated drainage has been minimized and controlled.
- Original or desired new surface drainage patterns have been established.
- For flooded pits, in-pit aquatic habitat has been established where practical and feasible.
- Emergency access and escape routes from flooded pits for humans and wildlife are in place.
- Dust levels are safe for people, vegetation, aquatic life, and wildlife.

Closure Planning & Options Considerations in Mine Design –

- The closure of mine is well planned at the initial stage of planning & design consideration by the internal and external stake holders
- Construction of 2m height bund all along the mine pit boundary and ensure its stability all time & construction of garland drain along the natural slope to avoid sliding and collection of soil to the pit & surface runoff during rainfall
- After complete exploitation of mineral, the lowest bench foot wall side will be maintained as plain surface without any sump pits to avoid any accidents
- All the sharp edges will be dressed to smoother face before the closure of mine and ensure no loose debris on hanging wall side
- The project proponent as a part of social responsibilities assures to supply the stored mine pit water to the nearby villages after effective treatment process as per the standards of TNPCB & TWAD
- Native species will be planted in 3 row patterns on the boundary barriers and 1st bench, a full-time sentry will be appointed at the gate to prevent inherent entry of public & cattle.
- The access road to the quarry will be cut-off immediately after the closure
- The layout design shall be prepared and get approved from Department of Geology and Mining.
- The proponent is instructed to construct as per the layout approved
- Physical and chemical stability of structures left in place at the site, the natural rehabilitation of a biologically diverse, stable environment, the ultimate land use is optimized and is compatible with the surrounding area and the requirements of the local community, and taking the needs of the local community into account and minimizing the socio-economic impact of closure

- There will be a positive change in the environmental and ecology due to the mine closure



Post-Closure Monitoring –

The purpose of post-closure monitoring with respect to open pit mine workings is to ensure the attainment of closure objectives.

- Monitor physical and geotechnical stability of remnant pit walls.
- Monitor the ground regime in pit walls to confirm achievement of design objectives.
- Monitor water level in pit to confirm closure objectives regarding fish, fish habitat, and wildlife safety are being achieved.
- Sample water quality and quantity at controlled pit discharge points.
- Identify and test unanticipated areas where water management is an issue.
- Inspect integrity of barriers such as berms & fences.
- Monitor wildlife interactions with barriers to determine effectiveness.
- Inspect aquatic habitat in flooded pits where applicable.
- Monitor dust levels.

TABLE 2.9: MINE CLOSURE BUDGET

ACTIVITY	I YEAR					RATE	AMOUNT (INR)
	1200						
Plantation under safety zone						@100 Rs Per sapling	Rs.1,20,000/-
Wire Fencing (In Mtrs) 585 Mtrs	1,75,500	-	-	-	-	@300 Rs Per Meter	Rs.1,75,500/-
Garland drain (In Mtrs) 830 Mtrs	1,38,000	-	-	-	-	@300 Rs Per Meter	Rs.1,38,000/-
TOTAL							Rs. 4,33,500 /-

Source: Proposed by FAE's and EC

2.5 METHOD OF MINING

The method of mining is Opencast Mechanized Mining Method is being proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain

relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.5.1 Drilling & Blasting Parameters

Diameter of hole – 32 mm Drilling & Blasting will be carried out as per parameters given below:

Spacing	–	1.2m
Burden	–	1.0 m
Depth of hole	–	1.5 m
Charge per hole	–	0.50 – 0.75kg
Powder factor	–	6.0 tonnes/kg

Type of Explosives to be used –

Slurry explosives (An explosive material containing substantial portions of a liquid, oxidizers, and fuel, plus a thickener), NONEL / Electric Detonator & Detonating Fuse.

Storage of Explosives –

No proposal for storage of explosives within the project area, the respective project proponents have made agreement with authorized explosives agencies for carrying out blasting activities and competent person as per DGMS guidelines will be employed for safety and supervision of overall quarrying activities.

The explosives will be sourced from the blasting agency on daily basis and the blasting will be carried out under the supervision of competent qualified Blaster and it will be ensured that there shall be no balance of explosive stock; any balance stock will be taken back by the supplier.

2.5.2 Extent of Mechanization

TABLE 2.10 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	1	300	Diesel Drive
4	Tippers / Dumpers	2	20 Tonnes	Diesel Drive

Source: Approved Mining Plan

2.6 GENERAL FEATURES

2.6.1 Existing Infrastructures

Infrastructures like Mine office, Temporary Rest shelters for workers, Latrine and Urinal Facilities will be constructed as per the Mine Rule after the grant of quarry lease in all the proposed quarries.

2.6.2 Drainage Pattern

Drainage pattern are created by stream erosion over time that reveals characteristics of the kind of rocks and geological structures in a landscape region drained by streams.

Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land.

Dendritic patterns, which are by far the most common, develop in areas where the rock (or unconsolidated material) beneath the stream has no particular fabric or structure and can be eroded equally easily in all directions.

There are no streams, canals or water bodies crossing within the project area. The drainage pattern of the area is dendritic – sub dendritic.

2.6.3 Traffic Density

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through Panchayat Road. - Salipalayam to Karudampalayam on Southeast Side of the Cluster and Major District Road Noyyal Road on NW Side.

Traffic density measurements were performed at two locations

1. Panchayat Road-Salipalayam to Karudampalayam -South side
2. Major District Road Noyyal Road - NW side

Traffic density measurement were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

TABLE.2.11: TRAFFIC SURVEY LOCATIONS

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Panchayat Road-Salipalayam to Karudampalayam	1.5km SE	Panchayat Road
TS2	Major District Road-Noyyal Road	2.5 km NW	Major District Road (two Lane)

Source: On-site monitoring by GEMS FAE & TM

TABLE 2.12: EXISTING TRAFFIC VOLUME

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	55	165	62	62	226	113	340
TS2	135	405	128	128	284	142	675

Source: On-site monitoring by GEMS FAE & TM

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

TABLE 2.13: ROUGH STONE & GRAVEL HOURLY TRANSPORTATION REQUIREMENT

Transportation of Rough Stone & Gravel per day		
Capacity of trucks	No. of Trips per day Cumulatively	Volume in PCU
10 tonnes	49	49

Source: Data analysed from Approved Mining Plan

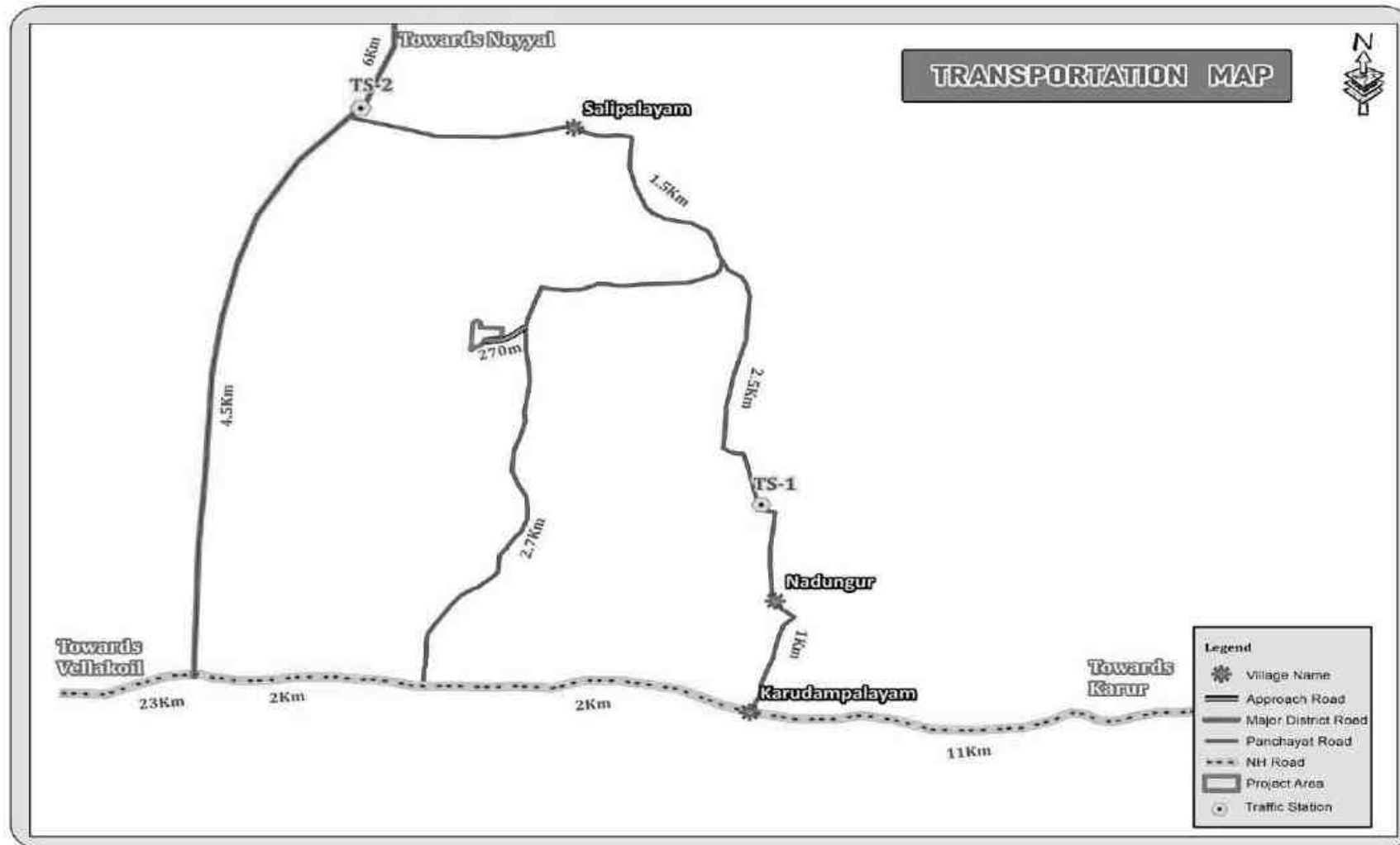
TABLE 2.14: SUMMARY OF TRAFFIC VOLUME

Route	Existing Traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per (IRC – 1960 Guidelines)
TS1 - Panchayat Road-Salipalayam to Karudampalayam	340	49	389	1200
TS2 - Major District Road-Noyyal Road	675	49	724	1500

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

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

FIGURE.2.11: MINERAL TRANSPORTATION ROUTE MAP



2.6.4 Mineral Beneficiation and Processing

There is no proposal for the mineral processing or ore beneficiation in any of the proposed project

2.7 PROJECT REQUIREMENT

2.7.1 Water Source & Requirement

Detail of water requirements in KLD as given below:

TABLE 2.15: WATER REQUIREMENT FOR THE PROJECT

*Purpose	Quantity	Source
Dust Suppression	0.3 KLD	From Existing bore wells from nearby area
Green Belt development	0.7 KLD	From Existing bore wells from nearby area
Domestic purpose	0.5 KLD	From existing, bore wells and drinking water will be sourced from Approved water vendors.
Total	1.5 KLD	

Source: Prefeasibility report

* Drinking water will be sourced from Approved Water Vendors

2.7.2 Power and Other Infrastructure Requirement

No proposed projects require power supply for the mining operations. The quarrying activity is proposed during day time only (General Shift 8 AM – 5 PM, Lunch Break 1 PM – 2 PM). Electricity for use in office and other internal infrastructure will be obtained from SEB by respective project proponent.

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

2.7.3 Fuel Requirement

High speed Diesel (HSD) will be used for quarrying machineries. Diesel will be brought from nearby Fuel Stations.

1. Gravel:

Per hour Excavator will consume	=	10 liters / hour
Per hour Excavator will excavate	=	60m ³ of Gravel
Gravel quantity	=	11,446/60 = 191hours
Diesel consume	=	191 hours x 10 liters
Total diesel consumption	=	1,910 Liters of HSD will be utilized for Gravel

2. Rough stone:

Per hour Excavator will consume	=	16 liters / hour
Per hour Excavator will excavate	=	20m ³ of Rough stone
Rough stone quantity	=	1,40,607/20 = 7,030 hours
Diesel consume	=	7,030 hours x 16 liters
Total diesel consumption	=	1,12,480 Liters of HSD will be utilized for Rough stone
Total diesel consumption	=	1,14,390 Liters of HSD will be utilized for entire project life

2.7.4 Project Cost

TABLE 2.16: PROJECT COST OF PROPOSED PROJECT

Project Cost	Rs. 47,30,000/-
---------------------	------------------------

Source: Approved Mining Plan & Prefeasibility Report

2.8 EMPLOYMENT REQUIREMENT:

The following manpower's are proposed in the mining plan to carry out the day-to-day quarrying activities, the same employment is maintaining aimed at the proposed production target and also to comply with the statutory provisions of The Metalliferous mines regulations, 1961 for the proposed project.

TABLE 2.17: PROPOSED MANPOWER DEPLOYMENT

Sno	Employment	No.of persons
1	Mines Manager/Mines Foreman	1
2	Mate/Blaster	1
3	Jack hammer operator	8
4	Excavator Operator & Driver	3
5	Security	1
6	Labour & Helper	3
7	Cleaner & Co-operator	3
	Total	20

Source: Approved Mining Plans of respective Project

2.9 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO 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.

TABLE 2.18: EXPECTED TIME SCHEDULE

Sl.No.	Particulars	Time Schedule (In Month)					Remarks if any
		1 st	2 nd	3 rd	4 th	5 th	
1	Environmental Clearance						
2	Consent to Operate						Production Start Period
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

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

3. DESCRIPTION OF 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 **March, April and May 2023** with CPCB guidelines. Environmental data has been collected with reference to cluster quarries by EHS 360 Labs Pvt Ltd Approved by (Approved by ISO/IEC 17025:2017), for the below attributes –

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

Study Area

An area of 10 km radius (aerial distance) from the periphery of the cluster is considered for EIA study. The data collection has been used to understand the existing environment scenario around the cluster against which the potential impacts of the project can be assessed. The study area has been divided into two zones viz **core zone** and **buffer zone** where core zone is considered as cluster and buffer zone taken as 10km radius from the periphery of the Cluster. Both Core zone and Buffer zone is taken as the study area.

Study Period

The baseline study was conducted during the pre-monsoon season i.e., **March, April and May 2023**

Study Methodology

- The project area was surveyed in detail with the help of Total Station and the boundary pillars were picked up with the help of GPS. The boundary coordinates were superimposed on the satellite imagery to understand the relief of the area, besides Land use pattern of the area was studied through the Landsat8-9 OLI/TIRS C2 L2 - USGS-Earth Explorer.
- Soil samples were collected and analysed for relevant physio-chemical characteristics, exchangeable Cations, nutrients & micro nutrients etc., in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development
- Ground water samples were collected during the study period from the existing bore wells, while surface water was collected from ponds in the buffer zone. The samples were analysed for parameters necessary to determine water quality (based on IS: 10500:2012 criteria) and those which are relevant from the point of view of environmental impact of the proposed mines
- A onsite meteorological station was setup in cluster area, to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period
- In order to assess the Ambient Air Quality (AAQ), samples of ambient air were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM₁₀ and SO₂, NO_x with gaseous attachments & Fine Dust Samplers (FDS) for PM_{2.5} and other parameters as per NAAQ norms and analysed for primary air pollutants to work out the existing status of air quality.
- The Noise level measurements were also made at various locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.

- Baseline biological studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area.
- Socio-Economic survey was conducted at village and household level in the study area to understand the present socio-economic conditions and assess the extent of impact due to the proposed mining project.

The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of samples analysis, etc., are given below Table 3.1.

TABLE 3.1: MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data's from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio-Chemical Characteristics	Once during the study period	6 (1 core & 5 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	6 (1 surface water & 5 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 hourly twice a week (March to May 2023)	8 (2core & 6 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (2 core & 6 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

Source: On-site monitoring/sampling by EHS 360 Labs Pvt Ltd in association with GEMS

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

3.1 LAND ENVIRONMENT

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the **Standard ToR point no. 4 & 10 Stating:**

Point No. 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).

Point No. 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.

Current vintage data of Indian Remote Sensing Satellite ResourceSat-2A L4FMX (False Color Composite) has been used for Land Use / Land Cover study. Satellite image has been procured from National Remote Sensing Centre, Hyderabad.

3.1.2 OBJECTIVE

The objectives of the LULC study are as follow:

- ☞ To develop the Land use & Land cover map using land coordinates of the Quarry area (Core Zone) and 10 km radius from the quarry area (Buffer area).
- ☞ To Identify and mark the important Land use and Land cover features using the primary and secondary data collected.
- ☞ To evaluate the impacts on existing land use/cover features of the buffer area by the Proposed Project activities.
- ☞ To identify the mitigative measures for the sustainable use of land and to protect the buffer zone from the adverse impacts.

Technical specification of Satellite imagery Data Used:

Current vintage data of Indian Remote Sensing Satellite RESOURCESAT1 (LISS-III) digital FCC (False Color Composite) has been used for preparation of Land use/ Land cover thematic map of study area. Satellite image has been procured from National Remote Sensing Centre, Hyderabad. Survey of India Toposheet as a reference map on 1:50,000 scale has been used for preparation of base layer data like road, rail network; village for geo-referencing of satellite image.

- ☞ Satellite Image - Resourcesat1-LISSIII, 23.5m Resolution
- ☞ Satellite Data Source - NRSC, Hyderabad
- ☞ Satellite Vintage - 14st July 2020, Swath 141km wide.
- ☞ SOI Toposheet No - 58 F/13 etc.,
- ☞ Software Used - ArcGIS 10.8

The satellite image (FCC color 3,2,1) of the buffer zone is given in 3.1

The spatial resolution and the spectral bands in which the sensor collects the remotely sensed data are two important parameters for any land use survey. Resourcesat1-LISSIII, 23m Resolution of 23.5m and a 141 km wide swath of the earth in 23.5m resolution covering wide areas the data is collected in 4 visible bands namely band number and Resolution.

TABLE 3.2: Resourcesat1-LISSIII SENSOR characteristics

Band Number	Description	Wavelength	Resolution
Band 1	Green	0.52-0.59 μm	23.5 meters
Band 2	Red	0.62-0.68 μm	23.5meters
Band 3	NIR	0.77-0.86 μm	23.5meters
Band 4	SWIR	1.55-1.70 μm	70meters

Source: NRSC, Hyderabad

3.1.3 METHODOLOGY

The land use / land cover map is prepared by adopting the interpretation techniques of the Satellite image in combination with collateral data such as Survey of India topographical maps. Image classification is done by using visual interpretation techniques and digital classification using any of the image processing software. The various activities for preparation of LULC include preprocessing, rectification, image enhancements and classifying the satellite data for assessing the change in land use land cover due to proposed developmental activities.

- ☞ Preliminary/primary data collection of the study area
- ☞ Satellite data procurement from NRSC
- ☞ Secondary data collection from authorized bodies
- ☞ Survey of India Toposheet (SOI)
- ☞ Mine Layout
- ☞ Cadastral / Khasra map
- ☞ GPS Coordinates of Lease Boundary
- ☞ Processing of satellite data using ArcGIS 10.8 and preparing the Land Use & Land cover maps (e.g. Plant/Mine area, Existing Quarries, Settlements, Agriculture land, Non agriculture land, water bodies, etc.) by Digital Image Processing (DIP) technique.
- ☞ Geo-Referencing of the Survey of India Toposheet
- ☞ Geo-Referencing of satellite Imagery with the help of Geo-Referenced Toposheets
- ☞ Enhancement of the Satellite Imagery
- ☞ Base Map layer creation (Roads, Railway, Village Names, and other Secondary data, etc.)
- ☞ Data analysis and Classification using Digital interpretation techniques.
- ☞ Ground truth studies or field Verification.
- ☞ Error fixing / Reclassification
- ☞ Final Map Generation.

The land use/Land cover Map of the buffer zone is given in 3.4(b).

Land Use Pattern of the Buffer Zone (Study area),

Details of the same are given in Table - 3.3 and the map is shown in Figure - 3.2

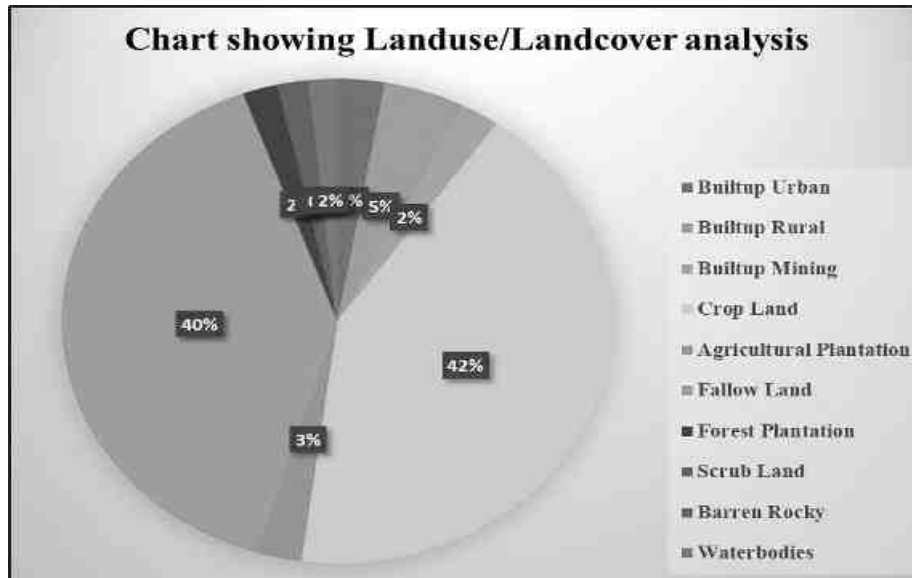
TABLE :3.3 LAND USE / LAND COVER DETAILS OF STUDY AREA

S.No	Classification	Area_Ha	Area_%
BUILTUP			
1	Builtup Urban	919.60	2.77
2	Builtup Rural	1589.35	4.78
3	Builtup Mining	756.52	2.27
AGRICULTURAL LAND			
4	Crop Land	14057.11	42.27
5	Agricultural Plantation	902.47	2.71
6	Fallow Land	13177.96	39.63
FOREST			
7	Forest Plantation	686.58	2.06
BARREN/WASTELAND			
8	Scrub Land	448.50	1.35
9	Barren Rocky	167.83	0.50

WATERBODIES			
10	Waterbodies	548.98	1.65
		33254.89	100.00

Source: USGS-Earth Explorer, LU/LC Map for Buffer Zone.

FIGURE 3.1: BAR DIAGRAM OF LAND USE AND LAND COVER IN STUDY AREA



From the above table and bar diagram, it is inferred that the majority of the land in the study area is Crop and fallow land 81.76 % followed by Built-Up land 11.41%, Scrub land 0.53%. The total mining area within the study area is 655.09 ha i.e., 2.01 %. The cluster area of 7.34.0 ha contributes about 1.12 % of the total mining area within the study area. This percentage of Mining Activities shall not have any significant impact on the environment.

FIGURE 3.2: LAND USE LAND COVER MAP 10KM RADIUS

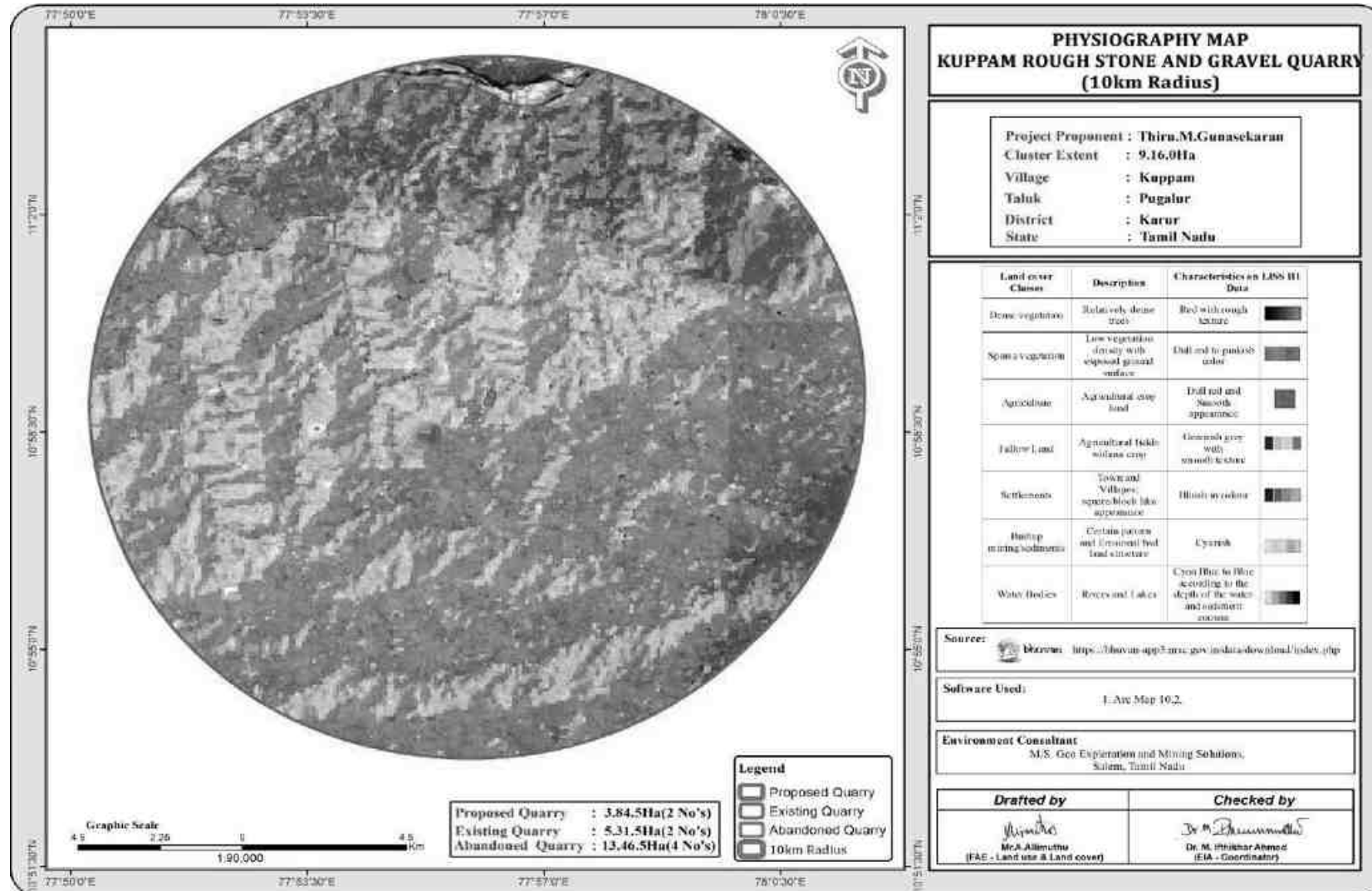
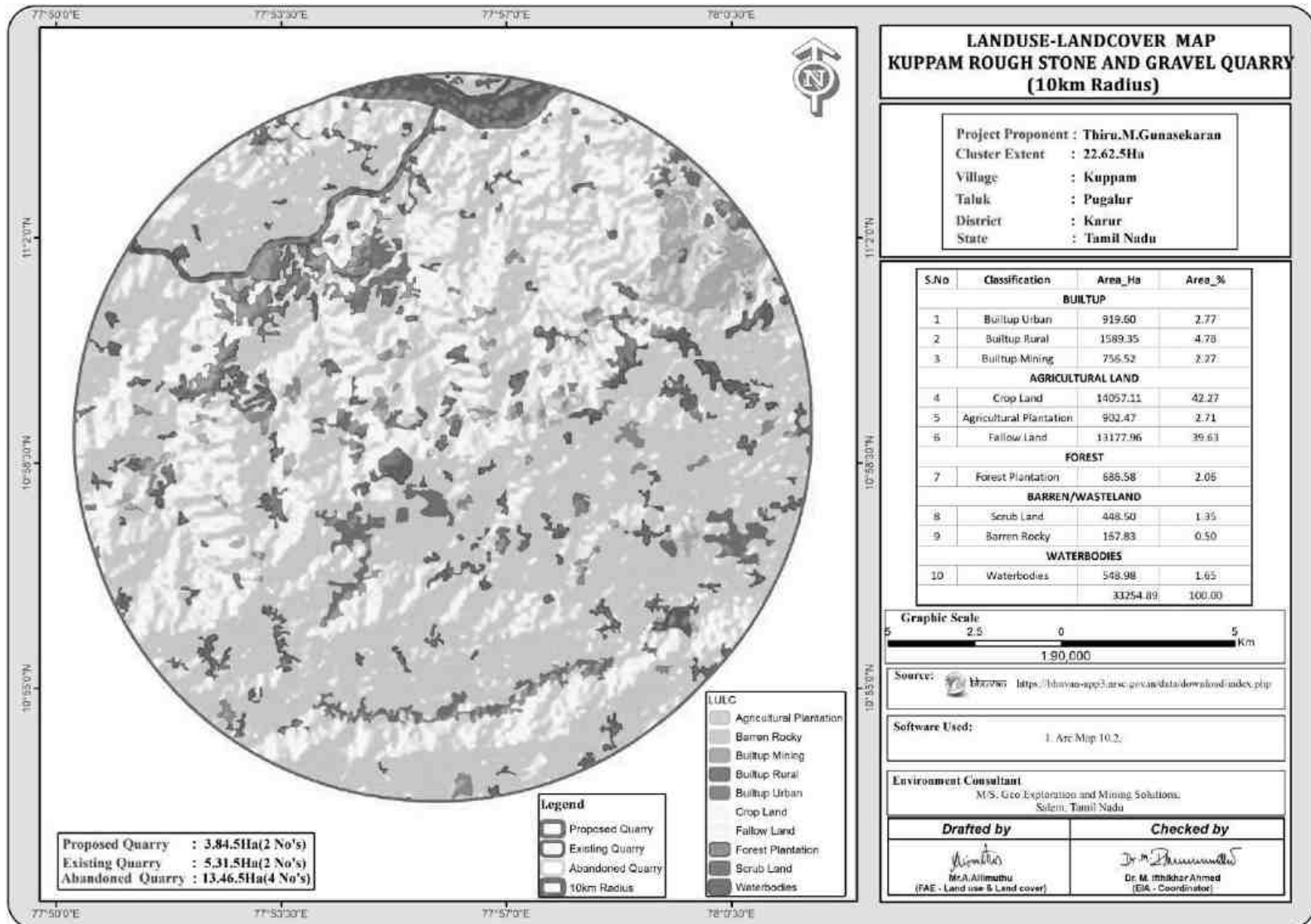


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS



3.1.4 Interpretation

- ☞ The 10 km radius study area mainly comprises of crop land & Agriculture Plantation land accounting of 42.27% & 2.71% of the total study area. The study area also consists of fallow land of 39.63%.
- ☞ The buffer zone studied has no ecological sensitive area (National Park, Wildlife Sanctuary, Biosphere Reserve/ etc.).
- ☞ Water Bodies such as ponds/ lakes comprises of 1.65% of the total buffer area. The two seasonal rivers such as Kaveri river at 9Km in N direction, Thathampalayam Lake 8.5km in E and Aathupalayam dam at 9.5km in NW direction of the total study area.
- ☞ The Scrub land accounts of 1.35%. As per the primary survey, it was observed the scrub land is mainly occupied by the stony waste and left-over domestic waste generated by the nearby areas.
- ☞ 2.27% of the total study area is occupied by mines. The area occupied by Mainly Roughstone and gravel of the total buffer area. As also observed within the primary survey, the 10 km buffer area is also occupied by the medium scaled granite and small Brick kiln industries also located in the study area.
- ☞ 7.5% of the area is covered under the Builtup Land. The nearest village within the 3 km radius from the project site boundary is observed to be villages Kuppam, Salipalayam, Karudayampalayam, K. Paramathi etc.,

3.1.5 Cropping Pattern of the Buffer Zone

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

Horticultural area of the Karur district was 16000.00 Ha. In general, Karur district has specifically known for Moringa and Banana cultivation and other prominent crops under cultivation are Tapioca, Gloriosa, Betelvine, Jasmine, Ixora, Coconut and other vegetable crops. Thanthoni, Pugalur, Kadavur and K. Paramathy were major vegetable growing region and Thogamalai, Krishnarayapuram, Kulithalai were major Banana growing region and Karur block was major Coconut growing region. State Horticulture Farms was located on Mudalaipatti, Thogamalai block where Quality Planting materials are produced. Source: <https://karur.nic.in/departments/department-of-horticulture-and-plantation-crops/>

3.1.6 Interpretation and Conclusion

- ☞ Kuppam village Roughstone and gravel quarry has proposed Project. It is a Patta land.
- ☞ Total project area is 33254..89 ha around 10km radius.
- ☞ As new Proposed mine is coming in the area, percentage of human settlement will be increased in surrounding of project site and Infrastructure facilities also will be developed on the basis of requirement.
- ☞ The 10 km study area mostly covers of crop land 42.27%. As per current study area is occupied by scrub land 1.35%, Barren rocky land 0.50% in 10 km radius from the study area land use into quarrie purpose for this proposed project.
- ☞ The project site falls under the Roughstone and gravel region. Therefore, the area is appropriate for developing Road development and building etc., it shows that the region has good prospects in the future. Due to proposed Roughstone in this region, economic condition of locals is expected to be improved directly & indirectly. Hence project will prove to be the best economic proposal for the coming times.

3.1.5 Topography

The lease applied area exhibits plain terrain. The area has gentle sloping towards Southern side. The altitude of the area is 179m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation.

3.1.6 DIGITAL ELEVATION MODEL

Digital Elevation Model (DEM) has been prepared for the project at Kuppam Village, Pugalur Taluk, Karur District for a 10 km radius study area.

Data Used

- ∞ DEM Data : SRTM (DEM) -1ArcSecond-90m Resolution
- ∞ Data Source : <https://urs.earthdata.nasa.gov/>
- ∞ Software Used : Arc GIS 10.8

Methodology

SRTM (DEM) data has been used for the creation of the Digital Elevation Model of the study area. IRS Satellite-derived DEM with 30m or coarser posting shall be made available as a free download. IRS Satellite-derived DEM less than 30m and more than 10m postings may be made available at par with the base price for all categories of users.

Source: <https://urs.earthdata.nasa.gov/>

1st Stage:

The first processing stage involves importing and merging the 7.5' x 7.5' tiles into continuous elevation surfaces in DEM format.

2nd Stage:

Re-sampling the data at 15 m is done and a contour interval of 10 m through the usual process of interpolation is created.

3rd Stage:

DEM data is converted in grid format through Arc GIS 10.8 to obtain elevation information of the study area. Contours are then generated at 10 m intervals through spatial analysis of Arc GIS and with SRTM DEM data.

4th Stage:

Integration of DEM with contour map showing spatial analyst is done.

The Digital Elevation Model (DEM) of the Study Area with Contour Map DEM is given in Figure - 3.3.

Slope

The slope map was derived from SRTM DEM data of the study area. The slope of the study area was classified into four classes: less than 1Percent/degree Flat to almost flat, and no meaningful denudation process. 1 to 3 percent/degree gentle low speed ground motion, sheet erosion and soil rosion in the 3⁰ to 10⁰ more gentle the same as above but with a higher magnitude and slightly steep, a lot of ground movement and erosion especially landslides that are flat. Slope zone 5 class divide 0-07°, 0.7-1.2°, 1.2-3.6°, 3.6-9.9°, and above-10° (Fig.3.5)

Slope Class	Nature, Process and Natural Conditions
0 ⁰ - 2 ⁰ (0-2%)	Flat to almost flat, no meaningful denudation process
2 ⁰ - 4 ⁰ (2-7%)	Gentle, low-speed ground motion, sheet erosion and soil erosion (sheet & rill erosion), erosion swamps.
4 ⁰ - 8 ⁰ (7-15%)	More Gentle, the same as above, but with a higher magnitude.
8 ⁰ - 16 ⁰ (15-30%)	Slightly steep, a lot of ground movement and erosion, especially landslides that are flat.
16 ⁰ - 35 ⁰ (30-70%)	Steep, intensive denudation processes and ground movements are common.
35 ⁰ - 55 ⁰ (70-140%)	Very steep, rocks generally begin to unfold, a very intensive denudational process, have begun to produce rework material.
> 55 ⁰ >140%	Very steep, exposed rocks, a very strong denudational process and prone to falling rocks, rarely grown plants (limited)

Source: Calculation of this slope using van zuidam classification, 1985

Interpretation & Conclusion

It is very clear from the DEM that the elevation varies from 117m to 237m in the whole study area, thus having an elevation difference of 120m. The areas in the Northern, Wester portion have higher elevation which is covered by plain land while the low-lying areas are generally used for agricultural purpose with builtup land. The contour over the DEM shows that the project site is 180m-190m in the elevation range of 10 m interval present on the flat land in the study area.

FIGURE 3.4: DIGITAL ELEVATION MODEL OF THE STUDY AREA WITH CONTOUR MAP

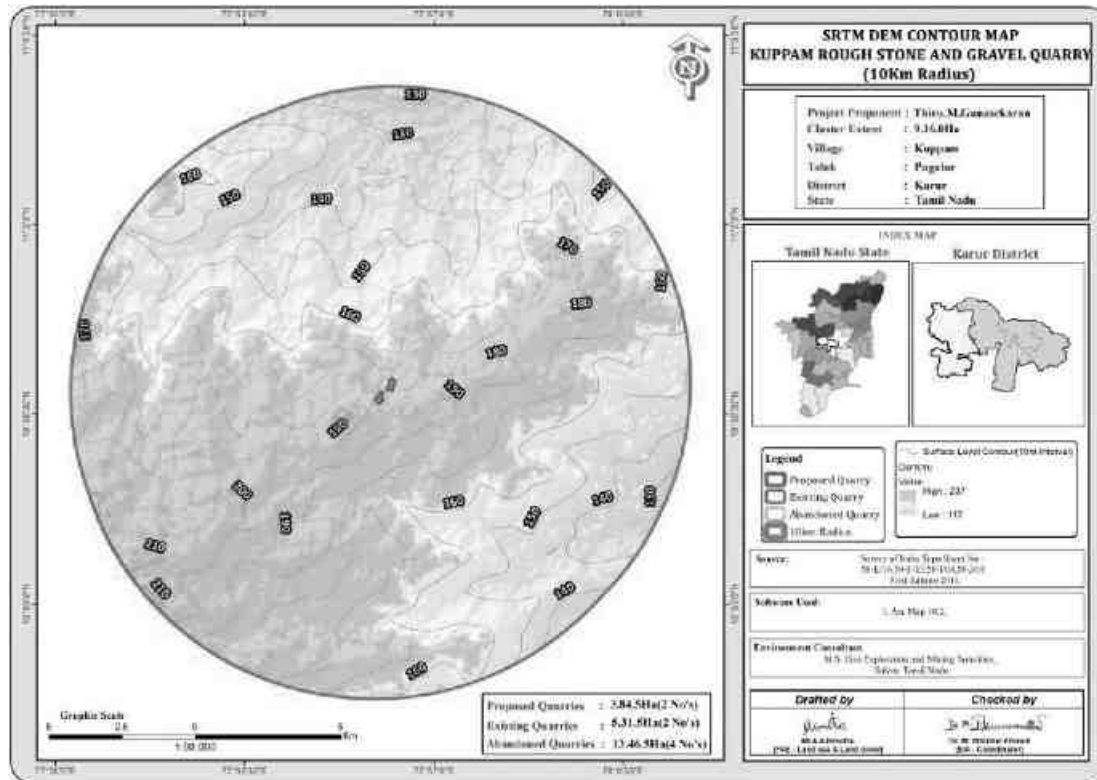
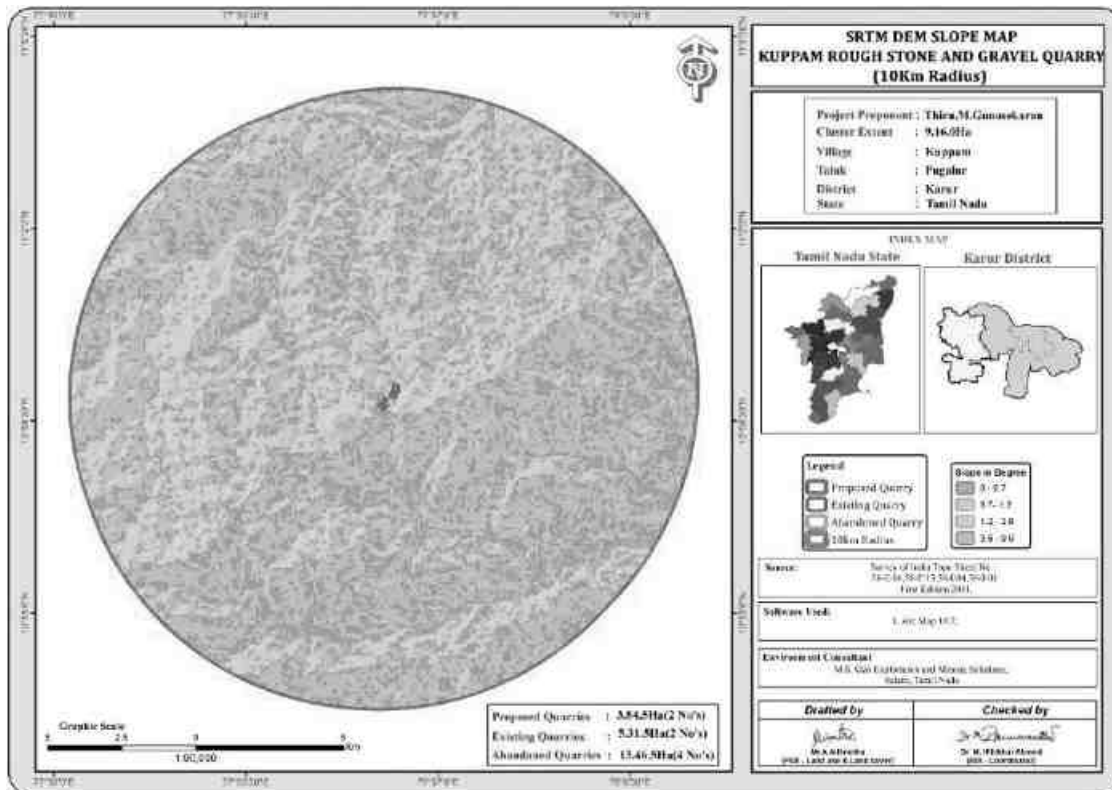


FIGURE 3.5: SLOPE MAP AROUND 10KM RADIUS



3.1.6 Drainage Pattern of the Area

Drainage pattern are created by stream erosion over time that reveals characteristics of the kind of rocks and geological structures in a landscape region drained by streams. Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. Dendritic patterns, which are by far the most common, develop in areas where the rock (or unconsolidated material) beneath the stream has no particular fabric or structure and can be eroded equally easily in all directions.

There are no streams, canals or water bodies crossing within the project area. The drainage pattern of the area is dendritic – sub dendritic.

3.1.8 Seismic Sensitivity

The proposed project site falls in the seismic Zone III, low damage risk zone as per BMTPC, Vulnerability Atlas of Seismic zone of India IS: 1893 – 2002. The project area falls in the hard rock terrain on the peninsular shield of south India which is highly stable.

3.1.9 Environmental Features in the Study Area

There is no Wildlife Sanctuaries, National Park and Archaeological monuments within cluster area. No Protected and Reserved orest area is involved in the cluster area. Therefore, there will be no need to acquisition/diversion of forest land. The details related to the environment sensitivity around the cluster area i.e., 10 km radius, are given in the below Table 3.3.

TABLE 3.4: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER

Sl.No	Sensitive Ecological Features	Name	Arial Distance in km from Cluster
1	National Park / Wild life Sanctuaries	None	Vellode Bird Sanctuary 42km-NW
2	Reserved Forest	Thathampalayam RF	8.0 km SW
3	Tiger Reserve/ Elephant Reserve/ Biosphere Reserve	None	Nil within 10Km Radius
4	Critically Polluted Areas	None	Nil within 10Km Radius
5	Mangroves	None	Nil within 10km Radius
6	Mountains/Hills	None	Nil within 10km Radius
7	Notified Archaeological Sites	None	Nil within 10km Radius
8	Industries/ Thermal Power Plants	None	Nil within 10km Radius
9	Defence Installation	None	Nil within 10km Radius

Source: Survey of India Toposheet

TABLE 3.5: NEARBY WATER BODIES FROM THE PROPOSED PROJECT SITE

S.No	LABEL	DISTANCE & DIRECTION
1	Thathampalayam Lake	8.5Km SE
2	Odai	7Km SE
3	Odai	6Km NW
	Kaveri Rver	9Km N

Source: Village Cadastral Map and Field Survey

3.1.10 Soil Environment

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 detailed in Table 3.5 and Figure 3.3.

The objective of the soil sampling is -

To determine the baseline soil characteristics of the study area the impact of proposed activity on soil characteristics and study the impact on soil more importantly agriculture production point of view.

TABLE 3.6: SOIL SAMPLING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	S-1	Core Zone	Project Area	10°58'53.86"N 77°56'1.22"E
2	S-2	Velayudampalayam	800m NW	10°59'8.13"N 77°55'35.01"E
3	S-3	Kuppam	3.5km NW	11° 0'42.46"N 77°55'32.24"E
4	S-4	Pavithram	6km SE	10°58'1.05"N 77°59'7.94"E
5	S-5	Pullaiyampalayam	4.5km NE	11° 0'1.88"N 77°58'14.68"E
6	S-6	Malapalayampudur	5km SE	10°56'36.93"N 77°57'31.07"E

Source: On-site monitoring/sampling by Laboratories in association with GEMS

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 by auger boring into the soil up to 90-cm depth. Six (6) 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 analysed for physical and chemical characteristics. The samples were sent to laboratory for analysis. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology in respect are given in below Table 3.6.

TABLE 3.7: METHODOLOGY OF SAMPLING COLLECTION

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 depths, and mixed to provide a representative sample for analysis. They were stored in airtight Polythene bags and analysed at the laboratory.

Source: On-site monitoring/sampling by Laboratories in association with GEMS

Soil Testing Result –

The samples were analysed 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 are bulk density, porosity, infiltration rate, pH and Organic matter, Nitrogen, Phosphorous and Potassium. The standard classifications of soil and physico-chemical characteristics of the soils are presented below in Table 3.6 & test Results in Table 3.7.

FIGURE 3.3: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS

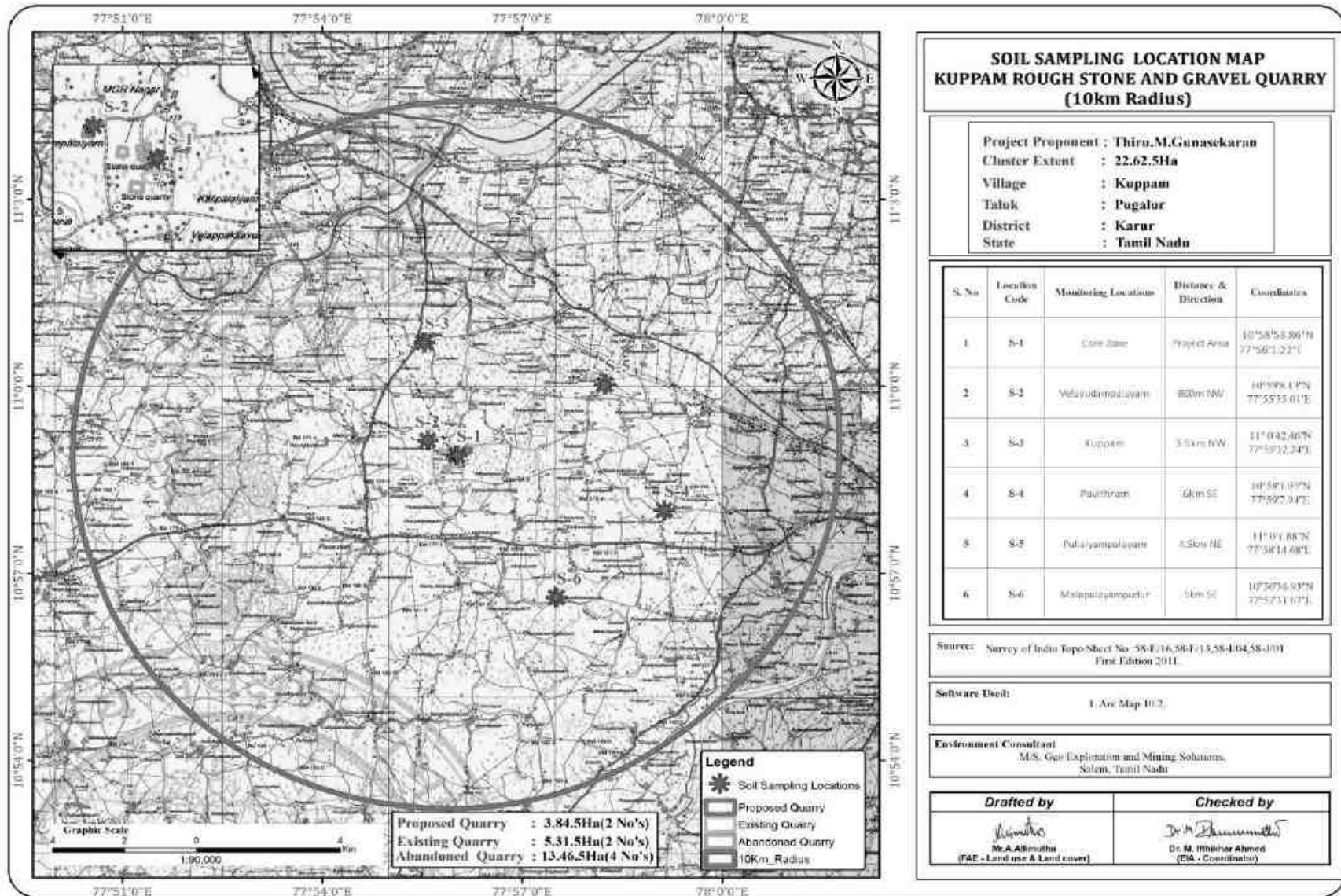


FIGURE 3.4: SOIL MAP

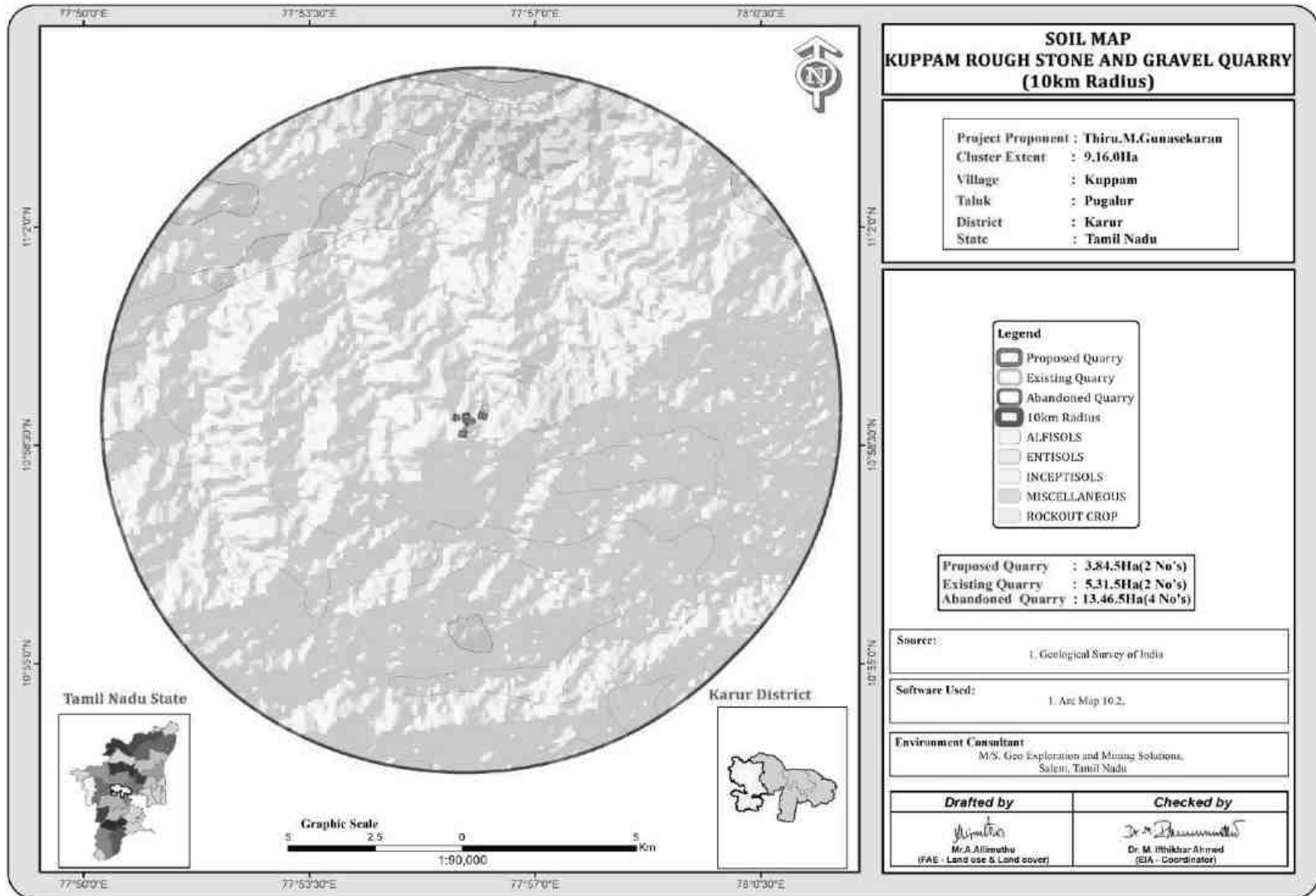


TABLE 3.8: SOIL QUALITY OF THE STUDY AREA

S.No	Parameters	Units	S1	S-2	S-3	S-4	S-5	S-6
1	pH at 27°C	-	8.23	8.54	8.43	7.89	8.07	8.57
2	Electrical Conductivity @25°C	µs/cm	421µmhos/cm	584 µmhos/cm	492 µmhos/cm	524 µmhos/cm	334 µmhos/cm	547 µmhos/cm
3	Texture	-	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Sandy Clay Loam
	Clay	%	32.7 %	34.2 %	35.8 %	34.6 %	37.1 %	37.8 %
	Sand	%	36.7 %	32.1 %	30.5 %	31.9 %	33.6 %	34.9 %
	Slit	%	30.6 %	33.7 %	33.7 %	33.5 %	28.3%	27.3 %
4	Water Holding Capacity	%	43.1 %	43.1%	45.6 %	46.5 %	45.7 %	412 %
5	Bulk Density	g/cc	1.09 g/cm ³	1.26 g/cm ³	1.28 g/cm ³	1.24 g/cm ³	1.16 g/cm ³	1.3 g/cm ³
6	Porosity	%	43.2 %	44.6 %	42.9 %	41.3 %	42.7 %	45.1 %
7	Exchangeable Calcium (as Ca)	mg/Kg	179 mg/kg	190 mg/kg	248 mg/kg	163.5 mg/kg	168 mg/kg	176.8 mg/kg
8	Exchangeable Magnesium (as Mg)	mg/Kg	83.6 mg/kg	79.2 mg/kg	88.7 mg/kg	79.8 mg/kg	71.2 mg/kg	91.4 mg/kg
9	Exchangeable Manganese (as Mn)	mg/Kg	28 mg/kg	24.6 mg/kg	27.9 mg/kg	22.3 mg/kg	28.5 mg/kg	19.8 mg/kg
10	Exchangeable Zinc as Zn	mg/Kg	1.01 mg/kg	1.4 mg/kg	2.7 mg/kg	3.02 mg/kg	1.98 mg/kg	1.24 mg/kg
11	Available Boron (as B)	mg/Kg	1.2mg/kg	1.6 mg/kg	1.7 mg/kg	1.5 mg/kg	1.35mg/kg	1.9mg/kg
12	Soluble Chloride (as Cl)	mg/Kg	128 mg/kg	216 mg/kg	137mg/kg	142 mg/kg	139 mg/kg	137 mg/kg
13	Soluble Sulphate (as SO ₄)	mg/Kg	0.018 %	0.022 %	0.021 %	0.023 %	0.021 %	0.026 %
14	Available Potassium (as K)	mg/Kg	31.2 mg/kg	39.7 mg/kg	48.4 mg/kg	37.4 mg/kg	39.6 mg/kg	39.8 mg/kg
15	Available Phosphorous (as P)	Kg/hect	1.7 mg/kg	2.07 mg/kg	1.47 mg/kg	1.47 mg/kg	1.47 mg/kg	1.58 mg/kg
16	Available Nitrogen (as N)	Kg/hect	275 mg/kg	312 mg/kg	318 mg/kg	308 mg/kg	289 mg/kg	362 mg/kg
17	Cadmium (as Cd)	mg/Kg	BDL (DL:1.0)					
18	Chromium (as Cr)	mg/Kg	BDL (DL:1.0)					
19	Copper (as Cu)	mg/Kg	BDL (DL:1.0)					
20	Lead (as Pb)	mg/Kg	0.6 mg/kg	1.4 mg/kg	0.79 mg/kg	1.07 mg/kg	0.5 mg/kg	37.8 %
21	Total Iron	mg/Kg	2.12 mg/kg	1.89 mg/kg	2.74 mg/kg	2.56 mg/kg	2.97 mg/kg	34.9 %
22	Organic Matter	%	1.94 %	3.22 %	3.03 %	2.43 %	3.20 %	27.3 %
23	Organic Carbon	%	1.13 %	1.87 %	1.76 %	1.41 %	1.86 %	412 %
24	CEC	meq/100g	37 meq/100g of soil	38.9 meq/100g of soil	39.7 meq/100g of soil	37.8 meq/100g of soil	42.7 meq/100g of soil	1.3 g/cm ³

Source: Sampling Results by Laboratories

Interpretation & Conclusion

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay Loam Soil 32.7-37.8 and Bulk Density of Soils in the study area varied between 1.09– 1.28 g/cc. The Water Holding Capacity 43.1-412% and Porosity of the soil samples is found to be medium i.e. ranging from 41.3 – 45.1 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 7.89 to 8.57
- The available Nitrogen content range between 275to 362kg/ha
- The available Phosphorus content range between 1.47 to 2.07 kg/ha
- The available Potassium range between 31.2 to 48.4 mg/kg

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 water quality characteristics for critical parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity. The water samples were collected and transported as per the norms in pre-treated sampling cans to laboratory for analysis.

3.2.1 Surface Water Resources:

The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

S.No	LABEL	DISTANCE & DIRECTION
1	Odai	440m SE
2	Odai	2.2km NE
3	Amaravathi River	7km SW

3.2.2 Ground Water Resources:

In view of the comparatively high level of ground water development in the major part of the district and the quality problems due to lithogenic and anthropogenic factors, it is necessary to exercise caution while planning further development of available ground water resources in the district. The development of ground water for irrigation in the district is mainly through dug wells tapping the weathered residuum. The yields of dug wells are improved at favorable locations by construction of extension bores, which are 50 to 100m. deep. Bore wells have also become popular as the source for irrigation in the district in recent years. Dug wells with extension bores wherever necessary is ideal for hard rock areas whereas large diameter dug wells with radial well is suitable for alluvial areas.

3.2.3 Methodology

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

- Drainage pattern;
- Location of Residential areas representing different activities/likely impact areas; and

- Likely areas, which can represent baseline conditions

One (1) surface water and Five (5) ground water samples were collected from the study area and were analysed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on surface and 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 water sampling locations are given in Table 3.8 and shown as Figure 3.6.

TABLE 3.9: WATER SAMPLING LOCATIONS

S. No	Location code	Monitoring Locations	Distance & Direction	Coordinates
1	SW-1	Noyyal River	6.8km NW	11° 2'5.06"N 77°54'3.63"E
2	WW-1	Near Project Area	300m SW	10°58'48.74"N 77°55'46.46"E
3	WW-2	Pavithram	5.5km SE	10°58'6.07"N 77°59'2.35"E
4	BW-1	Near Project Area	240m SW	10°58'45.15"N 77°55'49.81"E
5	BW-2	Pullaiyampalayam	4.5km NE	11° 0'5.44"N 77°58'17.06"E
6	BW-3	Malapalayampudur	4.8km SE	10°56'38.94"N 77°57'29.80"E

Source: On-site monitoring/sampling by Laboratories in association with GEMS

FIGURE 3.5: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS

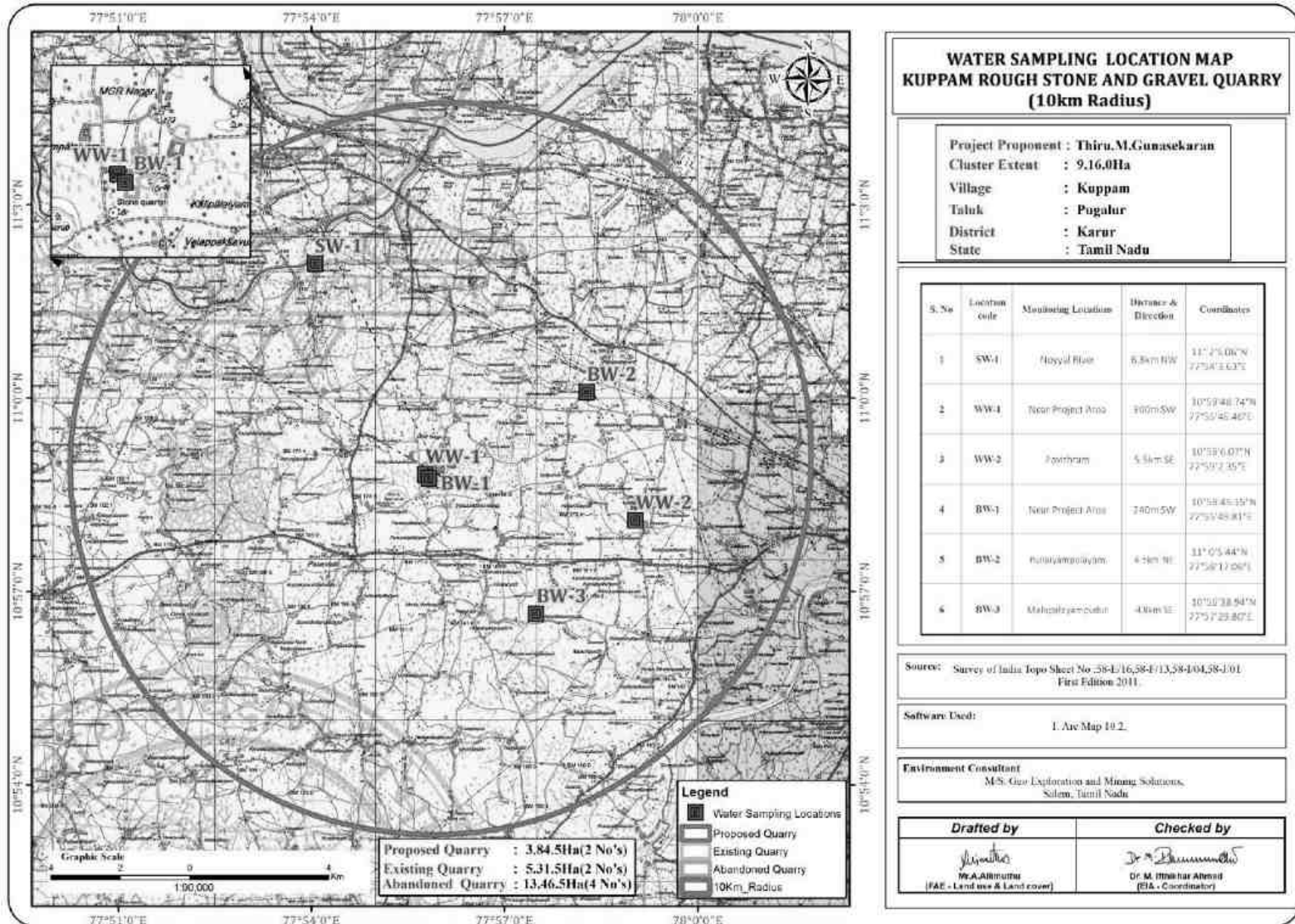


TABLE:3.10 GROUND WATER SAMPLING RESULTS

S.No	Parameters	Units	RESULTS					Standards as Per IS 10500: 2012	
			BW3	WW1	WW2	BW1	BW2	Acceptable limit	Permissible limit
1	Color	Hazen	< 5	< 5	< 5	< 5	< 5	5	5
2	Odour	-	Agreeable					Agreeable	Agreeable
3	Taste	-	Agreeable					Agreeable	Agreeable
4	pH@ 25°C	-	7.36	7.22	7.62	7.71	7.87	6.5-8.5	6.5-8.5
5	Electrical Conductivity @ 25°C	µs/cm	1125	884	1161	1127	873 µmhos/cm	Not specified	Not specified
6	Turbidity	NTU	1.7 NTU	2.2 NTU	2.3 NTU	2.7 NTU	2.9 NTU	1	1
7	TDS	mg/l	664 mg/l	521 mg/l	685 mg/l	665 mg/l	515 mg/l	500	500
8	Total Hardness	mg/l	252 mg/l	216 mg/l	240 mg/l	252 mg/l	208 mg/l	200	200
9	Calcium as Ca	mg/l	59.3 mg/l	46.5 mg/l	51.3 mg/l	54.5 mg/l	44.8 mg/l	75	75
10	Magnesium as Mg	mg/l	25.3 mg/l	24.2 mg/l	27.2 mg/l	28.2 mg/l	23.3 mg/l	30	30
11	Total Alkalinity	mg/l	224mg/l	172 mg/l	224mg/l	228 mg/l	188 mg/l	200	200
12	Chloride as Cl-	mg/l	176mg/l	148.6 mg/l	187.6 mg/l	166mg/l	135.6 mg/l	250	250
13	Sulphate as SO4-	mg/l	68.2 mg/l	48.9 mg/l	62.3mg/l	62.3 mg/l	56.8 mg/l	200	200
14	Iron as Fe	mg/l	0.28 mg/l	0.45 mg/l	0.32 mg/l	0.36 mg/l	0.49 mg/l	0.3	0.3
15	Free Residual Cl	mg/l	BDL (DL:0.1 mg/l)					BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
16	Fluoride as F	mg/l	0.34 mg/l	0.38 mg/l	0.41mg/l	0.54 mg/l	0.34 mg/l	1.0	1.0
17	Nitrates as NO3	mg/l	6.2 mg/l	9.6 mg/l	8.6mg/l	6.3 mg/l	9.7 mg/l	45	45
18	Copper as Cu	mg/l	BDL (DL:0.01)					0.05	0.05
19	Manganese as Mn	mg/l	BDL(DL:0.02)					0.1	0.1
20	Mercury as Hg	mg/l	BDL (DL:0.02)					0.001	0.001
21	Cadmium as Cd	mg/l	BDL(DL:0.0005)					0.003	0.003
22	Selenium as Se	mg/l	BDL(DL:0.005)					0.01	0.01
23	Aluminium as Al	mg/l	BDL(DL:0.005)					0.03	0.03
24	Lead as Pb	mg/l	BDL(DL:0.005)					0.01	0.01
25	Zinc as Zn	mg/l	BDL(DL:0.05)					5	5
26	Total Chromium	mg/l	BDL(DL:0.02)					0.05	0.05
27	Boron as B	mg/l	BDL (DL:0.05)					0.5	0.5
28	Mineral Oil	mg/l	BDL (DL:0.01)					0.5	0.5
29	Phenolic Compounds	mg/l	BDL (DL:0.0005)					0.001	0.001
30	Anionic Detergents	mg/l	BDL (DL:0.01)					0.2	0.2
31	Cyanide as CN	mg/l	BDL (DL:0.01)					0.05	0.05
32	Total Coliform	MPN/100ml	228 MPN/100ml					Shall not be detectable in any100 ml	Shall not be detectable in any100 ml
33	E-Coli	100ml	< 1.8 MPN/100ml						
34	Barium as Ba	mg/l	BDL (DL:0.05)					0.7	0.7
35	Ammonia	mg/l	BDL (DL:0.01)					0.5	0.5
36	Sulphide as H ₂ S	mg/l	BDL(DL:0.01)					0.05	0.05
37	Molybdenum	mg/l	BDL (DL:0.02)					0.07	0.07
38	Total Arsenic	mg/l	BDL(DL:0.005)					0.01	0.01
39	Total Suspended Solids	Mg/l	BDL(DL:1.0)					-	-

* 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: SW - Surface water, GW – Ground water

TABLE: 3.11: SURFACE WATER SAMPLING RESULTS

Sl. No.	Parameter	Unit	RESULT	CPCB Designated Best Use
			SW1	
1	Color	Hazen	6	300
2	Odour	-	Agreeable	Not specified
3	Taste	-	Agreeable	Not specified
4	pH@ 25°C	-	7.83	6.5 – 8.5
5	Electrical Conductivity @ 25°C	µs/cm	1034µmhos/cm	
6	Turbidity	NTU	4.2 NTU	Not specified
7	Total Dissolved Solids	mg/l	610 mg/l	1500
8	Total Hardness as CaCO ₃	mg/l	248 mg/l	Not specified
9	Calcium as Ca	mg/l	62.5 mg/l	Not specified
10	Magnesium as Mg	mg/l	22.3 mg/l	Not specified
11	Total Alkalinity as CaCO ₃	mg/l	218 mg/l	Not specified
12	Chloride as Cl ⁻	mg/l	110 mg/l	600
13	Sulphate as SO ₄ ⁻	mg/l	48.2 mg/l	400
14	Iron as Fe	mg/l	0.5 mg/l	50
15	Free Residual Chlorine	mg/l	BDL (DL:0.1 mg/l)	400
16	Fluoride as F	mg/l	0.41mg/l	1.5
17	Nitrates as NO ₃	mg/l	13.2 mg/l	50
18	Copper as Cu	mg/l	BDL (DL:0.01)	1.5
19	Manganese as Mn	mg/l	BDL (DL:0.02)	Not specified
20	Mercury as Hg	mg/l	(BDL (DL: 0.0005))	Not specified
21	Cadmium as Cd	mg/l	BDL (DL:0.001)	0.01
22	Selenium as Se	mg/l	BDL (DL: 0.005)	Not specified
23	Aluminium as Al	mg/l	BDL (DL: 0.005)	Not specified
24	Lead as Pb	mg/l	BDL (DL:0.01)	0.1
25	Zinc as Zn	mg/l	BDL (DL:0.05)	15
26	Total Chromium	mg/l	BDL (DL: 0.02)	0.05
27	Boron as B	mg/l	BDL (DL:0.05)	Not specified
28	Mineral Oil	mg/l	BDL (DL:0.01)	Not specified
29	Phenolic Compounds as C ₆ H ₅ OH	mg/l	BDL (DL:0.0005)	0.005
30	Anionic Detergents as MBAS	mg/l	BDL (DL:0.01)	Not specified
31	Cyanide as CN	mg/l	BDL (DL:0.01)	0.05
32	Biological Oxygen Demand, 3 days @ 27°C		8.2 mg/l	3
33	Chemical Oxygen Demand		28mg/l	Not specified
34	Dissolved Oxygen		5.9 mg/l	4
35	Total Coliform	MPN/ 100ml	1420 MPN/100ml	5000
36	E-Coli		132 MPN/100ml	Not specified
37	Barium as Ba	mg/l	BDL (DL:0.05)	300
38	Ammonia (as Total Ammonia-N)	mg/l	BDL (DL:0.01)	Not specified
39	Sulphide as H ₂ S	mg/l	BDL (DL:0.01)	Not specified
40	Molybdenum as Mo	mg/l	BDL (DL:0.02)	Not specified
41	Total Arsenic as As	mg/l	BDL (DL:0.005)	0.2
42	Total Suspended Solids	mg/l	27.6	-

3.2.4 Interpretation & Conclusion

Surface Water

Ph:

The pH 7.83 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solid 610 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 110 mg/l. Nitrates 13.2 mg/l, while sulphate 48.2 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.36 to 7.87 and within the acceptable limit of 6.5 to 8.5. PH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 515- 685mg/l in all samples. Total hardness varied between 208 – 252mg/l for all samples.

On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.2.5 Hydrology and Hydrogeological studies

The district is underlain by hard rock formation fissured and fractured crystalline rocks constitute the important aquifer systems in the district. Geophysical prospecting was carried out in that area by SSRMP-80 Instrument by qualified Geo physicist with the help of IGIS software and it was inferred that the low resistance encountered at the depth between 69-65m. The maximum depth proposed out of proposed project is 37m BGL. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area. There is no necessity of stream, channel diversion due to these proposed projects.

During the rainy season there is a possibility of collection of seepage water from the subsurface levels which will be collected and stored in the mine sump pits and will be used for dust suppression and greenbelt development and during the end of the life of the mine this collected water will act as a temporary reservoir.

TABLE 3.12: WATER LEVEL OF OPEN WELLS 1 KM RADIUS

S.No	LABEL	LATITUDE	LONGITUDE	MAR2023	APR2023	May2023
1	OW1	10° 58' 47.80"N	77° 55' 43.41"E	11	11.6	12.2
2	OW2	10° 58' 58.77"N	77° 55' 31.57"E	11.3	11.9	12.5
3	OW3	10° 59' 10.03"N	77° 55' 35.60"E	11.2	11.8	12.4
4	OW4	10° 59' 12.84"N	77° 55' 52.86"E	11.5	12.1	12.7
5	OW5	10° 59' 04.64"N	77° 56' 22.93"E	11.4	12	12.6
6	OW6	10° 58' 47.16"N	77° 56' 18.10"E	11.1	11.7	12.3
7	OW7	10° 58' 31.61"N	77° 56' 20.79"E	11.9	12.5	13.1
8	OW8	10° 58' 27.40"N	77° 56' 02.74"E	11.7	12.3	12.9
9	OW9	10° 58' 42.51"N	77° 55' 34.99"E	11.8	12.4	13
10	OW10	10° 58' 24.52"N	77° 55' 47.07"E	12	12.6	13.2

Source: Onsite monitoring data

TABLE 3.13: WATER LEVEL OF BOREWELLS 1 KM RADIUS

S.No	Name	LATITUDE	LONGITUDE	MAR	APR	May
1	BW1	10° 59' 07.22"N	77° 55' 32.94"E	56	56.6	57.2
2	BW2	10° 59' 20.41"N	77° 55' 39.01"E	56.2	56.8	57.4
3	BW3	10° 59' 16.94"N	77° 56' 01.79"E	56.1	56.7	57.3
4	BW4	10° 58' 55.58"N	77° 56' 31.06"E	56.4	57	57.6
5	BW5	10° 58' 32.01"N	77° 56' 22.61"E	56.3	56.9	57.5
6	BW6	10° 58' 20.70"N	77° 56' 02.41"E	56.9	57.5	58.1
7	BW7	10° 58' 28.90"N	77° 55' 38.24"E	56.7	57.3	57.9
8	BW8	10° 58' 48.83"N	77° 55' 41.25"E	56.5	57.1	57.7

Source: Onsite monitoring data

FIGURE 3.6: WATER LEVEL CONTOUR MAP OF OPEN WELLS 1 KM RADIUS – MARCH 2023

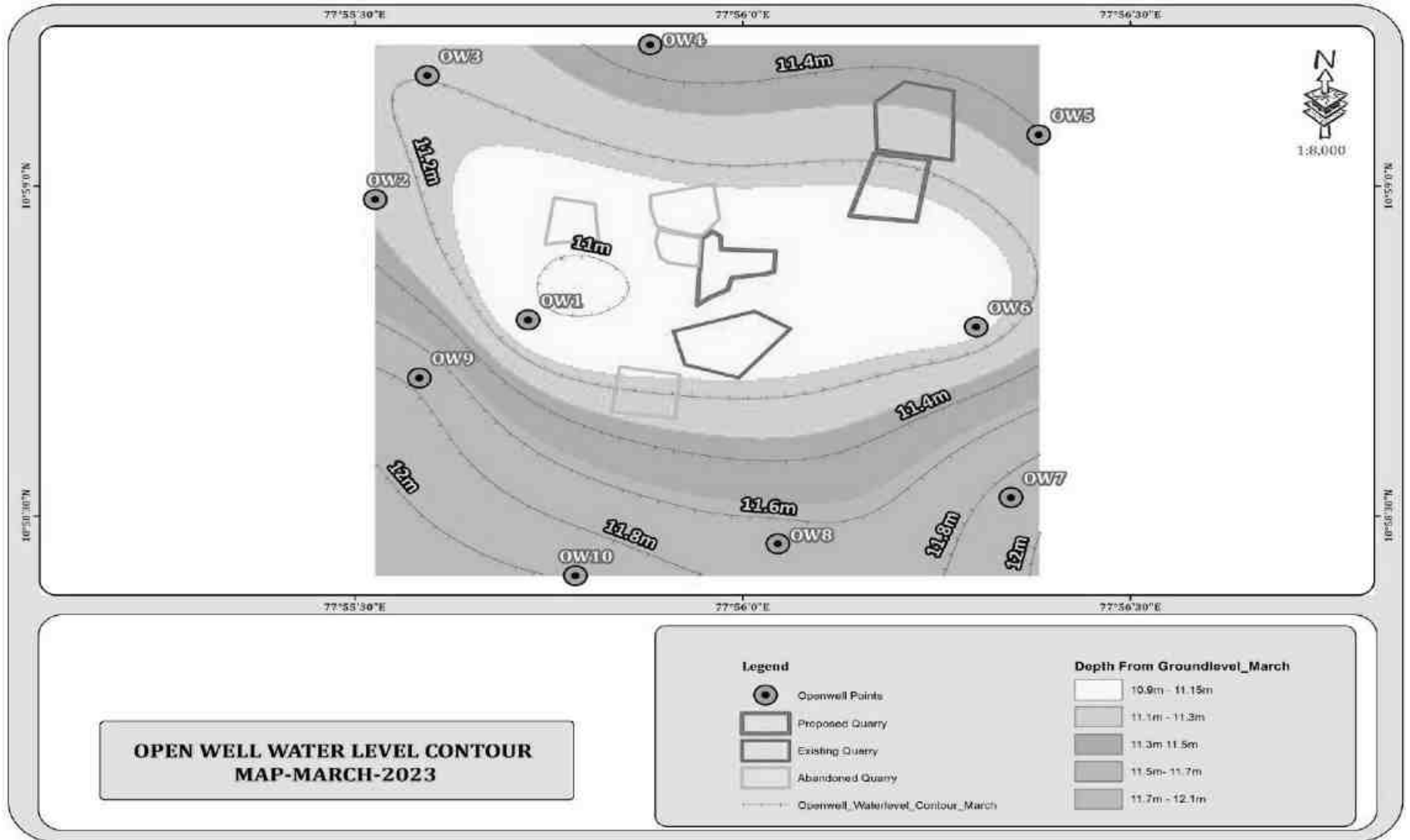


FIGURE 3.7: WATER LEVEL CONTOUR MAP OF OPEN WELLS 1 KM RADIUS – APRIL 2023

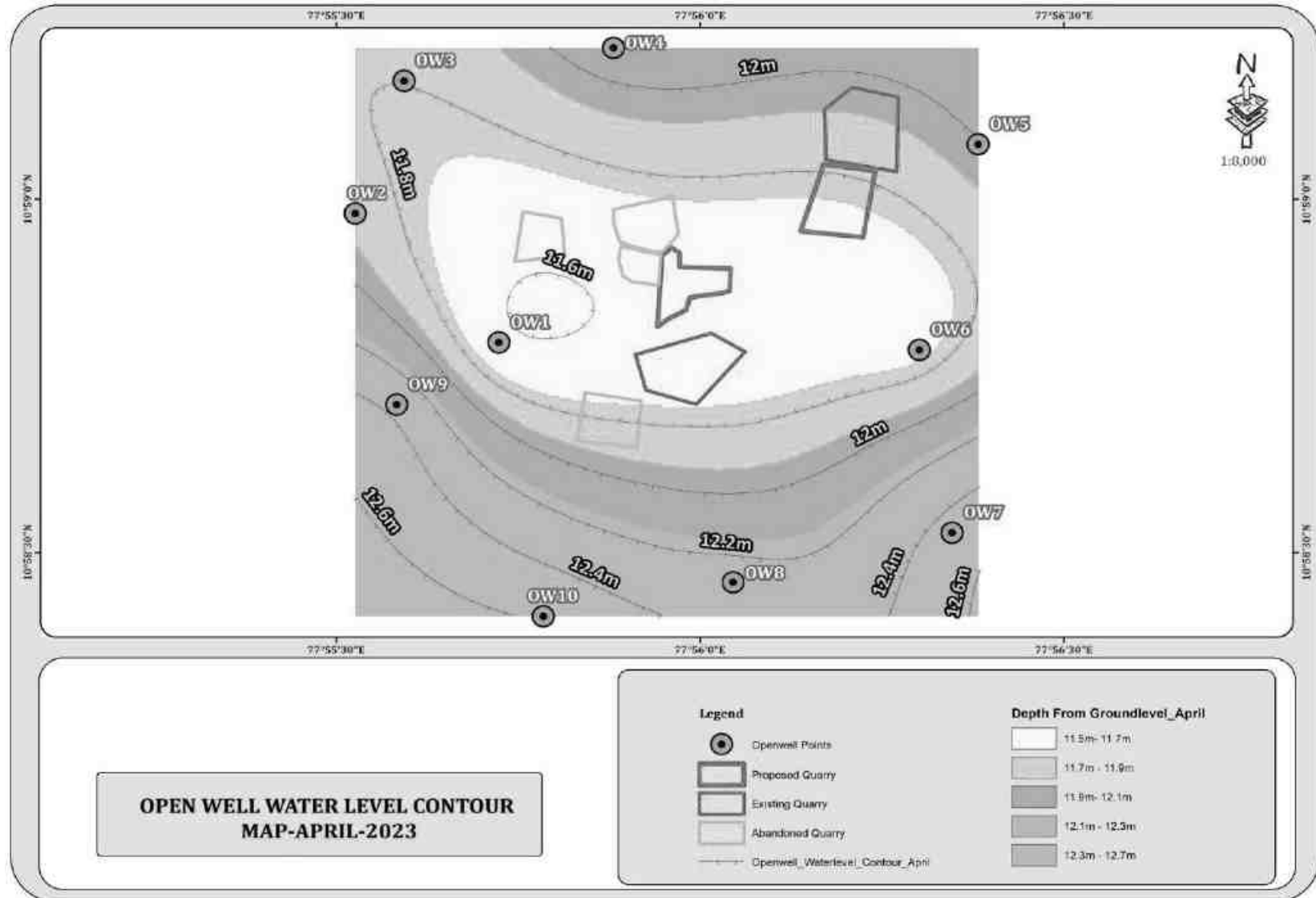


FIGURE 3.8: WATER LEVEL CONTOUR MAP OF OPEN WELLS 1 KM RADIUS – MAY 2023

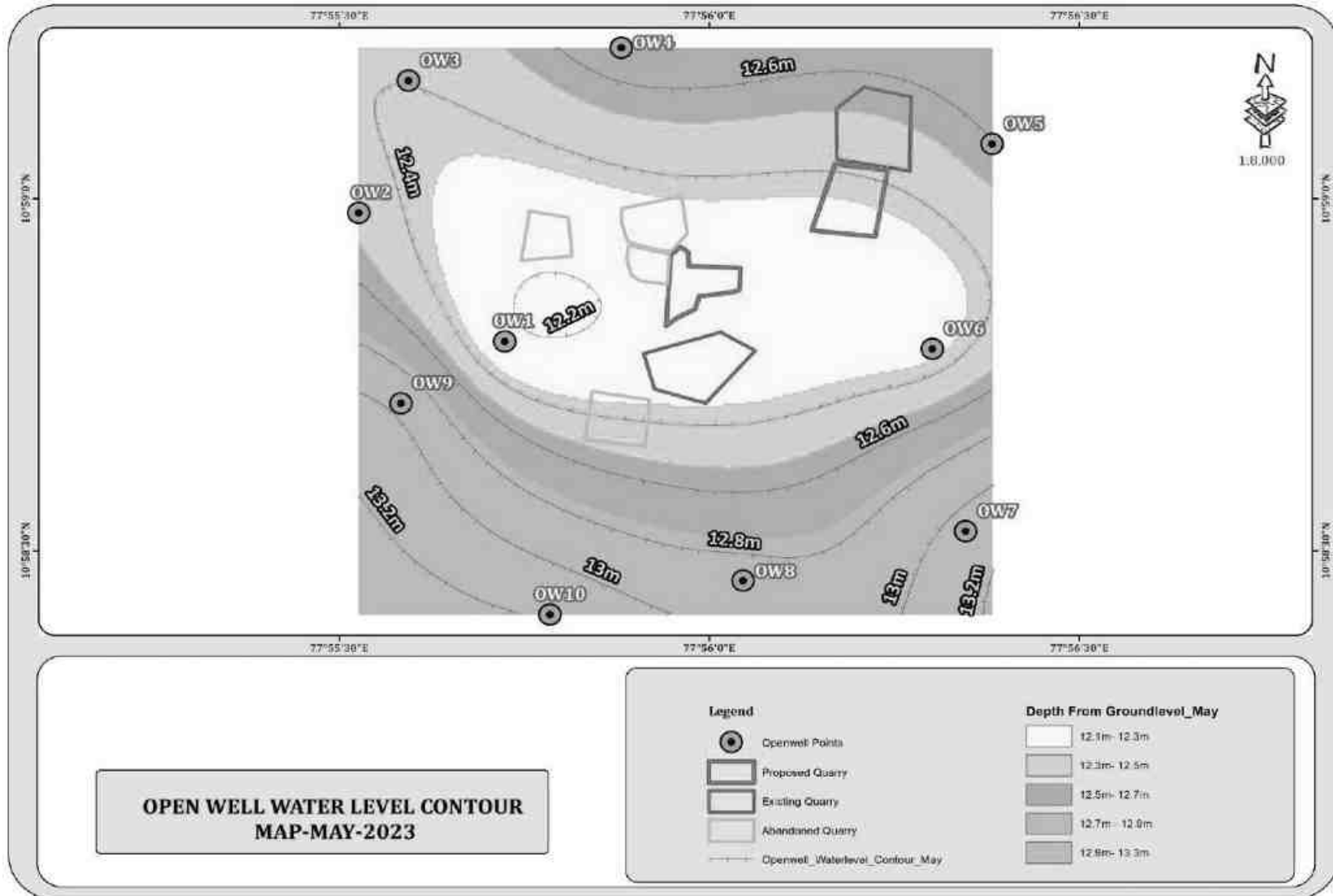


FIGURE 3.9: WATER LEVEL CONTOUR MAP OF BORE WELLS 1 KM RADIUS – MARCH 2023

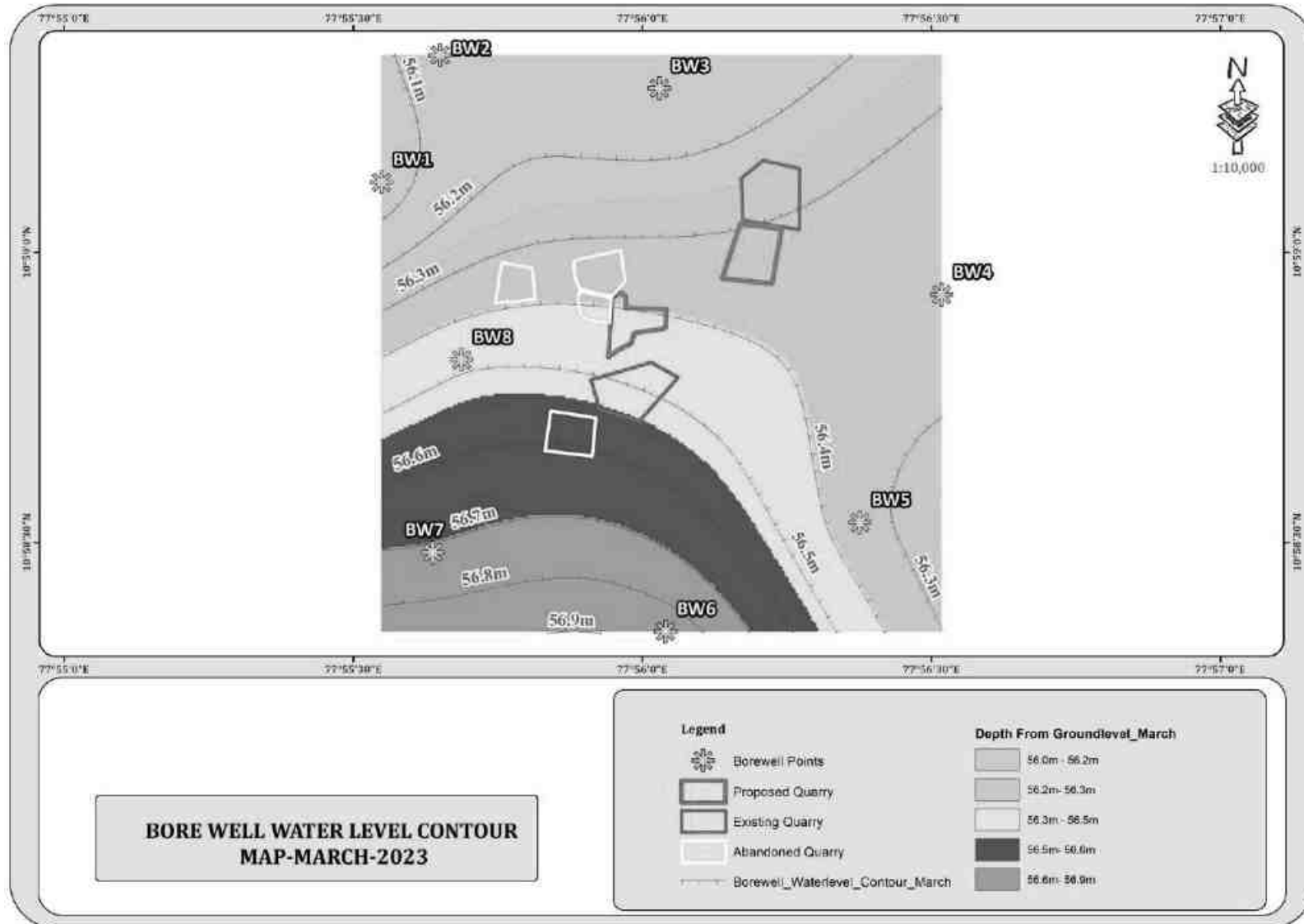


FIGURE 3.10: WATER LEVEL CONTOUR MAP OF BORE WELLS 1 KM RADIUS – APRIL 2023

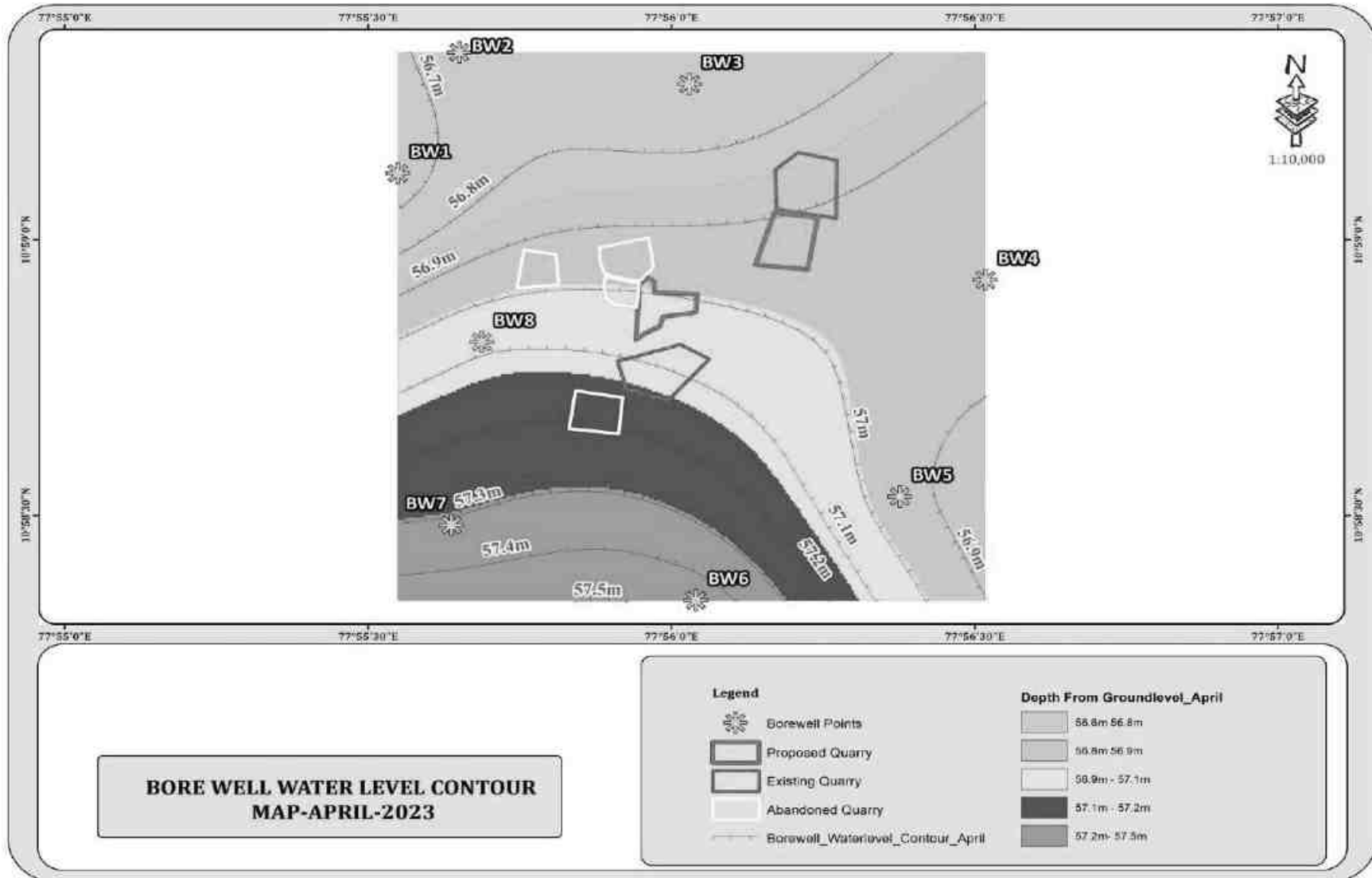


FIGURE 3.11: WATER LEVEL CONTOUR MAP OF BORE WELLS 1 KM RADIUS – MAY 2023

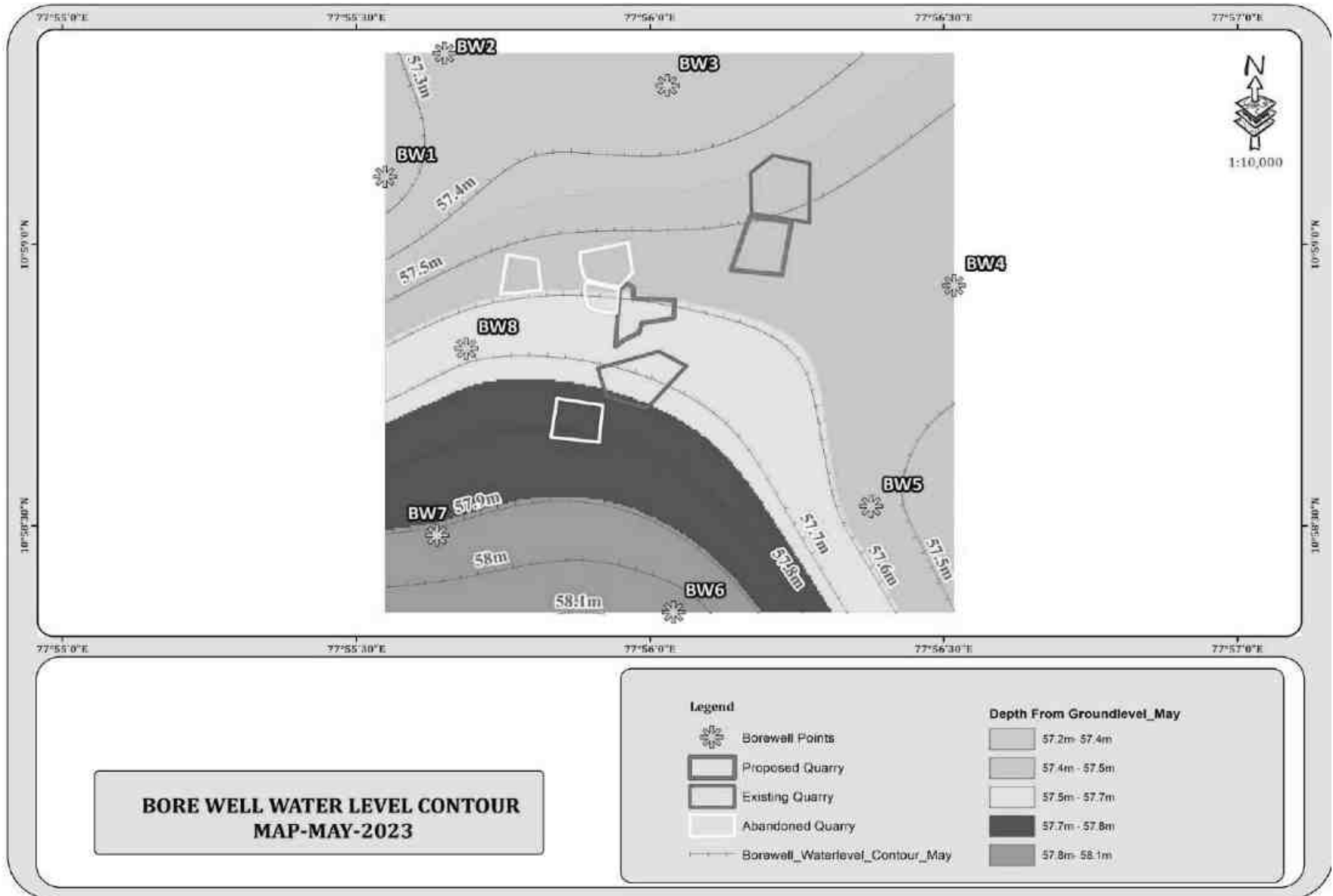


FIGURE 3.12: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE

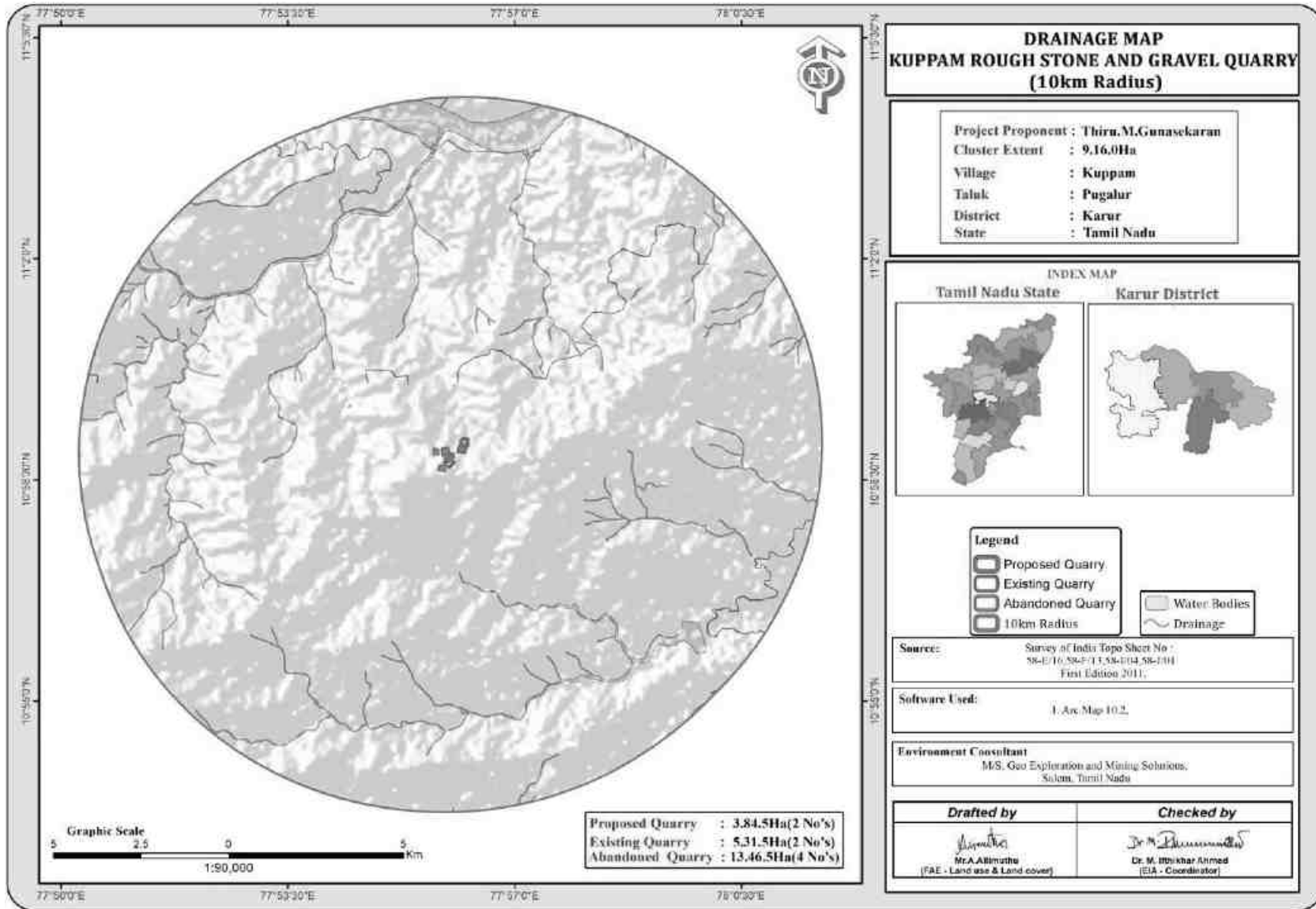
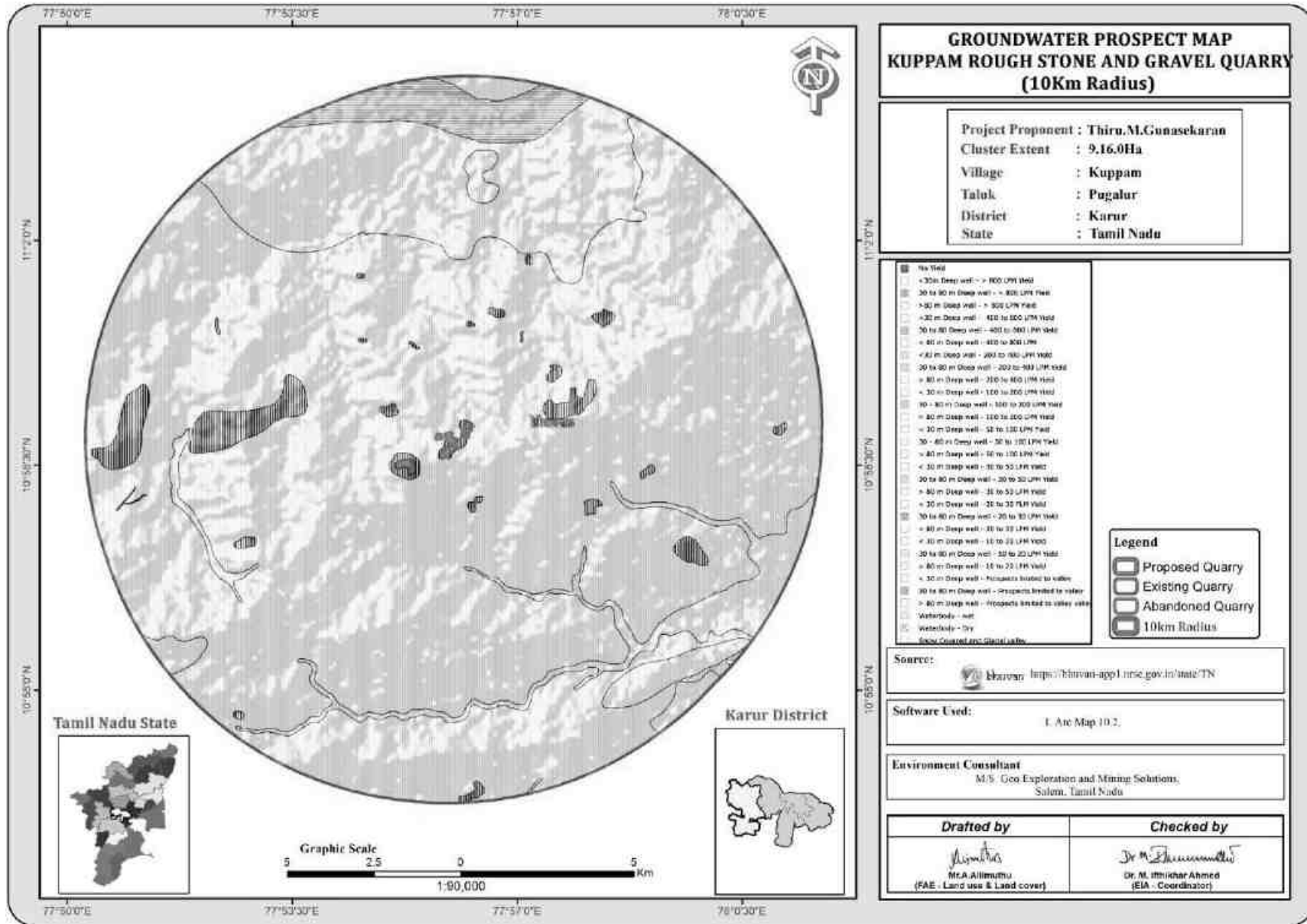


FIGURE 3.13: GROUND WATER PROSPECT MAP



3.2.5.1 Methodology and Data Acquisition

Electric Resistivity Method is well established for delineating lateral as well vertical discontinuities in the resistive structure of the Earth's subsurface. The present study makes use of vertical electric sounding (VES) to delineate the Vertical Resistivity structure at depth. Schlumberger electrode set up was employed for making sounding measurements. Since it is least influenced by lateral inhomogeneities and is capable of providing higher depth of investigation. This is four electrodes collinear set up where in the outer electrodes send current into the ground and the inner electrodes measure the potential difference.

The present study utilizes maximum current electrode separation $AB/2$. The data from this survey are commonly arranged and contoured in the form of Pseudo-section that gives an approximate of the subsurface resistivity. This technique is used for the inversion of Schlumberger VES data to predict the layer parameter namely layer resistivity and Geo electric layer thickness. The main goal of the present study is to search the vertical inhomogeneities that is consistent with the measured data.

For a Schlumberger among the Apparent resistivity can be calculated as follows

$$\rho_a = \frac{G\Delta V}{I}$$

ΔV = potential difference between receiving electrodes

G = Geometric Factor.

Rocks show wide variation in resistivity ranging from 10⁻⁸ more than 10⁺¹⁴ ohmmeter. On a broad classification, one can group the rocks falling in the range of 10⁻⁸ to 1 ohmmeter as good conductors. 1 to 10⁶ ohmmeter as intermediate conductors and 10⁶ to 10¹² ohmmeter as more as poor conductor. The resistivity of rocks and subsurface lithology, which is mostly dependent on its porosity and the pore fluid resistivity is defined by Archie's Law,

$$\rho_r = F\rho_w = a \emptyset^m \rho_w$$

ρ_r = Resistivity of Rocks

ρ_w = Resistivity of water in pores of rock

F = Formation Factor

\emptyset = Fractional pore volume

A = Constants with values ranging from 0.5 to 2.5

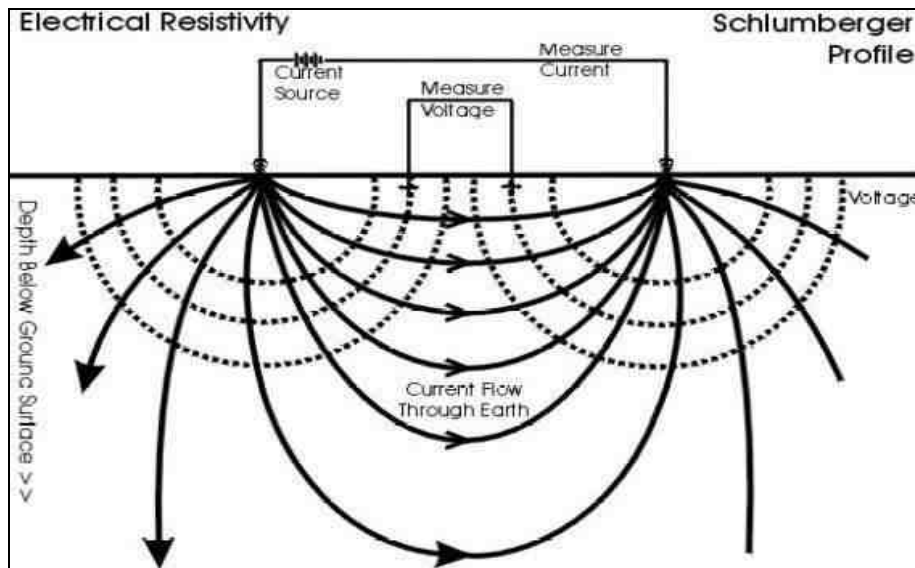
3.2.5.2 Survey Layout

The layout for a resistivity survey depends on the choice of the current and potential electrode arrangement, which is called electrode array. Here the present study is considered with Schlumberger array. In which the distance may be used for current electrode separation while potential electrode separation is kept on third to one fifth of the same. One interesting aspect in VES is the principle of reciprocity, which permits interchange of the potential and current electrode without any effect on the measured apparent resistivity.

The field equipment deployed for the study is in a deep resistivity meter with a model of SSR – MP – AT. This Signal stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for Earth resistivity. In the presence of random earth Noises the signal to noise ration can be enhanced by \sqrt{N} where N is the number of stacked readings. This SSR meter in which running averages of measurements [1, (1+2)/2, (1+2+3)/3 ... (1+2...+16/16)] up to the chosen stacks are displayed and the final average is stored automatically, in memory utilizing the principles of stacking to achieve the benefit of high signals to noise ratio.

Based on these above significations the signal stacking resistivity meter was used for (VES) Vertical Electric Resistivity Sounding.

RESISTIVITY SURVEY PROFILE



Measurements of ground Resistivity is essentially done by sending a current through two electrodes called current electrodes (C_1 & C_2) and measuring the resulting potential by two other electrodes called potential electrode (P_1 & P_2). The amount of current required to be sent into the ground depends on the contact resistance at the current electrode, the ground resistivity and the depth of interest.

3.2.5.3 Data Presentation

It was inferred that the low resistance encountered at the depth between 69-65m. The maximum depth proposed out of proposed projects is 37m BGL. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

3.2.5.4 Geophysical Data Interpretation

The geophysical data was obtained to study the lateral variations, vertical in homogeneities in the sub – surface with respect to the availability of groundwater. From the interpreted data, it has inferred that the area has moderate groundwater potential in the investigated area. This small quarrying operation will not have any significant impact on the natural water bodies.

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 10 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 projects in cluster.

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

3.3.1 Meteorology & Climate

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 project site by covering cluster quarries. The station was installed at a height of 3 m above the ground level in such a way that there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature are recorded on hourly basis.

Climate

- The climatic conditions of Karur are tropical in nature. In winter, there is much less rainfall than in summer. According to Köppen and Geiger, this climate is classified as Aw. The average temperature in Karur is 28.2 °C | 82.7 °F. The annual rainfall is 724 mm | 28.5 inch .
- The Karur is situated close to the equator, making summers difficult to define. The most popular time to visit is January, February, October, November, December.
- The driest month is January. There is 8 mm | 0.3 inch of precipitation in January. Most precipitation falls in October, with an average of 168 mm | 6.6 inch.
- With an average of 31.5 °C | 88.7 °F, April is the warmest month. In December, the average temperature is 24.9 °C | 76.7 °F. It is the lowest average temperature of the whole year.

<https://en.climate-data.org/asia/india/tamil-nadu/karur-24030/>

TABLE 3.14: RAINFALL DATA

Actual Rainfall in mm					Normal Rainfall in mm
2017	2018	2019	2020	2021	
715.3	468.4	524.5	684.2	919.8	628.9

Source: <https://www.twadboard.tn.gov.in/content/karur>

TABLE 3.15: METEOROLOGICAL DATA RECORDED AT SITE

S.No	Parameters		Mar-2023	Apr-2023	May-2023
1	Temperature (°C)	Max	31.83	34.43	30.71
		Min	25.48	29.14	26.04
		Avg	28.65	31.78	28.37
2	Relative Humidity (%)	Avg	56.43	51.59	79.31
3	Wind Speed (m/s)	Max	4.48	4.27	4.73
		Min	1.8	1.59	1.26
		Avg	3.14	2.93	2.99
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind Direction		ENE,SSE	SE,ESE	WSW,W

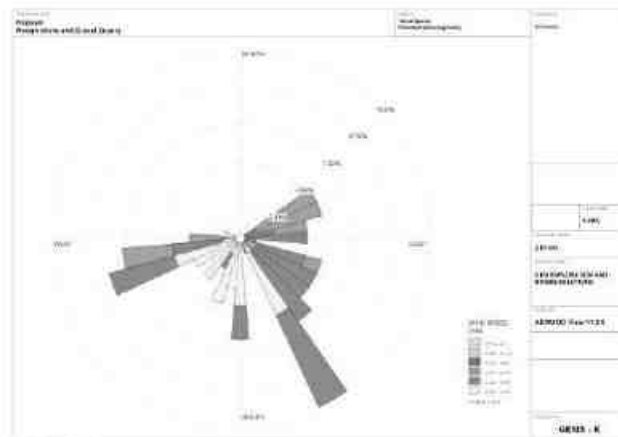
Source: On-site monitoring/sampling by EHS 360 Labs PVT LTD in association with GEMS

Correlation between Secondary and Primary Data

The meteorological data collected at the site is almost similar to that of secondary data collected from IMD Karur_Agro. A comparison of site data generated during the three months with that of IMD, Karur Agro reveals the following:

- The average maximum and minimum temperatures of IMD, Karur_Agro showed a higher in respect of on-site data i.e., in Nadanthai(North) village.
- The relative humidity levels were lesser at site as compared to IMD, Karur_Agro.
- The wind speed and direction at site shows similar trend that of IMD, Karur_Agro.

Wind rose diagram of the study site is depicted in Figure. 3.14. Predominant downwind direction of the area during study season is North-East to South West.

FIGURE 3.14: WINDROSE DIAGRAM

Source: Wind Rose plot view, Lake Environmental Software

In the abstract of collected data wind rose were drawn on presented in figure No.3.15 during the monitoring period in the study area

- Predominant winds were from ENE, SSE,SE,ESE.,
- Wind velocity readings were recorded between 0.00 to 3.60 m/s
- Calm conditions prevail of about 0.00 % of the monitoring period
- Temperature readings ranging from 25.48 to 34.43°C
- Relative humidity ranging from 51.59 to 79 %
- The monitoring was carried out continuously for three months

3.3.2 Methodology and Objective

The prime objective of the ambient air quality study is to assess the existing air quality of 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; etc.,

3.3.3 Sampling and Analytical Techniques

TABLE 3.16: METHODOLOGY AND INSTRUMENT USED FOR AAQ MONITORING

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 & Hochheiser modifiedmethod)	Respirable Dust Sampler with gaseous attachment
Free Silica	NIOSH – 7601	Visible Spectrophotometry

Source: Sampling Methodology followed by Laboratories & CPCB Notification

TABLE 3.17: NATIONAL AMBIENT AIR QUALITY STANDARDS

Sl. 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.* 24 hours**	50.0 80.0	20.0 80.0
2	Nitrogen Dioxide (µg/m ³)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	Particulate matter (size less than 10µm) PM ₁₀ (µg/m ³)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less	Annual Avg.	40.0	40.0

	than 2.5 μm PM _{2.5} ($\mu\text{g}/\text{m}^3$)	24 hours	60.0	60.0
--	---	----------	------	------

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

*Annual Arithmetic mean of minimum 104 measurements in a year taken twice a Week 24 hourly at uniform interval

** 24 hourly / 8 hourly or 1 hourly monitored value as applicable shall be complied with 98 % of the time in a year. However, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

3.3.4 Frequency & Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at eight (8) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October to December, 2022. The baseline data of ambient air has been generated for PM₁₀, PM_{2.5}, Sulphur Dioxide (SO₂) & Nitrogen Dioxide (NO₂) 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 0.5m above the ground level at each monitoring station, for negating the effects of wind-blown ground dust. The equipment was placed at open 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 (8) monitoring stations were set up in the study area as depicted in Figure 3.6.1 for assessment of the existing ambient air quality. Details of the sampling locations are as per given below.

TABLE 3.18: AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	AAQ-1	Core Zone	Project Area	10°54'40.47"N 77°52'36.47"E
2	AAQ-2	Nadanthai	1.4km North	10°55'27.41"N 77°52'35.36"E
3	AAQ-3	Koodalur	4.5km SW	10°54'7.59"N 77°50'09.85"E
4	AAQ-4	Soodamani	6km SE	10°51'46.64"N 77°54'18.13"E
5	AAQ-5	Thennilai	5.8km NW	10°56'46.43"N 77°50'13.57"E
6	AAQ-6	Nadanthai South	3.8km East	10°54'35.88"N 77°54'48.33"E
7	AAQ-7	Chinnathirumangalam	4.3km SW	10°52'47.93"N 77°51'04.48"E
8	AAQ-8	Semmandampalayam	4.8km NE	10°56'35.92"N 77°54'29.59"E

Source: On-site monitoring/sampling by Laboratories in association with GEMS

FIGURE 3.15: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS

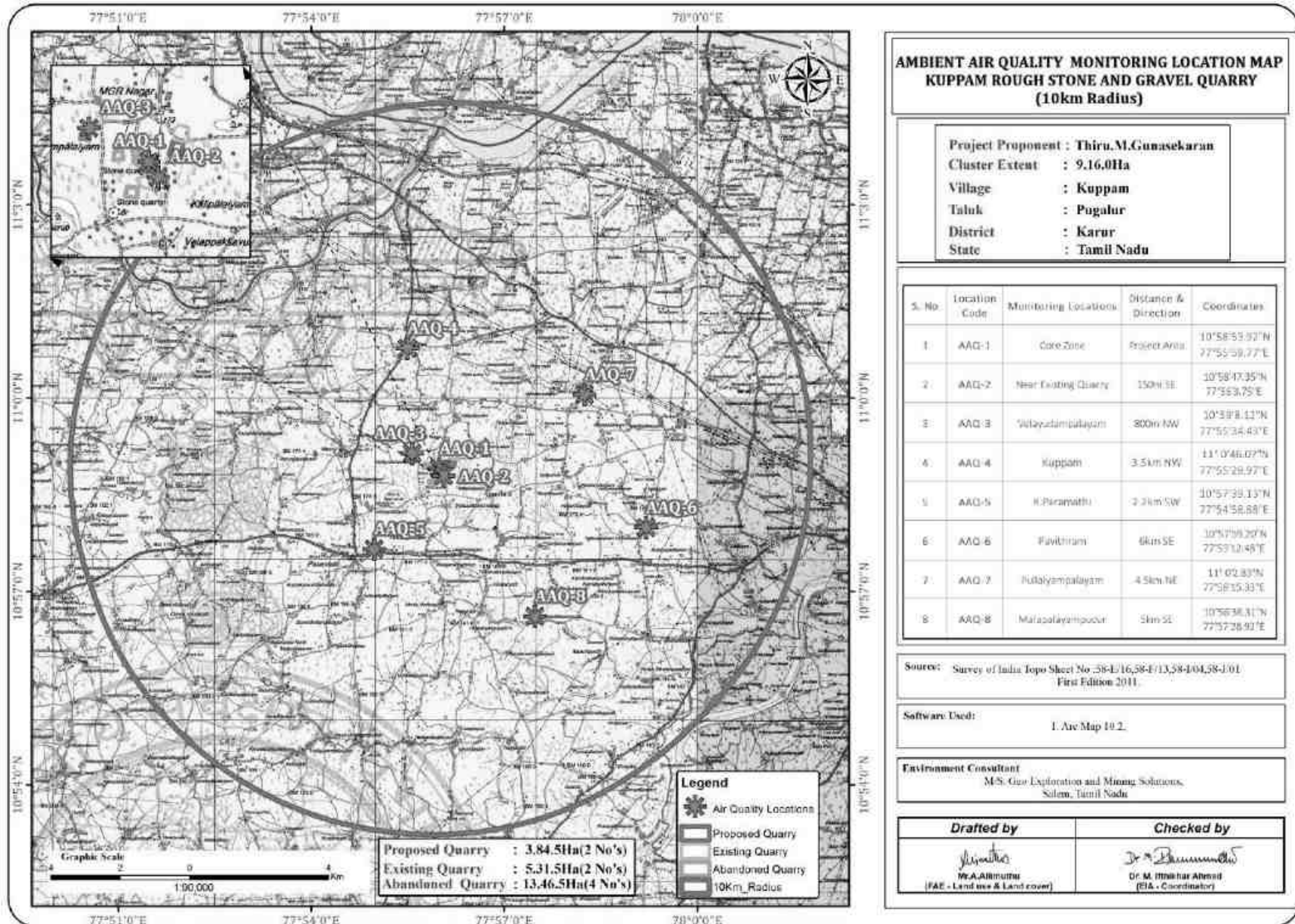


TABLE 3.19: AMBIENT AIR QUALITY DATA LOCATION AAQ1

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	58.0	43.1	24.3	6.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	56.2	42.1	22.1	7.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	57.3	45.6	23.6	8.1	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	55.0	46.3	24.5	6.0	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	59.3	47.1	25.3	7.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	60.2	43.0	23.5	8.5	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	58.3	42.5	24.1	6.6	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	59.3	44.5	25.1	7.1	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	56.3	45.3	23.1	6.4	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	57.1	46.1	24.3	8.2	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	55.0	47.3	25.2	5.1	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	58.2	44.0	22.3	7.0	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	59.3	43.2	24.2	5.3	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	60.1	44.5	25.6	6.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	56.0	41.6	23.2	7.2	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	55.3	45.3	22.1	8.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	57.2	42.0	24.3	6.3	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	59.1	45.8	25.2	5.4	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	58.6	46.3	23.0	6.8	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	59.3	47.1	22.4	7.2	25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	60.2	43.0	25.0	8.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	58.4	45.6	24.3	6.0	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	56.3	44.2	22.1	7.2	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	59.4	46.3	25.5	8.4	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	60.2	47.5	23.5	7.7	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	62.3	44.2	24.0	6.9	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note:BDL: Below Detection Limit ;DL: Detection Limit ; 8.4NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.20: AMBIENT AIR QUALITY DATA LOCATION AAQ2

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	63.2	42.3	25.3	5.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	62.1	43.2	26.1	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	64.3	44.1	27.0	7.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	62.3	44.3	25.3	8.0	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	60.1	45.2	26.5	6.2	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	63.5	43.5	27.3	7.4	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	65.5	41.2	26.0	6.0	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	63.2	43.0	25.2	8.2	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	62.0	44.7	27.3	6.6	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	61.3	41.4	25.0	7.2	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	63.4	48.1	26.7	8.2	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	64.0	49.3	27.1	7.6	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	65.0	46.0	25.5	5.3	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	64.2	47.2	26.3	8.5	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	65.3	48.3	25.1	7.1	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	62.1	46.0	27.3	8.6	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	63.0	47.3	26.0	7.3	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	64.5	48.2	25.2	6.5	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	65.2	49.3	26.3	8.3	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	64.3	46.2	27.1	7.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	61.2	47.2	27.3	6.3	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	62.0	48.0	26.2	7.4	25.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	63.1	49.3	25.5	6.8	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	64.5	47.2	27.3	7.2	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	63.4	48.3	26.1	8.3	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	61.2	49.1	27.5	6.4	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1) **Remarks:** The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.21: AMBIENT AIR QUALITY DATA LOCATION AAQ3

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	62.3	44.5	22.3	5.6	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	61.3	45.3	23.1	6.0	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	63.1	43.1	24.2	7.2	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	66.0	46.5	25.3	5.3	19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	67.0	47.3	22.1	6.4	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	64.1	48.2	24.0	7.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	62.0	46.3	23.5	5.0	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	63.4	45.1	24.3	6.4	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	65.2	47.0	25.6	7.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	63.2	43.2	23.0	7.0	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	64.1	46.5	24.5	7.2	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	68.1	47.1	25.6	6.5	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	69.3	48.3	22.0	5.3	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	64.2	45.0	23.6	7.2	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	61.0	43.5	25.1	6.3	19.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	62.3	44.6	24.3	5.4	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	63.5	45.7	23.6	7.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	63.1	46.8	24.0	6.2	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	68.3	47.5	25.4	5.3	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	63.1	48.3	23.1	6.1	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	67.7	46.0	24.6	7.3	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	68.4	47.3	25.1	6.2	19.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	69.2	48.2	25.4	5.3	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	62.5	44.0	23.1	7.5	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	63.7	45.3	24.3	6.0	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	64.1	46.8	25.6	7.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: **BDL:** Below Detection Limit ;**DL:** Detection Limit ; **NH₃:** BDL (DL:20); **O₃:** BDL (DL:20); **CO:** BDL (DL:1.0); **Pb:** BDL (DL:0.1); **Ni:** BDL (DL:1.0); **As:** BDL (DL:1.0); **C₆H₆:** BDL (DL:1.0); **BaP:** BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.22: AMBIENT AIR QUALITY DATA LOCATION AAQ4

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	65.0	43.4	23.1	5.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	64.3	45.2	22.1	6.2	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	66.2	42.1	24.5	7.1	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	67.2	46.0	25.3	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	66.0	44.1	26.1	7.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	64.3	45.2	23.1	6.8	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	65.2	46.3	24.2	5.3	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	66.3	44.2	25.0	6.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	67.1	42.1	26.3	5.4	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	66.0	45.3	27.0	6.3	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	65.2	46.1	22.4	5.4	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	67.0	44.0	23.5	5.0	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	66.3	45.3	24.5	6.3	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	64.1	46.0	25.3	5.2	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	65.2	43.1	26.1	6.8	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	66.3	42.0	27.3	5.0	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	67.1	44.1	26.3	6.4	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	65.2	45.3	24.5	5.0	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	66.3	46.2	25.3	6.8	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	67.4	45.1	26.1	5.4	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	65.2	46.3	23.4	6.2	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	66.1	42.1	22.1	5.1	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	67.3	44.3	25.3	6.3	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	65.2	46.2	26.4	5.8	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	64.3	42.3	25.1	6.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	65.1	45.2	27.3	5.9	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1) **Remarks:** The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.23: AMBIENT AIR QUALITY DATA LOCATION AAQ5

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	64.2	44.5	22.1	6.2	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	63.2	43.2	20.3	7.2	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	65.3	46.1	21.3	6.3	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	66.1	47.1	22.4	7.4	20.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	62.1	43.0	25.1	8.0	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	63.2	44.2	22.0	6.0	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	64.5	45.1	23.1	7.2	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	65.2	46.3	24.0	8.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	66.0	47.1	25.3	6.2	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	64.3	44.2	24.0	8.3	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	66.2	45.0	23.1	7.1	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	63.4	46.2	22.0	8.2	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	64.5	43.2	24.3	6.5	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	65.2	44.1	25.1	8.3	18.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	66.1	45.2	24.0	7.0	19.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	65.0	46.1	25.3	8.2	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	63.2	47.0	22.1	6.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	64.1	44.2	24.0	7.1	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	65.2	45.6	25.3	8.4	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	66.1	46.3	21.4	6.4	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	62.3	44.1	22.6	8.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	65.3	45.2	25.4	7.2	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	64.1	46.3	24.3	8.3	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	65.3	47.2	25.6	6.2	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	66.1	45.2	23.1	8.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	64.2	46.3	22.3	7.1	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.24: AMBIENT AIR QUALITY DATA LOCATION AAQ6

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	62.3	45.3	23.4	6.2	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	64.3	46.2	22.1	7.8	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	63.5	44.1	21.0	6.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	62.3	45.0	24.6	7.0	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	64.2	46.2	25.3	6.2	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	65.3	45.0	26.1	7.1	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	62.0	46.3	23.4	6.5	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	63.1	44.1	25.1	7.3	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	60.2	45.2	26.2	6.4	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	62.3	46.3	23.4	7.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	64.0	45.1	21.2	6.4	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	63.0	46.3	25.0	6.5	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	65.1	44.0	26.2	7.2	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	66.5	45.0	24.0	6.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	62.1	46.3	22.3	7.4	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	63.5	45.0	25.1	6.1	18.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	64.0	46.2	26.1	7.0	19.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	63.5	44.3	25.8	6.5	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	62.0	45.8	26.0	6.0	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	61.2	46.2	24.8	7.4	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	65.2	45.0	25.3	6.3	17.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	61.0	46.3	24.1	7.2	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	63.4	44.0	26.1	7.1	19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	64.2	45.2	25.3	6.4	20.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	63.8	46.3	24.1	7.2	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	64.2	45.0	23.0	6.5	19.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: **BDL:** Below Detection Limit ;**DL:** Detection Limit ; **NH₃:** BDL (DL:20); **O₃:** BDL (DL:20); **CO:** BDL (DL:1.0); **Pb:** BDL (DL:0.1); **Ni:** BDL (DL:1.0); **As:** BDL (DL:1.0); **C₆H₆:** BDL (DL:1.0); **BaP:** BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.25: AMBIENT AIR QUALITY DATA LOCATION AAQ7

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	63.1	44.2	24.3	6.2	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	64.2	45.3	23.1	7.1	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	65.3	46.1	25.6	6.8	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	66.1	47.2	26.1	7.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	64.0	43.2	27.3	6.5	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	65.2	44.5	28.3	7.0	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	63.2	45.0	29.3	6.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	61.2	46.2	26.2	7.5	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	52.3	47.3	27.4	6.5	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	64.5	45.1	26.3	7.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	66.8	46.0	27.4	6.1	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	67.2	45.3	28.2	7.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	66.3	46.7	23.4	6.4	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	64.1	47.2	25.0	7.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	65.2	42.5	24.6	6.3	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	66.3	43.5	25.1	7.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	61.0	44.5	26.3	7.0	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	62.3	46.1	27.4	6.3	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	63.4	47.2	28.3	7.2	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	65.1	45.0	29.2	6.5	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	64.2	42.0	24.3	6.1	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	65.0	43.1	25.1	7.2	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	66.3	45.6	26.3	6.5	23.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	64.1	45.8	24.3	7.3	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	65.3	46.2	27.8	6.4	23.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	66.4	47.0	29.2	7.2	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1) **Remarks:** The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.26: AMBIENT AIR QUALITY DATA LOCATION AAQ8

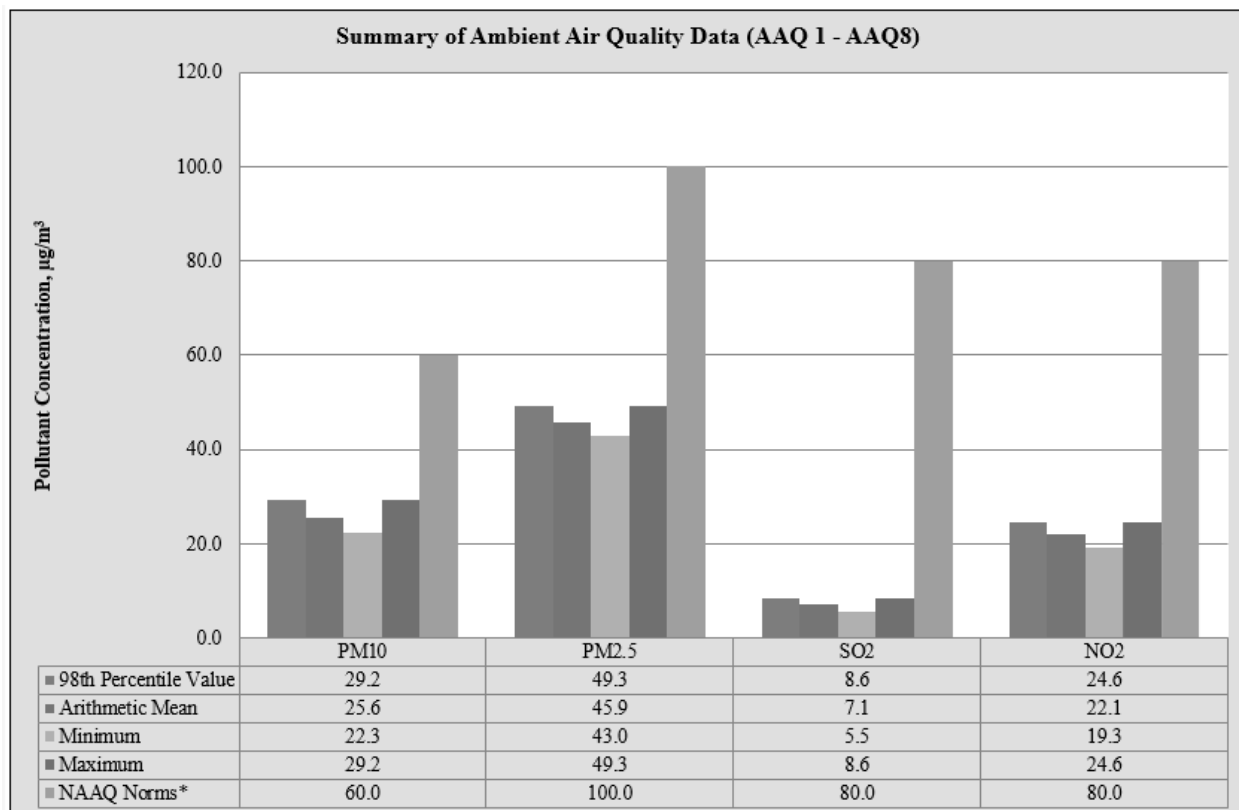
Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
02.03.2023	7:00-7:00	63.2	43.2	23.5	6.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.03.2023	7:15-7:15	64.1	44.5	24.1	7.3	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.03.2023	7:00-7:00	65.2	45.6	26.2	8.2	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:15-7:15	66.0	46.2	25.4	5.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.03.2023	7:00-7:00	67.2	42.1	26.3	6.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:15-7:15	68.3	43.2	27.4	8.2	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.03.2023	7:00-7:00	64.2	44.5	28.2	7.1	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:15-7:15	66.3	46.1	24.3	6.0	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.03.2023	7:00-7:00	67.5	44.0	25.1	8.8	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:15-7:15	68.2	45.2	26.3	7.5	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.04.2023	7:00-7:00	63.5	43.1	24.5	6.3	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:15-7:15	64.1	42.1	27.3	5.5	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.04.2023	7:00-7:00	65.8	45.0	28.6	6.3	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:15-7:15	66.3	46.3	23.0	7.2	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.04.2023	7:00-7:00	67.2	44.0	24.5	8.8	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:15-7:15	68.3	45.2	26.3	6.5	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.04.2023	7:00-7:00	66.0	46.1	28.5	7.3	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:15-7:15	67.0	44.2	27.1	5.5	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.05.2023	7:00-7:00	64.2	43.2	25.3	6.3	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:15-7:15	65.3	44.5	26.4	7.2	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2023	7:00-7:00	66.4	42.0	23.1	8.3	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:15-7:15	67.9	43.1	25.4	6.4	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2023	7:00-7:00	68.1	44.5	26.7	5.5	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:15-7:15	65.2	46.5	27.8	6.3	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2023	7:00-7:00	66.4	47.1	26.5	8.4	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:15-7:15	65.2	45.2	25.1	7.2	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1) **Remarks:** The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.27: ABSTRACT OF AMBIENT AIR QUALITY DATA

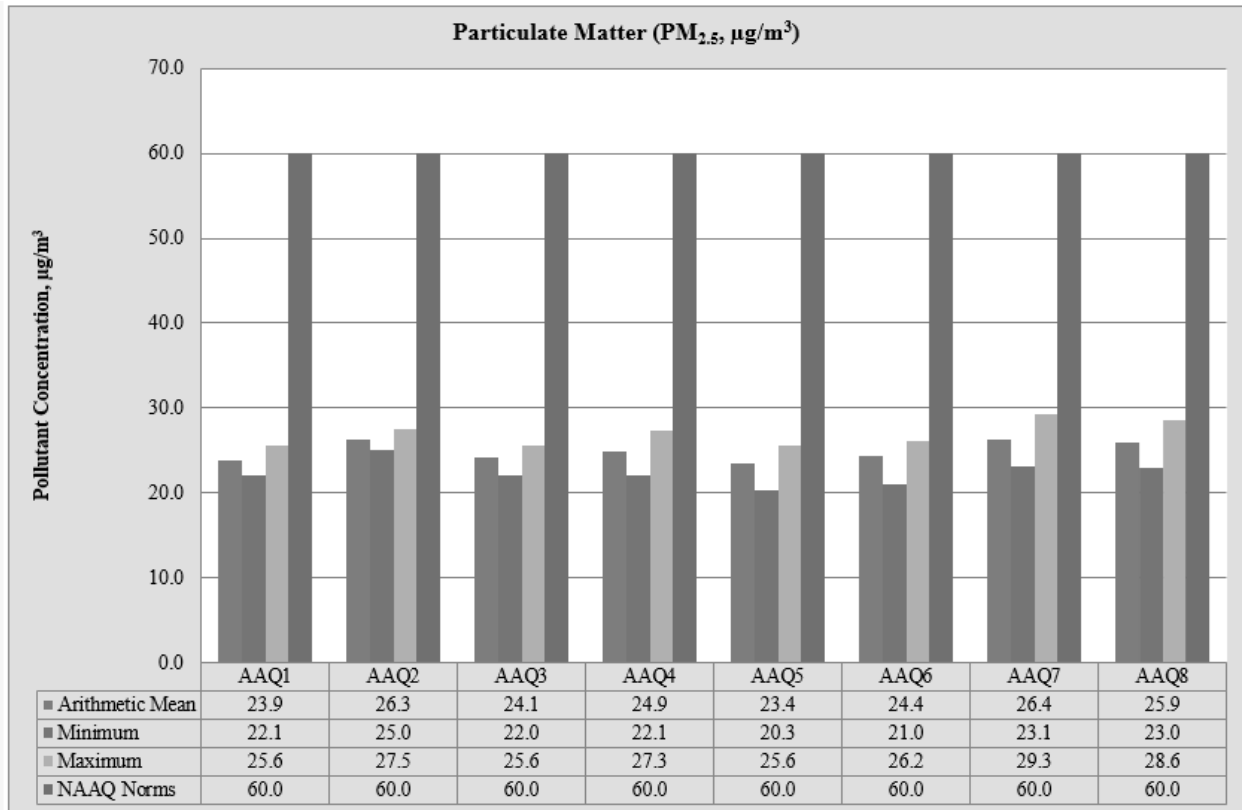
1	Parameter	PM2.5	PM10	SO ₂	NO ₂
2	No. of Observations	260	260	260	260
3	10 th Percentile Value	22.3	43.0	5.5	19.3
4	20 th Percentile Value	23.2	44.0	6.2	20.3
5	30 th Percentile Value	24.1	44.3	6.3	20.6
6	40 th Percentile Value	24.5	45.0	6.4	21.4
7	50 th Percentile Value	25.1	45.2	6.8	21.6
8	60 th Percentile Value	25.3	46.0	7.1	22.3
9	70 th Percentile Value	26.0	46.2	7.2	22.5
10	80 th Percentile Value	26.3	46.5	7.3	23.1
11	90 th Percentile Value	27.3	47.3	8.2	23.6
12	95 th Percentile Value	28.1	48.2	8.3	24.1
13	98 th Percentile Value	29.2	49.3	8.6	24.6
14	Arithmetic Mean	25.6	45.9	7.1	22.1
15	Geometric Mean	25.5	45.9	7.0	22.1
16	Standard Deviation	2.1	1.9	1.0	1.7
17	Minimum	22.3	43.0	5.5	19.3
18	Maximum	29.2	49.3	8.6	24.6
19	NAAQ Norms*	100.0	60.0	80.0	80.0
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

FIGURE 3.16: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ 8



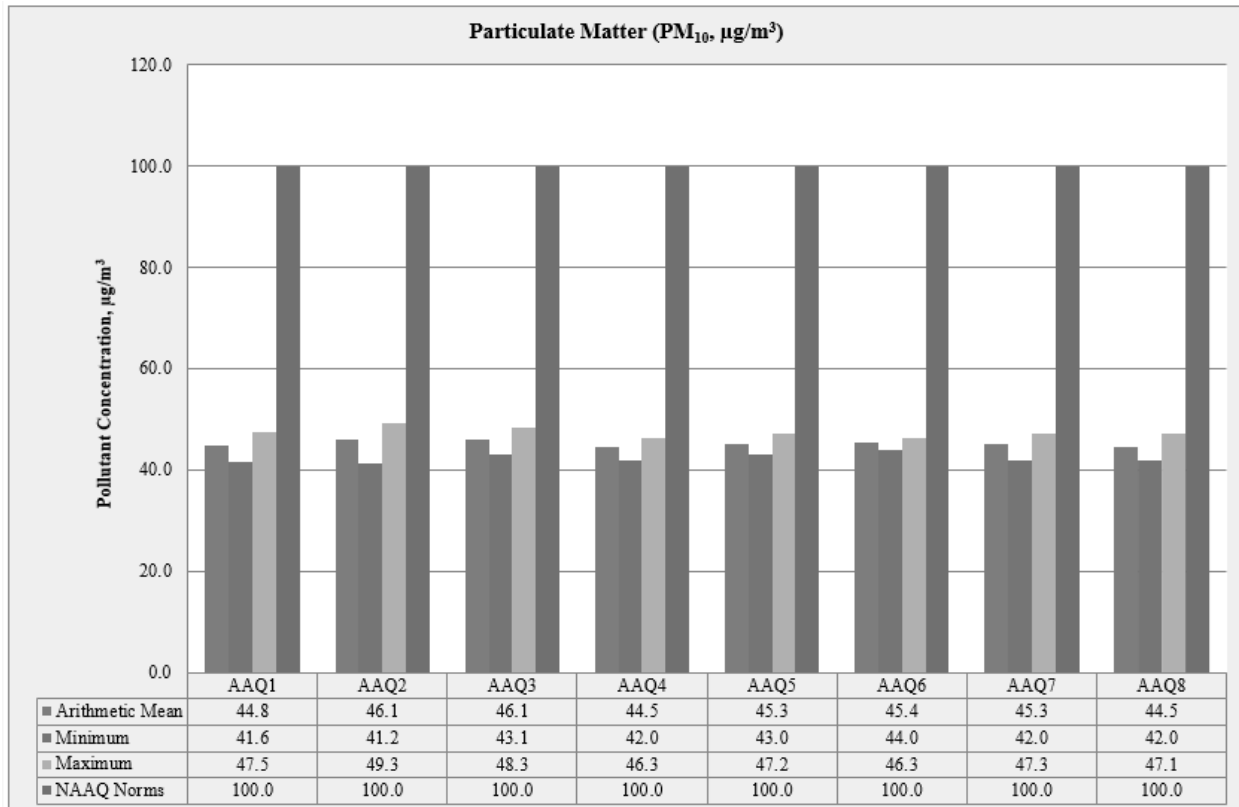
Source: Table 3.17 to 3.27

FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER PM_{2.5}



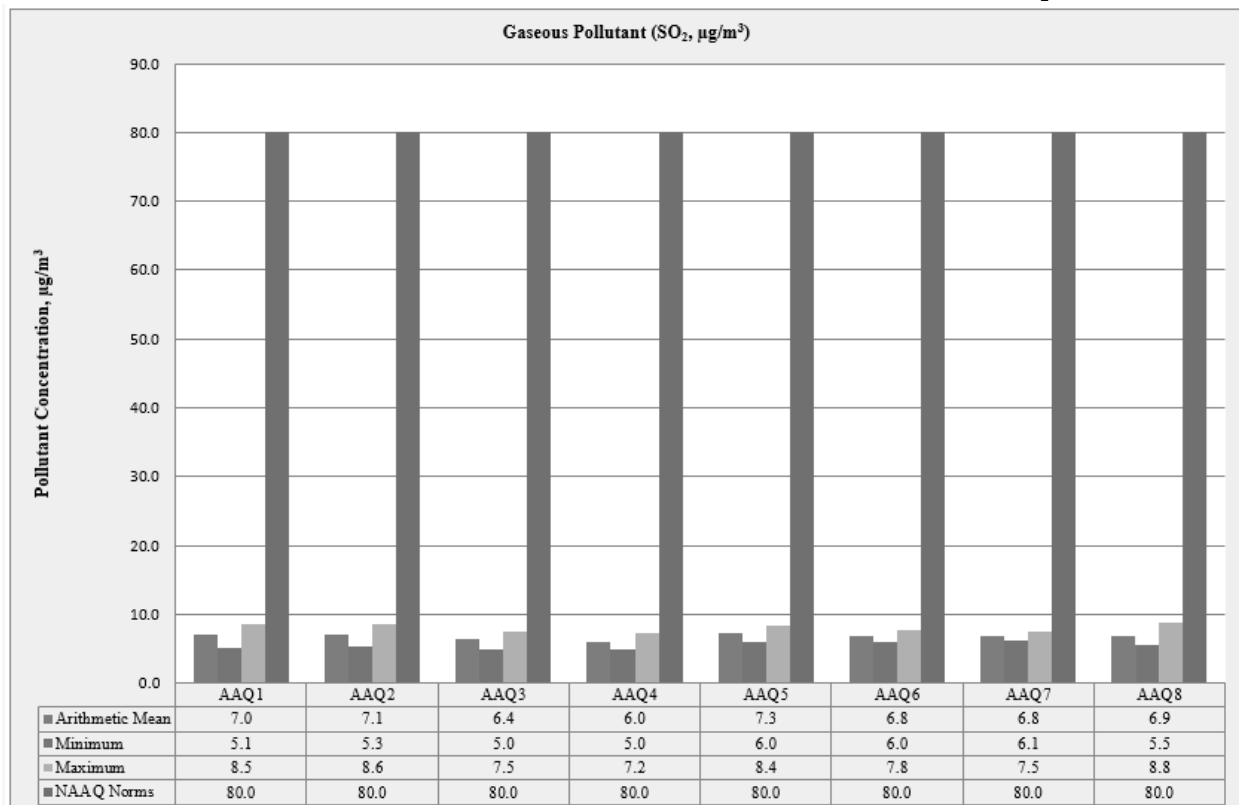
Source: Table 3.17 to 3.27

FIGURE 3.18: BAR DIAGRAM OF PARTICULATE MATTER PM₁₀

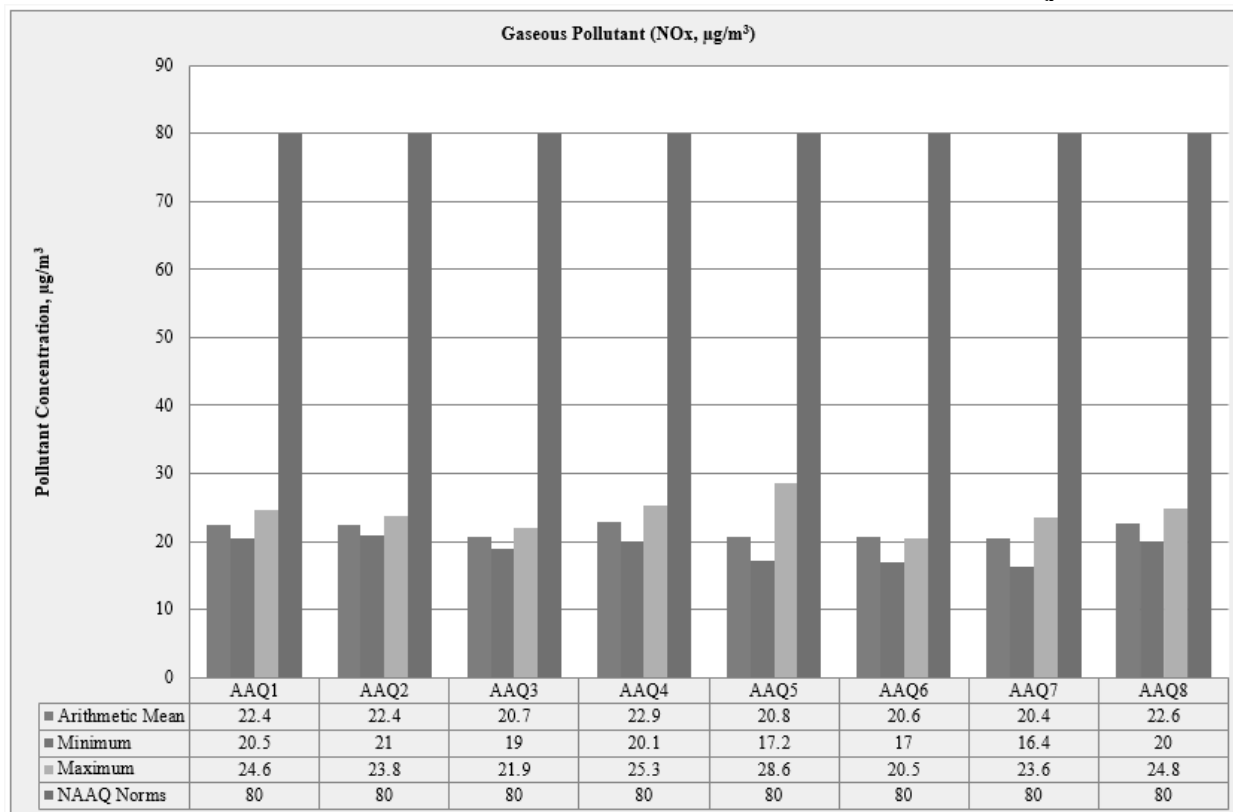


Source: Table 3.17 to 3.27

FIGURE 3.19: BAR DIAGRAM OF GASEOUS POLLUTANT SO₂



Source: Table 3.17 to 3.27

FIGURE 3.20: BAR DIAGRAM OF GASEOUS POLLUTANT NO_x

Source: Table 3.17 to 3.27

3.3.6 Interpretations & Conclusion

As per monitoring data, PM₁₀ ranges from 41.2 µg/m³ to 49.3 µg/m³, PM_{2.5} data ranges from 20.3 µg/m³ to 29.3 µg/m³, SO₂ ranges from 6.8µg/m³ to 8.8 µg/m³ and NO₂ data ranges from 21.6 µg/m³ to 25.6 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.3.7 FUGITIVE DUST EMISSION –

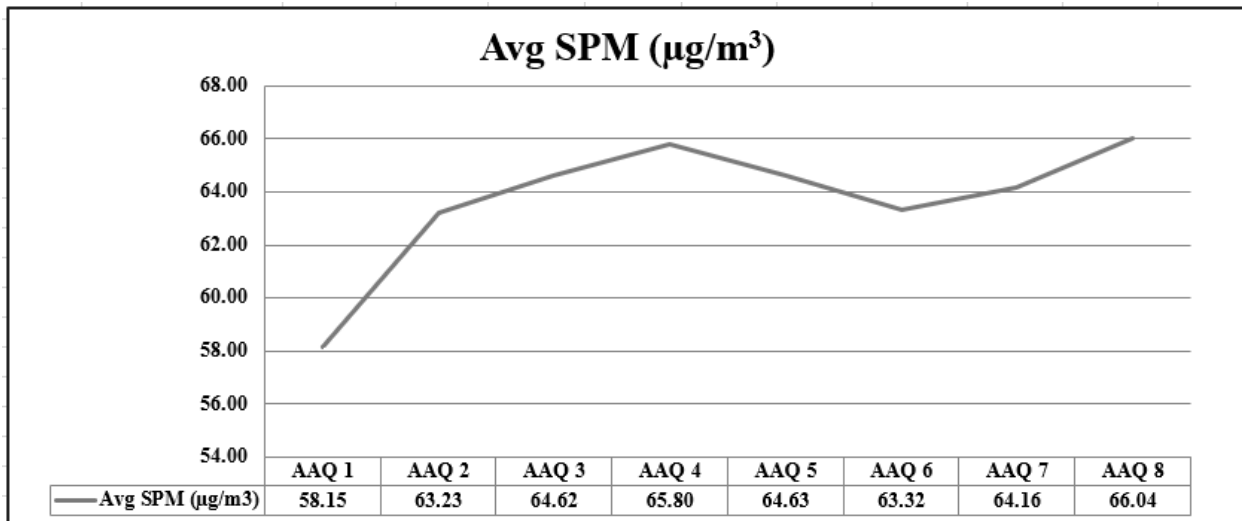
Fugitive dust was recorded at AAQ monitoring stations for 30 days average during the study period.

TABLE 3.28: AVERAGE FUGITIVE DUST SAMPLE VALUES

AAQ Locations	Avg SPM (µg/m ³)
AAQ 1	58.15
AAQ 2	63.23
AAQ 3	64.62
AAQ 4	65.80
AAQ 5	64.63
AAQ 6	63.32
AAQ7	64.16
AAQ 8	66.04

Source: Onsite monitoring/ sampling by EHS 360 Labs PVT LTD

FIGURE 3.21: LINE DIAGRAM OF AVERAGE SPM VALUES



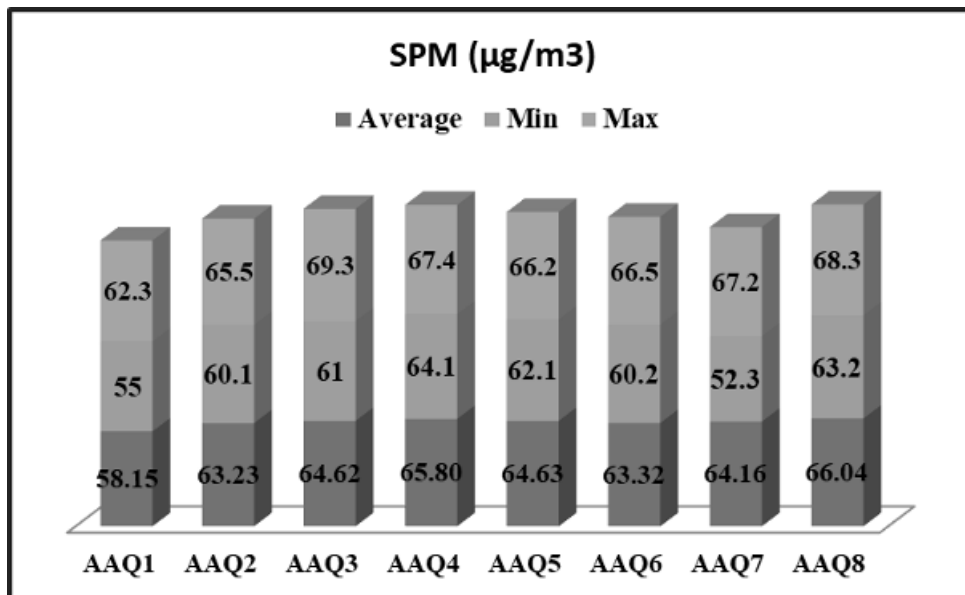
Source: Table 3.28

TABLE 3.29: FUGITIVE DUST SAMPLE VALUES IN µg/m³

SPM	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8
Arithmetic Mean	58.15	63.23	64.62	65.80	64.63	63.32	64.16	66.04
Minimum	55	60.1	61	64.1	62.1	60.2	52.3	63.2
Maximum	62.3	65.5	69.3	67.4	66.2	66.5	67.2	68.3
NAAQ Norms	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0

Source: Calculations from Lab Analysis Reports

FIGURE 3.22: BAR DIAGRAM OF SPM VALUES



Source: Table 3.29

3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in 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 (8) locations. The noise level monitoring locations were carried out by covering commercial, residential, rural areas within the radius of 10km. A noise monitoring methodology was chosen such that it best suited the purpose and objectives of the study.

TABLE 3.30 DETAILS OF SURFACE NOISE MONITORING LOCATIONS

S. No	Location code	Monitoring Locations	Distance & Direction	Coordinates
1	N-1	Core Zone	Project Area	10°58'51.80"N 77°55'59.75"E
2	N-2	Near Existing Quarry	150m SE	10°58'47.39"N 77°56'3.35"E
3	N-3	Velayudampalayam	800m NW	10°59'7.85"N 77°55'34.05"E
4	N-4	Kuppam	3.5km NW	11° 0'45.65"N 77°55'31.22"E
5	N-5	K. Paramathi	2.7km SW	10°57'39.76"N 77°54'58.64"E
6	N-6	Pavithram	6km SE	10°57'59.57"N 77°59'11.87"E
7	N-7	Pullaiyampalayam	4.5km NE	11° 0'2.65"N 77°58'15.34"E
8	N-8	Malapalayampudur	5km SE	10°56'36.26"N 77°57'28.41"E

Source: On-site monitoring/sampling by Laboratories in association with GEMS

3.4.2 Method of Monitoring

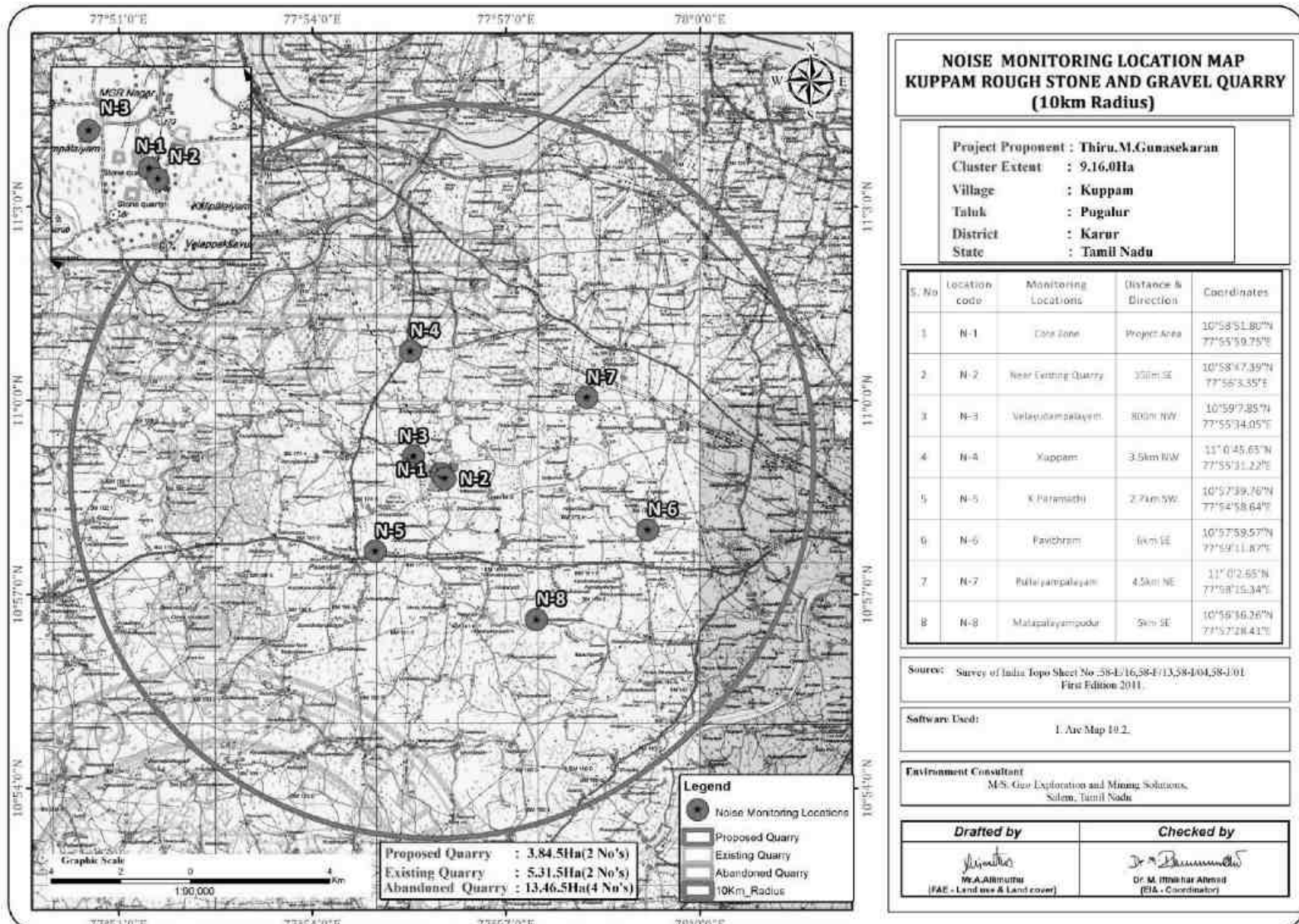
Digital Sound Level Meter was used for the study. All reading was taken on the 'A-Weighting' frequency network, at a height of 1.5 meters from ground level. The sound level meter does not give a steady and consistent reading and it is quite difficult to assess the actual sound level over the entire monitoring 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

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.

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

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

FIGURE 3.23: NOISE MONITORING STATIONS AROUND 10 KM RADIUS



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 3.31

Day time: 6:00 hours to 22.00 hours.

Night time: 22:00 hours to 6.00 hours.

TABLE 3.31: AMBIENT NOISE QUALITY RESULT

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	42.9	37.5	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Near Existing Quarry	41.7	37.0	
3	Velayudampalayam	41.0	35.4	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
4	Kuppam	40.3	35.0	
5	K. Paramathi	38.3	35.8	
6	Pavithram	41.6	36.6	
7	Pullaiyampalayam	38.1	36.7	
8	Malalayampudur	37.3	35.3	

Source: On-site monitoring/sampling by Laboratories in association with GEMS

FIGURE 3.24: DAY TIME NOISE LEVELS IN CORE AND BUFFER ZONE

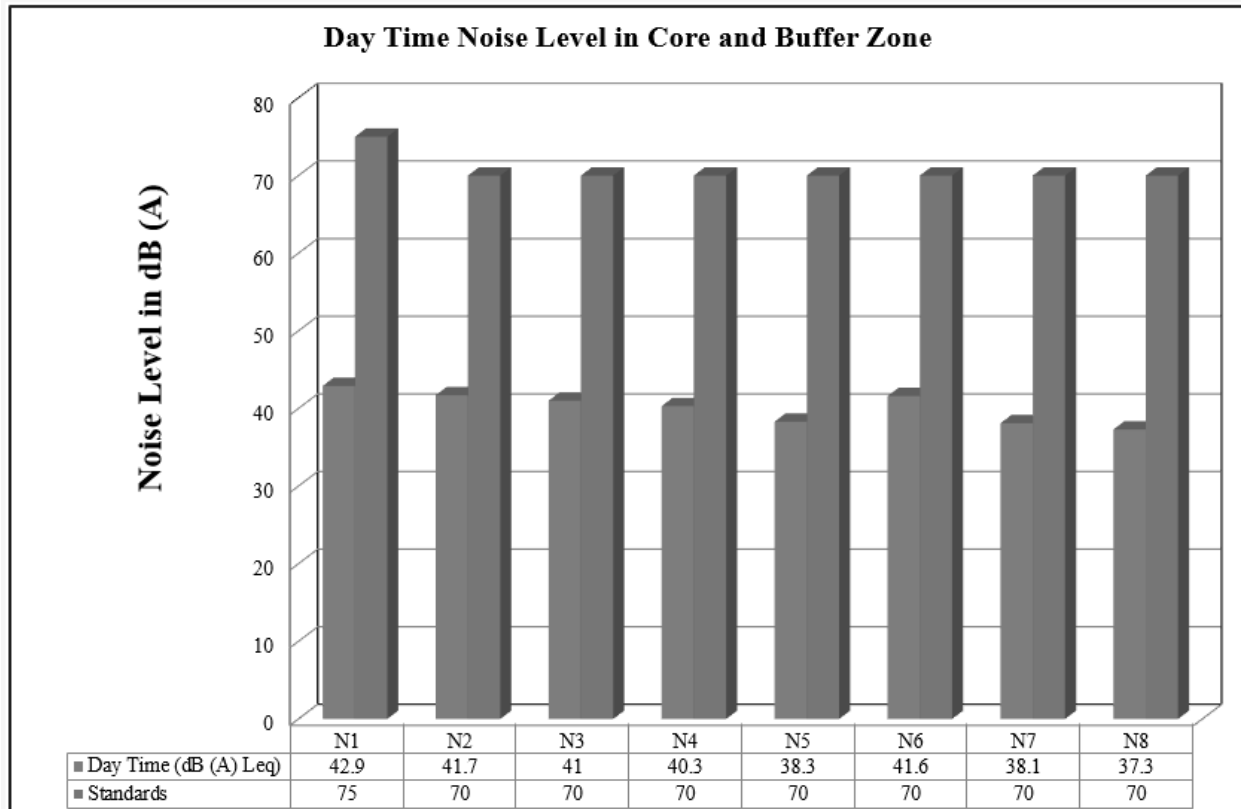
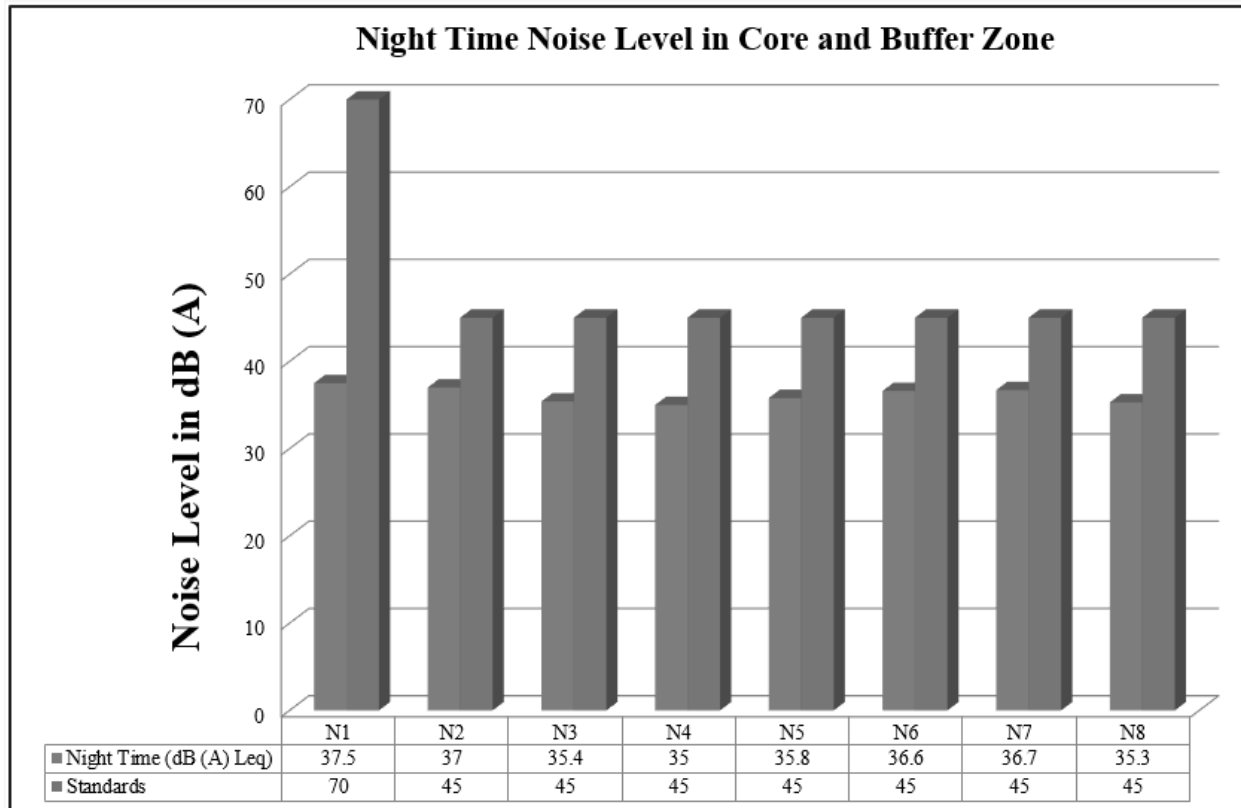


FIGURE 3.25: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE



3.4.4 Interpretation & Conclusion:

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time were from 42.9 dB (A) Leq and during night time were is 37.5 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 37.3 to 41.7 dB (A) Leq and during night time were from 35.0 to 37.0 dB (A) Leq.

Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.5 ECOLOGICAL ENVIRONMENT

3.5.1. Study area Ecology

The study of the biological environment is one of the important aspects of Environmental Impact Assessments. The biotic component comprises both plant and animal communities which interact within the community and between themselves but also with abiotic i.e. physical and chemical components of the environment. A general ecological survey was carried out in the study area of 10 km radius around the Mine area. The study Area is not part of any National Park, Sanctuary, Biosphere Reserve, Wildlife Corridors, Migratory Path, etc. The primary data was generated by preparing a general checklist of all plants encountered in the study area. The species of vegetation found were identified and listed according to their families. The division of core and buffer zone is the best way to study the pattern of biodiversity for environmental impact assessment.

3.5.2 Objectives of Biological Studies

The present study was undertaken with the following objectives:

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

3.5.3 Methodology of Sampling

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

The faunal elements (animal species) of core and buffer zone were identified by direct sightings or indirect evidences viz. pug marks, skeletal remains, scats and droppings etc. (Jayson and Easa 2004). Standard binocular was used for the observations. The authenticity of faunal elements occurrence was confirmed by interaction with the local people. Avifauna identification was done with pictorial descriptions of published literature. Information pertaining to existence of any migratory corridors and paths were obtained from local inhabitants. The status of each

faunal element was determined and the Wildlife schedule category was ascertained as per the IUCN-Red Data Book and Indian wildlife (Protection) Act, 1972.

Plot method is used in the floral documentation in the core and buffer zone. For trees (10x10-m), shrubs (5x5-m) and herbs (1x1-m) plots were taken. Birds and butterflies were mainly focused during faunal assessment, transect method was employed for birds and butterflies. Transect is a path along which one counts and records the occurrence of an individual for study. A straight-line walk covering desired distance, within a time span of one hour to 30 minutes was carried out in the proposed region. Bird species were recorded during the hours of peak activity. 0700 to 1100 Hrs and 1430 to 1730 Hrs (Bibby et al. 2000).

Direct observations and bird calls were used for bird documentation. Same transects were used for counting butterflies. Opportunistic observations were made for Amphibians, reptiles and ordinates. Presence of mammals was recorded by direct and indirect signs. All possible transects were taken for birds and butterflies. Birds and butterflies were classified into species level. Recorded bird species were identified to species level using standard books (Ali & Ripley 1987, Grimmett et al., 2016).

A) Sampling

A stratified simple random sampling procedure was employed to obtain a sample from study area. The study area was further stratified in different land use/ecosystems.

b) Sampling Size

Keeping in mind both random sampling technique and covering all land use patterns for the study following sampling locations were chosen depending up on the area of the proposed site.

c) Timing of Study

The study was carried out during morning and evening hours, to cover the different activity phases for important species such as time resting, feeding, hunting, and daily movements.

d) Observations from Sampling

The various observations relating to flora and fauna species are discussed in detail below, in separate sections.

e) Equipment/ References

- Canon Mark III Camera with 50-500mm lens– Snap shots taken
- Leica Binoculars (8x 20) to spot/identify species
- IUCN Red Data Book – <https://www.iucnredlist.org/species>

Ornithological/Entomological/Herpetological/Mammalian catalogues and pictorial descriptions from various authors and websites are followed for species identification.

3.5.4. Part I Field Sampling Techniques

3.5.4.1. Transect walk – Birds

Six no transect lines with varying length (100m-300m) and fixed width (2m) were laid which cuts through the core and buffer areas of proposed site. The transect surveys were conducted from 0700 to 1100Hrs and 1430 to 1730Hrs (Bibby et al. 2000). All avifauna found along these transects were recorded for analysing the data. Counts were conducted while there is no heavy rain, mist or strong wind.

3.5.4.2. Modified Pollard Walk – for Butterflies

The Modified Pollard Walk (Pollard 1977, 1993, Walpole 1999) using fixed width transect walk method were employed to investigate butterfly spatial distribution, diversity and abundance at the different survey sites.

3.5.4.3. Visual Encounter Survey (VES) - reptiles and amphibians

VES is a time-constrained sampling technique (Campbell and Christman, 1982; Corn and Bury, 1990). It needs a systematic search through an area or habitat for a prescribed time period (Campbell and Christman, 1982). The result of VES is measured against the time spent on search. VES technique is one of the simplest methods, and an appropriate technique for both inventory and monitoring Herpetofauna (Heyer et al. 1994).

3.5.4.4. Observational methods- Mammals

For the purpose of recording mammals, we used two different observational techniques: (1) direct observations, and (2) recording of occurrences like holes, markings, scats, hairs, and spines (Menon 2003). For identification confirmations, photographs with a scale reference were used, and locations were recorded using a portable GPS device. Indigenous knowledge particularly that of the locals, was occasionally employed to compile a preliminary list of species and/or aid in the recognition of indicators.

3.5.4.5. Multiple Stage Quadrat – Vegetation

A variety of habitat or vegetation structure variables were measured using the Multiple Stage Quadrat sampling protocol (Sykes and Horrill 1977). All of those areas were sampled, and the major corners were temporarily delineated with colored ribbons. Each site was identified in the field using a compass and clinometer, and the plot's latitude, longitude, and elevation were recorded using a handheld Global Positioning System (Garmin 12XL).

3.5.4.6. Flora

The quadrat sampling technique was used for sampling vegetation. Sampling quadrats of the regular shape of dimensions 10 × 10 m, 5 × 5 m, and 1 × 1 m, were nested within each other and were defined as the units for sampling the area and measuring the diversity of trees, Shrubs, and herbs respectively.

Table No: 3.32. Flora in the Core Zone of Rough stone and gravel quarry

SI.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	White Bark Acacia	Vela maram	<i>Vachellia leucophloea</i>	Fabaceae
2.	Neem or Indian lilac	Vembu maram	<i>Azadirachta indica</i>	Meliaceae
3.	Millettia Pinnata	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
4.	Asian Palmyra palm	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
5.	Bitter Albizia	Arappu Tree	<i>Albizia amara</i>	Fabaceae
Shrubs				
1.	West Indian Lantana	Unni chedi	<i>Lantana camara</i>	Verbenaceae
2.	Avaram	Avarai	<i>Senna auriculata</i>	Fabaceae
3.	Devil's trumpet	Umathai	<i>Datura metel</i>	Solanaceae
4.	Milk Weed	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
Herbs				
1.	Common leucas	Thumbai	<i>Leucas aspera</i>	Lamiaceae
2.	Ban Tulsi	Milagai poondu	<i>Croton sparsiflorus</i>	Euphorbiaceae
3.	Coat buttons	Thatha poo	<i>Tridax procumbens</i>	Asteraceae
4.	Devil's thorn	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales
5.	Indian doab	Arugampul	<i>Cynodon dactylon</i>	Poaceae
6.	Aloe	Katrzhai	<i>Aloe vera</i>	Liliaceae
7.	Holy basil	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
8.	Indian nettle	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae
Climber				
1.	Stemmed vine	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
Grasses				
1.	Eragrostis	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
2.	Great brome	Thodappam	<i>Bromus diandrus</i>	Poaceae
Cactus				
1.	Triangular spruce	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae

3.5.4.7 Flora Composition in the Core Zone

Taxonomically a total of 21 species belonging to 13 families have been recorded from the core mining lease area. The proposed area applied area is situated on plain terrain. Based on the habitat classification of the enumerated plants the majority of species were Herbs 8 followed by Shrubs 4, Trees 5, Climber 1, and Grasses 2 and Cactus 1. Details of flora with the scientific name were mentioned in Table No. 3.1. The result of the core zone of flora studies shows that Fabaceae and Poaceae, Apocynaceae are the main dominating species in the study area mentioned in Table No.3.1 No species found as threatened category.



a. *Euphorbia antiquorum*



b. *Cissus quadrangularis*



c. *Croton sparsiflorus*



d. *Azadirachta indica*



e. *Senna auriculata*



f. *Calotropis gigantea*



g. *Vachellia leucophloea*



h. *Datura metel*



i. *Albizia amara*



k. *Aloe vera*



l. *Leucas aspera*

Fig No: 3.36 Flora species observation in the core zone area**Table No: 3.33 Flora in the Buffer zone of study area.**

S.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Millettia Pinnata	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
2.	White Bark Acacia	Vela maram	<i>Vachellia leucophloea</i>	Fabaceae
3.	Asian Palmyra palm	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
4.	Lemon	Ezhumuchaipalam	<i>Citrus lemon</i>	Rutaceae
5.	Gooseberry	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae
6.	Neem or Indian lilac	Vembu	<i>Azadirachta indica</i>	Meliaceae
7.	Indian plum	Elanthai maram	<i>Ziziphus mauritiana</i>	Rhamnaceae
8.	Coconut	Thennai maram	<i>Cocos nucifera</i>	Arecaceae
9.	Gum arabic tree	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae
10.	Drumstick tree	Karimurungai	<i>Moringa olefera</i>	Moraginaceae
11.	Banana tree	Vazhaimaram	<i>Musa</i>	Musaceae
12.	Senna siamea	Manjal Konnai	<i>Sennasiamea</i>	Fabaceae
13.	Banyan tree	Alamaram	<i>Ficus benghalensis</i>	Moraceae
14.	Creamy Peacock Flower	Vadanarayani	<i>Delonix elata</i>	Fabaceae
15.	Beauty leaf	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae
16.	Umbrella thorn	Kodaivelam	<i>Acacia planifrons</i>	Mimosaceae
17.	Indian fig tree	Athi	<i>Ficus recemosa</i>	Moraceae
18.	Jujube	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae
19.	Oil cake tree	Arappu	<i>Albizia amara</i>	Mimosaceae
20.	Giant thorny bamboo	Perumungil	<i>Bambusa bambos</i>	Poaceae
21.	Woman's tongue	Vagai	<i>Albizia lebbeck</i>	Mimosaceae
22.	Tamarind	Puliyamaram	<i>Tamarindus indica</i>	Legumes
23.	Rain Tree	Thoongu moonji	<i>Albizia saman</i>	Mimosaceae
24.	Muntingia calabura	Singapore cherry	<i>Muntingiacalabura</i>	Malvaceae

25.	Chinesh cheery	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae
26.	Chebolic myrobalan	Kadukkai	<i>Terminalia chebula</i>	Combretaceae
27.	Indian fir tree	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae
28.	Indian bael	Vilvam	<i>Aegle marmelos</i>	Rutaceae
29.	Indian Mulberry	Manjanati	<i>Morinda coreia</i>	Rubiaceae
30.	Henna	Marudaani	<i>Lawsonia inermis</i>	Lythraceae
31.	Eucalyptus	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae
32.	Manilkara zapota	Sapota	<i>Manilkara zapota</i>	Sapotaceae
33.	Black plum	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae
34.	Mango	Manga	<i>Mangifera indica</i>	Anacardiaceae
35.	Jack fruit	Palamaram	<i>Artocarpus heterophyllus</i>	Moraceae
36.	Curry tree	Karivembu	<i>Murraya kentia</i>	Rubiaceae
37.	Robber-thorn tree	Anaimullu	<i>Acacia horrida</i>	Mimosaceae
38.	Teak	Thekku	<i>Tectona grandis</i>	Verbenaceae
39.	Indian gooseberry	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae
40.	Chinese chaste tree	Nochi	<i>Vote negundo</i>	Verbenaceae
41.	Madras Thorn	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae
42.	Noni	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae
43.	Five leaf chastera	Nochi	<i>Vitex negundo</i>	Lamiaceae
44.	Papaya	Pappali maram	<i>Carica papaya L</i>	Caricaceae
45.	Peepal	Arasanmaram	<i>Ficus religiosa</i>	Moraceae
46.	Monoon longifolium	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae
47.	Guava	Koyya	<i>Psidium guajava</i>	Myrtaceae
48.	custard apple	Seethapazham	<i>Annona reticulata</i>	Annonaceae
49.	Curry tree	Velipparuthi	<i>Murraya koenigii</i>	Asclepiadaceae
50.	Bamboo	Moonghil	<i>Bambusa bambo</i>	Poaceae
Shrubs				
1.	Shoe flower	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae
2.	Avaram	Avarai	<i>Senna auriculata</i>	Fabaceae
3.	Touch-me-not	Thottalchinung i	<i>Mimosa pudica</i>	Mimosaceae
4.	Rosy Periwinkle	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae
5.	Chrozophora tinctoria	Puramuttai	<i>Chrozophora rotleri</i>	Euphorbiaceae

6.	Milk Weed	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
7.	Triangular spruge	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
8.	Jackal jujube	Surai Ilantai	<i>Ziziphus oenoplia</i>	Rhamnaceae
9.	Datura metel	Uumaththai	<i>Datura metel</i>	Solanaceae
10.	Plumeria alba	Malaiarali	<i>Plumeria alba</i>	Appocynaceae
11.	Senna alata	Seemaiagaththi	<i>Cassia alata</i>	Caesalpinaceae
12.	Flame of the Woods	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae
13.	Puriging nut	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae
14.	Giant reed	Naanal	<i>Arunudo donax</i>	Poaceae
15.	Malabar nut	Adathodai	<i>Justicia adhatoda</i>	Acanthaceae
16.	Indian Oleander	Arali	<i>Nerium indicum</i>	Apocynaceae
17.	Indian mallow	Thuthi	<i>Abutilon indicum</i>	Meliaceae
18.	Solanum pubescens	Malaisundai	<i>Solanum pubescens Willd</i>	Solanaceae
19.	Hygrophila spinosa	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae
20	Ipomoea cornea	Neivelikattama naku	<i>Ipomoea carnea</i>	Convolvulaceae
21	Night shade plan	Sundaika	<i>Solanum torvum</i>	Solanaceae
22	Ceylon Date Palm	Icham	<i>Phoenix pusilla</i>	Arecaceae
Herbs				
1.	Common leucas	Thumbai	<i>Leucas aspera</i>	Lamiaceae
2.	Holy basil	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
3.	Aloes	Katrazhai	<i>Aloe</i>	Liliaceae
4.	European black nightshade	Manathakkali	<i>Solanumnigrum</i>	Solanaceae
5.	Sessile joyweed	Ponnanganni	<i>Alternanthera sessilis</i>	Amaranthaceae
6.	Indian doab	Arugampul	<i>Cynodon dactylon</i>	Poaceae
7.	Cat's claw	Thael Kodukku	<i>Martynia annua</i>	Pedaliaceae
8.	Poor land flatsedg	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae
9.	Goatweed	Pumpillu	<i>Ageratum conyzoides</i>	Asteraceae
10.	Mexican prickly poppy	Eli-yotti	<i>Argemone mexicana</i>	Papaveraceae
11.	Gotu kola	Vallarai	<i>Centella asiatica</i>	Apiaceae
12.	Chinese Spinach	Thandukeerai	<i>Amaranthus tricolor</i>	Amaranthaceae

13.	Tridax daisy	Veetukaayappondu	<i>Tridax procumbens</i>	Asteraceae
14.	Creeping chaffweed	Adai otti	<i>Alternanthera pungens</i>	Amaranthaceae
15.	<i>Digeria muricata</i>	Thoiya keera	<i>Digeria muricata</i>	Amarantheceae
16.	Indian Copperleaf	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae
17.	<i>Cyperus difformis</i>	Kudai koori	<i>Cyperus difformis</i>	Cyperaceae
18.	Riceweeds	Seruppada	<i>Coldenia procumbens</i>	Boraginaceae
19.	Goatweed	Kallurukki	<i>Scoparia dulcis</i>	Plantaginaceae
20.	East Indian globe thistle	kottai-k-karantai	<i>Sphaeranthus indicus</i>	Asteraceae
21.	False daisy	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae
22.	Chocolate weed	Punnakku poondu	<i>Melochia corchorifolia</i>	Sterculiaceae
23.	Black Mustard Seed	Kaduku	<i>Brassica juncea</i>	Brassicaceae
24.	Slender amaranth	Sirukeera	<i>Amaranthus polygonoides</i>	Amaranthaceae
25.	Prickly chaff flower	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae
26.	<i>Cleome viscosa</i>	Nai kadugu	<i>Cleome viscosa</i>	Capparidaceae
27.	Carrot grass	Partiniyam	<i>Parthenium hysterophorus</i>	Asteraceae
28.	Punarnava	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae
29.	Prickly amaranth	Mullukkeera	<i>Amaranthus spinosus</i>	Amaranthaceae
30.	Porcupine flower	Kundan	<i>Barleria prionitis</i>	Acanthaceae
31.	Billygoat weed	Pumpillu	<i>Ageratum conyzoides</i>	Asteraceae
Climbers				
1.	Ivy gourd	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
2.	Balloon vine	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae
3.	Stemmed vine	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
4.	Pointed gourd	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae
5.	Rosary pea	Kuntumani	<i>Abrus precatorius L</i>	Fabaceae
6.	Indian sarsparilla	Nannari	<i>Hemidesmus indicus</i>	Asclepiadaceae
7.	Coral vine	Kodi rose	<i>Antigonon leptopus</i>	Polygonaceae
8.	Butterfly-pea	Sangupoo	<i>Clitoria ternata</i>	Fabaceae
9.	Wild jasmine	Malli	<i>Jasminum augustifolium</i>	Oleaceae
10.	Bottle Guard	Sorakkai	<i>Lagenaria siceraria</i>	Cucurbitaceae

11.	Bitter gourd	Pavakkai	<i>Momordica charantia</i>	Cucurbitaceae
Creepers				
1.	Ground Spurge	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae
2.	<i>Ipomoea reniformis</i> chois	Elikkathilai	<i>Merremia gangetica</i>	Convolvulaceae
3.	Bitter Apple	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae
4.	Merremia	Muthiyar koontha	<i>Merremia tridentata</i>	Convolvulaceae
5.	Frog fruit	Poduthalai	<i>Phyla nodifolia</i>	Verbenaceae
Grasses				
1.	Apluda	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae
2.	Nut grass	Korai	<i>Cyperus rotandus</i>	Poaceae
3.	Eragrostis	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
4.	Jungle rice	Kuthirai vaal Kattu arusi	<i>Echinochloa colona</i>	Poaceae
5.	Windmill grass	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae
6.	Finger grass	Kuruthupillu	<i>Chloris dolichostachya</i>	Poaceae
7.	Umbrella-sedge	Vattakorai	<i>Cyperus difformis</i>	Cyperaceae
8.	Marvel grass	Marvel grass	<i>Dichanthium annulatum</i>	Poaceae
Cactus				
1.	Prickly pear	Nagathali	<i>Opuntia</i>	Cactaceae
2.	Triangular spruge	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae

*E- Economical, M- Medicinal, EM- Both Economical and Medicinal, NE- Not evaluated.

Source:

Nair.N.C and A.N. Henry, Flora of Tamil Nadu 1983, Series 1, Botanical Survey of India, Southern Circle.

3.5.4.8 Flora Composition in the Buffer Zone

The buffer region has a similar type of habitat, but it has a wider variety of vegetation than the core zone area. The proposed lease area has plain terrain. There are 129 different species identified in the buffer zone. Among the identified, floral (129) species were 50 trees, 31 herbs, 22 shrubs, 11 climbers, 5 Creepers, 8 grasses, and Cactus 2. According to the findings of the buffer zone flora studies, the dominant species in the study area are Fabaceae, Asteraceae, and Euphorbiaceae, as shown in Table No.3.2. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. Details of flora with the scientific name were mentioned in Table No.3.31. A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.32 and their % distribution is shown in Figure 3.2.

Table 3.34: Number of floral life forms in the Study Area

S. No	Plant Life Form	Number of Species
1	Trees	50
2	Shrubs	22
3	Herbs	31
4	Climber	11
5	Creepers	5
6	Grasses	8
7	Cactus	2
Total No. of Species		129

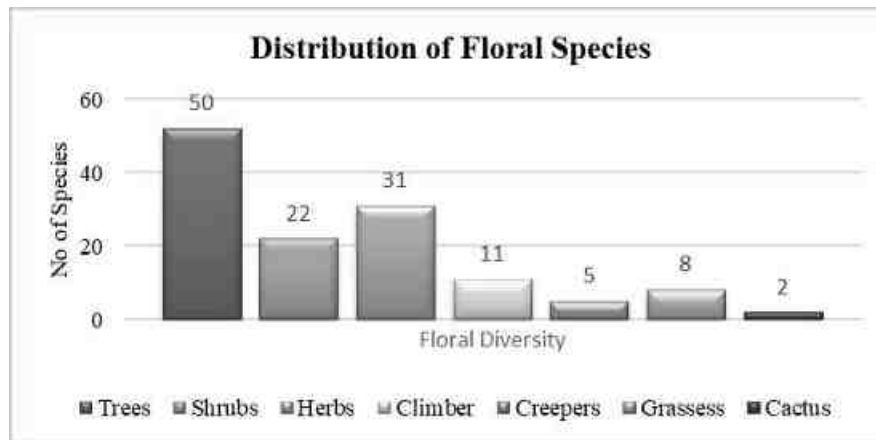


Fig No. 3.37: Graph showing % distribution of floral life forms

The floral composition along with the common name, and family name of the study area is listed below in Table No: 3.32

3.5.4.9 The vegetation in the RF / PF areas, ecologically sensitive areas

There are neither reserved (RF) nor protected (PF) forests either in the mine lease area or in the buffer zone. Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. There are no protected or ecologically sensitive areas such as National parks or Important Bird Areas (IBAs), or Wetlands or migratory routes of fauna or water bodies or human settlements within the proposed mine lease area. There are no Biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Thus, the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive. It is away from the proposed project site.

Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. There are no impacts due to this mining activity. There are neither forests nor forest dwellers nor 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.

3.5.4.10 Fauna

The faunal survey has been carried out as per the methodology cited and listed out Mammals, birds, Reptiles, Amphibians, and Butterflies. All the listed species were compared with Red Data Book and Indian Wildlife Protection Act, 1972. There are no rare, endangered, threatened (RET), and endemic species present in the core area.

3.5.4.11 Fauna Composition in the Core Zone

Core Zone: During the study, it was found that the faunal diversity in the core site was limited to Butterflies, insects, and some species of mammals & reptiles among them numbers Insects 5, Reptiles 6, Mammals 3, and Avian 8. The core site has avifauna species like the crow, Common myna, Koel, etc. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and nine species are under Schedule IV according to the Indian Wildlife Act 1972. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No: 3.35. Fauna in the Core zone of Rough stone and gravel quarry

SI. No	Common Name	Scientific Name	Schedule list WLPC 1972
Insects			
1.	Common Tiger	<i>Danaus genutia</i>	NL
2.	Tawny coster	<i>Danaus chrysippus</i>	Schedule IV
3.	Striped tiger	<i>Danaus plexippus</i>	Schedule IV
4.	House fly	<i>Musca domestica</i>	-
5.	Dragonfly	<i>Agriansp</i>	-
Reptiles			
1.	Oriental garden lizard	<i>Calotes versicolor</i>	NL
2.	Indian forest skink	<i>Sphenomorphus indicus</i>	NL
3.	Common krait	<i>Bungarus caeruleus</i>	LC
4.	Rat snake	<i>Ptyas mucosa</i>	NA
5.	House lizards	<i>Hemidactylus flaviviridis</i>	Schedule IV
6.	Green vine snake	<i>Ahaetulla nasuta</i>	LC
Mammals			
1.	Indian Field Mouse	<i>Mus booduga</i>	Schedule IV
2.	Asian Small Mongoose	<i>Herpestes javanicus</i>	Schedule (Part II)
3.	Squirrel	<i>Funambulus palmarum</i>	Schedule IV
Aves			
1.	Rose-ringed parakeet	<i>Psittacula krameri</i>	Schedule IV
2.	Common myna	<i>Acridotheres tristis</i>	NL
3.	Asian koel	<i>Eudynamys scolopacea</i>	Schedule IV
4.	Koel	<i>Eudynamys</i>	Schedule IV
5.	Black drongo	<i>Dicrurus macrocercus</i>	Schedule IV
6.	House crow	<i>Corvus splendens</i>	NL
7.	Cattle egret	<i>Bubulcus ibis</i>	NE
8.	Asian green bee-eater	<i>Merops orientalis</i>	NL

*NL- Not listed, LC- Least Concern

(Sources: Species observation in the field study)

3.5.4.12. Fauna Composition in the Buffer Zone

As animals, especially vertebrates move from place to place in search of food, shelter, mate or other biological needs, separate lists for core and buffer areas are not feasible however, a separate list of fauna pertaining

to core and buffer zone are listed separately. Though there are no reserved forest in the buffer zone. As such there are no chances of occurrence of any rare or endangered or endemic or threatened (REET) species within the core or buffer area.

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere Reserve or Elephant Corridor or other protected areas within 10 km radius from the core area. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. There were no resident birds other than common bird species such as green bee-eaters, Indian blue robin, Common Mynas, Black drangos, Crows, etc.

The list of bird species recorded during the field survey and literature from the study area is given in Table 3.33 The list of reptilian species recorded during the field survey and literature from the study area are given in Table 3.35 The list of insect species recorded during the field survey and literature from the study area are given in Table 3.36 The list of Amphibian species recorded during the field survey and literature from the study area are given in Table 3.11 and List of Butterflies identified from the project site and their conservation status is given in Table No.3.9. It is apparent from the list that none of the species either spotted or reported is included in Schedule I of the Wildlife Protection Act. Similarly, none of them comes under the REET category. Taxonomically a total of 69 species were identified from the project site. Based on habitat classification the majority of species were Insects 4, followed by birds 30, Reptiles 10, Mammals 5, amphibians 5, and Butterflies 15. A total of 30 species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species. Dominant species are mostly birds and buffer flies, and five Amphibians were observed during the extensive field visit *Duttaphrynus melanostictus*, *Rana tiger*, *Euphlyctis hexadactylus* and, *Hoplobatrachus tigerinus*. There is no schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

**Table 3.36 List of Fauna & Their Conservation Status,
Mammals: (*directly sighted animals & Secondary data)**

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Funambulus palmarum</i>	Indian palm squirrel	LC
2.	<i>Mus booduga</i>	Indian Field Mouse	LC
3.	<i>Herpestes javanicus</i>	Asian Small Mongoose	LC
4.	<i>Lepus nigricollis</i>	Indian hare	LC
5.	<i>Rattus norwegicus</i>	Brown rat	LC

Near Threatened; VU – Vulnerable, DA – Data Deficient, NE – Not Evaluated

Table 3.35 Listed birds

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Dicrurus macrocercus</i>	Black Drongo	LC
2.	<i>Passer domesticus</i>	House Sparrow	LC
3.	<i>Bubulcus ibis</i>	Cattle Egret	LC
4.	<i>Saxicoloides fulicata</i>	Indian Robin	LC
5.	<i>Columba livia</i>	Blue rock pigeon	IV

6.	<i>Streptopeliachinensis</i>	Spotted Dove	LC
7.	<i>Accipiter badius</i>	Shikra	LC
8.	<i>Corvus macrorhynchos</i>	Jungle Crow	LC
9.	<i>Turdoides caudatus</i>	Common babbler	LC
10.	<i>Orthotomus sutorius</i>	Tailor Bird	IV
11.	<i>Cuculus micropterus</i>	Indian Cuckoo	LC
12.	<i>Nectarinia minima</i>	Small Sunbird	LC
13.	<i>Acridotherestrictis</i>	Common Myna	LC
14.	<i>Apus affinis</i>	House swift	LC
15.	<i>Centropus sinensis</i>	Southern Coucal	LC
16.	<i>Cinnyris asiaticus</i>	Purple Sunbird	IV
17.	<i>Ardeola grayii</i>	Pond Heron	LC
18.	<i>Nycticorax nycticorax</i>	Night Heron	IV
19.	<i>Turdoides affinis</i>	White headed Babbler	LC
20.	<i>Corvus splendens</i>	House Crow	LC
21.	<i>Eudynamis</i>	Koel	LC
22.	<i>Psittacula krameni</i>	Rose ringed parakeet	LC
23.	<i>Dicrurus macrocercus</i>	Black drongo	LC
24.	<i>Corvus splendens</i>	House crow	LC
25.	<i>Alcedo atthis</i>	Small blue kingfisher	LC
26.	<i>Cuculus canorus</i>	Common Cuckoo	LC
27.	<i>Pycnonotus cafer</i>	Red vented Bulbul	LC
28.	<i>Milvus migrans</i>	Black kite	LC
29.	<i>Meropsorientalis</i>	Small Bee-eater	LC
30.	<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	LC

Not Evaluated (NE) Least Concern (LC) Near Threatened (NT) Endangered (E)

Table 3.37 List of Reptiles either spotted or reported from the study area.

SI. No	Scientific Name	Common Name	IUCN Red List data
1.	<i>Calotes versicolor</i>	Oriental garden lizard	LC
2.	<i>Hemidactylus flaviviridis</i>	House lizards	NL
3.	<i>Naja naja</i>	Indian cobra	LC
4.	<i>Eutropis carinata</i>	Keeled Grass Skink	IV
5.	<i>Ahaetulla nasuta</i>	Green vine snake	LC
6.	<i>Ptyas mucosa</i>	Rat snake	NA
7.	<i>Nerodipiscator</i>	Freshwater snake	NA
8.	<i>Bungarus caeruleus</i>	Common krait	LC
9.	<i>Mabuya carinatus</i>	Common skink	LC
10.	<i>Ophisops leschenaultii</i>	Leschenault's Lacertid Lizard	-

Table 3.38 List of Dragonflies and Damselflies spotted or reported from the study area

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Brachythemis contaminata</i>	Ditch jewe	LC
2.	<i>Diplocodes trivialis</i>	Ground skimmer	LC
3.	<i>Trithemis aurora</i>	Crimson marsh glider	LC
4.	<i>Trithemis pallidinervis</i>	Long legged marsh skimmer	-

Table.3.39 List of Butterflies identified from the project site and their conservation status

Sl. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Danaus chrysippuschrysippus</i>	Plain Tiger	LC
2.	<i>Danaus genutia</i>	Striped Tiger	LC
3.	<i>Junoniahierta</i>	Yellow Pansy	LC
4.	<i>Tirumala limniacae</i>	Blue Tiger	-
5.	<i>Papiliodemoleusdemoleus</i>	Lime Butterfly	LC
6.	<i>Phalanta phalantha</i>	Common leopard	NA
7.	<i>Papiliopolytespolytes</i>	Common Mormon	LC
8.	<i>Eurema hecabe</i>	Common grass yellow	NA
9.	<i>Zizeeria knysna</i>	Dark Crass Blue	-
10.	<i>Parantica aglea</i>	Glassy Tiger	IV
11.	<i>Euploea core</i>	Common Crow	LC
12.	<i>Junonialemonias</i>	Lemon Pansy	LC
13.	<i>Hypolimnasmisippus</i>	DanaidEggfly	LC
14.	<i>Acraea terpsicore</i>	Tawny Coster	LC
15.	<i>Euchrysopsnejeus</i>	Gram Blue	LC

3.5.4.13. Aquatic Ecology

Mining activities will not disturb the aquatic ecology as there is no effluent discharge proposed from the Rough Stone and Gravel quarry. There is no natural perennial surface water body within the mine lease area, like wetlands, rivers streams, lakes, and farmer sites. Noyyal River is located about 6.5km on the north side. Aquatic weeds are found to be growing everywhere in 10 km radius area, in every water bog, pond, etc. Typha angustata can be found growing all along the drains of villages, small water-logged depressions, and agricultural fields lacking water but containing enough moisture to support its growth. And where water is present, Eichhornia crassipes has taken its roots and covers the entire water surface by its sprawl and invasion.

3.5.4.14 Objectives of Aquatic Studies

- ✓ Generating data through actual field collection in these locations over the study period.
- ✓ Impacts on aquatic fauna/flora
- ✓ Consulted with locals to obtain knowledge about aquatic flora and animals.

3.5.4.15. Macrophytes

The macrophytes observed within the study area are tabulated in Table 3.39

Table No.3.40 Description of Macrophytes

S.No	Scientific name	Common Name	IUCN Red List of Threatened Species
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1.	<i>Cyperus exaltatus</i>	Tall Flat Sedge	LC
2.	<i>Carex cruciata</i>	Cross Grass	NA
3.	<i>Aponogeton natans</i>	Floating laceplant	NA
4.	<i>Hydrilla verticillata</i>	Waterthymes	LC
5.	<i>Eichornia crassipe</i>	Water hyacinth	NA
6.	<i>Chrysopogon aciculatus</i>	Golden false beardgrass	NA
7.	<i>Marsilea quadrifolia</i>	Water clover	LC

3.5.4.16 Aquatic Faunal Diversity

Amphibian species like the common Indian Burrowing frog, and Indian Pond Frog, Indian Toad, Indian Bull Frog, Common Tree Frog were sighted near the water bodies located in the study area.

Table no. 3.41 Amphibians Observed/Recorded from the Study Area

SI. No	Scientific Name	Common Name	IUCN Red List data
1.	<i>Duttaphrynus melanostictus</i>	Common Indian Toad	IV
2.	<i>Rana tiger</i>	Common Frog	NA
3.	<i>Euphlyctis hexadactylus</i>	Indian Pond Frog	LC
4.	<i>Hoplobatrachus tigerinus</i>	Indian Bull Frog	IV/LC
5.	<i>Polypedates maculatus</i>	Common Tree Frog	LC

*Status assigned by the IUCN, where – CR – Critically Endangered; EN – Endangered; LC – Least Concern; NT – Near Threatened; VU – Vulnerable, DA – Data Deficient, NE – Not Evaluated

3.5.4.17. Other Aquatic species

There are also a few canals and ponds in the study region. The presence of a few common/local fish species, as well as a broad range of plankton, has been documented in ponds in the communities listed below.

3.5.4.18 Phytoplanktons: Nitzschia, Microcystis, Oscillatoria, Navicula and Pediastrum sps.

3.5.4.19 Zooplanktons: These consist of microscopic organisms from groups Protozoa, Rotifers, Cladocera and Copepoda etc. Some common species of zooplanktons are; Deflandre, Arcella vulgaris, Centropyxis spinosa Arcella discooides, Arcella hemispherica, Centropyxis aculeate, Trigonopyxis arcula, Brachionus calyciflorus, Lecane curvicornis, Brachionus angularis, Polyarthra vulgaris, Filinia longiseta.

3.5.4.20. Fishes

Fish is commonly found in all types of natural water bodies and very common source of food in Eastern South India. The local fishermen were enquired and also the secondary resources were reviewed to collect information on the fishes found in the study area. Few common species are; Catla (Catla catla), Dwarf panchax (Aplocheilus parvus), Mrigal (Cirrhinus mrigala), Tank goby (Glossogobius giuris), Ticto barb (Pethia ticto),

Greenstripe barb (*Puntius vittatus*), Rohu (*Labeo rohita*) and Pool barb (*Puntius sophore*) etc., Species of fish reported in the study area are given in table 3.41

Table 3.42 Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data

S.No	Common name	Scientific name	Family
1.	Ticto barb	<i>Pethia ticto</i>	Cyprinidae
2.	Tank goby	<i>Glossogobius giuris</i>	Gobiidae
3.	Mrigal	<i>Cirrhinus mrigala</i>	Chordata
4.	Rohu	<i>Labeo rohita</i>	Cyprinidae
5.	Catfish	<i>Siluriformes</i>	Diplomystidae
6.	Dwarf panchax	<i>Aplocheilus parvus</i>	Aplocheilidae
7.	Greenstripe barb	<i>Puntius vittatus</i>	Cyprininae
8.	Pool barb	<i>Puntius sophore</i>	Cyprinidae
9.	Catla	<i>Catla Catla</i>	Cyprinidae

3.5.4.21 Findings/Results

The assessment was carried out during the summer season. The inspection day was quite alright with respectable weather. The details of the flora and fauna observed are given below.

Records of threatened species in the area

No threatened species were observed

Endangered Species as per Wildlife (Protection) Act

No Endangered fauna was recorded in the project area.

Endemic Species of the Project areas

No endemic species were observed in the project area.

Migratory species of the Project areas

No migratory fauna observed in project area.

Migratory corridors and Flight paths

No migratory corridors and Flight paths were observed in project area.

Breeding and spawning grounds

No breeding and spawning grounds were earmarked for the wildlife fauna in project area.

There are no critically endangered, endangered, vulnerable and endemic species were observed. As the rainfall in the area is scanty and as no toxic wastes are produced or discharged on account of mining, the proposed mining activity is not going to have any additional and adverse impacts on these RET species. There are no ecologically sensitive areas or protected areas within the 10 Km radius. Hence no specific conservation for conservation of any RET species or Wildlife is envisaged.

There are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, Tiger/Elephant Reserves/(existing as well as proposed) within 10 km of the mine lease area. There are no protected forests within the project area. Hence submission of clearance from the National Board of Wildlife does not arise. There is no endangered, endemic and RET Species. There is no Schedule I species in study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] The proposed project is not going to have any direct or indirect adverse impact on the species mentioned above.

3.5.4.22 Conclusion

The observations and assessment of the overall ecological scenario involve details such as classification of Biogeographic zone, eco-region, habitat types and land cover, distances from natural habitats, vegetation/forest types, and sensitive ecological habitats such as Wetlands sites, Important Bird areas, migration corridors of important wildlife etc. Such baseline information provides better understanding of the situation and overall ecological importance of the area. This baseline information viewed against proposed project activities help in predicting their impacts on the wildlife and their habitats in the region. Data collected and information gathered from secondary literature on flora, fauna, protected area, natural habitats, and wildlife species etc., and consulted and discussed with local people, from the villages, herders and farmers who inhabit close to the proposed project area.

3.6 SOCIO ECONOMIC ENVIRONMENT

The major developmental activities in mining /Industrial sector are required for economic development as well as creation of employment opportunities (direct and indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of the quality of life through upliftment of social, economic, health, education and nutritional status in the project region, state as well as the country. In this manner all developmental projects have direct as well as indirect relationships with socioeconomic aspects, which also include public acceptability for new developmental projects. Thus, the study of socioeconomic component incorporating various facets related to prevailing social and cultural conditions and economic status of the Roughstone and Gravel quarry project region is an important part of EIA study. The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio economics and parameters of human interest due to the project.

3.6.1 Objectives of the Study

The objectives of the socio-economic impact assessment are as follows:

-
-
- a) To study the socio-economic status of the people living in the study area of the project.
 - b) To identify the basic needs of the nearby villages within the study area.
 - c) To assess the impact on socio-economic environment due to the project.
 - d) To provide the employment and improved living standards.
 - e) To study the socio-economic status of the people living in the study area Roughstone and Gravel quarry project region
 - f) To assess the impact on socio-economic environment due to Roughstone and Gravel quarry project region
 - g) To analysis of impact of socio economic and Environmental Infrastructure facilities and road accessibility.

3.6.2 Scope of Work

- To study the Socio-economic Environment of area from the secondary sources
- Data Collection and Analysis
- Identification of impacts due to the mining projects
- Mitigation Measures

3.6.3 Methodology

The methodology adopted for the socio-economic impact assessment is as follows:

- a) The details of the activities and population structure have been obtained from Census 2001 and 2011 and analyzed.
- b) Based on the above data, impacts due to plant operation on the community have been assessed and recommendations for further improvement have been made.

3.6.4 Sources of Information and Data Base

To achieve the above objectives, the information has been collected from both primary and secondary sources. Both primary data and secondary data have been analyzed by means of suitable statistical techniques for the purpose of verifying the above selected hypotheses concerned with the surrounding area.

3.6.5 Primary Survey

The primary data collection includes the collection of data through a structured interview schedule by direct observation method. The questionnaire survey includes both open and closed methods. The sample size is limited respondents, who were selected on the basis of simple random sampling from Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State, in the field survey has been divided into three major segments namely Primary Zone (0 - 3 km), Secondary Zone (3 - 7 km) and tertiary Zone (7 - 10 km).

The questionnaires were designed to suit the subjects considering their rural background enabling to furnish correct information and data as far as possible. Data were collected at village level and household level by questionnaires and focused group discussions.

The study area for the field survey has been divided into three major segments namely Primary Zone (0 - 3 km), Secondary Zone (3 - 7 km) and Outer Zone (7 - 10 km).

3.6.6 Collection of Data from Secondary Sources

Data from secondary sources were collected on following aspects:

- Demographic profile of the area
- Economic profile of the area

Table 3.43 Type of Information and Sources

Information	Source
Demography	District Census Handbook, Govt. of India
Economic profile of the area	Census of India, Tamil Nadu State

b) Data Presentation and Analysis

The data collected were presented in a suitable, concise form i.e., tabular or diagrammatic or graphic form for further analysis. These tabulated data were interpreted and analyzed with the help of various qualitative techniques and ideographic approaches.

3.7 Background Information of the Area

Tamil Nadu is the 11th largest states in India in terms of area. The state is the seventh most populous state in the country and its main language Tamil has origins that date back to 500 BC. Chennai is the capital of Tamil Nadu and lies on the eastern coast line of India. Tamil Nadu is famous for its wonderful temples and monuments that have been built 1000s of years ago and has places that have been marked as heritage sites by the United Nations. In a 180 degree paradigm shift, this state with a rich historical importance is also one of the fastest developing centre for technology and trade.

The State can be divided broadly into two natural divisions (a) the Coastal plains of South India and (b) the hilly western area. Parallel to the coast and gradually rising from it is the broad strip of plain country. It can further be subdivided into coromandal plains comprising the districts of Kancheepuram, Karur, Cuddalore and Vellore. The alluvial plains of the Cauvery Delta extending over Thanjavur and part of Tiruchirapally districts and dry southern plains in Madurai, Dindigul, Ramanathapuram, Sivaganga, Virudhnagar, Tirunelveli and Tuticorin districts. It extends a little beyond Western Ghats in Kanyakumari District. The Cauvery Delta presents some extremely distinctive physical and human features, its power being a main factor in the remarkable growth, the towns of Tamilnadu have witnessed.

3.8 Geography of the Area

Tamil Nadu is one of the 28 states of India, located in the southernmost part of the country. It extends from 8°4'N to 13°35'N latitudes and from 76°18'E to 80°20'E longitudes. Its extremities are

- in eastern - Point Calimere
- in western - hills of Anaimalai
- in northern - Pulicat lake
- in southern - Cape Comorin

It covers an area of 1,30,058 sq.km and 11th largest state in India. It covers 4% of the area of our country. Tamil Nadu is bounded by the Bay of Bengal in the east, Kerala in the west, Andhra Pradesh in the north, Tamil Nadu in

the northwest and Indian Ocean in the south. Gulf of Mannar and Palk Strait separate Tamil Nadu from the Island of Sri Lanka, which lies to the southeast of India.

Already we have learnt that the state of Tamil Nadu had only 13 districts at the time of its formation. After that, the state was reorganised several times for the administrative convenience. At present there are 37 districts in Tamil Nadu, including the newly created districts such as Kallakurichi, Tenkasi, Chengalpet, Ranipet and Tirupathur.

3.9 Population Growth Rate

In 1991, there were only 21 districts in the State of Tamil Nadu. In 2001, eight new districts were created by reorganising the territorial jurisdiction. The nine districts are – Karur, Namakkal, Karur, Perambalur, Viluppuram, Thiruvarur, Nagapattinam, and Theni. The population and its growth trend are important economic factors in a developing economy.

Year	Tamil Nadu	India
1941	11.91	14.22
1951	14.66	13.31
1961	11.85	21.51
1971	22.30	24.80
1981	17.50	24.66
1991	15.39	23.86
2001	11.19	21.34
2011	15.61	5.96
2021	5.96	1.0

3.10 Karur District

Karur Taluk, which was once a part of Coimbatore district, was merged with Tiruchirappalli district during 1910. Karur District came into existence by the bifurcation of Trichy District. It is bounded on the North by Namakkal, South by Dindugal, East by Tiruchirappalli and West by Erode districts.

Karur District consists of two Revenue Divisions viz., Karur and Kulithalai, Seven Taluks viz., Karur, Pugalur, Manmangalam, Pugalur, Kulithalai, Krishnarayapuram and Kadavur.

Karur District is located in central Tamil Nadu and is 410 K.M. away from Chennai. The district has an area of 2904 Sq.Km. It is an inland district without any coast line. The district has Amaravathi River and Cauvery River and it has no well marked natural divisions. The district is rich in mineral deposits. Granite occurs at Thogamalai, K. Pitchampatty and various places in the district. Apart from the above major minerals the common use minor minerals viz Red Gravel, Brick Clay, filling earth and Kankar are also found in this District. Source: <https://karur.nic.in/about-district/>

3.11 Study Area

Detailed socio-economic survey was conducted in the study area (Core and buffer zone) within 10 km radius of the area at Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State. In order to determine the impact of the proposed project on nature and inhabitant. To get an overview of the villagers and their perspectives about this proposed activity, different demographic parameters and social aspects such population density, sex ratio, literacy rate, worker ratio etc. has been identified, analyzed, studied together. These impacts may be beneficial or

disadvantageous. If disadvantageous anticipated suggestions measures are advocated in order to have collective development.

3.12 Demographic pattern of 10km study area characteristics a comparative analysis

Table 3.44 Shows the socio-economic profile of the study area as compared to district, state and national level socio-economic profile

Particular	India	Tamil Nadu	Karur District	Study Area (10km Radius)
Area (in sq. km.)	3,287,263	130058	2904	332
Population Density/ sq. Km.	368	554	367	156
No. of Households	249454252	13357027	287095	15124
Population	1210569573	72147030	1064493	50311
Male	623121843	36137975	528184	24855
Female	587447730	36009055	536309	25456
Scheduled Tribes	104281034	794697	575	26
Scheduled Castes	201378086	14438445	221385	10485
Literacy Rate	72.99%	80%	75.60%	73.42%
Sex Ratio (Females per 1000 Males)	943	996	1015	1031

Source: Census of India, 2011

Table no 3.12.1 show demographic pattern of India, Tamil Nadu, Karur District & Study area (10km Radius). In India had total area of 3.2 sqkm, State of Tamil Nadu area was 130058 sqkm, District of Karur area was 2904 sqkm and study area is about 332 sqkm. Population density is total population per sqkm. So, India population density was 368 sqkm, state of Tamil Nadu density was 554 sqkm, District had density about 367 sqkm and study area density is about 156 sqkm. As per Census 2011, about 5.96percent of population in the state lives in areas. Karur had comparing state wise 2.14 percent of population lives in the district. In study area has 3.09 % around 10km radius. State, District and study area. In Tamil Nadu state SC categories people had about 20.02 %, district of Karur about 20.79 % it has increasing to Study area about 23.30% increasing in the total population Similarly ST population is about 1.10%, 1.26% and 0.05% of the total population in the study area. State level Literacy rate is 80%, district level is 76% but study area has almost decreased about 69.73%. There is literacy rate is study area decrease comparing district level decrease in the study area. Sex ratio female per thousand males about state level is 996, District level is 1015 and study area is 1031.

The study area has population density 156 persons per sq.km of total population about 48656 as per census 2011. There were about 49.25 percent male and 50.75% female population. Study area has literate rate is about 69.7%. District had about 75.60% of literate rate as per census 2011.

3.13 Population Projection of the Study Area

A population projection is an estimation of the number of people expected to be alive at a future date that is made based on assumptions of population structure, fertility, mortality and migration. It is an essential to assess the need for new jobs, schools, doctors and nurses, planning urban housing, foods, clothing and requirements of energy and resources. It is also needed for policy discourse i.e., helps to the policy-makers to understand the existing problems and finally supports to develop the suitable solutions.

Table 3.45 Total Population of Study Area

SI No.	Population in 2001	Population in 2011
1	42956	50311

Source: <https://censusindia.gov.in/census.website/>

Table 3.46 Population Projection of Study Area

S. No	Year	Projected Population (Approximately)
1.	2021	50311
2.	2031	57666
3.	2041	65021
4.	2051	72376

Source: Calculated by SPSS v29, 2022.

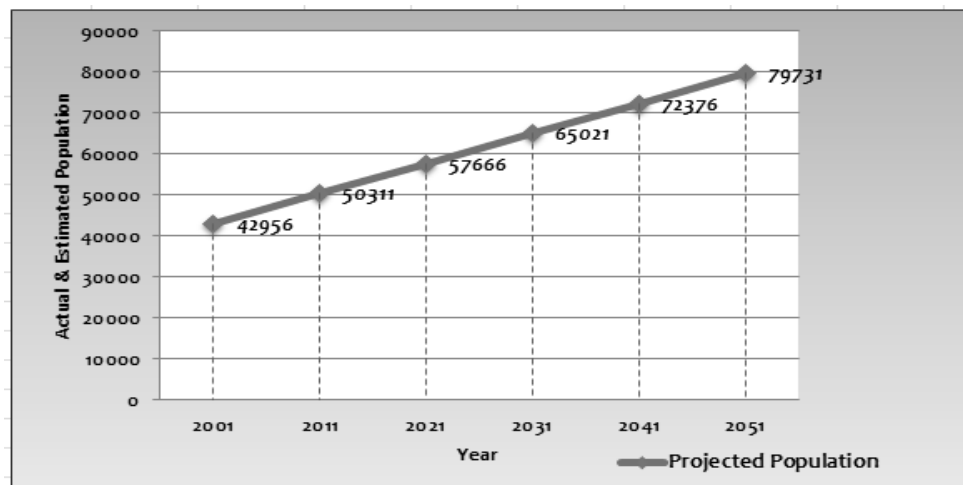


Fig 3.13.3 Graph Showing Population Projection

Following formula has been used for the projection of population.

$$Y=a+bt$$

Where: Y= Dependent variable (Population)

a=Intercept

b=Slope

t=Interdependent variables (Time)

Above formula is applied to project population for the years (2021, 2031,2041,2051). Due to avoid the errors in manual calculation the statistical software SPSS (demo version 29) is used to calculate the intercept and the slope.

Due to the shortage of data on population the results show same value of growth for the years (2021,2031,2041,2051). If the researcher gets enough the data on population for earlier years the data projection will be accurate.

- Ref: Indian Economic survey, the SLR (Simple Linear Regression) techniques are used by statistical department, Government of India to project population.
- Source: <https://www.ibm.com/in-en/analytics/spss-statistics-software>

3.14 Population Growth of the Study Area

Table 3.47 Population Growth rate in Study area

Year	Actual Population	Growth Rate %
2001	42956	-
2011	50311	11.71
2021	57666	11.46
2031	65021	11.28
2041	72376	11.13
2051	79731	11.02

Source: Compiled by Author-2022

Above table no 3.14.1 is showing the growth rate of population since 2001, as per census in 2001 the population of study area was 42956 and 2011 it was 50311 if the population growth rate is 11.71%, it will approximately 57666 in year 2021 and 79731 in the year of 2051. It has approximately population growth rate decline will be 11.02%.

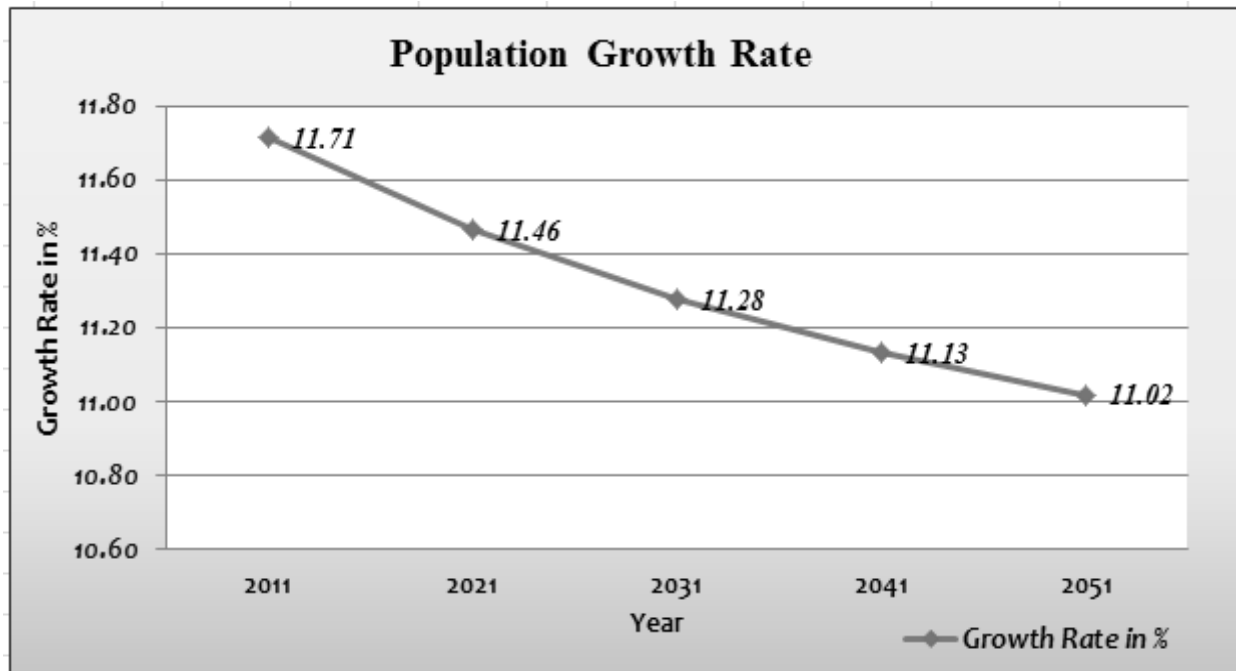


Fig.3.14.2 Graph Showing Population Growth Rate

Planning Analysis:

Calculating Growth Rates

The percent change from one period to another is calculated from the formula:

Where:

PR=Percent Rate

$V_{Present}$ =Present or Future Value

V_{Past} = Past or Present Value

$$PR = \frac{(V_{Present} - V_{Past})}{V_{Past}} \times 100$$

The *annual* percentage growth rate is simply the percent growth divided by N, the number of years.

Source: <https://pages.uoregon.edu/rgp/PPPM613/class8a.htm>

3.15 Population Distribution and Composition of Study Area

The population as per 2011 Census records is 50311 (for 10 km radius buffer zone). Total no. of household is 1120, 10062 and 3942 respectively, in primary, secondary and tertiary zone. Sex ratio is 1064, 1014 and 1042 (females per 1000 males) observed in primary, secondary and tertiary zone respectively. SC population distribution is 600, 7776 and 2109 respectively in primary, secondary and tertiary zone. ST population distribution is 0,25 and 16 respectively in primary, secondary and tertiary. Average household size is 3. Zone wise Demographic profile of study area is given in the table 1.18.1 below:

Source: <https://censusindia.gov.in/census.website/data/census-tables>

TABLE 3.48: ZONE WISE DEMOGRAPHIC PROFILE OF STUDY AREA

Zone	No. of Villages	Total Household	Total Population	Male Population	%	Female Population	%
Primary Zone (0 - 3 Km)	1	1120	3503	1697	48.44	1806	51.56
Secondary Zone (3 - 7 Km)	9	10062	34221	16993	49.66	17228	50.34
Tertiary Zone (7 - 10 km)	4	3942	12587	6165	48.98	6422	51.02
Study Area (0-10 km)	14	15124	50311	24855	49.40	25456	50.60

Source: Census of India, 2011

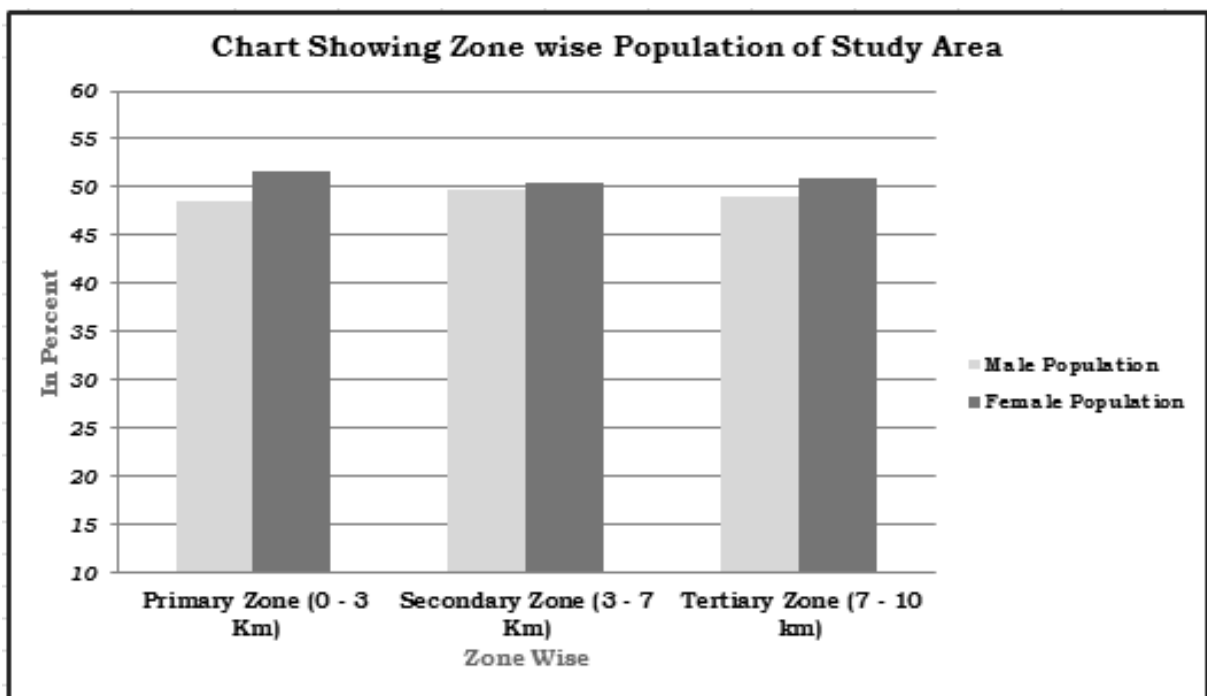


Figure 3.15.2 Population of study area

TABLE 3.49: VILLAGE WISE DEMOGRAPHIC PROFILE OF THE STUDY AREA (CORE AND BUFFER ZONE)

0-3km																														
Sno	Name	No.of Households	Total population	Total Male	Total Female	Sex Ratio	Population below 6	Male below 6	Female below 6	Child Sex Ratio	SC population	SC Male	SC Female	ST population	ST Male	ST Female	Literate population	Male Literate	Female Literate	Total Lite.rate (%)	Male Lite rate (%)	Female Lite.rate (%)	Total workers	Total Workers Rate (%)	Main workers	MainWorkers Rate (%)	Marginal workers	Marginal Workers Rate (%)	Nonworkers	Non Workers Rate (%)
1	Kuppam	1120	3503	1697	1806	1064	264	127	137	1079	600	286	314	0	0	0	1947	1143	804	60.11	72.80	48.17	2246	64.12	1941	55.41	305	8.71	1257	35.88
Total		1120	3503	1697	1806	1064	264	127	137	1079	600	286	314	0	0	0	1947	1143	804	60.11	72.80	48.17	2246	64.12	1941	55.41	305	8.71	1257	35.88
3-7km																														
Sno	Name	No.of Households	Total population	Total Male	Total Female	Sex Ratio	Population below 6	Male below 6	Female below 6	Child Sex Ratio	SC population	SC Male	SC Female	ST population	ST Male	ST Female	Literate population	Male Literate	Female Literate	Total Lite.rate (%)	Male Lite rate (%)	Female Lite.rate (%)	Total workers	Total Workers Rate (%)	Main workers	MainWorkers Rate (%)	Marginal workers	Marginal Workers Rate (%)	Nonworkers	Non Workers Rate (%)
1	Punnam	1452	5446	2839	2607	918	427	237	190	802	906	468	438	0	0	0	3679	2208	1471	73.30	84.86	60.86	2718	49.91	1504	27.62	53	0.97	2728	50.09
2	K.Paramathi	1093	3488	1709	1779	1041	299	148	151	1020	1256	619	637	0	0	0	2554	1380	1174	80.09	88.40	72.11	1782	51.09	1108	31.77	59	1.69	1706	48.91
3	Nedungur	403	1190	586	604	1031	61	33	28	848	298	149	149	6	5	1	800	469	331	70.86	84.81	57.47	753	63.28	418	35.13	19	1.60	437	36.72
4	Karudayampalayam	577	2347	1211	1136	938	132	62	70	1129	438	219	219	0	0	0	1614	977	637	72.87	85.03	59.76	1176	50.11	501	21.35	329	14.02	1171	49.89
5	Viswanathapuri	350	1105	511	594	1162	104	48	56	1167	1005	466	539	1	1	0	759	416	343	75.82	89.85	63.75	726	65.70	353	31.95	2	0.18	379	34.30
6	Vettamangalam (west)	1827	5882	2887	2995	1037	420	213	207	972	816	398	418	7	4	3	3953	2225	1728	72.37	83.21	61.98	3541	60.20	1920	32.64	86	1.46	2341	39.80
7	Vettamangalam (East)	807	2657	1310	1347	1028	202	99	103	1040	714	346	368	5	2	3	1521	900	621	61.96	74.32	49.92	1609	60.56	886	33.35	16	0.60	1048	39.44
8	Andankoil(West)	1687	6038	2939	3099	1054	580	304	276	908	801	381	420	4	3	1	4404	2342	2062	80.69	88.88	73.04	3039	50.33	1817	30.09	151	2.50	2999	49.67
9	Manmangalam	1866	6068	3001	3067	1022	489	242	247	1021	1542	759	783	2	2	0	4068	2345	1723	72.92	84.99	61.10	3448	56.82	1901	31.33	129	2.13	2620	43.18
Total		10062	34221	16993	17228	1014	2714	1386	1328	958	7776	3805	3971	25	17	8	23352	13262	10090	74.12	84.97	63.46	18792	54.91	10408	30.41	844	2.47	15429	45.09
7-10km																														
Sno	Name	No.of Households	Total population	Total Male	Total Female	Sex Ratio	Population below 6	Male below 6	Female below 6	Child Sex Ratio	SC population	SC Male	SC Female	ST population	ST Male	ST Female	Literate population	Male Literate	Female Literate	Total Lite.rate (%)	Male Lite rate (%)	Female Lite.rate (%)	Total workers	Total Workers Rate (%)	Main workers	MainWorkers Rate (%)	Marginal workers	Marginal Workers Rate (%)	Nonworkers	Non Workers Rate (%)
1	Athur	1633	5186	2548	2638	1035	478	250	228	912	1245	614	631	1	1	0	3488	1977	1511	74.09	86.03	62.70	2874	55.42	1560	30.08	219	4.22	2312	44.58
2	Kombupalayam	614	1932	973	959	986	133	78	55	705	235	121	114	0	0	0	1371	766	605	76.21	85.59	66.92	945	48.91	566	29.30	43	2.23	987	51.09
3	Thirukkattuthurai	944	3011	1458	1553	1065	217	118	99	839	387	190	197	0	0	0	2091	1150	941	74.84	85.82	64.72	1694	56.26	954	31.68	12	0.40	1317	43.74
4	Nanjaipugalur	751	2458	1186	1272	1073	208	120	88	733	242	113	129	0	0	0	1741	922	819	77.38	86.49	69.17	1215	49.43	738	30.02	36	1.46	1243	50.57
Total		3942	12587	6165	6422	1042	1036	566	470	830	2109	1038	1071	1	1	0	8691	4815	3876	75.24	86.00	65.12	6728	53.45	3818	30.33	310	2.46	5859	46.55
Grand total		15124	50311	24855	25456	1024	4014	2079	1935	931	10485	5129	5356	26	18	8	33990	19220	14770	73.42	84.39	62.79	27766	55.19	16167	32.13	1459	2.90	22545	44.81

Source: Village Wise Demographic Profile of the Study Area, Census of India, 2011

- ✓ Above table identifies the presence of villages and their subsequent population divided under three zones from plant boundary (i.e., Primary, secondary and tertiary zone
- ✓ Primary zone has 1 village where as much as 1120 households with 3503 population are located. Mostly lying on Built-up land for their livelihood and substance.
- ✓ Secondary and tertiary zone both comprise of 9 and 4 villages having a total population of 34221 and 12587 respectively.

3.16 Gender and Sex Ratio

Sex ratio is used to describe the number of females per 1000 of males. Sex ratio is a valuable source for finding the population of women in India and what is the ratio of women to that of men in India. In the Population Census of 2011, it was revealed that the population ratio in India 2011 is 940 females per 1000 of males. The study area has 1024 females per 1000 males. Gender and sex ratio determine the Human Development Index (HDI) of an area thereby understanding the status of women in that region. Following table entails information about sex ratio of 14 villages lying in study area (buffer zone) as primary, secondary and tertiary zone.

TABLE 3.50: SEX RATIO OF THE STUDY AREA

S. No.	Buffer Zone	Sex Ratio of Study area Female/ 1000 Male
1	Primary Zone (0-3 km)	1064
2	Secondary zone (3-7 km)	1014
3	Tertiary Zone (7-10 km)	1042

Source: Census of India, 2011

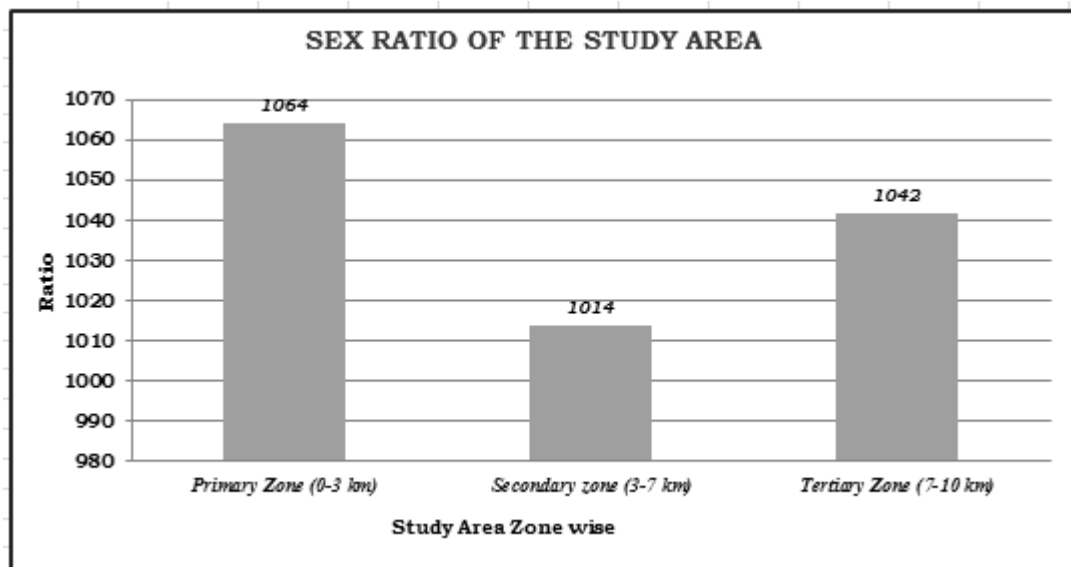


Figure 3.16.2 Sex Ratio within 10 Km study area

3.17 Literacy Rate in Study Area

Literacy Rate is the percentage of people in a country with the ability to read and write. The analysis of the literacy levels is done in the study area. The 10 km radius of study area demonstrates a literacy rate of 73.42% as per census data 2011. The male literacy rate in the study area indicates 84.39% whereas the female literacy rate, which is an important indicator for social change, is observed to be 62.79% as per the census data 2011. This needs to focus on the region and enhance further development focusing on education. (Table no 3.51).

TABLE 3.51: LITERACY RATE OF THE STUDY AREA

Zone	No. of Villages	Male Literacy Population	Male literacy Rate	Female Literacy Population	Female literacy Rate	Total Literacy	Total Literacy Rate
Primary Zone (0 - 3 Km)	1	1143	72.80	804	48.17	1947	60.11
Secondary Zone (3 - 7 Km)	9	13262	84.97	10090	63.46	23352	74.12
Tertiary Zone (7 - 10 Km)	4	4815	86.00	3876	65.12	8691	75.24
Study Area (0-10km)	14	19220	84.39	14770	62.79	33990	73.42

Source: Census of India, 2011

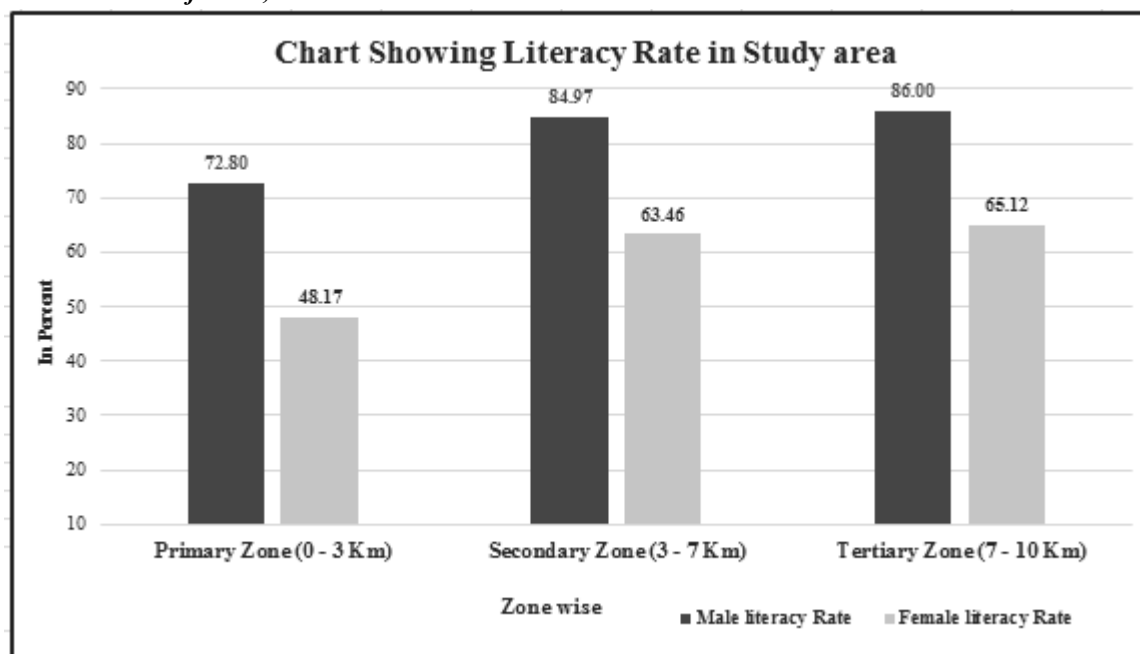


Figure 3.17.2 Gender wise Literacy Rate in the study area

3.18 Family Size

Size of family also describes about family functioning, resource consumption, total income generated and their expenditure pattern. Census 2011 data suggests that most of these households have a family size of up to 3 members, knowing the size of family also give fair understanding of relating how much resource consumption is being incurred, and annual income being generated and spent.

3.19 Vulnerable Group

While developing an action plan, it is very important to identify the population who fall under the marginalized and vulnerable groups and special attention has to be given towards these groups while making action plans. Special provisions should be made for them. In the observed villages schedule caste (SC) population is 26.86% and Schedule Tribe population 0.03%, Other Population is 73.11% in Total study area.

TABLE 3.52: VULNERABLE GROUPS OF THE STUDY AREA

Zone	No. of Villages	Vulnerable Groups					
		SC Population	%	ST Population	%	Other Population	%
Primary Zone (0 - 3 Km)	1	600	17.13	0	0.00	2903	82.87
Secondary Zone (3 - 7 Km)	9	7776	22.72	25	0.07	26420	77.20
Tertiary Zone (7 - 10 Km)	4	2109	16.76	1	0.01	10477	83.24
Total area (10km)	14	10485	20.84	26	0.05	39800	79.11

Source: Census of India, 2011

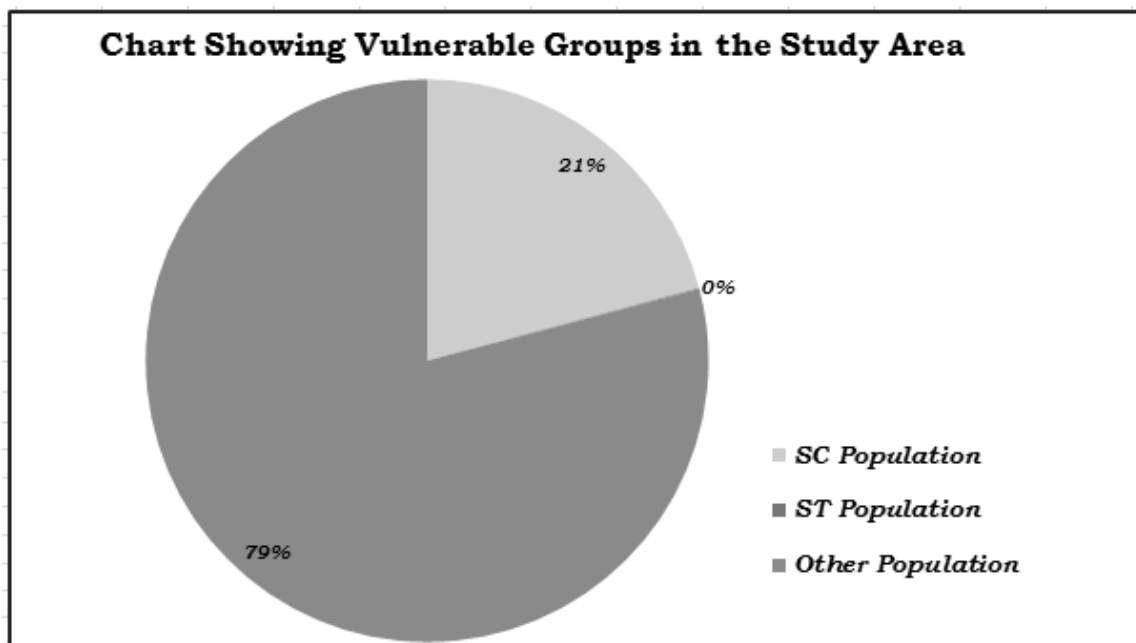


Figure 3.19.2 vulnerable groups

3.20 Economic Activities

The economy of an area is defined by the occupational pattern and income level of the people in the area. The occupational structure of residents in the study area is studied with reference to work category. The population is divided occupation wise into three categories, viz., Total workers, Main workers and non-workers. The main workers include cultivators, agricultural laborers, those engaged in household industry and other services. The non-workers include those engaged in unpaid household duties like, students, retired persons, dependents, beggars, vagrants etc. besides Institutional intimates or all other non-workers who do not fall under the above categories.

TABLE 3.53: SHOWS THE WORK FORCE OF THE STUDY AREA

Zone	No. of Villages	Total Workers	%	Main Workers	%	Marginal Workers	%	Non-Workers	%
Primary Zone (0 - 3 Km)	1	2246	64.12	1049	29.95	305	8.71	1257	35.88
Secondary Zone (3 - 7 Km)	9	18792	54.91	10408	30.41	844	2.47	15429	45.09
Tertiary Zone (7 - 10 Km)	4	6728	53.45	3818	30.33	310	2.46	5859	46.55
Study Area (10 Km)	14	27766	55.19	15275	30.36	1459	2.90	22545	44.81

Source: Census of India, 2011

The above table shows that out of the total working population, the percentage of main workers is 30.36% while 2.90% are marginal workers. Number of working populations is 55.19% and non-working population is 44.81% in the study area. As per the data obtained from the survey (as mentioned previously in occupational structure) most of these people are employed for major period of the year. Also, to mention the natural environment also restricts the people in finding stable business is performed for only certain months. Thus, proposed project will act as possible exposure for them to get enroll and earn sustain livelihood.

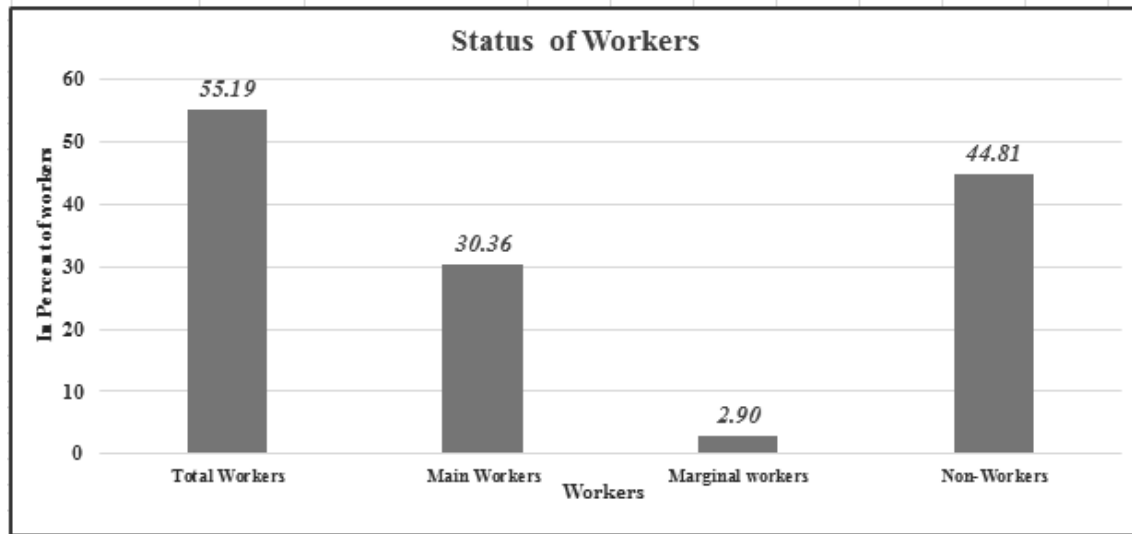


Figure 3.20.2. Working population in the study area

3.21 Infrastructure Base

A better network of physical infrastructure facilities (built up and roads, irrigation, power and social infrastructure support, viz. health and Education, water and sanitation are essential for the development of the rural economy.

A review of infrastructural facilities available in the area has been done based on the information from the baseline survey & census data of the study area. Infrastructural facilities available in the area are described in the subsequent sections.

- Administrative offices are located in Tamil Nadu, Karur district (15km-E) from site which by local transport.
- Amaravathi River Southern East side 10 km from mine lease boundary.
- Availability of Government high school Chathiram Village (NE-3.0km) ADW Government Higher Secondary school, Punnandupalayam Village (E-5.0km), Government school, Kurumpapatti (SE-4.0km), Government Elementary school, Orambupalayam (6km-N), Cambridge college of Arts and Science, Maravapalayam Village and Karur Taluk many college and Training institute found in study area.
- Health facilities covered in the Buffer zone area like Punnam PHC, Mochakottam Palayam Village Government Hospital, Chinnasamuthram PHC, etc.

TABLE 3.54: EDUCATIONAL FACILITIES IN THE SURVEYED AREA

Sno	Village Name	Govt Primary School (Numbers)	Private Primary School (Numbers)	Govt Middle School (Numbers)	Private Middle School (Numbers)	Govt Secondary School (Numbers)	Private Secondary School (Numbers)	Govt Senior Secondary School (Numbers)	Govt Arts and Science Degree College (Numbers)
0-3km									
1	Kuppam	5	0	1	0	0	0	0	0
	Total	5	0	1	0	0	0	0	0
3-7km									
1	Punnam	7	1	2	2	1	1	1	0
2	Manmangalam	5	2	1	3	1	3	0	0
3	Andankoil(West)	5	0	1	0	0	0	0	0
4	K.Paramathi	3	0	1	0	1	0	1	0
5	Nedungur	3	0	0	0	0	0	0	0
6	Karudayampalayam	3	0	1	0	0	0	0	0
7	Viswanathapuri	1	0	1	0	0	0	0	0
8	Vettamangalam (west)	8	0	1	1	1	1	1	0
9	Vettamangalam (East)	4	0	0	0	0	0	0	0
	Total	39	3	8	6	4	5	3	0
7-10km									
1	Kombupalayam	2	1	1	1	1	1	1	0
2	Thirukkattuthurai	3	1	0	1	0	1	0	0
3	Nanjaipugalur	2	0	2	0	0	0	0	0
4	Athur	5	0	1	0	0	0	0	0
	Total	12	2	4	2	1	2	1	0
	G.Total	56	5	13	8	5	7	4	0

Source: DCHB Census 2011, Tamil Nadu.

TABLE 3.55: HEALTH/ MEDICAL FACILITIES IN THE SURVEYED AREA

Sno	Village Name	Community Health Centre (Numbers)	Primary Health Centre (Numbers)	Primary Health Sub Centre (Numbers)	Maternity And Child Welfare Centre (Numbers)	Hospital Allopathic (Numbers)	Dispensary (Numbers)	Veterinary Hospital (Numbers)	Family Welfare Centre (Numbers)	Non Government Medical facilities Medicine Shop (Numbers)
0-3km										
1	Kuppam	0	0	1	0	0	0	1	0	0
	Total	0	0	1	0	0	0	1	0	0
3-7km										
1	Punnam	0	1	1	1	0	1	1	1	1
2	Manmangalam	1	1	1	1	0	1	1	1	0
3	Andankoil(West)	0	0	1	1	0	0	0	0	2
4	K.Paramathi	0	1	2	1	0	1	1	1	1
5	Nedungur	0	0	0	0	0	0	0	0	0

6	Karudayampalayam	0	0	1	0	0	0	0	0	0	0
7	Viswanathapuri	0	1	1	1	0	1	0	1	0	0
8	Vettamangalam (west)	0	0	2	1	0	0	1	0	1	0
9	Vettamangalam (East)	0	1	2	1	0	1	0	1	0	0
Total		1	5	11	7	0	5	4	5	5	5
7-10km											
1	Kombupalayam	0	0	1	1	0	0	0	0	0	0
2	Thirukkattuthurai	0	0	1	1	0	0	0	0	0	0
3	Nanjaipugalur	0	0	1	1	0	0	0	0	0	0
4	Athur	0	0	2	1	0	0	1	0	0	0
Total		0	0	5	4	0	0	1	0	0	0
G.Total		1	5	17	11	0	5	6	5	5	5

Source: DCHB Census 2011, Tamil Nadu.

TABLE 3.56: WATER & DRAINAGE FACILITIES IN THE SURVEYED AREA

Sno	Village Name	Tap Water-Treated (Status A(1)/NA(2))	Tap Water Untreated (Status A(1)/NA(2))	Covered Well (Status A(1)/NA(2))	Uncovered Well (Status A(1)/NA(2))	Hand Pump (Status A(1)/NA(2))	Tube Wells/Borehole (Status A(1)/NA(2))	Spring (Status A(1)/NA(2))	River/Canal (Status A(1)/NA(2))	Tank/Pond/Lake (Status A(1)/NA(2))	Closed Drainage (Status A(1)/NA(2))	Open Drainage (Status A(1)/NA(2))	No Drainage (Status A(1)/NA(2))
0-3km													
1	Kuppam	1	1	1	1	1	1	2	2	2	1	1	1
Total		1	1	1	1	1	1	0	0	0	1	1	1
3-7km													
1	Punnam	1	1	1	1	1	1	1	1	1	1	1	1
2	Manmangalam	1	1	1	1	1	1	2	1	2	1	1	1
3	Andankoil(West)	1	1	2	1	1	1	2	2	2	1	1	1
4	K.Paramathi	1	1	1	1	1	1	2	2	2	1	1	1
5	Nedungur	1	1	2	1	1	1	2	2	2	1	1	1
6	Karudayampalayam	1	1	2	1	2	1	2	2	2	1	1	1
7	Viswanathapuri	1	1	2	1	2	2	2	2	2	1	1	1
8	Vettamangalam (west)	1	1	1	1	1	1	2	1	2	1	1	1
9	Vettamangalam (East)	1	1	1	1	1	1	2	1	2	1	1	1
Total		9	9	5	9	7	8	1	4	1	9	9	9
7-10km													
1	Kombupalayam	1	1	1	1	2	1	1	2	2	1	1	1
2	Thirukkattuthurai	1	1	1	1	1	1	2	2	2	1	1	1
3	Nanjaipugalur	1	1	1	1	1	1	2	2	2	1	1	1
4	Athur	1	1	2	1	1	1	1	2	2	1	1	1
Total		4	4	3	4	3	4	2	8	8	4	4	4
G.Total		14	14	9	14	11	13	3	12	5	14	14	14

Source: DCHB Census 2011, Tamil Nadu.

Table 3.57: Transport and Other Infrastructure Facilities in the Surveyed Area

Sno	Village Name	Post Office (Status A(1)/NA(2))	Sub Post Office (Status A(1)/NA(2))	Post And Telegraph Office (Status A(1)/NA(2))	Telephone (landlines) (Status A(1)/NA(2))	Mobile Phone Coverage (Status A(1)/NA(2))	Private Courier Facility (Status A(1)/NA(2))	Public Bus Service (Status A(1)/NA(2))	Private Bus Service (Status A(1)/NA(2))	Railway Station (Status A(1)/NA(2))	Auto/Modified Autos (Status A(1)/NA(2))	Taxi (Status A(1)/NA(2))	Vans (Status A(1)/NA(2))	Tractors (Status A(1)/NA(2))	Cycle-pulled Rickshaws (manual driven) (Status A(1)/NA(2))	Cycle-pulled Rickshaws (machine driven) (Status A(1)/NA(2))	Carts Driven by Animals (Status A(1)/NA(2))	Sea/River/Ferry Service (Status A(1)/NA(2))	National Highway (Status A(1)/NA(2))	State Highway (Status A(1)/NA(2))	Major District Road (Status A(1)/NA(2))	Other District Road (Status A(1)/NA(2))
0-3km																						
1	Kuppam	2	1	2	1	1	2	1	1	2	1	2	2	2	2	2	2	2	2	1	1	1
	Total	0	1	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
3-7km																						
1	Punnam	2	2	2	1	1	2	1	1	2	2	1	1	2	2	2	2	2	2	1	2	2
2	Manmangalam	2	1	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	2
3	Andankoil(West)	2	2	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1
4	K.Paramathi	2	1	2	1	1	2	1	1	2	2	1	1	2	2	2	2	2	2	1	1	1
5	Nedungur	2	2	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	2	2	1
6	Karudayampalayam	2	1	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	2	2	1
7	Viswanathapuri	2	1	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Vettamangalam (west)	2	1	2	1	1	2	1	2	2	2	1	1	2	2	2	2	2	1	1	1	1
9	Vettamangalam (East)	2	2	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1
	Total	0	5	0	9	9	0	9	8	0	18	3	3	0	0	0	0	0	5	5	5	6
7-10km																						
1	Kombupalayam	1	2	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1
2	Thirukkattuthurai	2	1	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1
3	Nanjaipugalur	2	1	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	2	2	2
4	Athur	2	1	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	1	1	2	2
	Total	1	3	1	2	4	0	4	4	8	8	8	8	0	0	0	0	0	2	1	2	2
	G.Total	1	9	1	12	14	0	13	12	5	27	12	12	0	0	0	0	0	7	6	7	8

Source: DCHB Census 2011, Tamil Nadu.

3.22. Other Issues in the Study Area

1. Deforestation of Land (Cutting Trees or Plant etc.)
2. Agriculture Land decreases
3. Lack of awareness among vulnerable groups for their welfare
4. Medical/Clinic facilities and PHC need for the Core area
5. Environmental clean with solid wastage pin each village.
6. Functioning of Hospital facilities with Sub Health care centers.
7. Need proper drainage system with public toilet men and women separately.

3.23 Interpretation

Based on the data, following inferences could be drawn:

- Total literacy rate in the study area is 73.42%.
- The study area had average educational facilities. The overall status depicts that the education is limited to primary and middle level.
- The schedule tribe community forms 0.05% and Scheduled Caste forms 20.84% of the total population of study area.
- The Other Population forms 79.11% of the total population of study area.
- The study area is well connected by District/Village Road.
- The study area not well health facilities of primary level.
- Considering the above facts, the proposed project will boost the socio-economic development activities in the area and hence will leave positive impact.
- The study area has mobile connectivity.

3.24 Recommendation and Suggestions

The village development plans are made in consultation with the community through Gram Sabha; these appear to address the needs of the community. However, it may be noted that at the implementation stage these plans often are fraught with problem of inadequate funds, lack of proper planning, corruption, vested interests and political agendas. Hence while ascertaining the scope for convergence with the government activities, care must be taken to ascertain realistic possibilities for implementation.

- **Women empowerment**– Home based income generation activities, vocational training programs and common education centre for increasing the literacy rate.
- **Education** – Free uniform, construction of common rooms and library, computer education and physical education, additional schools for girls, furniture and equipment in schools, up-gradation of existing school infrastructure.
- **Agriculture/livestock** – Infrastructure such as agricultural practices, electricity connections, assistance with buying improved tools and equipment, capacity building, supply and/or knowledge of better variety of seeds, pasture land development and trainings on animal husbandry& facility of veterinary doctor.
- **Health** – Improvements in sanitary conditions of villages, assistance with construction of latrines, improvement in drainage system, health camps and awareness campaigns for diseases like Covid-19, malaria, typhoid, tuberculosis, yellow fever and pneumonia. Repairing of PHCs and Anganwadi centers.

-
- **People with disability** – Establishment of center for special education, sensitization of the community towards disabled and awareness on Government schemes.
 - 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.
 - **Connectivity** –Road network and transport connectivity to easiness accessibility to the region.

3.25 Conclusion

To evaluate the impacts of proposed quarry project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the locality of the site. Hence it can be concluded that the present environment status of the study area will not be affected by the project as Thiru.Gunasekaran will adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas. 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.

4. 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 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.

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 (Impacts) are identified, quantified and assessed.

4.1 LAND ENVIRONMENT

4.1.2 Anticipated Impact from Proposed Project

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

4.1.3 Common Mitigation Measures for 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 minimise 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

4.1.4 Soil Environment

The proposed project area is covered by thin layer of gravel formation and the average thickness is about 2 m – 3 m, the excavated gravel will be dumped sold to needy customers in open market.

4.1.5 Impact on Soil Environment from Proposed Project

Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

4.1.6 Mitigation Measures for Proposed Project

- Run-off diversion – Garland drains will be constructed all 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

4.1.7 Waste Dump Management

There is no waste anticipated in this Rough Stone quarrying operation. The entire quarried out materials will be utilized (100%).

4.2 WATER ENVIRONMENT

4.2.1 Anticipated Impact from Proposed Project

- The major sources of water pollution normally associated due to mining and allied operations are:
 - Generation of waste water from vehicle washing.
 - Washouts from surface exposure or working areas
 - Domestic sewage
 - Disturbance to drainage course in the project area
 - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table

Detail of water requirements in KLD as given below:

TABLE 4.1: WATER REQUIREMENTS

*Purpose	Quantity	Source
Dust Suppression	0.3 KLD	Rainwater accumulated in Mine Pit/ Water Tanker
Green Belt development	0.7 KLD	Rainwater accumulated in Mine Pit/ Water Tanker
Domestic purpose	0.5 KLD	Water Tankers
Total	1.5 KLD	

* Water for drinking purpose will be brought from approved water vendors

Source: Approved Mining Plan Pre-Feasibility Report

4.2.2 Mitigation Measures for Proposed Project

- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;

- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & 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 (every 6 month once) and analysing the quality of water in open well, bore wells and surface water

4.3 AIR ENVIRONMENT

4.3.1. Anticipated Impact from Proposed Project

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

4.3.2 Modelling of Incremental Concentration from Proposed Project

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM₁₀ & PM_{2.5} and emissions of Sulphur dioxide (SO₂) & Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Similarly, loading - unloading and transportation of Rough Stone, wind erosion of the exposed area and movement of light vehicles causes of pollution. This leads to an impact on the ambient air environment around the project area.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500 meters around the project area is predicted by Open Pit Source modelling using AERMOD Software.

The impact on Air Environment is due to the mining and allied activities during Land Development phase, Mining process and Transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Rough Stone, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM₁₀) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration cumulative production three proposed quarries. Air environment and net increase in emissions by Open pit source modelling in AERMOD Software.

4.3.3 Emission Estimation

An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

Where:

E = emissions;

A = activity rate;

EF = emission factor, and

ER =overall emission reduction efficiency, %

The proposed mining activity includes various activities like ground preparation, excavation, handling and transport of Rough Stone. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 4-2.

TABLE 4.2: ESTIMATED EMISSION RATE FOR PM₁₀

Activity	Source type	Value	Unit
Drilling	Point Source	0.073545273	g/s
Blasting	Point Source	0.000520461	g/s
Mineral Loading	Point Source	0.040075588	g/s
Haul Road	Line Source	0.002487748	g/s
Overall Mine	Area Source	0.050518120	g/s

TABLE 4.3: ESTIMATED EMISSION RATE FOR SO₂

Activity	Source type	Value	Unit
Overall Mine	Area Source	0.000383902	g/s

TABLE 4.4: ESTIMATED EMISSION RATE FOR NO_x

Activity	Source type	Value	Unit
Overall Mine	Area Source	0.000016703	g/s

4.3.4 Frame work of Computation & Model details

By using the above-mentioned inputs, ground level concentrations due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by quarrying activities. Suspended Particulate Matter (SPM) is the major pollutant occurred during quarrying activities. The prediction included the impact of Excavation, Drilling, Blasting (Occasionally), loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and Cloud cover.

Impact was predicted over the distance of 10 km around the source to assess the impact at each receptor separately at the various locations and maximum incremental GLC value at the project site. Maximum impact of PM₁₀ was observed close to the source due to low to moderate wind speeds. Incremental value of PM₁₀ was superimposed on the base line data monitored at the proposed site to predict total GLC of PM₁₀ due to combined impacts.

FIGURE 4.1: AERMOD TERRAIN MAP

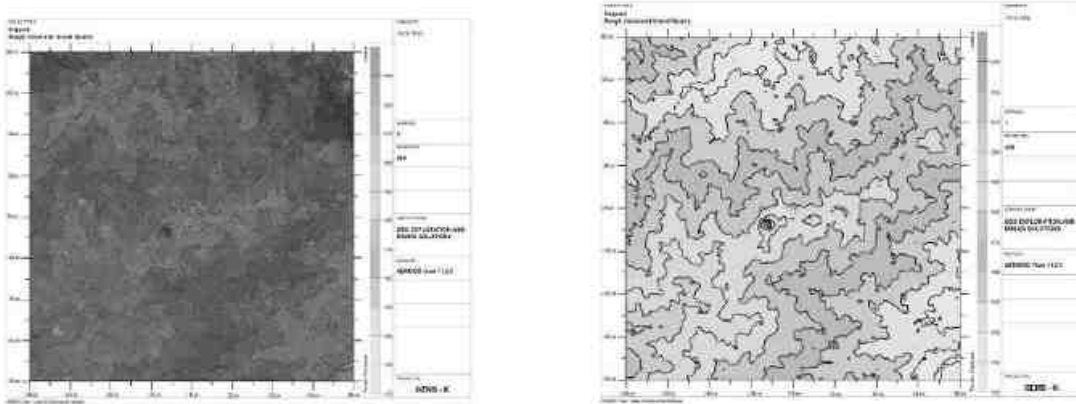


FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM₁₀

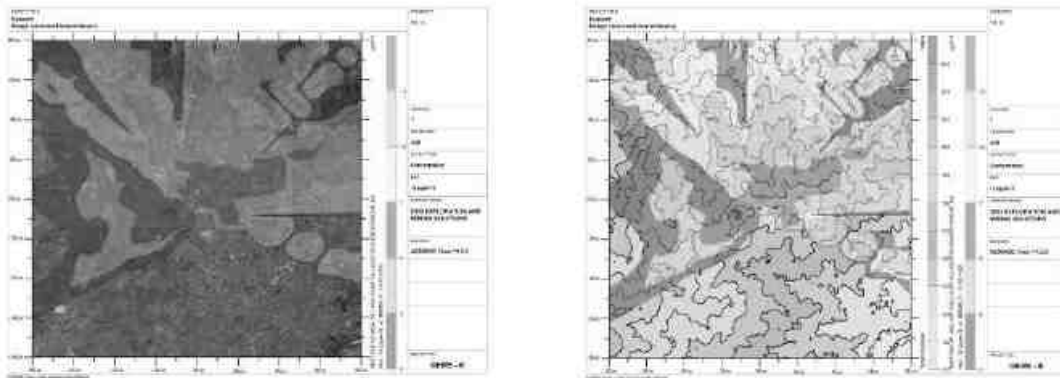


FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM₂₅

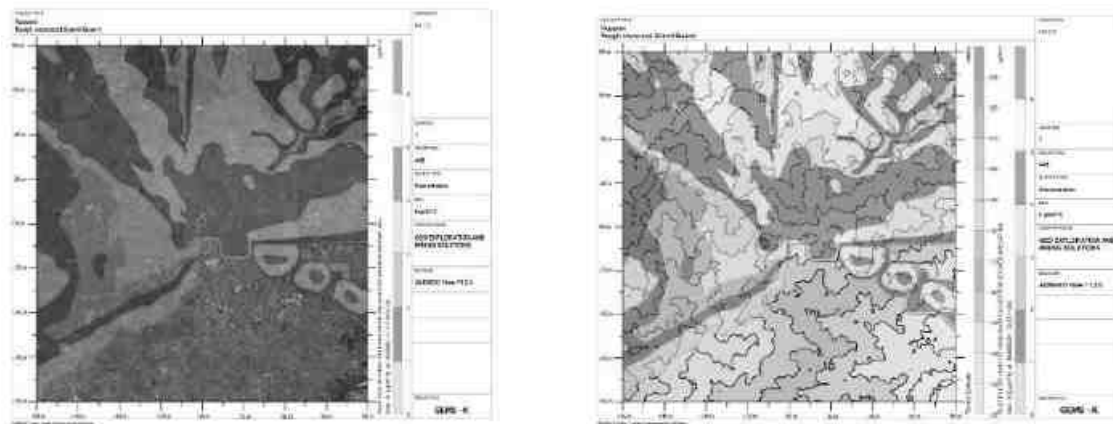


FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO_x

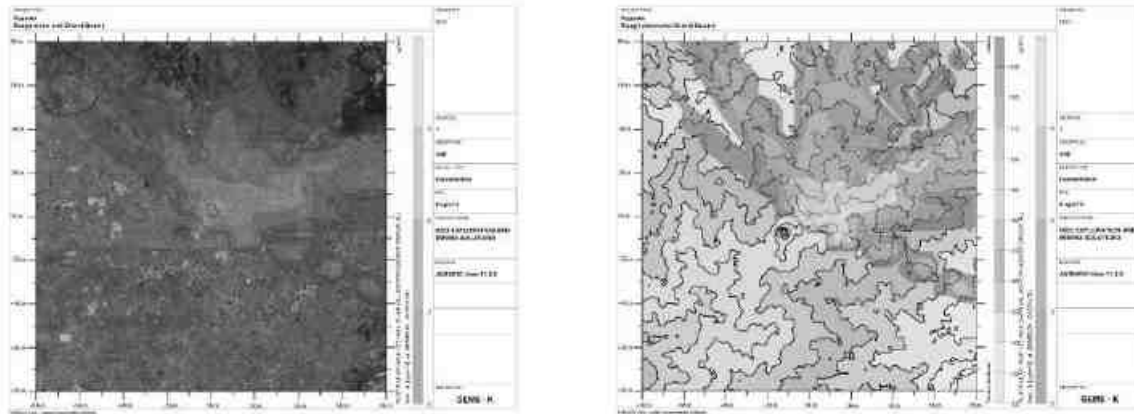


FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF SO₂

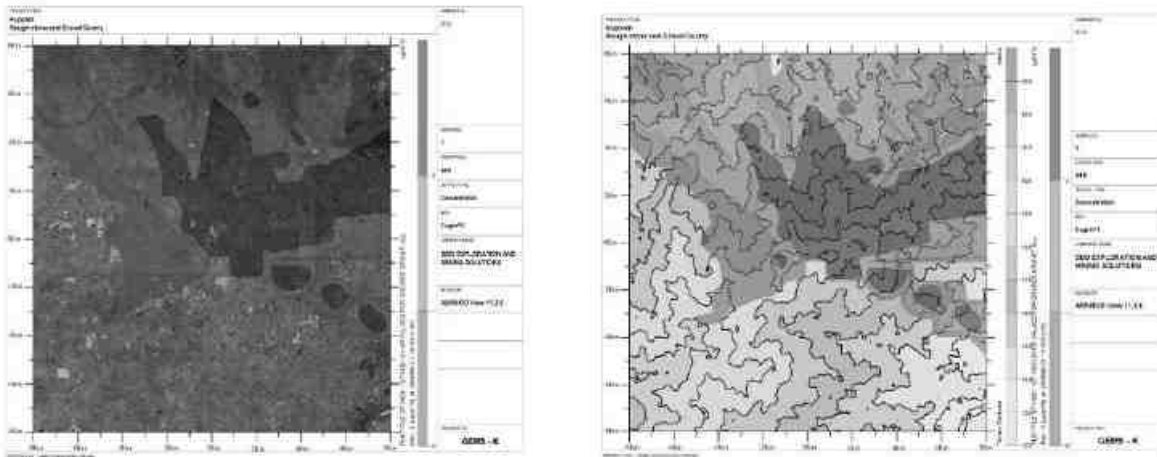
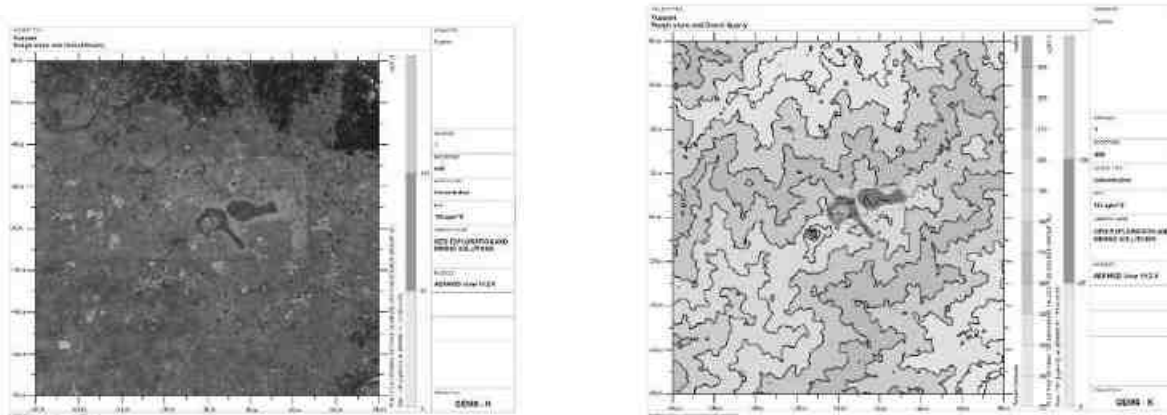


FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST



The post project Resultant Concentrations of PM₁₀, PM_{2.5}, SO₂& NO_x (GLC) is given in Table below:

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF PM₁₀

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM ₁₀ (µg/m ³)	Incremental value of PM ₁₀ due to mining (µg/m ³)	Total PM ₁₀ (µg/m ³) (5+6)
AAQ1	10°58'53.92"N 77°55'59.77"E	11	45	44.8	13.80	58.6
AAQ2	10°58'47.35"N 77°56'3.75"E	134	-166	46.1	13.12	59.2
AAQ3	10°59'2.28"N 77°55'32.10"E	-834	299	46.1	12.00	58.1
AAQ4	11° 0'46.07"N 77°55'29.97"E	-902	3524	44.5	8.76	53.3
AAQ5	10°57'39.13"N 77°54'58.88"E	-1859	-2280	45.3	3.05	48.4
AAQ6	10°57'58.97"N 77°59'12.43"E	5926	-1670	45.4	0.41	45.8
AAQ7	11° 0'38.13"N 77°58'30.65"E	4637	3277	45.3	6.13	51.4
AAQ8	10°56'36.31"N 77°57'28.92"E	2750	-4226	44.5	0	44.5

TABLE 4.6: INCREMENTAL & RESULTANT GLC OF PM_{2.5}

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM _{2.5} (µg/m ³)	Incremental value of PM _{2.5} due to mining (µg/m ³)	Total PM _{2.5} (µg/m ³)
AAQ1	10°58'53.92"N 77°55'59.77"E	11	45	23.9	6.92	30.8
AAQ2	10°58'47.35"N 77°56'3.75"E	134	-166	26.3	6.37	32.7
AAQ3	10°59'2.28"N 77°55'32.10"E	-834	299	24.1	5.81	29.9
AAQ4	11° 0'46.07"N 77°55'29.97"E	-902	3524	24.9	4.50	29.4
AAQ5	10°57'39.13"N 77°54'58.88"E	-1859	-2280	23.4	2.79	26.2
AAQ6	10°57'58.97"N 77°59'12.43"E	5926	-1670	24.4	1.62	26.0
AAQ7	11° 0'38.13"N 77°58'30.65"E	4637	3277	26.4	3.84	30.2
AAQ8	10°56'36.31"N 77°57'28.92"E	2750	-4226	25.9	0	25.9

TABLE 4.7: INCREMENTAL & RESULTANT GLC OF SO₂

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO ₂ (µg/m ³)	Incremental value due to mining (µg/m ³)	Total SO ₂ (µg/m ³)
AAQ1	10°58'53.92"N 77°55'59.77"E	11	45	7.0	2.47	9.4
AAQ2	10°58'47.35"N 77°56'3.75"E	134	-166	7.1	2.23	9.4
AAQ3	10°59'2.28"N 77°55'32.10"E	-834	299	6.4	2.00	8.4
AAQ4	11° 0'46.07"N 77°55'29.97"E	-902	3524	6.0	1.61	7.6
AAQ5	10°57'39.13"N 77°54'58.88"E	-1859	-2280	7.3	0.20	7.5

AAQ6	10°57'58.97"N 77°59'12.43"E	5926	-1670	6.8	0	6.8
AAQ7	11° 0'38.13"N 77°58'30.65"E	4637	3277	6.8	0.56	7.4
AAQ8	10°56'36.31"N 77°57'28.92"E	2750	-4226	6.9	0	6.9

TABLE 4.8: INCREMENTAL & RESULTANT GLC OF NO_x

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NO _x (µg/m ³)	Incremental value due to mining (µg/m ³)	Total NO _x (µg/m ³)
AAQ1	10°58'53.92"N 77°55'59.77"E	11	45	22.4	9.76	32.2
AAQ2	10°58'47.35"N 77°56'3.75"E	134	-166	22.4	9.21	31.6
AAQ3	10°59'2.28"N 77°55'32.10"E	-834	299	20.7	7.77	28.5
AAQ4	11° 0'46.07"N 77°55'29.97"E	-902	3524	22.9	1.00	23.9
AAQ5	10°57'39.13"N 77°54'58.88"E	-1859	-2280	20.8	0	20.8
AAQ6	10°57'58.97"N 77°59'12.43"E	5926	-1670	20.6	0	20.6
AAQ7	11° 0'38.13"N 77°58'30.65"E	4637	3277	20.4	0	20.4
AAQ8	10°56'36.31"N 77°57'28.92"E	2750	-4226	22.6	0	22.6

TABLE 4.9: INCREMENTAL & RESULTANT GLC OF FUGITIVE DUST

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline Fugitive (µg/m ³)	Incremental value due to mining (µg/m ³)	Total Fugitive Dust (µg/m ³)
AAQ1	10°58'53.92"N 77°55'59.77"E	11	45	58.15	133	191.2
AAQ2	10°58'47.35"N 77°56'3.75"E	134	-166	63.23	41	104.2
AAQ3	10°59'2.28"N 77°55'32.10"E	-834	299	64.62	0	64.6
AAQ4	11° 0'46.07"N 77°55'29.97"E	-902	3524	65.80	0	65.8
AAQ5	10°57'39.13"N 77°54'58.88"E	-1859	-2280	64.63	0	64.6
AAQ6	10°57'58.97"N 77°59'12.43"E	5926	-1670	63.32	0	63.3
AAQ7	11° 0'38.13"N 77°58'30.65"E	4637	3277	64.16	0	64.2
AAQ8	10°56'36.31"N 77°57'28.92"E	2750	-4226	66.04	0	66.0

From the resultant of cumulative concentration i.e., Background + Incremental Concentration of pollutant in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 80 & 80 µg/m³ for PM₁₀, SO₂ & NO_x respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.3.6 Mitigation Measures for Proposed Project

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

Advantages of Wet Drilling: -

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

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- 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
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & 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 below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & 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 & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads 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 dumpers/trucks
- Green belt of adequate width will be developed around the project areas

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 & tipper drivers
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed

4.4 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling & blasting 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 blasting and 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 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 & 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.

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

4.4.1 Anticipated Impact from Proposed Project

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 4-8.

TABLE 4.10: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY

Sl.No.	Machinery / Activity	Impact on Environment?	Noise Produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack Hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
Total Noise Produced			95.8

*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 95.8 dB (A). Generally, most mining operations produce noise between 100-109 dB (A). We have considered equipment and operation noise levels (max) to be approx. 109 dB (A) for noise prediction modelling.

TABLE 4.11: PREDICTED NOISE INCREMENTAL VALUES

Location ID	N1	N2	N3	N4	N5	N6	N7	N8
Maximum Monitored Value (Day) dB(A)	46.3	49.7	43.6	46.2	44.2	46.1	44.5	44.3
Incremental Value dB(A)	66.1	56.6	42.0	29.2	31.5	24.5	27.0	26.48
Total Predicted Noise level dB(A)	66.2	57.4	45.9	46.3	44.4	46.1	44.6	44.37

The incremental noise level is found within the range of 66.1 dB (A) in Core Zone and 24.5 - 56.6 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 Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations are within permissible limits of Industrial area (core zone) & 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.).

4.4.2 Mitigation Measures for Proposed Project

The following noise mitigation measures are proposed for control of Noise

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;

- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- 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

4.4.3 Ground Vibrations

Ground vibrations due to the proposed mining activities are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc., However, the major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. Nearest habitation from the proposed project areas are listed in below table. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation.

The empirical equation for assessment of peak particle velocity (PPV) is:

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

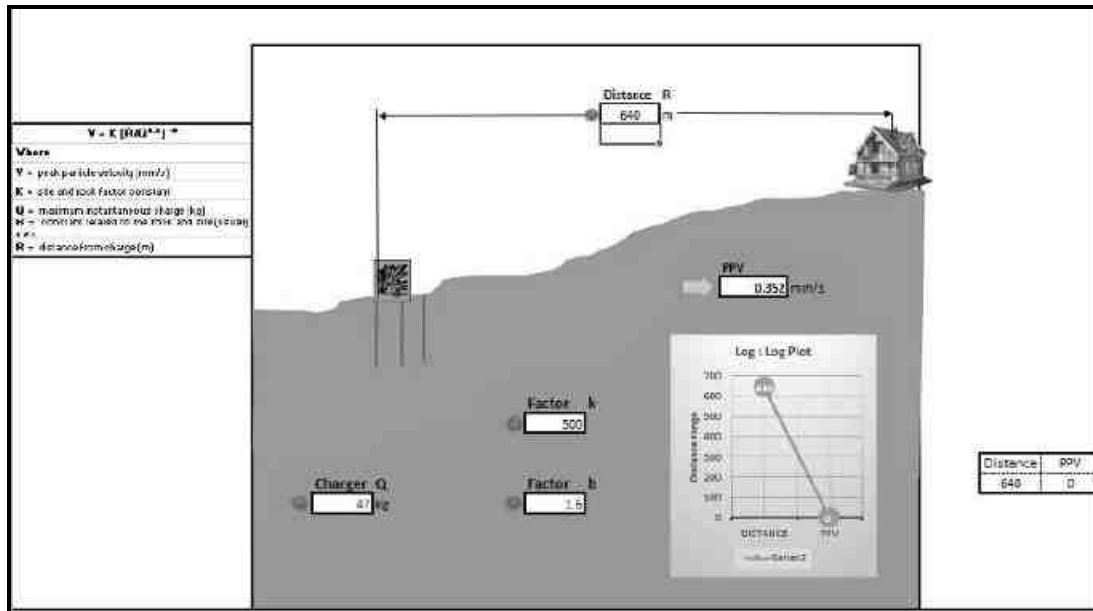
Q = maximum instantaneous charge (kg)

B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

TABLE 4.12: PREDICTED PPV VALUES DUE TO BLASTING

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	47	640	0.352

FIGURE 4.6: GROUND VIBRATION PREDICTION

From the above graph, the charge per blast of 47 kg 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. But the all the project proponents ensure that the charge per blast shall be less than 47 kg and carry out blasting twice or thrice a day based on the onsite conditions under the supervision of competent person employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

4.4.3.1 Mitigation Measures for Proposed Project

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

- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used.
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted such that the predicted peak particle velocity shall not exceed 8 Hz.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

4.5 ECOLOGY AND BIODIVERSITY

4.5.1 Impact on Ecology and Biodiversity

Mining activities generally result in deforestation, land degradation, and water, air, and noise pollution which directly or indirectly affect the faunal and floral status of the mine area. However, the occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation, and technology involved. Existing roads will be used; new roads will not be constructed to reduce the impact on flora. Wildlife is not commonly found in the lease area and its immediate environments because of the lack of vegetal cover and surface water.

4.5.1. Anticipated Impact on Flora

- None of the plants will be cut during the operational phase of the mine.
- There shall be negligible air emissions or effluents from the project site. During the loading of the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.
- Most of the land in the buffer area is undulating terrain with croplands, grass patches, and small shrubs. Hence, there will be no effect on the flora of the region.

4.5.1.1. Mitigation Measures

The project site should have land to develop a greenbelt in and around the limits of the mine, along roads, and another vacant area. The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. Although the project will not lead to any tree cutting, it is proposed to improve the greenery of the locality through plantation services. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

4.5.1.2. Selection of Plant Species for Green Belt Development

The selection of plant species for the green belt development depends on various factors such as climate, elevation, and soil. The plants should exhibit the following desirable characteristics in order to be selected for plantation.

- Native plant species will be preferred.

- The species should be wind-firm and deep-rooted.
- The species should form a dense canopy.
- Fast-growing plants will be planted
- Species tolerance to air pollution like SO₂ and NO₂ should be preferred.
- Plants having large leaf area index will be considered
- Soil improving plants (Nitrogen fixing rapidly decomposable leaf litter).
- Attractive appearance with good flowering and fruit-bearing.
- Birds and insects attract tree species.
- Roadsides will be planted with local vegetation.

Table No 4.13 List of plant species proposed for Greenbelt development

S. No	Scientific name	Tamil Name
1	<i>Aegle marmelos</i>	Vilva Maram
2	<i>Albizia lebbek</i>	Vaagai maram
3	<i>Cassia fistula</i>	Konrai tree
4	<i>Lannea coromandelica</i>	Othiyam
5	<i>Limonia acidissima</i>	Vila maram
6	<i>Syzygium cumini</i>	Naval maram
7	<i>Toona ciliata</i>	Santhana Vembu
8	<i>Ficus hispida</i>	Aththi maram
9	<i>Borassus flabellifer</i>	Panai-maram
Species suitable for abatement of noise and dust pollution		
1	<i>Azadirachta indica</i>	Vembhu maram
2	<i>Ficus religiosa</i>	Arasan maram
3	<i>Ficus hispida</i>	Aththi maram
4	<i>Bombax ceiba</i>	Mul Elavu
5	<i>Syzygium cumini</i>	Naval maram
6	<i>Tamarindus indica</i>	Puliyamaram
7	<i>Mangifera indica</i>	Manga maram
8	<i>Harwickia binata</i>	Anjan maram

(*Source: Guidance for Developing Green belts Manual, CPCB 2000)

4.5.2. Anticipated Impact on Fauna

- No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice the scientific method of mining with a proper Environmental

Management Plan including pollution control measures especially for air and noise, to avoid any adverse impact on the surrounding wildlife.

- Fencing around the mine lease area 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.

4.5.2.1. Mitigation Measures

- A suitable plan for the conservation of Schedule-I Species have been prepared and the necessary fund for implementation for the same will be made.
- All the preventive measures will be taken for the growth & development of fauna.
- Creating and developing awareness for nature and wildlife in the adjoining 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.
- Topsoil has a large number of seeds of native plant species in the mining area.
- Checks and controls the movement of vehicles in and out of the mine.
- Undertaking mitigative measures for a conducive environment for the flora and fauna in consultation with Forest Department.
- A dust suppression system will be installed within the mine and periphery of the mine.

4.5.3. Impact on Aquatic Biodiversity

Mining activities will not disturb the aquatic ecology as there is no effluent discharge proposed from the Rough Stone and Gravel quarry. There is no natural perennial surface water body within the mine lease area, like wetlands, rivers streams, lakes, and farmer sites. Noyyal River is located about 6.5km on the north side. There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. Aquatic biodiversity is observed in the study area.

4.5.4. Impacts on Bird Fauna:

The project does not involve any tree felling or removal of vegetation. Therefore, there may not be loss of nesting and roosting habitat of avian fauna.

4.5.5. Impacts on wildlife

There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Wildlife corridors and Tiger/Elephant Reserve found within 10 km radius of the project site.

4.5.6. Impact Assessment on Biological Environment

This chapter highlights the various impacts on ecology and biodiversity due to mining activity. The major adverse impacts due to pre-mining and mining phases are loss of habitat, biodiversity, rare flora and fauna, fisheries and other aquatic life, migration of wildlife, and overall disruption of the ecology of the area. During the post-mining phase after land restoration, ecology may effectively improve. A detail of impact and assessments was mentioned in Table No.4.2.

The Safety zone, Approach Road and village road 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 Neem, Pongamia, Pinnata will be planted along the Lease boundary and avenue plantation will be carried out in respective proposed projects. The rate of survival expected to be 80% in this area. Afforestation Plan is given in Table No.4.13 and budget of green belt development plan are given in Table No.4.14.

TABLE 4.14: GREENBELT DEVELOPMENT PLAN

Year	No. of trees proposed to be planted	Survival %	Area to be covered	Name of the species	No. of trees expected to be grown
I	1200	80%	Safety zone, Approach Road and village road	Neem, Pongamia Pinnata, etc.,	960

TABLE 4.15: BUDGET FOR GREENBELT DEVELOPMENT PLAN

ACTIVITY	I YEAR					RATE	AMOUNT (INR)
	1200						
Plantation under safety zone						@100 Rs Per sapling	Rs.1,20,000/-
Wire Fencing (In Mtrs) 585 Mtrs	1,75,500	-	-	-	-	@300 Rs Per Meter	Rs.1,75,500/-
Garland drain (In Mtrs) 830 Mtrs	1,38,000	-	-	-	-	@300 Rs Per Meter	Rs.1,38,000/-
TOTAL							Rs. 4,33,500 /-

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.

4.5.3. 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.

4.5.3.1. 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 all proposed projects
- 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.

4.5.3.2. 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.

4.5.4. 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.

4.5.5. Impact Assessment on Biological Environment

A detail of impact and assessments was mentioned in Table No 4.16.

TABLE 4.16: ECOLOGICAL IMPACT ASSESSMENTS

Sl.No	Attributes	Assessment
1	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/coastline/estuary/sea	There is no 500m Radius from lease boundary.
2	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.
3	Located near an area populated by rare or endangered species	NO endangered, critically endangered, vulnerable species sighted in core mining lease area.
4	Proposed project restricts access to waterholes for wildlife	'NO'
5	Project likely to affect migration routes	'NO' 'migration route observed during monitoring period.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management such as garland drains is proposed to be constructed, so there will be no siltation nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	'NO'
8	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.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	'NO'
10	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.
11	The project likely to affect wetlands, Fish breeding grounds, marine ecology	'NO'. Wetland was not present in near core Mining lease area. No breeding and nesting ground present in core mining area.
12	Project likely to affect flora of an area, which	'NO'

	have medicinal value	
13	Forestland is to be diverted, has carbon high sequestration	'NO 'There was no forest land diverted.

TABLE 4.17: ANTICIPATED IMPACT OF ECOLOGY AND BIODIVERSITY

Sl. 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 improve flora and fauna diversity of the project area.
		Site specific loss of associated faunal diversity (Partial impact)	Site supports only common species, which use wide variety of habitats of the buffer zone reserve forest area. So, there is no threat of faunal diversity.		
		-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.

TABLE : 4.18 GENERAL IMPACTS VS. MITIGATION MATRIX

Particulars	Issues	Reason/Status in relation to the mine site	Reference/Method	Suggestions
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Species	Rare/ Endangered/ Threatened species	Not reported	Field observation, interviews of local people	Nil
	Endemic Species	No endemic species of any flora, fauna or wildlife are present in the study area.	Field survey, Literature review	Nil
Important Natural Habitats	Protected Areas	No National Park, Wildlife Sanctuary, Tiger reserve, and Biosphere Reserve falls in the 10-km radius study area	ENVIS , Government of Tamil Nadu protected area website, Google Earth, Project Maps, etc.	Nil
	Important Bird Areas	No Important Bird Areas are falling in the 10-km radius area for Migratory Bird Habitat	ENVIS Centre on Wildlife & Protected Areas, Important Bird Area in India, IBA Book (Birdlife International)	Nil
	Ramsar site	No Ramsar sites present in the surrounding area region	Ramsar Web site	Nil
	Wetlands of National Importance	Nil	ENVIS Centre on Wildlife & Protected Areas, Wetlands directory of Government of India	Nil
	Wetlands of International Importance	Nil	Nil	Nil
	Wildlife Corridors	No Wildlife Corridor is falling in 10 km radius project study area	Protected Areas, Consultation with local naturalists & authenticated location map.	Nil
	Eco-sensitive zone identified by the government	No Eco-sensitive zone is falling 10 km radius project study area	ENVIS, Consultation with local naturalists & authenticated location map	Nil
	Forest Areas	No Reserve Forest is falling in 10 km radius project study area	ENVIS, Government of Tamil Nadu protected area website, Google Earth, Project Maps, etc.	NIL, Applicant will create the green belt plantation on the periphery of mine sites.
	Water bodies	Nil	Project Map and local maps, Google Earth	Ensure minimum destruction during in operation phase.
	Breeding/nesting areas	No breeding/Nesting's site are falling in the study area	Literature Survey Project Map and local maps, Google Earth	NIL

4.6 SOCIO ECONOMIC

4.6.1 Anticipated Impact from Proposed Project

- 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

4.6.2 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.

4.7 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

4.7.1 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

4.7.2 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

4.7.3 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, especially after blasting activities;
- 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

4.7.4 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.

4.8 MINE WASTE MANAGEMENT

No waste is anticipated from any of the proposed quarry.

4.9 MINE CLOSURE

Mine closure plan is the most important environmental requirement in mining projects. 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.

4.9.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.9.1.1 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.,

4.9.1.2 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.

4.9.1.3 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 e.g., planning for agriculture
- Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor e.g., development of green barriers

The Mine closure plan should be as per the approved mine 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.

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.1 INTRODUCTION

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal 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.

5.2 FACTORS BEHIND THE SELECTION OF PROJECT SITE

Thiru.M. Gunasekaran Rough Stone & Gravel Quarry Project at Kuppam Village is a mining project for excavation of Rough Stone and gravel, which is site specific. The proposed mining lease areas have 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.
- Study area falls in seismic zone – III, there is no major history of landslides, earthquake, subsidence etc., recorded in the past history

5.3 ANALYSIS OF ALTERNATIVE SITE

No alternatives are suggested as all the mine sites are mineral specific

5.4 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY

Mechanized open cast mining operation with drilling and blasting method will be used to extract Rough Stone and gravel in the area. the applied 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 dumpers / trippers and transported to the needy 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

5.5 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 in built flexibility for increasing or decreasing the production as per market condition.

6. 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 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 Project Proponent. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed projects; 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 all the proposed quarries.

- ♣ 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 each proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA 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).

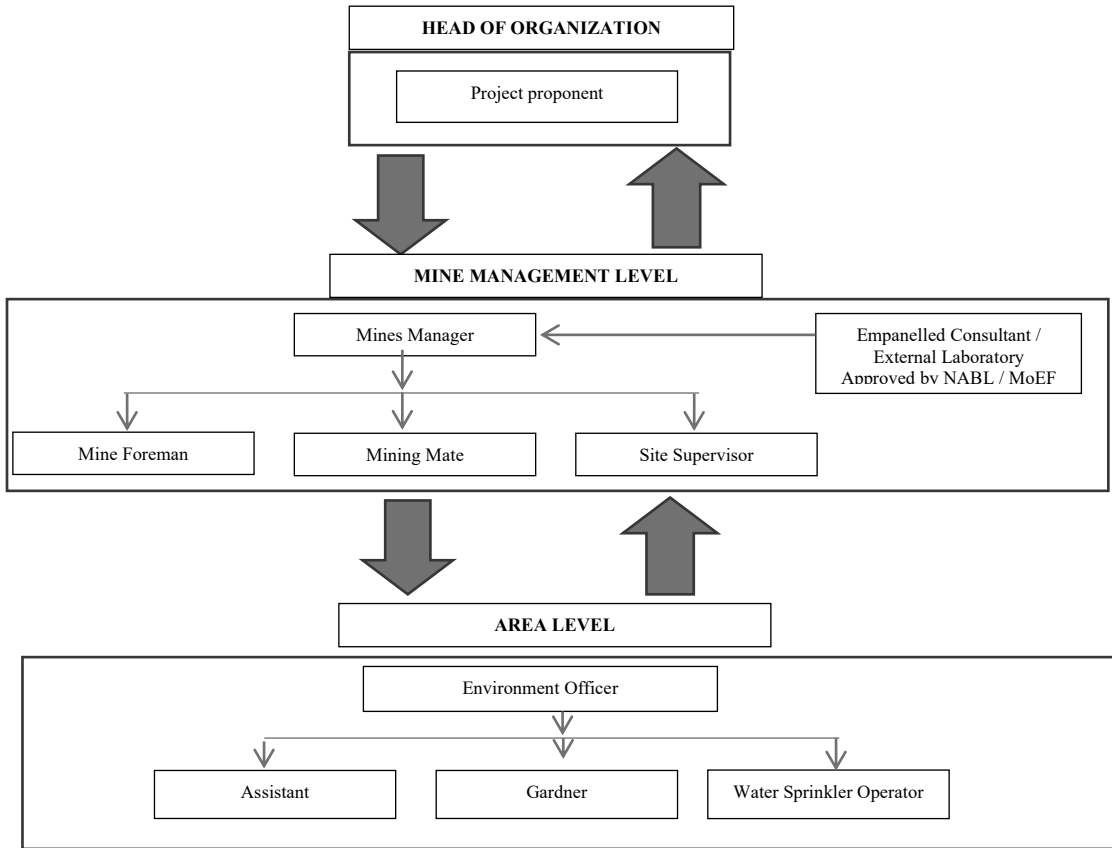


FIGURE 6.1: PROPOSED ENVIRONMENTAL MONITORING CELL PROPOSAL

* The Environmental Monitoring Cell will be formed in the proposed project

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in Chapter-4 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 PROJECTS

Sl 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 monitoring are detailed in Table 6.2

TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC FOR MINES

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 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 EMP

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 capital cost for Environmental Monitoring Programme is Rs 76,000/- and the recurring cost is Rs 76,000/- per annum for each Proposed Project.

TABLE 6.3 ENVIRONMENT MONITORING BUDGET

Sl.No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	Rs. 76,000/-	Rs. 76,000/-
2	Meteorology		
3	Water Quality		
4	Hydrology		
5	Soil Quality		
6	Noise Quality		
7	Vibration Study		
Total		Rs 76,000/-	Rs 76,000/-

Source: Approved Mining Plan

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.

7. ADDITIONAL STUDIES

7.0 GENERAL

The following Additional Studies were done as per items identified by project proponent and items identified by regulatory authority. And items identified by public and other stakeholders will be incorporated after Public Hearing.

- Public Consultation
- Risk Assessment
- Disaster Management Plan
- Cumulative Impact Study
- Plastic Waste Management

7.1. PUBLIC CONSULTATION

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.

7.2 RISK ASSESSMENT

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 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 all proposed projects. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

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 below Table 7.1.

TABLE 7.1 RISK ASSESSMENT& CONTROL MEASURES

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

			<p>office complex and mining area;</p> <ul style="list-style-type: none"> ▪ 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	<p>Improper and unsafe practices</p> <p>Due to high pressure of compressed air, hoses may burst</p> <p>Drill Rod may break</p>	<ul style="list-style-type: none"> ▪ Safe operating procedure established for drilling (SOP) will be strictly followed. ▪ Only trained operators will be deployed. ▪ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, ▪ Drilling shall not be carried on simultaneously on the benches at places directly one above the other. ▪ Periodical preventive maintenance and replacement of worn out accessories in the 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.
4	Blasting	<p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming & Blasting/ fining of blast holes</p> <p>Vibration due to movement of vehicles</p>	<ul style="list-style-type: none"> ▪ Restrict maximum charge per delay as per regulations and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blasting can be conducted safely. ▪ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation ▪ Shots are fired during daytime only. ▪ All holes charged on any one day shall be fired on the same day. ▪ The danger zone will be distinctly demarcated (by means of red flags)
5	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p>	<ul style="list-style-type: none"> ▪ Before commencing work, drivers personally check the dumper/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-

		While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	<ul style="list-style-type: none"> 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
6	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
7	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 height.

Source: Analysed and Proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN

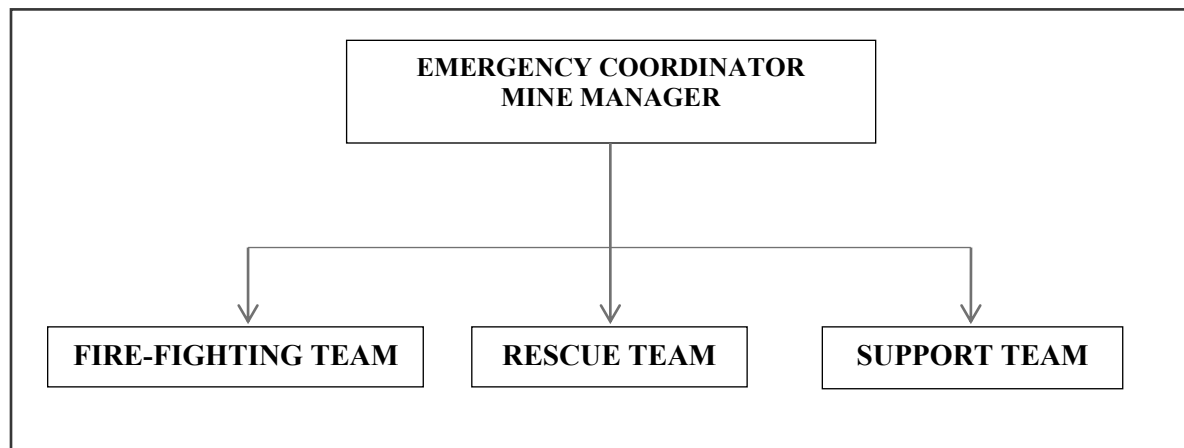
Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated.

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 and the coordination among key personnel and their team has been shown in Fig 7.1.

FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT

The emergency organization shall be headed by emergency coordinator who will be qualified competent mine manager. In his absence senior most people available at the mine shall be emergency coordinator till arrival of mine 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 TO DEAL WITH 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 proposed quarry. 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.

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 carryout 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.,

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

Proposed fire extinguishers at different locations –

The following type of fire extinguishers has been proposed at strategic locations within the mine.

TABLE 7.3: PROPOSED FIRE EXTINGUISHERS AT DIFFERENT LOCATIONS

LOCATION	TYPE OF FIRE EXTINGUISHERS
Electrical Equipment's	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
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Alarm system to be followed during disaster –

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.

- All safety precautions and provisions of Metalliferous Mines Regulations (MMR), 1961 is strictly followed during all mining operations.
- Observance of all safety precautions for blasting and storage of explosives as per MMR 1961.
- Entry of unauthorized persons into mine & allied areas is completely prohibited.
- 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.
- Handling of explosives, charging and blasting are carried out only by qualified persons following SOP.
- 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.
- A blasting SIREN is used at the time of blasting for audio signal.
- Before blasting and after blasting, red and green flags are displayed as visual signals.
- Warning notice boards indicating the time of blasting and NOT TO TRESPASS are displayed at prominent places.
- Regular maintenance and testing of all mining equipment were carried out as per manufacturer's guidelines.

7.4 CUMULATIVE IMPACT STUDY

For easy representation of Proposed and Existing Quarries in the Cluster are given unique codes and identifies and studied in this EIA EMP Report.

TABLE 7.4: LIST OF QUARRIES IN CLUSTER

PROPOSED QUARRIES				
Code	Name of the Owner	S.F. Nos	Extent (ha)	Status
P1	THIRU. M.GUNASEKARAN, S/o Muthusamy, No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District, Tamil Nadu State – 639 117	710/3,712/2	1.92.50	TOR Obtained: Lr.No. SEIAA- TN/F.No.9576/SEAC/ToR- 1353/Dated: 10.02.2023
Nearby Proposed Quarry				
P2	M/s Annai Blue Metals, S.F.No.451, Kaalipalayam, Kuppam Village, Pugalur Taluk, karur District.	682(P)	1.92.0	TOR Obtained: Lr No.SEIAA- TN/F.No.8693/SEACIToR- 1 0771202 I Dated : 01.03.2022
TOTAL			3.84.5 ha	
EXISTING QUARRIES				
Code	Name of the Owner	S.F. No	Extent (ha)	Status
E1	Tmt. S. Tamilselvi, W/o. Sapapathi, Ganesa Nagar, 1 st Street Enam Karur, Karur Taluk & District.	706 (P)	3.36.0	18.08.2017 To 17.08.2022
E2	Thiru S.K. Krishnamurthy, 1/22 Kavadikaranur, Thangayur village, Edapati Taluk,Karur District.	679,680/1 (P)	1.95.5	04.07.2018 to 03.07.2023
TOTAL			5.31.5 ha	
TOTAL CLUSTER EXTENT			9.16.0 ha	

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

TABLE 7.5: SALIENT FEATURES OF PROPOSAL “P1”

Name of the Quarry	Thiru. M.Gunasekaran, Rough Stone & Gravel Quarry	
Toposheet No	58 - F/13	
Latitude between	10°58'49.04"N to 10°58'55.76"N	
Longitude between	77°55'56.49"E to 77°56'02.53"E	
Highest Elevation	179m AMSL	
Proposed Depth of Mining	37m (2m Gravel + 35m Rough Stone)	
Geological Resources	Rough Stone in m ³	Gravel m ³
	7,24,430	29,112
Mineable Reserves	Rough Stone in m ³	Gravel m ³
	1,60,982	11,446
Ultimate Pit Dimension	170m (L) * 114 m (W) * 37m (D)	
Water Level in the surrounds area	The Water table is found at a depth of 69m in summer and at 65m in rainy seasons.	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards North East side. The altitude of the area is 179m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation. Massive Charnockite which is clearly inferred from the	

	existing quarry pits.	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	20 Nos	
Project Cost	Rs.47,30,000/-	
CER Cost	Rs.5,00,000	
Nearest water Bodies	Thathampalayam Lake	8.5Km SE
	Odai	7Km SE
	Odai	6Km NW
	Kaveri Rver	9Km N
Greenbelt Development Plan	Proposed to plant 1200 trees in Safety Zone, approach road and Village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	640m -North	

Source: Approved Mining Plan

TABLE 7.5: SALIENT FEATURES OF PROPOSAL “ P2”

Name of the Quarry	M/s Annai Blue Metals, Rough Stone & Gravel Quarry	
Toposheet No	58 - F/13	
Extent	1.92.0 Ha	
S.F.No, Taluk/Village	682(P), Kuppam, Pugalur Tk	
Mining Plan Period	Five years	
Latitude between	10°59'2.28"N to 10°58'57.34"N	
Longitude between	77°56'13.64"E to 77°56'08.30"E	
Highest Elevation	183m AMSL	
Proposed Depth of Mining	47m (2m Gravel + 45m Rough Stone)	
Geological Resources	Rough Stone in m ³	Gravel m ³
	7,84,728	20,592
Mineable Reserves	Rough Stone in m ³	Gravel m ³
	2,27,340	15,256
Proposed Production for the five years	2,27,340	15,256
Existing Pit Dimension	97.0m (L) *50 m (W) * 15m (H)	
Ultimate Pit Dimension	Pit-I-158m (L) *42m (W) * 2m (D) Pit-II-170m (L) *63m (W) * 5m (D) Pit-III-160m (L) *55 m (W) * 5m (D) Pit-IV-150m (L) *48 m (W) * 5m (D) Pit-V-140m (L) *57 m (W) * 5m (D) Pit-VI-130m (L) *47 m (W) * 5m (D) Pit-VII-120m (L) *37 m (W) * 5m (D) Pit-VIII-110m (L) *27 m (W) * 5m (D) Pit-IX-100m (L) *17 m (W) * 5m (D) Pit-X-90m (L) *7 m (W) * 5m (D)	
Water Level in the surrounds area	The Water table is found at a depth of 54m in	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The area is situated on a slightly undulated terrain sloping towards Southeast side covered with Roughstone and Gravel Which does not sustain any type of Vegetation. The altitude of the area is 183m Amsl.	
Machinery proposed	Jack Hammer	5 Nos
	Excavator with Bucket and Rock Breaker	1 No

	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	15 Nos	
Project Cost	Rs.48,60,000/-	
CER Cost	Rs.5,00,000	
Nearest water Bodies	Noyyal River	6.90km NW
	Kaveri River	8.90km N
	Kodaganar River	10.20Km SE
	Noyyal Irrigation canal	5.8Km NW
Greenbelt Development Plan	Proposed to plant 250 trees in Safety Zone, approach road and Village roads	
Proposed Water Requirement	2.0 KLD	
Nearest Habitation	490m -NorthWest	

TABLE 7.6: SALIENT FEATURES OF EXISTING “E1”

Name of the Quarry	Tmt. S. Tamilselvi, Rough Stone Quarry	
Toposheet No	58 - F/13	
Latitude between	10°58'44.7872"N to 10°58'48.6167"N	
Longitude between	77°55'55.6838"E to 77°56'56.2834"E	
Highest Elevation	205m AMSL	
Proposed Depth of Mining	31m from general ground profile	
Geological Resources	Rough Stone in m ³	Topsoil m ³
	6,81,502	1740
Mineable Reserves	Rough Stone in m ³	Topsoil m ³
	3,49,706	445
Ultimate Pit Dimension	Bench 1to VII - 346m (L) * 404 m (W) * 31m (D)	
Water Level in the surrounds area	The Water table is found at a depth of 42m	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards North East side. The altitude of the area is 205m (max) above Mean Sea level.	
Machinery proposed	Jack Hammer	6Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	3 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	18 Nos	
Project Cost	Rs.22,25,000/-	
CER Cost	Rs.5,00,000	
Greenbelt Development Plan	Proposed to plant 50 trees in Safety Zone, approach road and Village roads	
Proposed Water Requirement	2.0 KLD	
Nearest Habitation	660m -S	

TABLE 7.7: SALIENT FEATURES OF EXISTING “E2”

Name of the Quarry	Thiru S.K. Krishnamurthy, Rough Stone Quarry	
Toposheet No	58 - F/13	
Latitude between	10°59'7.10"N to 10°59'3.31"N	
Longitude between	77°56'15.22"E to 77°56'10.72"E	
Highest Elevation	210m AMSL	
Proposed Depth of Mining	35m from general ground profile	

Geological Resources	Rough Stone in m ³	Gravel m ³
	4,81,502	27,452
Mineable Reserves	Rough Stone in m ³	Gravel m ³
	1,75,435	15,400
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards North East side. The altitude of the area is 210m (max) above Mean Sea level.	
Machinery proposed	Jack Hammer	3Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	17 Nos	
Project Cost	Rs.35,00,000/-	
CER Cost	Rs.70,000	
Greenbelt Development Plan	Proposed to plant 100 trees in Safety Zone, approach road and Village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	350m -North	

Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.17& 7.18.

TABLE 7.8: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	PROPOSED PRODUCTION DETAILS			
	5 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load/6m ³ per day
P1	1,60,982	32,196	107	18
P2	2,27,340	45,468	152	25
List of Existing Quarry				
E1	3,49,706	69,941	233	39
E2	1,75,435	35,087	117	10
Total	9,13,463	1,82,692	609	92

TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	PROPOSED PRODUCTION DETAILS			
	1 - 3 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	11,446	3,815	13	2
P2	15,256	5,085	17	2
List of Existing Quarry				
E1	445	445	1	1
E2	15400	5,133	17	2
Total	42,547	14,478	48	7

On a cumulative basis considering all the 4 quarries it can be seen that the overall production of Rough Stone is 609 m³ per day and overall production of Gravel is 48 m³ per day with a capacity of 92 trips of Rough Stone per day and 7 Trips per day of Gravel from the cluster.

Note: Per day production of Rough Stone is calculated for 5 Years Lease Period and for Gravel production with 1, 2 or 3 or 5 years of production period. And the load of existing quarries is covered under existing environment of the cluster.

Based on the above production quantities the emissions due to various activities in all the 4 mines includes various activities like ground preparation, excavation, handling and transport of ore. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 7.19.

TABLE 7.10: EMISSION ESTIMATION FROM QUARRIES WITHIN 500 METER RADIUS

EMISSION ESTIMATION FOR QUARRY "P1"				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.073545273	g/s
	Blasting	Point Source	0.000520461	g/s
	Mineral Loading	Point Source	0.040075588	g/s
	Haul Road	Line Source	0.002487748	g/s
	Overall Mine	Area Source	0.050518120	g/s
	Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.000383902	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000016703	g/s
EMISSION ESTIMATION FOR QUARRY "P2"				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.081569152	g/s
	Blasting	Point Source	0.000873462	g/s
	Mineral Loading	Point Source	0.042225269	g/s
	Haul Road	Line Source	0.002491583	g/s
	Overall Mine	Area Source	0.051157647	g/s
	Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.000622417	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000027258	g/s
EMISSION ESTIMATION FOR QUARRY "E1"				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.092818328	g/s
	Blasting	Point Source	0.001666415	g/s
	Mineral Loading	Point Source	0.042853373	g/s
	Haul Road	Line Source	0.002493083	g/s
	Overall Mine	Area Source	0.064479353	g/s
	Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.000798347	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000058142	g/s
EMISSION ESTIMATION FOR QUARRY "E2"				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.122306366	g/s
	Blasting	Point Source	0.006620027	g/s
	Mineral Loading	Point Source	0.047348060	g/s
	Haul Road	Line Source	0.002511776	g/s
	Overall Mine	Area Source	0.055572248	g/s
	Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.001930787	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000090356	g/s

Source: Emission Calculations

TABLE 7.11: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER

PM_{2.5} in µg/m³	
Background	23.9
Incremental	6.92
Resultant	30.8
NAAQ Norms	100 µg/m³
PM₁₀ in µg/m³	

Background	44.8
Incremental	13.8
Resultant	58.6
NAAQ Norms	100 µg/m³
SO₂ in µg/m³	
Background	7.0
Incremental	2.47
Resultant	9.40
NAAQ Norms	80 µg/m³
NO_x in µg/m³	
Background	22.4
Incremental	9.76
Resultant	32.2
NAAQ Norms	80 µg/m³

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.

For hemispherical sound wave propagation through homogeneous loss free medium, one can estimate noise levels at various locations at different sources using 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 & 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.

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

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

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

TABLE 7.12: PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	46.3	44.0	48.3	55
Habitation Near P2	44.3	46.3	48.4	
Habitation Near E1	43.2	43.7	46.5	
Habitation Near E2	43.8	49.2	50.3	

Source: Lab Monitoring Data

The incremental noise level is found within the range of 49.7 – 50.6 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 Green Belt as 4.9 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.).

Ground Vibrations

Ground vibrations due to mining activities in the all the 4 Mines within cluster are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc. However, the major source of ground vibration from the all the 4 mines is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements. Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining areas and may cause injury to persons or damage to the structures. Nearest Habitations from 4 mines respectively are as in below Table 7.13

TABLE 7.13: NEAREST HABITATION FROM EACH MINE

Location ID	Distance in Meters
Habitation Near P1	640
Habitation Near P2	490
Habitation Near E1	660
Habitation Near E2	350

The ground vibrations due to the blasting in all the mines are calculated using the empirical equation for assessment of peak particle velocity (PPV) is:

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

TABLE 7.14: GROUND VIBRATIONS AT 4 MINES

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	47	640	0.352
P2	66	490	0.708
E1	101	660	0.618
E2	50	350	0.972

Source: Blasting Calculations

From the above table, the charge per blast is considered as maximum in each mine and the resultant 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.

Socio Economic Environment –

The 4 mines shall contribute towards CER and the community shall develop.

TABLE 7.15: SOCIO ECONOMIC BENEFITS FROM 4 MINES

Code	Project Cost	CER Cost
------	--------------	----------

P1	Rs.47,30,000/-	Rs.5,00,000/-
P2	Rs.48,60,000/-	Rs.5,00,000/-
E1	Rs.22,25,000/-	Rs.44,500/-
E2	Rs.35,00,000/-	Rs.70,000/-
Total	Rs. 1,53,15,000/-	Rs 11,14,500/-

As per para 6 (II) of the office memorandum, all the mines being a green field project & Capital Investment is \leq 100 crores, they shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC.

- 2 Proposed project shall fund towards CER – **Rs 10,00,000/-**
- 2 Existing project shall fund towards CER – **Rs 1,14,500/-**

TABLE 7.16: EMPLOYMENT BENEFITS FROM 4 MINES

Quarry	Employment
P1	20
P2	15
E1	18
E2	17
Total	70

A total of 35 people will get employment due to 2 proposed mine in cluster and 35 people are already employed at existing mines.

TABLE 7.17: GREENBELT DEVELOPMENT BENEFITS FROM QUARRY

CODE	No of Trees proposed to be planted	Survival %	Area Covered Sq.m	Name of the Species	No. of Trees expected to be grown
P1	1200	80%	Safety zone, village roads	Neem, Pungam,etc.,	960
P2	250	80%		Neem, Pungam,etc.,	200
E1	150	80%		Neem, Pungam,etc.,	120
E2	100	80%		Neem, Pungam,etc.,	80
Total	1700				1360

Based on the Proposed Mining Plans it's anticipated that there shall growth of native species of Neem, Casuarina, etc in the Entire Cluster at a rate of 1700 Trees Planted over a period of 5 Years with Survival Rate of 80% and expected growth is around 1360 Trees to planted safety zone and village roads.

In the proposed quarries, it is anticipated to plant 1200 Trees Planted over a period of 5 Years with Survival Rate of 80% and expected growth is around 960 Trees to planted safety zone and village roads.

7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOAL

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.

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.

TABLE 7.18: ACTION PLAN TO MANAGE PLASTIC WASTE

Sl.No.	Activity	Responsibility
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged	Mines

	from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance	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 FAE's and EC

8. PROJECT BENEFITS

8.0 GENERAL

Thiru. M.Gunasekaran for Quarrying Rough Stone and Gravel at Kuppam Village aims to produce cumulatively 1,40,607m³ Rough Stone over a period of 5 years & 11,446 m³ of Gravel over a period of 3 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 20 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be opportunity for indirect employment to many people 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 quarries are 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

Project Proponent 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

8.7 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.

8.8 CORPORATE ENVIRONMENT RESPONSIBILITY

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

TABLE 8.1: CER – ACTION PLAN

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

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

9. ENVIRONMENTAL COST BENEFIT ANALYSIS

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

10. 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 of ensuring that mitigative measures are implemented and their effectiveness monitored after approval of the EIA.

10.1 ENVIRONMENTAL POLICY

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

The Proponent M.Gunasekaran

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 programmes to provide early warning of any deficiency or unanticipated performance in environmental safeguards
- Conduct periodic reviews to verify environmental performance and to continuously strive towards improvement

Description of the Administration and Technical Setup –

The Environment Monitoring Cell discussed under Chapter 6 will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level of each Proposed Quarry.

The said team will be responsible for:

- Monitoring of the water/ waste water quality, air quality and solid waste generated
- Analysis of the water and air samples collected through external laboratory
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- Co-ordination of the environment related activities within the project as well as with outside agencies
- Collection of health statistics of the workers and population of the surrounding villages
- Green belt development
- Monitoring the progress of implementation of the environmental monitoring programme

- 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 (un utilized 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 programme.

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 & 100 m 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 Harvesting. Remaining area will be converted into greenbelt area	Mines Manager
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 FAE's & EIA Coordinator

10.3 SOIL MANAGEMENT

There is no overburden or waste anticipated from proposed project.

TABLE 10.2: PROPOSED CONTROLS FOR SOIL MANAGEMENT

CONTROL	RESPONSIBILITY
Surface run-off from the project boundary via garland drains will be diverted to the mine pits	Mine Foreman & Mining Mate
Design haul roads and other access roads with drainage systems to minimize concentration of flow and erosion risk	Mines Manager
Empty sediment from sediment traps Maintain, repair or upgrade garland drain system	Mines Manager
Test soils for pH, EC, chloride, size & water holding capacity	Manager Mines

Source: Proposed by FAE's & 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 is anticipated and domestic sewage from mines office.

The quarrying operation is proposed upto a depth of 37 m BGL, the water table in the area is 69m – 65 m below ground level, hence the proposed projects will not intersect the Ground water table during entire quarry period.

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 disturbed at any point of mining operations	Mines Manager
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 FAE's & EIA Coordinator

10.5 AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations due to fugitive dust. Daily water sprinkling on the haul roads, approach roads in the vicinity would 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.

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 access 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 FAE's & 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.

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 shall be 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 FAE's & EIA Coordinator

10.7 GROUND VIBRATION AND FLY ROCK CONTROL

The Rough stone and Gravel quarry operation creates vibration due to the blasting and movement of Heavy Earth moving machineries, fly rocks due to the blasting.

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 FAE's & 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 programme 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 1200 nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area with survival rate 80%. The greenbelt development plan has been prepared keeping in view the land use changes that will occur due to mining operation in the area.

TABLE 10.7 PROPOSED GREENBELT ACTIVITIES FOR 5 YEAR PLAN PERIOD

Year	No. of trees proposed to be planted	Survival %	Area to be covered	Name of the species	No. of trees expected to be grown
I	1200	80%	Safety zone, village roads	Neem, Pongamia, Pinnata, etc.,	960

Source: Conceptual Plan of Approved Mining plan & proposed by FAE's & EIA Coordinator

The objectives of the greenbelt development plan are –

- Provide a green belt around the periphery of the quarry area to combat the dispersal of dust in the adjoining areas,
- Protect the erosion of the soil, Conserve moisture for increasing ground water recharging,
- 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.

A well-planned Green Belt with multi rows (three tiers) preferably 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.

10.8.2 Species Recommended for Plantation

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

- Creating of bio-diversity.
- Fast growing, thick canopy cover, perennial and evergreen large leaf area,
- Efficient in absorbing pollutants without major effects on natural growth

TABLE 10.8: RECOMMENDED SPECIES TO PLANT IN THE GREENBELT

S.No	Botanical Name	Local Name	Importance
1.	Azadirachta indica	Neem, Vembu	Neem oil & neem products
2.	Tamarindus indica	Tamarind	Edible & Medicinal and other Uses
3.	Polyalthia longifolia	Nettilinkam	Tall and evergreen tree
4.	Borassus Flabellifer	Palmyra Palm	Tall Wind breaker tree and its fruits are edible

Source: Proposed by FAE's & EIA Coordinator

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
- 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 keep upgrading the database of medical history of the employees.

TABLE 10.9: MEDICAL EXAMINATION SCHEDULE

Sl.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 colours 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 centres. 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 Programme

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 Centres 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.

TABLE 10.10: 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	Employee rights Supervisor responsibilities Self-rescue Respiratory devices Transportation controls Communication systems Escape and emergency evacuation Ground control hazards Occupational health hazards Electrical hazards 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	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	Required health and safety standards Transportation controls Communication systems Escape ways, emergency evacuations Fire warning Ground control hazards First aid 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 FAE's & 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 10.11 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 10.11: EMP BUDGET FOR PROPOSED PROJECT

	Mitigation Measure	Provision for Implementation	Capital	Recurring
Air Environment	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	19250	19250
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	800000	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance - 4 Units	100000	10000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	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 - 2 Units	10000	500
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	38500
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50000	20000

Noise Environment	Source of noise will be during operation of transportation vehicles, 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 implements 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 / Compentent 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 Tonnes of Blasted Material	0	365578
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	5000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Mine Closure	1. Progressive Closure Activity - Surface Runoff managent	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance	19250	5000

		of Rs. 5,000/- per annum		
	2. Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	385000	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1200 Trees - (450 Inside Lease Area & 750 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	90000	13500
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	225000	22500
	4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	65025	0
	5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budget and not necessarily implemented in the Project Site	829581	0

Implementation of EC, Mining Plan & DGMS Condition	Scientific Study Report for the blast induced ground vibration	Scientific Study report has been conducted for the Proposed blasting parameters to the project area, quarry, Separate Blasting Study will be conducted after starting the quarry	400000	0
	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	10000	1000
	Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions	Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms	0	50000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 20 Employees	80000	20000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	20000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	3850
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	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	96250	10000
	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
CER	As per MoEF &CC OM 22-65/2017-IA.III Dated 25.02.2021	Detailed Description in following slides and Budget allocation is included as per MoeEF & CC OM	500000	0
TOTAL			2884750	1495678

Year wise Break Up Cost

Year	Total Cost
1 st	₹ 43,80,428
2 nd	₹ 15,70,462
3 rd	₹ 16,48,985
4 th	₹ 17,31,434
5 th	₹ 18,18,006
Total	Rs.111 Lakhs

Cost inflation 5% per annum

In order to implement the environmental protection measures, an amount of Rs.28.84 lakhs as capital cost and recurring cost as Rs. 14.95 lakhs as recurring cost is proposed considering present market price considering present market scenario for the proposed project.

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.

11. SUMMARY AND CONCLUSION

Thiru. M.Gunasekaran, Rough Stone & Gravel Cluster (Extent: 9.16.0 ha) falls under “B” category as per MoEF & CC Notification (S.O. 3977 (E)).

Now, as per 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 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

A detailed Draft EIA EMP Report is prepared for public and other stakeholders' suggestions and a final EIA/EMP Report will be prepared based on the outcome of Public Consultation.

Environmental monitoring and audit mechanism have been recommended before and after commencement of the project, where necessary, to verify the accuracy of the EIA predictions and the effectiveness of recommended mitigation measures.

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. 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, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months March to May 2023 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed.

Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Rough Stone & Gravel as per market demand.

Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 20 people directly in the cluster and indirectly around 35people.

As discussed, it is safe to say that the proposed quarries are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the Thiru. M.Gunasekaran Rough Stone & Gravel Cluster (Extent: 9.16.0 ha)

12. DISCLOSURE OF CONSULTANT

Thiru. M.Gunasekaran have engaged M/s Geo Exploration and Mining Solutions, an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi, for carrying out the EIA Study as per the ToR Issued and Standard ToR.

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: info@geoexploration@gmail.com

Web: www.gemssalem.com

Phone: 0427 2431989.

The Accredited Experts and associated members who were engaged for this EIA study as given below –

Sl.No.	Name of the expert	In house/ Empanelled	EIA Coordinator		FAE	
			Sector	Category	Sector	Category
1	Dr. M. Ifthikhar Ahmed	In-house	1 38	A B	WP GEO SC	B A A
2	Dr. P. Thangaraju	In-house	-	-	HG GEO	A A
3	Mr. A. Jagannathan	In-house	-	-	AP NV SHW	B A B
4	Mrs. Jisha parameswaran	In-house	-	-	SW	B
5	Mr. Govindasamy	In-house	-	-	WP	B
6	Mrs. K. Anitha	In-house	-	-	SE	A
7	Mrs. Amirtham	In-house	-	-	EB	B
8	Mr. A. Allimuthu	In-house	-	-	LU	B
9	Mr. N. Senthilkumar	Empanelled	38 28	B B	AQ WP RH	B B A
10	Mr. Alagappa Moses	Empanelled	-	-	EB	A
11	Mr. S. Pavel	Empanelled	-	-	RH	B
12	Mr. J. R. Vikram Krishna	Empanelled	1 38	A B	SHW RH	A A

Abbreviations			
EC	EIA Coordinator	EB	Ecology and bio-diversity
AEC	Associate 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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

Declaration by experts contributing to the EIA/EMP for **Thiru. M.Gunasekaran**, Rough Stone & Gravel Quarry Project over a Cluster Extent of 9.16.0 ha in Kuppam Village of Pugalur Taluk, Karur District of Tamil Nadu. It is also certified that information furnished in the above EIA study are true and correct to the best of our knowledge.

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

Name: **Dr. M. Ifthikhar Ahmed**

Designation: **EIA Coordinator**

Date & Signature:


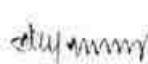





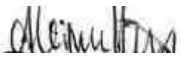



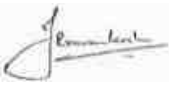
Period of Involvement: **January 2022 to till date**

Associated Team Member with EIA Coordinator:


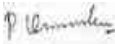

1. **Mr. S. Nagamani**
2. **Mr. P. Viswanathan**
3. **Mr. M.Santhoshkumar**
4. **Mr. S. Ilavarasan**

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

Sl. No.	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	<ul style="list-style-type: none"> ▪ Identification of different sources of air pollution due to the proposed mine activity ▪ Prediction of air pollution and propose mitigation measures / control measures 	Mr. A. Jagannathan	
2	WP	<ul style="list-style-type: none"> ▪ Suggesting water treatment systems, drainage facilities ▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures. 	Dr. M. Ifthikhar Ahmed	
3	HG	<ul style="list-style-type: none"> ▪ Interpretation of ground water table and predict impact and propose mitigation measures. ▪ Analysis and description of aquifer Characteristics 	Dr. P. Thangaraju	
4	GEO	<ul style="list-style-type: none"> ▪ Field Survey for assessing the regional and local geology of the area. ▪ Preparation of mineral and geological maps. ▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology. 	Dr. P. Thangaraju	
5	SE	<ul style="list-style-type: none"> ▪ Revision in secondary data as per Census of India, 2011. ▪ Impact Assessment & Preventive Management Plan ▪ Corporate Environment Responsibility. 	Mrs. K. Anitha	

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. 	Mr. Alagappa Moses	
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. 	Mr. J. R. Vikram Krishna	
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. 	Mr. A. Allimuthu	
9	NV	<ul style="list-style-type: none"> Identify impacts due to noise and vibrations Suggesting appropriate mitigation measures for EMP. 	Mr. A. Jagannathan	
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 	Mr. N. Senthilkumar	
11	SC	<ul style="list-style-type: none"> Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr. M. Ifthikhar Ahmed	
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. 	Mr. J. R. Vikram Krishna	

LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT

Sl.No.	Name	Functional Area	Involvement	Signature
1	Mr. S. Nagamani	AP; GEO; AQ	<ul style="list-style-type: none"> Site Visit with FAE Provide inputs & Assisting FAE with sources of Air Pollution, its impact and suggest control measures Provide inputs on Geological Aspects Analyse & provide inputs and assist FAE with meteorological data, emission estimation, AERMOD modelling and suggesting control measures 	
2	Mr. Viswathanan	AP; WP; LU	<ul style="list-style-type: none"> Site Visit with FAE Provide inputs & Assisting FAE with sources of Air Pollution, its impact and suggest control measures Assisting FAE on sources of water pollution, its impacts and suggest control measures Assisting FAE in preparation of land use maps 	
3	Mr. Santhoshkumar	GEO; SC	<ul style="list-style-type: none"> Site Visit with FAE Provide inputs on Geological Aspects Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan Provide inputs & Assisting FAE with soil conservation methods and identifying impacts 	

4	Mr. Umamahesvaran	GEO	<ul style="list-style-type: none"> ▪ Site Visit with FAE ▪ Provide inputs on Geological Aspects ▪ Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan 	<i>S. Umamahesvaran</i>
5	Mr. A. Allimuthu	SE	<ul style="list-style-type: none"> ▪ Site Visit with FAE ▪ Assist FAE with collection of data's ▪ Provide inputs by analysing primary and secondary data 	<i>A. Allimuthu</i>
6	Mr. S. Ilavarasan	LU; SC	<ul style="list-style-type: none"> ▪ Site Visit with FAE ▪ Assisting FAE in preparation of land use maps ▪ Provide inputs & Assisting FAE with soil conservation methods and identifying impacts 	<i>S. Ilavarasan</i>
7	Mr. E. Vadivel	HG	<ul style="list-style-type: none"> ▪ Site Visit with FAE ▪ Assist FAE & provide inputs on aquifer characteristics, ground water level/table ▪ Assist with methods of ground water recharge and conduct pump test, flow rate 	<i>E. Vadivel</i>
8	Mr. Panneer Selvam	EB	<ul style="list-style-type: none"> ▪ Site Visit with FAE ▪ Assist FAE with collection of baseline data ▪ Provide inputs and assist with labelling of Flora and Fauna 	<i>P. Panneer Selvam</i>

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, Dr. M. Ifthikhar Ahmed, Managing Partner, Geo Exploration and Mining Solutions, hereby, confirm that the above-mentioned Functional Area Experts and Team Members prepared the EIA/EMP for **Thiru. M.Gunasekaran**, Rough Stone & Gravel Quarry Project over a Cluster Extent of 9.16.0 ha in Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature & Date:

Dr. M. Ifthikhar Ahmed

Name:

Dr. M. Ifthikhar Ahmed

Designation:

Managing Partner

Name of the EIA Consultant Organization:

M/s. Geo Exploration and Mining Solutions

NABET Certificate No & Issue Date:

NABET/EIA/2225/RA0276 Dated: 20.02.2023

Validity:

Valid till 06.08.2025

ANNEXURE

THIRU.M. GUNASEKARAN ROUGH STONE AND GRAVEL QUARRY

Kuppam Village, Pugalur Taluk, Karur District

EXTENT = 1.92.50 ha

ToR obtained

Lr.No. SEIAA-TN/F.No.9576/SEAC/ToR-1353/Dated: 10.02.2023

Project Proponent

THIRU. M.GUNASEKARAN,

S/o Muthusamy,

No 3/37, Karaippalayam,

Thirukkatuthurai,

Pugalur Taluk, Karur District,

Tamil Nadu State – 639 117.

LIST OF ANNEXURES

Annexure No	DESCRIPTION	PAGE NO
P1 Thiru.M. Gunasekaran	COPY OF TERMS OF REFERENCE	1A-23A
	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	24A-27A
	COPY OF MINING PLAN APPROVED LETTER	28A-35A
	COPY OF APPROVED MINING PLAN WITH PLATES	36A-102A
P2 Annai Blue metals	COPY OF TERMS OF REFERENCE	103A – 119A
E1 T.M.Tamilselvi	COPY OF APPROVED MINING PLAN	120A-176A
	COPY OF BASE LINE MONITORING DATA	177A-220A
	COPY OF NABET CERTIFICATE	221A



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

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, PanagalMaaligai,
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.9576/SEAC/ToR- 1353/Dated:10.02.2023.

To

Thiru. M. Gunasekaran,
S/o, Muthusamy,
No 3/37, Karaippalayam,
Thirukkatuthurai,
Pugalur Taluk,
Karur District – 639 117

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough Stone and Gravel Quarry lease over an extent of 1.92.5ha at SF Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu Thiru. M. Gunasekaran - 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/404784/2022, dt: 03.11.2022.
 2. Your application submitted for Terms of Reference dated: 21.11.2022
 3. Minutes of the 346th SEAC meeting held on 12.01.2023
 4. Minutes of the 591st SEIAA meeting held on 10.02.2023


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

The proponent Thiru. M. Gunasekaran, submitted application for Terms of Reference (ToR) on 21.11.2022, in Form-I, Pre- Feasibility report for the proposed Rough Stone Gravel Quarry lease over an extent of 1.92.5ha at SF Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu

Discussion by SEAC and the Remarks:-

The proposal was placed in this 346th meeting of SEAC held on 12.01.2023. The details of the project are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The project proponent, Thiru.M.Gunasekaran has applied for Terms of Reference for the proposed Rough stone & gravel quarry lease over an extent of 1.92.5 Ha at S.F.No.710/3 & 712/2 of Kuppam Village, Pugalur Taluk, Karur district, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. As per the mining plan, the lease period is for 5 years. The mining plan is for 5 years. The production for 5 years not to exceed 1,40,607 cu.m of rough stone and 11,446 cu.m of gravel with an ultimate depth of 37m below ground level.

Based on the presentation and details furnished by the project proponent, SEAC decided to grant 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 project proponent shall submit a certified compliance report for the EC obtained earlier along with the EIA report.
2. The structures within the radius of (i) 100 m, (ii) 200 m and (iii) 300 m shall be enumerated with details such as dwelling houses with number of occupants, places of worship, industries, factories, sheds, etc and implications of the quarrying operations on it.
3. The proponent shall furnish photographs of adequate fencing installed, green belt development along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the


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approved mining plan.

4. The proponent shall also furnish details/photographs of the garland drains provided.
5. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director of Geology and Mining during the time of appraisal for obtaining the EC.
6. The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.
7. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.
8. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.
9. 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.
10. 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?
 - 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.


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11. 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).
12. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
13. The PP shall furnish the revised manpower including the statutory & competent persons as required under the provisions of the MMR 1961 for the proposed quarry based on the volume of rock handled & area of excavation.
14. 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.
15. 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.
16. 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. 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.
17. 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.
18. 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.


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19. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
20. 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.
21. 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.
22. 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.
23. 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.
24. Impact on local transport infrastructure due to the Project should be indicated.
25. 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.
26. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
27. 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.
28. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
29. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.


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30. 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.
31. 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 and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
32. 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
33. 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.
34. 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.
35. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
36. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
37. 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.
38. Details of litigation pending against the project, if any, with direction /order passed by any


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Court of Law against the Project should be given.

39. 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.
40. 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.
41. **The PP shall prepare the EMP for the entire life/lease of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.**
42. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Aegle marmelos</i>	Vilvam	வில்வம்
2	<i>Adenaanthera pavonina</i>	Manjadi	மஞ்சாடி, ஆனைக்குன்றிமணி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Usil	உசில்
5	<i>Bauhinia purpurea</i>	Mantharai	மந்தாரை
6	<i>Bauhinia racemosa</i>	Aathi	ஆத்தி
7	<i>Bauhinia tomentosa</i>	Iruvathi	இருவாத்தி
8	<i>Buchanania axillaris</i>	Kattuma	காட்டுமா
9	<i>Borassus flabellifer</i>	Panai	பனை
10	<i>Butea monosperma</i>	Murukkamaram	முருக்கமரம்
11	<i>Bobax ceiba</i>	Ilavu, Sevvilavu	இலவு
12	<i>Calophyllum inophyllum</i>	Punnai	புனை
13	<i>Cassia fistula</i>	Sarakondrai	சரக்கொன்றை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கொன்றை
15	<i>Chloroxylon sweitenia</i>	Purasamaram	புரசு மரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Manjallavu	கோங்கு, மஞ்சள் இலவு
17	<i>Cordia dichotoma</i>	Naruvuli	நருவூளி
18	<i>Creteva adanioni</i>	Mavalingum	மாவிலங்கம்
19	<i>Dillenia indica</i>	Uva, Uzha	உவா
20	<i>Dillenia pentagyna</i>	SiruUva, Sitruzha	சிறு உவா
21	<i>Diospyro sebenum</i>	Karungali	கருங்காலி
22	<i>Diospyro schloroxylon</i>	Vaganai	வாகனை
23	<i>Ficus amplissima</i>	Kallitchi	கல் இச்சி
24	<i>Hibiscus tiliaceou</i>	Aatrupoovaravu	ஆற்றுப்புலரசு
25	<i>Hardwickia binata</i>	Aacha	ஆச்சா
26	<i>Holoptelia integrifolia</i>	Aayili	ஆயா மரம், ஆயிலி
27	<i>Lannea coromandelica</i>	Odhiam	ஒதியம்
28	<i>Lagerstroemia speciosa</i>	Poo Marudhu	பூ மருது
29	<i>Lepisanthus tetraphylla</i>	Neikottaimaram	நெய் கொட்டை மரம்
30	<i>Limonia acidissima</i>	Vila maram	வில்லா மரம்
31	<i>Litsea glutinos</i>	Pisinpattai	பிளம்பா, பிசின்பட்டை
32	<i>Madhuca longifolia</i>	Illuppai	இலுப்பை
33	<i>Manilkara hexandra</i>	UlakkaiPaalai	உலக்கை பாலை
34	<i>Mimusops elengi</i>	Magizhamaram	மகிழமரம்
35	<i>Mitragyna parvifolia</i>	Kadambu	கடம்பு
36	<i>Morinda pubescens</i>	Nuna	நுணா
37	<i>Morinda citrifolia</i>	Vellai Nuna	வெள்ளை நுணா
38	<i>Phoenix sylvestre</i>	Eachai	ஈச்சமரம்
39	<i>Pongamia pinnat</i>	Pungam	புங்கம்

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40	<i>Prenna mollissima</i>	Murnai	முள்ளை
41	<i>Prenna serratifolia</i>	Narumalai	நறு முள்ளை
42	<i>Prenna tomentosa</i>	Malapoovarasu	மலை பூங்கா
43	<i>Prosopis cinerea</i>	Vanni maram	வள்ளி மரம்
44	<i>Pterocaryus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum caesecens</i>	Vennaragu, Tada	வெண்ணாந்து
46	<i>Pterospermum xylocaryum</i>	Polavu	பூவு
47	<i>Putranjiva roxburghii</i>	Karpala	கற்பலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus emarginatus</i>	Manupungan, Soapukai	மணிப்புகள் சோபுகாய்
50	<i>Saraca asoca</i>	Asoca	அஸோகா
51	<i>Streblus asper</i>	Piray maram	பிராய் மரம்
52	<i>Strychnos nuxvomica</i>	Yeti	யேதி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேத்தாங் கோட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia bellerica</i>	Thandri	தாண்ட்ரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வெண் மருது
57	<i>Toona ciliata</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Thespesia populnea</i>	Puvarasu	பூங்கா
59	<i>Walsuratri foliata</i>	valbura	வால்கரா
60	<i>Wrightia tinctoria</i>	Veppalai	வெப்பலா
61	<i>Pithecellobium dulce</i>	Kodukkappuli	கொடுக்கப்பூளி

Discussion by SEIAA and the Remarks:-

The subject was placed in 591st authority meeting held on 10.02.2023 The authority noted that the subject was appraised in 346th SEAC meeting held on 12.01.2023. 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 conditions mentioned in 'Annexure B' of this minutes.

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Annexure 'B'

Cluster Management Committee

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

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & soil biological, physical land chemical features .


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- b) Climate change leading to Droughts, Floods etc.
- c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
- d) Possibilities of water contamination and impact on aquatic ecosystem health.
- e) Agriculture, Forestry & Traditional practices.
- f) Hydrothermal/Geothermal effect due to destruction in the Environment.
- g) Bio-geochemical processes and its foot prints including environmental stress.
- h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

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

Forests

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


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Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

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

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.


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33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

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

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment


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

Disaster Management Plan

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

Others


39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.


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41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

STANDARD TERMS OF REFERENCE

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


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- 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


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with cost implications and submitted.

- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out


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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



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- present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
 - 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
 - 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
 - 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
 - 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
 - 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
 - 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
 - 36) Public health implications of the Project and related activities for the population in the impact


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- 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


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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


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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.


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- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.


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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
Thiru.M.Gunasekaran,
S/o.Muthusamy,
No.3/37, Karaipalayam,
Thirukkatuthurai,
Pugalur Taluk,
Karur District - 639 117

Rc.No.297/Mines/2021, Dated: 23.06.2022

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District - Pugalur Taluk - Kuppam Village - S.F.Nos.710/3(1.04.5 hect.,) and 712/2(0.88.0 hect.,) Over an extent of 1.92.5 hectares - Quarry lease application for Rough Stone and Gravel - Preferred by Thiru.M.Gunasekaran - Mining Plan approved - requested for the details of Existing/ proposed/ abandoned quarries situated within 500 mts radial distance - furnished - Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by Thiru.M.Gunasekaran, S/o.Muthusamy, No.3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District dated: 23.07.2021
 2. Precise Area Communication Notice Rc.No.297/Mines/2021, Dated: 04.03.2022
 3. Mining Plan submitted by Thiru.M.Gunasekaran, Letter dated: 29.04.2022.
 4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter Rc.No. 297/Mines/2021, Dated:27.05.2022
 5. Thiru.M.Gunasekaran letter dated:03.06.2022.

In the reference 1st cited, Thiru.M.Gunasekaran have applied quarry lease for quarrying Rough stone and Gravel in S.F.Nos.710/3(1.04.5 hect.,) and 712/2(0.88.0 hect.,) Over an extent of 1.92.5 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur have issued precise area letter to the proposed lease area vide reference 2nd cited.

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

In the reference 5th cited, the applicant has requested the Deputy Director of Geology and Mining, Karur for the Details of Existing, Proposed and abandoned quarries situated within 500 meter radial distance from subject area and same has been furnished as follows:-

I. Existing Quarries: -

Sl No.	Name of the Owner	S.F.Nos.	Extent (hect)	Lease Period
1	Tmt.S.Tamilselvi w/o.Sapapathi Ganesa Nagar 1 st Street Enam Karur Karur Taluk & District.	706 part	3.36.0	18.08.2017 to 17.08.2022
2	Thiru.S.K.Krishnamurthy, 1/22, Kavadikaranur, Thangayur village, Edapati Taluk, Karur District.	679, 680/1(Par)	1.09.5 <u>0.86.0</u> 01.95.5	04.7.2018 to 03.7.2023

5.31.5

II. Proposed Area: -

Sl No.	Name of the Owner	S.F.Nos.	Extent (hect)	Lease Period	Remarks
1	Thiru.M.Gunasekaran, S/o.Muthusamy, No.3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District - 639 117	710/3 712/2	1.925	Applied Area	
2	M/s.Annai Blue Metals, S.F.No.451, Kaalipalayam, Kuppam Village, Pugalur Taluk, Karur District - 639 111.	682(Part)	1.92.0	Proposed Area	


3.84.5

III. Lease Expired and abandoned Quarries : -

Sl No.	Name of the Owner	S.F.Nos.	Extent (hect)	Lease Period	Remarks
1	R.Natrayan S/o.Rengasamy Kuppam Aravakurichi	715/3	2.10.0	2.3.2004 to 1.3.2009	----
2	M.Gunasekaran, S/o.Muthusamy, Karaipalayam, Nadayanur Post,	710/2	3.04.5	16.06.2009 to 15.06.2014	----
3	S.Tamilselvi, W/o.S.Sapabathi, 16B, Ganesa Nagar, K.V.B Nagar,	702	3.35.5	09.09.2010 to 08.09.2015	
4	Thiru.M.Gunasekaran S/o. Muthusamy Nadaiyanur Post Karur Taluk Karur District.	710/1 710/3 712/2	4.96.5	05.07.2016 to 04.07.2021	

13.46.5


 Deputy Director,
 Geology and Mining,
 Karur.


 22/06/2022

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

To
Thiru.M.Gunasekaran,
S/o.Muthusamy,
No.3/37, Karaipalayam,
Thirukkatuthurai,
Pugalur Taluk,
Karur District - 639 117.

Rc.No.297/Mines/2021, Dated:27.05.2022

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District - Pugalur Taluk - Kuppam Village - S.F.Nos.710/3(1.04.5 hect.) and 712/2(0.88.0 hect.) Over an extent of 1.92.5 hectares - Quarry lease application for Rough Stone and Gravel - Preferred by Thiru.M.Gunasekaran - Precise area communicated - mining plan submitted for approval - Approved - Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by Thiru.M.Gunasekaran, S/o.Muthusamy, No.3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District dated: 23.07.2021.
 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.297/Mines/2021, Dated: 04.03.2022.
 7. Mining Plan submitted by Thiru.M.Gunasekaran, letter Dated: 29.04.2022.

In the reference 7th cited, as directed by the Deputy Director of Geology and Mining, Karur, Thiru.M.Gunasekaran have submitted three

copies of draft mining plan for approval in respect of Rough stone and Gravel quarry lease applied areas, over an extent 1.92.5 Hects., of patta lands in S.F.Nos.710/3(1.04.5 hect.,) and 712/2(0.88.0 hect.,) of Kuppam Village, Pugalur Taluk, Karur District.

The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.Nos.710/3(1.04.5 hect.,) and 712/2(0.88.0 hect.,) Over an extent of 1.92.5 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District has been examined in detail.

As per the guidelines/ instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, dt: 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.297/Mines/2021, Dated: 04.03.2022 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப புலங்களின் தெற்கில் புல எண்.711-இல் கிழமேலாக செல்லும் நாடைபாதைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்யப்பட வேண்டும்.
2. விண்ணப்ப புலங்களின் தெற்கில் கிழமேலாக அமைந்துள்ள நாடைபாதைக்கு இணையாக செல்லும் தாழ்வழுத்த மின்பாதைக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்யப்பட 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 விண்ணப்பதாரர் நிறுவனத்தினரால் 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.


27/5/22

Deputy Director,
Geology and Mining,
Karur.

Copy to:

Thiru.P.Viswanathan, M.Sc.,
Qualified Person,
Regd Off.No.17, Advaita Ashram Road,
Alagapuram, Salem District - 636 004.


27/05/2022

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

To
Thiru.M.Gunasekaran,
S/o.Muthusamy,
No.3/37, Karaippalayam,
Thirukkatuthurai,
Pugalur Taluk,
Karur District - 639 117.

Rc.No.297/Mines/2021, Dated:27.05.2022

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District - Pugalur Taluk - Kuppam Village - S.F.Nos.710/3(1.04.5 hect.) and 712/2(0.88.0 hect.) Over an extent of 1.92.5 hectares - Quarry lease application for Rough Stone and Gravel - Preferred by Thiru.M.Gunasekaran - Precise area communicated - mining plan submitted for approval - Approved - Regarding.

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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 விண்ணப்பதாரர் நிறுவனத்தினரால் 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.


Deputy Director,
Geology and Mining,
Karur.

Copy to:
Thiru.P.Viswanathan, M.Sc.,
Qualified Person,
Regd Off.No.17, Advaita Ashram Road,
Alagapuram, Salem District - 636 004.


27/05/2022



**MINING PLAN AND PROGRESSIVE QUARRY
CLOSURE PLAN FOR KUPPAM
ROUGH STONE AND GRAVEL QUARRY**

(PREPARED UNDER RULES 41 & 42 AS AMENDED IN TAMILNADU MINOR MINERAL CONCESSION RULES, 1959)

Patta Lands / Lease Period = Five Years

IN

LOCATION OF THE QUARRY LEASE APPLIED AREA

EXTENT : 1.92.5Ha
S.F.NO's : 710/3 and 712/2
VILLAGE : KUPPAM
TALUK : PUGALUR
DISTRICT : KARUR
STATE : TAMILNADU

FOR

APPLICANT

Thiru. M.Gunasekaran,

S/o Muthusamy,
No 3/37, Karaipalayam,
Thirukkatuthurai,
Pugalur Taluk, Karur District,
Tamil Nadu State – 639 117.

This Mining Plan is approved subject
to the conditions/stipulations
indicated in the Mining Plan approval
Letter No: 297/Mines/2021
Dated: 27.05.2022

PREPARED BY

**P. Viswanathan, M.Sc.,
Qualified Person**

Regd. Off. No.17, Advaita Ashram Road,
Alagapuram, Salem District – 636 004.
Cell: +91 94422 78601 & 94433 56539.
E-mail: infogeoexploration@gmail.com

M. Viswanathan

Thiru. M.Gunasekaran,
S/o Muthusamy,
No 3/37, Karaipalayam,
Thirukkatuthurai,
Pugalur Taluk, Karur District,
Tamil Nadu State – 639 117.



CONSENT LETTER FROM APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Kuppam Rough stone and Gravel Quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

P. Viswanathan, M.Sc.,
Qualified Person

We request to the Deputy Director, Department of Geology and Mining, Karur District to make further correspondence regarding the modification of the Mining Plan with the said Qualified Person at his following address.

P. Viswanathan, M.Sc.,
Regd. Off. No. 17,
Advaita Ashram Road,
Alagapuram, Salem District – 636 004.
Cell: +91 94422 78601 & 94433 56539..

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

Signature of the Applicant

M. Gunasekaran

M.Gunasekaran

Place: Karur
Date: 05.03.2022

M. Gunasekaran

Thiru. M.Gunasekaran,

S/o Muthusamy,

No 3/37, Karaipalayam,

Thirukkatuthurai,

Pugalur Taluk, Karur District,

Tamil Nadu State – 639 117.



DECLARATION OF THE APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Kuppam Rough stone and Gravel Quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared in full consultation with me.

We have understood its contents and agree to implement the same in accordance with Laws, Rules and Act applicable to Quarry.

Signature of the Applicant

M. Gunasekaran
M.Gunasekaran

Place: Karur

Date: 05.03.2022

M. Gunasekaran

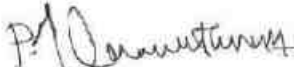
CERTIFICATE

Certified that I am, **P. Viswanathan**, M.Sc., having an office at Regd. Off. No. 17, Advaita Ashram Road, Alagapuram, Salem – 636 004, holding a Post Graduate Degree in Geology (M.Sc. Applied Geology) from Periyar University, Salem and I worked in the field of Geology in a role of Geologist.

Rule 15(I)(a) and (b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 stipulates the eligibility for preparing Mining plans as “(I)(a) a post graduate degree in Geology granted by a university established” and (I)(b) “Professional experience of five years of working in a supervisory capacity in the field of mining after obtaining the degree”. Since my qualification and experience are satisfied the Rule (I)(a) and (I)(b) of 15 of the said Rules, I am eligible to prepare Mining Plans for both Major and Minor Minerals.

Accordingly, I am prepare this Mining Plan and Progressive Quarry Closure Plan in Respect of Kuppam Rough stone and Gravel Quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State for **Thiru. M.Gunasekaran**, S/o Muthusamy, No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District, Tamil Nadu State – 639 117, Tamil Nadu State. Since the Mining Plan is prepared as per the provisions contained in Rule 15(I)(a) and (I)(b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Signature of the Qualified Person


P. Viswanathan, M.Sc.,

Place: Salem

Date: 11.03.2022

Mahesh

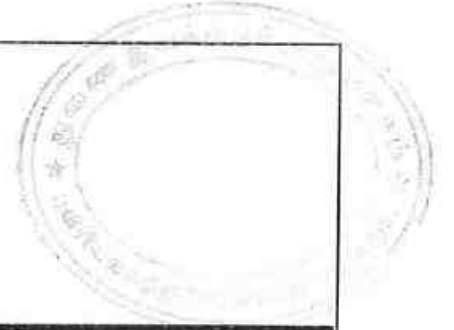
P. Viswanathan, M.Sc.,

Regd. Off. No. 17,

Advaita Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539.



CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the Provisions of under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Kuppam Rough stone and Gravel Quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared for

Thiru. M.Gunasekaran,

S/o Muthusamy,

No 3/37, Karaipalayam,

Thirukkatuthurai,

Pugalur Taluk, Karur District,

Tamil Nadu State – 639 117..

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of the Deputy Director, Department of Geology and Mining, Karur District, Tamil Nadu for such permissions/ exemptions/ relaxations and approvals.

It is also certified that information furnished in the above Mining Plan are true and correct to the best of my knowledge.

Signature of the Qualified Person

P. Viswanathan

P. Viswanathan, M.Sc.,

Place: Salem

Date: 11.03.2022

M. H. S. J.

P. Viswanathan, M.Sc.,

Regd. Off. No. 17,

Advaita Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539.



CERTIFICATE FROM THE QUALIFIED PERSON

Certified that the Provisions of Mines Act, Rules and Regulations and Orders made there under have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Kuppam Rough stone and Gravel Quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared for

Thiru. M.Gunasekaran,

S/o Muthusamy,

No 3/37, Karaipalayam,

Thirukkatuthurai,

Pugalur Taluk, Karur District,

Tamil Nadu State – 639 117..

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of Director General of Mines Safety (DGMS), No.5, II Street, Block-AA, Anna Nagar, Chennai-40, Tamil Nadu for such permissions / exemptions / relaxations and approvals.

It is also certified that information furnished in the Mining Plan are true and correct to the best of my knowledge.

Signature of the Qualified Person

P. Viswanathan, M.Sc.,

Place: Salem

Date: 11.03.2022

M. K. S.

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Mahant

This Mining Plan is approved subject
to the conditions/stipulations
indicated in the Mining Plan approval
Letter No: 297/Mines/2021
Dated: 27-05-2022

Mining Plan and PQCP

Kuppam Rough stone and Gravel Quarry

MINING PLAN AND PROGRESSIVE QUARRY CLOSURE PLAN FOR KUPPAM ROUGH STONE AND GRAVEL QUARRY

(PREPARED UNDER RULES 41 & 42 AS PER THE AMENDED UNDER TAMIL NADU MINOR MINERAL
CONCESSION RULES, 1959)

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This Mining Plan and Environment Management Plan is prepared for **Thiru. M.Gunasekaran**, S/o Muthusamy, No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District, Tamil Nadu State – 639 117.

The applicant applied for Rough stone and Gravel quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State.

The application was processed by the Deputy Director, Department of Geology and Mining, Karur District and passed a Precise Area Communication letter vide **Rc.No.297/Mines/2021, Dated:04.03.2022** to submit approved Mining Plan in Department of Geology and Mining, Karur and obtain Environmental Clearance from the State Level Environment Impact Assessment Authority, Tamil Nadu, with the following conditions to provide (Please refer Annexure No – I):

1. The applicant should leave a safety distance of 10 meters to the Pathway passing in S.F.No.711 situated on the South side of the applied area.
2. The applicant should leave a safety distance of 50 meters to the LT line passing likewise the pathway situated on the South side of the applied area.
3. The applicant should leave a safety distance of 7.5 meters to adjacent patta lands and 10 meters to the poramboke lands to work without any hindrance during quarrying operations..
4. The applicant should carried out the quarry operations by Hand Jackhammer drilling and mild blasting without any hindrance to the public and public properties as per Rules.
5. The quarry operation should be carried out with proper benches for safety to the quarry workers and compatible access of Men and Machineries as per Metalliferrous Mines Regulations.
6. The applicant should be submit the Mining plan approved by the Deputy Director of Geology and Mining and obtain Environment Clearance from the State Level

M. Gunasekaran

Environmental Impact Assessment Authority for the quarry lease applied area before grant of quarry lease.

In order to ensure compliance of the order of the Honourable Supreme Court Dated: 27.02.2012 in I.A.No.12.13.2011 in Special Leave Petition SLP (C) No 19628-19629/2009, it has been now decided that all mining projects of minor minerals including their renewal irrespective of sizes of the lease would hence forth require prior environmental clearance mining project within the lease applied area up to less than 100ha including projects or minor mineral with lease applied area less then 5ha would be treated as category B as defined in the EIA notification 2006 and will be considered by the state notified by MoEF as prescribed procedure under EIA notification 2006.

In the above circumstances the applicant through his consultant is hereby preparing the Mining Plan, Environmental Management Plan and Progressive Quarry Closure Plan for approval and subsequent submission of Form-I, Form-IM and Pre feasibility report to obtain environmental clearance from the SEIAA, Tamil Nadu, Rough stone and Gravel quarry. This mining plan is prepared by considering the Rules 41 & 42 as Amended in Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the EIA Notification 2006 and its subsequent Amendment and judgments till 24.01.2019.

Short Notes of Mining Plan:

- a. Village Panchayat - Kuppam
- b. Panchayat Union - K.Paramathi
- c. The Geological Resources are **7,24,430m³** of Rough stone and **29,112m³** of Gravel formation in the entire area.
- d. The Total Mineable Reserves are **1,60,982m³** of Rough and **11,446m³** of Gravel formation in the entire area.
- e. The proposed quantity of reserves/ (level of production) to be mined are **1,40,607m³** of Rough stone and **11,446m³** of Gravel formation for five years in the entire area.
- f. Total extent of the lease applied area = 1.92.5Ha
- g. Topography of the area = The area exhibits plain topography
- h. Proposed Depth of mining = 37m (2m Gravel +35m Rough stone).
- i. This Mining Plan period = Five years

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- j. It is a fresh lease application but, the applied area has been considered quarrying operation earlier. The quarry lease was previously granted in favour of **Thiru. M.Gunasekaran, S/o Muthusamy, No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District**, over an extent of 4.96.5 Ha of Patta lands in S.F.Nos.710/2, 710/3 and 712/2 of Kuppam Village, Pugalur Taluk (Formerly Aravakurichi Taluk), Karur District vide **Re.No.554/Mines/2014, Dated: 05.07.2016** for the period of five years from 05.07.2016 to 04.07.2021 for quarrying of Rough stone. The maximum dimension of the **existing quarry pit** is given table below (Refer Plate No. II).

Table – 1

Length (m) (max)	Width (m) (max)	Depth (m) (max)
90	63	3m below ground level

- k. Method of mining / level of mechanization.
Opencast mechanized method, the quarry operation involves shallow hand jack hammer drilling and mild blasting.
- l. Type of machineries proposed in the quarrying operation is given below:
Excavators attached with rock breaker (Rental Basis).
Hand jack hammer, Compressor (Diesel drive) (4 Jack Hammer capacity) (Rental Basis).
- m. No trees will be uprooted due to this quarrying operation.
- n. The existing road from the main road to quarry is in good condition. The same will be maintained and utilized for Transportation of quarry materials and machineries.
- o. There is No Export of this Rough stone and Gravel.
- p. Topo sketch covering 10km and 1km radius around the proposed area with markings of habitations, water bodies including streams, rivers, roads, major structure like bridges, wells, archaeological importance, places of worships is marked and enclosed as Plate Nos. IA and IB.
- q. The lease applied area is about 1.92.5ha bounded by eleven corners; the corners are designated as 1-11 Clockwise from the Southwest corner, the Co-ordinates for all the corners are clearly marked in the Quarry Lease and Surface Plan enclosed as (Plate No-II).

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- r. The plans of proposed quarrying area showing the dimensions of the pit, their proposed depth and maximum area of proposed quarrying are enclosed as Plate Nos. III.
- s. General conditions will not be applicable for the proposed area. The area applied for lease is 10Km away from the,
- i) *Interstate Boundary,*
 - ii) *Protected area under wild life protection ACT, 1972,*
 - iii) *Critically polluted areas as identified by CPCB,*
 - iv) *Notified Eco sensitive areas.*
- t. There is no waste anticipated during this quarry operation, hence waste dump is not proposed in the lease applied area.
- u. Around 20 employees are deploying in the quarrying operation.
- v. Total Cost of the project is about **Rs.48,25,000/-**
- w. Infrastructures around the quarry lease applied area:

Table – 2

Particulars	Location	Approximate aerial distance and direction from lease applied area
Nearest Post Office	Kuppam	3km – NW
Nearest School	Salipalayam	1km – NE
Nearest Dispensary	Salipalayam	1km – NE
Nearest Town	K.Paramathi	4km – SW
Nearest Police Station	K.Paramathi	4km – SW
Nearest Hospital	K.Paramathi	4km – SW
Nearest D.S.P. Office	Karur	16km – SE
Nearest Railway Station	Noyal	8km – North
Nearest Airport	Trichy	86km – SE
Nearest Seaport	Kochi	216km – SW
District Head quarters	Karur	16km – SE

M. K. S. J.

2.0 GENERAL INFORMATION**2.1 a) Name of the Applicant : Thiru. M.Gunasekaran,****b) Address of the Applicant (With Phone No and Aadhaar No)**

Address : S/o Muthusamy,
No 3/37, Karaipalayam,
Thirukkatuthurai,
Pugalur Taluk,
Karur District.

Pin Code : 639 117

Mobile No : 9787911811, 9943963636

Aadhaar No : 4344 2885 8792 (Annexure No. VIII)

Email ID : karthickmalphas@gmail.com

c) Status of the Applicant (Individual / Company / Firm):

The applicant is an individual.

2.2 a) Mineral which the Applicant intends to mine:

The Applicant intends to quarry Rough stone and Gravel.

b) Precise area communication letter details received from the Competent Authority of the Government:

The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, Karur District vide **Rc.No.297/Mines/2021, Dated:04.03.2022** to submit approved mining plan and to obtain Environmental Clearance from the SEIAA, Tamil Nadu.

c) Period of permission / lease to be granted:

Five Years.

d) Name and address of the Qualified Person who preparing the Mining Plan:Name : **P.Viswanathan, M.Sc.,**

Qualified Person

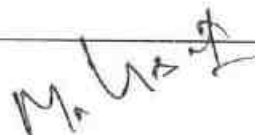
Address : Reg. No.17,
Advaita Ashram Road,
Alagapuram, Salem District – 636 004.

Telephone : 0427- 2431989 (Office)

Cell No : +91 94422 78601 & 94433 56539

Email : infogeoexploration@gmail.com

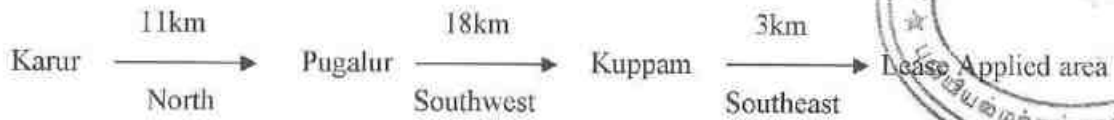
(Refer Annexure Nos.IX and X).



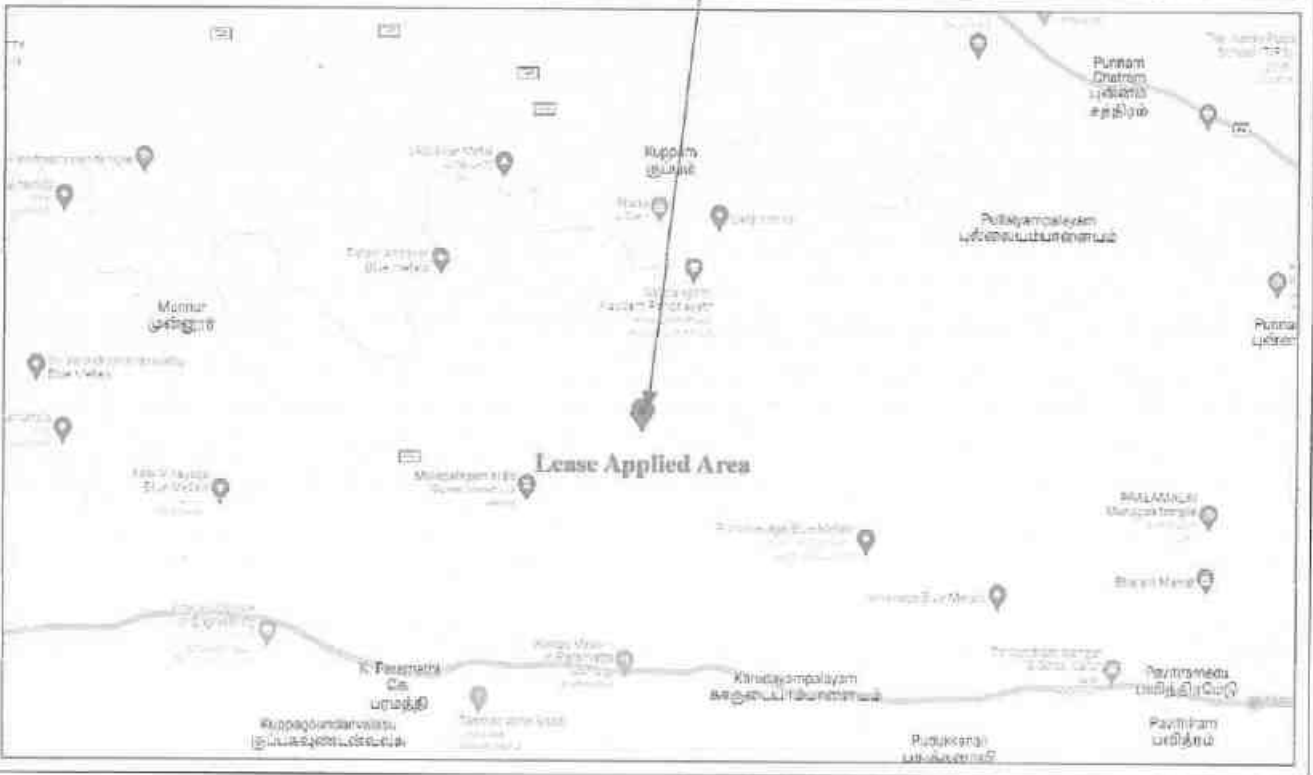
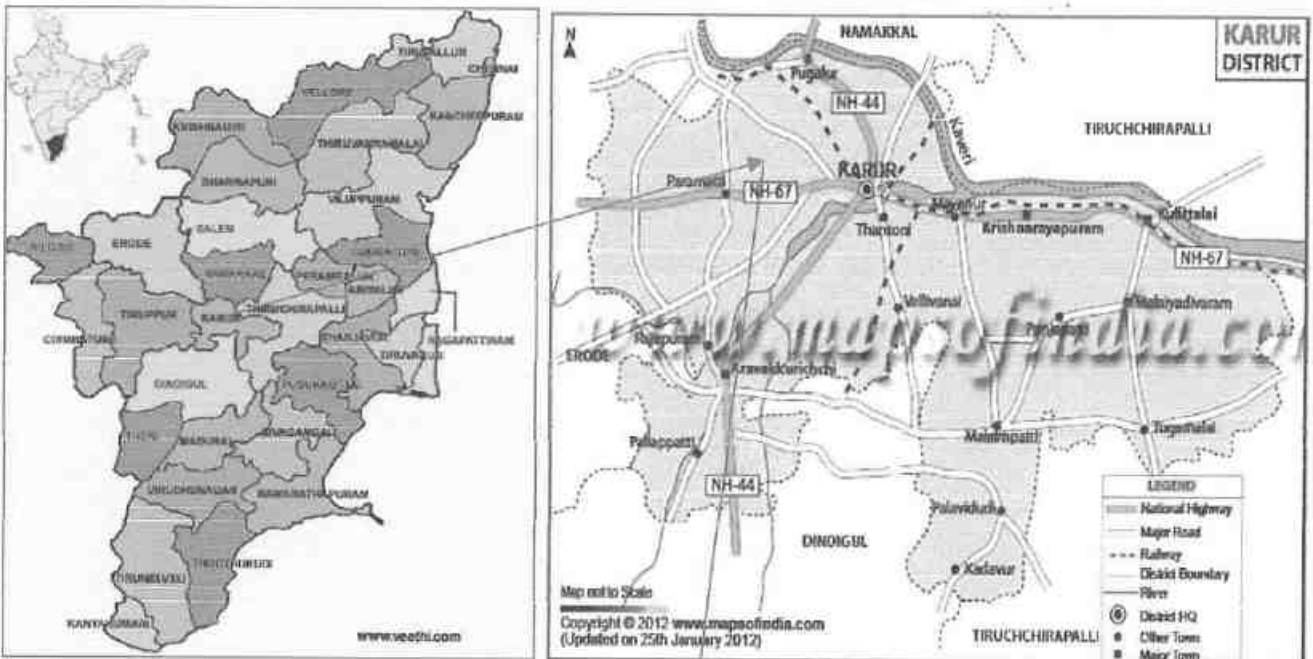
3.0 LOCATION

a) Details of the area with location map:

The lease applied area is about 16km Northwest side of Karur town, 10km Southwest side of Pugalur and 3km Southeast side of Kuppam Village.



Location Map of the Lease Applied area



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Table - 3

District	Taluk	Village	S.F. No.	Area in Ha.	Patta No.
Karur	Pugalur	Kuppam	710/3	1.04,5	330
			712/2	0.88.0	
Total				1.92.5	

b) Classification of the area (Ryotwari/ Poramboke / others):

It is a Patta land (Barren land) which are not fit for vegetation/ Cultivation.

c) Ownership / Occupancy of the applied area (surface right):

It is a Patta lands. Registered in the name Thiru. S. Murugesan, vide Patta No. 330 and the applicant has obtained consent from the pattadar for quarrying operation for 10 years. (Refer Annexure Nos. IV to VII).

d) Toposheet No. with latitude and longitude:

The lease applied area falls in the Toposheet No: 58 - F/13 Latitude between: 10°58'49.04"N to 10°58'55.76"N and Longitude between: 77°55'56.49"E to 77°56'02.53"E on WGS datum-1984 (Please refer the Plate Nos. I to II).

e) Existence of public road / Railway line, if any nearby and approximate distance:

The approach road is situated on the Southern side of the applied area which connects the Pathway on the South side of the applied area.

Multiple road access is available from the quarry to state highways and National Highway, no villages are enrooted hence the traffic density is not much more due to the transportation of Rough stone.

The approach road from the quarry is already in existence, the same will be utilized for haulage and maintained during the entire lease period, tree sapling will be planted on the either side of the road to prevent dust and noise propagation to the nearby areas.

The Nearest Railway line is Erode - Karur which is about 8km on the Northern side of the applied area.

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PART - A

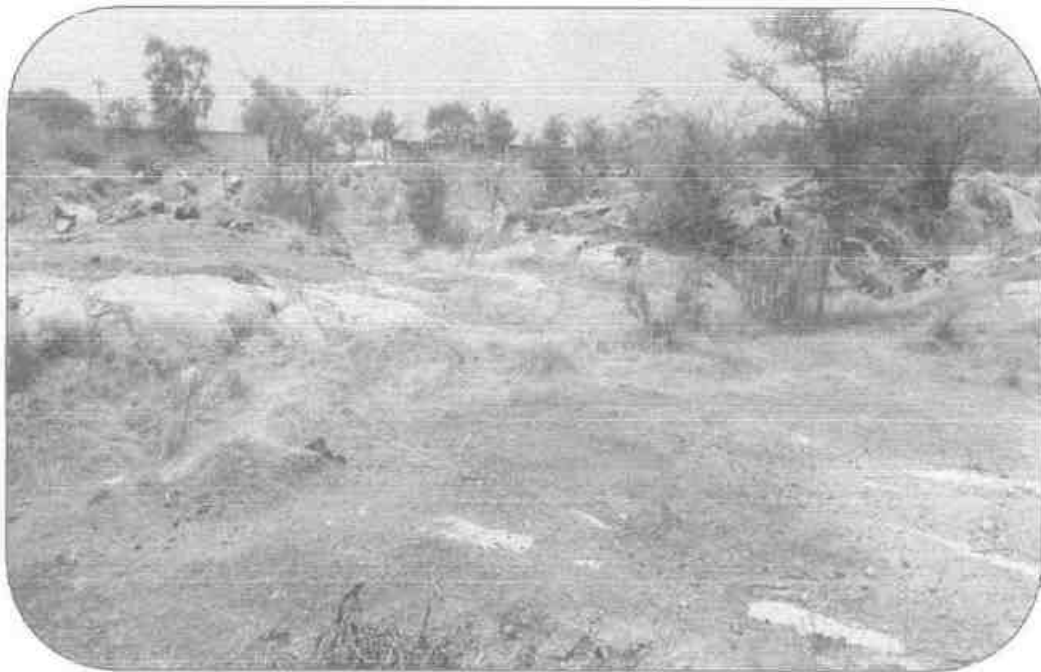
4.0 GEOLOGY AND MINERAL RESERVES

4.1 Brief description of the Topography and general Geology of the area (with plans):

The lease applied area exhibits plain topography. The area has gentle slope towards Northeast side and the altitude of the area is 179m above from Mean Sea level. The area is covered by Gravel with an average thickness of 2m. The Massive Charnockite is found after 2m Gravel which is clearly inferred from the existing quarry pit.

The Water table is found at a depth of 69m in summer and at 65m in rainy seasons. Average annual rainfall is about 655mm.

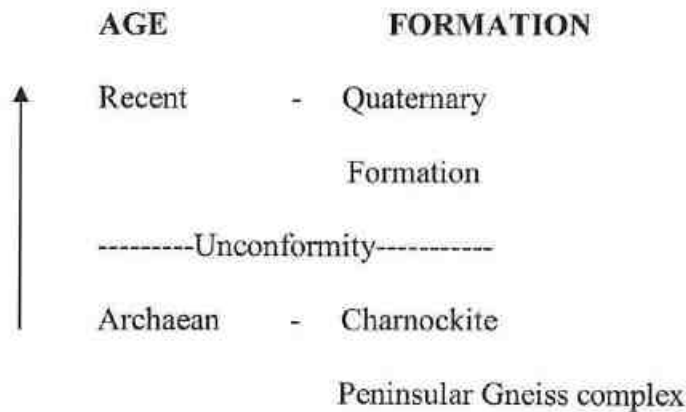
Topographical View of Kuppam Rough Stone and Gravel Quarry lease applied area



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Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale of the Charnockite is body N30°W – S30°E with dipping towards SW60°.

The general geological sequences of the rocks in this area are given below:



4.2 Details of exploration already carried out if any:

State Geology and Mining Dept, Govt. of Tamil Nadu, has carried out the Regional prospecting and exploration in these areas during 1992 to 1993.

Geological Survey of India has carried out detailed mapping in Karur District. Besides, the Qualified Person and his team members made a detailed geological study of the proposed area. The Rough stone formation is clearly inferred from the existing quarry pit.

4.3 Estimation of Reserves:

a) Geological reserves with geological sections on a scale of 1:1000 / 1:2000

As far as Rough stone (Charnockite) is concerned, the only practical method is the systematic geological mapping and delineation of Rough stone within the field and careful evaluation of body luster, physical properties, engineering properties and commercial aspects etc.,

Totally three sections have been drawn, one section is drawn Length wise as (X-Y) and other two cross sections are drawn Width wise as (A-B and C-D) to cover the maximum area considered for calculation upto a maximum depth of 37m below from the existing ground profile..

The Topographical, Geological plan and sections demarcated the commercial marketable Rough stone (Charnockite) deposit has been prepared in 1:1000 scale (please refer the Geological plan and sections Plate No- III). As the sale of Rough stone is in terms of cubic meters (Volume) only and not in terms of tonnage.

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Geological Resources (Plate No. III):

The Geological Resources of Rough stone and Gravel are calculated up to a maximum depth of 37m (2m Gravel + 35m Rough stone) below ground level. The total Geological resources are calculated by cross sectional method and the resources are estimated after depletion of existing quarry pit. The total available geological resources are given in table below:

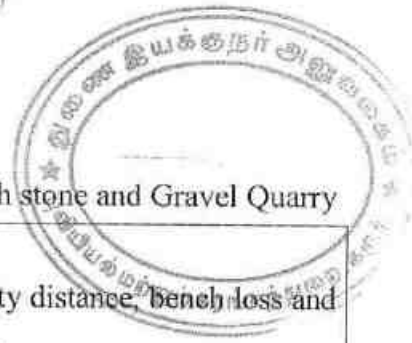
Table-4

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Geological Resources of Rough stone in (m ³) 100%	Gravel (m ³)
XY-AB	I	70	82	2	-	11480
	II	70	127	1	8890	-
	II	70	171	4	47880	-
	III	70	171	5	59850	-
	IV	70	171	5	59850	-
	V	70	171	5	59850	-
	VI	70	171	5	59850	-
	VII	70	171	5	59850	-
	VIII	70	171	5	59850	-
Total					415870	11480
XY-CD	I	116	76	2	-	17632
	II	116	76	5	44080	-
	III	116	76	5	44080	-
	IV	116	76	5	44080	-
	V	116	76	5	44080	-
	VI	116	76	5	44080	-
	VII	116	76	5	44080	-
	VIII	116	76	5	44080	-
Total					308560	17632
Grand Total					724430	29112

Total Geological Resources of Gravel : 29,112m³

Total Geological Resources of Rough stone : 7,24,430m³

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**Mineable Reserves:**

The available Mineable reserves are calculated after leaving the safety distance, bench loss and existing quarry pit to a maximum depth of 37m below ground level.

Table - 5

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Mineable Reserves of Rough stone in (m ³) 100%	Gravel (m ³)
XY-AB	I	61	23	2	-	2806
	II	58	64	1	3712	-
	II	58	110	4	25520	-
	III	53	100	5	26500	-
	IV	48	90	5	21600	-
	V	43	80	5	17200	-
	VI	38	70	5	13300	-
	VII	28	60	5	8400	-
	VIII	18	50	5	4500	-
	Total					120732	2806
XY-CD	I	108	40	2	-	8640
	II	105	35	5	18375	-
	III	100	25	5	12500	-
	IV	95	15	5	7125	-
	V	90	5	5	2250	-
	Total					40250	8640
Grand Total					160982	11446

Total Mineable Reserves of Roughstone : 1,60,982m³

Total Mineable Reserves of Gravel : 11,446m³

The mineable reserves have been computed as 1,60,982m³ of Rough stone and 11,446m³ of Gravel at the rate of 100% recovery upto a maximum depth of 37m below ground level for a period of five years.

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5.0 MINING

5.1 Method of mining (opencast / underground):

Open cast Mechanized Mining is being carried out with 5.0 meter vertical bench with a bench width is not less than the bench height.

However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act - 1952.

5.2 Mode of working (mechanized, semi mechanized, manual):

The Rough stone is proposed to quarry at 5m bench height & width with conventional Opencast Mechanized Method.

The quarry operation involves shallow hand jack hammer drilling, mild explosives in blasting, excavation, Loading and transportation of Rough stone to the needy crusher.

The production of Rough stone in this quarry involves the following method which is typical for Rough stone quarrying in contrast to other major mineral mining.

Splitting of rock mass of considerable volume from the parent rock mass by hand jackhammer drilling and mild explosives blasting, hydraulic excavators are used for loading the Rough stone from pithead to the needy crushers.

Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting. The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast mechanized method of mining.

5.3 Proposed Bench Height and Width:

The Charnockite is hard and compact rock, the bench height is proposed 5.0 meter vertical bench the width of the bench is not less than the Height.

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5.4 Indicate the overburden / mineral production expected pit wise as detailed below (composite plan and section showing pit layout, dumps, disposal of waste if any etc.):

The overburden in the form of Gravel, the quarried out Gravel will be directly loaded into tippers for the filling and levelling of low lying areas. , this will be done only after obtaining permission and paying necessary seigniorage fees to the Government. The excavated rough stone will be directly loaded into tippers to the needy customers. The Composite year wise Development and production plan and sections indicating the Pit lay out, Green belt development are shown in Plate No-III.

Year wise development and Production

Table - 6

Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Recoverable Reserve of Rough stone in (m ³) 100%	Gravel (m ³)
XY-AB	I	I	61	23	2	-	2806
		II	58	64	1	3712	-
		II	58	110	4	25520	-
	Total						29232	2806
XY-CD	II	III	35	100	5	17500	-
		I	38	40	2	-	3040
		II	35	35	5	6125	-
	III	30	25	5	3750	-	
Total						27375	3040
XY-AB	III	I	70	40	2	-	5600
		II	70	35	5	12250	-
		III	70	25	5	8750	-
	III	12	100	5	6000	-	
Total						27000	5600
XY-AB	IV	III	6	100	5	3000	-
		IV	36	90	5	16200	-
		V	26	80	5	10400	-
	Total						29600
XY-AB	V	IV	12	90	5	5400	-
		V	12	80	5	4800	-
		VI	28	70	5	9800	-
		VII	18	60	5	5400	-
VIII	8	50	5	2000	-		
Total						27400	
Grand Total						140607	11446

The Recoverable reserves have been computed as **1,40,607m³** of Rough stone at the rate of 100% recovery and **11,446m³** of Gravel upto a maximum depth of 37m below ground level for a mining plan period of five years.

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The applicant ensures the total quantity proposed in the benches will not exceed during the quarrying operation. Besides the rough stone locked up in benches will be exploited after obtaining necessary permission from the office of Director General of Mine Safety, Chennai region by submitting relevant documents, appropriate safety plans and its Mitigation measures..

One lorry load	=	6m ³ (approx.)
Total No of Working days	=	300 Days per year
Total quantity to be removed during the plan period	=	1,40,607m ³
Hence total lorry loads per day	=	1,40,607m ³ /6m ³
	=	23,435lorry loads
	=	23,435/5 years
	=	4,687/300 Days
Rough stone	=	15 - 16 lorry loads per day
Total gravel to be removed during paln period	=	11,446m ³
Hence total lorry loads per day	=	11,446m ³ /6m ³
	=	1908 lorry loads
	=	1908/3 Years
	=	636/300 Days
Gravel	=	2 lorry load per day
Working hours = 8.30 am to 5.30 pm (with 12.30-1.30 pm lunch break)		

5.5 Machineries to be used:

For Mining:

The following machineries are utilized on rental basis for the development and production work at this quarry.

Table-7

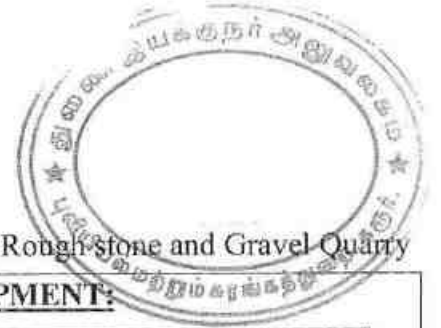
I. DRILLING MACHINE

S.No.	Type	Nos	Dia Hole mm	Size Capacity	Motive power
1	Hand jack hammer	4	30-35	1.2m to 2.0m	Compressed air
2	Compressor	1	-	400 psi	Diesel Drive

II. EXCAVATION & LOADING EQUIPMENT:

S.No.	Type	Nos	Capacity	Motive Power
1	Excavator with Bucket and Rock Breaker	1	300	Diesel Drive

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III. HAULAGE WITHIN THE MINE & TRANSPORT EQUIPMENT:

S.No.	Type	Nos	Capacity	Motive Power
1	Tippers	2	20 tonnes	Diesel Drive

5.6 Disposal of Overburden/Waste:

The overburden in the form of Gravel, the quarried out Gravel will be directly loaded into tippers for the filling and levelling of low lying areas. The excavated Rough stone (100%) will be directly loaded into tippers to the needy customers. There is no Waste anticipated during this plan period hence, disposal of waste does not arise.

5.7 Brief note on conceptual mining plan for the entire lease period base on the geological, mining and Environment considerations:

Conceptual mining plan is prepared with an object of long term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, selection of sites for construction of infrastructure, etc.,

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.,

As the applicant has applied quarry lease for five years, the ultimate pit limit (dimension) at the end of lease period is given below:

Table – 8

Length in m (Max)	Width in m (Max)	Depth in m (Max)
170	114	37m below ground level

Greenbelt has proposed on the safety zone by planting Neem, Pongamia Pinnata, Casuarina, etc., trees of native species. All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out every year as per the MoEF&CC Norms. Please refer Plate Nos. III & IV.

It is propose to engage any local institution to monitor the EIA and EMP during the course of quarrying operation after the grant of quarry lease.

There is no waste anticipated during the entire life of quarry. Hence, backfilling is not possible in this quarry. After completion of quarry operation, the quarry pit will be allowed to collect the seepage and rainwater, the water storage will be kept as temporary reservoir for charging the nearby wells and the storage water will be used for afforestation purpose. The quarry pit will be fenced with barbed wire fencing to prevent inadvertent entry of public and cattle (Refer Plate No. IV).

M. L. S. G.



6.0 BLASTING

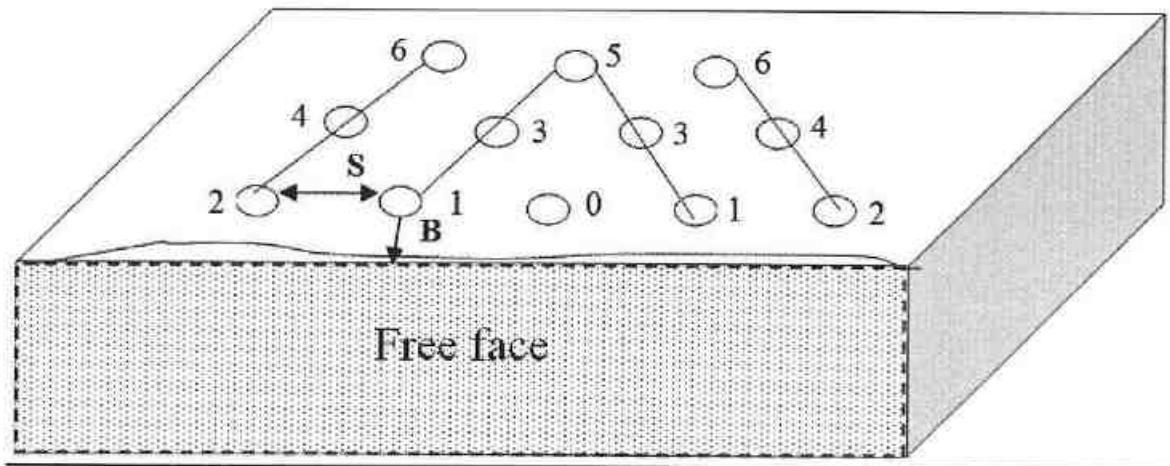
6.1 Blasting pattern:

The quarrying operation is proposed to be carried out by Opencast Mechanized Method in conjunction with conventional method of mining using Hand jack hammer drilling and blasting of shattering effect for loosening the Rough stone.

Drilling and blasting parameters are as follows:

Depth of Each hole	:	1.5m
Diameter of hole	:	30-32mm
Spacing between holes	:	1.2m
Burden for hole	:	1.0m
Pattern of hole	:	Zigzag – Multi-rows
Inclination of holes	:	80° from horizontal
Use of delay detonators	:	25millisecond relays
Detonating fuse	:	“Detonating” Cord

BLASTING PATTERN DRAWING



Staggered “V” Pattern of Blasting Design

Spacing	=	1.2m
Burden	=	1.0m
Depth of the hole	=	1.5m
No of holes proposed per day=		82 Holes

6.2 Type of explosives to be used:

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

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6.3 Measures proposed to minimize ground vibration due to blasting:

The quarry is situated more than 300m from the nearby villages, Controlled blasting measures is being adopt for minimizing ground vibration and fly rock.

Shallow depths hand jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in Rough stone for easy excavation and to control fly rock.

Delay detonators:

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

The major advantages of delay blasting are:

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

Blasting program for the production per day:

No of Holes	= 82 Holes
Yield	= 246 Tons
Powder factor	= 6 Tons/Kg of explosives
Total explosive required	= 41 Kg-Mild explosives
Charge/ hole	= 0.5 Kg
Blasting at day time only	= 12.00 – 12.30p.m (whenever required)

6.4 Storage and safety measures to be taken while blasting:

The applicant will engage authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/Permit Mines Manager. The explosives agencies should be have the valid Blaster certificate. He will blast holes in the quarry site. After the completion of Blasting the Explosives Agencies will take it out back the remaining quantity of Explosives. The magazine is available at the quarry site to temporarily store the explosives.

7.0 MINE DRAINAGE**7.1 Depth of water table (based on nearby wells and water bodies):**

The Water Table in the area is 69m in summer season and 65m in Rainy season which is observed from the existing private boreholes. The lease area is fully covered by Massive Charnockite formation. Hence the Ground Water problem will not arise. If water seepage may occur due to the fracture, the same will be used for Greenbelt.

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Table – 9

Type	Distance & Direction	Location
Bore Well	321m Northwest side	10°59'00.13"N 77°55'47.53"E

7.2 Arrangements and places where the mine water is finally proposed to be discharged:

Quarry operations are confined to well above the water table during the entire lease period. If water is encountered at due to rain water and seepage, the same will be pumped out by 5HP water pumps to the Greenbelt development areas. Besides, the water will also be used for dust suppression on haul roads during Haulage of machineries.

8.0 OTHER PERMANENT STRUCTURES (also shown in the map)

8.1 Habitations/ Villages natham:

There is no approved habitation/village located within 300m radius of the lease applied area.

8.2 Power Lines (HT/LT):

There is an LT line passing on the southern side of lease applied area, so necessary safetdistance of 50m will be provided. There is no HT line or Housing area situated within 50m radius of the lease applied area.

8.3 Water bodies (river, ponds, lake, odai, canal, etc.):

There is no River, Pond, Lake, Canal, Reservoir located within 50m radius of the lease applied area.

8.4 Archaeological / historical monuments:

There is no Archaeological / historical monuments within 500m radius from the applied area.

8.5 Road (NH, SH others):

The Nearest National Highway (NH-81) Coimbatore – Trichy is situated about 2km on the Southern side of the lease applied area.

The State Highway (SH-84) Erode – Karur is situated about 6km on the Northeastern side of the lease applied area.

The Major district road (MDR-332) Kuppam – Paramthi is situated about 2km on the western side of the lease applied area.

There is a pathway on southern side of lease applied area a safety distance of 10m will be provided.

8.6 Places of worships:

There is no place of worships within the radius of 300m from the lease applied area.

8.7 Reserved forest / forest / social forest / wild life sanctuary etc.:

There is no reserved forest / forest / social forest / wild life sanctuary etc., within radius of 10km of the lease applied area.

SALIENT FEATURES

Table - 10

S. No.	Salient Features Present around site	Prescribed safety distance	If any present within Prescribed distance it's actual distance and direction from the area																				
1.	Railways, Highways, Reservoirs or Canal	50m	None of the above situated within 50m radius.																				
2.	Village Road	10m	There is a pathway on southern side of lease applied area a safety distance of 10m will be provided.																				
3.	Habitation / Village	300m	There is no approved habitation within 300m radius from the lease applied area.																				
4.	Adjacent Patta lands / Govt. Land	7.5m/10m	<table border="1"> <thead> <tr> <th>Direction</th> <th>S.F.No.</th> <th>Classification</th> <th>Safety Distance</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>713, 712/1A & 712/1B</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>East</td> <td>712/3</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>South</td> <td>711</td> <td>Patta land</td> <td>50 m to EB line</td> </tr> <tr> <td>West</td> <td>710/2</td> <td>Patta land</td> <td>7.5m</td> </tr> </tbody> </table> <p>(Refer Plate No. II).</p>	Direction	S.F.No.	Classification	Safety Distance	North	713, 712/1A & 712/1B	Patta land	7.5m	East	712/3	Patta land	7.5m	South	711	Patta land	50 m to EB line	West	710/2	Patta land	7.5m
Direction	S.F.No.	Classification	Safety Distance																				
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South	711	Patta land	50 m to EB line																				
West	710/2	Patta land	7.5m																				
5.	Housing area, EB line (HT & LT Line)	50m	There is an LT line passing on the southern side of lease applied area, so necessary safety distance of 50m will be provided. There is no HT line or Housing area situated within 50m radius of the lease applied area.																				
6.	Boundaries of the permitted area	7.5m/10m	The boundaries of the permitted areas is as follows: North - S.F.Nos. 713, 712/1A & 712/1B East - S.F.No. 712/3 South - S.F.No.711 West - S.F.Nos.710/2 (Refer Plate No. II).																				
7.	Reserve forest	1Km	There is no reserved forest located within the radius of 1km from the lease applied area. (Refer Plate No. IA and IB).																				
8.	Protected area / ECO sensitive area/Wild Life Sanctuary	10Km	There is no ECO sensitive Zone/ Wild Life Sanctuary/ Critically Polluted Area/ HACA/ CRZ located within 10km radius of the area. (Refer Plate No. IA).																				

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9.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES**9.1 Employment potential (skilled, semi skilled, un skilled):**

The following manpower's are proposed in the mining plan to carry out the day-to-day quarrying activities, the same employment is maintaining aimed at the proposed production target and also to comply with the statutory provisions of the Metalliferous mines regulations, 1961.

a. Skilled labour:

Mine Foreman	:	1
Blaster/mate	:	1
Excavator – Operator & Driver	:	3
Hand jack hammer operator	:	8

b. Semi-skilled:

Security	:	1
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c. Unskilled:

Labour & Helper	:	3
Co-operator and Cleaner	:	3
Total	:	20

The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that the labour will not be employed less than 18 years, **No child labour** will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.

9.2 Welfare Measures:**a. Drinking Water:**

Packaged drinking water is available from the nearby approved water vendors in K. Paramathi which is about 3km on the Southwest side of the lease applied area.

b. Sanitary Facilities:

Hygienic modern Sanitary Facilities will be constructed with in the safety area as semi permanent structure and it will be maintained periodically.

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c. First aid facility:

First aid kits are kept in Mines office room, in case of such eventuality is the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager/mate will be in charge of first aid and injured person will be taken to the hospital by the applicant vehicle. Hospital is available in K. Paramathi located at a distance of 3km on the Southwest side.

d. Labour Health:

Periodically medical check-up related to occupational health safety will be conducted to all the workers in applicant own cost.

e. Precautionary safety measures to the labourers:

- Helmets,
- Mine Goggles,
- Ear plugs,
- Ear muffs,
- Dust mask,
- Reflector jackets,
- Safety Shoes

All personnel protective devices will be provided as per the specification approved by Director of mines safety. Periodically medical check-up will be conducted for all workers for any mine health related problems. Proper training and vocational education will be given by qualified and experienced safety officer to all the employees about the safety and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically, to carry out the quarrying operations scientifically and to safe guard the men and machinery and to create awareness about conventional opencast quarrying operations.

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PART - B**10.0 ENVIRONMENT MANAGEMENT PLAN****10.1 Existing Land use pattern:**

The quarry lease applied area exhibits plain topography. The area is a dry barren land devoid of Agriculture and Habitations. The land is not used for any specific vegetation.

Land Use Table - 11

Description	Present area in (ha)	Area at the end of this quarrying period (ha)
Quarrying Pit	0.45.5	0.88.0
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.10.0
Unutilized Area	1.45.0	0.91.5
Grand Total	1.92.5	1.92.5

10.2 Water Regime:





It is a simple opencast quarry operation. The quality of water will not be affected due to this quarrying operation. However, mitigation measures will be carried out like Garland drains constructed on all sides of quarry pit to avoid surface run-off rain water entering into the pit.

The waste water discharged to water bodies will be met the standard prescribed under the Environment (Protection) Act - 1986 by The Ministry of Environment, Forest and Climate change.





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10.3 Flora and Fauna:

Table - 12

S.No.	Name of the plant (Scientific)	Family Name	Common Name	Habit	Picture
1.	<i>Azadirachta indica</i>	<i>Meliaceae</i>	Neem, Vembu	Tree	
2.	<i>Pongamia pinnata</i>	<i>Fabaceae</i>	Pungai	Tree	
3.	<i>Terminalia chebula</i>	<i>Combretaceae</i>	Kadukkaay	Tree	
4.	<i>Cocciniagrandis</i>	<i>Cucurbitaceae</i>	Kovai kaai	Climber	

List of Fauna

S.No.	Scientific Name	Common Name	Picture
1.	<i>Dicrurus longicaudatus</i>	Grey Drongo	
2.	<i>Ovisaries</i>	Sheep	
3.	<i>Mirafraerythroptera</i>	Redwinged bushlark	
4.	<i>Bubalus bubalis</i>	Buffalo	

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10.4 Climatic Conditions:

The area receives rainfall of about 655mm/annum and the rainy season is mainly from Oct - Dec during monsoon. The summer is hot with maximum temperature of 40°C and winter encounters a minimum temperature of 22°C.

10.5 Human settlement:

There are few villages located in this area within 5km radius; the approximate distance and population are given below.

Table – 13

S. No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Munnur	2km – SW	2600
2.	Kuppam	3km – Northwest	3600
3.	K.Paramthi	4km – SW	3500
4.	Karudayampalayam	3km – SE	2400

Basic human welfare Amenities such as Health Centre, Schools, Communication Facilities, and Commercial Centres etc., are available at Karur located at a distance of 16km on the Southeast side of the area.

10.6 Plan for air, dust suppression:

The air quality will be affected by the Suspended Particulate Matter (SPM) generated by the mild blasting, hand jack hammer drilling, Loading and unloading during the Rough stone quarry operation.

The following Mitigations measures will be carried out:

- Mist Water spraying will be carried out by means of water sprinklers to suppress the dust emission in the Haul roads.
- Vegetations will be formed on the non quarrying area.
- Avoiding spillages during the transportation.

Air quality will be monitored periodically as per Norms and Mitigative measures carried out to prevent dust and Air propagation in to air. The estimated budget for dust suppression would be around **Rs.52,000/year**.

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10.7 Plan for Noise level control:

The noise level increased due to the Excavation, Drilling, Blasting and Transportation.

Engineering Noise control:

Noise will be created due to the usage of Machineries and Vehicles. The Noise will be controlled in the following manner.

- Selection of new low – noise equipment's is proposed to be deployed for the Rough stone quarry operation.
- Modifications of older equipments.
- Implementation of effective preventive maintenance which reduces noise more than 50%.
- Developing Green belts which act as Acoustic barrier, pollution absorbent and noise controller.
- The drivers will be strictly instructed to move the vehicle during the transportation not exceed 40km per hour.
- Sentries with flags & whistle will posted in village road junction and populated area to control and regulate traffic.

Shallow holes of 32mm diameter and maximum depth of 1.5m will be drilled and conventional low power explosives such as Mild Explosives, ordinary safety fuse will be used for Rough stone. Hence, ground vibration and noise pollution i.e., minimal and restricted within the quarry working area.

Noise level monitoring and other Mitigation measures will be carried out to reduce Noise and Vibration. The estimated budget for Noise level monitoring would be around **Rs.2,000/Year**.

10.8 Environment impact assessment statement describing impact of mining on the next five years:

In the mining plan proposed for a production of Rough stone does not involve deep hole drilling and blasting. Such limited mining activity is not likely to cause any impact adversely on the environment. As far as pollution of air, water and noise concerned, the Environment impact studies will be conducted as per EIA notification issued by MoEF&CC. It is B2 Category mine. The estimated budget would be around **Rs.3,80,000/-**

10.9 Proposal for waste management:

There is no waste anticipated in this Rough stone and Gravel quarrying operation. The entire quarried out materials will be utilized (100%).

10.10 Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.):

In the mining plan proposed only to a maximum depth of 37m below ground level has been envisaged as workable depth for safe & economic mining during entire lease applied area. There is no waste generated hence, backfilling is not possible. Hence, the quarry area will be fenced with Barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle. The barbed wire fencing cost would be around **Rs.2,70,000/-**.

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10.11 Programme of Greenbelt development (indicate extend, number, name of species to be afforested):

The safety zone along the Northern boundary barrier has been identified to be utilized for Greenbelt development. Appropriate native species of Neem, Pongamia Pinnata, Casuarina, etc., trees will be planted in a phased manner as described below.

Table - 14

Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	25	80	200	Neem, Pongamia Pinnata, Casuarina, etc.,	20
II	25	80	200		20
III	25	80	200		20
IV	25	80	200		20
V	25	80	200		20

Nearly 1,000sq.m area is proposed to use under Greenbelt by planting 25 Number of tree saplings during every year with an anticipated survival rate of 80% (Please refer Plate No. III). The estimated budget for plantation and maintenance of Greenbelt development would be around **Rs.12,500/-** for the period of five years.

The Greenbelt Development will be formed in around the quarried out top benches and panchayat road of the lease applied area. The cost would be around **Rs.10,000/-**.

10.12 Proposed financial estimate / budget for (EMP) environment management:

Budget Provision for the entire quarrying period:

TABLE-15

S. No	Monitory and Analysis Description	Rate per location	No. of location	Total Charges/ six months	Total Charges/ year
1	Ambient air quality monitoring	6500	4	26000	52000
2	Noise level monitoring	250	4	1000	2000
3	Ground vibration monitoring	1000	2	2000	4000
4	Water sampling and analysis	9000	1	9000	18000
Total EMP Cost/ year					76,000

The EMP cost would be around **Rs.3,80,000/-** for the period of five years.

A. Project cost / investment		
i) Land cost	The Land value as per the Government Guideline land cost is calculated as follows, Total Extent = 1.92.5ha Cost per Hectare = Rs. 6,62,500/Ha. $1.92.5 \times \text{Rs.}6,62,500/\text{Ha} = \text{Rs.}12,75,313/-$ (source : https://tnreginet.gov.in/portal/)	= Rs.12,76,000/-
ii) Machinery to be used	The following machineries are proposed to meet out the productions. Excavator attached with rock breaker, Tippers, Tractor mounted compressor with Hand jack hammer and loose tools (Rental Basis)	= Rs.20,00,000/-
iii) Refilling/ Fencing	Fencing will be constructed around the quarry pit to prevent the inadvertent entry of public and cattles cost would be around	= Rs.1,75,500/-
iv) Labourers shed	Labour sheds will be constructed as semi permanent structure. The cost would be around	= Rs.2,00,000/-
v) Sanitary facility	Adequate latrine and urinal accommodation shall be provided at conveniently accessible places the cost would be around	= Rs.1,00,000/-
vi) Others items	First aid room & accessories	= Rs.75,000/-
vii) Drinking water facility for the labourers	Packaged drinking water will be provided for all the Labours. Drinking water will be readily available at conveniently accessible points during the whole of the working shift the cost would be around	= Rs.1,20,000/-
viii) Sanitary arrangement	The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around	= Rs.68,000/-
ix) Safety kit	All the Safety kit such as Helmet, Earmuffs, Goggles, Reflector Jackets, Safety shoes etc., will be provided to the workers by the applicant own cost which would be around	= Rs.75,000/-
x) Water sprinkling	Water will be sprinkled in the haul roads by water sprinklers the cost would be around	= Rs.1,00,000/-
xi) Garland drains Construction	Construction of garland drains to divert surface run-off from virgin area away from mining area	= Rs.1,38,000/-
xii) Greenbelt etc.	Greenbelt program will be carried out in the boundary barriers the cost would be around	= Rs.12,500/-
	Greenbelt program will be carried out in the worked out benches	= Rs.10,000/-
Total Project Cost		= Rs.43,50,000/-

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B. EMP Cost :- (Per year)	
Air Quality monitoring	Rs.52,000/-
Water Quality Sampling	Rs.18,000/-
Noise Monitoring	Rs. 2,000/-
Ground vibration test	Rs. 4,000/-
Total Cost	Rs.76,000/-
Total EMP Cost for the five years period is Rs.3,80,000/-	
Description	Amount (Rs.)
A. Operational Cost	43,50,000
B. EMP Cost	3,80,000
Total Project Cost (A+ B)	47,30,000
The applicant Indents to involve corporate environment responsibilities (CER) activity like Water Purifier, Cot, Bed and Medicine Storage rack to the Salipalayam Dispensary at 2.0% from the total project cost. The Cost would be around Rs.95,000/- .	95,000
Total Cost	48,25,000
The Total cost would be around forty eight lakhs and twenty five thousand only.	

Mr. [Signature]

11.0 PROGRESSIVE QUARRY CLOSURE PLAN**11.1 Introduction:**

The Progressive Quarry Closure Plan for Rough stone and Gravel quarry over an extent of 1.92.5 Ha of Patta lands in S.F.Nos.710/3 and 712/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared for **Thiru. M.Gunasekaran**, S/o Muthusamy, No 3/37, Karaipalayam, Thirukkatuthurai, Pugalur Taluk, Karur District, Tamil Nadu State – 639 117.

11.2 Present Land use pattern:LAND USE TABLE – 16

Description	Present area in (ha)
Quarrying Pit	0.45.5
Infrastructure	Nil
Roads	0.02.0
Green Belt	Nil
Unutilized Area	1.45.0
Grand Total	1.92.5

11.3 Method of Mining:

Open cast Mechanized Mining is being carried out with 5.0 meter vertical bench with a bench width is not less than the bench height for Rough stone.

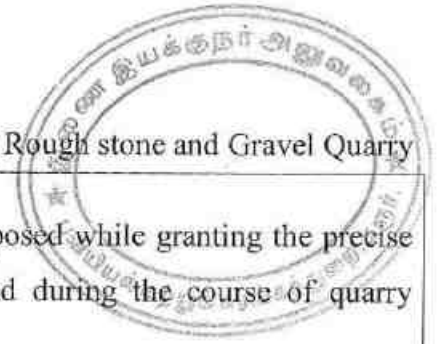
However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

11.4 Mineral Processing Operations:

The quarried out Rough stone will be transported by the 20tons capacity tippers to the needy crushers. Splitting of rock mass of considerable volume from the parent rock mass by hand jack hammer drilling and blasting, hydraulic excavators are used for loading the Rough stone from pithead to the needy crushers.

11.5 Reasons for closure:

As the mineral is not going to be exhausted during the proposed plan period no immediate closure is planned and sufficient reserves are available to carry on the activities. The reason for closure will be discussed in the ensuing mining plan.

**11.6 Statutory obligations:**

The applicant ensures to comply all the conditions were imposed while granting the precise area communication letter before the execution of lease deed and during the course of quarry operations.

11.7 Progressive quarry closure plan preparation:

Name and address of the Qualified Person who prepared the progressive closure plan and name and address of the executing agency who is involved in the preparation of progressive quarry closure plan.

Name : **P. Viswanathan, M.Sc.**
Qualified Person

Address : Reg. No.17, Advaita Ashram Road,
Alagapuram, Salem District – 636 004.

Telephone : 0427- 2431989 (Office)

Cell No : +91 94422 78601 & 94433 56539

Applicant will himself implement the closure plan; no outside agency will be involved.

11.8 Review of Implementation of Mining Plan including Progressive Closure Plan upto the Final Closure Plan:

Mining Plan and Progressive quarry closure plan are being submitted for the first time. It will be reviewed after five years and review of implementation will be given in the next mining plan.

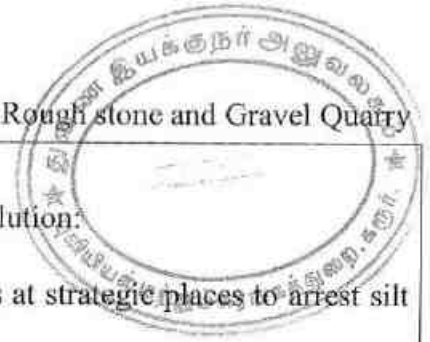
11.9 Closure Plan:**(i) Mined Out Land:**

At the end of mining plan period, about 0.88.0Ha of area will be mined out. Land use at various stages is given in the table below.

LAND USE TABLE – 17

Description	Present area in (ha)	Area at the end of this quarrying period (ha)
Quarrying Pit	0.45.5	0.88.0
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.10.0
Unutilized Area	1.45.0	0.91.5
Grand Total	1.92.5	1.92.5

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**(ii) Water quality management:**

Following control measures will be adopted for controlling water pollution:

- Construction of Garland drain with check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- Collection of surface run-off from broken up area in mine pits for settling and only properly settled excess water from mine pit will be discharged to nearby users. The storm water/ mine water will be used for dust suppression, greenbelt development, etc.
- Periodic analysis of mine pit water and ground water quality in nearby villages.
- The quarried out pit will be allowed to collect rain and seepage water which will act as a reservoir for storage. This water storage will enhance the static level and ground water recharge of nearby wells and it will be used for agriculture purpose to the nearby agriculture lands.
- Domestic sewage from site office & urinals/latrines provided in QL is discharged in septic tank followed by soak pits.

(iii) Air Quality Management:

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face-mask, earplug/ muffs.

For air pollution management at the progressive quarry closure plan, greenbelt will be developed to prevent and control air pollution.

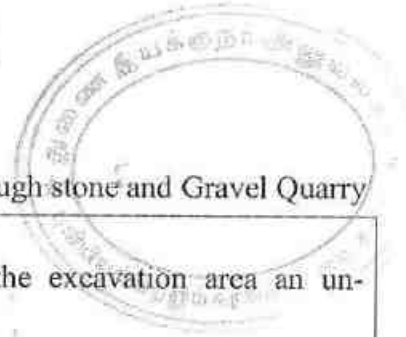
(iv) Top Soil and Waste Management:

There is no topsoil or waste generated during the proposed plan period. The entire quarried out Rough stone and Gravel will be utilized (100%). Hence, waste management does not arise.

(v) Disposal of mining machinery:

All the Machineries will be engaged on rental basis. Hence, disposal or decommissioning of mining machinery does not arise.

M. hsd

**(vi) Safety & Security:**

Safety measures will be implemented to prevent access in the excavation area an unauthorized persons as per Mine Act 1952, MMR 1961.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, and Mines Rules 1955.
- Provisions of MMR 1961 shall be strictly followed and all roads shall be wider than the height of the bench or equal to the height of the bench and have a gradient of not more than 1 in 16.
- The bench height will be 5.0m.
- Width of working bench will be kept about 5.0m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations and proper signal by siren alarm will be provide before blasting time to prevent accident.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.

(vii) Disaster Management and Risk Assessment:

This should deal with action plan for high risk accidents like landslides, subsidence, flood, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of applicant to meet such eventualities and the assistance to be required from the local authorities should be described.

- The mechanized mining activities in the area may involve any high risk accident due to side falls/collapse, flying stones due to blasting etc.
- The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, TNMMCR 1959 and other laws applicable to mine will be strictly complied with.
- During heavy rainfall the mining activities will be suspended.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.
- The Greenbelt Development will be formed in around the quarried out top benches and panchayat road of the lease applied area.

M. h s 2

**(viii) Care and Maintenance during Temporary Discontinuance:**

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.
- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
 - Quarry roads and approach roads,
 - Fencing on approach roads,
 - Checking and maintenance of machines and equipment,
 - Drinking water arrangements,
 - Quarry office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, mining operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

(ix) Economic Repercussion of Closure of Quarry and manpower Retrenchments:

The quarrying lease is granted for a maximum period of five years only. As per the production Programme envisaged, there will be no effect on the man power as the majority of persons belongs to nearby villages and will have an option either to be available for employment for the next five years lease period and contract/ lease or do the agriculture in their fields.

M. hs 2

(x) Time Scheduling For Abandonment:

The lease applied area has enormous potential for continuance of operations even after the expiry of the lease period. The details of time schedule of all abandonment will be given at the time of final closure plan.

(xi) Abandonment Cost:

As at present mining is not going to be closed so abandonment cost could not be assessed. However based on the progressive quarry closure activities during the plan period, the cost is assessed as given below:

LAND USE TABLE - 18

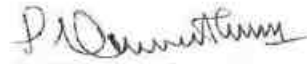
ACTIVITY		YEAR					RATE	AMOUNT (INR)
		I	II	III	IV	V		
Plantation under safety zone	Nos.	25	25	25	25	25	@100 Rs	Rs.12,500/-
	Cost	2500	2500	2500	2500	2500		
Plantation in the quarried out top bench and approach road	Area	Road		Quarried out Top benches			Per sapling	Rs.10,000/-
	Nos	20	20	20	20	20		
	Cost	2,000	2,000	2,000	2,000	2,000		
Wire Fencing (In Mtrs) 585 Mtrs		1,75,500	-	-	-	-	@300 Rs Per Meter	Rs.1,75,500/-
Garland drain (In Mtrs) 830 Mtrs		1,38,000	-	-	-	-	@300 Rs Per Meter	Rs.1,38,000/-
TOTAL								Rs.3,36,000/-

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12.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

This Mining plan for Rough stone (Charnockite) and Gravel is under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959. The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied within the quarrying operations so that the safety of the mine, machinery and person will be well protected. Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety. Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Concerned Department.

Prepared by



P. Viswanathan, M.Sc.,

Qualified person

Place: Salem

Date: 11.03.2022

DONATE RED

SPREAD GREEN

SAVE BLUE

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



27/5/22

Deputy Director of Geology and Mining
Karur District

this Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 297/Mincs/2021
Dated: 21-05-2022



27/5/2022



ந.க.எண். 297/கனிமம்/2021

மாவட்ட ஆட்சியர் அலுவலகம்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்

நாள். 04.03.2022.

குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - குப்பம் கிராமம் - பட்டா புல எண்கள்.710/3(1.04.5 ஹெக்டேர்) மற்றும் 712/2 (0.88.0 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.92.5 ஹெக்டேர் பரப்பு பட்டா நிலத்தில் - சாதாரணகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி திரு.குணசேகரன் என்பவர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை:**
1. திரு.குணசேகரன், த/பெ.முத்துசாமி, கதவு எண்.3/37, கரைப்பாளையம், திருக்காடுதுறை, புகளூர் வட்டம், கரூர் மாவட்டம் என்பவரின் விண்ணப்ப நாள்: 23.07.2021.
 2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் கடித எண். ந.க.எண். அ1/2643/2021, நாள்:29.11.2021
 3. கரூர், புவியியல் மற்றும் சுரங்கத்துறை துணை இயக்குநர் அலுவலகம், உதவி புவியியலாளரின் புலத்தணிக்கை அறிக்கை நாள்: .11.12.2021

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கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.710/3(1.04.5 ஹெக்டேர்) மற்றும் 712/2 (0.88.0 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.92.5 ஹெக்டேர் பரப்பு நிலத்தில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி செய்ய அனுமதி கோரி கரூர் மாவட்டம், புகளூர் வட்டம், கரைப்பாளையம், திருக்காடுதுறை, கதவு எண்.3/37 என்ற முகவரியில் வசிக்கும் கிராமத்தில் அமைந்துள்ள திரு.குணசேகரன் என்பவர் பார்வை 1-இன்படி உரிய ஆவணங்களுடன் விண்ணப்பம் அளித்துள்ளார்.

மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர் (கனிமம்), கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல

Mahesh

எண்கள்.710/3(1.04.5 ஹெக்டேர்) மற்றும் 712/2 (0.88.0 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.92.5 ஹெக்டேர் பட்டா நிலத்தில் தமிழ்நாடு சிறு கனிமச்சலுகை விதிகளில் விதி எண்கள்.19-(1), 20 மற்றும் 33 -இன் கீழ் திரு.குணசேகரன் என்பவருக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புலங்களின் தெற்கில் புல எண்.711-இல் கிழமேலாக செல்லும் நாடைபாதைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்யப்பட வேண்டும்.
2. விண்ணப்ப புலங்களின் தெற்கில் கிழமேலாக அமைந்துள்ள நாடைபாதைக்கு இணையாக செல்லும் தாழ்வழுத்த மின்பாதைக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்யப்பட 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.

எனவே, கரூர் வருவாய் கோட்டாட்சியர் மற்றும் உதவிப் புவியியலாளர் (கனிமம்), கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.710/3(1.04.5 ஹெக்டேர்) மற்றும் 712/2 (0.88.0 ஹெக்டேர்) ஆகியவற்றின் மொத்தப் பரப்பு 1.92.5 ஹெக்டேர் பரப்பில் 1959-ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண். 19(1), 20 மற்றும் 33-ன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 5 (ஐந்து) வருட காலத்திற்கு



திரு.குணசேகரன் என்பவருக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு திரு.குணசேகரன் என்பவர் கேட்டுக்கொள்ளப்படுகிறார். மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959ம் 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]
04/03/22

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்.

பெறுநர்
திரு.குணசேகரன்,
த/பெ.முத்துசாமி,
கதவு எண்.3/37,
கரைப்பாளையம்,
திருக்காடுதுறை,
புகளூர் வட்டம்,
கரூர் மாவட்டம்.

04/03/2022

நகல்:-

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

M. h. s.

139

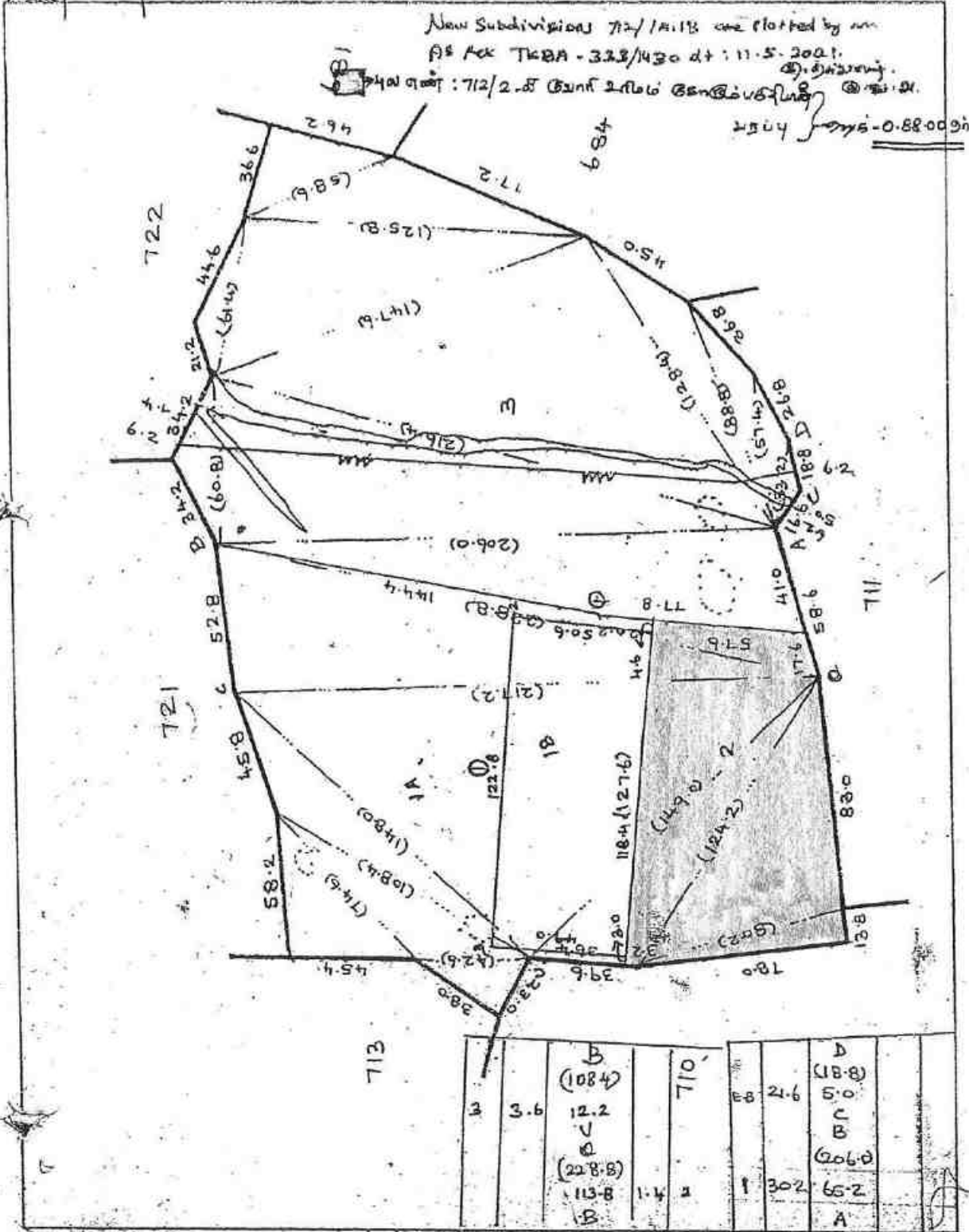
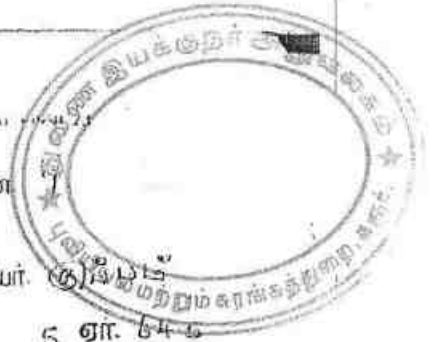
மாவட்டம். திருச்சிராப்பள்ளி

வட்டம். 867

புல எண். 712

பரப்பு: ஏக்கர்கள்

5 ஏ. 64 6



3	3.6	B (1084)	12.2	U (228.8)	113.8	1.4	1	302	D (18.8)	5.0	C B 606.0	65.2	A
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சியாரித்தன்
சு. ராமசாமி

அளவு. 1:2000

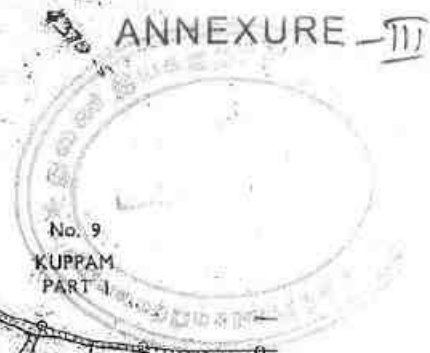
8.7.2001

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LEASE APPLIED AREA

No. 9
 KUPPAM (4 PARTS)
 PART 4
 KARUR TALUK
 TIRUCHIRAPPALLI DISTRICT

Area included in Part 1
 Scale 1 : 5000



No. 9
 KUPPAM
 PART 3

No. 9
 KUPPAM
 PART 1

No. 8
 KUPPAM
 PART

No. 8
 MUNNUR

No. 39
 PARAMATHI

No. 36
 KARUDAIYAMPALAYAM
 PART 1

LEASE APPLIED AREA

Survey No.	Name of Estate
413	Village Site
414	Andhargalpalayam
417	Sulapalayam
418	Thandirampalayam
420	Sankarapalayam
421	Perambalur
422	Vandavoor
423	Village Site
424	Village Site

44/9/87: 710/3-8 Gram 2ndi Gram of Karur Taluk 1.04.50 Gram

44/9/87: 712/2-8 Gram 2ndi Gram of Karur Taluk 0.88.00 Gram

9/12/87 - 1.92.50 Gram

G. G. G. G.
 8.7.2004

M. K. S.



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 330

உரிமையாளர்கள் பெயர்

1. சுப்பராயன் முகன் முருகேசன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
710	3	1 - 4.50	1.44	--	--	--	--	64/1415--- 26-07-2005
712	2	0 - 88.00	1.21	--	--	--	--	64/1415--- 26-07-2005
		1 - 92.50	2.65					

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/00330/30876 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 03-07-2021 அன்று 07:29:42 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

மு.பி.சி

1430 - ஆம் பரஸிபம் தரின் மாவட்டம் ஹக்கி வட்டம் கலெக்டர்

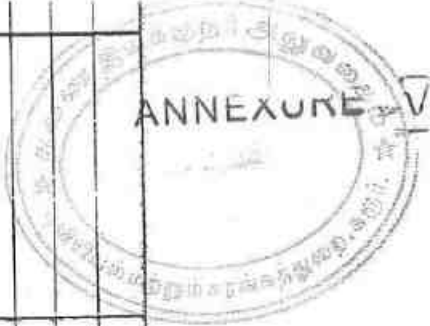
நில வரித் திட்டத்தின்படி புலனாய்வு செய்யும் நிலம்	முதல் பரஸிபம்					மேலும் பரஸிபம்	முதல் பரஸிபம்						
	நில வரித் திட்டத்தின்படி புலனாய்வு செய்யும் நிலம்	சீலம்	தரின்	மாவட்டம்	ஹக்கி வட்டம்		முதல் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்		
710 3 1010	144	330	குடுகுண்டி	மாவட்டம்	ஹக்கி வட்டம்	சீலம்	தரின்	மாவட்டம்	ஹக்கி வட்டம்	முதல் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்
712 2 1180	121	330	குடுகுண்டி	மாவட்டம்	ஹக்கி வட்டம்	சீலம்	தரின்	மாவட்டம்	ஹக்கி வட்டம்	முதல் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்

M. S. S.

பக்கம் 2

புலனாய்வு செய்து வருகின்ற நிலத்தின் பரஸிபம்

புலனாய்வு செய்து வருகின்ற நிலத்தின் பரஸிபம்	முதல் பரஸிபம்					மேலும் பரஸிபம்							
	நில வரித் திட்டத்தின்படி புலனாய்வு செய்யும் நிலம்	சீலம்	தரின்	மாவட்டம்	ஹக்கி வட்டம்								
710 3 1010	144	330	குடுகுண்டி	மாவட்டம்	ஹக்கி வட்டம்	சீலம்	தரின்	மாவட்டம்	ஹக்கி வட்டம்	முதல் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்
712 2 1180	121	330	குடுகுண்டி	மாவட்டம்	ஹக்கி வட்டம்	சீலம்	தரின்	மாவட்டம்	ஹக்கி வட்டம்	முதல் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்	மேலும் பரஸிபம்



அ-பதிவேடு விவரங்கள்



மாவட்டம் : கரூர்

வட்டம் : புகளூர்

கிராமம் : குப்பம்

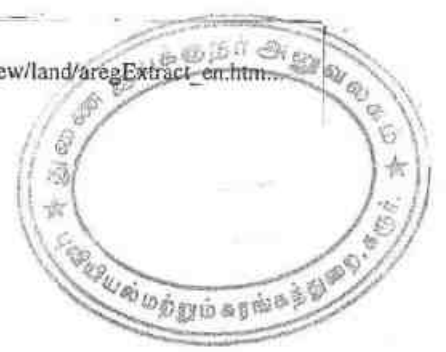
1. புல எண்	710	9. மண் வயனமும் ரகமும்	8 - 4
2. உட்பிரிவு எண்	3	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	710-3 ,	11. தீர்வை (ரூ - ஹெ)	1.38
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	1 - 4.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.44
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	330
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.முருகேசன்

குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் யின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70876 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

M. S. S.



அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

கிராமம் : குப்பம்

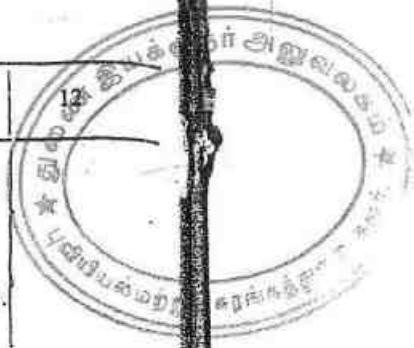
1. புல எண்	712	9. மண் வயனமும் ரகமும்	8 - 4
2. உட்பிரிவு எண்	2	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	712 ,	11. தீர்வை (ரூ - ஹெ)	1.38
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 88.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.21
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	330
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.முருகேசன்

குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70876 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

M. K. S.



1	2	3	4	5	6	7	8	9	10	11	
702	...	702	ர	4	...	8-4	6	1 38	3 35.5	4 64	329 செ. பழனி கவுண்டர்.
703	...	703	ர	4	...	8-4	6	1 38	3 01.0	4 17	541 வா. சாமலிங்கம்.
704	...	704	ர	4	...	8-4	6	1 38	2 37.0	3 28	742 வே. முத்துசாமி கவுண்டர் (1), வே. ராமசாமி கவுண்டர் (2).
705	...	705	ர	4	...	8-4	6	1 38	5 34.5	7 40	1010 மே. ராமசாமி மற்றும் முன்று பேர்களும்.*
706	...	706	ர	4	...	8-4	6	1 38	5 38.0	7 45	543 செ. ராமசாமி பண்டாரம்.
707	...	707	அ	4	...	...	...	...	0 27.0	...	..... தடைபடுத்த.
708	...	708	ர	4	...	8-4	6	1 38	3 18.5	4 41	1317 சி. செல்லப்ப கவுண்டர் மற்றும் பதினேழு பேர்களும்.*
709	...	709	ர	4	...	8-4	6	1 38	1 98.5	2 74	1133 பெ. ராமசாமி மற்றும் ஐந்து பேர்களும்.*
710	...	710	ர	4	...	8-4	6	1 38	9 15.0	12 66	1224 கு. வாங்கிலியப்ப கவுண்டர் மற்றும் ஏழு பேர்களும்.*
711	...	711	அ	4	...	...	...	...	1 03.0	...	..... தடைபடுத்த.
712	1	712-பா	ர	4	...	8-4	6	1 38	1 96.0	2 70	889 சி. வாங்கிலியப்ப கவுண்டர் (1), சி. சுப்பண்ண கவுண்டர் (2), வா. பழனிச்சாமி (3).
	2	-பா	ர	4	...	8-4	6	1 38	0 88.0	1 21	330 மு. பழனிச்சாமி கவுண்டர்.
	3	-பா	ர	4	...	8-4	6	1 38	2 80.5	3 90	735 மு. சின்னப்ப கவுண்டர் (1), மு. வாங்கிலியப்ப கவுண்டர் (2).
									5 64.5	7 81	
713	...	713	ர	4	...	8-4	6	1 38	1 54.0	2 13	1011 கு. வாங்கிலியப்ப கவுண்டர் மற்றும் முன்று பேர்களும்.*

சிராம நாவாதி...
 குப்பம்...
 புலவர் வட்டம்
 கருர் மாவட்டம்

* விவரப்படி யைலா... க்கவும்.

M. S. S.



தமிழ்நாடு தமிழ்நாடு TAMIL NADU ரூ. 20

85AB 352525

E 17 JUL 2021

S. முருகேசன்
கரூர்

R. Shanthi
R.SHANTHI, S.V
L.No:25/2008
KARUR.

சுப்
2020

சம்மதக்கடிதம்

கரூர் மாவட்டம், புகளூர் வட்டம், நடையனூர், கோம்புபாளையம் என்ற முகவரியில் வசிக்கும் சுப்பராயன் அவர்கள் குமாரர் S.முருகேசன் ஆகிய நான் எழுதிக்கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால், கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமத்தில் பட்டா எண்.330ல் புல எண் 710/3, 712/2ல் 1.92.5 ஹெக்டேர் பரப்பில் உள்ள நிலம் எனக்கு கூட்டமாக பாத்தியப்பட்டது. மேற்படி புலத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், நடையனூர், திருக்காடுதுறை, கரைப்பாளையம், கதவு எண்.3/37 என்ற முகவரியில் வசிக்கும் முத்துசாமி அவர்கள் குமாரர் M.குணசேகரன் அவர்கள் சாதாரண கற்கள் வெட்டியெடுக்க அரசு அனுமதி பெற்று பத்து வருடங்களுக்கு கல்குவாரி பணி செய்வதற்கு எனக்கு எவ்வித ஆட்சேபமும் இல்லை என உறுதி அளிக்கிறேன். கல்குவாரி குத்தகை உரிமம் வழங்க என்னுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறேன்.

பிரமாணதாரர்.

S. Shanthi



1417121
Cell: 99944 45789
KANMANI, B.A.B.L.,
Advocate & Notary Public
Govt. of India - Regd No. 6877/08
Pudur, Andan Kovil Post
KARUR - 639 008. T.N.

M. K. S.



இந்திய அரசாங்கம்

Unique Identification Authority of India

GOVERNMENT OF INDIA

பதிவு அடையாளம் / Enrollment No : 2189/79349/00391

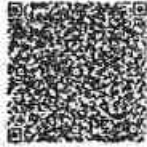
To,
குணசேகரன் மு
Gunasekaran M
S/O Muthusamy
3/37
Karaappalayam
Thirukkathuthurai
Nadayanur Karur Karur
Tamil Nadu 639117
9442257775

30/04/2015

Ref: 3001 / 0264 / 569587 / 569614 / P



SB568479115FH



உங்கள் ஆதார் எண் / Your Aadhaar No. :

4344 2885 8792

எனது ஆதார், எனது அடையாளம்



இந்திய அரசாங்கம்

GOVERNMENT OF INDIA

குணசேகரன் மு
Gunasekaran M

தந்தை முத்துசாமி
Father Muthusamy

பிறந்த நாள் / DOB 30/05/1972

ஆண்பால் / Male



4344 2885 8792

எனது ஆதார், எனது அடையாளம்

தகவல்

- ஆதார் அடையாளத்திற்கான சான்று குடியரிமைக்கு அல்ல
- அடையாள சான்றை இணையதளம் மூலம் உறுதிப்படுத்திக் கொள்ளவும் .

INFORMATION

- Aadhaar is proof of identity, not of citizenship .
- To establish identity, authenticate online .

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும் .
- வருங்காலத்தில் அரசு மற்றும் அரசு சாரா சேவைகளை பயன்படுத்திக் கொள்ள ஆதார் உதவிகரமாக இருக்கும் .
- Aadhaar is valid throughout the country .
- Aadhaar will be helpful in availing Government and Non-Government services in future .

02M/7668887



முகவர்: S/O முத்துசாமி 3/37
கராப்பலையம்
திருக்காடுதூரை, நாடையூர்,
கரூர் கரூர், தமிழ் நாடு, 639117

Address: S/O Muthusamy, 3/37,
Karaappalayam, Thirukkathuthurai,
Nadayanur, Karur, Karur, Tamil
Nadu, 639117

4344 2885 8792



1947



helpline@uidai.gov.in



www.uidai.gov.in

M. H. S.

आयकर विभाग
INCOME TAX DEPARTMENT

भारत सरकार
GOVT OF INDIA

M GUNASEKARAN

P MUTHUSAMY

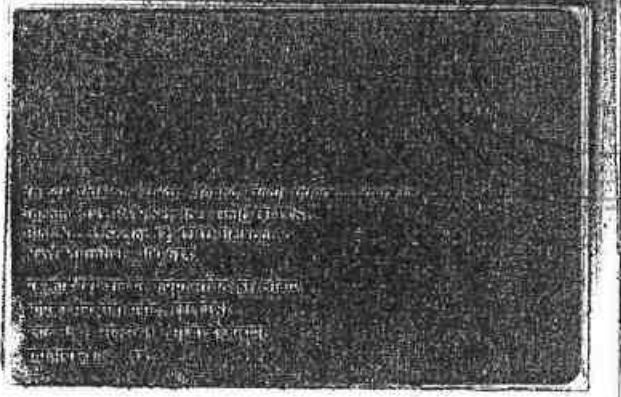
30/05/1972

Permanent Account Number

AIVPG7532J

M. Gunasekaran

Signature



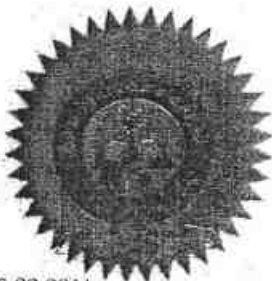
M. Gunasekaran



அறிவியல் புலம்
FACULTY OF SCIENCE

பெரியார் பல்கலைக்கழக ஆட்சிக்குழு 2010 ஆம் ஆண்டு ஏப்ரல் மாதம்
நடந்த பயன்பாட்டுப்புவியமைப்பியல் தேர்வில்
அரசு கலைக் கல்லூரி, சேலம் - 636 007 (தன்னாட்சி) பயிற்ற
P விஸ்வநாதன் என்பவர்
முதல் வகுப்பு A++ தரத்தில் தேர்ச்சி பெற்றார் என்று தக்க
தேர்வாளர்கள் சான்றளித்தபடி அறிவியல் நிறைஞர் என்னும்
பட்டத்தை அவருக்குப் பல்கலைக்கழக இலச்சினையுடன் வழங்குகிறது.

The Syndicate of the Periyar University hereby makes known
that **VISWANATHAN P** *has been*
admitted to the **DEGREE OF MASTER OF SCIENCE in**
APPLIED GEOLOGY
he/she having been certified by duly appointed Examiners to be qualified
to receive the same and was placed in the **FIRST CLASS**
WITH A++ GRADE *at the Examination held in* **APR-2010** *through*
GOVERNMENT ARTS COLLEGE, SALEM - 636 007 (AUTONOMOUS).



Given under the seal of this university

பதிவாளர்
Registrar

துணைவேந்தர்
Vice-Chancellor

நாள்
Dated 28-02-2011
சேலம் 636011, தமிழ்நாடு, இந்தியா.
Salem 636011, Tamil Nadu, India.

TIN. No. : 3312 2703755
 C.S.T. No. : 880783 / 29.11.2005
 Area Code : 142



Ph : Mines : 0427 - 2403645
 Fact : 0427 - 2400046

SUDHARSHAAN MINING CORPORATION

Mfrs : Dead Burnt Magnesite, Lightly Calcined Magnesite, Dunite Chips & Powder.
 S.F. No. 77, Kuduvampatty Road, Vinayagampatti, SALEM - 636 008.

Date : 28.12.2015.....

EXPERIENCE CERTIFICATE

This is to certify that **Shri.P.Viswanathan, S/o. P.Paramasivam, Geologist,** has worked in our Magnesite Mines from **13.09.2010 to 25.11.2015** as our company Geologist. During his service he used to maintain all records and returns submitted to Government Departments.

His nature of work in the mines was to show the plan of working and demarcate Magnesite reserve areas. He was looking after production of Magnesite and was maintaining quality of the Mineral as per the specifications given by the buyers.

During his tenor of his service he was very sincere and prompt in his duties.

I wish him the best of luck in all his future endeavours.

For M/s. SUDHARSHAAN MINING CORPORATION,

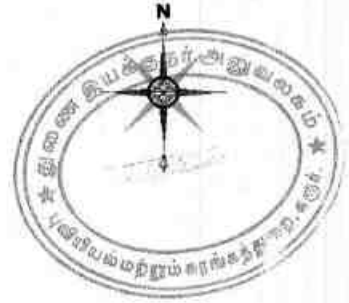
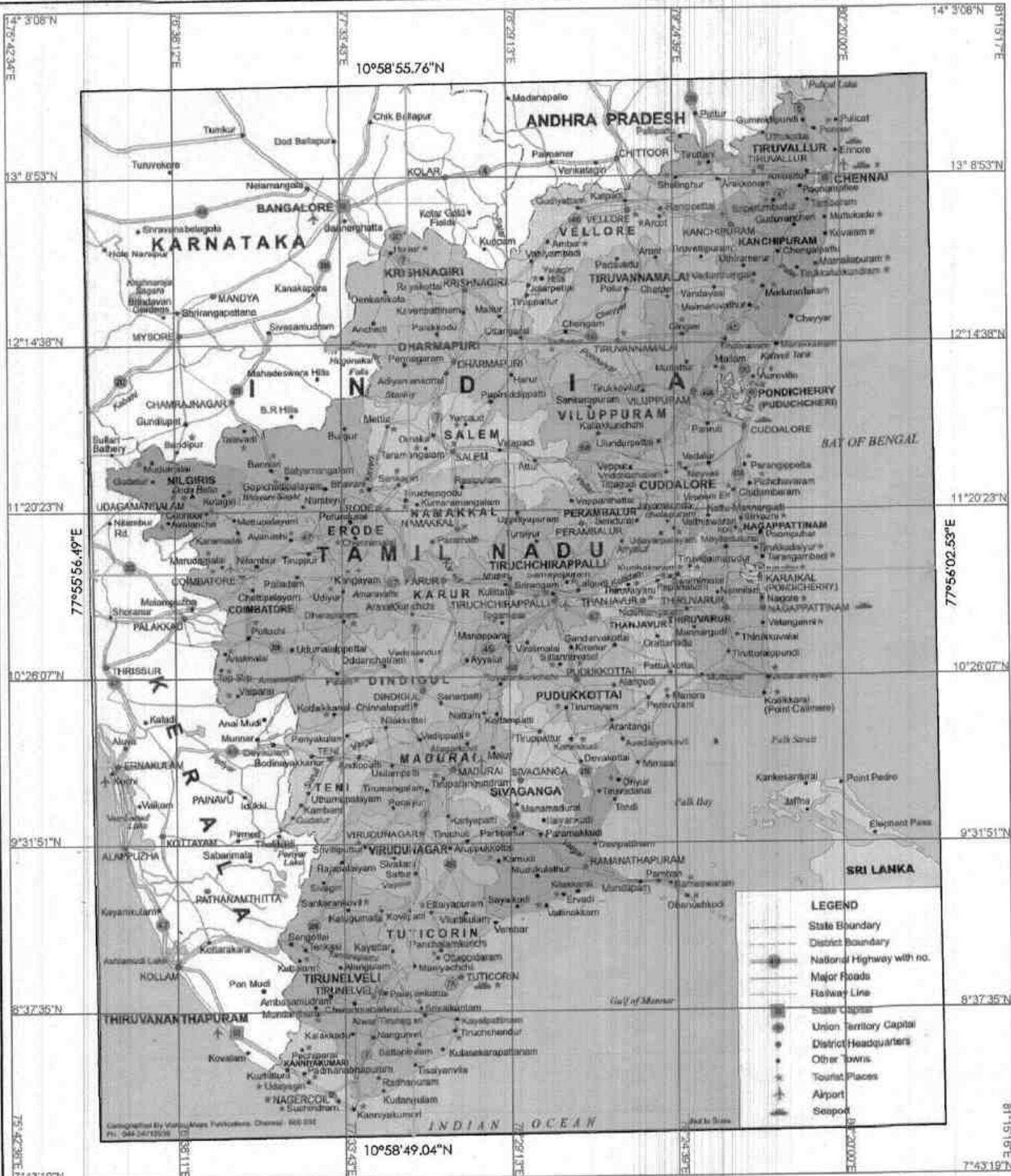
SUDHARSHAN MINING CORPORATION
 SF-77, KUDUVAMPATTI ROAD,
 SALEM - 636 008. Tamilnadu.

[Signature]
 G.PASUPATHY,
 Proprietor

28 Dec 2015

Resi : "Garuda" 14/315, Kaliyapillai Garden IInd Cross, Fairlands, Salem - 636 004. Tamilnadu.

Mahad



INDEX

Q.L.APPLIED AREA : ●
 TOPO SHEET NO. : 58 - F/13

LATITUDE : 10°58'49.04"N to 10°58'55.76"N
 LONGITUDE : 77°55'56.49"E to 77°56'02.53"E

APPLICANT :

Thiru.M. GUNASEKARAN,
 S/o. MUTHUSAMY,
 No. 3/ 37, KARAIPALAYAM,
 THIRUKADUTHURAI,
 PUGALUR TALUK,
 KARUR DISTRICT.

LOCATION OF Q.L.A AREA:

S.F.Nos : 710/ 3 & 712/ 2
 EXTENT : 1.92.5 Ha.
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR,
 STATE : TAMIL NADU.

PLATE NO - I

DATE OF SURVEY : 07.03.2022

LOCATION PLAN

SCALE. 1:24,00,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
 PLATE IS TRUE AND CORRECT TO THE BEST OF MY
 KNOWLEDGE BASED UPON THE LEASE MAP
 AUTHENTICATED BY STATE GOVERNMENT

(Signature)
 P. VISWANATHAN, M.Sc.,
 QUALIFIED PERSON

OCTOBER TO DECEMBER



INDEX

-  Q.L. APPLIED AREA
-  1 Km RADIUS
-  500m RADIUS
-  SEASONAL AGRICULTURE LAND
-  TREES
-  HABITATION
-  WIND DIRECTION
-  PANCHAYAT ROAD
-  PATHWAY
-  BARREN LAND
-  QUARRY PIT & CRUSHER UNIT

APPLICANT :

Thiru.M. GUNASEKARAN,
S/o. MUTHUSAMY,
No. 3/ 37, KARAIPALAYAM,
THIRUKADUTHURAI,
PUGALUR TALUK,
KARUR DISTRICT.

LOCATION OF Q.L.A AREA:

S.F.Nos : 710/ 3 & 712/ 2
EXTENT : 1.92.5 Ha.
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR,
STATE : TAMIL NADU.

PLATE NO - I-B

DATE OF SURVEY : 07.03.2022

ENVIRONMENTAL & LAND USE PLAN

SCALE: 1:10,000

M. S. ...

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

P. Viswanathan
P. VISWANATHAN
QUALIFIED PERSON
97A 103

77° 55' 23.68"E

77° 55' 40.04"E

77° 55' 18.98"E

77° 55' 35.43"E

10° 59' 28.22"N

10° 59' 2.02"N

10° 58' 32.79"N

10° 58' 16.53"N

Towards Nandipalayam

Towards Chinnamuthampalayam

Towards K.Paramath

Towards karuchiyampalayam



JULY TO SEPTEMBER

TOPO SHEET NO. : 58 - F/13
LATITUDE : 10°58'49.04"N to 10°58'55.76"N
LONGITUDE : 77°55'56.49"E to 77°56'02.53"E






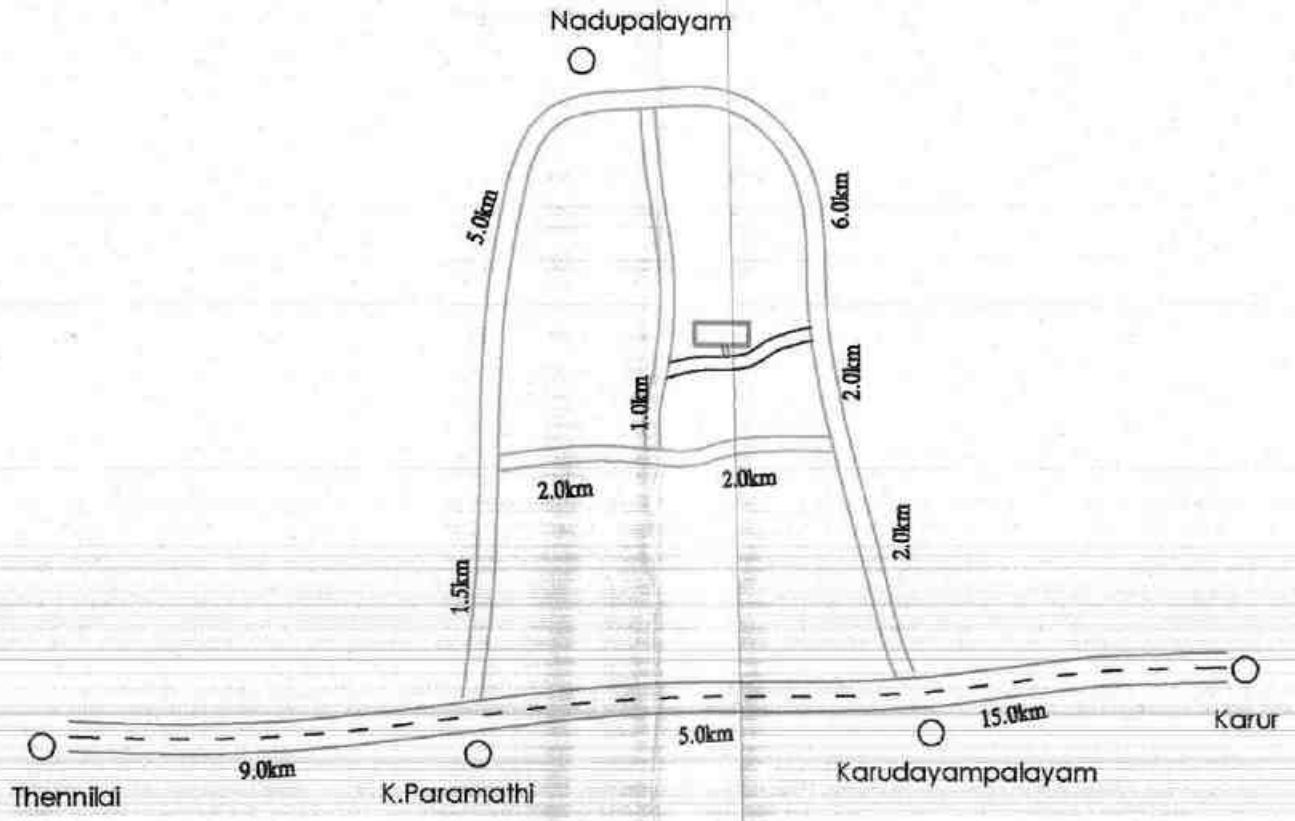
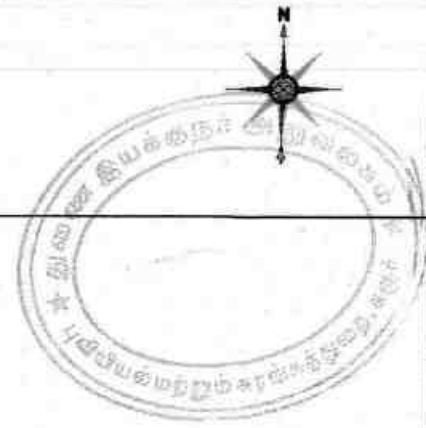
LAND USE PATTERN		
DESCRIPTION	PERCENTAGE	INDEX
OLD PITS / CRUSHER	(14%)	
TREES	(05%)	
BARREN LAND	(61%)	
ROADS	(06%)	
HABITATION	(04%)	
AGRICULTURE LAND	(10%)	
TOTAL	100%	

PLATE NO : I-C
ROUTE MAP



M. S. S. S.

INDEX

LEASE APPLIED AREA	
NATIONAL HIGHWAY	
VILLAGE ROAD	
APPROACH ROAD	
PATH WAY	

APPLICANT :
 Thiru.M. GUNASEKARAN,
 S/o. MUTHUSAMY,
 No. 3/ 37, KARAIPALAYAM,
 THIRUKADUTHURAI,
 PUGALUR TALUK,
 KARUR DISTRICT.

LOCATION OF Q.L.A AREA:
 S.F.Nos : 710/ 3 & 712/ 2
 EXTENT : 1.92.5 Ha.
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR,
 STATE : TAMIL NADU.

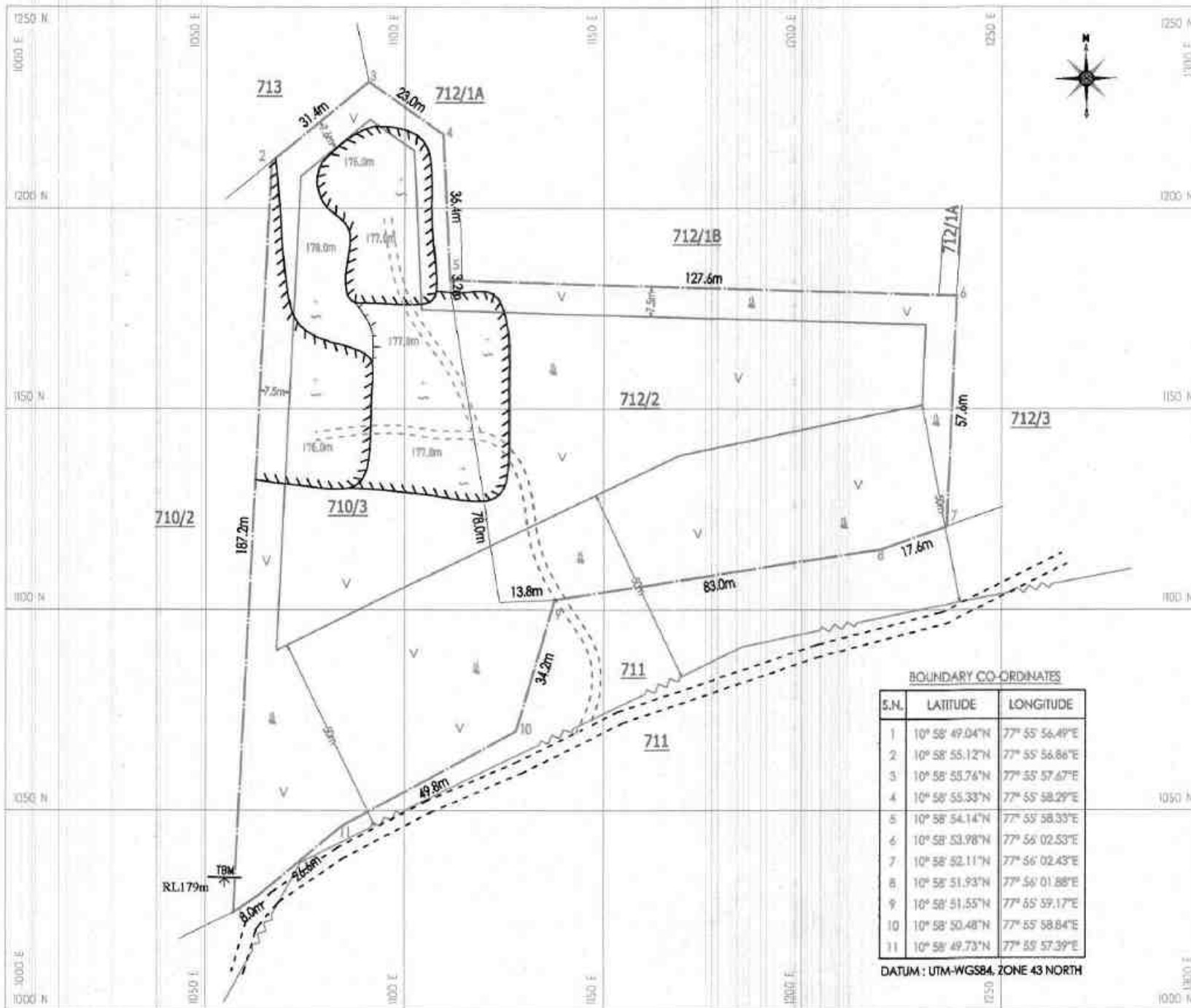
SCALE :
 NOT TO SCALE

PREPARED BY:
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

P. Viswanathan
 P. VISWANATHAN, M. Sc.,
 QUALIFIED PERSON
 98 A

154

Existing Pit Dimension (max)
= 90mX63mX3m(d)



INDEX

- Q.L. APPLIED AREA BOUNDARY
- 50m, 10m & 7.5m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- GRAVEL
- ROUGHSTONE
- QUARRY PIT
- SHRUBS
- QUARRY HAUL ROAD
- APPROACH ROAD
- PATHWAY
- LT LINE

APPLICANT :
 Thiru.M. GUNASEKARAN,
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 KARUR DISTRICT.

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 S.F.Nos : 710/ 3 & 712/ 2
 EXTENT : 1.92.5 Ha.
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR,
 STATE : TAMIL NADU.

BOUNDARY CO-ORDINATES

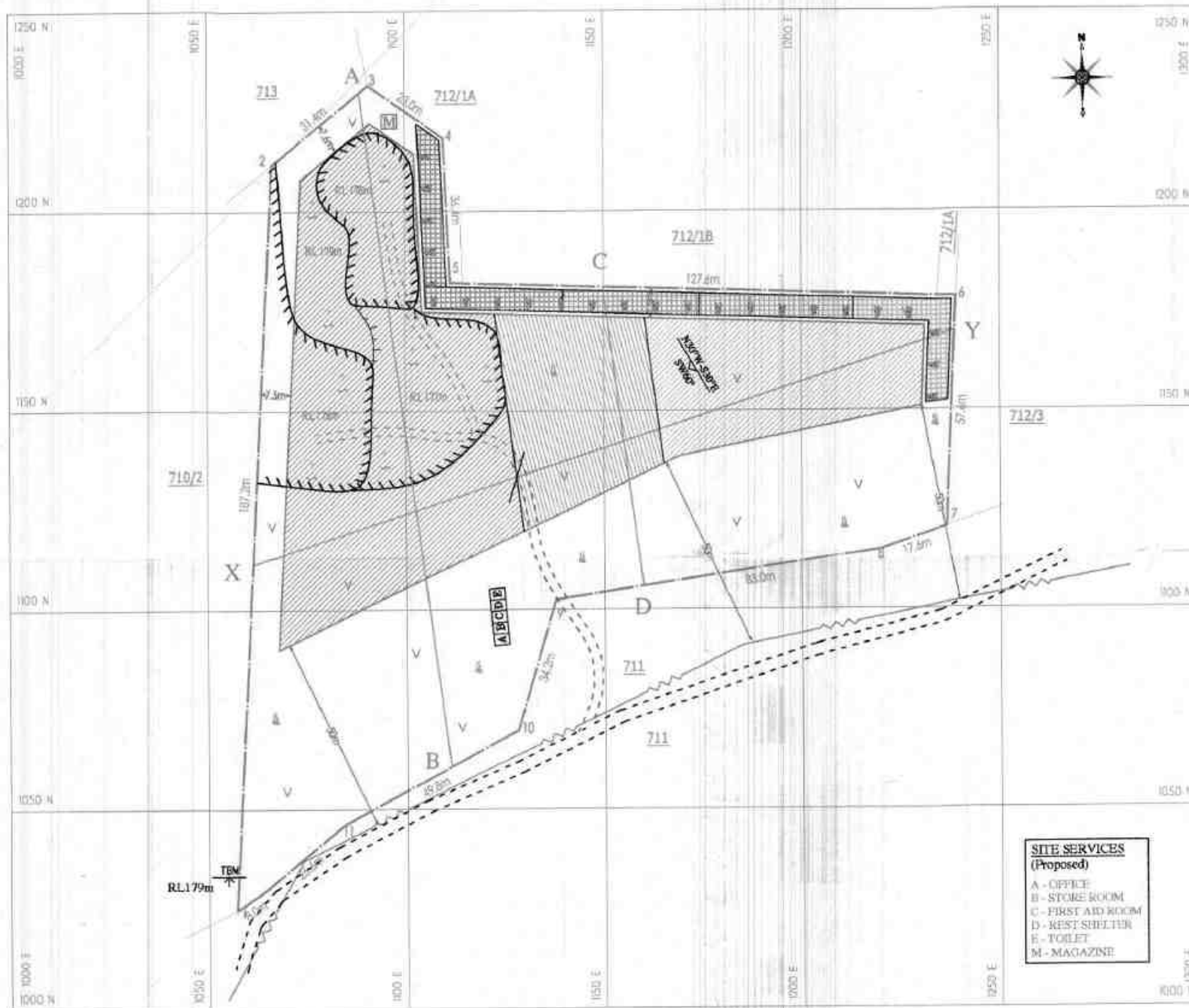
S.N.	LATITUDE	LONGITUDE
1	10° 58' 49.04"N	77° 55' 56.49"E
2	10° 58' 55.12"N	77° 55' 56.86"E
3	10° 58' 55.76"N	77° 55' 57.47"E
4	10° 58' 55.33"N	77° 55' 58.29"E
5	10° 58' 54.14"N	77° 55' 58.33"E
6	10° 58' 53.98"N	77° 56' 02.53"E
7	10° 58' 52.11"N	77° 56' 02.43"E
8	10° 58' 51.93"N	77° 56' 01.88"E
9	10° 58' 51.55"N	77° 55' 59.17"E
10	10° 58' 50.48"N	77° 55' 58.84"E
11	10° 58' 49.73"N	77° 55' 57.39"E

DATUM : UTM-WGS84, ZONE 43 NORTH

PLATE NO - II
 DATE OF SURVEY : 07.03.2022

QUARRY LEASE PLAN & SURFACE PLAN
 SCALE. 1:1000

PREPARED BY :
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT
 P. Viswanathan M. Sc.,
 QUALIFIED PERSON



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 58' 48.04"N	77° 55' 54.49"E
2	10° 58' 55.12"N	77° 55' 54.87"E
3	10° 58' 55.73"N	77° 55' 57.67"E
4	10° 58' 55.33"N	77° 55' 58.20"E
5	10° 58' 54.14"N	77° 55' 58.30"E
6	10° 58' 53.99"N	77° 55' 02.50"E
7	10° 58' 52.11"N	77° 55' 02.40"E
8	10° 58' 51.30"N	77° 55' 01.80"E
9	10° 58' 51.35"N	77° 55' 58.17"E
10	10° 58' 50.45"N	77° 55' 58.04"E
11	10° 58' 49.73"N	77° 55' 57.59"E

DATUM : UTM-WGS84, ZONE 43 NORTH

- I - yr Proposed area to be Planted
- II - yr Proposed area to be Planted
- III - yr Proposed area to be Planted
- IV - yr Proposed area to be Planted
- V - yr Proposed area to be Planted

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- Q.L. APPLIED AREA BOUNDARY
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- GRAVEL
- ROUGHSTONE
- STRIKE & DIP
- QUARRY PIT
- SHRUBS
- QUARRY HAUL ROAD
- APPROACH ROAD
- PATHWAY
- L.T LINE
- D.O.E DEPTH OF ESTIMATION

SITE SERVICES (Proposed)
 A - OFFICE
 B - STORE ROOM
 C - FIRST AID ROOM
 D - REST SHELTER
 E - TOILET
 M - MAGAZINE

APPLICANT :
 Thiru.M. GUNASEKARAN,
 S/o. MUTHUSAMY,
 No. 3/ 37, KARAIPALAYAM,
 THIRUKADUTHURAL,
 PUGALUR TALUK,
 KARUR DISTRICT.

LOCATION OF Q.L.A. AREA:
 S.F.No.s : 710/ 3 & 712/ 2
 EXTENT : 1.92.5 Ha.
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR,
 STATE : TAMIL NADU.

PLATE NO - III
 DATE OF SURVEY : 07.03.2022

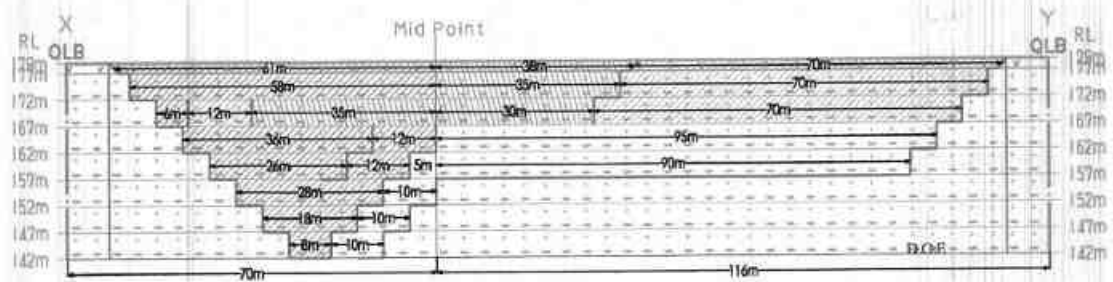
**TOPOGRAPHY, GEOLOGICAL PLAN,
 YEARWISE DEVELOPMENT &
 PRODUCTION PLAN & SECTIONS**

SCALE: 1:1000

PREPARED BY :
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
 PLATE IS TRUE AND CORRECT TO THE BEST OF MY
 KNOWLEDGE BASED UPON THE LEASE MAP
 AUTHENTICATED BY STATE GOVERNMENT

P. Viswanathan
 P.VISWANATHAN, M.Sc.,
 QUALIFIED PERSON

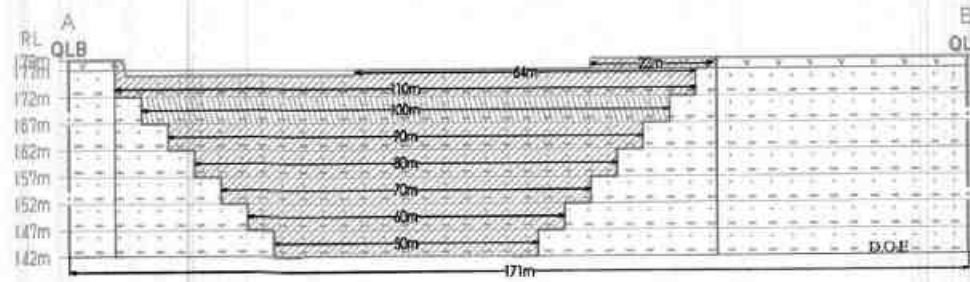
SECTION ALONG X-Y



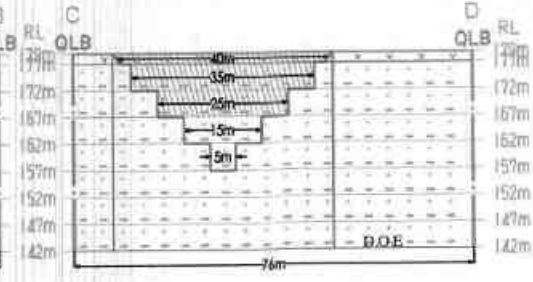
Existing Pit Dimension (max)
 = 90mX63mX3m(d)

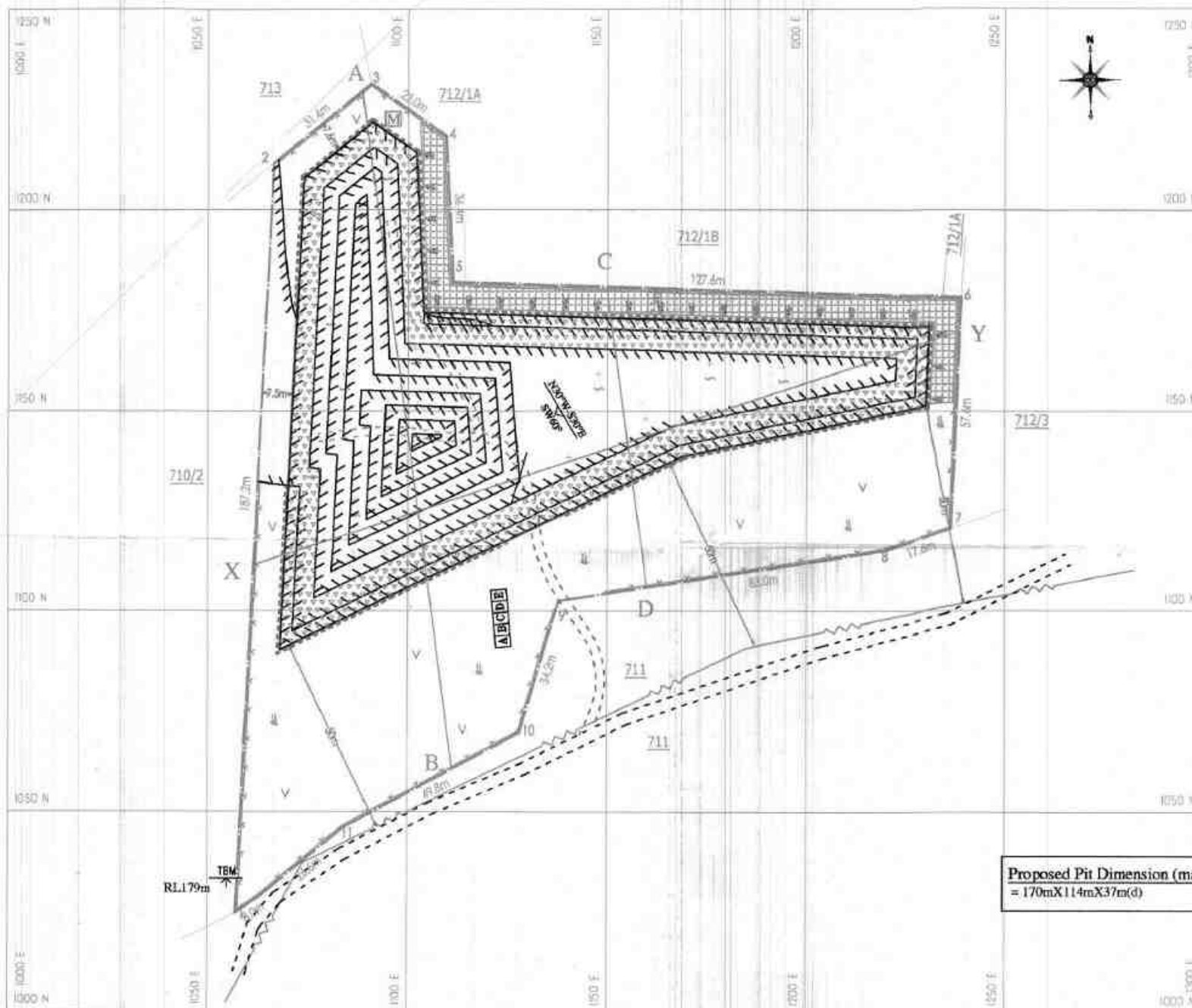
- I - yr Proposed area to be Quarried
- II - yr Proposed area to be Quarried
- III - yr Proposed area to be Quarried
- IV - yr Proposed area to be Quarried
- V - yr Proposed area to be Quarried

SECTION ALONG A-B



SECTION ALONG C-D





SITE SERVICES

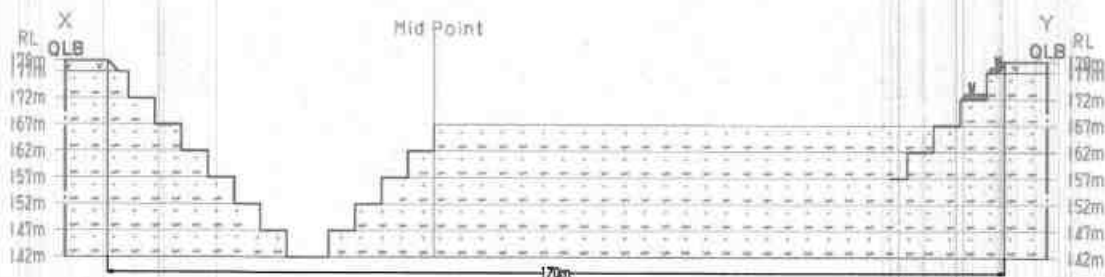
- A - OFFICE
- B - STORAGE ROOM
- C - FIRST AID ROOM
- D - REST SHELTER
- E - TOILET
- M - MAGAZINE

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- QUARRY PIT
- SHRUBS
- QUARRY HAUL ROAD
- APPROACH ROAD
- PATHWAY
- LT LINE
- I-V YI PLANTATION
- BARBED WIRE FENCING
- PROPOSED GARLAND DRAIN
- SOIL LAYER
- REHABILITATED LAND FORM

Proposed Pit Dimension (max)
= 170mX114mX37m(d)

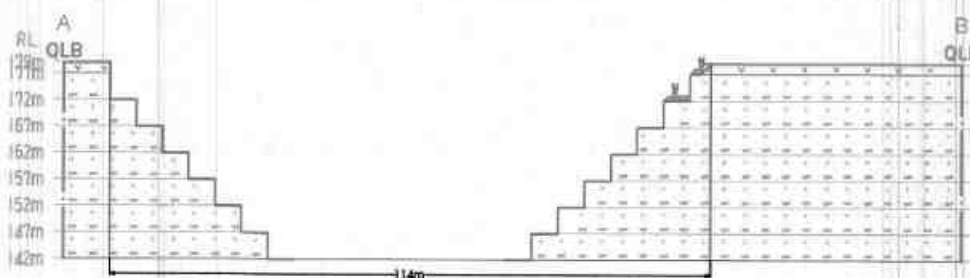
SECTION ALONG X-Y



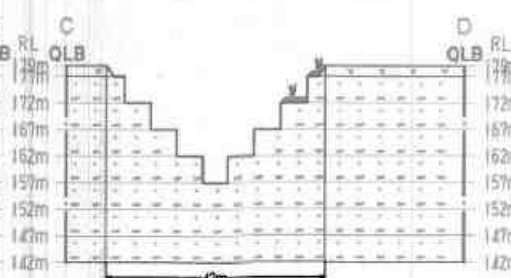
LAND USE PATTERN

DESCRIPTION	PRESENT AREA IN (Ha)	AREA AT THE END OF THIS QUARRYING PERIOD (Ha)
QUARRYING PIT	0.45.5	0.88.0
INFRASTRUCTURE	NIL	0.01.0
ROADS	0.02.0	0.02.0
GREEN BELT	NIL	0.10.0
UN-UTILIZED AREA	1.45.0	0.91.5
TOTAL	1.92.5	1.92.5

SECTION ALONG A-B



SECTION ALONG C-D



APPLICANT :

Thiru.M. GUNASEKARAN,
S/o. MUTHUSAMY,
No. 3/ 37, KARAIPALAYAM,
THIRUKADUTHURAL,
PUGALUR TALUK,
KARUR DISTRICT.

LOCATION OF Q.L.A AREA:

S.F.Nos : 710/ 3 & 712/ 2
EXTENT : 1.92.5 Ha.
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR,
STATE : TAMILNADU.

PLATE NO- IV

DATE OF SURVEY : 07.03.2022

**PROGRESSIVE QUARRY CLOSURE
PLAN & SECTIONS**

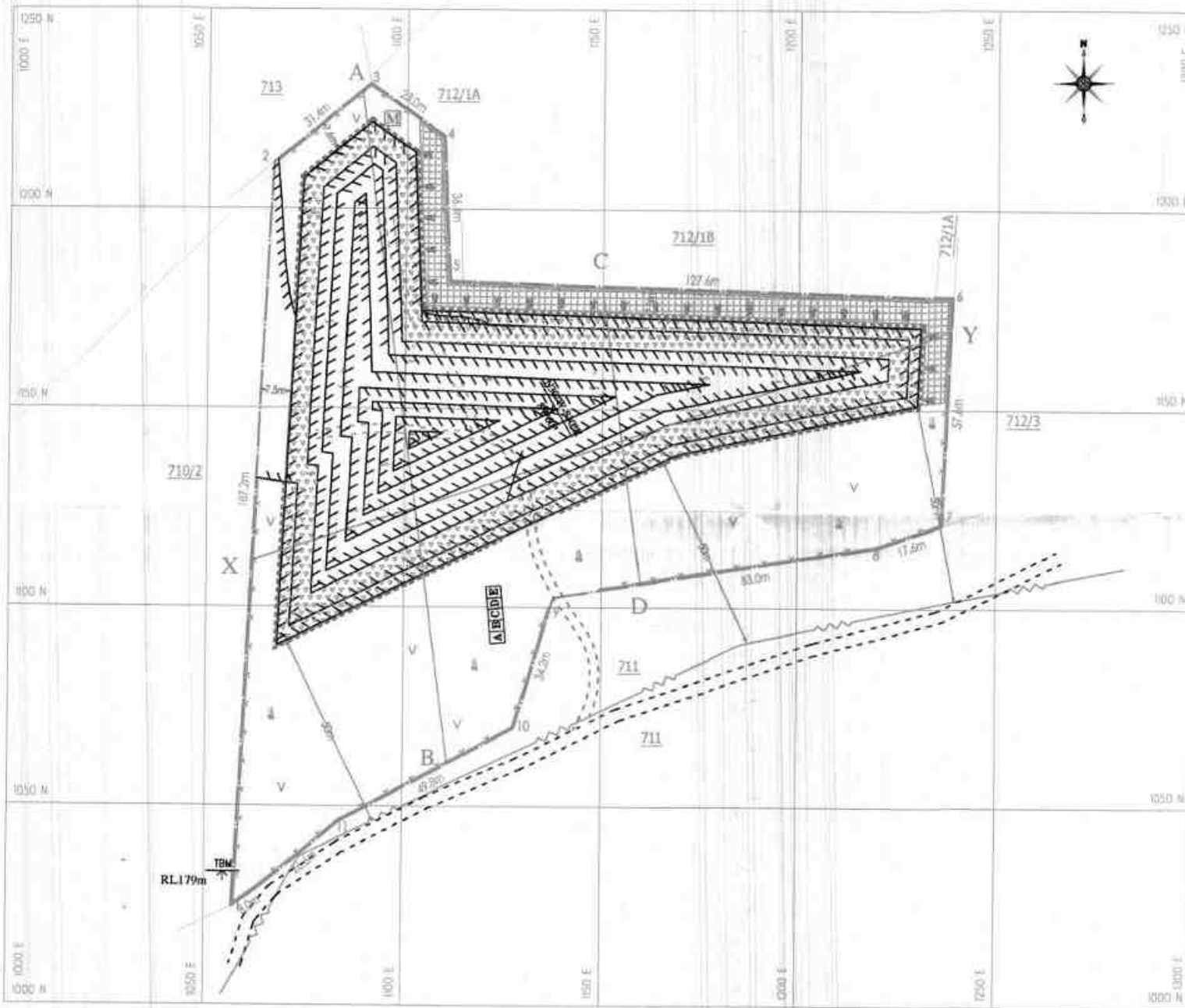
SCALE: 1:1000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
PLATE IS TRUE AND CORRECT TO THE BEST OF MY
KNOWLEDGE BASED UPON THE LEASE MAP
AUTHENTICATED BY STATE GOVERNMENT

P. Viswanathan, M.Sc.,
QUALIFIED PERSON

157



INDEX	
	Q.L. APPLIED AREA BOUNDARY
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	SHRUBS
	QUARRY HAUL ROAD
	APPROACH ROAD
	PATHWAY
	LT LINE
	E-V Yr PLANTATION
	BARBED WIRE FENCING
	EXISTING LAND FORM
	PROPOSED GARLAND DRAIN
	OLD SURFACE LEVEL
	FINISHED SURFACE LEVEL
	RAIN WATER STORAGE
	SOIL LAYER
	REHABILITATED LAND FORM

APPLICANT :
 Thiru.M. GUNASEKARAN,
 S/o. MUTHUSAMY,
 No. 3/ 37, KARAI PALAYAM,
 THIRUKADUTHURAI,
 PUGALUR TALUK,
 KARUR DISTRICT.

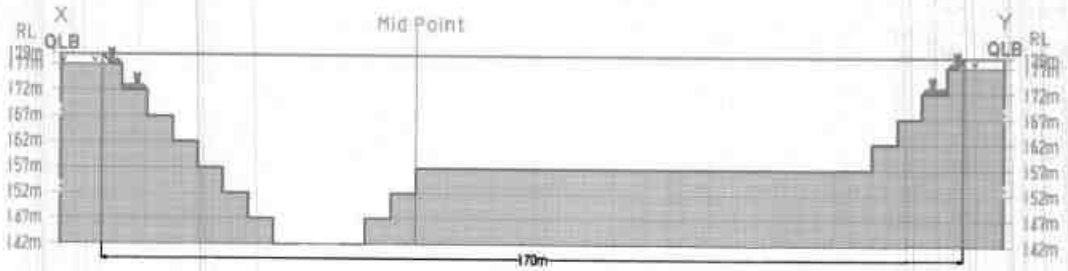
LOCATION OF Q.L.A. AREA:
 S.F.Nos : 710/ 3 & 712/ 2
 EXTENT : 1.92.5 Hg.
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR,
 STATE : TAMIL NADU.

PLATE NO - V
 DATE OF SURVEY : 07.03.2022

CONCEPTUAL PLAN & SECTIONS
 SCALE: 1:1000

PREPARED BY :
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT
 P. Viswanathan, M.Sc.,
 QUALIFIED PERSON

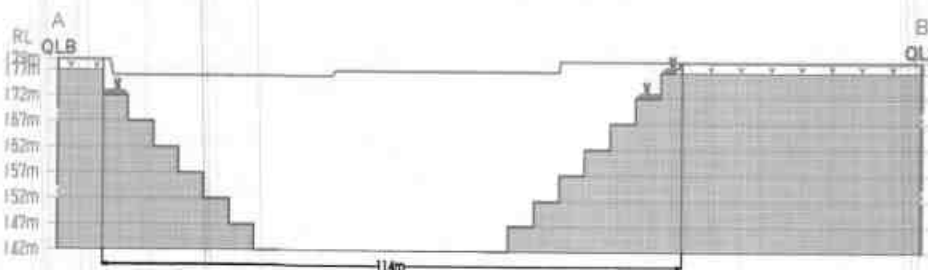
SECTION ALONG X-Y



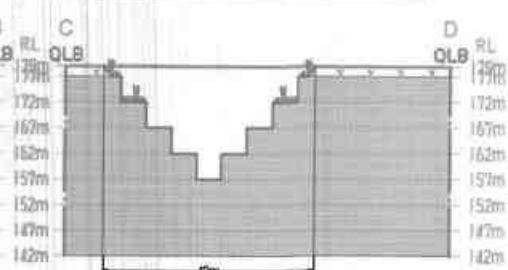
SITE SERVICES
 A - OFFICE
 B - STORE ROOM
 C - FIRST AID ROOM
 D - REST SHELTER
 E - TOILET
 M - MAGAZINE

Ultimate Pit Dimension (max)
 = 170mX114mX37m(d)

SECTION ALONG A-B



SECTION ALONG C-D





TMT.P.RAJESWARI, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU

3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.

Phone No. 044-24359973

Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.8693/SEAC/ToR-1077/2021 Dated:01.03.2022

To

M/s.Annai Blue metals
S.F.No.451, Kaalipalayam
Kuppam Village
Pugalur Taluk
Karur District-639111

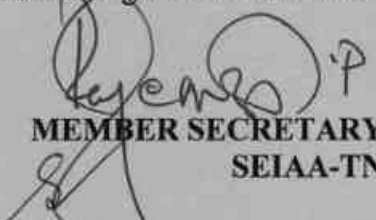
Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for the proposed Rough stone and Gravel over an extent of 1.92.0ha in S.F.Nos. 682 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu by M/s. Annai Blue Metals - 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/66211/2021, dated: 02.08.2021
2. Your application submitted for Terms of Reference dated: 06.08.2021
3. Minutes of the 245th meeting of SEAC held on 11.02.2022, minutes received on 24.02.2022
4. Minutes of the 488th meeting of SEIAA held on 28.02.2022.

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

The proponent, M/s.Annai Blue metals has submitted application for ToR with public Hearing on 06.08.2021, in Form-I, Pre- Feasibility report for the proposed Rough stone and Gravel


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over an extent of 1.92.0ha in S.F.Nos. 682 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

The proposal was placed in 245th SEAC meeting held on 11.2.2022. The project proponent has given a detailed presentation. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The project proponent gave detailed presentation. SEAC noted the following:

1. The Project Proponent, M/s Annai Blue Metals has applied for Terms for Reference for the proposed Rough stone & gravel quarry lease over an extent of 1.92.0 Ha in SF.No. 682(Part), 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 Production furnished approved mining plan for 5 years and states that total quantity should not exceed 227340 m³ of rough stone and 15256 m³ of Gravel with ultimate depth of mining is 47m(2m gravel &45m rough stone) below ground level.

Based on the presentation made by the proponent and the documents furnished, SEAC decided to recommend the proposal for the grant of **Terms of Reference (TOR) with Public Hearing for the Production furnished approved mining plan for 5 years and states that total quantity should not exceed 227340 m³ of rough stone and 15256 m³ of Gravel with ultimate depth of mining is 47m(2m gravel &45m rough stone) below ground level**, Subject to the following TORs is in annexure of this minutes, 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:

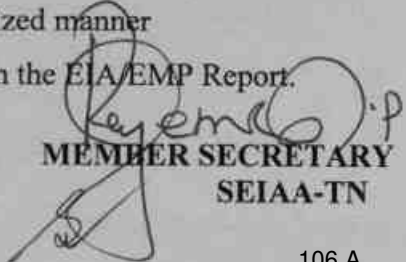
1. The Proponent shall carry out the cumulative & comprehensive impact study due to mining operations carried out in the quarry cluster specifically with reference to the environment in terms of air pollution, water pollution, health impacts, & impact on poultry farms located in the vicinity of the quarrying operations accordingly the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
2. 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,


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- a) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
 - 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.
3. 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).
 4. 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.
 5. 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.
 6. 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.
 7. 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. 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.
 8. The proponent shall furnish the baseline data for the environmental and ecological


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- parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
9. 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.
 10. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
 11. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
 12. 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.
 13. The recommendation for the issue of "Terms of Reference" is subjected to the outcome of the Hon'ble NGT, Principal Bench, New Delhi in O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).
 14. 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** in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
 15. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper spacing 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
 16. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.


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17. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.
18. 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.
19. 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.
20. 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 Reference besides attracting penal provisions in the Environment (Protection) Act, 1986.

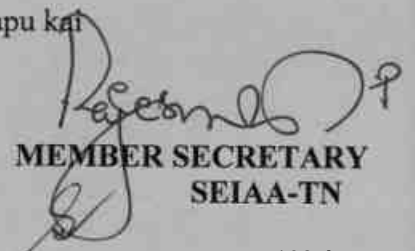
Appendix

List of Native Trees for Planting

1. Aegle marmelos – Vilvam
2. Adenaanthera pavonina - Manjadi
3. Albizia lebbeck – Vaagai
4. Albizia amara - Usil
5. Bauhinia purpurea - Mantharai
6. Bauhinia racemosa - Aathi
7. Bauhinia tomentosa – Iruvathi
8. Buchanania aillaris - Kattuma
9. Borassus flabellifer - Panai
10. Butea monosperma - Murukka maram
11. Bobax ceiba – Ilavu, Sevvilavu
12. Calophyllum inophyllum - Punnai
13. Cassia fistula - Sarakondrai
14. Cassia roxburghii- Sengondrai
15. Chloroxylon sweitenia - Purasa maram
16. Cochlospermum religiosum – Kongu, Manjal Ilavu
17. Cordia dichotoma – Mookuchali maram


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18. *Creteva adansonii* – Mavalingum
19. *Dillenia indica* – Uva, Uzha
20. *Dillenia pentagyna* – Siru Uva, Sitruzha
21. *Diospyros ebenum* - Karungali
22. *Diospyros chloroxylon* – Vaganai
23. *Ficus amplissima* – Kal Itchi
24. *Hibiscus tiliaceous* – Aatru poovarasu
25. *Hardwickia binata* – Aacha
26. *Holoptelia integrifolia* - Aayili
27. *Lanea coromandelica* - Odhiam
28. *Lagerstroemia speciosa* - Poo Marudhu
29. *Lepisanthus tetraphylla* - Neikottai maram
30. *Limonia acidissima* - Vila maram
31. *Litsea glutinosa* –Pisin pattai
32. *Madhuca longifolia* - Illuppai
33. *Manilkara hexandra* – Ulakkai Paalai
34. *Mimusops elengi* - Magizha maram
35. *Mitragyna parvifolia* - Kadambu
36. *Morinda pubescens* – Nuna
37. *Morinda citrifolia* – Vellai Nuna
38. *Phoenix sylvestre* - Eachai
39. *Pongamia pinnata* – Pungam
40. *Premna mollissima* – Munnai
41. *Premna serratifolia* – Narumunnai
42. *Premna tomentosa* - Purangai Naari, Pudanga Naari
43. *Prosopis cinerea* - Vanni maram
44. *Pterocarpus marsupium* - Vengai
45. *Pterospermum canescens* – Vennangu, Tada
46. *Pterospermum xylocarpum* - Polavu
47. *Puthranjiva roxburghii* – Puthranjivi
48. *Salvadora persica* – Uгаа Maram
49. *Sapindus emarginatus* - Manipungan, Soapu kai
50. *Saraca asoca* - Asoca


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51. Streblus asper - Piraya maram
52. Strychnos nuxvomica – Yetti
53. Strychnos potatorum - Therthang Kottai
54. Syzygium cumini - Naval
55. Terminalia bellerica - Thandri
56. Terminalia arjuna - Ven marudhu
57. Toona ciliate – Sandhana vembu
58. Thespesia populnea - Puvarasu
59. Walsura trifoliata – valsura
60. Wrightia tinctoria - Vep

Discussion by SEIAA and the Remarks:-

The subject was placed in the 488th Authority meeting held on 28.02.2022. 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 condition in addition to the following conditions:

1. 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.
2. 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.
3. 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.
4. Action should specifically suggested for sustainable management of the area and restoration of ecosystem for flow of goods and services.
5. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
6. 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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7. The Environmental Impact Assessment should study impact on biodiversity, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
8. The Environmental Impact Assessment should study impact on standing trees and the trees should be numbered.
9. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.
10. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
11. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
12. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways.
13. The project proponent shall conduct detail study on impact on the 11 wells around the project site.

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

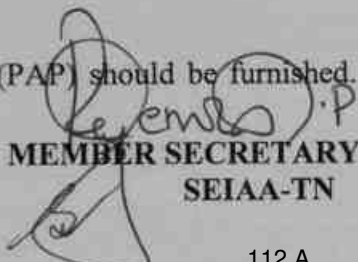

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whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA)

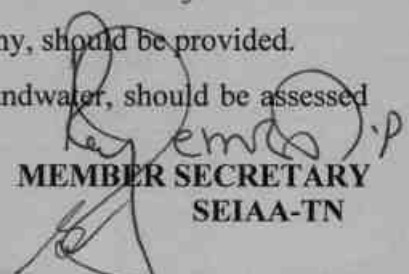

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- should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 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.

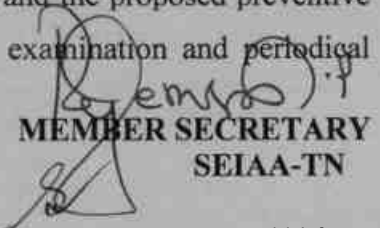

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While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should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

- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed


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- 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


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medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.

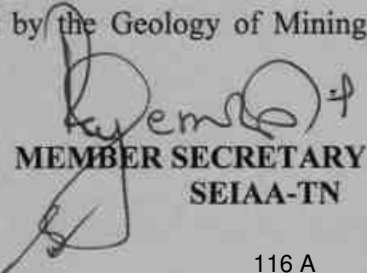

MEMBER SECRETARY
SEIAA-TN

- 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.


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9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of 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

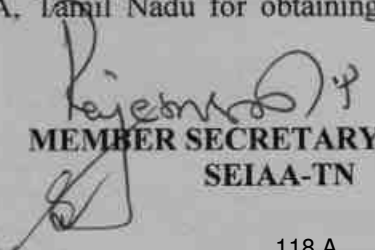

MEMBER SECRETARY
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during the operations of the mines.

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.


MEMBER SECRETARY
SEIAA-TN

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.

MINING PLAN

FOR

GRANT OF ROUGH STONE QUARRY LEASE IN OWN PATTI LAND

(Minor Mineral Conservation and Development Rules, 2010 & as per the amendments under 19 (1) Tamil Nadu Minor Mineral Concession Rules, 1959)



LOCATION OF THE APPLIED AREA

EXTENT : 3.36.0 Ha
S.F.NO : 706 (Part)
VILLAGE : KUPPAM
TALUK : ARAVAKURICHI
DISTRICT : KARUR
STATE : TAMIL NADU

APPLICANT

Tmt.S.TAMILSELVI,
W/O SABAPATHI,

16B, GANESHA NAGAR 1ST STREET,
INAM KARUR,
KARUR TALUK,
KARUR DISTRICT.

PREPARED BY

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

RQP/MAS/263/2014/A

MANGANIKADU, MUTHAMPATTY (Post)

BOMMIDI (via), OMALUR TALUK

SALEM-635 301.

TAMILNADU

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 888/Minus/2016
Dated: . 2. 2017

CONTENTS



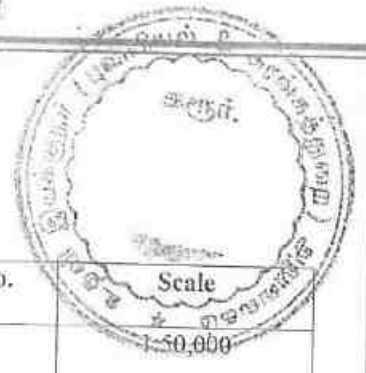
Sl. No.	Description	
1.0	Introduction	08
2.0	Executive Summary	09
3.0	General Information	10
4.0	Location	11
5.0	Geology and Mineral Reserves	11
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10.0	Employment Potentials & Welfare Measures	21
11.0	Environment Management Plan	23
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ANNEXURES



Sl. No.	Description	Annexure No.
1.	Precise Area Communication letter	
2.	Copy of the FMB	II
3.	Village Map	III
4.	Land documents(Patta, Adangal, A-Register)	IV
5.	Photo copy of the applied area	V
6.	Copy of Explosive License	VI
7.	Agreement from Explosive License holder	VII
8.	Copy of ID Proof	VIII
9.	Copy of RQP Certificate	IX
10.	Resistivity Survey Report	X

LIST OF PLATES



Sl. No.	Description	Plate No.	Scale
1	Location Plan	I	1:50,000
2	Key Map	I-A	Not to scale
3	Topo Sheet Map	I-B	1:1,00,000
4	Satellite Imaginary Map	I-C	1:5000
5	Environmental Plan	I-D	1:10,000
6	Mine Lease Plan	II	1:1000
7	Surface With Geological Plan	III	1:1000
8	Surface and Geological Section	III-A	HOR 1:1000 VER 1:500
9	Yearwise Development & Production Plan	IV	1:1000
10	Yearwise Development & Production Section	IV-A	HOR 1:1000 VER 1:500
11	Mine Layout Plan And Land Use Pattern	V	1:1000
12	Conceptual/Final Mine Closure plan	VI	HOR 1:1000 VER 1:500
13	Conceptual/Final Mine Closure Plan section	VI-A	1:1000

Tmt.S.TAMILSELVI,
W/O.SABAPATHI,
16B, GANESHA NAGAR 1ST STREET
INAM KARUR,
KARUR TALUK,
KARUR DISTRICT.



CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of Rough Stone quarry over an extent of 3.36.0 hectares of Own Patta land in S.F.NO: 706(Part) of Kuppam Village, Aravakurichi Taluk, Karur District, Tamil Nadu State has been prepared by Dr.S.Karuppannan, M.Sc.,Ph.D., Regn. No. RQP/MAS/263/2014/A.

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

Dr.S.Karuppannan M.Sc.,Ph.D
RQP/MAS/263/2014/A
Manganikadu, Muthampatty (post)
Bommidi (via), Omalur Taluk
Salem-635 301.

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

Date:

* S. Tamilselvi

Signature of the Applicant

Tmt.S.TAMILSELVI,

Tmt.S.TAMILSELVI,
W/O.SABAPATHI,
16B, GANESHA NAGAR 1ST STREET
INAM KARUR,
KARUR TALUK,
KARUR DISTRICT.



DECLARATION

The Mining Plan in respect of Rough Stone quarry over an extent of 3.36.0 hectares of Own Patta land in S.F.NO: 706(Part) of Kuppam Village, Aravakurichi Taluk, Karur District, and Tamil Nadu State has 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

Date:

Signature of the Applicant

Tmt.S.TAMILSELVI,

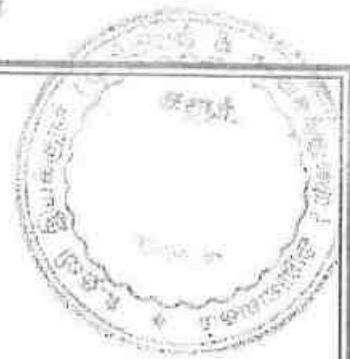
Dr. S.Karuppannan M.Sc.,Ph.D

RQP/MAS/263/2014/A

Manganikadu, Muthampatty (post)

Bommidi (via), Omalur Taluk

Salem - 635 301.



CERTIFICATE

This is to certify that, the provisions of Minor Minerals Conservation and Development Rules, 2010 (MMCDR) have been observed in the Mining Plan for the grant of Rough Stone quarry lease over an extent of 3.36.0 hectares of Own Patta Land in S.F.NO. 706(Part) of Kuppam Village, Aravakurichi Taluk, Karur District, Tamil Nadu State applied by Tmt.S.TAMILSELVI, for Existing quarry lease.

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

Place: SALEM

Date: 06.02.2017

Certified

Signature of Recognized Qualified Person.

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
Manganikadu, Muthampatty (Post)
Bommidi (Via), Omalur (Tk),
Salem (Dist), Tamil Nadu - 635 301.
Cell: 94439 37841

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

RQP/MAS/263/2014/A

Manganikadu, Muthampatty (post)

Bommidi (via), Omalur Taluk

Salem-635 301.



CERTIFICATE

Certified that, in preparation of Mining Plan for Rough Stone quarry over an extent of 3.36.0 hectares of Own Patta land in S.F.NO: 706(Part) of Kuppam Village, Aravakurichi Taluk, Karur District, Tamil Nadu State for Tmt.S.TAMILSELVI, covers all the provisions of Mines Act, Rules, and Regulations etc made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Place: SALEM

Date: 06.02.2017

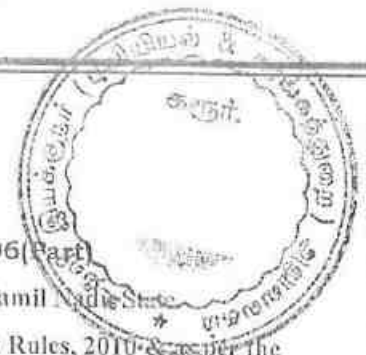
Certified

Signature of Recognized Qualified Person.

Dr. S. KARUPPANNAN, M.Sc.,Ph.D.,
RQP/MAS/263/2014/A
Manganikadu, Muthampatty (Post)
Bommidi (Via), Omalur (Tk),
Salem (Dist), Tamil Nadu - 635 301.
Cell: 94439 37841

MINING PLAN FOR MINOR MINERALS
ROUGH STONE QUARRY

Over an extent 3.36.0 Ha of OWN PATTa land in S.F.No. 706 (Part)
Of KUPPAM Village, ARAVAKURICHI Taluk, KARUR District, Tamil Nadu State
(Prepared under rule 19(1) of Minor Mineral Conservation and Development Rules, 2010 & as per the
amendments under Tamil Nadu Minor Mineral Concession Rules, 1959)

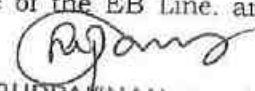


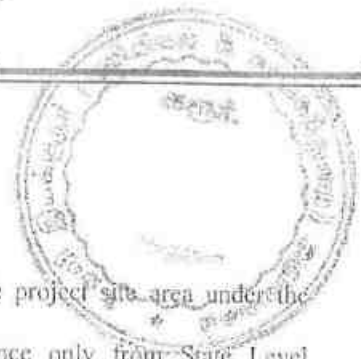
1.0 INTRODUCTION AND EXECUTIVE SUMMARY:

1. Tmt.S.Tamilselvi, residing at Ganesha Nagar 1st street, Inam Karur, Karur Taluk, and Karur District has applied for the grant of quarry lease to quarry Rough Stone over an extent of 3.36.0 hectares of Own Patta land in S.F.No. 706 (Part) of KUPPAM Village, ARAVAKURICHI Taluk, KARUR District of Tamil Nadu State for a period of 5 years.
2. The District Collector, KARUR in his letter **Rc.888/Mines/2016 Dated 05.01.2017** has directed the applicant to produce approved Mining Plan and Environmental Clearance certificate from the State Level Environmental Impact Assessment Authority (SEIAA) for the grant of quarry lease for the applied area.
3. Accordingly, Mining Plan is prepared under the provisions of rule 19(1) of Minor Mineral Conservation and Development Rules, 2010 & as per the amendments under TamilNadu Minor Mineral Concession Rules, 1959 by incorporating the conditions imposed in the precise area communication letter and by incorporating all the details proposed in the letter No. SEIAA-TN/Minor Minerals / 2012 dated 17.09.2012 of State Level Environmental Impact Assessment Authority.
4. Geological Reserves is estimated as 681502M³ and Mineable Reserves is estimated as 349706M³ and recoverable reserves is estimated as 349706M³ of Rough Stone after leaving necessary safety distance from the lease boundary as indicated in the precise area letter and relevant mining laws in force.
5. Production Schedule is proposed an average production of 69941M³/ year of Rough Stone Production is 349706M³ for the proposed 5 years.
6. 50m safety distance has to be left from the North-West Side of the EB Line. and 7.5m safety distance has to be left from the other side.

**This Mining Plan is approved subject
to the conditions/stipulations**

**Indicated in the Mining Plan approval
Letter No: 808/M.N.M. 2016
Dated: .2. 2017**


Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
Manganikadu, Muthampatty (Post)
Bommidi (Via), Omalur (Tk),
Salem (Dist), Tamil Nadu - 635 301.
Call: 94433 87377



7. Environmental parameters,
- i) There is no interstate boundary around 10Kms radius.
 - ii) There is no wild life animal sanctuary within 10Kms radius from the project site area under the Wildlife (Protection) Act, 1972. Therefore the project seeks clearance only from State Level Environmental Impact Assessment Authority (SEIAA), under B2 Category.

8. Environmental measures to be adopted shall be,

- i) Dust Control at source while drilling and blasting.
- ii) Dust suppression at loading point and transport haul roads,
- iii) Noise Control in blasting, control of fly rock missiles and vibration by doing peak particle velocity with in standard as prescribed by the DGMS and MoEF.
- iv) Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.
- v) Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining.
- vi) Mining near major fracture zones if any should be avoided to control ground water fluctuation in the adjacent agricultural lands.
- vii) Emission test of vehicles should be in stack to maintain minimum emission level of flue gases.
- viii) Noise level should not exceed 80db and the vehicles should use only permitted Air Horn while on road near residential areas.
- ix) Safety zones as prescribed by the Department of Geology and Mining from adjacent infrastructures should be strictly adhering to.
- x) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

2.0 EXECUTIVE SUMMARY:

a.	Name of the Village	:	Kuppam
b.	Name of the Panchayat / Union	:	Kuppam/K.Paramathi
c.	The proposed total Minable Reserves	:	349706M ³
d.	The proposed quantity of reserves (level of production) for FIVE to be mined is (Recoverable reserves)	:	349706M ³
e.	Total extent of the area	:	3.36.0 Ha
f.	Period of mining	:	FIVE years

g.	Depth of mining	:	31m from general ground profile
h.	Average production per year	:	69941M ³
i.	Method of mining / level of mechanization	:	Opencast, Semi-mechanized Mining with a bench height of 5m and bench width of 5m is proposed.
j.	Types of Machineries used in the quarry	:	i) Compressor with jack hammer ii) Excavator
k.	Cost of the Project		
	a. Fixed Cost		Rs. 2,50,000/-
	b. Operational Cost		Rs. 20,00,000/-
	c. EMP Cost		Rs. 3,50,000/-
l.	The area applied for lease is bounded by four corners and the coordinates are	:	Toposheet No. 58 F/13,
	Latitude	:	10° 58' 44.7872" N 77° 55' 55.6838" E
	Longitude	:	10° 58' 47.0098" N 77° 55' 55.6905" E 10° 58' 47.0826" N 77° 55' 56.1131" E 10° 58' 48.6167" N 77° 55' 56.2834" E

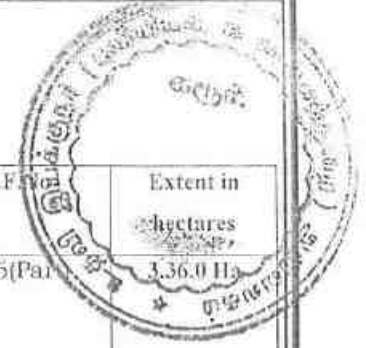
3.0 GENERAL INFORMATION:

.1	a.	Name of the Applicant	:	Tmt.S.TAMILSELVI,
	b.	Address of the Applicant with phone No and e-mail id if any	:	W/O.Sabapathi, 16B, Ganesha Nagar 1st Street Inam Karur, Karur Taluk, Karur District. Mobile: 9344455594
	c.	Status of the Applicant	:	Individual
3.2	a.	Mineral Which the applicant intends to mine	:	Rough Stone
	b.	Precise area communication letter No.	:	Rc.888/Mines/2016 Dated 05.01.2017
	c.	Period of permission / lease granted	:	FIVE years
	d.	Name and Address of the RQP preparing Mining Plan	:	Dr. S.KARUPPANNAN M.Sc.,Ph.D., Manganikadu, Muthampatty (post) Bommidi (via),Omalur Taluk Salem-635 301.
	e.	RQP Regn. No.	:	RQP/MAS/263/2014/A Valid up to 15.12.2024.

4.0 LOCATION:

a. Details of the Area:

State	District	Panchyat / union	Taluk	Village	S.F.No	Extent in hectares
Tamil Nadu	Karur	Kuppam/ K.Paramathi	Aravakurichi	Kuppam	706(Pa	3.36.0 Ha
Total =						3.36.0 Ha



b.	Classification of the Area (Ryotwari / poramboke / others)	:	OWN PATTa land
c.	Ownership / Occupancy of the Applied area (Surface rights)	:	OWNPATTa land in S.F.No. 706(Part) (3.36.0Ha) The Area vide Patta No 543.and hence the applicant has got surface right over the area.
d.	Toposheet No. with Latitude and Longitude	:	Toposheet No. 58 F/13, 10° 58' 44.7872" N 77° 55' 55.6838" E 10° 58' 47.0098" N 77° 55' 55.6905" E 10° 58' 47.0826" N 77° 55' 56.1131" E 10° 58' 48.6167" N 77° 55' 56.2834" E
e.	Existence of Public Road / Railway line if any nearby the area and approximate distance	:	K.Paramathi – Punnam Quarry site is located at kuppam village in west side at a distance of 2 kms

PART - A

5.0 GEOLOGY AND MINERAL RESERVES:

5.1	a.	Topography	:	<ol style="list-style-type: none"> 1. The area applied for quarry lease is almost with gentle elevation of 7m the ground level and sloping towards Western covered with Rough Stone which does not sustain any type of vegetation. 2. No major river is found nearby the applied area. 3. Water table is noticed at a depth of 42m from the surface in the adjacent open wells of the area. 4. Temperature of the area is reported to be 18⁰C to a maximum of 38⁰C during summer. 5. Rainfall of this area is about 800mm to 900 mm during the monsoons in a year.
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b.	<p>Infrastructures nearby the applied area.</p> <p>1. Post Office : K.Paramathi - 5kms</p> <p>2. Police Station : K.Paramathi - 5kms</p> <p>3. G.H : K.Paramathi - 5kms</p> <p>4. DSP Office : Aravakurichi - 20kms</p> <p>5. Railway Station : Karur - 13kms</p> <p>6. School : K.Paramathi - 5kms</p> <p>7. Airport : Trichy - 120Kms</p> <p>8. Seaport : Chennai - 364kms</p>								
c.	<p>Regional Geology : Karur District is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite.</p> <p>The generalized stratigraphic succession of the geological formations met within this District is as follows.</p> <table border="1"> <thead> <tr> <th>Age</th> <th>Rock Formation</th> </tr> </thead> <tbody> <tr> <td>1. Recent to Sub recent</td> <td>Soil, Alluvium</td> </tr> <tr> <td>2. Archaean</td> <td>Granites, basic granulites, Peninsular Gneiss, Calc Gneiss and Charnockites</td> </tr> </tbody> </table>	Age	Rock Formation	1. Recent to Sub recent	Soil, Alluvium	2. Archaean	Granites, basic granulites, Peninsular Gneiss, Calc Gneiss and Charnockites		
Age	Rock Formation								
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2. Archaean	Granites, basic granulites, Peninsular Gneiss, Calc Gneiss and Charnockites								
d.	<p>Geology of the Precise Area :</p> <ol style="list-style-type: none"> The area is mainly composed of Archaean crystalline metamorphic complex. The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock. The general trend of formation is NE – SW and dips steeply. The general geological succession of the area is given as under. <table border="1"> <thead> <tr> <th>Age</th> <th>Rock Formation</th> </tr> </thead> <tbody> <tr> <td>1. Recent to Sub recent</td> <td>Soil, Alluvium</td> </tr> <tr> <td>2. Archaean</td> <td>Charnockites</td> </tr> <tr> <td>3. Archaean</td> <td>Peninsular Gneiss, and Calc Gneiss</td> </tr> </tbody> </table>	Age	Rock Formation	1. Recent to Sub recent	Soil, Alluvium	2. Archaean	Charnockites	3. Archaean	Peninsular Gneiss, and Calc Gneiss
Age	Rock Formation								
1. Recent to Sub recent	Soil, Alluvium								
2. Archaean	Charnockites								
3. Archaean	Peninsular Gneiss, and Calc Gneiss								

5.2		Details of Exploration already carried out if any	<ol style="list-style-type: none"> 1. Since the Rough Stone is seen from the Surface itself, no exploration was carried out. 2. However, the area was personally examined by the Geologist who prepared the Mining Plans.
5.3	a.	Estimation of Reserves	The Geological and Recoverable reserves are estimated by cross sectional method up to a depth of 31mts as the Rough Stone. Plans and Sections have been drawn with a scale of 1:1000 and 1:500 respectively.

b. **Geological Reserves**

The Geological reserve is estimated as 681502M³ by area cross sectional method.

GEOLOGICAL RESERVES								
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume in M3	Geological Reserves in m3 @ 98%	Mine waste in m3 @ 2%	Top Soil in m3
XY-AB	I	18	45	1	810			810
	II	18	45	5	4050	3969	81	
	III	18	45	5	4050	3969	81	
	IV	104	160	5	83200	81536	1664	
	V	104	160	5	83200	81536	1664	
	VI	104	160	5	83200	81536	1664	
	VII	104	160	5	83200	81536	1664	
					340900	334082	6818	810
XY-CD	I	30	31	1	930	911	19	930
	II	30	31	5	4650	4557	93	
	III	30	31	5	4650	4557	93	
	IV	144	151	5	86070	84349	1721	
	V	144	151	5	86070	84349	1721	
	VI	144	151	5	86070	84349	1721	
	VII	144	151	5	86070	84349	1721	
					354510	347420	7090	930
					695410	681502	13908	1740

c. Recoverable Reserves

The mineable reserves and the recoverable reserves are 349706m³ respectively

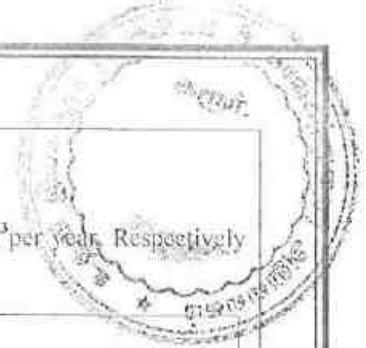
MINEABLE RESERVES								
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In M3	MINEABLE Reserves in m3 @ 98%	Mine waste in m3 @ 2%	Top Soil in m3
XY-AB	I	11	7	1	77			77
	II	11	7	5	385	377	8	
	III	6	2	5	60	59	1	
	IV	87	112	5	48720	47746	974	
	V	82	102	5	41820	40984	836	
	VI	77	92	5	35420	34712	708	
	VII	72	82	5	29520	28930	590	
TOTAL					156002	152807	3119	77
XY-CD	I	23	16	1	368	361	7	368
	II	23	16	5	1840	1803	37	
	III	18	11	5	990	970	20	
	IV	96	126	5	60480	59270	1210	
	V	91	116	5	52780	51724	1056	
	VI	86	106	5	45580	44668	912	
	VII	81	96	5	38880	38102	778	
TOTAL					200918	196900	4018	368
GRAND TOTAL					356920	349706	7137	445

6.0 MINING:

6.1	Method of Mining	:	<ol style="list-style-type: none"> Opencast method of semi mechanized mining will be adopted to extract Rough Stone of required size. Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Excavators are proposed for quarrying of Rough Stone Tippers / Lorries are proposed for the transportation of Rough Stone to the destination
6.2	Mode of Working	:	It is a semi mechanized quarrying operation using shot hole drilling with the help of compressor and jack hammers, smooth blasting, block lifting using cranes and waste and are removal using Hydraulic excavator and loaded directly to the tippers and transported to the crushing plants into required size in the crushing plants from 75mm jelly to 10mm chips.
6.3	Proposed bench height & Width	:	Bench height = 5mts. Bench width = 5 mts.
6.4	Details of Overburden / Mineral Production proposed for Rough stone 5 years	:	<p>Top Soil :</p> <p>Topsoil / Overburden production details follows:</p> <p>There is an topsoil in this applied lease area. Refer plate No-VI Reject S-E side = 445m³</p>

Rough Stone production details as follows:

The average proposed rate of production of Rough Stone is about 69941m³ per year. Respectively 349706 m³



YEARWISE PRODUCTION

YEAR	Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume in M3	Mineable Reserves in m3 @ 98%	Mine waste in m3 @ 2%	Top Soil in m3
I-YEAR	XY-AB	I	11	7	1	77			77
		II	11	7	5	385	377	8	
		III	6	2	5	60	59	1	
		IV	87	112	5	48720	47746	974	
		V	44	102	5	22440	21991	449	
II-YEAR	XY-AB	V	38	102	5	19380	18992	388	
		VI	77	92	5	35420	34712	708	
		VII	40	82	5	16400	16072	328	
III-YEAR	XY-CD	VII	32	82	5	13120	12858	262	
		I	23	16	1	368	361	7	368
		II	23	16	5	1840	1803	37	
		III	18	11	5	990	970	20	
IV-YEAR	XY-CD	IV	87	126	5	54810	53714	1096	
		IV	9	126	5	5670	5557	113	
		V	91	116	5	52780	51724	1056	
V-YEAR	XY-CD	VI	23	106	5	12190	11946	244	
		VI	63	106	5	33390	32722	668	
		VII	81	96	5	38880	38102	778	
						356920	349706	7137	445

6.5 a. Mining

: Drilling of shot holes will be carried out using compressor and jack hammer. Depth of holes shall be 1 to 2m bench height and spacing shall be 0.75m and burden shall be 0.60m from the preface. Details of drilling equipments are given below.

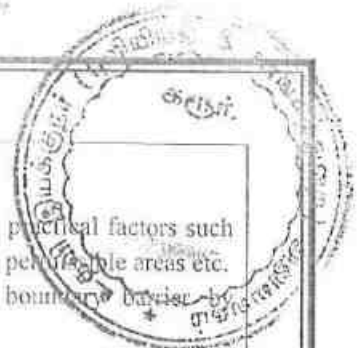
Type	Nos	Dia of hole	Size / Capacity	Make	Motive power	H.P.
Jack Hammer	6	25.5 mm	Hand held	Atlas copco 2Nos	Diesel	60

b.	Loading	:	<p>Loading of waste and Rough Stone shall be carried out by Excavator into 10 tonne capacity tippers from the working place periodically. Details of loading equipment are given as under.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Bucket Capacity (MT)</th> <th>Make</th> <th>Motive power</th> <th>H.P.*</th> </tr> </thead> <tbody> <tr> <td>Hydraulic excavator</td> <td>1</td> <td>1.2 M³</td> <td>L&T or Ex200</td> <td>Diesel</td> <td>120</td> </tr> </tbody> </table>	Type	Nos	Bucket Capacity (MT)	Make	Motive power	H.P.*	Hydraulic excavator	1	1.2 M ³	L&T or Ex200	Diesel	120
Type	Nos	Bucket Capacity (MT)	Make	Motive power	H.P.*										
Hydraulic excavator	1	1.2 M ³	L&T or Ex200	Diesel	120										

c.	Transportation	:	<p>Transport of raw materials and waste shall be done by Tipper of 10 tonnes capacity.</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>3</td> <td>10 M.T</td> <td>Ashok Leyland</td> <td>Diesel</td> <td>110</td> </tr> </tbody> </table>	Type	Nos	Size / Capacity	Make	Motive power	H.P.	Tipper	3	10 M.T	Ashok Leyland	Diesel	110
Type	Nos	Size / Capacity	Make	Motive power	H.P.										
Tipper	3	10 M.T	Ashok Leyland	Diesel	110										

6.6	Disposal of Overburden	:	<p>The overburden of the applied area NO Topsoil and Reject is N-E side.</p> <p>Topsoil = 445m³ Dump = 7137 TOTAL = 7582m³</p>
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6.7	Brief Note on Conceptual Mining Plan for the entire lease period	:	<p>Conceptual Mining Plan is prepared with an object of FIVE YEARS of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of infrastructures etc.,</p> <p>Average Ultimate Pit dimension in given as Under,</p> <table border="1"> <thead> <tr> <th colspan="5">ULTIMATE PIT DIMENSION</th> </tr> <tr> <th>Section</th> <th>Bench</th> <th>length in (m)</th> <th>Width in (m)</th> <th>Depth in (m)</th> </tr> </thead> <tbody> <tr> <td rowspan="7">XY-AB</td> <td>I</td> <td>11</td> <td>7</td> <td>1</td> </tr> <tr> <td>II</td> <td>11</td> <td>7</td> <td>5</td> </tr> <tr> <td>III</td> <td>6</td> <td>2</td> <td>5</td> </tr> <tr> <td>IV</td> <td>87</td> <td>112</td> <td>5</td> </tr> <tr> <td>V</td> <td>82</td> <td>102</td> <td>5</td> </tr> <tr> <td>VI</td> <td>77</td> <td>92</td> <td>5</td> </tr> <tr> <td>VII</td> <td>72</td> <td>82</td> <td>5</td> </tr> <tr> <td rowspan="7">XY-CD</td> <td>I</td> <td>23</td> <td>16</td> <td>1</td> </tr> <tr> <td>II</td> <td>23</td> <td>16</td> <td>5</td> </tr> <tr> <td>III</td> <td>18</td> <td>11</td> <td>5</td> </tr> <tr> <td>IV</td> <td>96</td> <td>126</td> <td>5</td> </tr> <tr> <td>V</td> <td>91</td> <td>116</td> <td>5</td> </tr> <tr> <td>VI</td> <td>86</td> <td>106</td> <td>5</td> </tr> <tr> <td>VII</td> <td>81</td> <td>96</td> <td>5</td> </tr> </tbody> </table>	ULTIMATE PIT DIMENSION					Section	Bench	length in (m)	Width in (m)	Depth in (m)	XY-AB	I	11	7	1	II	11	7	5	III	6	2	5	IV	87	112	5	V	82	102	5	VI	77	92	5	VII	72	82	5	XY-CD	I	23	16	1	II	23	16	5	III	18	11	5	IV	96	126	5	V	91	116	5	VI	86	106	5	VII	81	96	5
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Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc. Afforestation has been proposed on the boundary barrier by planting trees.

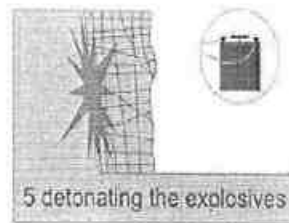
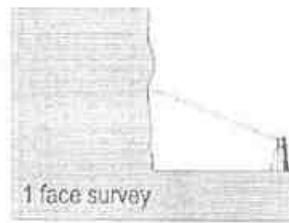
All the baseline information studies like Air Quality monitoring, Noise and Vibration monitoring, Water Analysis studies will be carried out every year as per the MOEF norms.

7.0 BLASTING:

7.1	Blasting Pattern	:	<p>The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 tonnes per K.g of explosives. Blasting parameters are as follows.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Diameter of the hole</td> <td style="width: 10%;">:</td> <td style="width: 40%;">32-36 mm</td> </tr> <tr> <td>Spacing</td> <td>:</td> <td>60 Cms</td> </tr> <tr> <td>Depth</td> <td>:</td> <td>1 to 1.5m</td> </tr> <tr> <td>Charge / Hole</td> <td>:</td> <td>D.Cord with water or 70 gms of gun powder or Gelatine.</td> </tr> <tr> <td>Pattern of hole</td> <td>:</td> <td>Zig Zag</td> </tr> <tr> <td>Inclination of hole</td> <td>:</td> <td>70° from the horizontal.</td> </tr> <tr> <td>Quantity of rock broken</td> <td>:</td> <td>233 MT x 2.6 = 1.17 MT</td> </tr> <tr> <td>Blasting efficiency @95%</td> <td>:</td> <td>1.17 x 95% = 1.05MT / hole</td> </tr> <tr> <td>Charge per hole</td> <td>:</td> <td>140 gms of 25mm dia cartridge</td> </tr> <tr> <td>Quantity of rock broken per day</td> <td>:</td> <td>577MT per day</td> </tr> </table>	Diameter of the hole	:	32-36 mm	Spacing	:	60 Cms	Depth	:	1 to 1.5m	Charge / Hole	:	D.Cord with water or 70 gms of gun powder or Gelatine.	Pattern of hole	:	Zig Zag	Inclination of hole	:	70° from the horizontal.	Quantity of rock broken	:	233 MT x 2.6 = 1.17 MT	Blasting efficiency @95%	:	1.17 x 95% = 1.05MT / hole	Charge per hole	:	140 gms of 25mm dia cartridge	Quantity of rock broken per day	:	577MT per day
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ROCK BLASTING



7.2 Types of Explosives

: Following explosives are recommended for efficient blasting with safe practice.

S. No	Description	Class / Division	Type	Size
1.	Slurry	Class - 3	Nitro Compound	25 x 200
2.	Nitrate Mixture	Class - 2	ANFO (Ammonium nitrate with 12% diesel)	Prepared at the site.
3.	Detonators	Class - 3	Ordinary and elec (OD & ED)	6.5 x 32
4.	Safety fuse	Class - 6	Blue sump fuse coils of 10mts each	

The applicant will approach the District Collector for grant of explosives license as the quantity of daily consumption is very low, i.e., less than 5Kgs.

7.3	Measures proposed to minimize ground vibration due to blasting	<p>The following steps shall be adopted to control ground vibration due to blasting.</p> <ol style="list-style-type: none"> 1. The minimum recommended delay time of 8ms was introduced to minimize ground vibration to avoid constructive interference of blast vibration waves and hence its impact or amplitude. 2. In case of electronic detonators, which are inherently much more accurate delays (+/- 0.2 milliseconds delay) to minimize the ground vibration. 3. Use of Ammonium nitrate fuel oil mixture for shot holes may be avoided because which cause for high fly of rocks in view critical diameter problem. Only high strength explosives like slurry will be used in the form of cartridge. 4. Charge per hole should exceed the powder factor designed for each hole based on the quantum of blasting, strength of rocks, fracture pattern etc.
7.4	Storage of Explosives and safety measures to be taken while blasting.	<ol style="list-style-type: none"> 1. The applicant is advised to store the explosives as per the Indian Explosives Act, 1958. 2. The explosives to be used in mines being a small quantity, the District collector may be approached to keep the stocks not exceeding 5kgs at time or any other quantity permitted by the concerned authorities in a portable magazine of S & B types. 3. The applicant is advised to engage an authorized explosive agency to carry out blasting. 4. The blasting time at a day is proposed to be 5 PM to 6 PM. 5. First Aid Box will be keeping ready at all the time. 6. Necessary precautionary announcement will be carried out before the blasting operation.

8.0 MINE DRAINAGE:

8.1	Depth of Water table	<p>The ground water table is reported as 42 m below ground level in nearby wells of this area. Now, the present quarry shall be proposed above the water table and hence, quarrying may not affect the ground water.</p>
8.2	Arrangement and Places where the mine water is finally proposed to be discharged	<p>The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 lpm and it shall be pumped about periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and it is not contaminated with any hazardous things.</p>

9.0 OTHER PERMANENT STRUCTURES:

9.1	Habitations / Village	<p>: There are no villages within a radius of 500m. The nearest habitations with the population is given as under</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>Village</th> <th>Distance in Kms</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>Sallyapalliyam</td> <td>1.5km</td> <td>300</td> </tr> <tr> <td>East</td> <td>Kalipalayam</td> <td>1km</td> <td>50</td> </tr> <tr> <td>South</td> <td>Velapa Goundanoor</td> <td>1.5km</td> <td>60</td> </tr> <tr> <td>West</td> <td>Velayuthampalayam</td> <td>1.5km</td> <td>100</td> </tr> </tbody> </table>	Direction	Village	Distance in Kms	Population	North	Sallyapalliyam	1.5km	300	East	Kalipalayam	1km	50	South	Velapa Goundanoor	1.5km	60	West	Velayuthampalayam	1.5km	100
Direction	Village	Distance in Kms	Population																			
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East	Kalipalayam	1km	50																			
South	Velapa Goundanoor	1.5km	60																			
West	Velayuthampalayam	1.5km	100																			
9.2	Power lines (HT/LT)	: There is power line at a distance 18m NW corner, necessary safety distance has been provided for the EP line as per the province laid down under Tamil Nadu Minor Minerals Concession Rules, 1959.																				
9.3	Water bodies (River, Pond, Lake, Odai, Channel etc)	: There is no any water bodies located around 1Km Radius																				
9.4	Archeological / Historical Monuments	: There are no Archeological / Historical Monuments within a radius of 500m.																				
9.5	Road (NH, SH, Village Road etc)	: K.Paramathi - Punnam = 5kms (N-W) Quarry site is located at Kuppam in Eastern side at a distance of 2 kms																				
9.6	Places of Worship	: There are no Places of Worship within a radius of 500m.																				
9.7	Reserved Forest / Forest / Social Forest / Wild Life Sanctuary etc.,	: There are no Reserved Forest / Forest / Social Forest / Wild Life Sanctuary etc within a radius of 500m.																				
9.8	Any Interstate Border, Protected areas under the Wild Life (Protection) Act, 1972, Critically Polluted Areas as Identified by Central Pollution Control Board and Notified Eco sensitive areas	: There are No inter State border within a radius of 15 kms.																				

10.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES:

10.1	Employment Potential (Management & Supervisory personal)	<p>1. As per Mines safety under the provisions of MMR, 1961 under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision.</p> <p>2. The following man power is proposed for quarrying Rough Stone during the FIVE years period to achieve the proposed production and to comply the provisions of the OWN PATTA norms.</p> <table border="1"> <tr> <td>1.</td> <td>Skilled</td> <td>Operator</td> <td>2 No.</td> </tr> <tr> <td></td> <td></td> <td>Mechanic</td> <td>1 No.</td> </tr> <tr> <td></td> <td></td> <td>Blaster/Mat</td> <td>1 No.</td> </tr> <tr> <td>2.</td> <td>Semi - skilled</td> <td>Driver</td> <td>2 Nos</td> </tr> <tr> <td>3.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>5 Nos</td> </tr> <tr> <td></td> <td></td> <td>Cleaners</td> <td>3Nos</td> </tr> <tr> <td></td> <td></td> <td>Office Boy</td> <td>1No</td> </tr> <tr> <td>4.</td> <td colspan="2">Management & Supervisory staff</td> <td>3No.</td> </tr> <tr> <td></td> <td colspan="2" style="text-align: right;">Total =</td> <td>18Nos</td> </tr> </table>	1.	Skilled	Operator	2 No.			Mechanic	1 No.			Blaster/Mat	1 No.	2.	Semi - skilled	Driver	2 Nos	3.	Unskilled	Musdoor / Labours	5 Nos			Cleaners	3Nos			Office Boy	1No	4.	Management & Supervisory staff		3No.		Total =		18Nos
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4.	Management & Supervisory staff		3No.																																			
	Total =		18Nos																																			
10.2	Welfare Measures																																					
	a. Drinking Water	: Drinking water at the rate of 2Ltrs per person shall be provided as per the Mines Rules, 1960. It is proposed to make a borehole for providing uninterrupted supply of drinking water and other utilities.																																				
	b. Sanitary facilities	: Semi permanent latrines & urinals shall be maintained at convenient places for use of labours as per the provisions of Rule (33) of the Mines Rules, 1960 separately for males and females. Washing facilities shall also be arranged as per rule (36) of the Mines Rules, 1960.																																				
	c. First Aid Facility	: Being a small mine First Aid station as per provisions under Rule (44) of the Mines Rules 1960 will be provided with facilities as per the third schedule as prescribed.																																				




		Qualified First Aid personnel should be appointed or nominated to attend emergency first aid treatment.
d.	Labour Health	: As per Mines Rule, Periodic medical examination has to be arranged for occupational health once in a year in addition to attending medical treatment of occupational injuries under the Rule 45 (A), MR, 1960.
e.	Precautionary safety measures to the Laborers.	: Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation. Necessary training will be conducted once in a year to all the employees with the help of qualified and experienced officers to train about the safe and system at quarrying operation.

PART – B

11.0 ENVIRONMENTAL MANAGEMENT PLAN:

11.1	Existing Land Use Pattern	:	The existing land use pattern is given as under:			
			Sl. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
			1.	Area Under Quarrying Pit	2.30.0	2.70.57
			2.	Infrastructure	0.01.0	0.02.0
			3.	Roads	0.01.0	0.02.0
			4.	Unutilized	1.04.0	0.61.43
			Total =	3.36.0Ha	3.36.0Ha	
11.2	Water Regime	:	Water table in this area is noticed at a depth of 42m and presently, the quarrying of Rough Stone is proposed up to a depth of 5m and hence, it will not affect the ground water depletion of this area.			
11.3	Flora and Fauna	:	Except acacia bushes, no other valuable trees are noticed in the applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.			
11.4	Climatic conditions	:	<p>Generally sub tropical climatic condition prevails throughout the year and this District receives rain both in South west and North east monsoon.</p> <p>The average rainfall is about 800mm to 900mm and the temperature ranges from 18°C during winter and to a maximum of 38°C during the summer.</p>			
11.5	Human Settlement	:	The nearest habitations with the population is given as under			
			Direction	Village	Distance in Kms	Population
			North	Salliyapalliyam	1.5km	300
			East	Kalipalayam	1km	50
			South	Velapa Goundanoor	1.5km	60
			West	Velayuthampalayam	1.5km	100
11.6	Plan for Air, Dust Suppression	:	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			
11.7	Plan for Noise Control	:	Quarrying of Rough Stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out to check the noise level in and around the quarry site.			

11.8	Environmental Impact Assessment Statement Describing Impact on mining on the next SIX years	: Factors to be considered for EIA are, <ol style="list-style-type: none"> 1. Dust generation, 2. Land degradation 3. Stabilization and vegetation of dumps 4. Adverse effect on water regime 5. Socio economic benefits arising out of Mining. 6. Noise and Vibration. 
	a. Dust	: Dust is expected to be generated from drilling, hauling roads; place of excavation etc and it will be suppressed by periodical wetting of lands.
	b. Land degradation	: Land degradation is by means of cutting the trees and removal of fertile soil does not arise. Proposed usage of land for the next FIVE years shall be less than 3.36.0hectare. Afforestation will be started during the first year of mining operation itself.
	c. Stabilization and vegetation of dumps	: The topsoil will be spread over the non-active dumps along the slope and edges to plant tree saplings to form vegetal cover over the dumps. Such vegetal cover will prevent erosion of dumps during rainy seasons.
	d. Measures to minimize Adverse effect on water regime	: There are no chemicals of high metals and no hazardous substances are likely to be quarried during the quarrying of Rough Stone and hence, the in no way the quality of ground water will be affected. The water to be pumped will be pure and potable and therefore it will not affect any water regime of the area.
	e. Socio economic benefits arising out of mining	: <ol style="list-style-type: none"> 1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
	f. Noise and vibration	: Since, no deep hole blasting is proposed with small dia explosives are used for breaking the hard rock and boulders, the noise and vibration will be very minimum and are within the permissible limits.
11.9	Proposal for Waste Management	: The overburden of the applied area Topsoil. So Reject W-E Side. Topsoil = 445m ³ Dump = 7137 TOTAL = 7582m ³
11.10	Proposal of Reclamation of Land affected during mining activities and at the end of mining.	: The present mining is proposed to an average depth of 5m. The mined out area will be fenced on top of open cast working with S1 fencing. Low lying areas with water logging shall be used for fish culture. No immediate proposals for closure of pit as the Rough Stone persist still at deeper level.

11.11	Program for Afforestation	:	Trees like tamarind, casuarinas etc will be planted along the lease boundary and avenues as well as over non active dumps at a rate 10 trees per annum with an interval of 5m. The rate of survival expected to be 80% in this area.
11.12	Proposed Financial Estimate / Budget for (EMP) Environment Management	:	
	Fixed Asset Cost:		
	1. Land Cost	:	Own Patta land
	2. Labour Shed	:	Rs. 50,000/-
	3. Sanitary Facility	:	Rs. 50,000/-
	4. Fencing cost	:	Rs. 1,25,000/-
	Total=	:	Rs. 2,25,000/-
	Machinery cost	:	Rs.20,00,000/-
	EMP Cost:		
	1. Drinking water facility	:	Rs. 1,00,000/-
	2. Safety kids	:	Rs. 50,000/-
	3. Water sprinkling	:	Rs. 50,000/-
	4. Afforestation	:	Rs. 50,000/-
	5. Water quality test	:	Rs. 50,000/-
	6. Air quality test	:	Rs. 25,000/-
	7. Noise/vibration test	:	Rs. 25,000/-
	8. Cost towards charity	:	Rs. 25,000/-
	Total=		Rs. 3,75,000/-
	Total Project Cost	:	Rs. 26,00,000/-

12.0 MINE 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 5m. The mined out area will be fenced on top of open cast working with S1 fencing to arrest the entry of cattles 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 using Barbed wire fencing. Green belt development at the rate of 10 trees per year will be proposed.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	The area applied for quarry lease was already held under the quarry lease and the pits were already opened. Hence, the quarrying operation will be continued in the existing pit after making proper benches within the applied area for lease.


13.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

- (i) Permission will be obtained from the District Mines Office to extract the Rough Stone from the Boundary barriers and for slopes.
- (ii) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (iii) The applicant will endeavor every attempt to quarry the Rough Stone economically, without any wastage and to improve the environment and ecology.
- (iv) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued and also prepared by incorporating the details mentioned in the letter SEIAA/TN/Minor and Minerals/2012 dated 17.04.2012.
- (v) The average proposed production of Rough Stone for five years for 349706m³ and average production per year is 69941 m³.



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Salem (Dist), Tamil Nadu - 635 301.
Cell: 94439 37841

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 3458 / LC / 2012 dt 19-11-2012 and Draft Minor Mineral Conservation & Development Rules 2010


Assistant Director of Geology and Mining
Kannur District.

This Mining Plan is approved subject to the conditions / stipulations indicated in the Mining Plan approval Letter No: 888/MINMS/201 Dated: . 2. 2017



ந.க.எண்.888/கனிமம்/2016 நாள். 05.01.2017

மாவட்ட ஆட்சியர், வரலாற்று அலுவலகம், கனிமப் பிள்ளை

குறிப்பாணை

- பொருள்** - கனிமங்களுக்கும் குவாரிகளுக்கும் - சாதாரண கற்கள் - குப்பம் கிராமம் - புல எண். 706(பகுதி) - ல் 3.36.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டியெடுக்க ஐந்து ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் கோரிய திருமதி.ச.தமிழ்செல்வி என்பவரின் மனு - அங்கீகரிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் மாநில அளவிலான சுற்றுச் சூழல் தூக்க மதிப்பீட்டு ஆணையத்தின் ஒப்புதல் பெற்று அளிக்க வேண்டுவது - தொடர்பாக.
- பார்வை**
1. திருமதி.ச.தமிழ்செல்வி, க/பெ.சபாபதி, கணேசா நகர் 1 வது தெரு, இனாம் கரூர் கரூர் வட்டம், & மாவட்டம் என்பவரின் மனு நாள்: 15.09.2016
 2. இவ்வலுவலக இதே எண்ணிட்ட கடிதம் நாள்: 16.09.2016 வருவாய் கோட்டாட்சியருக்கு முகவரியிட்டது.
 3. கரூர், வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கை ந.க.அ1/3835/2016 நாள்: 26.12.2016.
 4. கரூர் புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநர் இடப்பார்வை அறிக்கை நாள்: 31.12.2016
 5. அரசாணை எண்.79 தொழில் (எம்.எம்.சி1) துறை, நாள்.06.4.2015.

கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், குப்பம் கிராமம் பட்டா புல எண். 706(பகுதி) - ல் 3.36.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் ஐந்து ஆண்டுகளுக்கு வெட்டியெடுக்க திருமதி.ச.தமிழ்செல்வி, க/பெ.சபாபதி, கணேசா நகர் 1 வது தெரு, இனாம் கரூர் கரூர் வட்டம், & மாவட்டம் என்பவரின் குவாரி குத்தகை உரிமம் கோரி பார்வை 1ல் விண்ணப்பித்துள்ள மனுவின் பேரில் கரூர், வருவாய் கோட்டாட்சியர் மற்றும் உதவி இயக்குநர் (கனிமம்) ஆகியோரால் மேற்காணும் விண்ணப்ப புலத்தின் மொத்தப் பரப்பு 3.36.0 ஹெக்டேரில் ஐந்து ஆண்டுகளுக்கு தமிழ்நாடு சிறு கனிம சலுகை விதிகள் 1959ன் விதி எண் 19(1), 20 மற்றும் 22 -ன் படியும் கீழ்காணும் நிபந்தனைகளுக்கு உட்பட்டும் பரிந்துரை செய்யப்பட்டுள்ளது.

1. அருகிலுள்ள பட்டா புலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி மேற்கொள்ள வேண்டும்.



2. விண்ணப்ப புலத்திற்கு வடமேற்காக 18 மீட்டர் தொலைவிற்கு அப்பால் செல்லும் மின்கம்பிக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி வீட்டு குவாரிப்பணி செய்யவேண்டும்.

விண்ணப்ப புலம் 706 (பகுதி) ல் 4.00.0 ஹெக்டேர்ஸ் பரப்பில் கருள் மாவட்ட ஆட்சித் தலைவர் அவர்களின் செயல்முறை ஆணைகள் ந.க.எண். RC.No:118/G&M/2010, நாள்:30.09.2010 முதல் 29.09.2015 -ன்படி ஐந்து ஆண்டுகளுக்கு ஏற்கனவே அனுமதி வழங்கப்பட்டு சாதாரண வகை கற்கள் வெட்டி எடுக்கப்பட்ட குழி 2.30.0 ஹெக்டேர் பரப்பில் சராசரியாக 11 மீட்டர் அளவில் காணப்படுவதாக உதவி இயக்குநர் (கனிமம்) அறிக்கை அளித்துள்ளார்.

உதவி இயக்குநர் (கனிமம்) தனது அறிக்கையில் மேற்கண்ட புலத்தை சுற்றி 500 மீட்டர் தொலைவிற்குள் அமைந்துள்ள குவாரிகள் பற்றிய விவரங்களை பின்வருமாறு தெரிவித்துள்ளார்.

வ. எண்	குவாரிகளின் பெயர்	கிளாம்	புல எண்	பரப்பு	மாவட்ட ஆட்சியின் செயல்முறை/நாள்	குத்தகை வகை
1	திருமதி ச.துமிழ்செல்லி க/பெசபாபதி, கணேச நகர் 1 வது தெரு, இளம் கருள் கருள் வட்டம், & மாவட்டம்.	குடும்பம்	702	3.35.5	117/2010 Dt.03.9.10	அருகிலுள்ள விண்ணப்ப புலம்.
2	திரு.குணசேகரன், த/பெ.முத்துச்சாமி, காரையாணையம், நட்டையூர் அஞ்சல், கருள் மாவட்டம்.	குடும்பம்	710/2	3.04.5	B/268/08 Dt.29.05.09	குத்தகை உரிமம் முடிவற்றது
3	வி.எ.பாதுவிதையகர் பருமெட்டல்ஸ், புல எண்.1177/1,2,3 ஏ. 3.வி, குடும்பம் அஞ்சல், கருள்.	குடும்பம்	706/2	1.85.0	207/2011, Dt.29.2.16	02.3.2015 முதல் 03.2.2021 வரை
4	திருமதி ச.துமிழ்செல்லி க/பெசபாபதி, புதிய எண். 16பி/2, கணேச நகர் 1 வது தெரு, இளம் கருள் கருள் வட்டம், & மாவட்டம்.	குடும்பம்	706(Part)	3.36.0		விண்ணப்ப புலம்
			மொத்தம்	11.61.0		

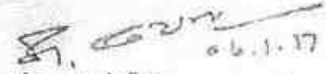
இது தொடர்பாக கருள் வருவாய் கோட்டாட்சியர் மற்றும் உதவி இயக்குநர் (கனிமம்) ஆகியோர்களின் பரிந்துரை மற்றும் நிபந்தனையின் அடிப்படையில் விண்ணப்ப புல எண். 706 (பகுதி)- ல் 3.36.0 ஹெக்டேர்ஸ் பரப்பில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வழங்க அங்கீகரிக்கப்பட்ட சுரங்கத் திட்டம் (Approved Mining Plan) மற்றும் யாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு



ஆணையத்தின் சுற்றுச் சூழல் ஒப்புதல் (Environment Clearance) ஆகியவற்றை தமிழ்நாடு சிறு கனிம சலுகை விதிகள் 1959ன் விதி எண்.41 மற்றும் 2020ன் கீழ் உரிய கால அலகாசத்தில் பெற்று சமர்ப்பிக்க வேண்டும் என இதன் மூலம் அறிவுறுத்தப்படுகிறது.

(ஓம்)/-கு.கோவிந்தராஜ்,
மாவட்ட ஆட்சித்தலைவர்,
கனடர்

// உண்மை நகல் / உத்தரவுப்படி //


06.10.17

மாவட்ட ஆட்சித்தலைவருக்காக
கனடர்

பெறுநர்
திருமதி.ச.தமிழ்செல்வி,
க/பெ.சபாபதி, கணேசா நகர் 1 வது தெரு, இனாம் கனடர்,
கனடர் வட்டம், & மாவட்டம்.


06.10.17

நகல்:-

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

மாவட்டம். (தென்மேற்குப் பகுதி)

கீழர்

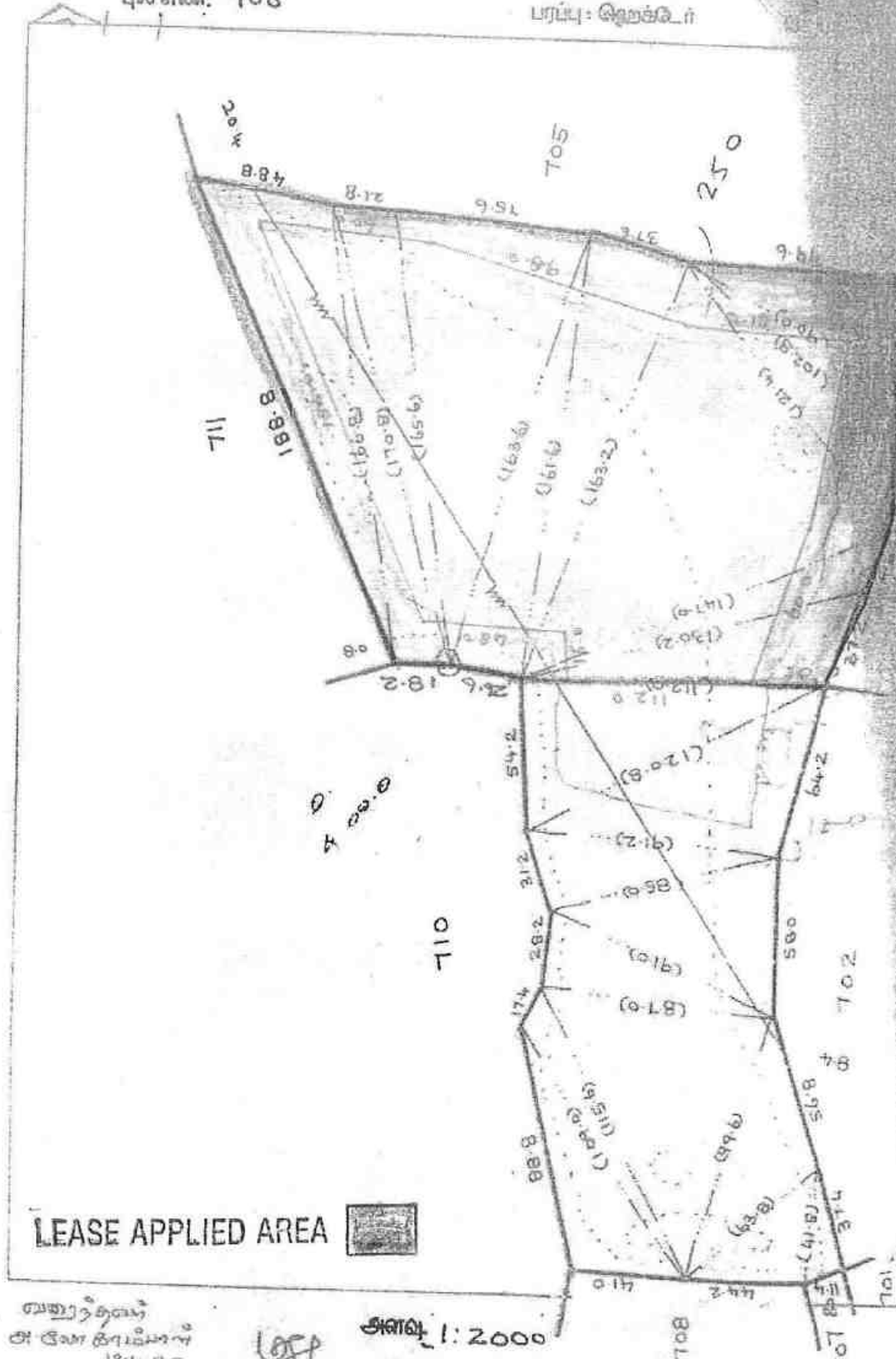
வட்டம். (சே) அரவடீர்ப்பி

சீரமம்



புல எண். 706

பரப்பு: ஏக்கர்கள்



LEASE APPLIED AREA

வகுத்தல்
சென்னை கிராமியம்
19-11-85

அளவு 1:2000

சுமார் / வகுப்புவாரி
[Signature]

மா. தென்மேற்குப் பகுதி

No. 9
 KUPPAM (4 PARTS)
 PART 4
 KARUR TALUK
 TRICHIRAPPALI DISTRICT

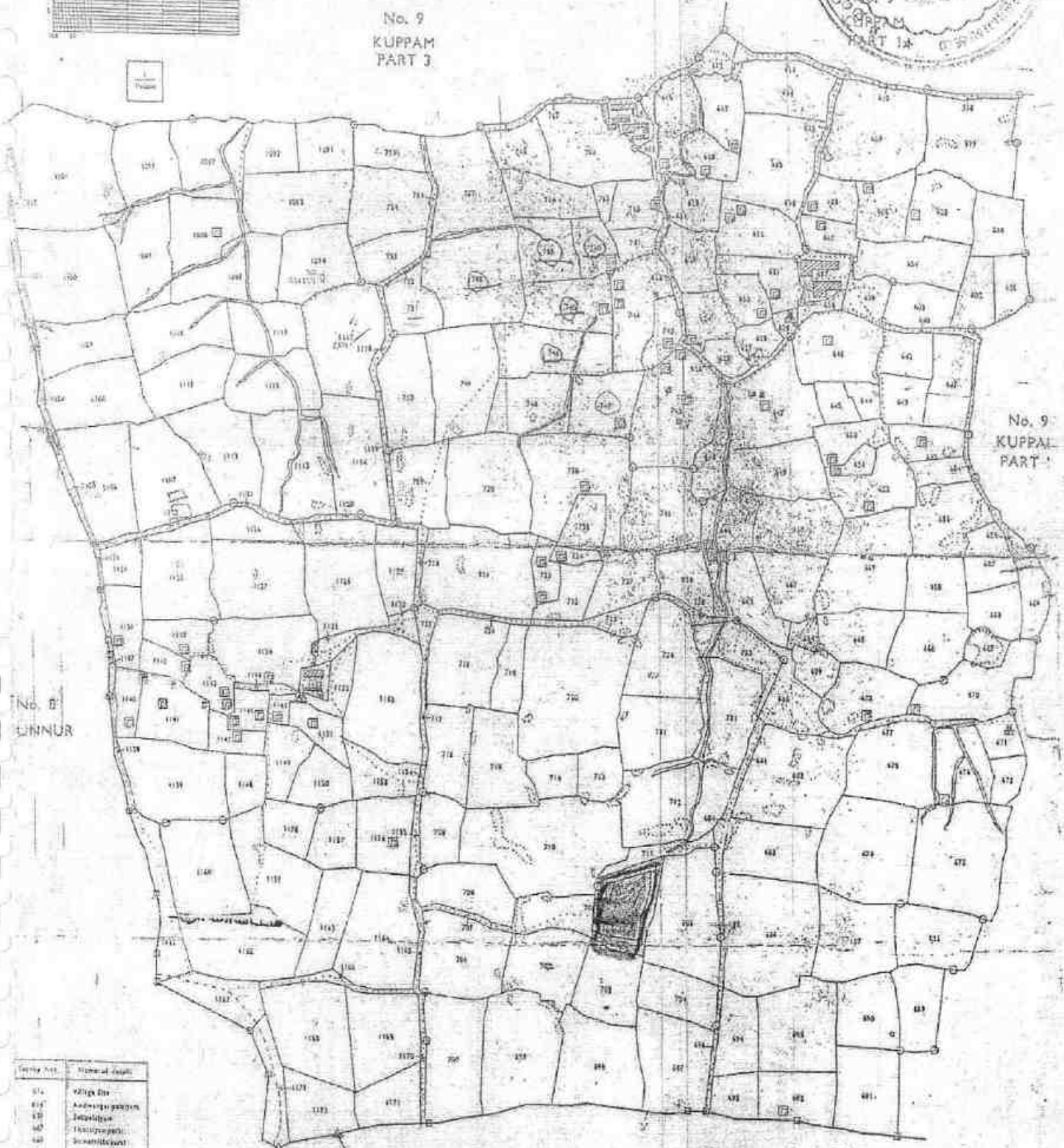


No. 9
 KUPPAM
 PART 3

No. 9
 KUPPAM
 PART 1

No. 8
 LINNUR

Survey No.	Original Name
674	Kattigudi
675	Andampalayam
676	Indalpet
677	Kattipalayam
678	Somathikulam
679	Meluruppalayam
680	Veerampalayam
681	Village
682	Kattipalayam



No. 39
 PARAMATHI

No. 36
 KARUDAIYAMPALAYAM
 PART 1.

செய்யப்பட்டிருக்கிற பகுதி
 செய்யப்படாத பகுதி

சென்னை
 தர்மநாயக அலுவலர்
 10, சம்பத் திரைத் தெரு
 அரவக்குறிச்சி வட்டம்

LEASE APPLIED AREA

செய்யப்பட்டிருக்கிற பகுதி
 செய்யப்படாத பகுதி



தமிழக அரசு

வருவாய்த் துறை

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

பட்டம் : கரூர்

வட்டம் : அரவக்குறிச்சி

பாய் கிராமம் : குப்பம்

பட்டா எண் : 543

உரிமையாளர்கள் பெயர்

சபாபதி	மனைவி		தமிழ் செல்வி		மற்றவை	
	நன்செய்	புன்செய்	நன்செய்	புன்செய்	நன்செய்	புன்செய்
	பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை
எண் உட்பிரிவு	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை
706	--	--	5 - 38.00	7.45	--	--
			5 - 38.00	7.45		

படி :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/02/007/00543/50752 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து, உறுதி செய்துகொள்ளவும்.
2. இது தகவல்கள் 15-07-2016 அன்று 03:03:04 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படப்பாண மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



அ-பதிவேடு விவரங்கள்



மாவட்டம் : கரூர்

வட்டம் : அரவக்குறிச்சி

விராமம் : குப்பம்

1. புல எண்	706	9. மண் வயனமும் ரகமும்	8 - 4
2. உட்பிரிவு எண்	-	10. மண் தரம்	6
3. அழைய புல உட்பிரிவு எண்	706 ,	11. தீர்வை (ரூ - ஹெ)	1.38
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	5 - 38.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	7.45
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	543
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.தமிழ் செல்வி

114

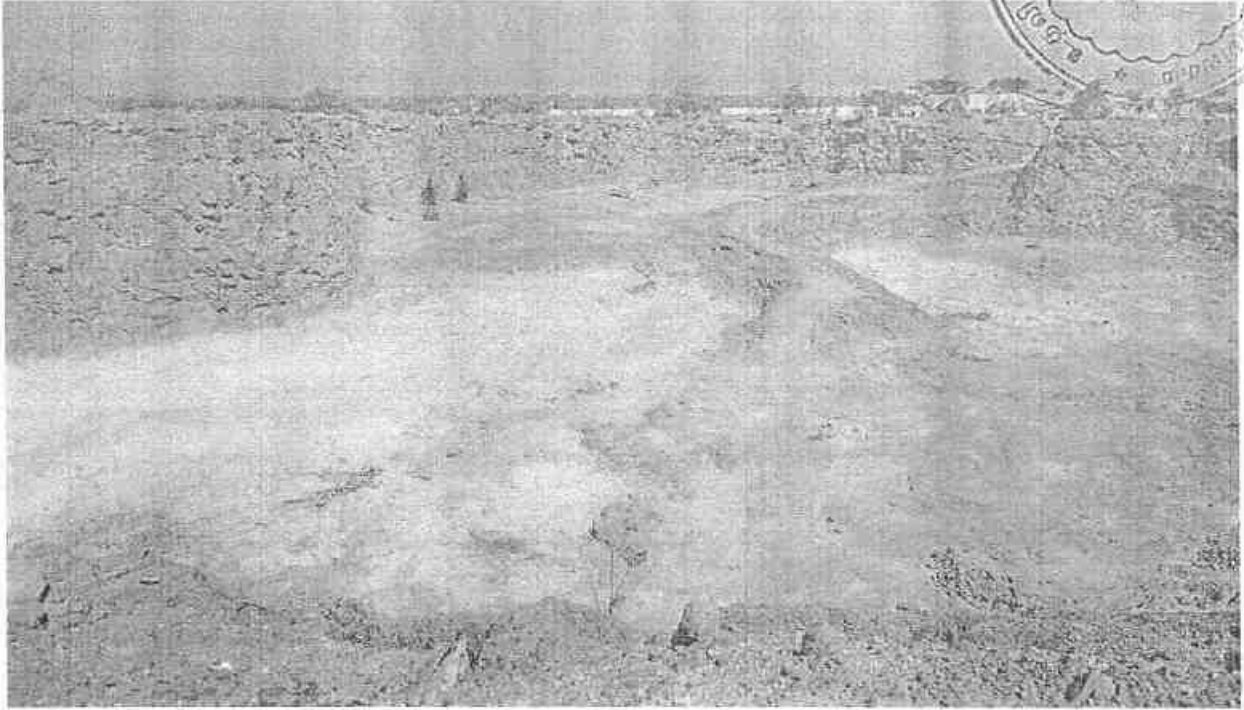
கி. எண் 9 குப்பம்.



1	2	3	4	5	6	7	8	9	10	12	
702	...	702	ர	4	...	8-4	6	1 38	3 35.5	4 64	329 செ. பழனி கவுண்டர்.
703	...	703	ர	4	...	8-4	6	1 38	3 01.0	4 17	541 வச. ராமலிங்கம்.
704	...	704	ர	4	...	8-4	6	1 38	2 37.0	3 28	742 வே. முத்துசாமி கவுண்டர் (1), வே. ராமசாமி கவுண்டர் (2).
705	...	705	ர	4	...	8-4	6	1 38	5 34.5	7 40	1010 மொ. ராமசாமி மற்றும் மூன்று பேர்களும்.*
706	...	706	ர	4	...	8-4	6	1 38	5 38.0	7 45	543 செ. ராமாண்டி பண்டாரம்.
707	...	707	அ	4D	...	...	...	...	0 27.0	...	.....
708	...	708	ர	4	...	8-4	6	1 38	3 18.5	4 41	1317 சி. செல்லப்ப கவுண்டர் மற்றும் பதினோறு பேர்களும்.*
709	...	709	ர	4	...	8-4	6	1 38	1 98.5	2 74	1133 பெ. ராமசாமி மற்றும் ஐந்து பேர்களும்.*
710	...	710	ர	4	...	8-4	6	1 38	9 15.0	12 66	1224 கு. வாங்கிலியப்ப கவுண்டர் மற்றும் ஏழு பேர்களும்.*
711	...	711	அ	4D	...	...	...	...	1 03.0	...	.....
712	1	712-பா	ர	4	...	8-4	6	1 38	1 95.0	2 70	889 சி. வாங்கிலியப்ப கவுண்டர் (1), சி. கருப்பண கவுண்டர் (2), வச. பழனிச்சாமி (3).
	2	-பா	ர	4	...	8-4	6	1 38	0 88.0	1 21	330 மு. பழனிச்சாமி கவுண்டர்.
	3	-பா	ர	4	...	8-4	6	1 38	2 80.5	3 90	735 மு. சின்னப்ப கவுண்டர் (1), மு. வாங்கிலியப்ப கவுண்டர் (2).
									5 64.5	7 81	
713	...	713	ர	4	...	8-4	6	1 38	1 54.0	2 13	1011 கு. வாங்கிலியப்ப கவுண்டர் மற்றும் மூன்று பேர்களும்.*

1. கண்ணா ரவி / டீபி

விவரம் பட்டியலைப் பார்ப்பதற்காக.

LOCATION OF THE APPLIED AREA

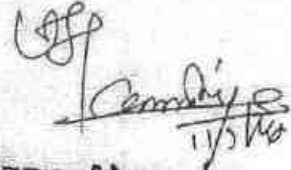
SURVEY NO	: 706(Part)
VILLAGE	: KUPPAM
TALUK	: ARAVAKURICHI,
DISTRICT	: KARUR,
STATE	: TAMILNADU.

சுயக்ஞ

கீரர் மாவட்டம், கீரர். சூப்பம், கீரம்
கீரர் கிராமம், கீரர்சாரை, KVB காலனி
என்ற இடங்களில் உள்ளிட்ட சமீபத்தில்
சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்
சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்
சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்
சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்
சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்

சமீபத்தில் 706 மாவட்டம் சமீபத்தில்

1. சமீபத்தில் 708 மாவட்டம் (அ) சமீபத்தில் சமீபத்தில்
2. சமீபத்தில் 703 V. சமீபத்தில் (ஆ) சமீபத்தில் சமீபத்தில்
3. சமீபத்தில் 711 சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்
4. சமீபத்தில் 705 சமீபத்தில் (அ) சமீபத்தில் சமீபத்தில்


11/1/16

சமீபத்தில் சமீபத்தில் சமீபத்தில் சமீபத்தில்
13, சமீபத்தில் சமீபத்தில்,
சமீபத்தில் சமீபத்தில் சமீபத்தில்,
சமீபத்தில் சமீபத்தில்

Transferred to: M/s. Sivakuru Explosives Prop. Murrugesan

LICENCE FORM LE-3

(See article 3(a) to (d) of Part I of Schedule IV of Explosives Rules, 2008)

Licence to possess : (c) for use, explosives of class 1, 2, 3, 4, 5, 6 or 7

Licence No. : E/SC/TN/12/431(E28779)
Annual Fee Rs 5000/-

Licence is hereby granted to : M/s.Sivakuru Explosives Prop.V.P Murrugesan (Occupier : V.P.MURRUGESAN)
Karur to Erode Main Road ,Punnamchartram (PO)Aravankurichi Taluk, Karur, Town/Village -
Aravankurichi
District-KARUR, State-Tamil Nadu, Pincode - 639136

- 2 Status of licensee : Partnership Firm
- 3 Licence is valid only for the following purpose : possess for use of Nitrate Mixture, Safety Fuse, Detonating Fuse, Electric and/or Ordinary Detonators,
4. (a) Licence is valid for the following kinds and quantity of explosives:

Sr. No.	Name and Description	Class & Division	Sub-division (If any)	Quantity at any one time
1	Nitrate Mixture	2.0	0	1000 Kg.
2	Safety Fuse	6.1	0	20000 Mtrs
3	Detonating Fuse	6.2	0	20000 Mtrs
4	Electric and/or Ordinary Detonators	6.3	0	40000 Nos.

(b) Quantity of explosives to be purchased in a calendar month [applicable for licence under article 3(b) and (c)] : 18 times as above.

- 5 The licensed premises shall conform to the following drawing(s):
Drawing No : E/SC/TN/12/431(E28779) dated : 13/12/2005
- 6 The licensed premises are situated at following address:
Survey No(s) : 1274/2. Town/Village : PUNNAM, Aravankurichi taluk
Police Station : VELAYUTHAMPALAYAM P.S
PinCode : Phone : District : KARUR State : Tamil Nadu
E-Mail : Fax :
- 7 The licensed premises consist of following facilities : A MAIN MAGAZINE, A DETONATOR ANNEXE AND A LOBBY
- 8 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.
(1) Drawings (showing site, constructional and other details) as stated in serial No. 5 above.
(2) Conditions and Additional Conditions of this licence signed by the licensing authority.
(3) Distance Form DE-2
- 9 This licence shall remain valid till 31st day of March 2007

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 Ser 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

The Date 13/12/2005


Joint Chief Controller of Explosives
South Circle, Chennai

Amendments :

- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 04/10/2011
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 22/12/2011
- Change in Postal Address dated : 22/12/2011

Transfers :

- Change in Authorized Signatory/Occupier/Partners/Directors dated : 11/03/2014

Endorsement for renewal of licence:

Date of Renewal	Date of Expiry	Signature of licensing authority
07/03/2014	31/03/2019	Sd/- Jt. Chief Controller of Explosives, South Circle, Chennai



Statutory Warning : Misbandling and misuse of explosives shall constitute serious criminal offence under the law.



SIVAKURU EXPLOSIVES

KARUR TO ERODE MAIN ROAD, PUNNAMCHATARAM POST, ARAVAKURUICHI (TK), KARUR.

Date: 10.01.2017

To

S. TAMILSELVI,
w/o Sabapathi,
16B, Ganesha nagar 1 st Street,
KVB Colony,
Karur-Dt.

Sub: Regarding blasting work using explosive in your proposed quarry

Sir,

We are having explosive Licence in Form 22 holding No: E28779 situate in survey SF No.1274/2, Punnam village, Aravakurichi taluk, Karur District. our office functioning At, Karur to Erode Main Road, Punnamchataram, Aravakurichi (Tk), karur District.

We are enacting 2 explosive vans for transporting detonators and class 2 separately for our magazine to our work site and well experienced and licensed blasters and shot firer for safe blasting work since 5 years without untoward incident.

We are willing to undertake blasting work on contract basis at your SFNO: 706, KUPPAM Village, Aravakurichi (Tk), Karur District.

Thank you

Enclosure:

1. License Copies

Yours faithfully,
For SIVAKURU EXPLOSIVES,

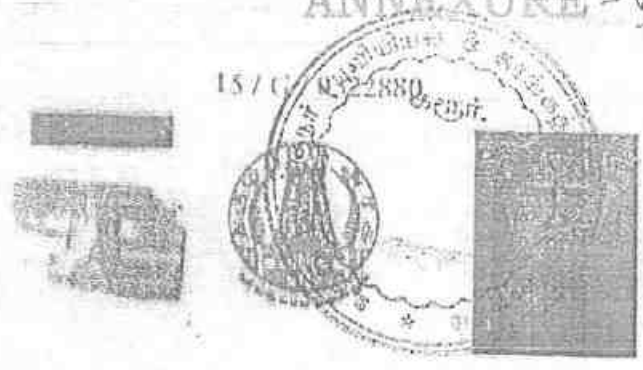
V.P.M.

Proprietor.

1. குடும்பத்தலைவரின் பெயர்/குடும்ப		2. குடும்பத்தலைவர், வயது/பாலினம்	
நிழல்செய்யிட		ஒன்று	
பெயர்	வயது 168/2/	3. குடும்பத்தலைவரின் தகவல்	
கனம் தங்க இயற்கு		பெரியவர்கள் 3	
கனம் சந்திர		சிறியவர்கள் 0	
39001			
பி (ய)			
குடி			
பெயர்	வயது	பெயர்	வயது
நிழல்செய்யிட	43		
கனம் தங்க	23		
கனம் சந்திர	21		

A0051189P4 --- November 2009

CI Name null
O/AC Name null



குடும்ப அட்டை Family Card
2008 - 2009

உணவுப்பொருள் வழங்கல் மற்றும் நுகர்வு
பாதுகாப்புத்துறை
Civil Supplies and Consumer Protection
Department

பி (ய)		
குடும்ப அட்டை/பெயர்	பெரியவர்கள்	சிறியவர்கள்
007	021	168/2/168
கனம் தங்க	கனம் தங்க பெயர்	குடும்பத்தலைவர் பெயர்
AC023	கனம் தங்க பெயர் 1	74424



Signature of Shri S. Karuppannan

अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रमाण पत्र
(खनिज रियायत नियमावली, 1960 के नियम 22सी के तहत)
CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON
(Under Rule 22C of Mineral Concession Rules, 1960)

श्री एस. करुपप्पण, मॉगनीकाडू, मुत्तमंपट्टी पोस्ट, बोम्मीडी वर्यो, ओमलूर तालुक, सेलम डीस्ट्रीक्ट, तमिलनाडू - 635 301, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोष जनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है।

Shri S. Karuppannan, Manganikadu, Muthampatty (Post), Bommiidi (Via), Omalur Taluk, Salem District, Tamilnadu - 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है

His registration number is

RQP /MAS/263/2014/A

यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 15.12.2024 को समाप्त होगी।
This recognition is valid for a period of 10 years ending on 15.12.2024.

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

This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai

दिनांक/ Date : 16.12.2014.

Signature of Regional Controller of Mines

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



GEO TECHNICAL MINING SOLUTIONS

5/1485-4, Salem Main Road,
Elakkiampatty, Dharmapuri - 636705, Tamilnadu
Off. Ph:04342 231813, Mobile: +91 9443937841, 979041
E-mail: info.gtmsdpr@gmail.com

ANNEXURE - X



GEO PHYSICAL RESISTIVITY SURVEY REPORT ON THE ASCERTAIN GROUNDWATER TABLE FOR S.F.NO. 706 (PART) KUPPAM VILLAGE, ARAVAKURICHI TALUK, KARUR DISTRICT, TAMILNADU STATE.

SL. NO.	DETAILS	
1	Name of the Applicant	Tmt.S.TAMILSELVI
2	Address of the Applicant	Tmt.S.TAMILSELVI W/O.S.SABAPATHI, 16B,GANESHA NAGAR 1ST STREET,INAM KARUR, KARUR TALUK,KARUR DISTRICT
3	S.F.No	706(Part)
4	Extent in	3.36.0
5	Village	KUPPAM
6	Taluk	ARAVAKURICHI
7	District	KARUR

- ✱ Exploration & Geological Investigation
- ✱ Comprehensive Ground Water Investigation
- ✱ E.I.A, E.M.P & E.C

- ✱ Preparation of mining plan, SOM, PMCP, FMCP
- ✱ Electrical Resistivity Testing (ERT)
- ✱ Ambient Air Quality Monitoring

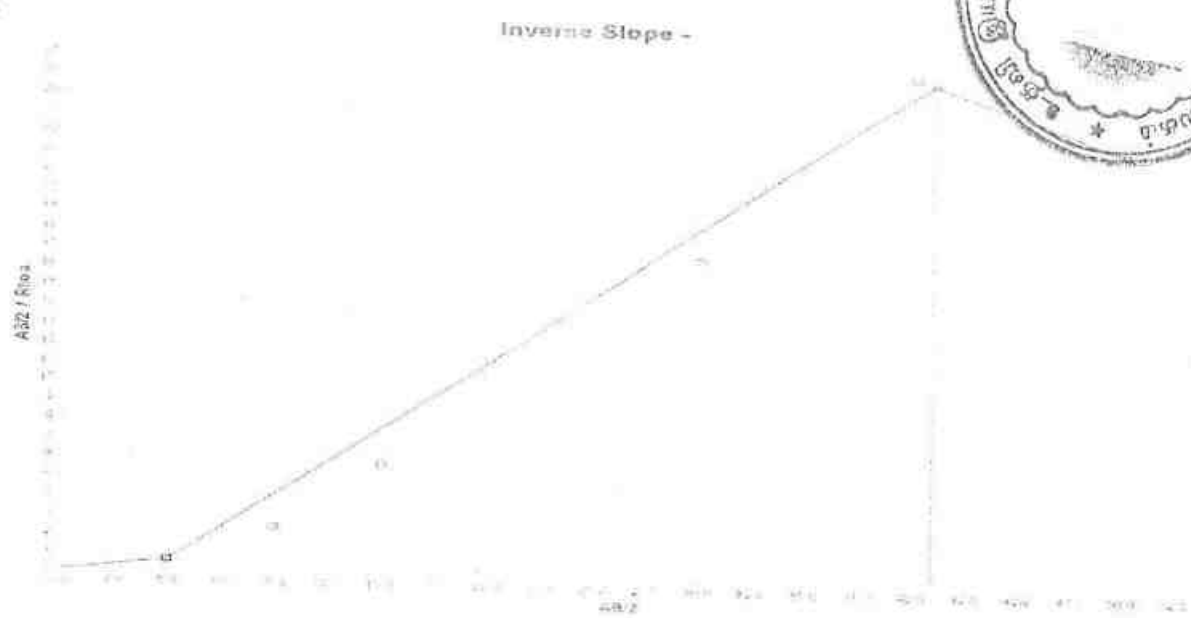
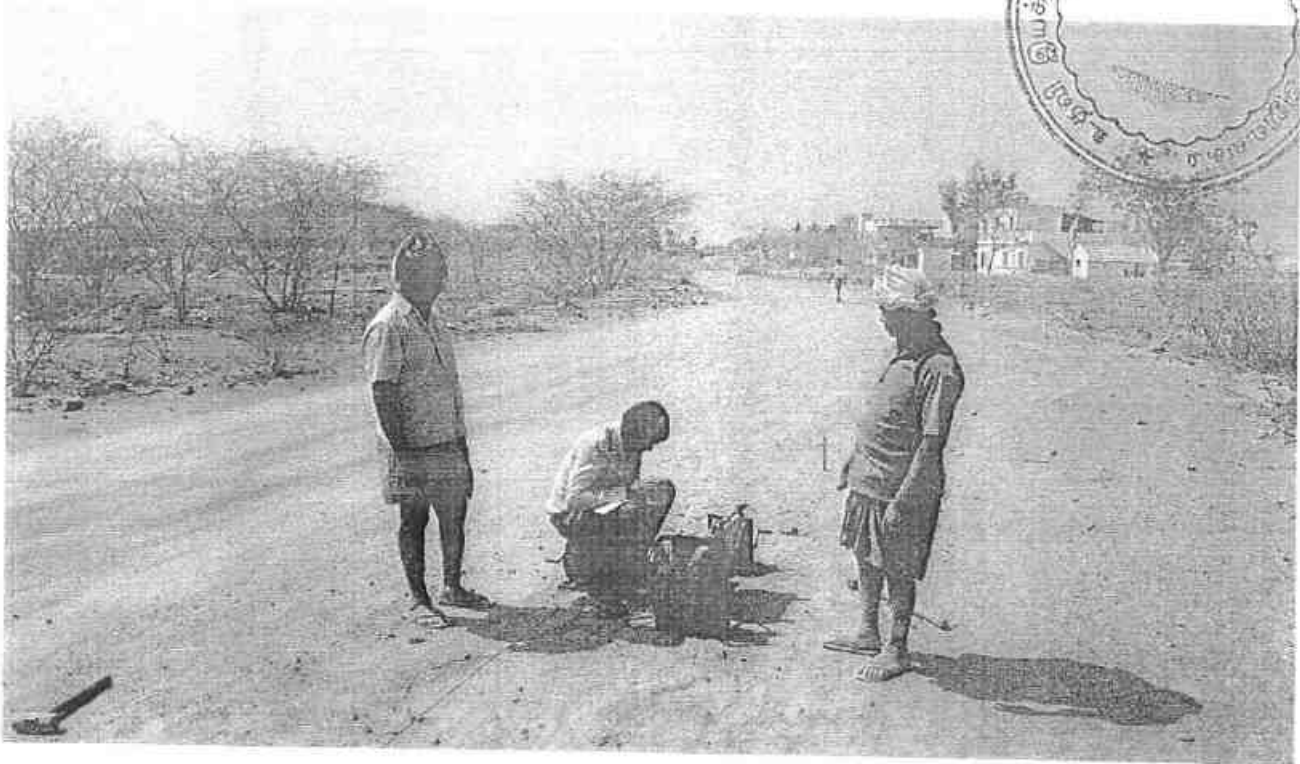


Table.1. Geophysical Investigation Field Data

<u>Direction / Location</u>			<u>GPS Lat/long</u>	
North Eastern side			10°58'44.78"N 77°55'55.68"E	
AB/2 Depth (Mts)	MN/2 (Mts)	Geometrical factor G	Resistivity R	Apparent Resistance (Ohms Mts)
5	3	8.381	26.29	220.31
10	3	47.67	6.37	303.78
15	3	113.14	3.55	401.38
20	3	204.81	2.44	499.86
25	5	188.57	2.82	531.78
30	5	275.00	2.42	665.73
40	5	495.00	1.64	811.54
50	10	377.143	3.23	1220.00
60	10	550.000	2.67	1470.36
70	10	754.286	2.00	1510.00
80	10	990.000	1.71	1689.00
90	10	1257.143	1.63	2049.14
100	10	1555.714	1.43	2224.67

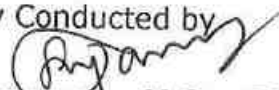
Geologist doing Geophysical work in the field



On the data's derived by Geophysical prospecting and after carefully analyzed the formation that there is topsoil with weathered formation from surface up to 3.3 m and followed by hard rock fracture zones are 42m respectively therefore the rough stone quarry above the water table and hence, quarrying may not affect the ground water.

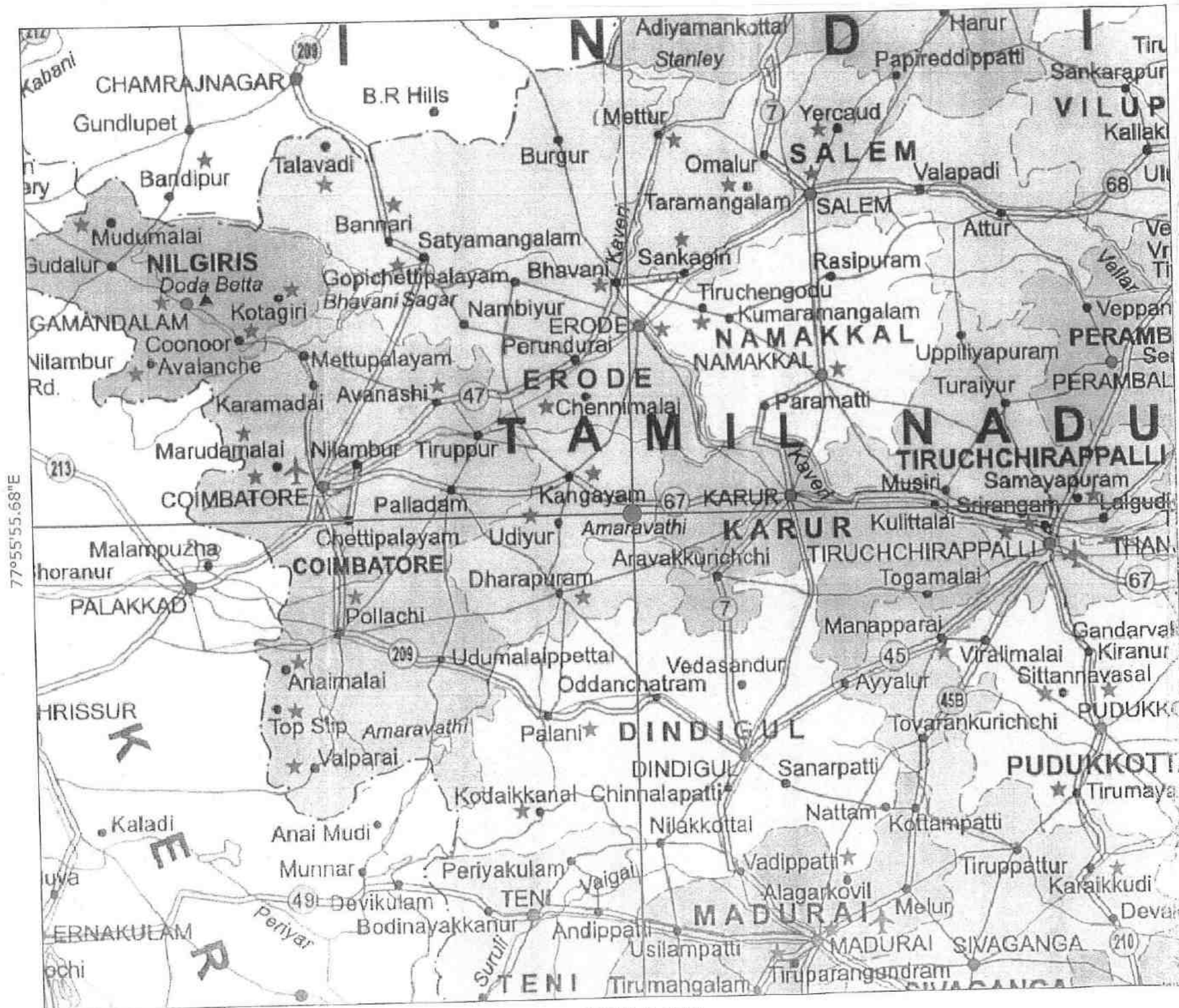
VES No	Water Level in m. below ground level (BGL)	Probed Depth
1, North East corner	42m	100m.

This report is prepared to our best of knowledge, experience and the data's obtain by Geophysical prospecting of results derived by Vertical Electrical Sounding (VES).

Study Conducted by

Dr.S.Karuppannan, M.Sc., Ph.D.,
Govt. Approved Geologist

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
Manganikadu, Mulhampatty (Post)
Bommidi (Via), Omalur (Tk),
Salem (Dist), Tamil Nadu - 635 301.
Cell: 94439 37841

10°58'50.85"N



77°55'55.68"E

77°55'55.68"E

10°58'43.65"N



PLATE NO-I

APPLICANT:
 Tmt. THAMILSELVI,
 W/o. P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

MINE LEASE AREA : ●
 TOPO SHEET NO : 58-F/13
 LATITUDE : 10°58'50.85"N to 10°58'43.65"N
 LONGITUDE: 77°55'55.68"E to 77°56'1.01"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

D. S. KARUPPANNAN, M.Sc. Ph.D.
 RECOGNIZED QUALIFIED PERSON
 EQYMAS/203/2015/A

KEY MAP

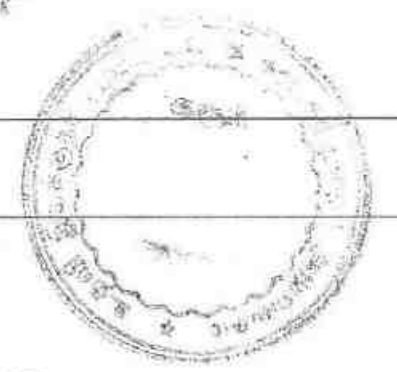
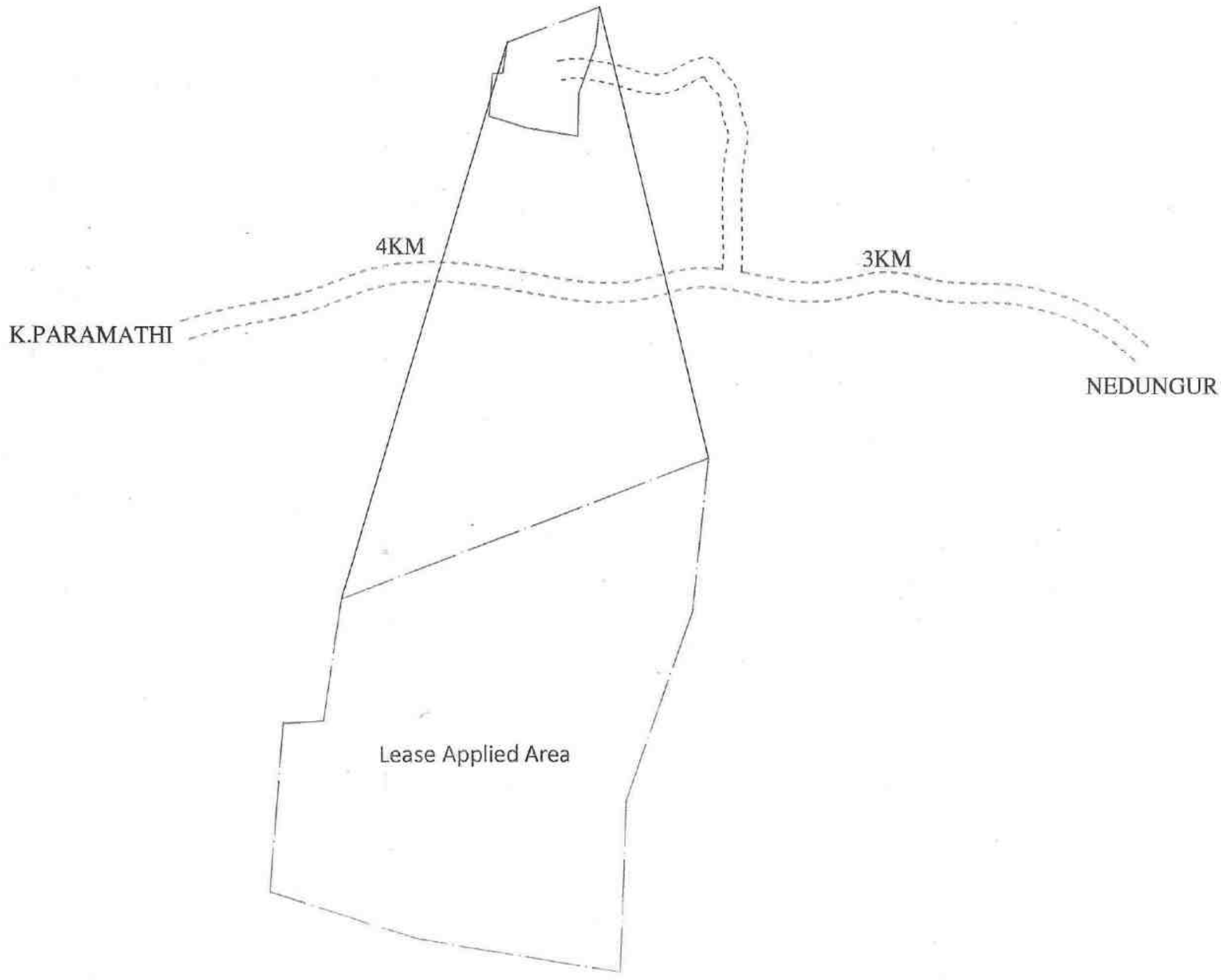

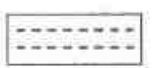


PLATE NO-IA

APPLICANT:
Tmt. THAMILSELVI,
W/o. P. SABAPATHI,
GANESANAGAR 1st STREET,
ENAM,
KARUR TALUK,
KARUR DISTRICT.

LOCATION:
EXTENT : 3.36.0 Ha,
S.F.NO : 706(part)
VILLAGE : KUPPAM
TALUK : ARAVAKURICHI,
DISTRICT : KARUR.

INDEX

- MINE LEASE AREA 
- APPROACH ROAD 

KEY MAP

Not to Scale

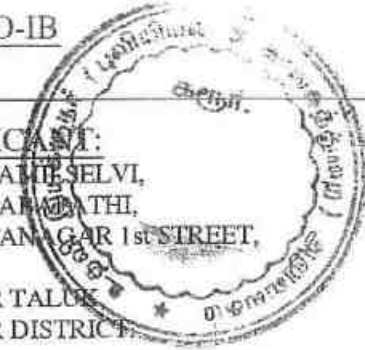
Prepared By:

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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A 165 A

PLATE NO-IB

APPLICANT:
Tmt. THAMIL SELVI,
W/o. P. SANKARATHI,
GANESAN GAR 1st STREET,
ENAM,
KARUR TALUK,
KARUR DISTRICT



LOCATION:

EXTENT : 3.36.0 Ha,
S.F.NO : 706(part)
VILLAGE : KUPPAM
TALUK : ARAVAKURICHI,
DISTRICT : KARUR.

INDEX

TOPO SHEET NO : 58-F/13
LATITUDE : 10°58'50.85"N to 10°58'43.65"N
LONGITUDE: 77°55'55.68"E to 77°56'1.01"E

MINE LEASE BOUNDARY

10KM RADIOUS

TOPO SHEET MAP

Prepared By:

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TO THE BEST OF MY KNOWLEDGE

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



10°58'50.85"N



77°55'55.68"E

77°55'55.68"E

10°58'43.65"N









PLATE NO-IC

APPLICANT:
 Tmt. THAMILSELVI,
 W/o. P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.


LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F. NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

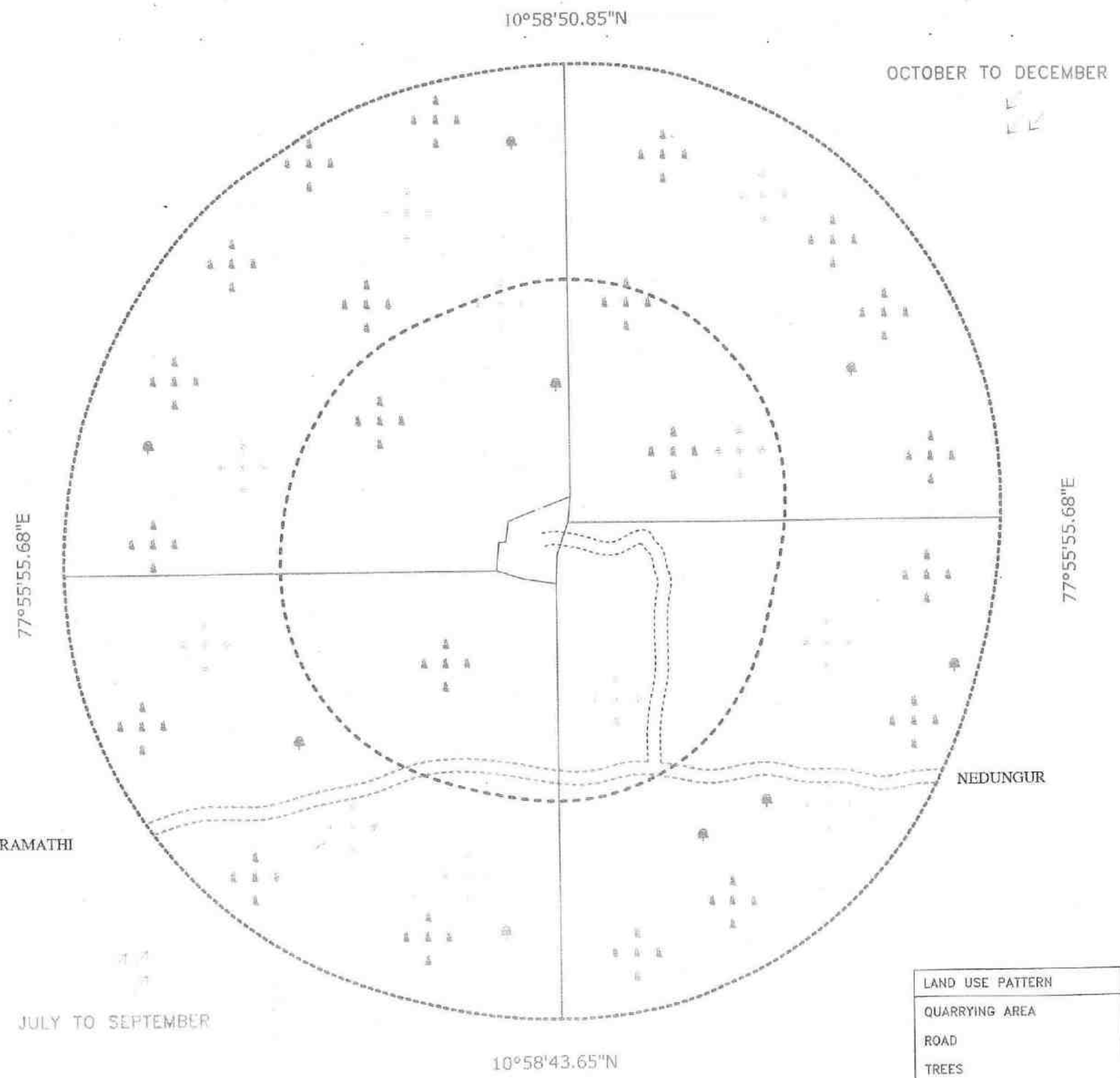
INDEX

- MINE LEASE AREA 
- VILLAGE ROAD 
- APPROACH ROAD 
- 300m RADIUS 
- 500m RADIUS 
- 1Km RADIUS 

TOPO SHEET NO : 58-F/13
 LATITUDE : 10°58'50.85"N to 10°58'43.65"N
 LONGITUDE: 77°55'55.68"E to 77°56'1.01"E

SATELLITE IMAGINARY MAP

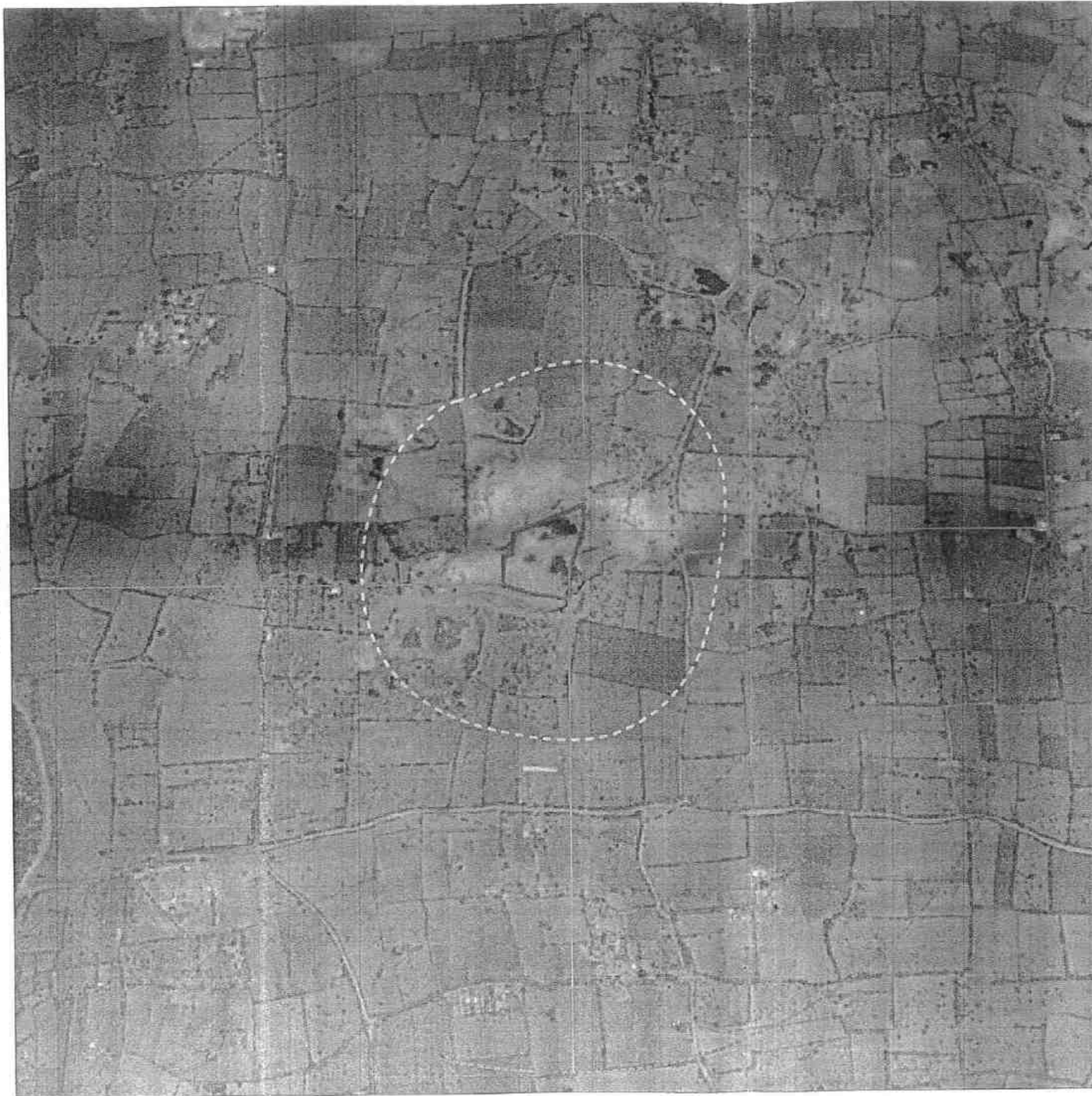
Prepared By:
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 TO THE BEST OF MY KNOWLEDGE

 Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/763/2014/A



LAND USE PATTERN	PERCENTAGE%
QUARRYING AREA	03%
ROAD	10%
TREES	15%
SESONAL AGRICULTURAL LAND	36%
BARREN LAND	36%

10°58'50.85"N

77°55'55.68"E



77°55'55.68"E

10°58'43.65"N

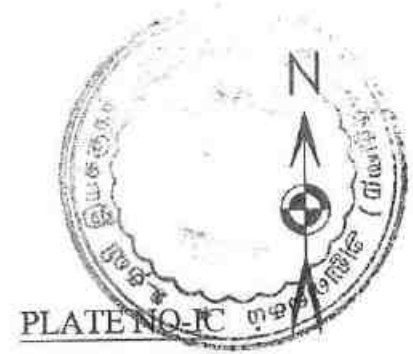


PLATE NO-IC

APPLICANT:

Tmt. THAMILSELVI,
W/o. P. SABAPATHI,
GANESANAGAR 1st STREET,
ENAM,
KARUR TALUK,
KARUR DISTRICT.

LOCATION:

EXTENT : 3.36.0 Ha,
S.F.NO : 706(part)
VILLAGE : KUPPAM
TALUK : ARAVAKURICHI,
DISTRICT : KARUR.

INDEX

MINE LEASE AREA	
VILLAGE ROAD	
APPROACH ROAD	
300m RADIUS	
500m RADIUS	
1Km RADIUS	

TOPO SHEET NO : 58-F/13
LATITUDE : 10°58'50.85"N to 10°58'43.65"N
LONGITUDE: 77°55'55.68"E to 77°56'1.01"E

SATELLITE IMAGINARY MAP

Prepared By:

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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/265/2014/A

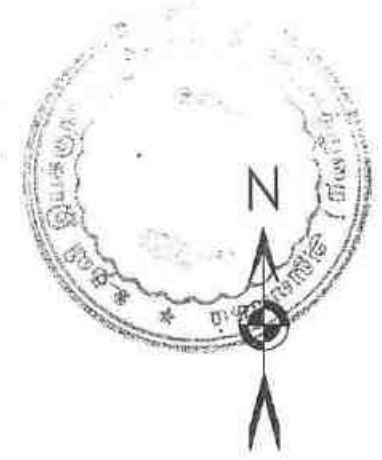
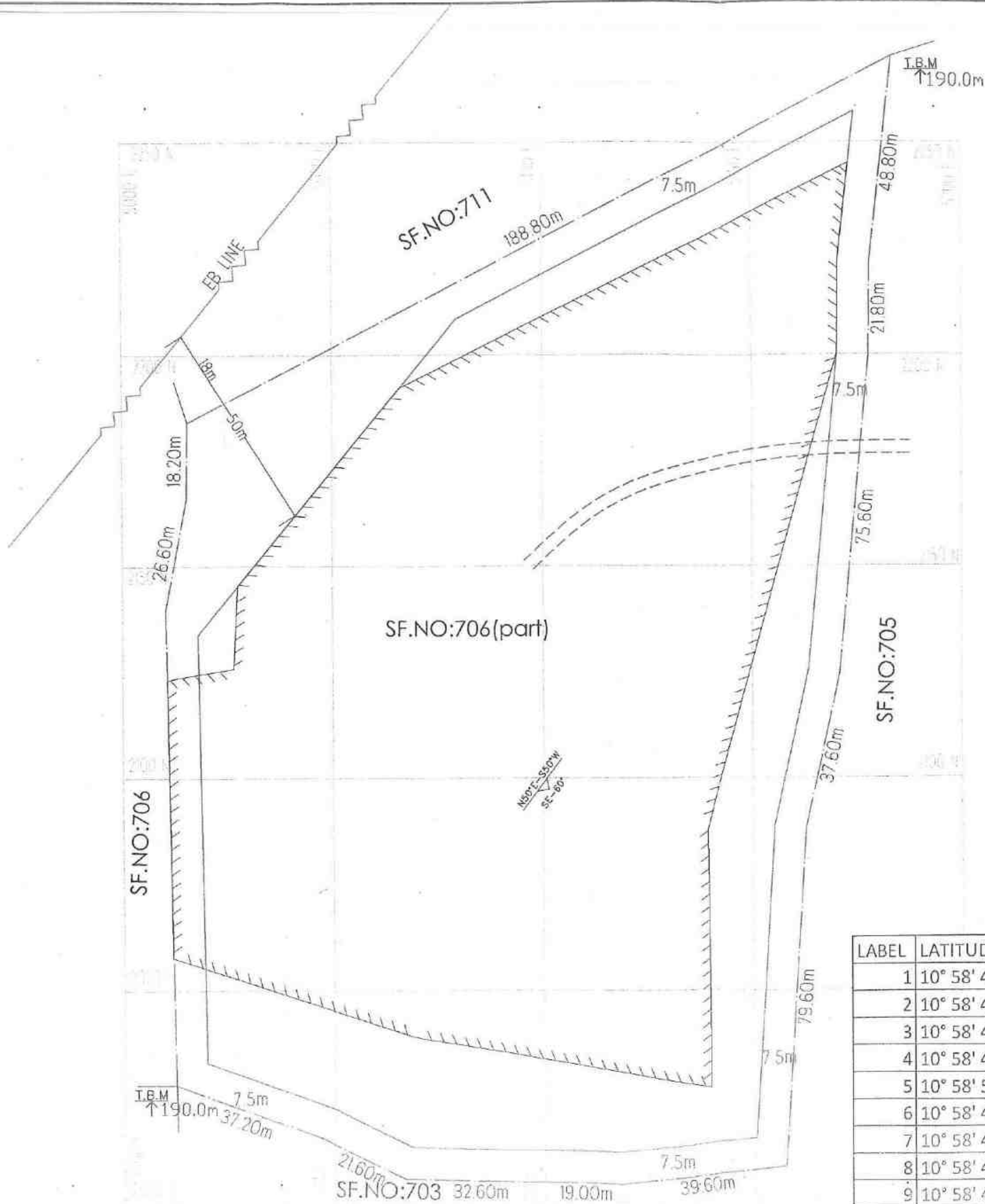


PLATE NO-II

APPLICANT:
 Tmt. THAMILSELVI,
 W/o. P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

- MINE LEASE BOUNDARY
- 7.5m & 50m SAFTY DISTANCE
- TEMPORARY BENCH MARK
- APPROACH ROAD
- STRIKE & DIP
- EB LINE

MINE LEASE PLAN

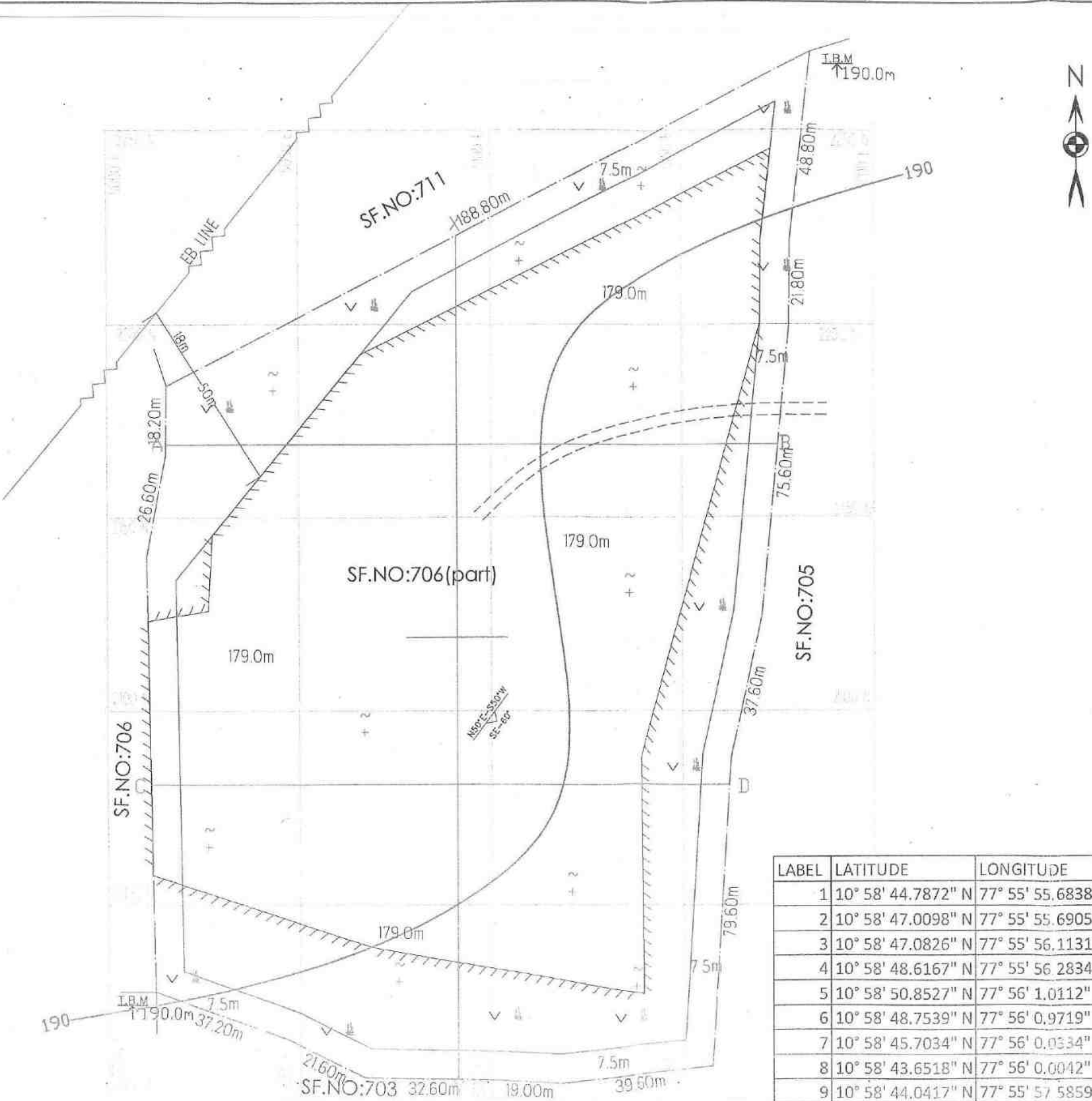
SCALE 1 : 1000

Prepared By:

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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
 RECOGNIZED QUALIFIED 169 A SON
 ROP/MAS/263/2014/A

LABEL	LATITUDE	LONGITUDE
1	10° 58' 44.7872" N	77° 55' 55.6838" E
2	10° 58' 47.0098" N	77° 55' 55.6905" E
3	10° 58' 47.0826" N	77° 55' 56.1131" E
4	10° 58' 48.6167" N	77° 55' 56.2834" E
5	10° 58' 50.8527" N	77° 56' 1.0112" E
6	10° 58' 48.7539" N	77° 56' 0.9719" E
7	10° 58' 45.7034" N	77° 56' 0.0334" E
8	10° 58' 43.6518" N	77° 56' 0.0042" E
9	10° 58' 44.0417" N	77° 55' 57.5859" E



APPLICANT
 Tmt. THAMIESELVI,
 W/o. P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

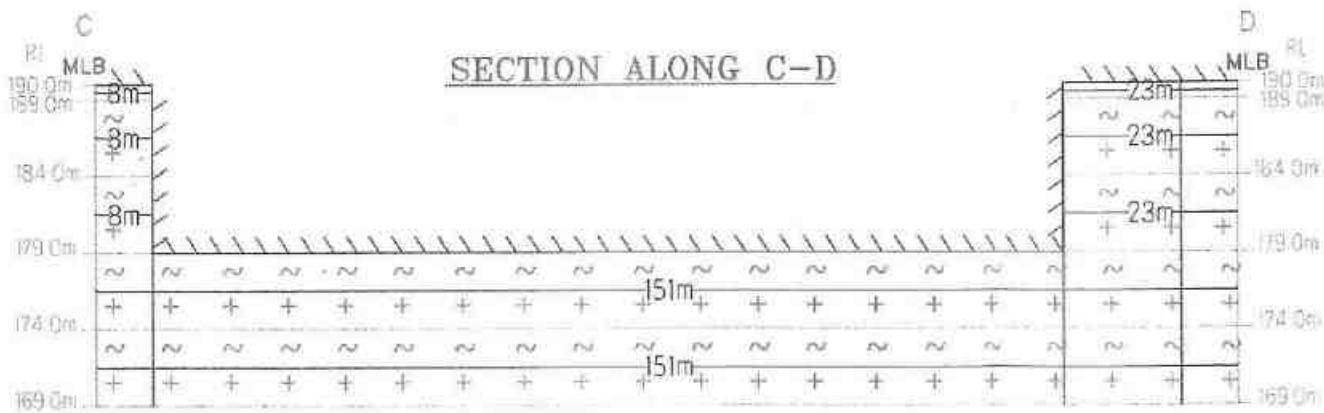
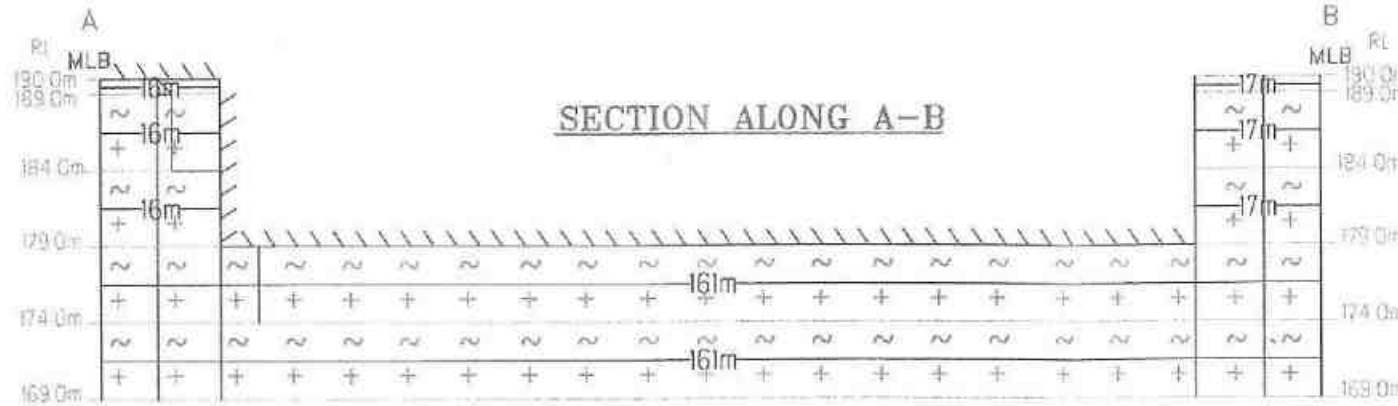
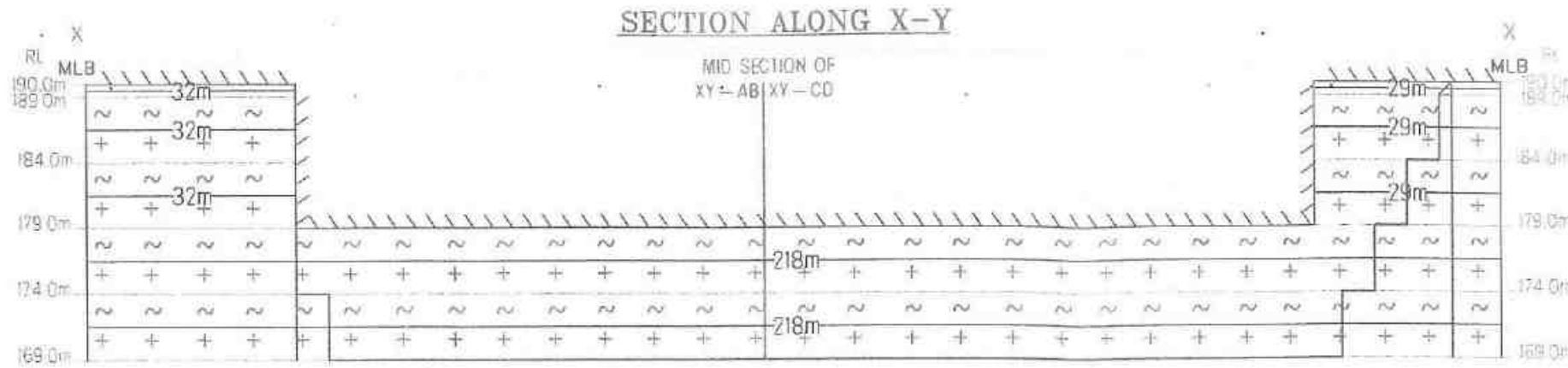
- MINE LEASE BOUNDARY
- 7.5m & 50m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- APPROACH ROAD
- STRIKE & DIP
- ROUGH STONE
- CONTOUR
- PIT
- EB LINE

SURFACE AND GEOLOGICAL PLAN
 SCALE 1 : 1000

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

Dr. S. KARUPPANNAN, M.Sc., Ph.D.
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/20170 A

LABEL	LATITUDE	LONGITUDE
1	10° 58' 44.7872" N	77° 55' 55.6838" E
2	10° 58' 47.0098" N	77° 55' 55.6905" E
3	10° 58' 47.0826" N	77° 55' 56.1131" E
4	10° 58' 48.6167" N	77° 55' 56.2834" E
5	10° 58' 50.8527" N	77° 56' 1.0112" E
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8	10° 58' 43.6518" N	77° 56' 0.0042" E
9	10° 58' 44.0417" N	77° 55' 57.5859" E



GEOLOGICAL RESERVES								
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In M3	Geological Reserves in m3 @ 98%	Mine waste in m3 @ 2%	Top Soil in m3
XY-AB	I-	18	45	1	810			810
	II	18	45	5	4050	3969	81	
	III	18	45	5	4050	3969	81	
	IV	104	160	5	83200	81536	1664	
	V	104	160	5	83200	81536	1664	
	VI	104	160	5	83200	81536	1664	
	VII	104	160	5	83200	81536	1664	
TOTAL					340900	334082	6818	810
XY-CD	I	30	31	1	930	911	19	930
	II	30	31	5	4650	4557	93	
	III	30	31	5	4650	4557	93	
	IV	114	151	5	86070	84349	1721	
	V	114	151	5	86070	84349	1721	
	VI	114	151	5	86070	84349	1721	
	VII	114	151	5	86070	84349	1721	
TOTAL					354510	347420	7090	930
GRAND TOTAL					695410	681502	13908	1740

PLATE NO-III-A

APPLICANT:
Tmt. THAMILSELVI,
W/o. P. SABAPATHI,
GANESANAGAR 1st STREET,
ENAM,
KARUR TALUK,
KARUR DISTRICT.

LOCATION:
EXTENT : 3.36.0 Ha,
S.F.NO : 706(part)
VILLAGE : KUPPAM
TALUK : ARAVAKURICHI
DISTRICT : KARUR.

INDEX

- MINE LEASE BOUNDARY ▬▬▬▬
- 7.5m & 50m SAFTY DISTANCE ▬▬▬▬
- ROUGH STONE ▬▬▬▬
- PIT ▬▬▬▬

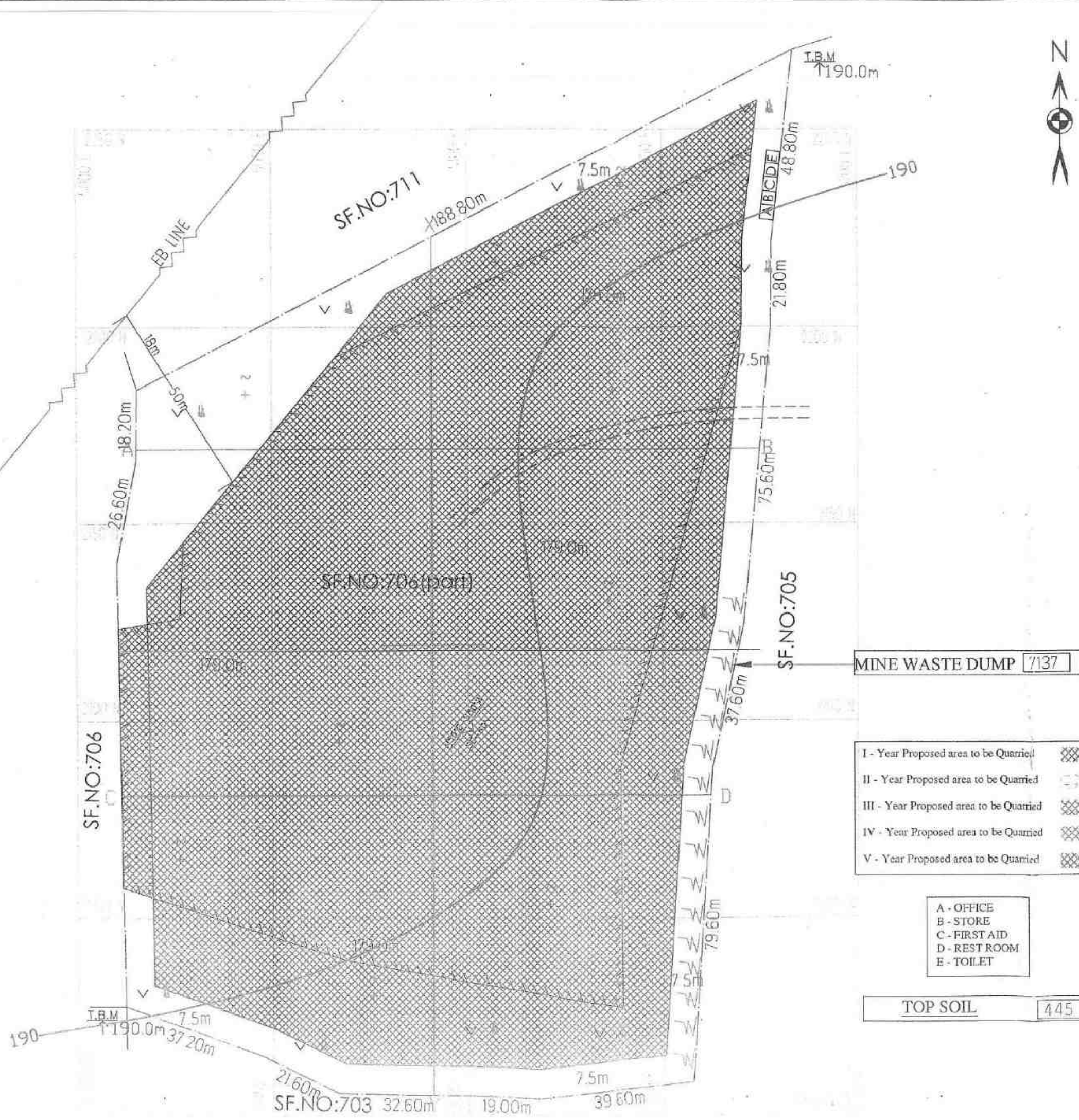
SURFACE AND GEOLOGICAL PLAN SECTIONS

SECTION / HOR. 1 : 1000, VEP : 500

Prepared By:

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



APPLICANT:
 Tmt. HANMISTH-VI,
 W/o. P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

MINE LEASE BOUNDARY	
7.5m & 50m SAFTY DISTANCE	
TEMPORARY BENCH MARK	
APPROACH ROAD	
STRIKE & DIP	
ROUGH STONE	
CONTOUR	
MINE WASTE DUMP	
PIT	
EB LINE	

MINE WASTE DUMP 7137

- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

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

TOP SOIL 445

YEARWISE DEVELOPMENT & PRODUCTION PLAN

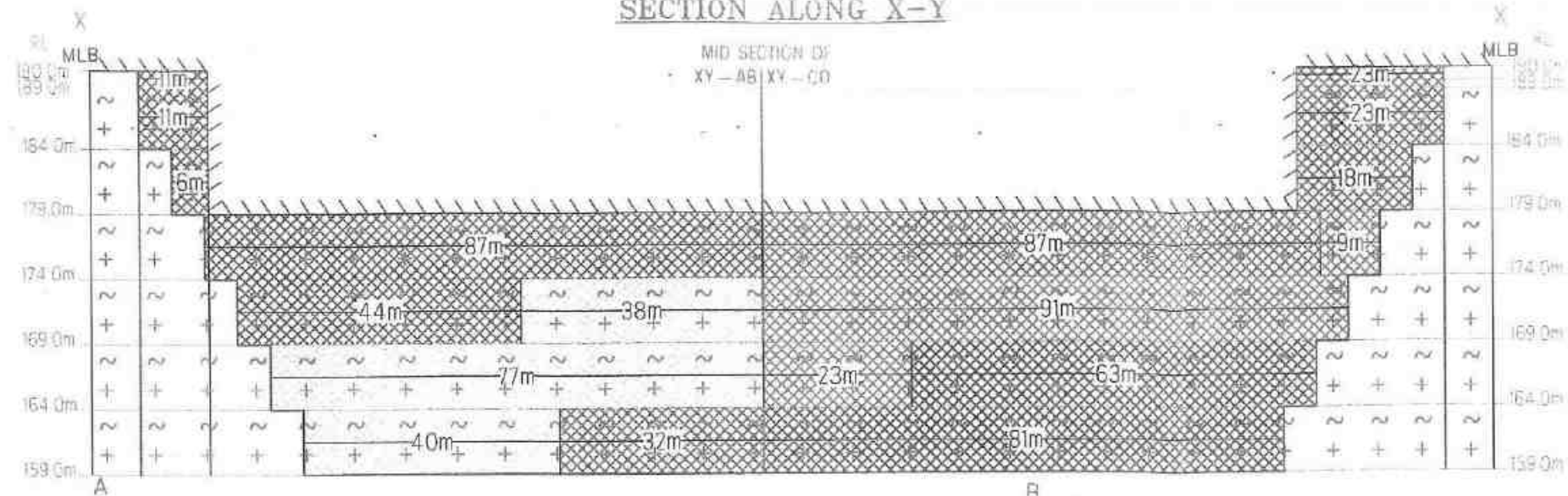
SCALE 1 : 1000

Prepared By:
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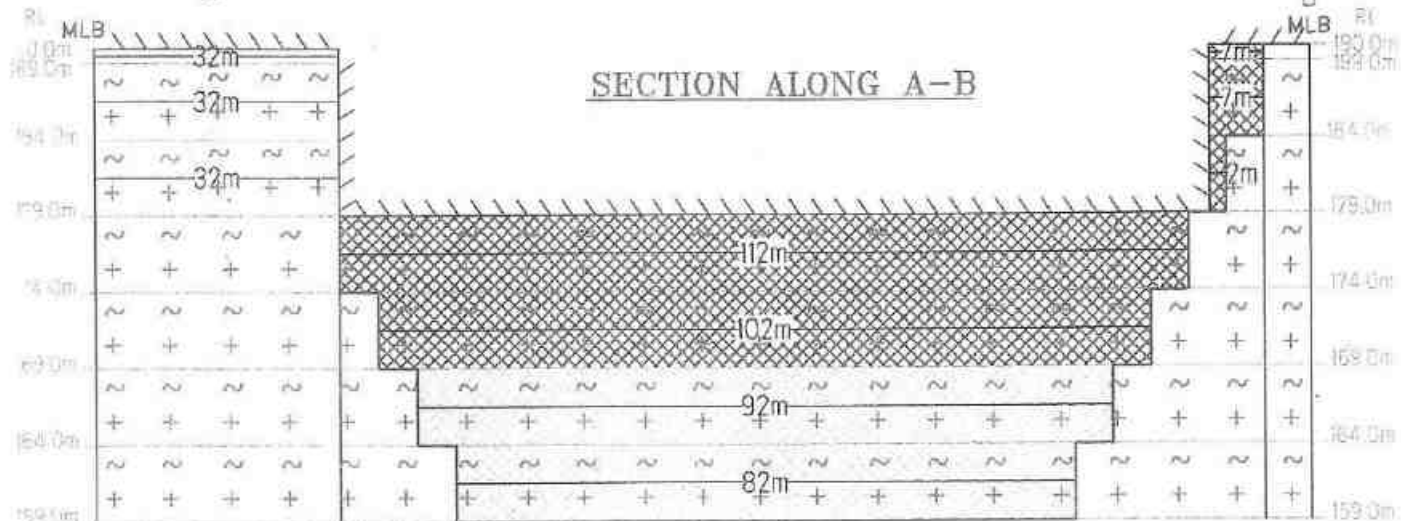
(Signature)

DES. KARUPPANNAN, M.Sc., Ph.D.
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/20172 A

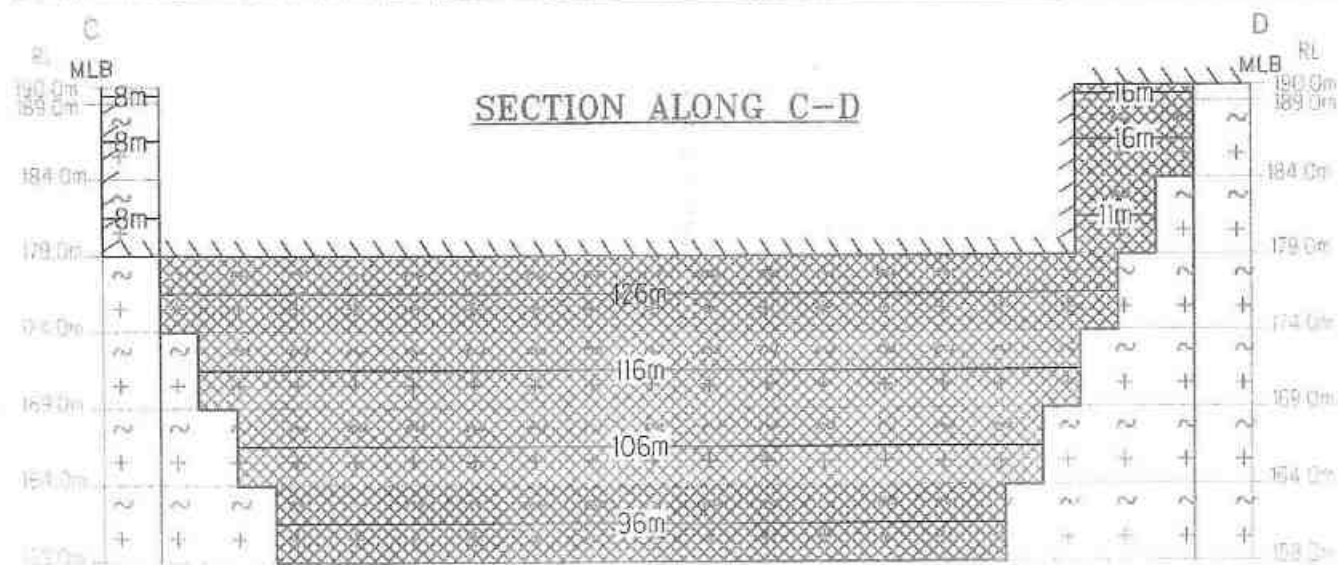
SECTION ALONG X-Y



SECTION ALONG A-B



SECTION ALONG C-D



YEARWISE PRODUCTION									
YEAR	Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In M3	Mineable Reserves in m3 @ 98%	Mine waste in m3 @ 2%	Top Soil in m3
I-YEAR	XY-AB	I	11	7	1	77			77
		II	11	7	5	385	377	8	
		III	6	2	5	60	59	1	
		IV	87	112	5	48720	47746	974	
		V	44	102	5	22440	21991	449	
		VI	38	102	5	19380	18992	388	
		VII	77	92	5	35420	34712	708	
II-YEAR	XY-AB	VIII	40	82	5	16400	16072	328	
		IX	32	82	5	13120	12858	262	
		X	23	16	1	368	361	7	368
III-YEAR	XY-CD	XI	23	16	5	1840	1803	37	
		XII	18	11	5	990	970	20	
		XIII	87	126	5	54810	53714	1096	
IV-YEAR	XY-CD	XIV	9	126	5	5670	5557	113	
		XV	91	116	5	52780	51724	1056	
		XVI	23	106	5	12190	11946	244	
V-YEAR	XY-CD	XVII	63	106	5	33390	32722	668	
		XVIII	81	96	5	38880	38102	778	
TOTAL						356920	349706	7137	445

PLATE NO-IV-A

APPLICANT:
 Tmt. THAMILSELVI,
 W/o.P.SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

- MINE LEASE BOUNDARY
- 7.5m & 50m SAFTY DISTANCE
- ROUGH STONE
- PIT

YEARWISE DEVELOPMENT & PRODUCTION PLAN SECTION SECTION FOR I-YEAR

Prepared By:

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

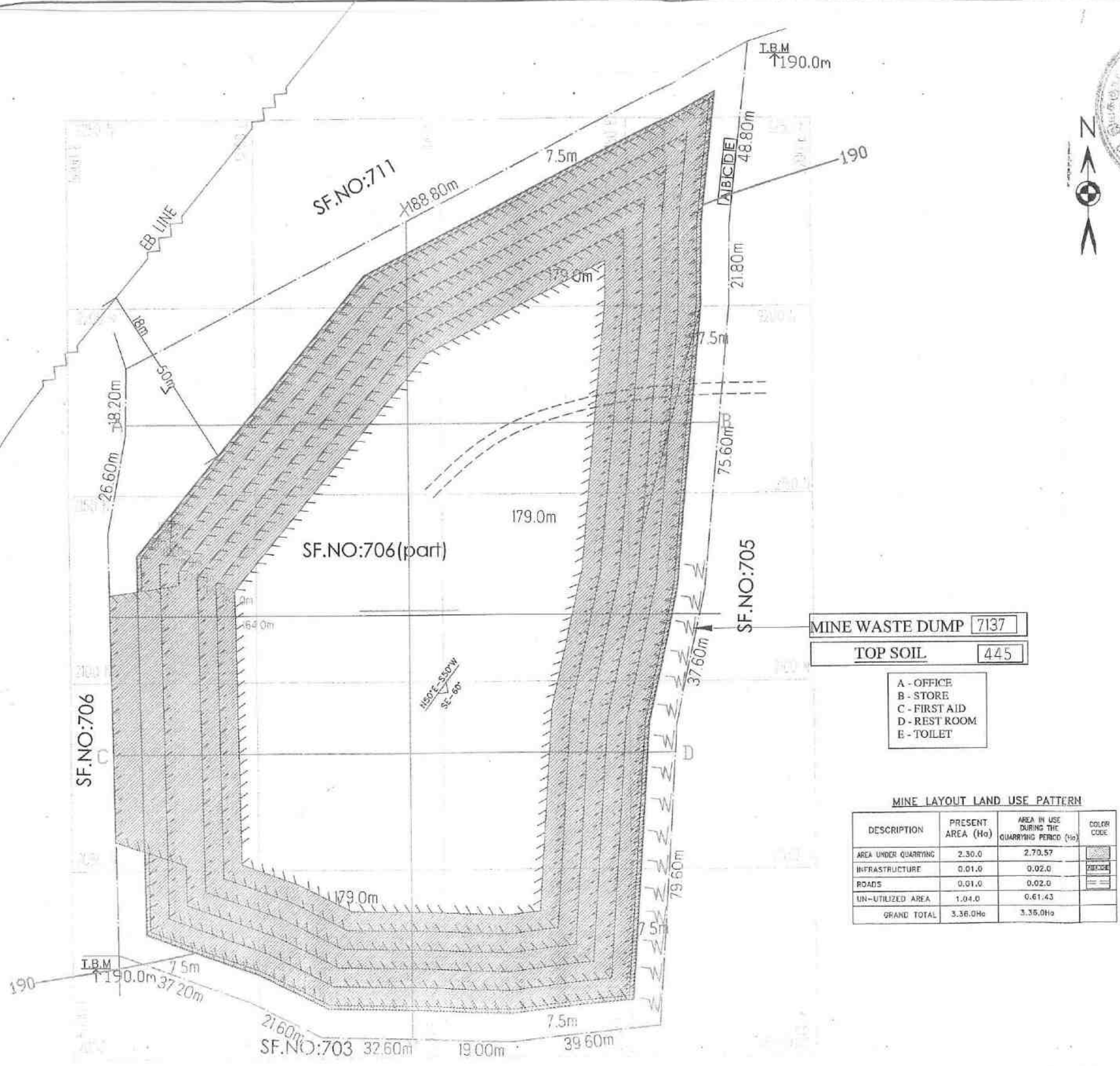


PLATE NO-V

APPLICANT:
 M^{rs}. THAMILSELVI,
 W/o P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

- MINE LEASE BOUNDARY
- 7.5m & 50m SAFTY DISTANCE
- TEMPORARY BENCH MARK
- APPROACH ROAD
- STRIKE & DIP
- ROUGH STONE
- CONTOUR
- MINE WASTE DUMP
- PIT
- EB LINE

MINE WASTE DUMP 7137
 TOP SOIL 445

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

MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Ha)	AREA IN USE DURING THE QUARRYING PERIOD (Ha)	COLOR CODE
AREA UNDER QUARRYING	2.30.0	2.70.57	
INFRASTRUCTURE	0.01.0	0.02.0	
ROADS	0.01.0	0.02.0	
UN-UTILIZED AREA	1.04.0	0.61.43	
GRAND TOTAL	3.36.0Ha	3.35.0Ha	

MINE LAYOUT PLANE AND LAND USE PATTERN
 SCALE : 1:1000

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

 Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 POP/MAS/263/201174 A

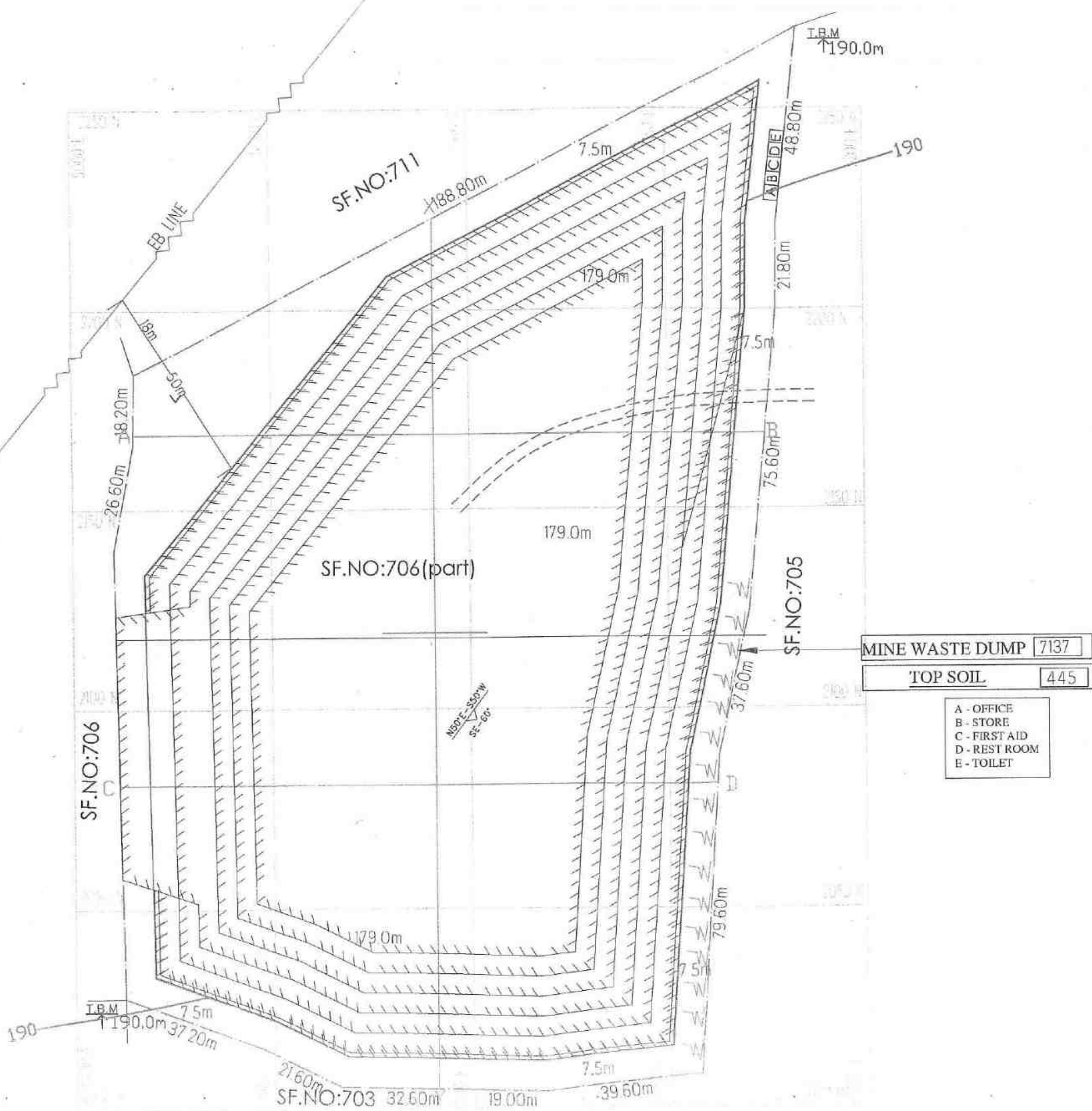


PLATE NO:VI

APPLICANT:
 THE THAMIL SELVI,
 W/o P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

MINE LEASE BOUNDARY	
7.5m & 50m SAFTY DISTANCE	
TEMPORARY BENCH MARK	
APPROACH ROAD	
STRIKE & DIP	
ROUGH STONE	
CONTOUR	
MINE WASTE DUMP	
PIT	
EB LINE	

MINE WASTE DUMP 7137
 TOP SOIL 445

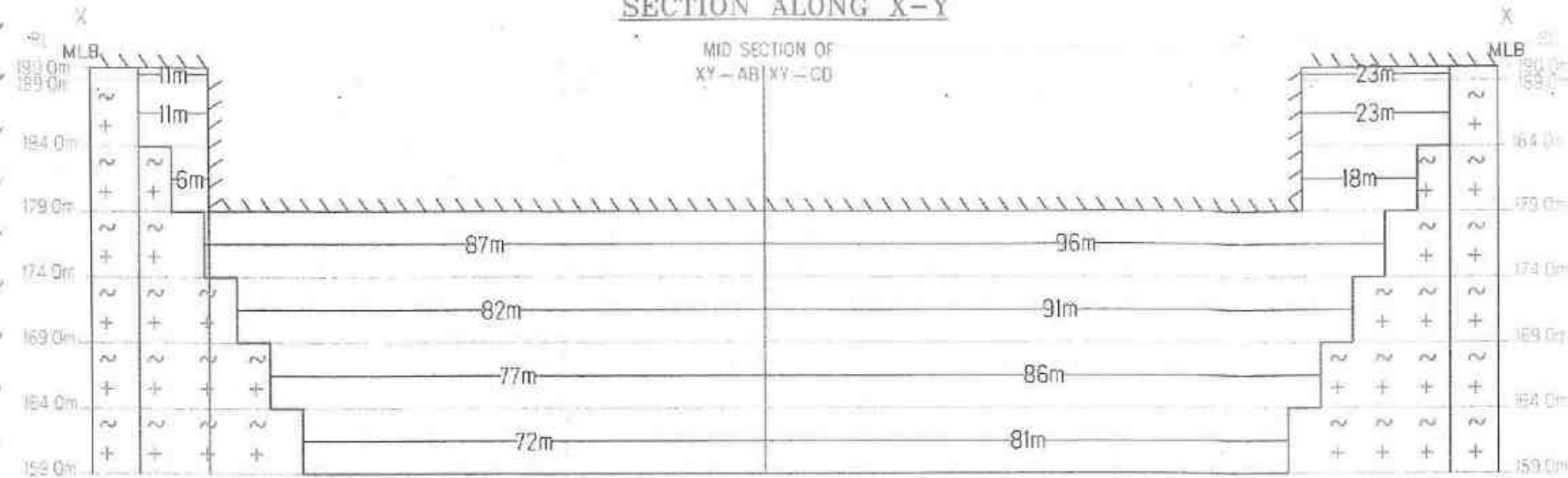
- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET

CONCEPTUAL / FINAL MINE
 CLOSURE PLAN
 SCALE 1:1000

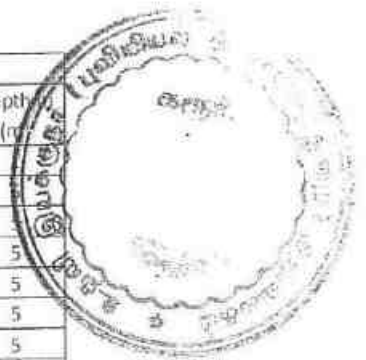
Prepared By:
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 Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/203/2014/175 A

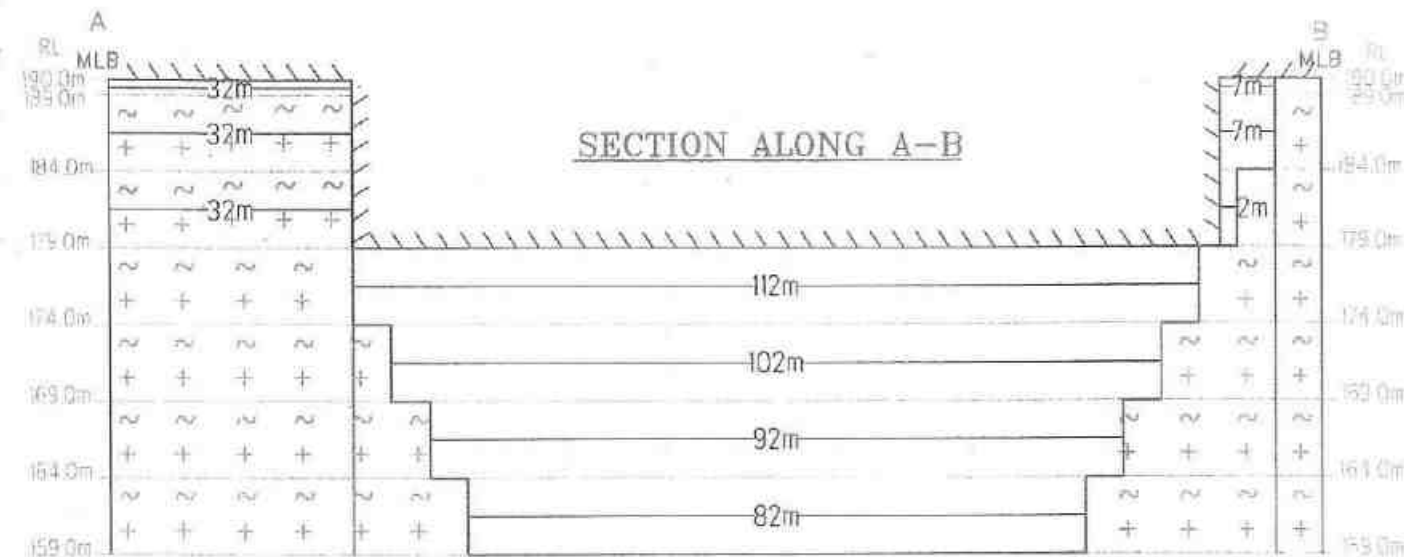
SECTION ALONG X-Y



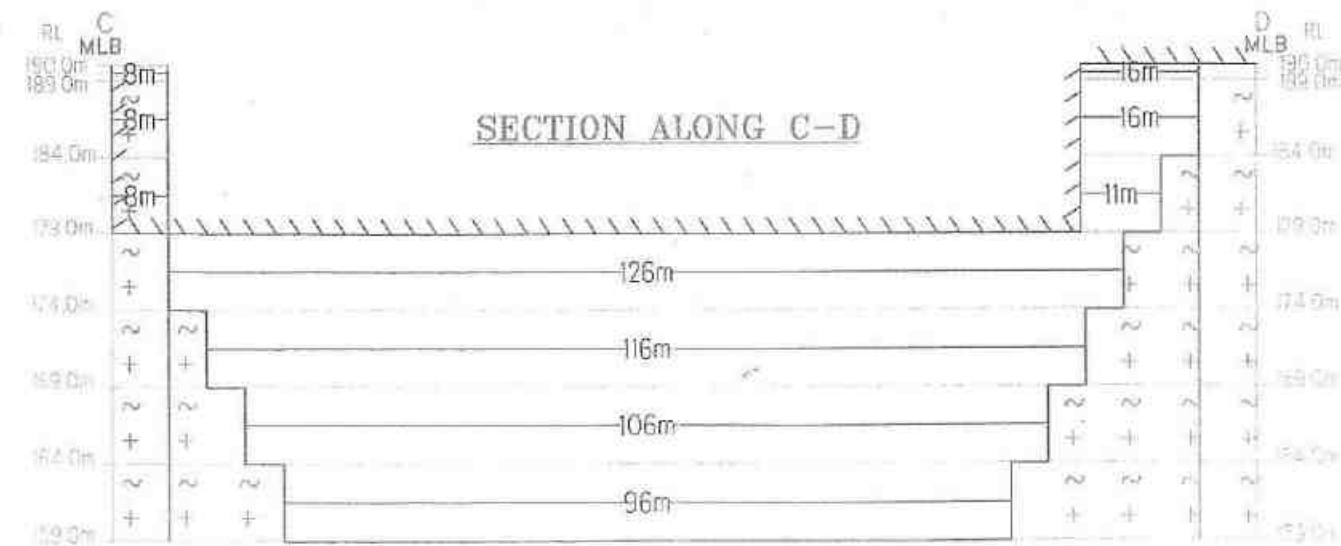
ULTIMATE PIT DIMENSION				
Section	Bench	length in (m)	Width in (m)	Depth (m)
XY-AB	I	11	7	1
	II	11	7	5
	III	6	2	5
	IV	87	112	5
	V	82	102	5
	VI	77	92	5
	VII	72	82	5
TOTAL				
XY-CD	I	23	16	1
	II	23	16	5
	III	18	11	5
	IV	96	126	5
	V	91	116	5
	VI	86	106	5
	VII	81	96	5



SECTION ALONG A-B



SECTION ALONG C-D



MINEABLE RESERVES								
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In M3	MINEABLE Reserves in m3 @ 98%	Mine waste in m3 @ 2%	Top Soil in m3
XY-AB	I	11	7	1	77			77
	II	11	7	5	385	377	8	
	III	6	2	5	60	59	1	
	IV	87	112	5	48720	47746	974	
	V	82	102	5	41820	40984	836	
	VI	77	92	5	35420	34712	708	
	VII	72	82	5	29520	28930	590	
TOTAL					156002	152807	3119	77
XY-CD	I	23	16	1	368	361	7	368
	II	23	16	5	1840	1803	37	
	III	18	11	5	990	970	20	
	IV	96	126	5	60480	59270	1210	
	V	91	116	5	52780	51724	1056	
	VI	86	106	5	45580	44568	912	
	VII	81	96	5	38880	38102	778	
TOTAL					200918	196900	4018	368
GRAND TOTAL					356920	349706	7137	445

PLATE NO-VI-A

APPLICANT:
 Tmt. THAMILSELVI,
 W/o. P. SABAPATHI,
 GANESANAGAR 1st STREET,
 ENAM,
 KARUR TALUK,
 KARUR DISTRICT.

LOCATION:
 EXTENT : 3.36.0 Ha,
 S.F.NO : 706(part)
 VILLAGE : KUPPAM
 TALUK : ARAVAKURICHI,
 DISTRICT : KARUR.

INDEX

- MINE LEASE BOUNDARY
- 7.5m & 50m SAFTY DISTANCE
- ROUGH STONE
- PIT

CONCEPTUAL / FINAL MINE
 CLOSURE PLAN SECTION
 SECTION FOR 1:1000 & 1:500

Prepared By:

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

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

TEST REPORT

Report No	EHS360/TR/2023-24/001	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/001
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ1 Core Zone - 10°58'53.92"N 77°55'59.77"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	43.1	24.3	6.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	42.1	22.1	7.3	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	45.6	23.6	8.1	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	46.3	24.5	6.0	20.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	47.1	25.3	7.4	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	43.0	23.5	8.5	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	42.5	24.1	6.6	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	44.5	25.1	7.1	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	45.3	23.1	6.4	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	46.1	24.3	8.2	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	47.3	25.2	5.1	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	44.0	22.3	7.0	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	43.2	24.2	5.3	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	44.5	25.6	6.4	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	41.6	23.2	7.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	45.3	22.1	8.4	21.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	42.0	24.3	6.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	45.8	25.2	5.4	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	46.3	23.0	6.8	24.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	47.1	22.4	7.2	25.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	43.0	25.0	8.3	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	45.6	24.3	6.0	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	44.2	22.1	7.2	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	46.3	25.5	8.4	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	47.5	23.5	7.7	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	44.2	24.0	6.9	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/001	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/001
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ1 Core Zone - 10°58'53.92"N 77°55'59.77"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	58.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	56.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	57.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	55.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	59.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	58.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	59.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	56.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	57.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	55.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	58.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	59.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	60.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	56.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	55.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	57.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	59.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	58.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	59.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	58.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	56.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	59.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/002	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/002
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ 2 – Near Existing quarry - 10°58'47.35"N 77°56'3.75"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	42.3	25.3	5.5	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	43.2	26.1	6.3	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	44.1	27.0	7.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	44.3	25.3	8.0	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	45.2	26.5	6.2	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	43.5	27.3	7.4	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	41.2	26.0	6.0	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	43.0	25.2	8.2	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	44.7	27.3	6.6	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	41.4	25.0	7.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	48.1	26.7	8.2	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	49.3	27.1	7.6	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	46.0	25.5	5.3	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	47.2	26.3	8.5	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	48.3	25.1	7.1	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	46.0	27.3	8.6	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	47.3	26.0	7.3	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	48.2	25.2	6.5	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	49.3	26.3	8.3	22.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	46.2	27.1	7.2	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	47.2	27.3	6.3	24.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	48.0	26.2	7.4	25.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	49.3	25.5	6.8	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	47.2	27.3	7.2	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	48.3	26.1	8.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	49.1	27.5	6.4	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/002	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/002
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ 2 – Near Existing quarry - 10°58'47.35"N 77°56'3.75"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	62.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	60.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	61.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	64.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	62.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	63.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	61.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	61.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/003	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/003
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ3 – Velayudampalayam - 10°59'8.12"N 77°55'34.43"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	44.5	22.3	5.6	20.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	45.3	23.1	6.0	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	43.1	24.2	7.2	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	46.5	25.3	5.3	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	47.3	22.1	6.4	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	48.2	24.0	7.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	46.3	23.5	5.0	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	45.1	24.3	6.4	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	47.0	25.6	7.3	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	43.2	23.0	7.0	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	46.5	24.5	7.2	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	47.1	25.6	6.5	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	48.3	22.0	5.3	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	45.0	23.6	7.2	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	43.5	25.1	6.3	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	44.6	24.3	5.4	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	45.7	23.6	7.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	46.8	24.0	6.2	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	47.5	25.4	5.3	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	48.3	23.1	6.1	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	46.0	24.6	7.3	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	47.3	25.1	6.2	19.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	48.2	25.4	5.3	20.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	44.0	23.1	7.5	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	45.3	24.3	6.0	20.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	46.8	25.6	7.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/003	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/003
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ3 – Velayudampalayam - 10°59'8.12"N 77°55'34.43"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	61.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	67.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	68.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	69.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	61.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	67.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	68.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	69.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	63.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

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[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/004	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/004
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ4 – Kuppam - 11°0'46.07"N 77°55'29.97"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	43.4	23.1	5.5	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	45.2	22.1	6.2	20.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	42.1	24.5	7.1	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	46.0	25.3	6.3	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	44.1	26.1	7.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	45.2	23.1	6.8	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	46.3	24.2	5.3	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	44.2	25.0	6.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	42.1	26.3	5.4	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	45.3	27.0	6.3	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	46.1	22.4	5.4	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	44.0	23.5	5.0	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	45.3	24.5	6.3	20.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	46.0	25.3	5.2	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	43.1	26.1	6.8	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	42.0	27.3	5.0	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	44.1	26.3	6.4	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	45.3	24.5	5.0	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	46.2	25.3	6.8	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	45.1	26.1	5.4	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	46.3	23.4	6.2	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	42.1	22.1	5.1	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	44.3	25.3	6.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	46.2	26.4	5.8	21.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	42.3	25.1	6.4	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	45.2	27.3	5.9	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/004	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/004
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ4 – Kuppam - 11°0'46.07"N 77°55'29.97"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	67.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	67.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	67.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	67.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

[Signature]

Authorised Signatory

[Signature]
Name: Santhosh Kumar A
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/005	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/005
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ5 – K.Paramathi - 10°57'39.13"N 77°54'58.88"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	44.5	22.1	6.2	19.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	43.2	20.3	7.2	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	46.1	21.3	6.3	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	47.1	22.4	7.4	20.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	43.0	25.1	8.0	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	44.2	22.0	6.0	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	45.1	23.1	7.2	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	46.3	24.0	8.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	47.1	25.3	6.2	19.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	44.2	24.0	8.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	45.0	23.1	7.1	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	46.2	22.0	8.2	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	43.2	24.3	6.5	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	44.1	25.1	8.3	18.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	45.2	24.0	7.0	19.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	46.1	25.3	8.2	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	47.0	22.1	6.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	44.2	24.0	7.1	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	45.6	25.3	8.4	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	46.3	21.4	6.4	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	44.1	22.6	8.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	45.2	25.4	7.2	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	46.3	24.3	8.3	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	47.2	25.6	6.2	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	45.2	23.1	8.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	46.3	22.3	7.1	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/005	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/005
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ5 – K.Paramathi - 10°57'39.13"N 77°54'58.88"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	62.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/006	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/006
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ 6 – Pavithram - 10°57'59.20"N 77° 59'12.48"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	45.3	23.4	6.2	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	46.2	22.1	7.8	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	44.1	21.0	6.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	45.0	24.6	7.0	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	46.2	25.3	6.2	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	45.0	26.1	7.1	17.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	46.3	23.4	6.5	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	44.1	25.1	7.3	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	45.2	26.2	6.4	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	46.3	23.4	7.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	45.1	21.2	6.4	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	46.3	25.0	6.5	18.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	44.0	26.2	7.2	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	45.0	24.0	6.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	46.3	22.3	7.4	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	45.0	25.1	6.1	18.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	46.2	26.1	7.0	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	44.3	25.8	6.5	17.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	45.8	26.0	6.0	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	46.2	24.8	7.4	19.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	45.0	25.3	6.3	17.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	46.3	24.1	7.2	18.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	44.0	26.1	7.1	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	45.2	25.3	6.4	20.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	46.3	24.1	7.2	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	45.0	23.0	6.5	19.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/006	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/006
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ 6 – Pavithram - 10°57'59.20"N 77° 59'12.48"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	64.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	63.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	62.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	64.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	61.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	61.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	63.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

[Signature]

Authorised Signatory

[Signature]
Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/007	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/007
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ7 – Pullaiyampalayam - 11°0'2.83"N 77°58'15.33"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	44.2	24.3	6.2	20.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	45.3	23.1	7.1	21.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	46.1	25.6	6.8	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	47.2	26.1	7.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	43.2	27.3	6.5	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	44.5	28.3	7.0	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	45.0	29.3	6.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	46.2	26.2	7.5	20.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	47.3	27.4	6.5	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	45.1	26.3	7.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	46.0	27.4	6.1	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	45.3	28.2	7.5	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	46.7	23.4	6.4	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	47.2	25.0	7.3	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	42.5	24.6	6.3	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	43.5	25.1	7.2	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	44.5	26.3	7.0	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	46.1	27.4	6.3	20.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	47.2	28.3	7.2	21.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	45.0	29.2	6.5	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	42.0	24.3	6.1	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	43.1	25.1	7.2	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	45.6	26.3	6.5	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	45.8	24.3	7.3	21.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	46.2	27.8	6.4	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	47.0	29.2	7.2	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/007	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/007
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ7 – Pullaiyampalayam - 11°0'2.83"N 77°58'15.33"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	64.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	61.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	52.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	66.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	61.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

[Signature]

Authorised Signatory

[Signature]
Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/008	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/008
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ8 – Malalayampudur - 10°56'36.31"N 77°57'28.92"E		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.03.2023	7:00-7:00	43.2	23.5	6.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.03.2023	7:15-7:15	44.5	24.1	7.3	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.03.2023	7:00-7:00	45.6	26.2	8.2	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.03.2023	7:15-7:15	46.2	25.4	5.5	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.03.2023	7:00-7:00	42.1	26.3	6.3	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.03.2023	7:15-7:15	43.2	27.4	8.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.03.2023	7:00-7:00	44.5	28.2	7.1	24.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.03.2023	7:15-7:15	46.1	24.3	6.0	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.03.2023	7:00-7:00	44.0	25.1	8.8	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.03.2023	7:15-7:15	45.2	26.3	7.5	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.04.2023	7:00-7:00	43.1	24.5	6.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.04.2023	7:15-7:15	42.1	27.3	5.5	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.04.2023	7:00-7:00	45.0	28.6	6.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.04.2023	7:15-7:15	46.3	23.0	7.2	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.04.2023	7:00-7:00	44.0	24.5	8.8	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.04.2023	7:15-7:15	45.2	26.3	6.5	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.04.2023	7:00-7:00	46.1	28.5	7.3	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.04.2023	7:15-7:15	44.2	27.1	5.5	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.05.2023	7:00-7:00	43.2	25.3	6.3	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.05.2023	7:15-7:15	44.5	26.4	7.2	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.05.2023	7:00-7:00	42.0	23.1	8.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.05.2023	7:15-7:15	43.1	25.4	6.4	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.05.2023	7:00-7:00	44.5	26.7	5.5	24.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.05.2023	7:15-7:15	46.5	27.8	6.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.05.2023	7:00-7:00	47.1	26.5	8.4	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.05.2023	7:15-7:15	45.2	25.1	7.2	22.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/008	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 5182	Sample Drawn by	Laboratory
Sample Name	Air	Sample Code	EHS360/008
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sampling Location	AAQ8 – Malapalayampudur - 10°56'36.31"N 77°57'28.92"E		

Date	Period. hrs	SPM ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	C6H6 ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)
02.03.2023	7:00-7:00	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.03.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.03.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.03.2023	7:15-7:15	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.03.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.03.2023	7:15-7:15	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.03.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.03.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.03.2023	7:00-7:00	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.03.2023	7:15-7:15	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.04.2023	7:00-7:00	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.04.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.04.2023	7:00-7:00	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.04.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.04.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.04.2023	7:15-7:15	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.04.2023	7:00-7:00	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.04.2023	7:15-7:15	67.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.05.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.05.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.05.2023	7:00-7:00	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.05.2023	7:15-7:15	67.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.05.2023	7:00-7:00	68.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.05.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.05.2023	7:00-7:00	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.05.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	6	5	1	1	20

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory

 Name: Santhosh Kumar A
 Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/ 009	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 9989	Sample Drawn by	Laboratory
Sample Name	Noise Level Monitoring	Sample Code	EHS360/ 009
Sample Description	Ambient Noise	Sample Collected Date	25.05.2023

Location	N1 – Core zone - 10°58'51.80"N 77°55'59.75"E			N2 – Near Existing quarry - 10°58'47.39"N 77°56'3.35"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	42.3	43.2	42.8	30.2	37.8	35.5
07:00-08:00	40.2	42.5	41.5	31.4	38.9	36.6
08:00-09:00	43.2	44.1	43.7	32.5	39.4	37.2
09:00-10:00	44.1	45.3	44.7	33.6	43.8	41.2
10:00-11:00	42.3	46.2	44.7	34.5	44.7	42.1
11:00-12:00	43.1	44.2	43.7	35.6	45.9	43.3
12:00-13:00	44.2	46.3	45.4	36.9	46.8	44.2
13:00-14:00	42.1	43.2	42.7	36.8	46.7	44.1
14:00-15:00	41.3	42.5	41.9	37.6	48.9	46.2
15:00-16:00	40.2	42.3	41.4	38.9	49.7	47.0
16:00-17:00	44.2	46.3	45.4	34.3	48.7	45.8
17:00-18:00	41.5	43.2	42.4	39.7	47.6	45.2
18:00-19:00	42.1	44.5	43.5	38.6	42.1	40.7
19:00-20:00	40.2	42.3	41.4	37.6	41.0	39.6
20:00-21:00	41.3	43.2	42.4	37.1	41.3	39.7
21:00-22:00	39.2	41.3	40.4	36.4	42.0	40.0
22:00-23:00	38.2	43.6	41.7	35.6	43.5	41.1
23:00-00:00	37.4	41.2	39.7	34.5	42.7	40.3
00:00-01:00	35.6	37.2	36.5	33.6	41.7	39.3
01:00-02:00	34.2	38.6	36.9	32.5	40.9	38.5
02:00-03:00	33.6	39.2	37.2	34.1	38.9	37.1
03:00-04:00	34.2	38.2	36.6	33.5	37.4	35.9
04:00-05:00	36.2	38.6	37.6	32.7	35.6	34.4
05:00-06:00	35.6	39.9	38.3	31.9	34.6	33.5
Result	Day Means		42.9	Day Means		41.7
	Night Means		37.5	Night Means		37.0

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/ 010	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 9989	Sample Drawn by	Laboratory
Sample Name	Noise Level Monitoring	Sample Code	EHS360/ 010
Sample Description	Ambient Noise	Sample Collected Date	25.05.2023

Location	N3 – Velayudampalayam - 10°59'7.85"N 77°55'34.05"E			N4 – Kuppam - 11°0'45.65"N 77°55'31.22"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	40.3	42.3	41.4	40.3	42.3	41.4
07:00-08:00	41.9	43.2	42.6	41.3	43.5	42.5
08:00-09:00	41.3	43.2	42.4	42.1	44.1	43.2
09:00-10:00	40.3	42.1	41.3	41.3	43.6	42.6
10:00-11:00	38.6	40.2	39.5	40.3	42.5	41.5
11:00-12:00	39.6	41.2	40.5	38.2	40.2	39.3
12:00-13:00	40.2	42.3	41.4	39.2	42.1	40.9
13:00-14:00	41.2	43.6	42.6	36.1	42.5	40.4
14:00-15:00	40.1	42.1	41.2	35.2	37.2	36.3
15:00-16:00	41.6	43.2	42.5	38.6	42.1	40.7
16:00-17:00	40.9	42.8	42.0	40.1	43.1	41.9
17:00-18:00	40.2	42.3	41.4	42.3	44.6	43.6
18:00-19:00	41.5	43.5	42.6	41.6	46.2	44.5
19:00-20:00	40.8	42.1	41.5	36.5	38.6	37.7
20:00-21:00	40.2	42.3	41.4	34.1	36.5	35.5
21:00-22:00	37.6	38.2	37.9	36.5	38.6	37.7
22:00-23:00	34.1	36.2	35.3	35.2	37.1	36.3
23:00-00:00	34.2	36.1	35.3	34.2	36.5	35.5
00:00-01:00	33.2	35.2	34.3	32.1	34.2	33.3
01:00-02:00	35.2	38.2	37.0	33.6	35.6	34.7
02:00-03:00	34.2	36.1	35.3	34.2	36.7	35.6
03:00-04:00	36.2	38.2	37.3	36.4	38.9	37.8
04:00-05:00	32.2	34.6	33.6	31.2	33.2	32.3
05:00-06:00	33.5	36.2	35.1	34.6	36.9	35.9
Result	Day Means		41.0	Day Means		40.3
	Night Means		35.4	Night Means		35.0

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/ 011	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 9989	Sample Drawn by	Laboratory
Sample Name	Noise Level Monitoring	Sample Code	EHS360/ 011
Sample Description	Ambient Noise	Sample Collected Date	25.05.2023

Location	N5 – K.Paramathi - 10°57'39.76"N 77°54'58.64"E			N6 – Pavithram - 10°57'59.57" 77°59'11.87"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	39.2	42.1	40.9	39.9	41.2	40.6
07:00-08:00	38.2	43.2	41.4	40.2	42.3	41.4
08:00-09:00	39.2	40.1	39.7	38.6	41.2	40.1
09:00-10:00	37.2	38.6	38.0	37.2	46.1	43.6
10:00-11:00	36.2	38.2	37.3	39.2	42.1	40.9
11:00-12:00	35.4	36.2	35.8	41.3	43.1	42.3
12:00-13:00	33.2	35.2	34.3	40.2	42.3	41.4
13:00-14:00	32.1	35.6	34.2	42.3	45.3	44.1
14:00-15:00	36.2	38.2	37.3	41.2	44.2	43.0
15:00-16:00	38.2	40.2	39.3	40.5	41.8	41.2
16:00-17:00	40.2	42.3	41.4	38.2	40.9	39.8
17:00-18:00	42.3	44.2	43.4	40.1	42.6	41.5
18:00-19:00	35.2	37.6	36.6	42.1	45.3	44.0
19:00-20:00	36.8	38.2	37.6	41.1	44.1	42.9
20:00-21:00	39.8	40.2	40.0	40.2	42.2	41.3
21:00-22:00	34.2	38.2	36.6	39.9	41.3	40.7
22:00-23:00	36.5	38.1	37.4	38.5	40.1	39.4
23:00-00:00	34.2	36.4	35.4	35.6	38.2	37.1
00:00-01:00	33.1	35.6	34.5	36.6	38.2	37.5
01:00-02:00	32.5	34.1	33.4	34.2	36.1	35.3
02:00-03:00	33.6	36.2	35.1	35.6	38.2	37.1
03:00-04:00	35.2	38.1	36.9	38.2	40.2	39.3
04:00-05:00	36.4	38.6	37.6	34.2	36.2	35.3
05:00-06:00	37.1	38.2	37.7	33.6	35.2	34.5
Result	Day Means		38.3	Day Means		41.6
	Night Means		35.8	Night Means		36.6

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/ 012	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	IS 9989	Sample Drawn by	Laboratory
Sample Name	Noise Level Monitoring	Sample Code	EHS360/ 012
Sample Description	Ambient Noise	Sample Collected Date	25.05.2023

Location	N7 – Pullaiyampalayam - 11°0'2.65"N 77°58'15.34"E			N8 – Malapalayampudur - 10°56'36.26"N 77°57'28.41"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	38.2	40.2	39.3	35.5	38.2	37.1
07:00-08:00	38.6	42.3	40.8	36.7	38.6	37.8
08:00-09:00	37.2	41.2	39.6	34.2	36.5	35.5
09:00-10:00	36.2	43.2	41.0	38.2	40.2	39.3
10:00-11:00	38.6	42.3	40.8	36.5	42.1	40.1
11:00-12:00	37.2	40.2	39.0	34.2	38.2	36.6
12:00-13:00	39.6	44.5	42.7	38.4	40.3	39.5
13:00-14:00	35.1	43.2	40.8	39.2	42.1	40.9
14:00-15:00	38.6	40.2	39.5	33.5	36.4	35.2
15:00-16:00	31.2	38.2	36.0	36.4	38.1	37.3
16:00-17:00	32.5	37.4	35.6	34.2	36.9	35.8
17:00-18:00	34.2	38.4	36.8	37.8	40.2	39.2
18:00-19:00	35.2	37.2	36.3	35.6	44.3	41.8
19:00-20:00	36.2	38.6	37.6	32.1	35.6	34.2
20:00-21:00	33.1	36.2	34.9	33.5	36.4	35.2
21:00-22:00	32.1	34.2	33.3	32.2	34.2	33.3
22:00-23:00	30.2	35.6	33.7	33.1	36.2	34.9
23:00-00:00	32.5	36.2	34.7	35.4	36.5	36.0
00:00-01:00	35.6	38.2	37.1	34.2	38.2	36.6
01:00-02:00	34.1	37.2	35.9	32.1	34.2	33.3
02:00-03:00	35.1	39.8	38.1	33.6	36.5	35.3
03:00-04:00	36.5	39.2	38.1	32.1	35.4	34.1
04:00-05:00	34.2	36.8	35.7	35.2	37.2	36.3
05:00-06:00	33.1	39.2	37.1	34.1	36.9	35.7
Result	Day Means		38.1	Day Means		37.3
	Night Means		36.7	Night Means		35.3

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 013	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 013
Sample Description	Soil 1	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 1 – Core Zone		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.23
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	421µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	43.1 %
04	Bulk Density	By Cylindrical Method	1.09 g/cm ³
05	Porosity	By Gravimetric Method	43.2 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	179 mg/kg
07	Magnesium as Mg		83.6 mg/kg
08	Chloride as Cl		128 mg/kg
09	Soluble Sulphate as SO ₄		0.018 %
10	Total Phosphorus as P		1.7 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	275 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.94 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.13 %

*****End of Report*****

Page 1 of 1

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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 013	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 013
Sample Description	Soil 1	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 1 – Core Zone		

S. No	Test Parameters	Protocols	Results
14	Texture :		
	Clay	Gravimetric Method	32.7 %
	Sand		36.7 %
	Silt		30.6 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	28 mg/kg
16	Zinc as Zn		1.01 mg/kg
17	Boron as B		1.2mg/kg
18	Potassium as K		31.2 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.6 mg/kg
23	Iron as Fe		2.12 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	37 meq/100g of soil

*****End of Report*****

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[Signature]

Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 014	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 014
Sample Description	Soil 2	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 2 – Velayudampalayam		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.54
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	584 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	43.1%
04	Bulk Density	By Cylindrical Method	1.26 g/cm ³
05	Porosity	By Gravimetric Method	44.6 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	190 mg/kg
07	Magnesium as Mg		79.2 mg/kg
08	Chloride as Cl		216 mg/kg
09	Soluble Sulphate as SO ₄		0.022 %
10	Total Phosphorus as P		2.07 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	312 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	3.22 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.87 %

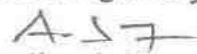
*****End of Report*****

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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 014	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 014
Sample Description	Soil 2	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 2 – Velayudampalayam		

S. No	Test Parameters	Protocols	Results
14	Texture :		
	Clay	Gravimetric Method	34.2 %
	Sand		32.1 %
	Silt		33.7 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	19.2 mg/kg
16	Zinc as Zn		3.91 mg/kg
17	Boron as B		1.06 mg/kg
18	Potassium as K		15 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.35 mg/kg
23	Iron as Fe		1.91 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

*****End of Report*****

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 Name : Santhosh Kumar A
 Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 015	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 015
Sample Description	Soil 3	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 3 – Kuppam		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.43
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	492 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	45.6 %
04	Bulk Density	By Cylindrical Method	1.28 g/cm3
05	Porosity	By Gravimetric Method	42.9 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	248 mg/kg
07	Magnesium as Mg		88.7 mg/kg
08	Chloride as Cl		137mg/kg
09	Soluble Sulphate as SO ₄		0.021 %
10	Total Phosphorus as P		1.47 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	318 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	3.03 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.76 %

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Name: Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 015	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 015
Sample Description	Soil 3	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 3 – Kuppam		

S. No	Test Parameters	Protocols	Results
14	Texture :		
	Clay	Gravimetric Method	35.8 %
	Sand		30.5 %
	Silt		33.7 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	27.9 mg/kg
16	Zinc as Zn		2.7 mg/kg
17	Boron as B		1.7 mg/kg
18	Potassium as K		48.4 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.79 mg/kg
23	Iron as Fe		2.74 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

*****End of Report*****

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Name : Santhosh Kumar A.
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 016	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 016
Sample Description	Soil 4	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 4 – Pavithram		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	7.89
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	524 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	46.5 %
04	Bulk Density	By Cylindrical Method	1.24 g/cm3
05	Porosity	By Gravimetric Method	41.3 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	163.5 mg/kg
07	Magnesium as Mg		79.8 mg/kg
08	Chloride as Cl		142 mg/kg
09	Soluble Sulphate as SO ₄		0.023 %
10	Total Phosphorus as P		1.47 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	308 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.43 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.41 %

*****End of Report*****



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Authorised Signatory

Name: Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 016	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 016
Sample Description	Soil 4	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 4 – Pavithram		

S. No	Test Parameters	Protocols	Results
14	Texture :		
	Clay	Gravimetric Method	34.6 %
	Sand		31.9 %
	Silt		33.5 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	22.3 mg/kg
16	Zinc as Zn		3.02 mg/kg
17	Boron as B		1.5 mg/kg
18	Potassium as K		37.4 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		1.07 mg/kg
23	Iron as Fe		2.56 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

*****End of Report*****

Page 1 of 1

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Name: Santhosh Kumar A.
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 017	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 017
Sample Description	Soil 5	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 5 – Pullaiyampalayam		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.07
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	334 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	45.7 %
04	Bulk Density	By Cylindrical Method	1.16 g/cm ³
05	Porosity	By Gravimetric Method	42.7 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	168 mg/kg
07	Magnesium as Mg		71.2 mg/kg
08	Chloride as Cl		139 mg/kg
09	Soluble Sulphate as SO ₄		0.021 %
10	Total Phosphorus as P		1.47 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	289 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	3.20 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.86 %

*****End of Report*****

Page 1 of 1

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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 017	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 017
Sample Description	Soil 5	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 5 – Pullaiyampalayam		

S. No	Test Parameters	Protocols	Results
14	Texture :		
	Clay	Gravimetric Method	37.1 %
	Sand		34.6 %
	Silt		28.3%
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	28.5 mg/kg
16	Zinc as Zn		1.98 mg/kg
17	Boron as B		1.35mg/kg
18	Potassium as K		39.6 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.5 mg/kg
23	Iron as Fe		2.97 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	42.7 meq/100g of soil


*****End of Report*****

Page 1 of 1

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 Name : Santhosh Kumar A
 Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 018	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 018
Sample Description	Soil 6	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil – 6 – Malapalayampudur		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.57
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	547 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	412 %
04	Bulk Density	By Cylindrical Method	1.3 g/cm ³
05	Porosity	By Gravimetric Method	45.1 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	176.8 mg/kg
07	Magnesium as Mg		91.4 mg/kg
08	Chloride as Cl		137 mg/kg
09	Soluble Sulphate as SO ₄		0.026 %
10	Total Phosphorus as P		1.58 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	362 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.31 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.34 %

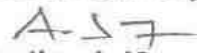
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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/ 018	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Soil	Sample Code	EHS360/ 018
Sample Description	Soil 6	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 KG	Sample Received On	27.05.2023
Sample Condition	Good	Test Commenced On	27.05.2023
Sampling Location	Soil - 6 - Malapalayampudur		

S. No	Test Parameters	Protocols	Results
14	Texture :		
	Clay	Gravimetric Method	37.8 %
	Sand		34.9 %
	Silt		27.3 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	19.8 mg/kg
16	Zinc as Zn		1.24 mg/kg
17	Boron as B		1.9mg/kg
18	Potassium as K		39.8 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.72 mg/kg
23	Iron as Fe		2.55 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986


*****End of Report*****

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Authorised Signatory


 Name : Santhosh Kumar A
 Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/019	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/019
Sample Description	Surface Water (SW-1)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Surface Water (SW-1) - Noyyal River		

S.No.	Parameters	Test Method	RESULTS
Discipline: Chemical			
1	Colour	IS 3025 Part 4:1983	6 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.83
4	Conductivity @ 25°C	IS 3025 Part 14:2013	1034µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	4.2 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	610 mg/l
7	Total Hardness as CaCO ₃	IS 3025 Part 21:2009	248 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	62.5 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	22.3 mg/l
10	Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986	218 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	110 mg/l
12	Sulphate as SO ₄	IS 3025 Part 24:1986	48.2 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.5 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.41mg/l
16	Nitrate as NO ₃	IS 3025 Part 34:1988	13.2 mg/l

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/019	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/019
Sample Description	Surface Water (SW-1)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Surface Water (SW-1) - Noyyal River		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	8.2 mg/l
32	Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	28 mg/l
33	Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.9 mg/l
34	Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
35	Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.01 mg/l)
36	Sulphide as H ₂ S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
37	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
38	Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
39	Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	27.6 mg/l
	Discipline: Biological	Group: Water	
40	Total Coliform	APHA 23 rd Edn. 2017:9221B	1420 MPN/100ml
41	<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	132 MPN/100ml

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A

Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/020	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/020
Sample Description	Ground Water (BW-3)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (BW-3) – Malapalayampudur		

S.No.	Parameters	Test Method	RESULTS
Discipline: Chemical			
1	Colour	IS 3025 Part 4:1983	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.36
4	Conductivity @ 25°C	IS 3025 Part 14:2013	1125µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	1.7 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	664 mg/l
7	Total Hardness as CaCO ₃	IS 3025 Part 21:2009	252 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	59.3 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	25.3 mg/l
10	Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986	224mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	176mg/l
12	Sulphate as SO ₄	IS 3025 Part 24:1986	68.2 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.28 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.34 mg/l
16	Nitrate as NO ₃	IS 3025 Part 34:1988	6.2 mg/l

*****End of Report*****

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Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/021	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/021
Sample Description	Ground Water (WW-3)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (BW-3) – Malapalayampudur		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	Group: Water	
37	Total Coliform	APHA 23 rd Edn. 2017:9221B	95 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml

*****End of Report*****

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Authorised Signatory

 Name: Santhosh Kumar A
 Designation : Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/022	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Customer Name			
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/022
Sample Description	Ground Water (WW-1)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (WW-1) –Near Project Area		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical	Group: Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.22
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	884 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	2.2 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	521 mg/l
7	Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	216 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	46.5 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	24.2 mg/l
10	Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	172 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	148.6 mg/l
12	Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	48.9 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.45 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.38 mg/l
16	Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	9.6 mg/l

*****End of Report*****

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/022	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/022
Sample Description	Ground Water (WW-1)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (WW-1) –Near Project Area		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	Group: Water	
37	Total Coliform	APHA 23 rd Edn. 2017:9221B	228 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml

*****End of Report*****

Page 1 of 1

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Authorised Signatory

 Name: Santhosh Kumar A
 Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

Report No	EHS360/TR/2023-24/023	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Customer Name			
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/023
Sample Description	Ground Water (WW-2)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (WW-2) - Pavithram		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical	Group: Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.62
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1161 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	2.3 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	685 mg/l
7	Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	240 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	51.3 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	27.2 mg/l
10	Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	224mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	187.6 mg/l
12	Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	62.3mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.32 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.41mg/l
16	Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	8.6mg/l

*****End of Report*****

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/023	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/023
Sample Description	Ground Water (WW-2)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (WW-2) - Pavithram		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	Group: Water	
37	Total Coliform	APHA 23 rd Edn. 2017:9221B	117 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

 Name: Santhosh Kumar A
 Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/024	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/024
Sample Description	Ground Water (BW-1)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (BW-1) – Near Project Area		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical	Group: Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.71
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1127µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	2.7 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	665 mg/l
7	Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	252 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	54.5 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	28.2 mg/l
10	Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	228 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	166mg/l
12	Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	62.3 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.36 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.54 mg/l
16	Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	6.3 mg/l

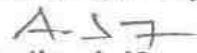
*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory



Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/024	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/024
Sample Description	Ground Water (BW-2)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (BW-1) – Near Project Area		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	Group: Water	
37	Total Coliform	APHA 23 rd Edn. 2017:9221B	142 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml

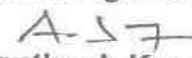
*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory


 Name: Santhosh Kumar A
 Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/024	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Customer Name			
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/024
Sample Description	Ground Water (BW-2)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (BW-2) – Pullaiyampalayam		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical	Group: Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.87
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	873 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	2.9 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	515 mg/l
7	Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	208 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	44.8 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	23.3 mg/l
10	Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	188 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	135.6 mg/l
12	Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	56.8 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.49 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.34 mg/l
16	Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	9.7 mg/l

*****End of Report*****

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Verified by




Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

Report No	EHS360/TR/2023-24/024	Report Date	01.06.2023
Site Location	M.Gunasekaran Rough Stone and Gravel Quarry S.F.Nos. 710/3 and 712/2 ,Kuppam Village, Pugalur Taluk, Karur District, Extent: 1.92.5Ha		
Sampling Method	SOP Method	Sample Drawn by	Laboratory
Sample Name	Water	Sample Code	EHS360/024
Sample Description	Ground Water (BW-2)	Sample Collected Date	26.05.2023
Qty. of Sample Received	2 Litres	Sample Received On	27.05.2023
Sample Condition	Fit for Analysis	Test Commenced On	27.05.2023
Sampling Location	Ground Water (BW-2) – Pullaiyampalayam		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	Group: Water	
37	Total Coliform	APHA 23 rd Edn. 2017:9221B	159 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml

*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory

 Name: Santhosh Kumar A
 Designation : Quality Manager

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National Accreditation Board for Education and Training



Certificate of Accreditation

Geo Exploration & Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

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

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals opencast only	1	1 (a) (i)	A
2	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	B
3	Building and construction projects	38	8(a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 20, 2023

Certificate No.
NABET/EIA/2225/RA 0276

Valid up to
August 06, 2025

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