
**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT &
ENVIRONMENT MANAGEMENT PLAN**

“B1” CATEGORY – MINOR MINERAL – NON-FOREST LAND – GOVERNMENT LAND-CLUSTER

THIRU.K. SILAMBARASAN ROUGH STONE QUARRY

IN CLUSTER OVER AN EXTENT OF 6.22.0 Ha

At

Sokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State

For Obtaining

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

Project Proponent	Proposed Project	Extent
THIRU.K.SILAMBARASAN, S/o. Karuppusamy, No.339, Mallakottai, Thiruppathur, Sivagangai District Tamil Nadu State – 630 566.	S.F.Nos. 352/2 (P-1) Sokkampatti Village, Melur Taluk, Madurai District,	2.02.0 ha
ToR obtained vide Lr No. SEIAA-TN/F.No.8692/SEAC/TOR-1356/ Dated :09.02.2023		

Environmental Consultant	Laboratory
 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/RA0276 Phone: 0427-2431989, Email: ifthiahmed@gmail.com, geothangam@gmail.com Web: www.gemssalem.com	 CHENNAI METTEX LAB PRIVATE LIMITED, (ISO/IEC 17025:2017) No.83, M.K.N. Road, Jothi Complex, Guindy, Chennai – 600 032 Tamilnadu, INDIA. 

BASELINE MONITORING SEASON – MARCH 2023 to MAY 2023

SEPTEMBER - 2023

For the easy representation the proposed quarries and existing quarries are designated as below –

PROPOSED QUARRIES				
CODE	Name of the Proponent and Address	S.F.Nos ,Village & Taluk	Extent in Ha	Status
P1	Thiru.K.Silambarasan	352/2 (P-1) Sokkampatti	2.02.0	Tor Obtained Lr No. SEIAA- TN/F.No.8692/SEAC/TOR- 1356/ Dated :09.02.2023
P2	Thiru.S.Maheswaran	352/2 (P-3) Sokkampatti	3.20.0	EC Granted
Total			5.22.0	

EXISTING QUARRY				
CODE	Name of the Proponent and Address	S.F.Nos	Extent in Ha	Lease Period
E-1	Thiru.C.Veeramalai	352 (P-2)	1.00.0	21.02.2019 to 20.02.2024
Total			1.00.0	
TOTAL CLUSTER EXTENT			6.22.0	

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.K. Silambarasan

Lr No. SEIAA-TN/F.No.8692/SEAC/T0R-1356/Dated :09.02.2023

SPECIFIC CONDITIONS		
1	The PP shall submit a letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., with the proposed project site.	Noted and agreed
2	The PP shall enumerate the existence of houses, permanent structures, habitations, etc. within a distance range of 100 m, 200 m. 300 m. and 500 m.	Noted and agreed
3	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
4	The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30m Bgl..	Noted and agreed
5	The Proponent 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 directly employed on fulltime basis only by the proponent.	Noted and agreed
6	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
7	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.	Noted and agreed

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8	<p>If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,</p> <ol style="list-style-type: none"> What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? Quantity of minerals mined out Highest production achieved in any one year Detail of approved depth of mining Actual depth of the mining achieved earlier Name of the person already mined in that lease area If EC and CTO already obtained, the copy of the same shall be submitted Whether the mining was carried out as per the approved mining plan (or EC if issued with stipulated benches) 	<p>Noted and agreed It is an Existing Quarry -Government Land</p>
9	<p>All corner coordinates of the mine lease area, superimposed on a High-Resolution imagery/ Topo sheet, topographic sheet, Geomorphology, Lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p>	<p>Satellite imagery of the project area along with boundary coordinates is given in the Chapter No 1 Figure No .1.1 Page No.2 Geomorphology of the area is given in Chapter No 2 Figure No 2.10. Page No.23</p> <p>Land use pattern of the project area is tabulated in the Chapter No.2. Table No.2.3 Page No.18</p> <p>Land use pattern of the Study area is tabulated in the Chapter No.3 Table No 3.2 Page No.33.</p>
10	<p>The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,</p>	<p>Noted and agreed</p>
11	<p>The project proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act' 1952 and the MMR 1961 for carrying out the quarrying operations specifically and systematically in order to ensure safety and to protect the environment.</p>	<p>Organization chart indicating Proposal for the appointment of Statutory officials is given in the Chapter No.7 Figure No. 7.1 Page No. 139.</p>
12	<p>The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.</p>	<p>Noted and agreed</p>
13	<p>The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology</p>	<p>Details of Geological Resources and Proposed reserves are discussed under Chapter No. 2.</p>

	with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	
14	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.	Discussed about Organization chart in Chapter 6,
15	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 ground water. Necessary data and documentation in this regard may be provided.	The hydro-geological study was conducted to evaluate the possible impact on the ground water table. No significant impacts are anticipated on the water bodies around the project area. Details are discussed under Chapter No. 3, Page No 45 No of Ground water pumping wells, Open wells within radius of 1km along with Contour map is given in the Chapter No.3 Page No.46-49 Table No. 3.11 & 3.12. Figure No. 3.6 & 3.7.
16	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.	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 to assess the cumulative impact of the proposed project on the environment is prepared as Final EIA EMP Report along with public hearing response.
17	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 and its mitigation measures. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	There are no trees within the lease applied area and no cutting down of trees are anticipated as it's an existing quarry. There are few trees in buffer zone of 300m from the proposed lease area and it shall not be cut down or have any impact due to the mining activities and project proponent ensures to carrying out activities like watering for preserving the green cover around 300 m from proposed project site. The detailed Greenbelt Development Plan is discussed in Chapter No. 4, Table No 4.12, Page No 101.
18	Rain water harvesting management with recharging details along with water balance (both) monsoon & non-monsoon) be submitted.	Detailed discussed in chapter 3
19	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.	Details discussion Land environment in chapter 3

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	operational and post operational phases and submitted- impact, if any. Of change of land use should be given.	
20	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.	No overburden waste dump present in this quarry
21	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.	Noted and agreed
22	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	Detailed discussed in chapter 4.
23	the PP shall provide the Travelling route for the proposed quarry and also indicate the impact on local transport infrastructure due to the Project activities.	Detailed discussed in chapter 2 Transport density.
24	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.	There are few trees within the lease applied area. There are few trees in buffer zone of 300 m from the proposed lease area and it shall not be cut down or have any impact due to the mining activities and project proponent ensures to carrying out activities like watering for preserving the green cover around 300 m from proposed project site. The detailed Greenbelt Development Plan is discussed in Chapter No. 4.
25	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Detailed under Chapter 4
26	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.	Details will be provided in Final EIA/EMP report after the completion of public hearing
27	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Public hearing advertisement will be made as per the Tor Recommendations
28	The PP shall produce/display the EIA report, Executive summery and other related information with respect to public hearing in Tamil Language also.	Noted & agreed.
29	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall	Noted & agreed.

	strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	
30	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	Noted & agreed. It is proposed to plant a 1010nos of trees in the 7.5m safety barrier and approach roads
31	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	Noted & agreed.
32	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.	Detailed under Chapter 7,
33	A Risk Assessment and management Plan shall be prepared and included in the ELA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Detailed under Chapter 7,
34	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.	Detailed discussed in the chapter 4.
35	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.	Detailed discussed in the chapter 10.
36	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.	Socio Economic study has been carried out the details are given in the Chapter No.3.
37	Details of litigation pending against the project, if any, with direction /Order passed by any Court of	No litigation pending cases

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	Law against the Project should be given.	
38	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.	Detailed discussed in the chapter 8.
39	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.	Noted & and the compliance report will be submitted along with Final EIA report.
40	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	Detail discussed in chapter 10.
41	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.	Noted & 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	Noted & agreed

	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.	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.
<i>Impact study of mining</i>		
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 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 steams.	Species Recommended for Plantation in chapter 3&10.
<i>Agriculture & Agro-Biodiversity</i>		
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.

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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 commit 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 govt 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
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.	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	Details in Chapter 2

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	fragile areas.	
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
Energy		
31	The measures taken to control Noise. Air, Water. Dust Control and steps adopted to efficiently utilize 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	Details in Green belt development in chapter 4

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	management plan.	
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.	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, odai, vaari, canal, channel. river, lake pond, tank etc.	Noted & agreed. Detailed under Chapter 4
40	As per the MoEF& CC office memorandum tr.No.22-65/201 7-1A.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 int 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 projects are 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 levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	Noted & agreed.
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	Satellite imagery of the project area along with boundary coordinates is given in the Chapter No 1 Figure No .1.1 Page No.2 Geomorphology of the area is given in Chapter No 2 Figure No 2.10. Page No.23

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	the land use and other ecological features of the study area (core and buffer zone).	Land use pattern of the project area is tabulated in the Chapter No.2. Table No.2.3 Page No.18 Land use pattern of the Study area is tabulated in the Chapter No.3 Table No 3.2 Page No.33.
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. 2.9, Page No. 22 Geomorphology Map of the area is given in Chapter No 2 Figure No 2.10. Page No.23 Soil Map of the area in chapter-2
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, Page No 110.
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.

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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, Page No. 33. 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, Page No 18.
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 /Existing project area is a poramboke 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	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.

	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.	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, Page No. 77. 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, Page No 77.
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	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.

	the Report.	
22	<p>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.</p>	<p>Baseline Data were collected for One Season (March-May (Summer Season) 2023) as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3, Page No. 53-72.</p>
23	<p>Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.</p>	<p>Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view Model.</p> <p>Details in Chapter No. 4, Page No. 90 -95</p>
24	<p>The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.</p>	<p>Total Water Requirement for this project is given in the chapter No 2, Table No 2.14, Page No 29.</p>
25	<p>Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.</p>	<p>Water for dust suppression, greenbelt development and domestic use will be obtained from accumulated rainwater/seepage water in mine pits. Drinking water will be sourced from the approved water vendors, chapter No 2, Table No 2.14, Page No 29</p>
26	<p>Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</p>	<p>The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression.</p>
27	<p>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.</p>	<p>Impact Studies and Mitigation Measures of Water Quality discussed in Chapter No. 4, Page No. 89.</p>
28	<p>Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard</p>	<p>The ground water table is at 70-65m below ground level. In these projects, ultimate depth is 41m It is inferred the quarrying activities in the</p>

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	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.	Cumulative EIA project (Quarries) 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.	Discussed in chapter No 3, Water Environment and Drainage pattern
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.	Highest elevation of the project area is 193m AMSL Ultimate depth of the mine is 41m AMSL Water level in the area is 70m BGL to 65m BGL
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	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, Page No 27.
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.	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. Page No. 29.
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, Page No 29
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 4, Page No. 105.
35	Occupational Health impacts of the Project should	Occupational health impact and details of the

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	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.	medical examination to the workers given in the Details in Chapter 4, Page No. 104.
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, Page No 81.
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, Page No. 159.
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 raised and commitment of the project proponent is discussed in the Chapter No 10, Page No. 159.
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 Chapter No 2, Table No 2.15, page No 30.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Detailed under Chapter 7, Page No 134.
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.	Details in chapter -8, Project benefits
44	Besides the above, the below mentioned general points are also to be followed: -	
A	Executive Summary of the EIA/EMP Report	Given as Page No i to xxiv
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.	Copy of Baseline monitoring reports are enclosed with this draft as annexure

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	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.	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 is enclosed as Annexure
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 are 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 coordinates is given in the Chapter No 1 Figure No .1.1 Page No.2 Geomorphology of the area is given in Chapter No 2 Figure No 2.10. Page No.23

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CHAPTER – 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 is the major requirement for construction industry. This EIA Report is prepared for Thiru. K. Silambarasan Rough stone quarry project Over an Extent of 2.02.0 Ha in S.F.No 352/2 (P-1), Sökkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State considering Cumulative impact from the Cluster quarries,

Cluster Quarries consisting of three (3) quarries total **Cluster extent of 6.22.0 ha**

(1) Proposal applied for public hearing {2.02.0 ha},

(1) Proposals already EC granted (3.20.0 ha)

& 1 Existing quarries under operation {1.00.0 ha}

Total extent of Cluster of 6.22.0 Ha in Sökkampatti Village, Melur Taluk, Madurai District, Tamil Nadu, cluster area calculated as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016.

Initially the mining plan was prepared over an extent of 2.02.0 Ha in S.F.No 352/2 (P-1), and the same has been approved. Proponent applied for Environmental Clearance in SEIAA, Tamil Nadu vide online proposal No SIA/TN/MIN/65995/2021 dated 24.07.2021. The proposal was placed in the 345th SEAC Meeting and issued ToR vide Lr No. SEIAA-TN/F.No.8692/SEAC/TOR-1356/Dated :09.02.2023.

The Baseline Monitoring study has been carried out during Summer season (March - May 2023) and this EIA and EMP report is prepared for considering cumulative impacts arising out of this project, 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**

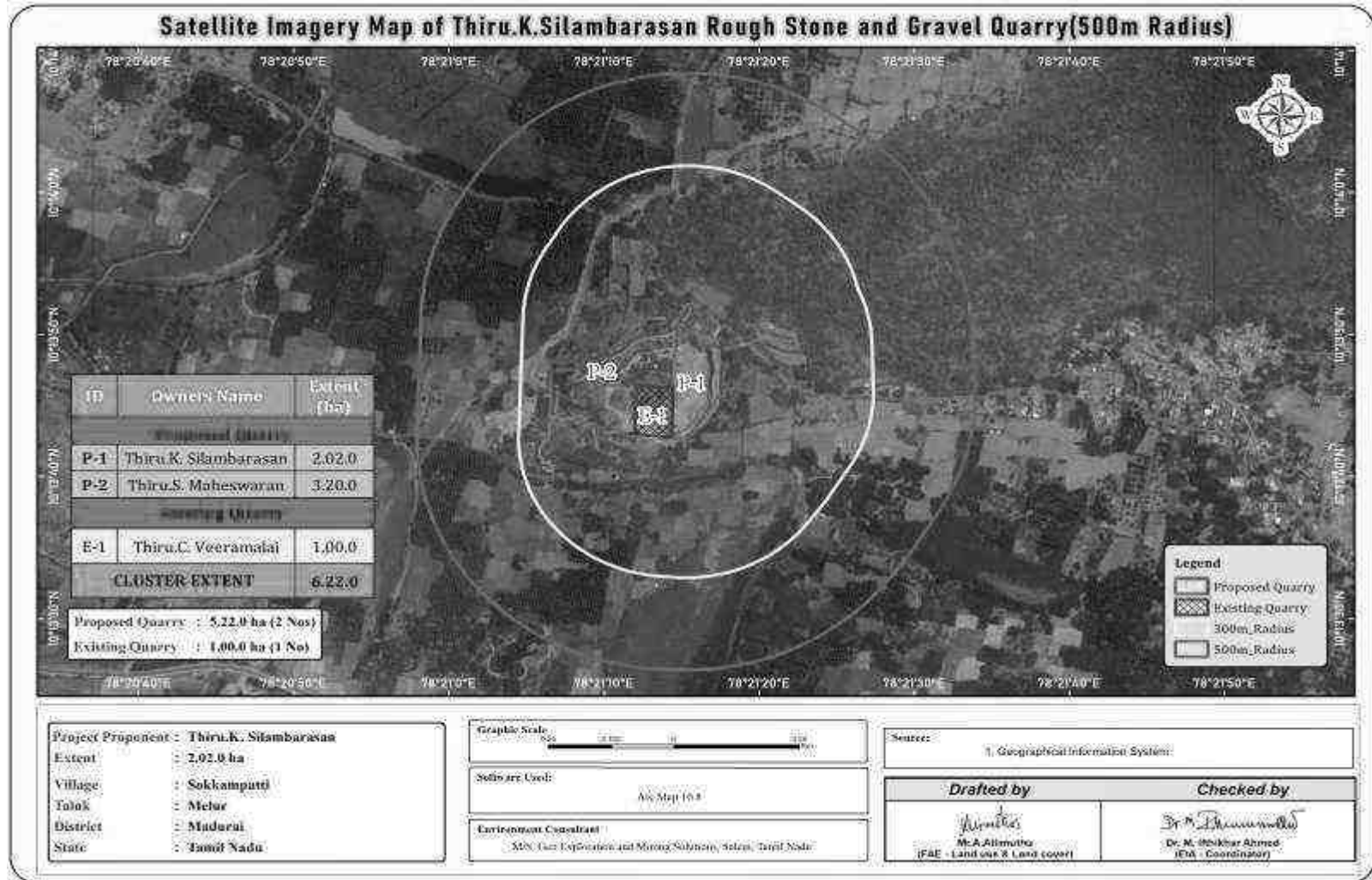
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 1889 of 20th April 2022, Mining Projects are classified under two categories i.e. A (> 250 Ha) and B (\leq 250 Ha), 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



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

Note: As per above notification S.O.2269(E) dated: 01.07.2016 in para (b) in Appendix XI, - (i) (6) A cluster shall be formed when the distance between the peripheries of one lease is less than 500 meters from the periphery of other lease in a homogeneous mineral area which shall be applicable to the mine lease or quarry licenses granted on and after 9th September, 2013

1.2 Identification of Project and Project Proponent

1.2.1 Identification of Project

TABLE 1.1: SALIENT FEATURES OF THE PROPOSAL

Name of the Project	Thiru.K.Silambarasan, Rough Stone Quarry
S.F. No.	352/2 (P-1)
Extent & Classification	2.02.0 ha – Government Poramboke Land
Village Taluk	Sokkampatti Village, Melur Taluk,
District	Madurai District

Source: Approved Mining Plan

1.2.2 Identification of Project Proponent

TABLE 1.2: DETAILS OF PROJECT PROPONENT

Name of the Project	Thiru.K.Silambarasan, Rough Stone Quarry
Address	S/o. Karuppusamy, No.339, Mallakottai, Thiruppathur, Sivagangai District Tamil Nadu State – 630 566.
Mobile	9047874215 & 8056777917
Status	Individual
Email	megablumetals@gmail.com

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 & Controlled blasting using slurry explosives and delay detonators. Hydraulic Excavator and tippers are used for Loading and transportation. Rock Breakers are deployed to avoid secondary blasting.

TABLE 1.3: SALIENT FEATURES OF THE PROJECT

Name of the Mine	Thiru.K.Silambarasan Rough Stone Quarry	
Land Type	It is a Government Poramboke land	
S.F. Nos	352/2 (P-1)	
Extent	2.02.0 ha	
Proposed depth of mining As per Mining plan	41m (1m Topsoil + 40m Rough stone)	
Existing pit dimension (As per Ad Letter)	Pit-1: 180m (L) X 77m (W) X 10m (D) (6m AGL + 4m BGL)	
Geological Resources in m³	Rough Stone	Topsoil
	7,59,392	9,122
Mineable Reserves	Rough Stone	Topsoil
	2,04,792	1,560
Year wise production	Rough Stone	Topsoil
	2,04,792	1,560
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	216m (L) x 77 m(W) x 41m (D) (6m AGL + 35m BGL)	
Toposheet No	58-J/08	
Latitude between	10° 13' 42.56"N to 10° 13' 52.06"N	

Longitude between	78° 21' 14.35"E to 78° 21' 17.52"E	
Topography	The lease applied area is exhibits an undulated topography. The area has gentle sloping towards South-eastern side. The altitude of the area is 193m (max) above Mean Sea level. The area is covered by 1m thickness of Topsoil and followed by Massive Charnockite which is clearly inferred from the existing quarry pits.	
Machinery proposed	Jack Hammer	6
	Compressor	2
	Excavator with Bucket and Rock Breaker	1
	Tippers	2
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	24 Nos	
Water table	70-65m	
Water requirements	3.5 KLD	
Total Project Cost	Project cost	Rs 81,15,000/-
	Compliance Monitoring Cost	Rs 3,80,000/-
	Total	Rs 84,95,000/-
Proposed CER Cost	Rs. 5,00,000/-	

Source: Approved Mining Plan

1.3.2 Location of the project

The lease applied area is located at a distance of 42km North-eastern side of Madurai, 22km Northern side of Melur and 1km Southwestern side of Sökkampatti Village.

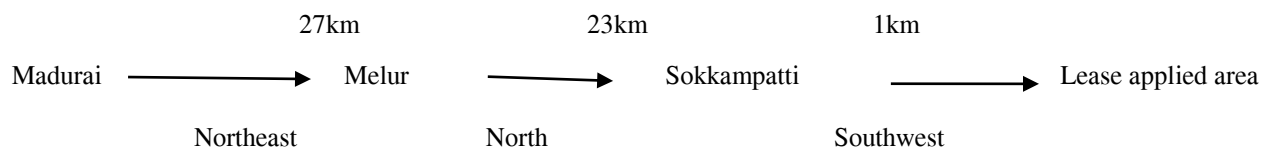


FIGURE 1.1A KEY MAP SHOWING THE LOCATION OF THE PROJECT SITE

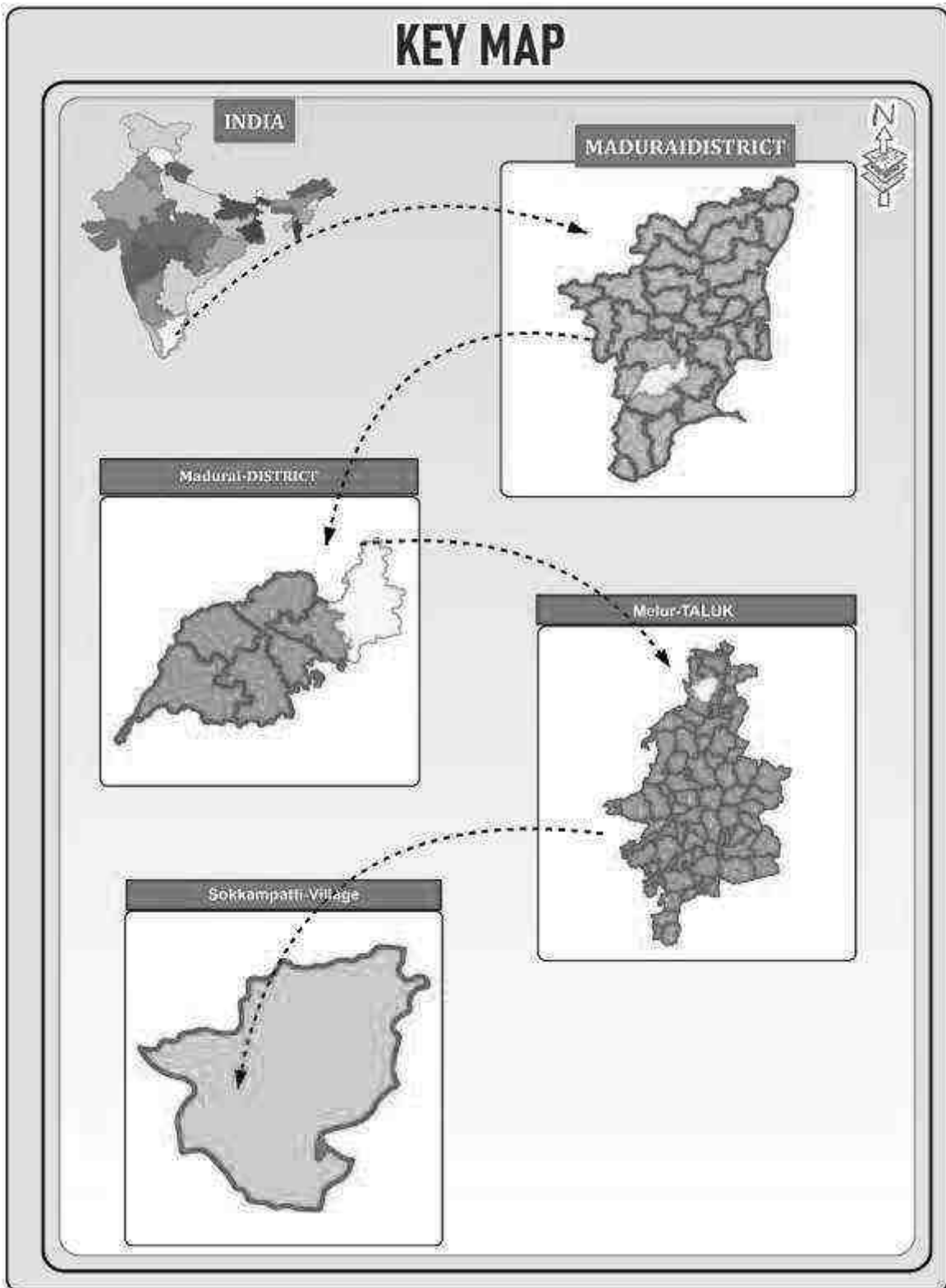


FIGURE 1.2: TOPOSHEET SHOWING LOCATION OF THE PROJECT SITE AROUND 10 KM RADIUS

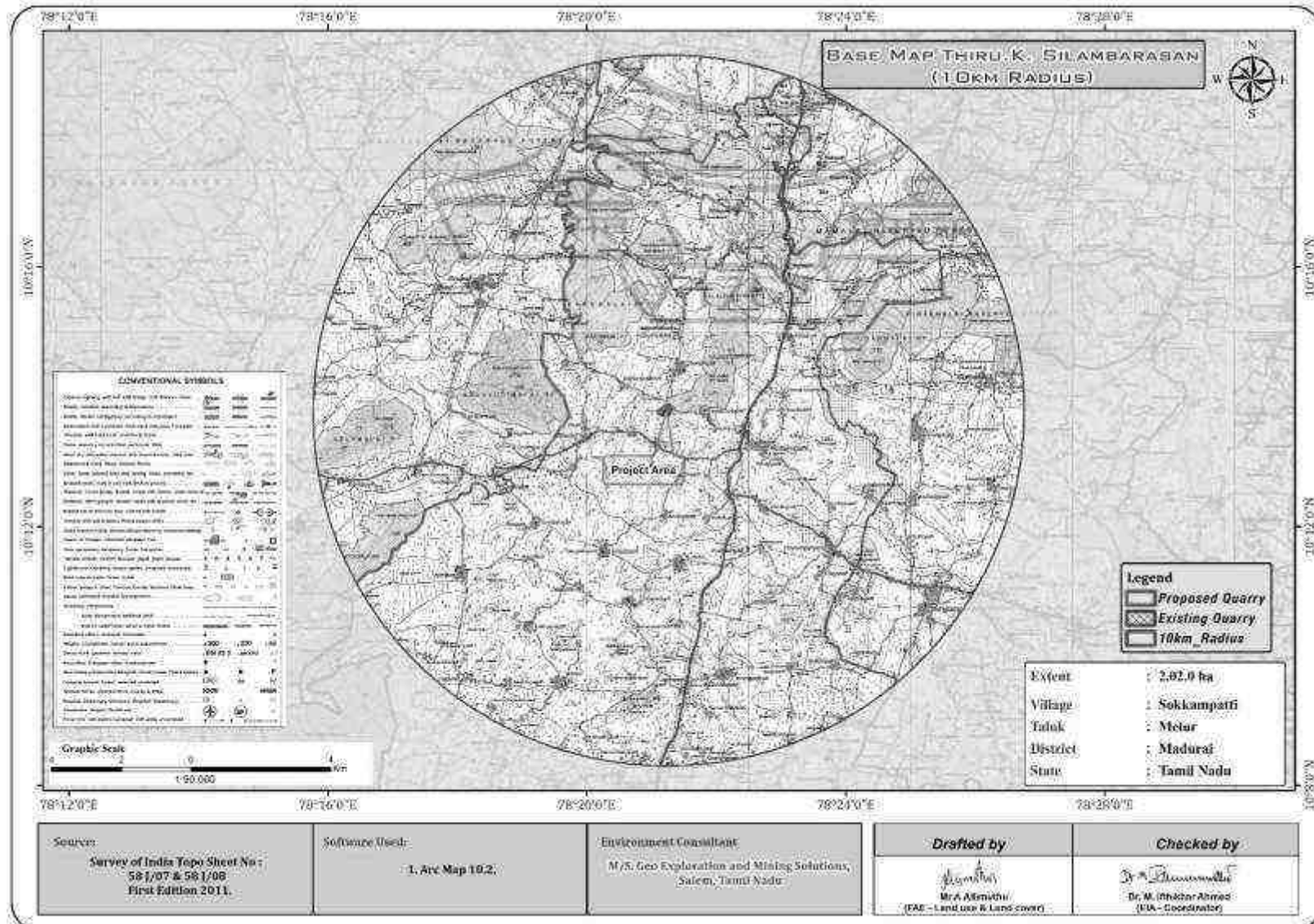
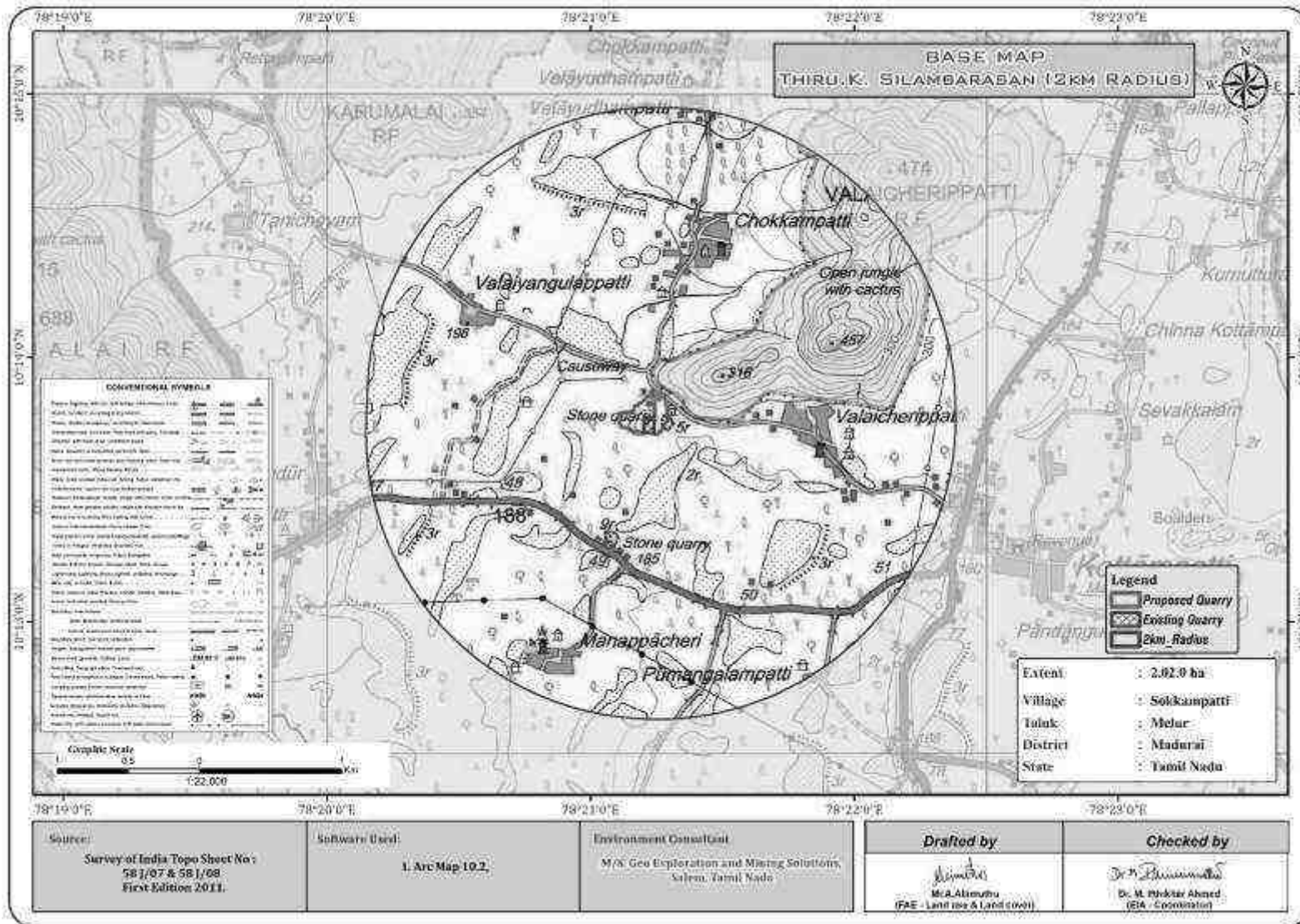


FIGURE 1.3: TOPOSHEET SHOWING LOCATION OF THE PROJECT SITE AROUND 2 KM RADIUS



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 Quarry Lease Dated: 20.01.2021.
- Precise Area Communication Letter was issued by the Assistant Director, Department of Geology and Mining, Madurai District R. C. No.76/Mines/2021 Dated: 13.07.2021.
- The Mining Plan was prepared by Qualified Person and approved by Assistant Director, Department of Geology and Mining, Madurai District, vide R. C. No.76/Mines/2021 Dated: 08.07.2021.
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/65995/2021, Dated:24.07.2021.

SCOPING –

- The proposal was placed in 245th, 265th, 345th SEAC meeting held on 24.07.201, 06.08.2021 & 10.1.2023 the committee recommended for issue of ToR.
- The proposal was considered in 590th SEIAA meeting held on 09.02.2023 and issued ToR vide Letter No SEIAA-TN/F.No.8692/SEAC/TOR-1356/Dated :09.02.2023

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 was submitted reference Dated - Nil.

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, 2010
- EIA Notification, 14th September, 2006
- TOR Letter No SEIAA-TN/F.No.8692/SEAC/TOR-1356/Dated :09.02.2023.
- Approved Mining plan

1.5 Post Environment Clearance Monitoring

The Project Proponents in the Cluster will 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 every year.

1.6 Generic Structure of EIA Document

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. A brief description of each Chapter is presented in Table No. 1.5.

TABLE 1.4 – STRUCTURE OF THE EIA REPORT

S. No	Chapters	Title	Particulars
1	Chapter 1	Introduction	Presents, an Introduction along with Scope and Objective of this EIA/EMP Studies
2	Chapter 2	Project Description	Presents the Technical Details of the Project
3	Chapter 3	Description of Environment	Presents the Baseline Status for various Environmental Parameters in the Study Area for One Season (3 Months)
4	Chapter 4	Anticipated Environmental Impacts and Mitigation Measures	Presents the Identification, Prediction and Evaluation of overall Environmental Impacts due to the Proposed Projects Activities. Also presents Proposed Mitigation Measures.
5	Chapter 5	Analysis of Alternatives (Technology & Site)	Presents Analysis of alternatives with respect to site
6	Chapter 6	Environment Monitoring Programme	Present details of post project environment monitoring
7	Chapter 7	Additional Studies	Presents Public Consultation, Risk Assessment and Disaster Management Plan
8	Chapter 8	Project Benefits	Presents project benefits as: Improvements in the Physical Infrastructure, Social Infrastructure Employment Potential –Skilled; Semi-Skilled and Unskilled etc.,
9	Chapter 9	Cost Benefit Analysis	Environmental Cost Benefit Analysis has not been recommended at Scoping Stage – thus no analysis carried out separately in this EIA/EMP Report
10	Chapter 10	Environmental Management Plan	Description of the administrative aspects to ensure the Mitigation Measures are implemented and their effectiveness monitored, after approval of the project.
11	Chapter 11	Summary & Conclusion	Summary of the EIA Report
12	Chapter 12	Disclosure of Consultants Engaged	Disclosure of the Consultants

1.7 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 lease. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out considering all the proposed and existing quarries falls within the cluster during the Summer season (March 2023 – 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 1.5 – ENVIRONMENT ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	24 hourly samples twice a week for three months at 7 locations
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, Madurai
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 4 ground water and 2 surface water locations 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)	At 7 locations data monitored once for 24 hours during EIA study.
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations 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 assessment done for the mining associated activities

Source: Field Monitoring Data

The data has been collected as per the requirement of the ToR issued by SEIAA – TN

1.7.1 Regulatory Compliance & Applicable Laws/Regulations

- 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 of Rough Stone quarry has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959
- Lr No. SEIAA-TN/F.No.8692/SEAC/T0R-1356/Dated:09.02.2023 – **Thiru.K.Silambarasan**

CHAPTER – 2: PROJECT DESCRIPTION

2.0 General

This EIA & EMP report prepared for **Thiru.K.Silambarasan** Rough Stone Quarry (2.02.0Ha) in Sökkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State. The Proposed Rough Stone Quarry requires Environmental Clearance.

There are 2 proposed and one existing quarry forming a cluster; Cluster Quarries consisting of three (3) quarries total **Cluster extent of 6.22.0 ha**

(1 Proposals applied for public hearing {2.02.0 ha},

1 Proposals already EC granted (3.20.0 ha)}

& 1 Existing quarries under operation {1.00.0 ha} calculated as per MoEF & CC Notification S.O. 2269(E)

Dated 1st July 2016.

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 this project. There is no effluent generation/discharge from the project.

Rough Stone is 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 pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.2 Location of the Project

- The Cluster quarries are located in Sökkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State.
- The project falls in Toposheet No: 58 J/08
- The project area Falls in the Latitude between 10° 13' 42.56"N to 10° 13' 52.06"N and Longitude between 78° 21' 14.35"E to 78° 21' 17.52"E
- The project area is a Government Poramboke land classified & does not fall within 10 km radius of any Eco – sensitive zone, Wild life Sanctuary, National Park, Tiger Reserve, Elephant Corridor and Biosphere Reserves.

TABLE 2.1: SITE CONNECTIVITY TO THE CLUSTER QUARRIES

Nearest Roadway	NH - 45B - Madurai – Tiruchirappalli – 2.0km -SE SH-35- Dindigul – Tiruppathur – 1.0km-S
Nearest Village	Sökkampatti – 1.0Km - NE
Nearest Town	Natham – 13.0Km - W
Nearest Railway	Madurai Railway station – 43km- SW
Nearest Airport	Madurai Airport – 42.0km -SW
Seaport	Kochi- 230Km-SW

Source: Survey of India Toposheet

The cluster quarries coners coordinates are given below.

TABLE 2.2 – BOUNDARY CO-ORDINATES OF PROJECT AREA

Corner Nos.	Latitude	Longitude
1	10°13'52.06"N	78°21'15.39"E
2	10°13'51.09"N	78°21'16.73"E
3	10°13'49.14"N	78°21'17.10"E
4	10°13'49.07"N	78°21'17.42"E
5	10°13'45.85"N	78°21'17.52"E
6	10°13'43.67"N	78°21'16.12"E
7	10°13'42.56"N	78°21'15.28"E
8	10°13'42.63"N	78°21'14.35"E
9	10°13'50.21"N	78°21'14.45"E
Datum: UTM-WGS84		

Source: Quarry Lease Plan of the respective proposals

FIGURE 2.1: TOPOGRAPHICAL VIEW OF THE PROJECT SITE



FIGURE 2.2: GOOGLE IMAGE ROUGH STONE QUARRY PROJECT AREA

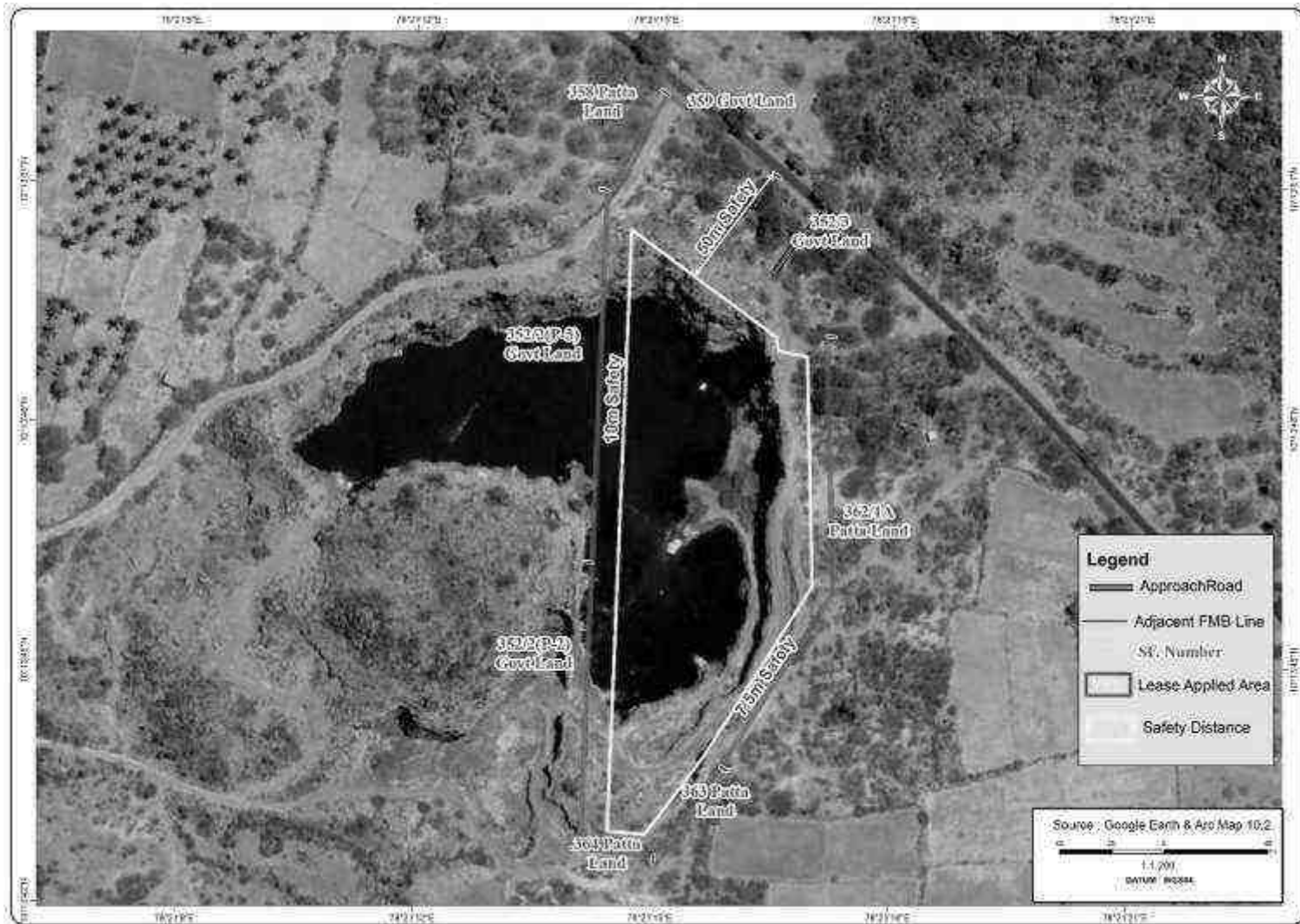


FIGURE 2.3: QUARRY LEASE PLAN

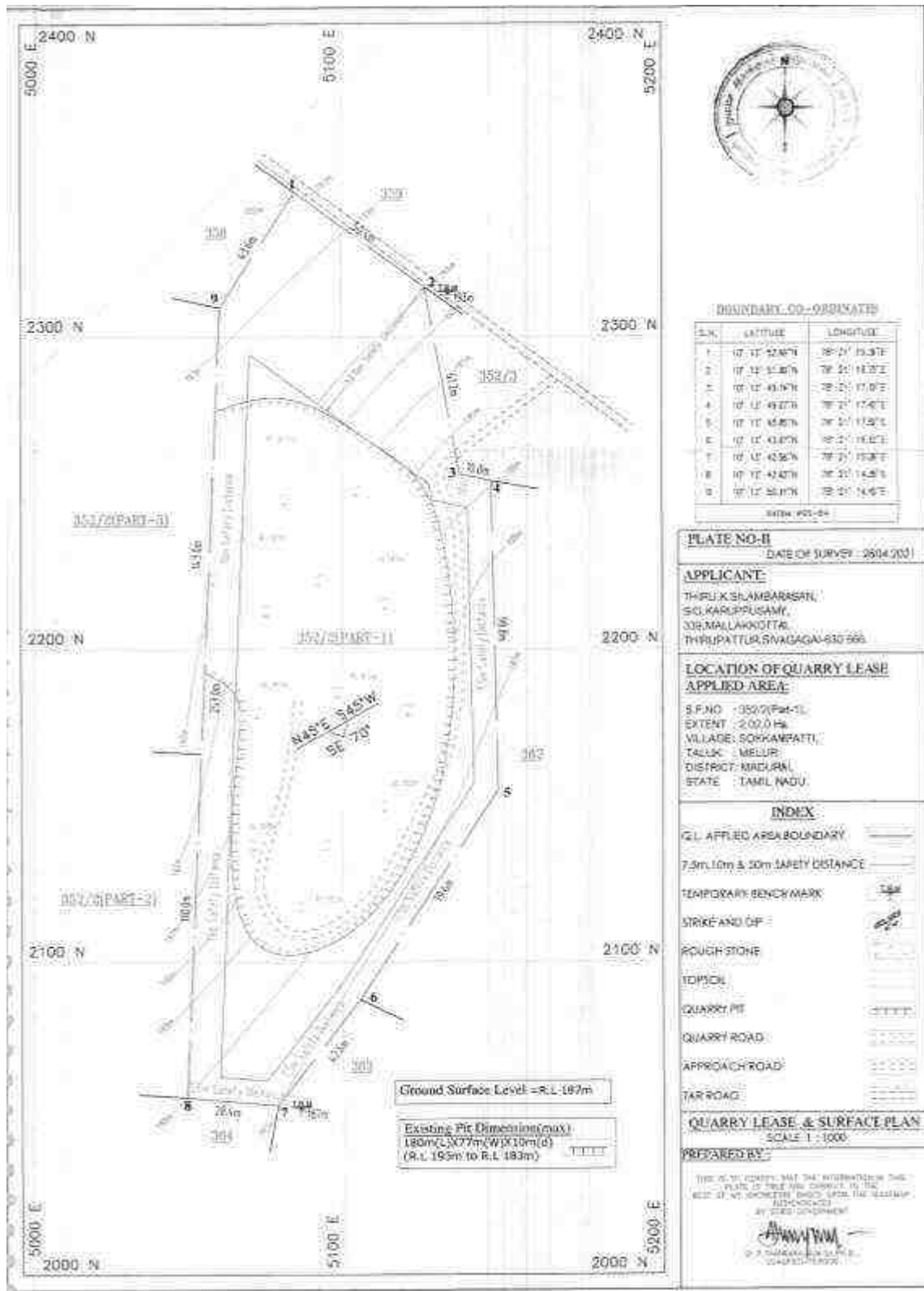


FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE

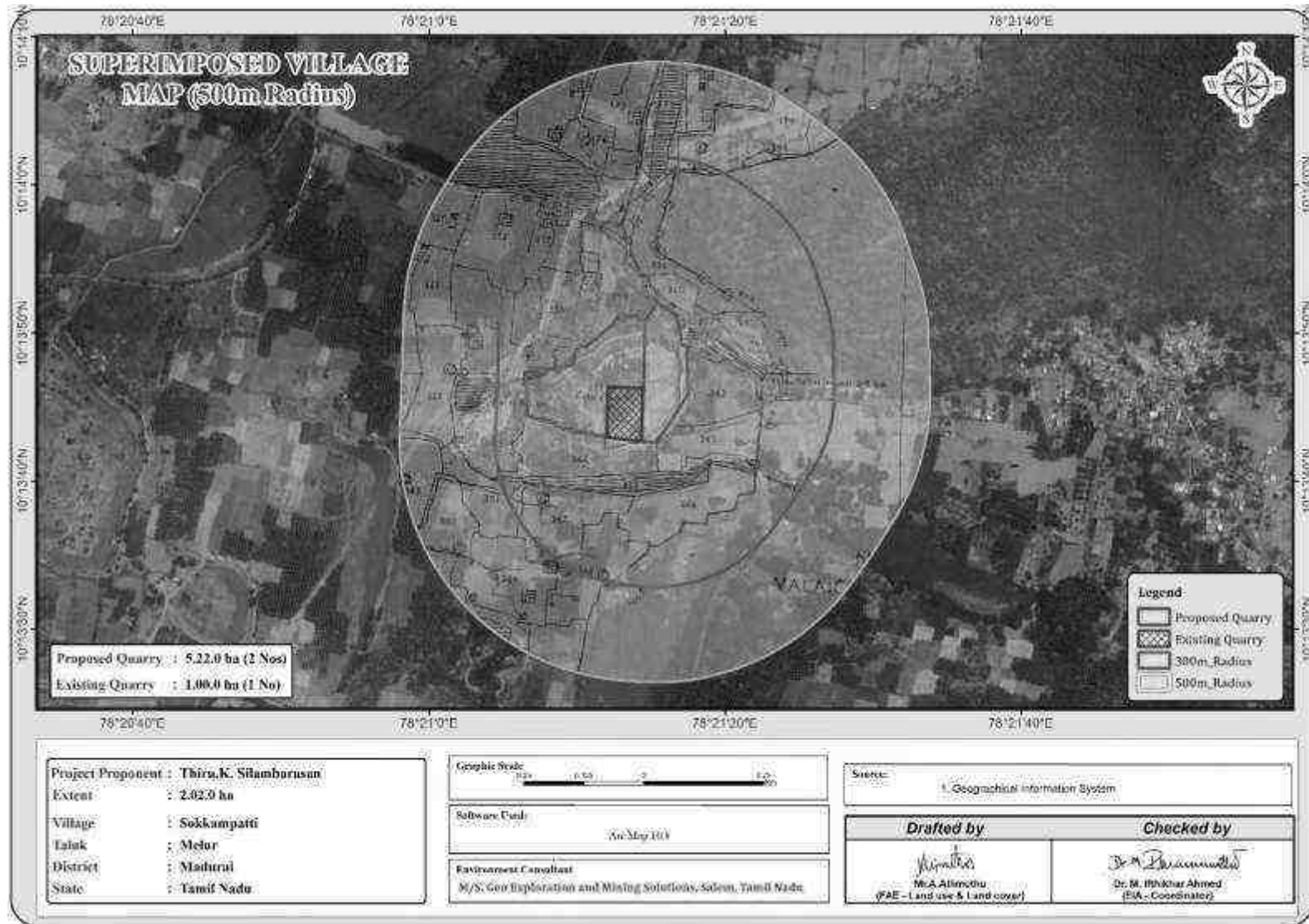


FIGURE 2.5: DIGITIZED MAP OF THE STUDY AREA (10 KM RADIUS FROM PROJECT SITE)

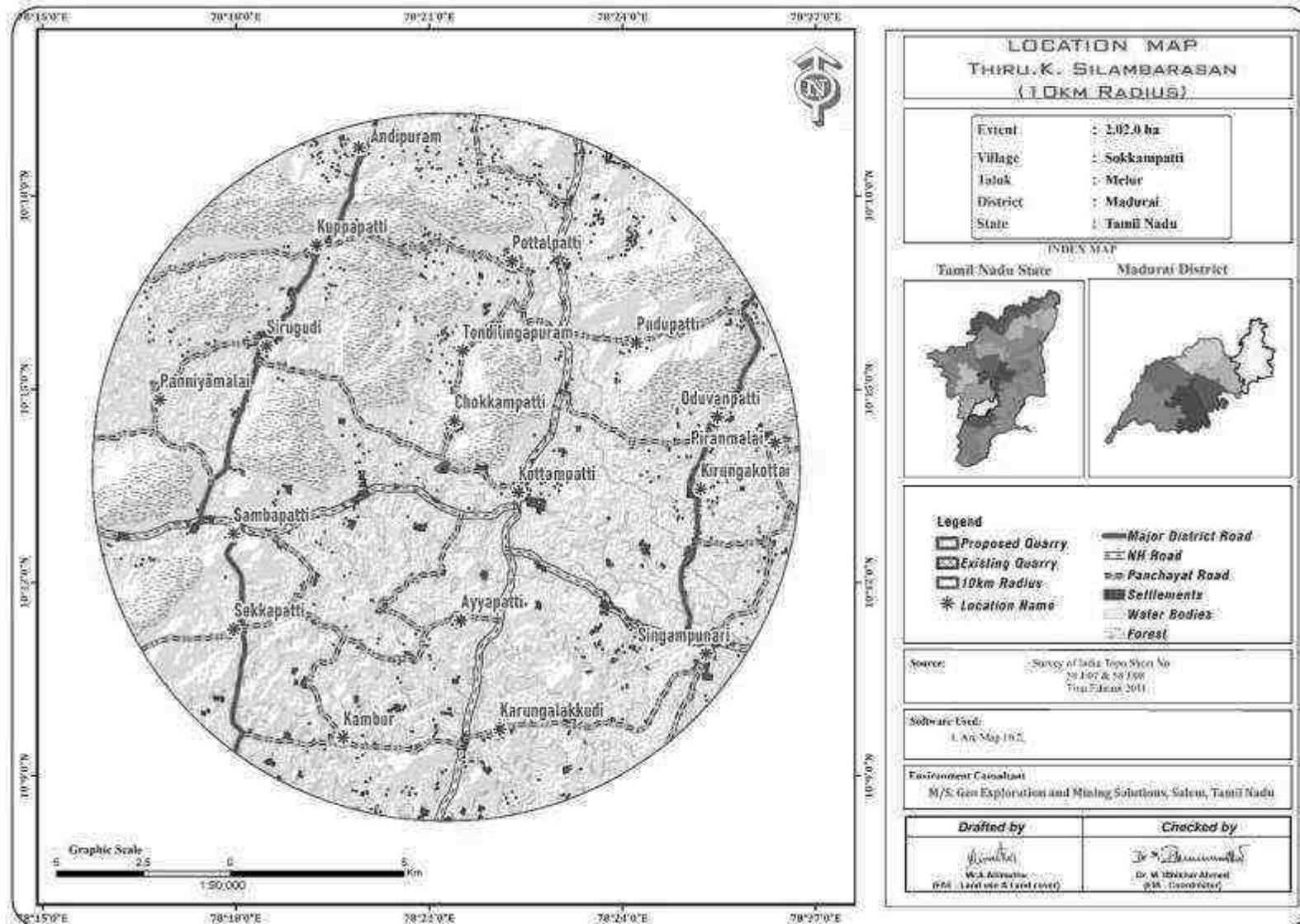


FIGURE 2.6: DIGITIZED MAP OF THE STUDY AREA (5 KM RADIUS FROM PROJECT SITE)

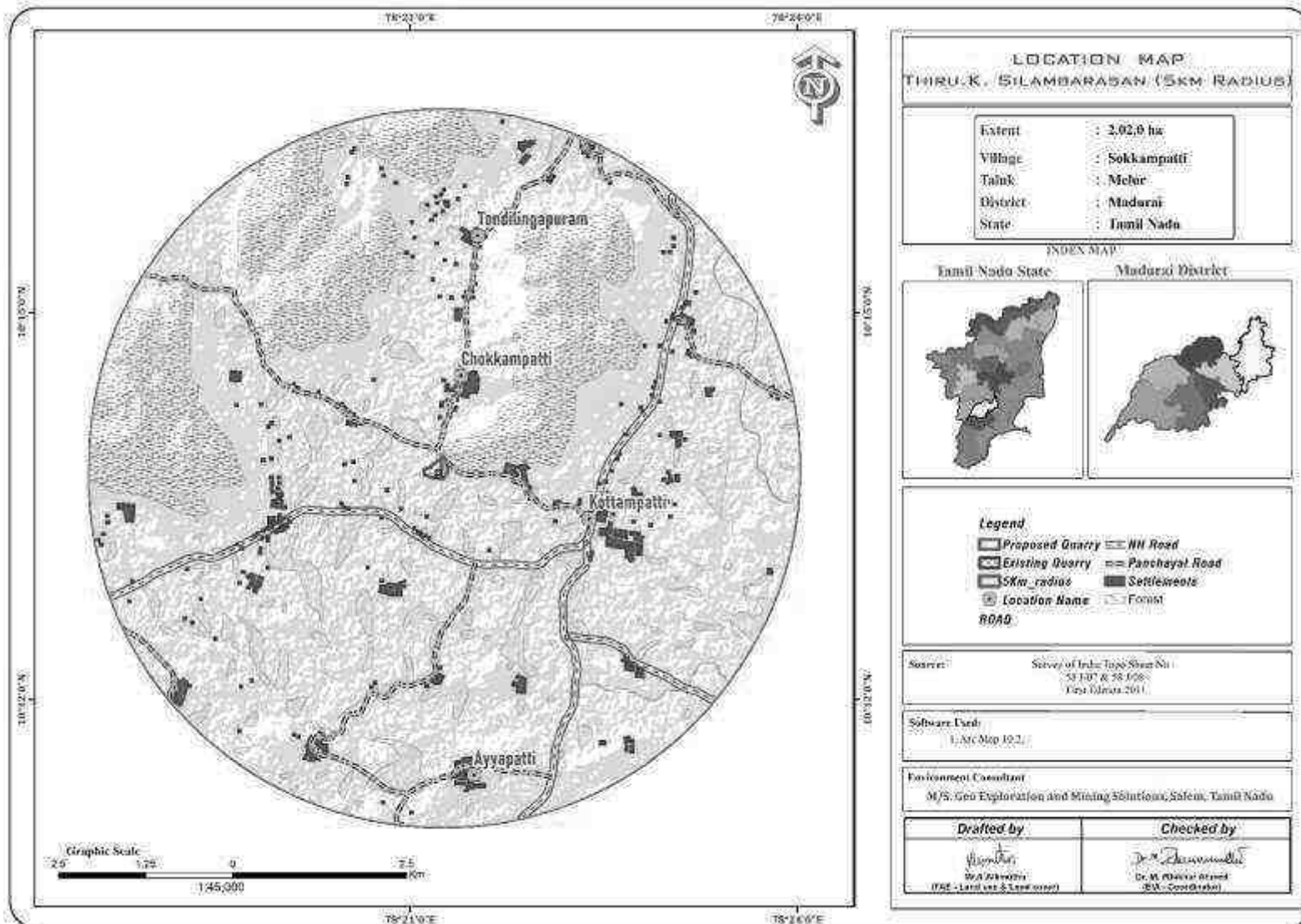
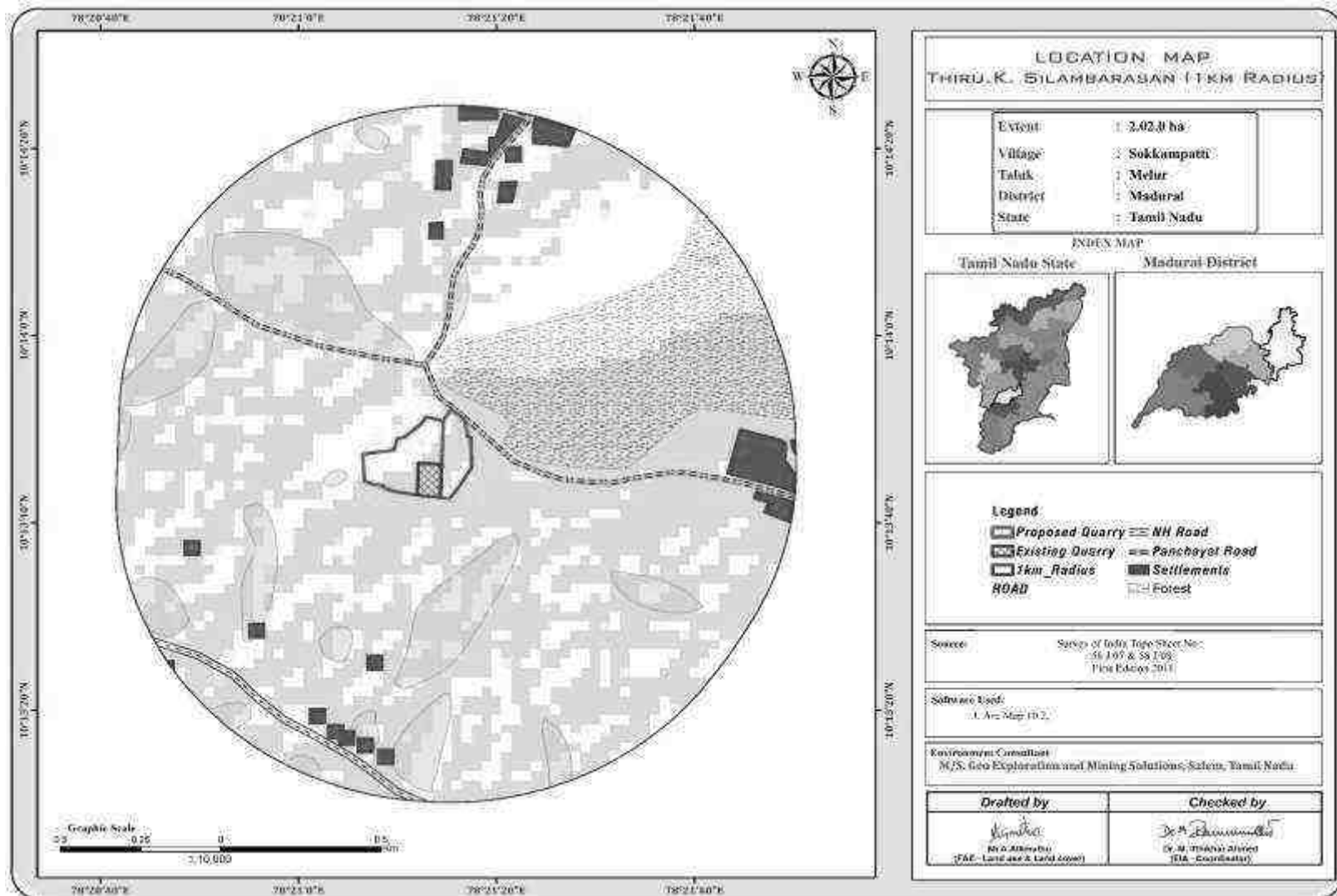


FIGURE 2.7: DIGITIZED MAP OF THE STUDY AREA (1 KM RADIUS FROM PROJECT SITE)



2.2.1 Project Area

- The Rough Stone quarry is proposed to operate by opencast mechanized method of mining and the project is site specific
- There is no beneficiation or processing proposed inside the project area.
- Highest elevation is 193m AMSL.
- The lease applied area classified as Government Land and exhibits Undulated topography. The area has gentle sloping towards Southeastern side. The altitude of the area is 193m (max) above Mean Sea level. The area is covered by 1m thickness of Topsoil and followed by Massive Charnockite which is clearly inferred from the existing quarry pits.
- Peninsular gneiss forms the oldest rock formations, in which the massive formation of charnockite body N45 °E – S45 °W with dipping towards SE70°
- There is no forest land involved in the proposed project area and the area is devoid of major cultivation and trees.

TABLE 2.3 – LAND USE PATTERN OF THE PROPOSED PROJECT

Description	Present area (Ha)	Area at the end of this Mining plan period (Ha)
Area Under Quarrying	1.09.0	1.24.3
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.45.0
Unutilized Area	0.91.0	0.29.7
Grand Total	2.02.0	2.02.0

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)	Top soil (1 years)
Geological Resources	7,59,392	9,122
Mineable Reserves	2,04,792	1,560
Production for five-year plan period	2,04,792	1,560
Mining Plan Period	5Years	
Number of Working Days	300 Days	
Production per day	137	5
No of Lorry loads (12 m ³ per load)	12	1
Total Depth of Mining proposed as per Mining plan	41m (1m Topsoil + 40m Rough stone)	

Source: Approved mining plan

2.3 Geology

2.3.1 Regional Geology

Madurai district of Tamil Nadu forms a part of southern Granulitic terrain and is predominantly occupied by crystalline rocks of Archaean to late Proterozoic age. Regionally, the rocks can be grouped under five categories namely:

- ❖ Metasedimentary group comprising quartzite, calc gneiss/crystalline limestone, garnet- sillimanite \pm biotite \pm cordierite \pm spinel gneiss, minor garnet-cordierite gneiss and garnetiferous quartzo-feldspathic gneiss (Khondalites and leptynite), magnetite and quartzite.
- ❖ Charnockite Group consisting of acid charnockite and pyroxene granulite.
- ❖ Older Intrusive rocks consisting of amphibolite, pyroxenite and gabbro (mafic sultramafics).
- ❖ Migmatite group made up of banded hornblende biotite gneiss, grey granitic gneiss,
- ❖ Pink granitic gneiss and grey hornblende granite.

Table 2.5 Stratigraphy of Madurai District

Age	Group	Lithology
Holocene		Red lomy/Block cotton soil/clay \pm gypsum
Cenozoic		Kankar/calc-tufa
Neoproterozoic	Acid intrusives	Quartz veins Pegmatite Pink Granite
	Sivamalai syenite Complex	Nepheline-syenite
	Chalk Hills (Basic Intrusives)	Pyroxenite/Dunite
Archaean - Palaeoproterozoic	Peninsular Gneiss Complex (II) PGC (II)	Pink Granite Gneiss Hornblende Biotite gneiss
Archaean	Charnockite Group	Charnockite (Unclassified) Pyroxene Granulite Banded Magnetite Quartzite

2.3.2 Local Geology: -

Regional foliation trend of the rock types in Melur area swerves from NE-SW to ENEWSW direction dipping either east or westwards with dip amounts ranging between 50 and 80 depicting a broad antiformal fold with axial plane trending along ENE-WSW direction and plunging at low angles towards ENE direction. The garnetiferous quartzo-feldspathic granulite viz. Kashmir White bands are located mainly in the limb portions of the major fold. The pink medium grained granite viz. Vanjinagaram Pink has been intruded mainly along the weak plane of the above major fold axis and in turn has influenced the adjoining grey granite/ grey migmatite rocks with pink permeations, giving rise to the formation of pink and grey augen gneiss viz. Tiger Skin. Due to the cross folding of the above major fold mainly along NNW-SSE direction, puckering effect (microfolds) besides development of minor step like fractures are seen in the Tiger Skin deposit. Minor folds trending along ENE-WSW direction are also noticed mainly in the Kashmir White bands. Some of the fractures and cleavages are seen filled by pegmatites and quartz veins, especially in Tiger Skin deposit. Apart from the above-mentioned structural features, no other major structural disturbance which may affect production of commercial granite could be deciphered in Melur area.

The study area follows the regional trend and mainly comprises of Hard Rock Formation as a homogeneous formation / Batholith formation of Charnockite. All the project areas are plain terrain, all the project areas are covered with Topsoil formation of 2m thickness; Massive Charnockite formation is found after 2 m Topsoil formation which is clearly inferred from the nearby existing quarry pit.

Source: District Survey Report for Minor Minerals Madurai District – May 2019

2.3.3 Hydrogeology

The district is underlain predominantly by crystalline formations and alluvium is found along the courses of the river. Ground water occurs under phreatic conditions in weathered residuum and interconnected shallow fractures and under semi-confined to confined conditions in deeper fractures. The depth of weathering varies from 20-25 m bgl in Usilampatti, Sedapatti and Kottampatti area, while it varies from 30 to 40 m bgl in remaining parts of the district.

The depth of dug wells varies from 10 – 20 m with a yield of 45 – 135 lpm. In the exploration programme of Central Ground Water Board, 29% of the wells yielded less than 1 lps while 30% of the wells yielded between 1 – 3 lps. In general, there are about 2 – 3 fracture zones less than 50 m and about 2 – 3 fracture form beyond 100 m also. The variation in the yield of bore wells are very high in the district. Potential fractures with high discharge have been established along Valandur-usilampatti Timmarasanayakanur, Thirali-Peraiyur tract and Palkalainagar- Nilayur tract in the district. The depth to water level in the district varies from 3.13 to 7.66 m bgl during premonsoon (May) and 1.86 to 5.74 m bgl during post monsoon period. (Source: CGWB).

Source: http://cgwb.gov.in/district_profile/tamilnadu/madurai.pdf

Aquifer Systems:

Granite, Charnockite, Pegmatite, Gneissic Rocks are largely found in Madurai area. Sedimentary rocks namely calcareous gritty (sand stone mixed clay), and quartz vein. The younger alluvium formations are seen predominantly in the northern part of the area and are considered as highly permeable. The northwest and middle east part of the area consist of fluvial– deltaic sediment deposits, which are laid on Granitoid gneiss and are considered as good zone for groundwater potential. However, the hard rock materials composed of crystalline charnockite, conglomerate, and quartzite vein present in the southern part of the area are not suitable for groundwater potential zones.

Hard Rock Formations

More than 90% of the district is underlain by hard rocks. The gneissic type of formation is found on the western portion in the Western Ghats and its offshoots, Cumbum valley, north of Thirumangalam, parts of Melur, etc., Infact, this is the major formation among the various types of hard rocks.

Charnockite

Groundwater occurs under water table conditions but the intensity of weathering, joint, fracture and its development is much less when compared to gneissic formations. The groundwater potential is low, when compared with the gneissic formations. Charnockite occurs as distinct pockets in parts of Periyakulam, Melur, Thirumangalam and Usilampatti taluks. Quartzites which are resistant to weathering are also seen as patches in Charnockite and gneissic varieties.

Valley fill sediments

Valley fill sediments composed of admixtures of calcareous mud, clay, silt and sand occur in several places in the western portion particularly in Uthamapalayam and Usilampatti taluks. Good deposits are found in Cumbum valley, Varshanad valley and near Palakombai. These are the products of quick transportation of weathering material from the adjacent mountain slopes around the valley.

Alluvial Formations

Alluvial deposits such as sand, silt, stiff clay, Topsoil, etc., which are transported sediments by the river are found on either side of Vaigai near Madurai and Vadipatti blocks. These formations are overlying the hard rock as a thin layer. In the river alluvium groundwater occurs under water table condition. The maximum thickness is 40 m and the average thickness of the aquifer is approximately 15 m. These formations are porous and permeable which have good water bearing zones.

Aquifer Parameters

The thickness of aquifer in this district is highly erratic and varies between 15 m to 40 m below ground level. The intergranular Porosity is essentially dependent on the intensity and degree of weathering and fracture development in the bed rock. As discussed earlier deep weathering has developed in Gneissic formations and moderate weathering in charnockite formations. The range of aquifer parameters in hard rock and sedimentary formations are given below:

TABLE 2.6: RANGE OF AQUIFER PARAMETERS

Type of Aquifer	Water Table conditions
hard rock areas	
Permeability	0.98-2.45 m/day
Transmissivity (T) m ² /day	15-60 m ² /day
Well yield in LPM	45-135 lpm
Valley fill sediments	
Permeability	1.95-4.40 m/day
Transmissivity (T) m ² /day	75-150 m ² /day
Well yield in LPM	225-450 lpm
Alluvium formation	
Permeability	19.57-48.93 m/day
Transmissivity (T) m ² /day	210-1500 m ² /day
Well yield in LPM	315-1080 lpm

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

TABLE 2.7: GROUND WATER LEVEL VARIATIONS OF MADURAI DISTRICT

Jan 2017	May 2017	Jan 2018	May 2018	Jan 2019	May 2019	Jan 2020	May 2020	Jan 2021	May 2021	5 Years Pre Monsoon Average	5Years Post Monsoon Average
9.7	14.1	7.1	10.0	7.2	11.0	7.6	10.3	4.7	5.4	9.3	6.5

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

FIGURE 2.8: REGIONAL GEOLOGY MAP

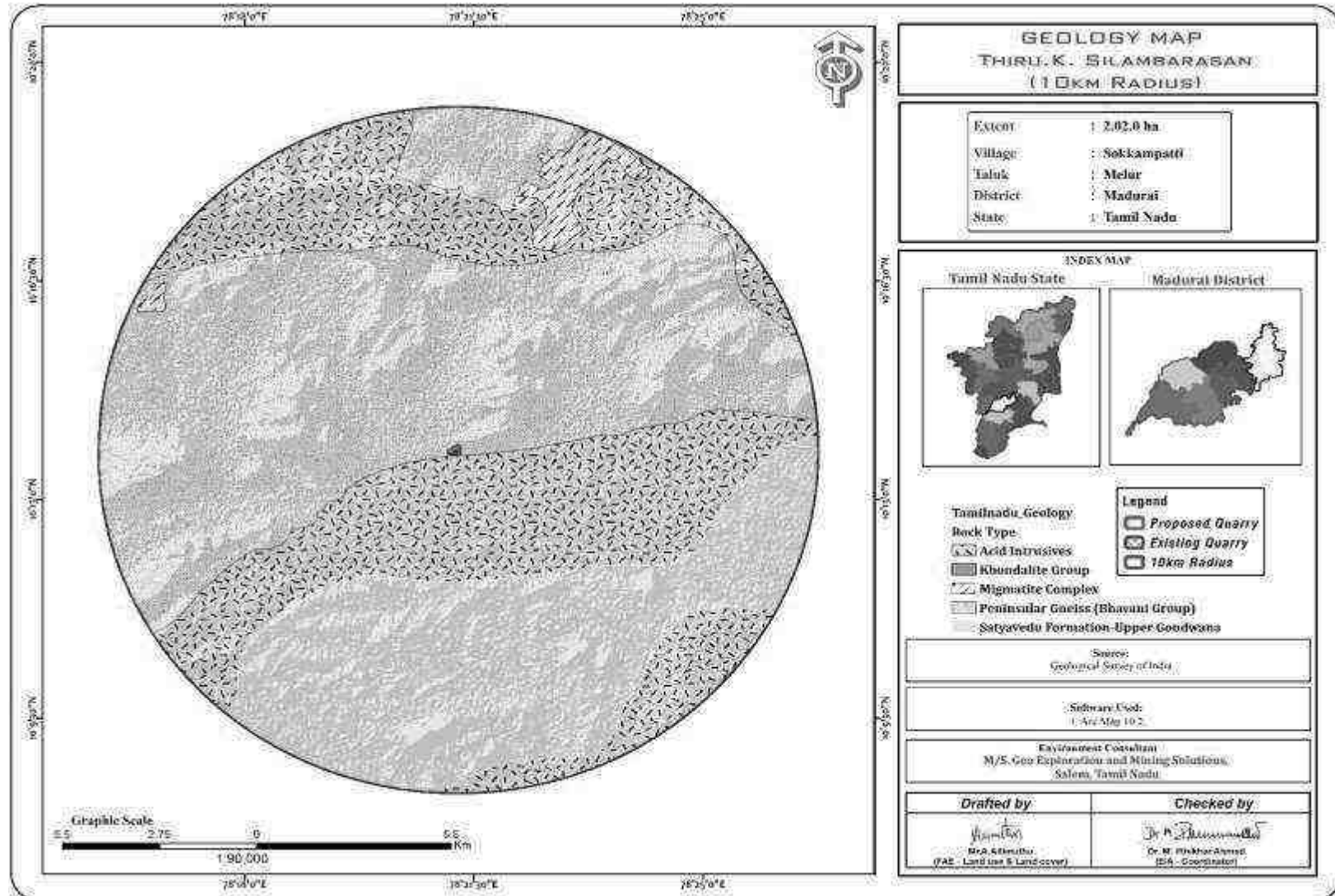


FIGURE 2.9: GEOMORPHOLOGY MAP

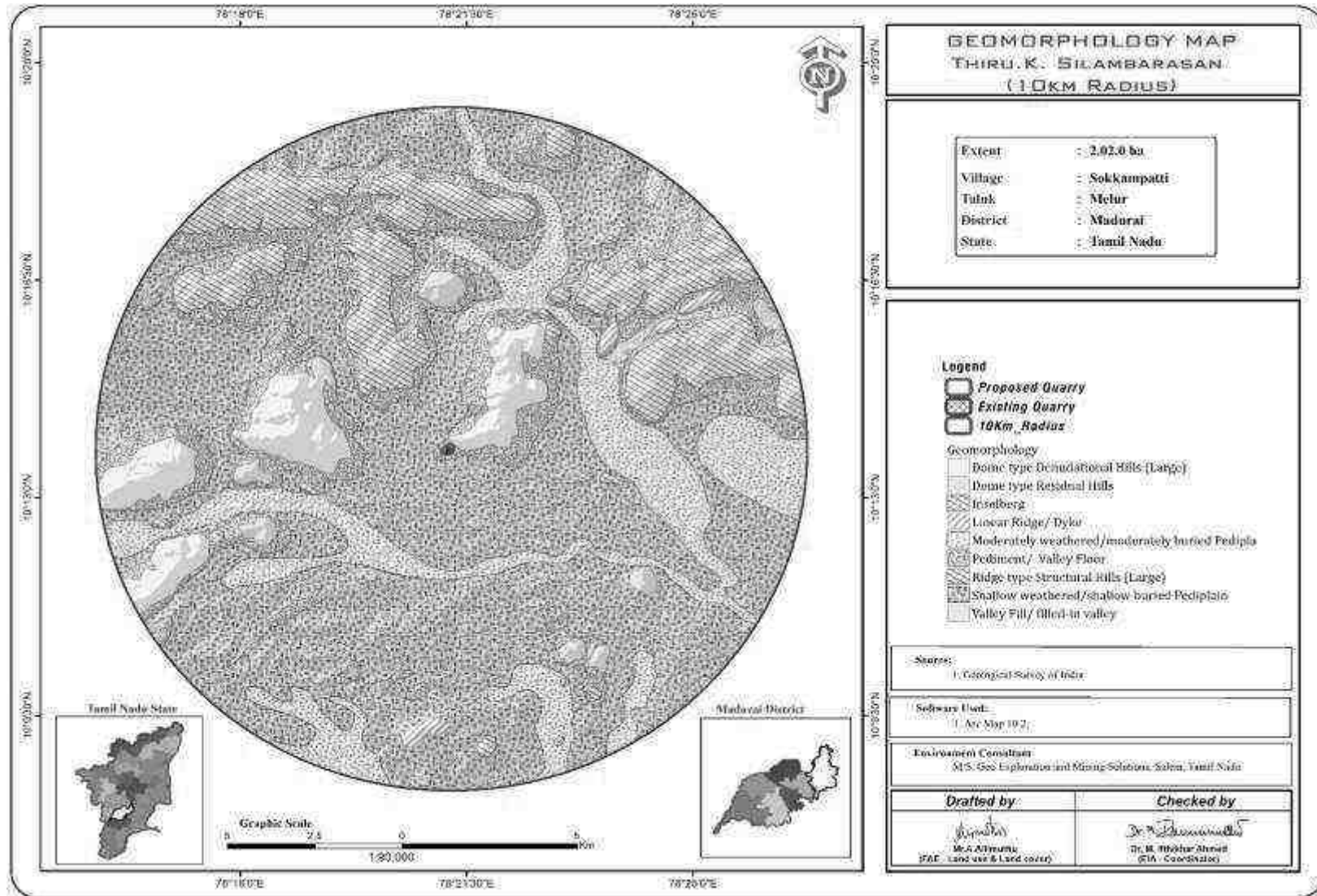
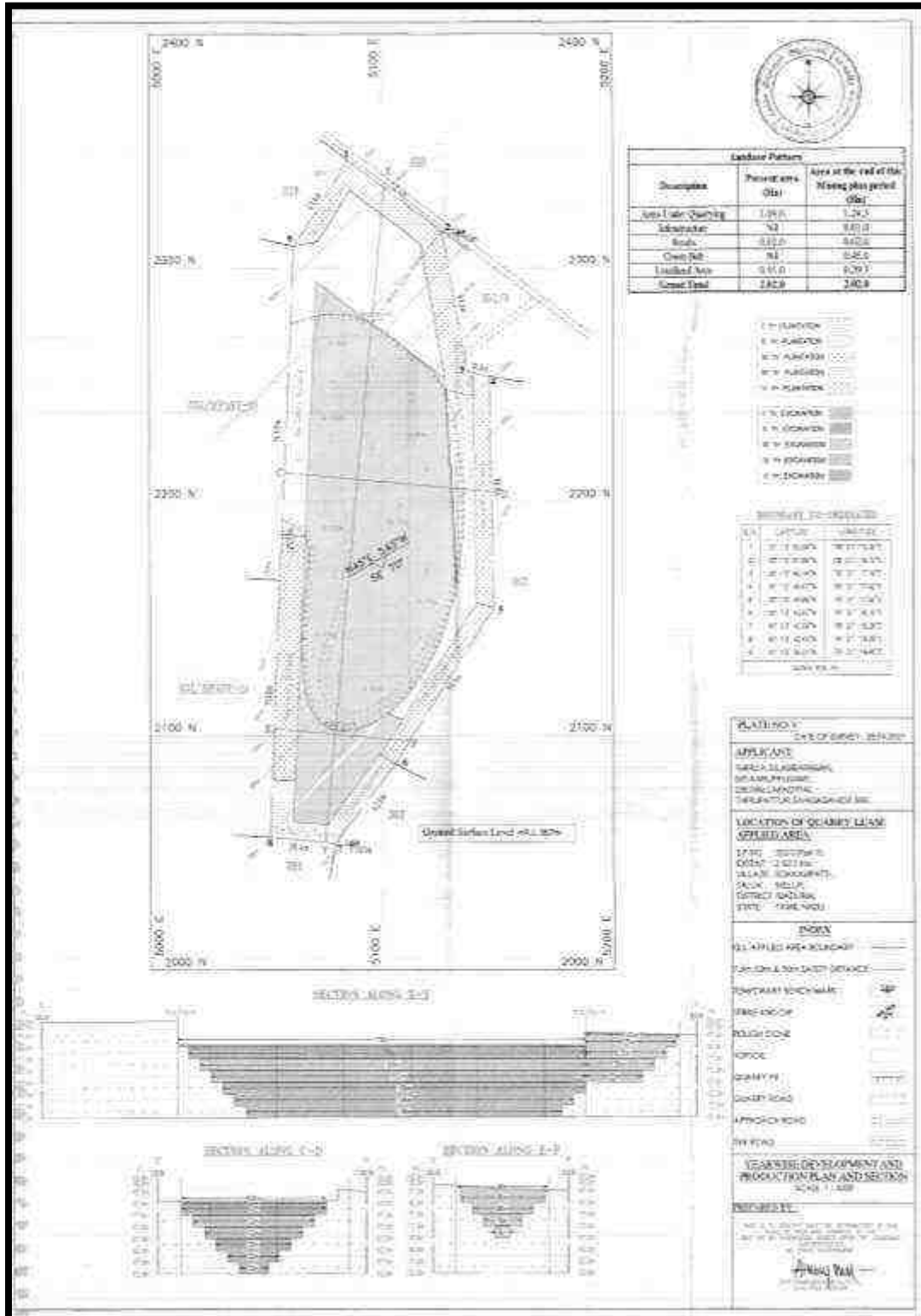


FIGURE 2.10: YEARWISE DEVELOPMENT PRODUCTION PLAN AND SECTION



2.4 Resources and Reserves of the Cluster quarries

The available mineable reserves are calculated after leaving necessary safety distances, reduced depth considering bench width.

TABLE 2.8: RESOURCE AND RESERVES

Description	Rough Stone in m ³	Top soil in m ³
Geological Resource in m ³	7,59,392	9,122
Mineable Reserves in m ³	2,04,792	1,560
Proposed production considering bench safety parameters	2,04,792	1,560

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), 10m safety distance to the road and 50m safety distance to the EB Line and deducting the locked-up reserves during bench formation. (Also called as Bench Loss). The Mineable Reserves is calculated considering that there is no waste / overburden / side burden (100% Recovery Anticipated).

The above calculated Mineable Reserves is further divided for tentative excavation plan period of the Lease Applied Period for 5 Years.

TABLE 2.9: YEAR-WISE PRODUCTION PLAN

YEAR	ROUGH STONE (m ³)	Top soil (m ³)
I	22,482	1560
II	53,010	-
III	45,560	-
IV	34,560	-
V	49,180	-
TOTAL	2,04,792	1560

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 Topsoil 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 2.10: ULTIMATE PIT DIMENSION OF PROPOSED PROJECT

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	216	77	41m (AGL 6m + BGL 35m)

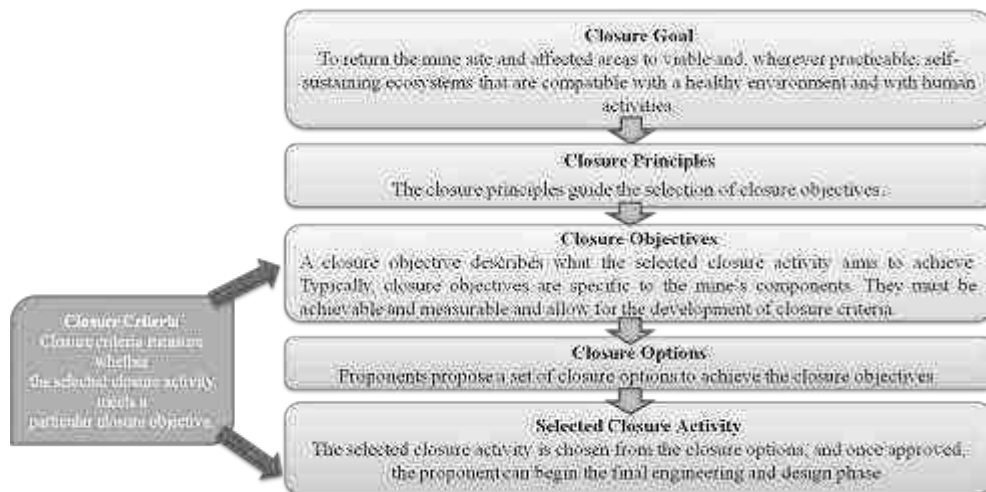
Source: Approved Mining Plan

- 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.

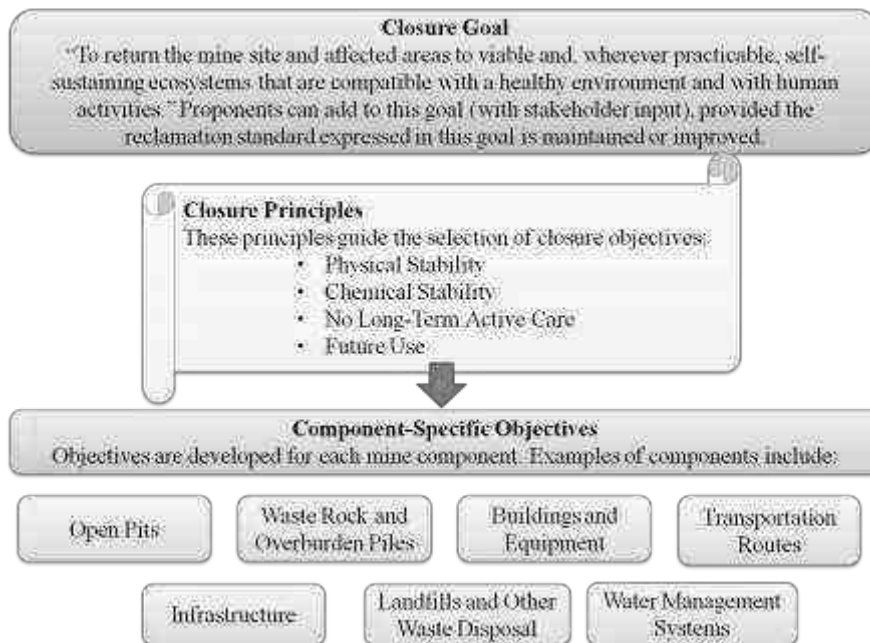


Closure Planning & Options Considerations in Mine Design –

- 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
- There is a river on southern side of the project area. The river will not be hindered by any of mine closure activities
- 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 2.11: MINE CLOSURE BUDGET FOR THE PROPOSED PROJECT

ACTIVITY	YEAR					RATE	AMOUNT (INR)	
	I	II	III	IV	V			
Plantation under safety zone (In Nos.)	100	100	100	100	100	@ 100 Rs Per sapling	Rs.50,000/-	
Plantation Cost	10000	10000	10000	10000	10000			
Plantation in quarried out bench and approach road (In Nos.)	80	80	80	80	80	@ 300 Rs Per Meter	Rs.40,000/-	
Plantation Cost	8,000	8,000	8,000	8,000	8,000			
Wire Fencing (In Mtrs) 660 Mtrs	1,98,000	-	-	-	-	@300 Rs Per Meter	Rs.1,98,000/-	
Garland drain (In Mtrs) 540 Mtrs	1,62,000	-	-	-	-	@300 Rs Per Meter	Rs.1,62,000/-	
TOTAL								Rs. 4,50,000/-

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 top layer of overburden (Topsoil) will be Excavate directly by Hydraulic Excavators and loaded into tippers directly and sold to needy customers. 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

Drilling will be carried out as per parameters given below :-

Spacing – 1.2m, Burden –1.0, Depth of hole - 1.5m

2.5.2 Blasting

Blasting will be done as per details below: -

- Controlled blasting parameter: -
 - Spacing – 1.2m
 - Burden – 1.0 m
 - Depth of hole – 1.5m
 - Charge per hole – 0.5Kg
 - Powder factor – 6.0 tonnes/kg

Dia of hole – 30-32 mm

Details of blasting design and parameters are discussed in approved mining plan.

Volume of Rough Stone will be excavated from one hole	=	3 Tonnes
Total Volume from proposed quarry	=	2,04,792m³
	=	2,04,792/5
	=	40,958/300
	=	137* 2.6
	=	355 Tonnes per day
Therefore, Number of Holes per day	=	355/3
	=	118 Holes per day

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.

2.5.3 Extent of Mechanization

TABLE 2.12. PROPOSED MACHINERY DEPLOYMENT

PROPOSAL – P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	6	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	1	300 HP	Diesel Drive
4	Tippers	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 are available in the Existing quarries and the same infrastructure as per the Mine Rule will be arranged.

2.6.1 Drainage Pattern

The general drainage pattern of the area is dendritic. There are no streams, canals or water bodies crossing within the project area, hence there is no requirement of stream or canals diversion in the near future.

2.6.2 Traffic Density

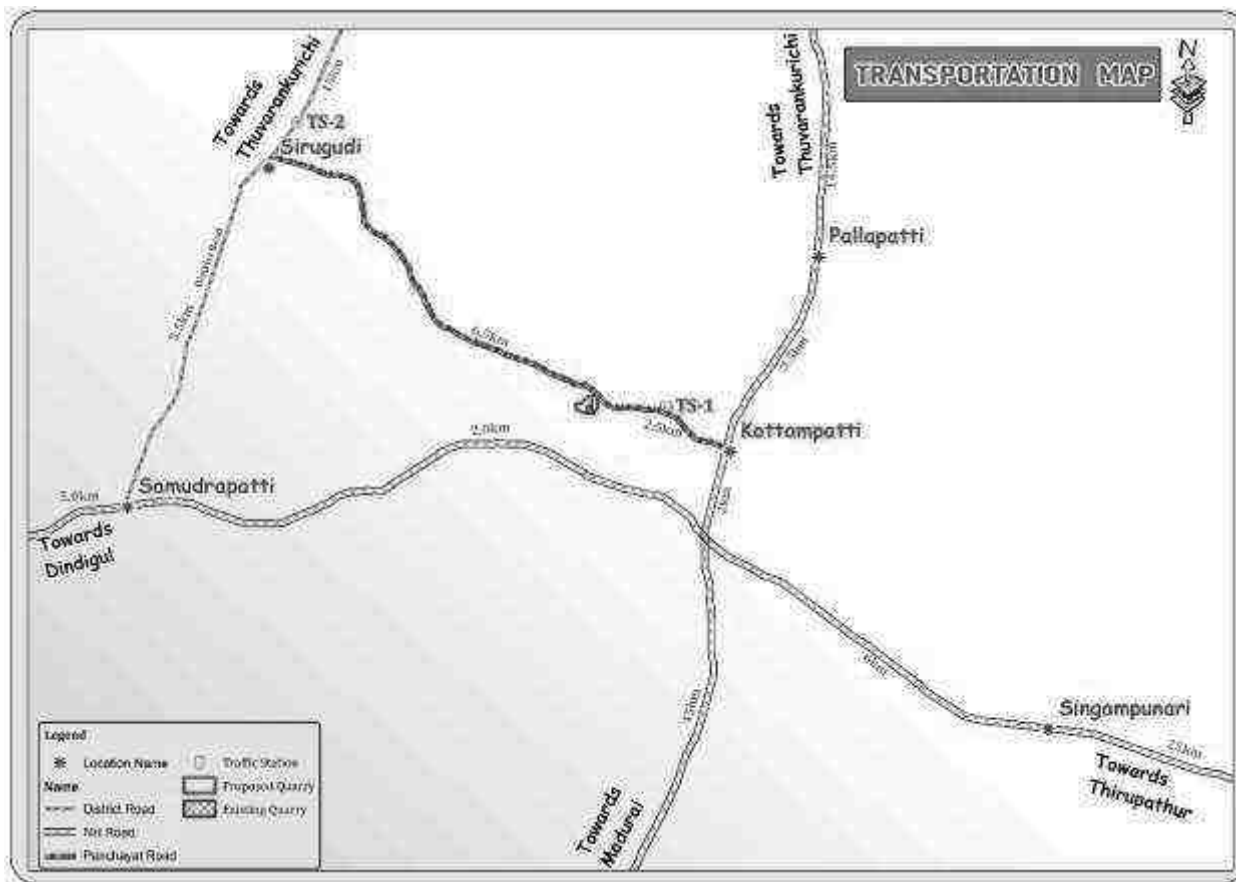
Traffic density measurements were performed as per IRC 1960 Guidelines at three locations based on the transportation route. The monitoring was carried out on 10-4-2023. Traffic density measurement were made continuously for 24 hours by visual observation and counting of vehicles under three categories, 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 2.13 – TRAFFIC SURVEY LOCATION'S

Station code	Station location	Distance and Direction	Type of Road
TS1	Kottampatti-Sirugudi	670m- NE	Panchayat Road
TS2	Samudrapatti-Thuvarankurichi	6.2km-NW	District Road

Source: On-site monitoring by GEMS FAE & TM

FIGURE 2.11: TRAFFIC SURVEY LOCATIONS & TRANSPORTATION ROUTE MAP



(Source: Survey of India Toposheet)

TABLE 2.14 – EXISTING TRAFFIC VOLUME

Station code	HMV (Hourly Average)		LMV hourly average		2/3 Hourly average		Total PCU per hour
	No	PCU	No	PCU	No	PCU	
TS1	24	72	12	12	38	19	103
TS2	102	306	143	143	114	57	506

Source: On-site monitoring by GEMS FAE & TM

- PCU conversion factor for HMV (Trucks and Bus) = 3, LMV (Car, Jeep and Auto) = 1 and 0.5 for Motor Vehicles (2/3 Wheelers)

TABLE 2.15 – ANTICIPATED TRAFFIC DUE TO THIS PROPOSED PROJECTS

Transportation of Rough stone per day		
Capacity of trucks	Cumulative Trips	Volume in PCU
10/20 tonnes	24 per day (25 Trips of Rough stone)	52

Source: Anticipated based on Approved Mining Plan Production

TABLE 2.16 – SUMMARY OF TRAFFIC VOLUME

Route	Existing traffic value in PCU	Incremental traffic from the quarry in PCU	Total traffic volume	Hourly Capacity in PCU as per IRC guidelines
Village road	103	52	155	500
Major District Road	506	52	558	1200

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

Rough stone from the project site mainly will be supplied to the needy crushers located within the radius of 2 km from the project site.

- No villages in the proposed mineral transportation route
- Mineral loaded Vehicles will not be allowed during school hours (Morning 8AM to 10AM & Evening 4.30PM to 5.30PM)

As per the IRC 1960 this existing 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 transportation.

2.6.3 Mineral Beneficiation and Processing

There is no mineral beneficiation processing or ore beneficiation in this project within the lease area.

2.6.4 Existing Infrastructure

The project area is new and Existing quarries for the existing quarries infrastructures are already available within the project area. The infrastructural facilities to be made after the start of the quarrying operations will be prepared outside limit as per the rules and safe distance to be adopted.

2.6.2 Drainage Pattern

The drainage pattern of the area is dendritic – sub dendritic.

2.7 Project Requirement

2.7.1 Water Source & Requirement

Detail of Total water requirements in KLD as given below:

TABLE 2.17 – WATER REQUIREMENT FOR THE INDIVIDUAL PROJECT

*Purpose	Quantity	Source
Domestic & Drinking purpose	1.0KLD	From Existing, bore wells and drinking water will be sourced from Approved Water vendors.
Dust Suppression	1.5KLD	From nearby tank
Green Belt	1.0KLD	From nearby tank
Total	3.5 KLD	

Source: Prefeasibility Report

For the water conservation point of view about 50% water will be required for the suspension of the dust, Water shall be obtained from accumulated rainwater/seepage water in quarry pits. Packaged Drinking Water is available from the nearby approved water vendors.

2.7.2 Power and Other Infrastructure Requirement

The project does not require power supply for the quarry operation. 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 TNEB. For the quarrying operation like compressor for drilling Diesel will be utilized.

The temporary infrastructures such as Mine Office, First Aid Room, Rest Shelter etc., will be constructed within the project area before commencing the quarry operation. 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.

2.7.3 Fuel Requirement

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

1. For Top soil:

Per hour Excavator will consume	= 10 liters / hour
Per hour Excavator will excavate	= 60m ³ of Top soil
Top soil Quantity	= 1,560/60 = 26hours
Diesel consume	= 26hours x 10liters
Total diesel consumption	= 260 Liters of HSD will be utilized for Top soil

2. For Rough stone:

Per hour Excavator will consume	= 16 liters / hour
Per hour Excavator will excavate	= 20m ³ of Rough stone
Rough stone quantity	= 2,04,792/20 =10,240hours
Diesel consume	= 10,240hours x 16 liters
Total diesel consumption	= 1,63,840Liters of HSD will be utilized for Rough stone

Total diesel consumption is around **1, 64,100**Liters of HSD for the entire period of life.

2.7.4 Employment Requirement:

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community. For this project it is proposed to deploy 24 employees. Besides about 10 -15 peoples will be getting indirect employment through this project.

2.7.5 Project Cost

TABLE 2.18 PROJECT COST OF PROPOSED PROJECT

Description	Project Cost
Project Cost	Rs. 81,15,000/-
Environmental Management Plan Cost	Rs. 3,80,000/-
CER Cost	Rs. 5,00,000/-

Source: Approved Mining Plan & Prefeasibility Report of the respective projects

2.8 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 2.19 EXPECTED TIME SCHEDULE FOR THE PROPOSED QUARRIES

S.No	Particulars lease execution	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

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

CHAPTER – 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.

As per the MoEF & CC Office Memorandum F. No IA3-22/10/2022.IA.III (E 177258) Dated 8th June, 2022 the baseline data is utilized for this proposal.

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 2023, April & May 2023 with CPCB guidelines. Environmental data has been collected with reference to cluster quarries by Chennai Mettex Lab Private Limited, accredited by ISO/IEC-17025:2017 (NABL) 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 quarries 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 summer season i.e., March 2023 – May 2023.

Study Methodology

Baseline data was generated for various environmental parameters including Land, Soil, Water (surface and groundwater), Air, Noise, Ecology & Biodiversity and Socio-economic status to determine the quality of the prevailing environmental settings. An MoEF accredited Laboratory was used for generating the baseline data.

1. The project area (Core zone) was surveyed in detail with the help of Total Station survey instrument and the boundary pillars were picked up with the help of handheld 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 Bhuvan (ISRO).
2. Soil samples were collected and analysed for relevant physio-chemical characteristics, exchangeable cations, nutrients & micro nutrients etc., in order to assess the impact of mining activities and proposed greenbelt development
3. Ground water samples were collected during the study period from the open wells and bore wells, while surface water was collected from river and lake 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 project.

4. A meteorological station was setup in Sakkampatti village. Wind speed, Wind direction, Dry and wet bulb temperature, Relative humidity, Rainfall with cloud cover and general weather conditions were recorded throughout the study period.
5. 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
6. 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
7. Baseline Ecology and Biodiversity studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area
8. 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 – ENVIRONMENTAL 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 (2 surface water & 4 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 CO Fugitive Dust	24 hourly twice a week (March 2023 – May 2023)	7 (1 core & 6 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	7 (1 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
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 Chennai Mettex Lab Private Limited in association with GEMS

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

3.1 Land Environment

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

3.1.1 Study of Land Use/ Land Cover

Indian Remote Sensing satellite IRS-P6, LISS III of Bhuvan (ISRO), multi-spectral digital data has been used for the preparation of land use/ land cover map of present study.

A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping.

An image interpretation keys were developed based on such image characteristics, which enable interpretation of satellite images for land use/land cover features. Further, the land use / land cover and other baseline layers was put in GIS database for integration, analysis, statistics generation and final out in the form of land use land cover map.

Interpreted thematic details were transferred on the base map. Besides, other supporting data like project reports and statistical data published by various Government departments have also been used.

TABLE 3.2 – LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
BUILTUP			
1	URBAN	314.96	0.98
2	RURAL	324.37	1.01
3	MINING	331.54	1.03
AGRICULTURAL LAND			
4	CROP LAND	17014.71	52.97
5	PLANTATION	5627.74	17.52
FOREST			
6	FOREST	6070.07	18.90
BARREN/WASTE LANDS			
7	SCRUB LAND	935.61	2.91
8	BARREN ROCKY	293.57	0.91
WETLANDS/ WATER BODIES			
9	WATER BODIES/LAKE/RIVER	1205.99	3.75
TOTAL		32118.56	100.00

FIGURE 3.1: PHYSIOGRAPHY MAP 10KM RADIUS

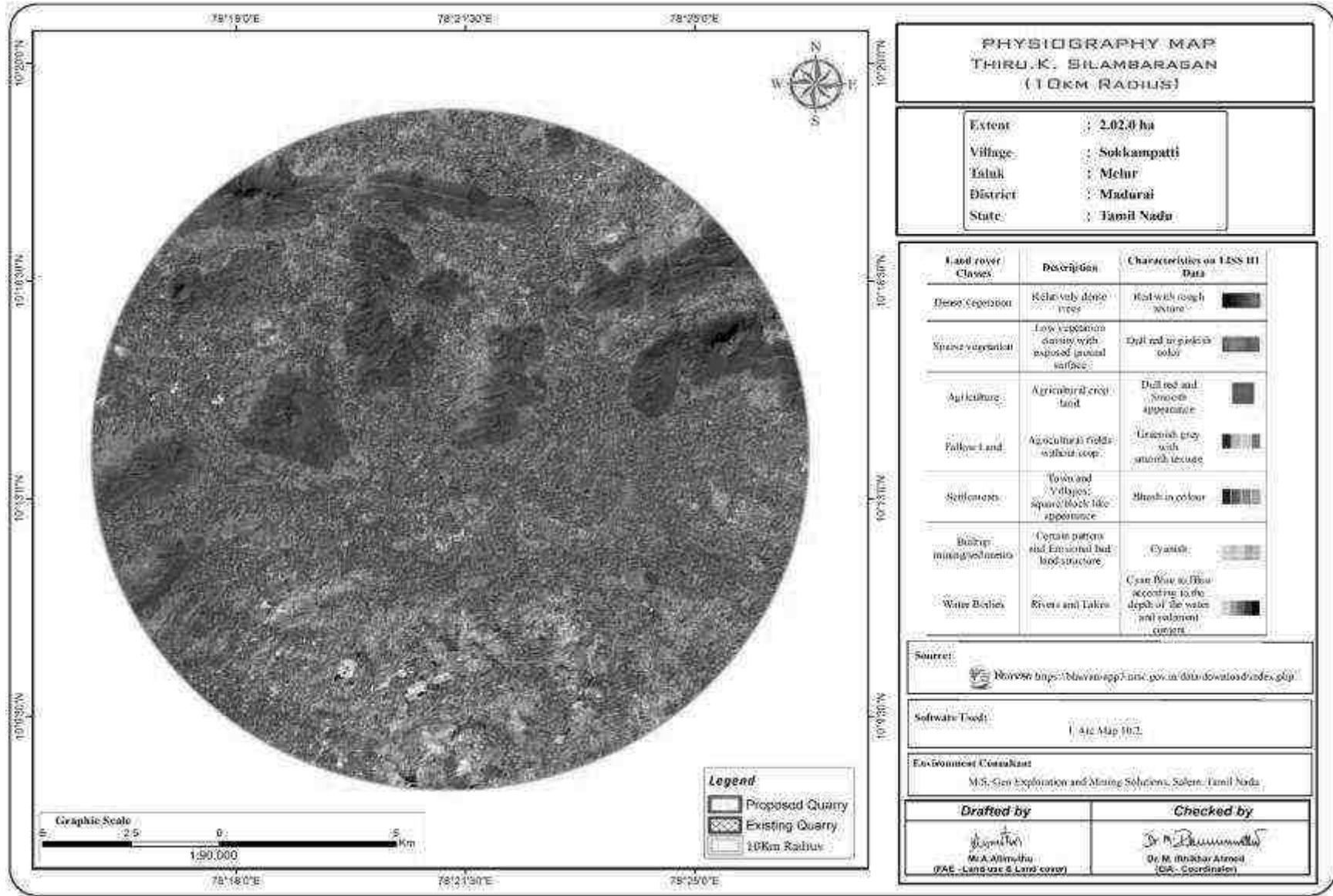


FIGURE 3.2: LAND USE LAND COVER MAP 10KM RADIUS

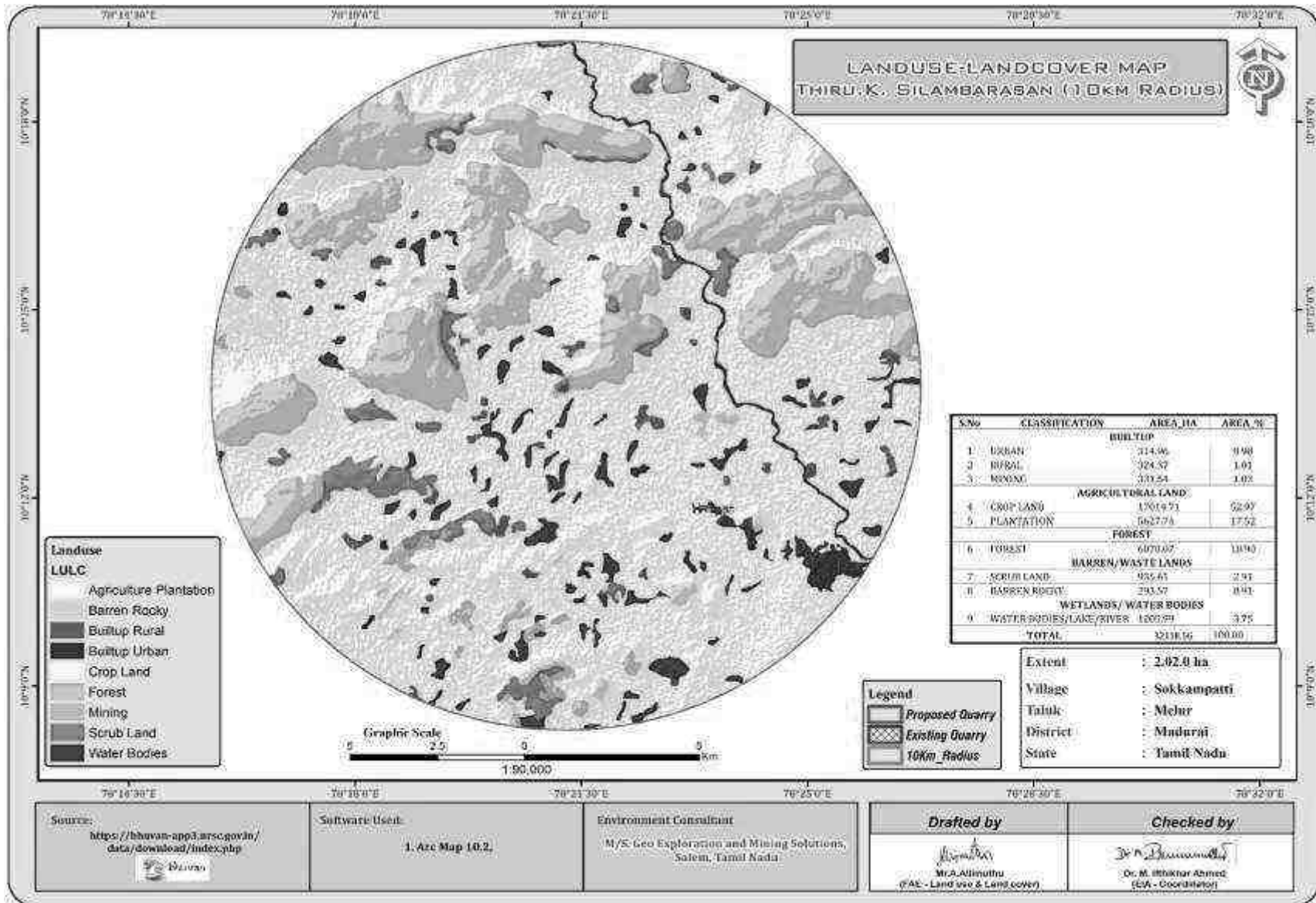
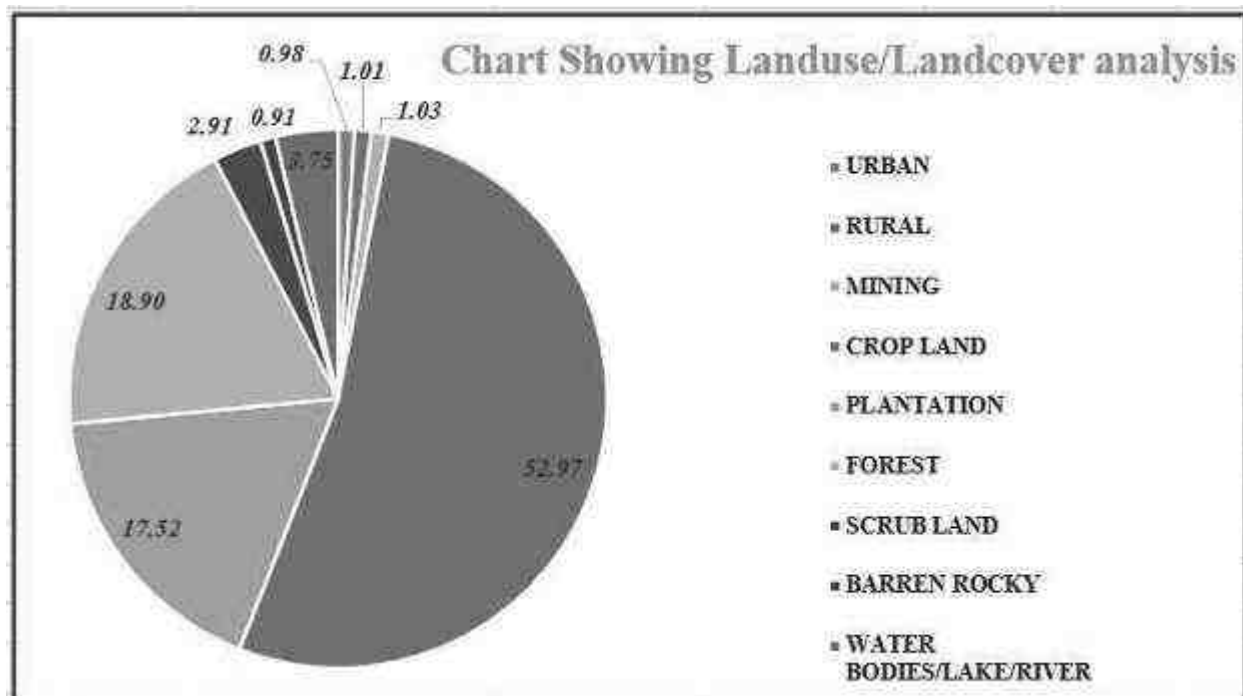


FIGURE 3.3: LAND USE AND LAND COVER CHART

Source: Table 3.2

Interpretation:

Built-up area	=	639.33 ha ie.,	1.99 %
Agriculture land	=	17014.71 ha ie.,	52.97 %
Plantation	=	5627.74ha i.e.,	17.52
Barren Rocky	=	293.57 ha ie.,	0.91%
Scrub Land	=	935.61ha i.e.,	2.91%
Mining area	=	331.54ha ie.,	1.03%
Water bodies	=	1205.99ha ie.	3.75%
Forest	=	6070.07	18.90%

Cluster of quarries within 500m radius is 6.22.0 ha of the total Mining areas within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.1.2 Topography

The cluster areas are almost plain terrain with gentle gradient towards Southeast – Southwestern side, maximum elevation of the area is 193m above AMSL. There are no hilly regions in and around the area.

3.1.3 Drainage Pattern of the Area

There are no developed surface drainage channels in the study area. Palaru River is a perennial pass 4.2km-North East from the project site. The area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The area is mostly dry in all seasons except rainy seasons.

The general drainage pattern of the area is of sub dendritic and dendritic pattern. No prominent water course or nallah is inferred. During rainy season the surface runoff flows in W to E direction. The drainage pattern of the study area is given in Fig. 3.5. The quarrying activity will not hinder the natural flow of rainwater.

3.1.4 Environmental Features in the Study Area

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

3.1.5 Seismic Sensitivity

The proposed project site falls in the seismic Zone II, 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.

TABLE 3.3 – DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE PROJECT AREA

Sl.No	Sensitive Ecological Features	Name	Arial Distance in km from Mine Lease Boundary
1	National Park / Wild life Sanctuaries	Vettangudi Birds Sanctuary	22km-SE
		Kadavur Slender Loris Wildlife Sanctuary	24km - NW
2	Reserve Forest	Valacheripatti R.F.	80 m – NE
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	Defence Installation	None	Nil within 10KM Radius

Source: Survey of India Toposheet, Village Cadastral Map& Google Earth/Maps

TABLE 3.4 – WATER BODIES WITHIN THE CLUSTER FROM PROPOSED QUARRIES

S.No	NAME	DISTANCE & DIRECTION
1	Odai	10m Safety NE
2	Tank	80m South
3	Tank	240m SE
4	Tank	330m West
5	Tank	420m NW
6	Tank	440m SE
7	Tank	520m SW
8	Tank	780m West
9	Palaru River	4.2km NE
10	Tank	8.5km South

Source: Village Cadastral Map and Field Survey

3.1.6 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 3.4 and Figure 3.3.

TABLE 3.5 – SOIL SAMPLING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	S-1	Core Zone	Project Area	10°13'51.16"N 78°21'16.14"E
2	S-2	Chokkampatti	1.2km NE	10°14'32.83"N 78°21'14.82"E
3	S-3	Sambapatti	6km SW	10°12'39.13"N 78°18'2.00"E
4	S-4	Sirugudi	6.2km NW	10°15'46.10"N 78°18'37.78"E
5	S-5	Pudupatti	6.2km NE	10°15'46.65"N 78°24'9.26"E
6	S-6	Ayyapatti	5.5km South	10°10'52.41"N 78°20'50.86"E

Source: On-site monitoring/sampling by Chennai Mettex Lab Private Limited in association with GEMS

The objective of the soil sampling is -

1. To determine the baseline soil characteristics of the study area;
2. To determine the impact of proposed activity on soil characteristics and;

To determine the impact on soil more importantly agriculture production point of view.

Methodology –

For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the proposed quarry site representing various land use conditions. The samples were collected by auger boring into the soil up to 90-cm depth. Six 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 sealed 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 3.5.

TABLE 3.6 – 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 Chennai Mettex Lab Private Limited 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, kjeldahi Nitrogen, Phosphorous and Potassium. The standard classification of soil and physico-chemical characteristics of the soils are presented below in Table 3.6 & Test Results in Table 3.7.

FIGURE 3.4: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS

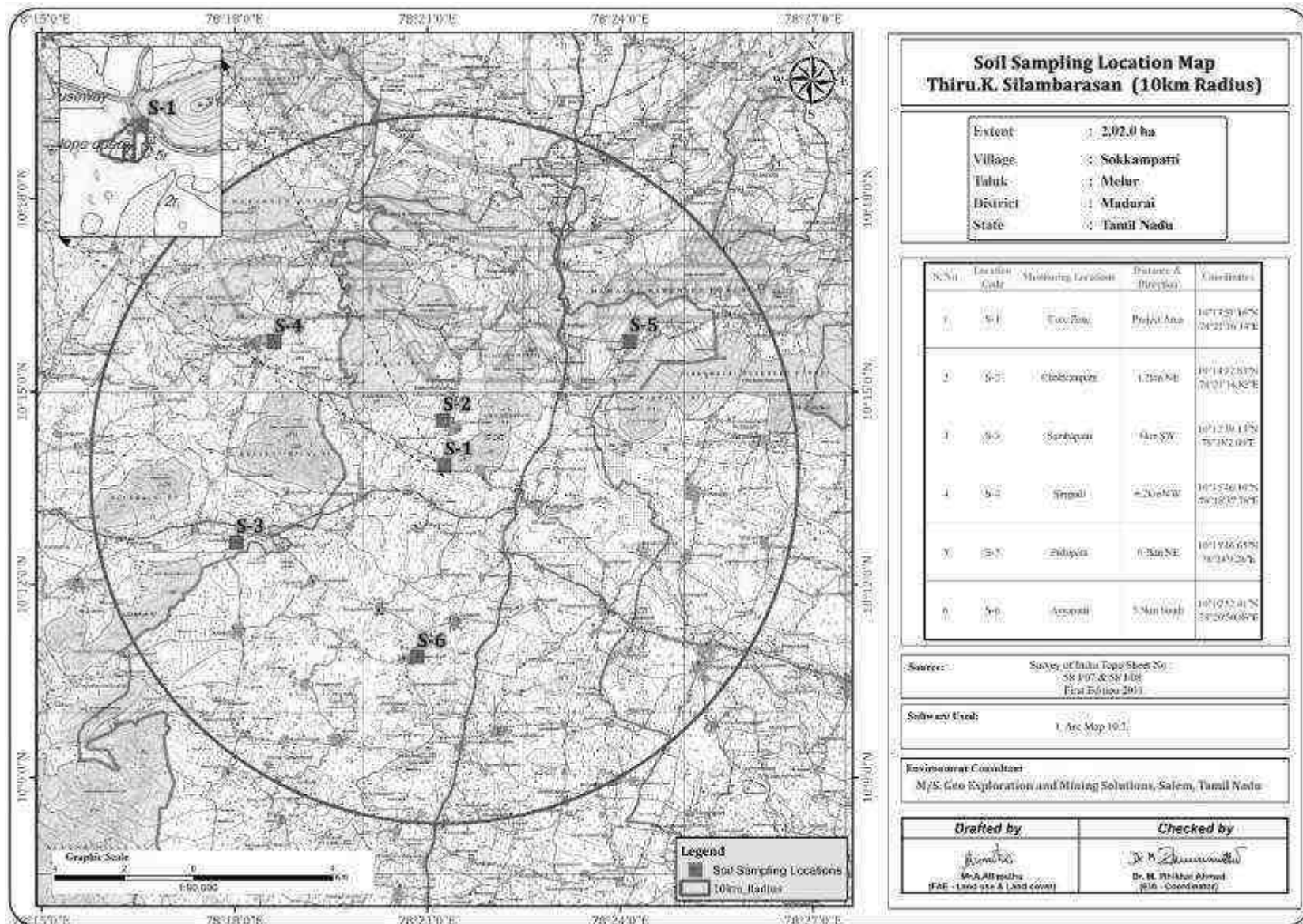


FIGURE 3.5: SOIL MAP

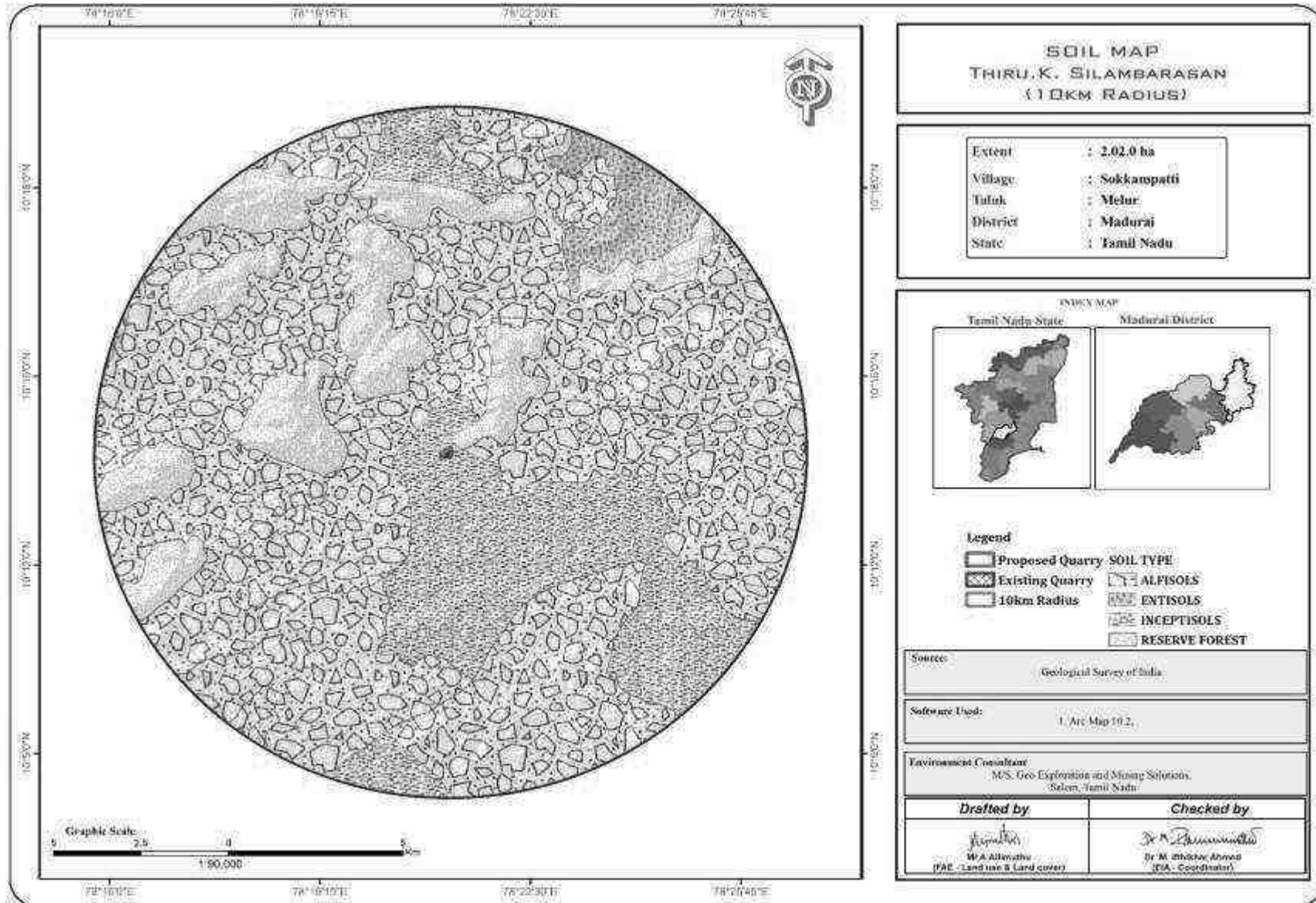


TABLE 3.7 – SOIL QUALITY MONITORING DATA

S. No	Test Parameters	Protocols	S1-Core Zone	S2-Chokkampatti	S3-Sambapatti	S4- Sirugudi	S5- Pudupatti	S6- Ayyapatti
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.01	8.88	8.19	8.65	8.04	8.43
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	325 µmhos/cm	401 µmhos/cm	440 µmhos/cm	564 µmhos/cm	375 µmhos/cm	254 µmhos/cm
03	Texture :							
	Clay	Gravimetric Method	31.6 %	27.5 %	30.2 %	32.7 %	31.6 %	35.5 %
	Sand		35.9 %	36.4 %	31.9 %	31.7 %	34.6 %	31.7 %
	Silt		32.5 %	36.1 %	37.9 %	35.6 %	33.8 %	32.8 %
04	Water Holding Capacity	By Gravimetric Method	47.8 %	46.7 %	47.6 %	48.4 %	47.6 %	45.2 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm ³	1.10 g/cm ³	0.97 g/cm ³	1.09 g/cm ³	1.16 g/cm ³	1.19 g/cm ³
06	Porosity	By Gravimetric Method	47.1 %	46.1 %	48.8 %	45.5 %	46.7 %	48.16 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	98.6 mg/kg	101 mg/kg	94.6 mg/kg	110 mg/kg	80.6 mg/kg	130 mg/kg
08	Magnesium as Mg		60.7 mg/kg	75.8 mg/kg	70.6 mg/kg	81.6 mg/kg	70 mg/kg	71.6 mg/kg
09	Manganese as Mn		21.3 mg/kg	16.2 mg/kg	24 mg/kg	33.8 mg/kg	25.9 mg/kg	30.5 mg/kg
10	Zinc as Zn		1.5 mg/kg	1.61 mg/kg	3.6 mg/kg	3.1 mg/kg	3.55 mg/kg	1.17 mg/kg
11	Boron as B		1.08 mg/kg	0.84 mg/kg	1.15 mg/kg	1.05 mg/kg	1.13 mg/kg	0.23 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	47.6 mg/kg	90.4 mg/kg	80.2 mg/kg	30.7 mg/kg	61.8 mg/kg	102 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.016 %	0.0014 %	0.0018 %	0.0015 %	0.0013 %	0.019 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	25 mg/kg	34 mg/kg	27.5 mg/kg	27 mg/kg	90 mg/kg	26.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	2.6 mg/kg	2.1 mg/kg	1.68 mg/kg	1.55 mg/kg	2.36 mg/kg	3.66 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	380.2 mg/kg	409 mg/kg	400 mg/kg	359 mg/kg	490 mg/kg	405.6 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.77 mg/kg	0.26 mg/kg	0.75 mg/kg	0.16 mg/kg	0.48 mg/kg	0.19 mg/kg
21	Iron as Fe		2.06 mg/kg	1.09 mg/kg	2.67 mg/kg	1.08 mg/kg	1.06 mg/kg	1.03 mg/kg
22	Organic Matter		IS : 2720 Part 22: 1972 (Reaff: 2015)	2.05 %	1.81 %	2.32 %	2.75 %	1.98 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.19 %	1.05 %	1.35 %	1.60 %	1.15 %	1.21 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	42.8 meq/100g of soil	35.2 meq/100g of soil	40.1 meq/100g of soil	42.87 meq/100g of soil	40.1 meq/100g of soil	42.6 meq/100g of soil

Source: Sampling Results by Chennai Mettlex Lab Private Limited

- This proposed mining activity is for Rough Stone Quarry by opencast mechanized mining method involving occasional drilling & blasting activities on the weathered formation and removal of topsoil and preserving in safety barrier of the lease area to facilitate greenbelt development and winning of Rough stone by eco-friendly wire-saw cutting method.
- Dust generation due to this quarrying activity becomes air borne and gets carried away to surrounding areas which may retard the photosynthesis activities of plants and heavy metals naturally occur in soil, but additional pollution come from anthropogenic activities such as agriculture, urbanisation, industrialisation, and mining.
- The proposed rough stone project is a Charnockite formation which does not source to heavy metal contamination.
- This proposed mining is a small-scale activity and in order to mitigate the impact of mining around the proposed mine lease area on Soil Health and Biodiversity its proposed by ways of daily three times water sprinkling by own water tanker and water sprinkling arrangements and greenbelt development all along the mine lease boundary
- Therefore, the implementation of proposed mitigation measures for winning of mineral may not have much of impact on the surrounding Soil Health and Biodiversity.

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 to Sandy Soil and Bulk Density of Soils in the study area varied between 0.97 – 1.19 g/cc. The Water Holding Capacity is 45.2% to 48.4% and Porosity of the soil samples is found to be medium i.e. ranging from 45.5 – 48.16 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 8.01 to 8.88
- The available Nitrogen content range between 359 mg/kg -490 mg/kg
- The available Phosphorus content range between 1.55 mg/kg to 3.66 mg/kg
- The available Potassium range between 25 mg/kg to 90 mg/kg

Whereas, the micronutrient as zinc (Zn), iron (Fe) and copper (Cu) were found in the range of 1.5 mg/kg to 3.6 mg/kg, 1.03 mg/kg to 2.67 mg/kg and ND

Wilting co efficient in significant level would mean that the soil would support the vegetation. The soil properties in the buffer zone reveal that the soil can sustain vegetation. If amended suitability the core area can also withstand plantation.

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:

Palaru river lies at 4.2 Km North East from the project cluster. The buffer area is studded with few tanks that serve as the source for agriculture and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells, trenches is in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

3.2.2 Ground Water Resources:

The terrain is underlain by hard rock formations, Fissured and fractured crystalline rocks constitute the important aquifer systems in the Coimbatore region. Ground water occurs under phreatic to semi-confined conditions in these formations and is being developed by means of dug wells and filter points. Proterozoic formation is the basement rocks which consist of quartzite, crystalline limestone, calc-granulite, hornblende – biotite gneiss, charnockite or pyroxene granulite, granite and pegmatite. Weathered, a fissured crack, shear zones and joints in the basement rock act as a good groundwater potential zone in the study area.

The study area falls in the Melur block which is categorized as over-exploited zone as per G.O (MS) No 113 dated 09.06.2016.

3.2.3 Methodology

Reconnaissance survey was undertaken to collect the sampling and locations were finalized based on;

1. Drainage pattern;
2. Location of residential areas representing different activities/likely impact areas; and
3. Likely areas, which can represent baseline conditions

Two (2) surface water and four (4) ground water samples were collected in the study area and physico-chemical, heavy metals and bacteriological parameters were analysed. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard methods for the Examination of Water and Waste water' published by American Public Health Association (APHA). The water sampling locations are given in Table 3.8 and shown as Figure 3.5.

TABLE 3.8 – WATER SAMPLING LOCATIONS

S. No	Location code	Distance & Direction from the cluster	Coordinates
1	Tank Near Chokkampatti	1.5km NW	10°14'37.22"N 78°21'2.53"E
2	Palar River	4.5km NE	10°15'7.18"N 78°23'28.17"E
3	Near Project Area	400m NW	10°13'56.21"N 78°21'2.64"E
4	Ayyapatti	5km South	10°11'3.20"N 78°20'54.84"E
5	Valacheripatti	1.5km SE	10°13'29.02"N 78°22'2.65"E
6	Sirugudi	6.2km NW	10°15'43.11"N 78°18'34.76"E

Source: On-site monitoring/sampling by Chennai Mettex Lab Private Limited in association with GEMS

Note: SW- Surface water, WW – Well Water, BW – Bore well

FIGURE 3.6: SITE PHOTOGRAPHS OF WATER SAMPLING LOCATIONS



Sample Collection in Ayyapatti Bore well



Sample collection in Sokkampatti Borewell

FIGURE 3.7: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS

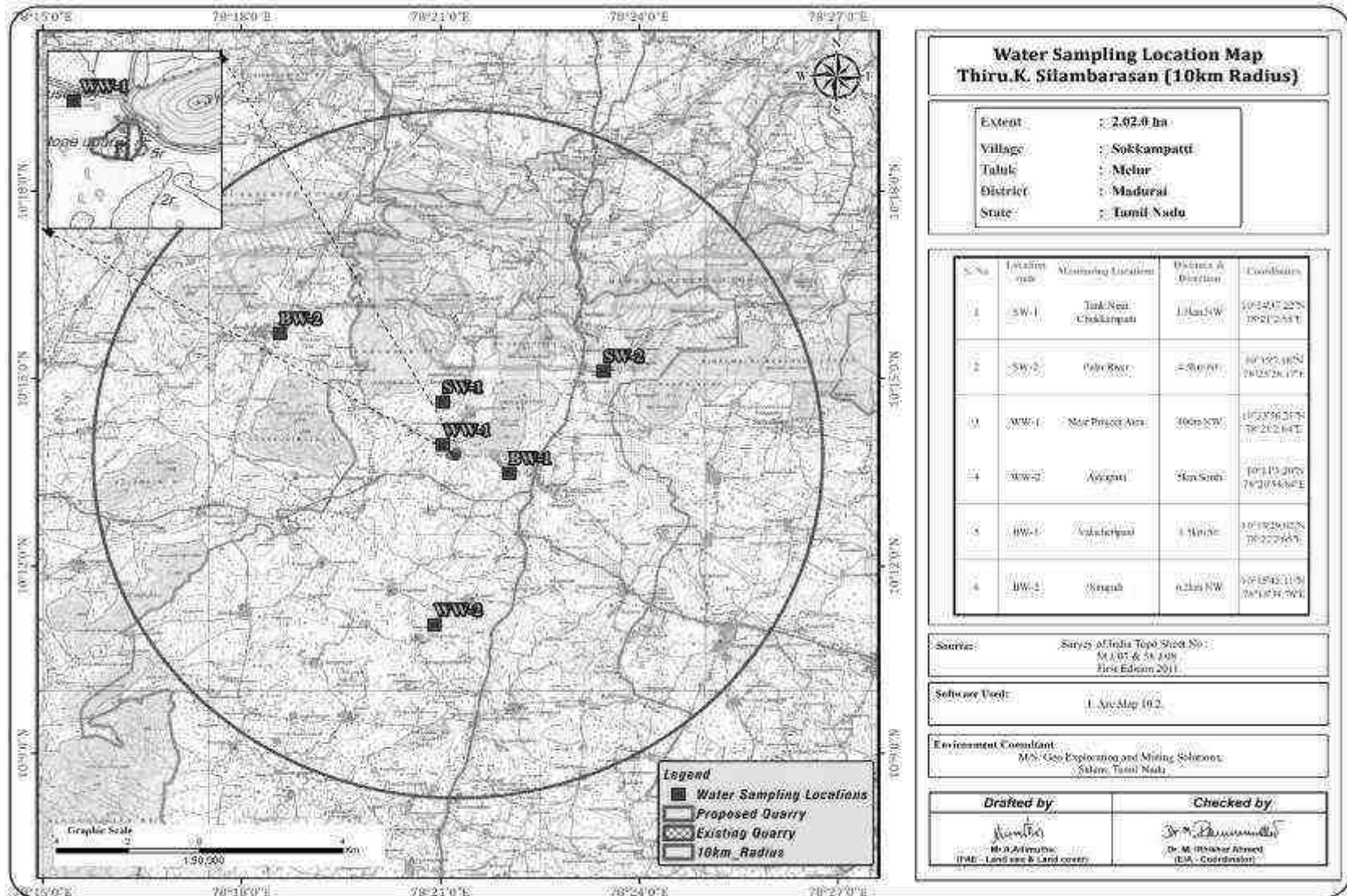


TABLE 3.9 – SURFACE WATER ANALYSIS RESULTS

S.NO	Parameter	UNIT	Surface Water (SW-1) -Tank Near Chokkampatti	Surface Water (SW-2) – Palar River
1	Color	Hazen	5 Hazen	10 Hazen
2	Odour	-	Agreeable	Agreeable
3	pH@ 25°C	-	7.65	7.06
4	Electrical Conductivity @ 25°C	µs/cm	1095 µmhos/cm	1198 µmhos/cm
5	Turbidity	NTU	2.5 NTU	2.8 NTU
6	Total Dissolved Solids	mg /l	645 mg/l	706 mg/l
7	Total Hardness as CaCO ₃	mg/l	200.82 mg/l	210.25 mg/l
8	Calcium as Ca	mg/l	32.7 mg/l	40.6 mg/l
9	Magnesium as Mg	mg/l	29 mg/l	26.5 mg/l
10	Total Alkalinity as CaCO ₃	mg/l	210.5 mg/l	226.1 mg/l
11	Chloride as Cl ⁻	mg/l	166.1 mg/l	205 mg/l
12	Sulphate as SO ₄ ⁻	mg/l	95 mg/l	89 mg/l
13	Iron as Fe	mg/l	0.21 mg/l	0.31 mg/l
14	Free Residual Chlorine	mg/l	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
15	Fluoride as F	mg/l	0.16 mg/l	0.11 mg/l
16	Nitrates as NO ₃	mg/l	10.3 mg/l	10.9 mg/l
17	Copper as Cu	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	mg/l	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	mg/l	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	mg/l	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
21	Selenium as Se	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	mg/l	BDL (DL: 0.03)	BDL (DL:0.005 mg/l)
23	Lead as Pb	mg/l	BDL (DL:0.01)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	mg/l	BDL (DL:0.02)	BDL(DL : 0.05 mg/l)
25	Total Chromium	mg/l	BDL (DL: 0.05)	BDL(DL : 0.02 mg/l)
26	Boron as B	mg/l	BDL (DL:0.1)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	mg/l	BDL (DL:1.0)	BDL(DL : 0.01 mg/l)
28	Phenolic Compunds as	mg/l	Absent	BDL (DL:0.0005 mg/l)
29	Anionic Detergents as	mg/l	BDL (DL:0.1)	BDL (DL:0.01 mg/l)
30	Cynaide as CN	mg/l	Absent	BDL (DL:0.01 mg/l)
31	Biological Oxygen	mg/l	8.1 mg/l	5.8 mg/l
32	Chemical Oxygen	mg/l	36 mg/l	28 mg/l
33	Dissolved Oxygen	mg/l	5.6 mg/l	5.9 mg/l
34	Total Coliform	Per 100ml	980 MPN/100ml	1005 MPN/100ml
35	E-Coli	Per 100ml	100 MPN/100ml	115 MPN/100ml
36	Barium as Ba	mg/l	BDL (DL:0.5)	BDL(DL:0.05 mg/l)
37	Ammonia-n (as Total	mg/l	3.3	1.6 mg/l
38	Sulphide as H ₂ S	mg/l	BDL (DL:0.05)	BDL (DL:0.01 mg/l)
39	Molybdenum as Mo	mg/l	BDL (DL:0.5)	BDL (DL:0.02 mg/l)
40	Total Arsenic as As	mg/l	BDL (DL:0.01)	BDL (DL:0.005 mg/l)
41	Total Suspended Solids	mg/l	12	8.6 mg/l

TABLE 3.10 – GROUND WATER ANALYSIS RESULTS

S.NO	Parameter	Unit	WW1 Near Project Area	WW2 Ayyapatti	BW1 Valacheripatti	BW2 Sirugudi
1	Color	Hazen	5	5 Hazen	5 Hazen	5 Hazen
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable
3	pH@ 25°C	-	7.65	7.06	7.91	7.06
4	Electrical Conductivity	µs/cm	856 µmhos/cm	1153 µmhos/cm	746 µmhos/cm	891 µmhos/cm
5	Turbidity	NTU	1 NTU	1.0 NTU	1 NTU	1 NTU
6	Total Dissolved Solids	mg/l	505 mg/l	680 mg/l	440 mg/l	526 mg/l
7	Total Hardness as CaCO ₃	mg/l	153.90 mg/l	220.15 mg/l	175.00 mg/l	183.80 mg/l
8	Calcium as Ca	mg/l	27.9 mg/l	38.8 mg/l	30.1 mg/l	32.8 mg/l
9	Magnesium as Mg	mg/l	20.5 mg/l	30.0 mg/l	24.3 mg/l	24.8 mg/l
10	Total Alkalinity	mg/l	170 mg/l	250 mg/l	122 mg/l	170 mg/l
11	Chloride as Cl ⁻	mg/l	102 mg/l	188.6 mg/l	99.4mg/l	112.4 mg/l
12	Sulphate as SO ₄ ⁻	mg/l	71.5 mg/l	73 mg/l	60.7 mg/l	74 mg/l
13	Iron as Fe	mg/l	0.22 mg/l	0.35 mg/l	0.15 mg/l	0.19 mg/l
14	Free Residual Chlorine	mg/l	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
15	Fluoride as F	mg/l	0.26 mg/l	0.25 mg/l	0.32 mg/l	0.22 mg/l
16	Nitrates as NO ₃	mg/l	4.7 mg/l	6.4 mg/l	8 mg/l	6.1 mg/l
17	Copper as Cu	mg/l	BDL (DL:0.2)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	mg/l	BDL (DL:0.05)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	mg/l	(BDL (DL: 0.0005)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	mg/l	BDL (DL:0.01)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
21	Selenium as Se	mg/l	BDL (DL: 0.05)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	mg/l	BDL (DL: 0.03)	BDL (DL:0.005 mg/l)	BDL (DL: 0.03)	BDL (DL:0.005 mg/l)
23	Lead as Pb	mg/l	BDL (DL:0.01)	BDL (DL:0.005 mg/l)	BDL (DL:0.01)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	mg/l	BDL (DL:0.02)	BDL (DL: 0.05 mg/l)	BDL (DL:0.02)	BDL (DL: 0.05 mg/l)
25	Total Chromium	mg/l	BDL (DL: 0.05)	BDL(DL : 0.02 mg/l)	BDL (DL: 0.05)	BDL(DL : 0.02 mg/l)
26	Boron as B	mg/l	BDL (DL:0.1)	BDL(DL : 0.05 mg/l)	BDL (DL:0.1)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	mg/l	BDL (DL:1.0)	BDL(DL : 0.01 mg/l)	BDL (DL:1.0)	BDL(DL : 0.01 mg/l)
28	Phenolic Compunds	mg/l	Absent	BDL (DL:0.0005 mg/l)	Absent	BDL (DL:0.0005 mg/l)
29	Anionic Detergents	mg/l	BDL (DL:0.1)	BDL (DL:0.01 mg/l)	BDL (DL:0.1)	BDL (DL:0.01 mg/l)
30	Cynaide as CN	mg/l	Absent	BDL (DL:0.01 mg/l)	Absent	BDL (DL:0.01 mg/l)
31	Total Coliform	Per 100ml	130 MPN/100ml	110 MPN/100ml	85 MPN/100ml	100 MPN/100ml
32	E-Coli	Per 100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml
33	Barium as Ba	mg/l	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL (DL:0.5)	BDL (DL:0.5)
34	Ammonia (as Total	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
35	Sulphide as H ₂ S	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
36	Molybdenum as Mo	mg/l	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
37	Total Arsenic as	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
38	Total Suspended Solids	mg/l	BDL(DL:1.0)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)

* 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.

Source: Sampling Results by Chennai Mettex Lab Private Limited

3.2.4 Interpretation & Conclusion

Surface Water

The pH of surface 7.06-7.65 while turbidity found within the standards. Total Dissolved Solids 645-706mg/l and Chloride 166.1-205 mg/l. Nitrates 10.3-10.9 mg/l, while sulphates 89-95 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.06 to 7.91 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. Total Dissolved Solids were found in the range of 440 - 680mg/l in all samples. Total hardness varied between 153.9 – 220.15 mg/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

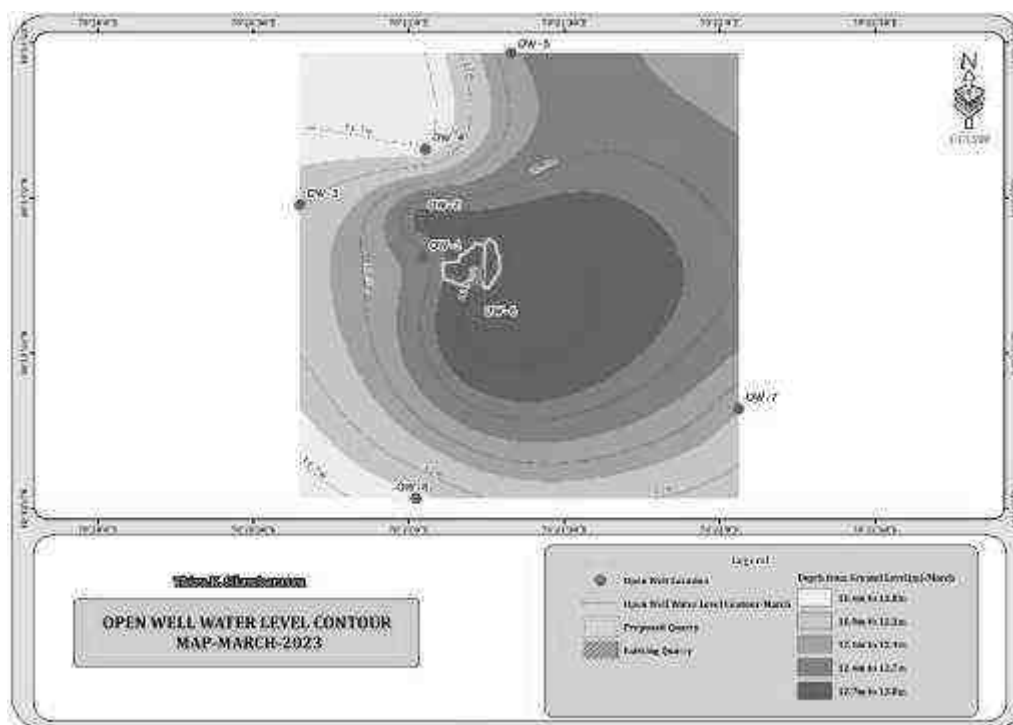
The district is underlain by hard rock formation Fissured and Fractured crystalline rocks constitute the important aquifer systems in the district. Geophysical prospecting was carried out in that area by SSRMP-80 Instrument by qualified Geo physicist with the help of IGIS software and it was inferred that the low resistance encountered at the depth between 70 - 65m. The Maximum depth of the quarrying operation in this proposal is 41m 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 this upcoming project.

During the rainy season there is a possibility of collection of seepage water from the subsurface levels this is due to the high intensity of fracture and weathered portion upto a depth of 10m thus the collected seepage water will be 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 be as a temporary reservoir in that area.

TABLE 3.11: WATER LEVEL OF OPEN WELLS 1 KM RADIUS

S.No	Name	LATITUDE	LONGITUDE	MARCH23	APRIL23	MAY23
1	OW1	78° 21' 02.7509" E	10° 13' 48.5781" N	12.5	13.1	13.7
2	OW2	78° 21' 02.4675" E	10° 13' 56.3682" N	12.8	13.4	14
3	OW3	78° 20' 39.0252" E	10° 13' 58.6171" N	12	12.6	13.2
4	OW4	78° 21' 03.2606" E	10° 14' 09.3393" N	11.7	12.3	12.9
5	OW5	78° 21' 19.7614" E	10° 14' 27.9220" N	12.4	13	13.6
6	OW6	78° 21' 13.2934" E	10° 13' 35.9166" N	13	13.6	14.2
7	OW7	78° 22' 03.6986" E	10° 13' 19.2847" N	12.2	12.8	13.4
8	OW8	78° 21' 01.4663" E	10° 13' 01.9705" N	11.8	12.4	13

FIGURE 3.8: CONTOUR MAP OF OPEN WELL WATER LEVEL



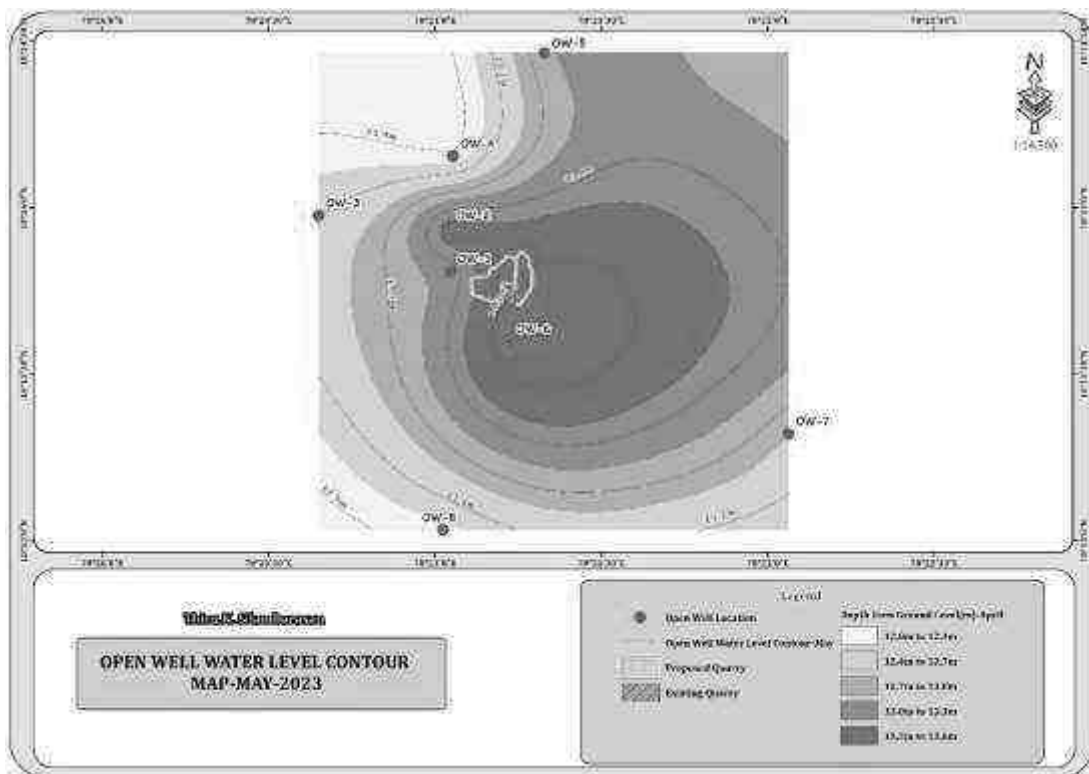
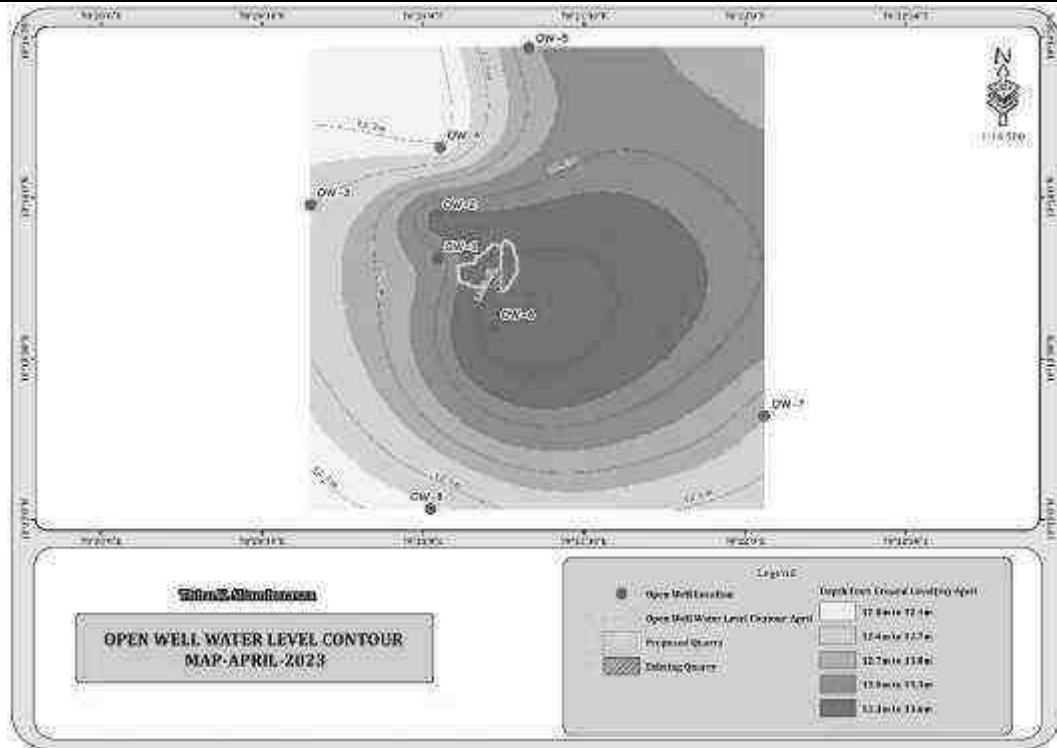
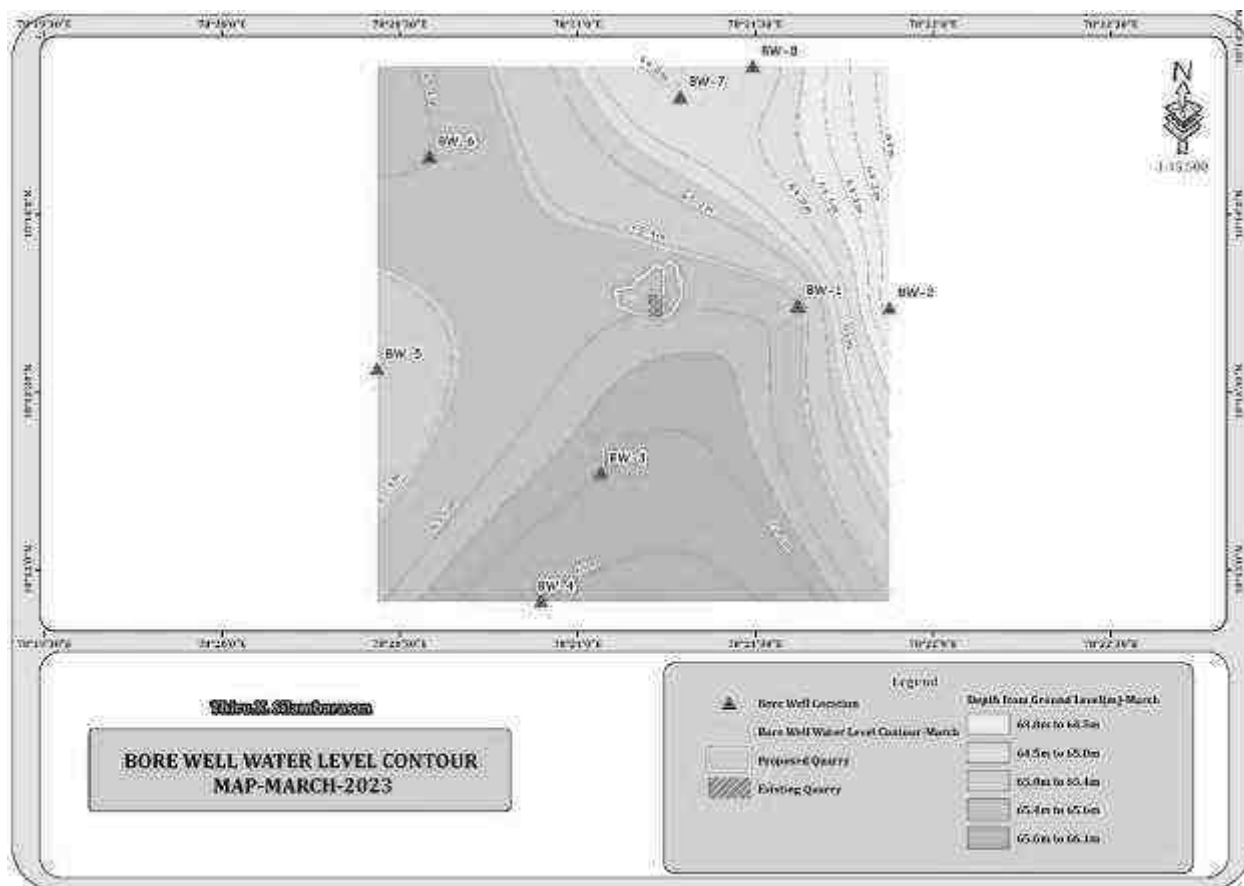


TABLE 3.12: WATER LEVEL OF BOREWELLS 1 KM RADIUS

S.No	Name	LATITUDE	LONGITUDE	MARCH-23	APRIL-23	MAY-23
1	BW1	78° 21' 37.2268" E	10° 13' 44.6268" N	65.5	66.1	66.7
2	BW2	78° 21' 52.6454" E	10° 13' 44.2357" N	64	64.6	65.2
3	BW3	78° 21' 03.9798" E	10° 13' 16.3470" N	65.8	66.4	67
4	BW4	78° 20' 53.8451" E	10° 12' 54.6966" N	66	66.6	67.2
5	BW5	78° 20' 26.1806" E	10° 13' 33.9113" N	65.2	65.8	66.4
6	BW6	78° 20' 35.0475" E	10° 14' 09.7803" N	65.6	66.2	66.8
7	BW7	78° 21' 17.3748" E	10° 14' 19.8552" N	64.8	65.4	66
8	BW8	78° 21' 29.5953" E	10° 14' 25.0253" N	65	65.6	66.2

FIGURE 3.9: CONTOUR MAP OF BORE WELL WATER LEVEL



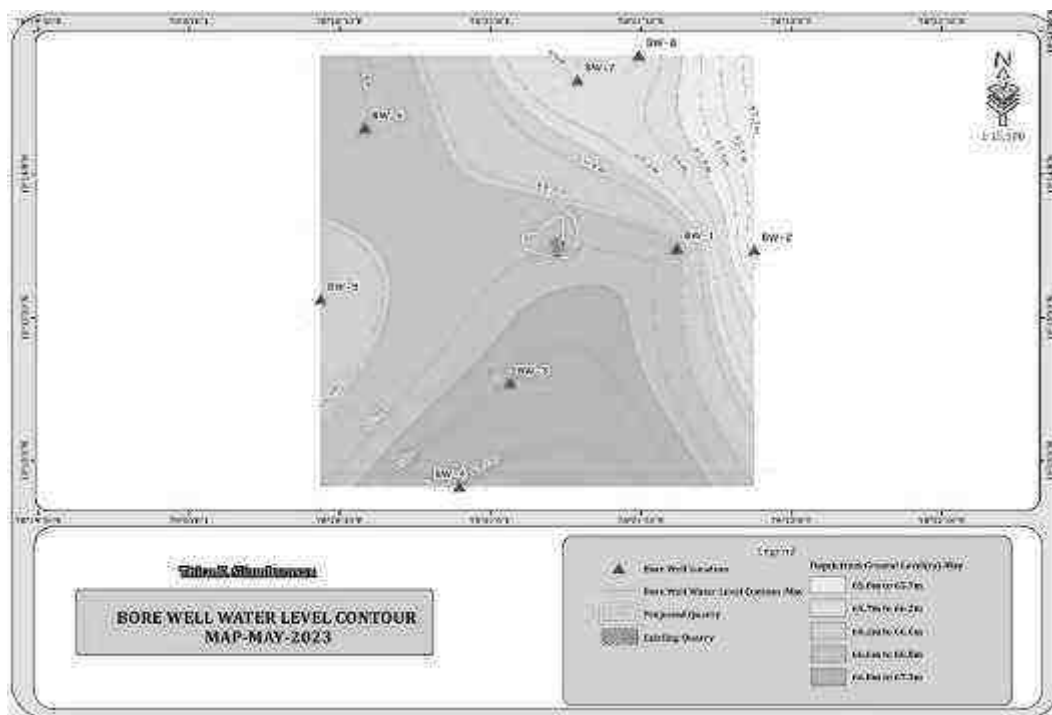
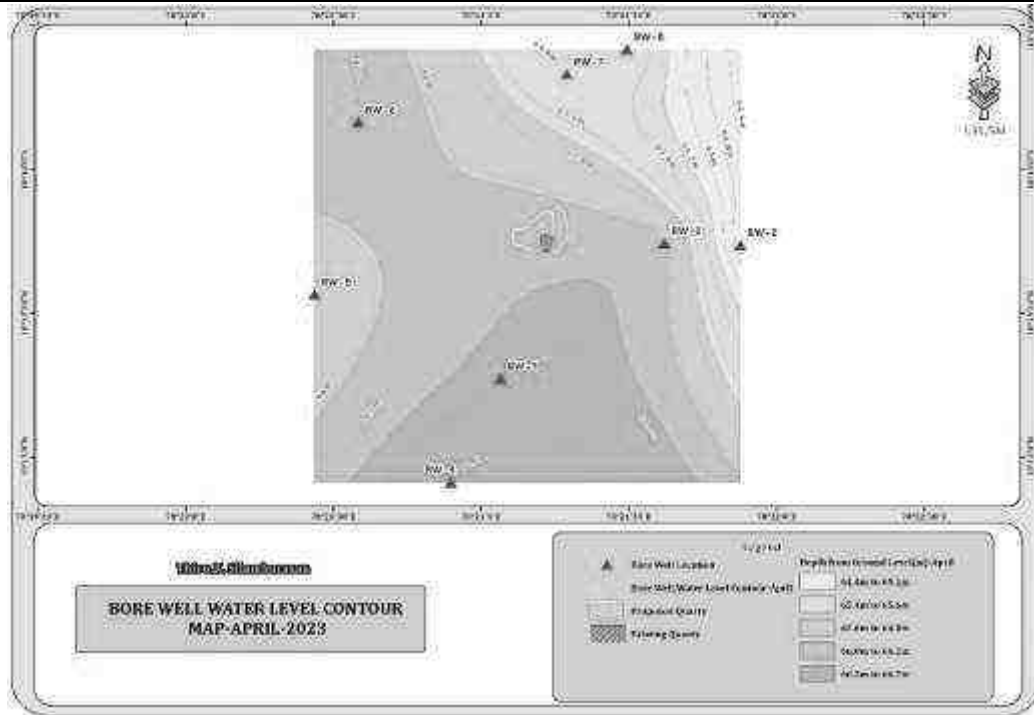


FIGURE 3.10: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE

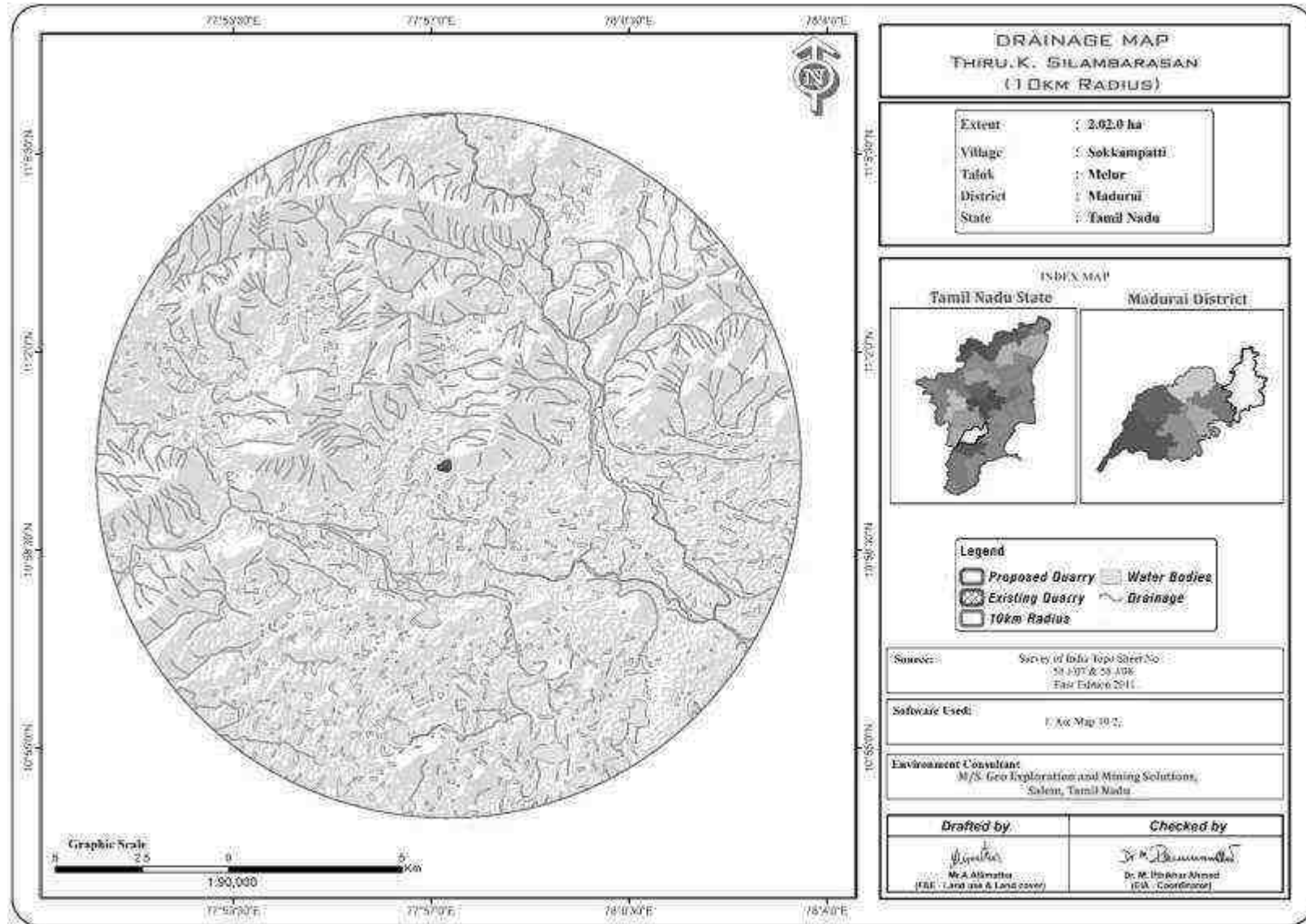
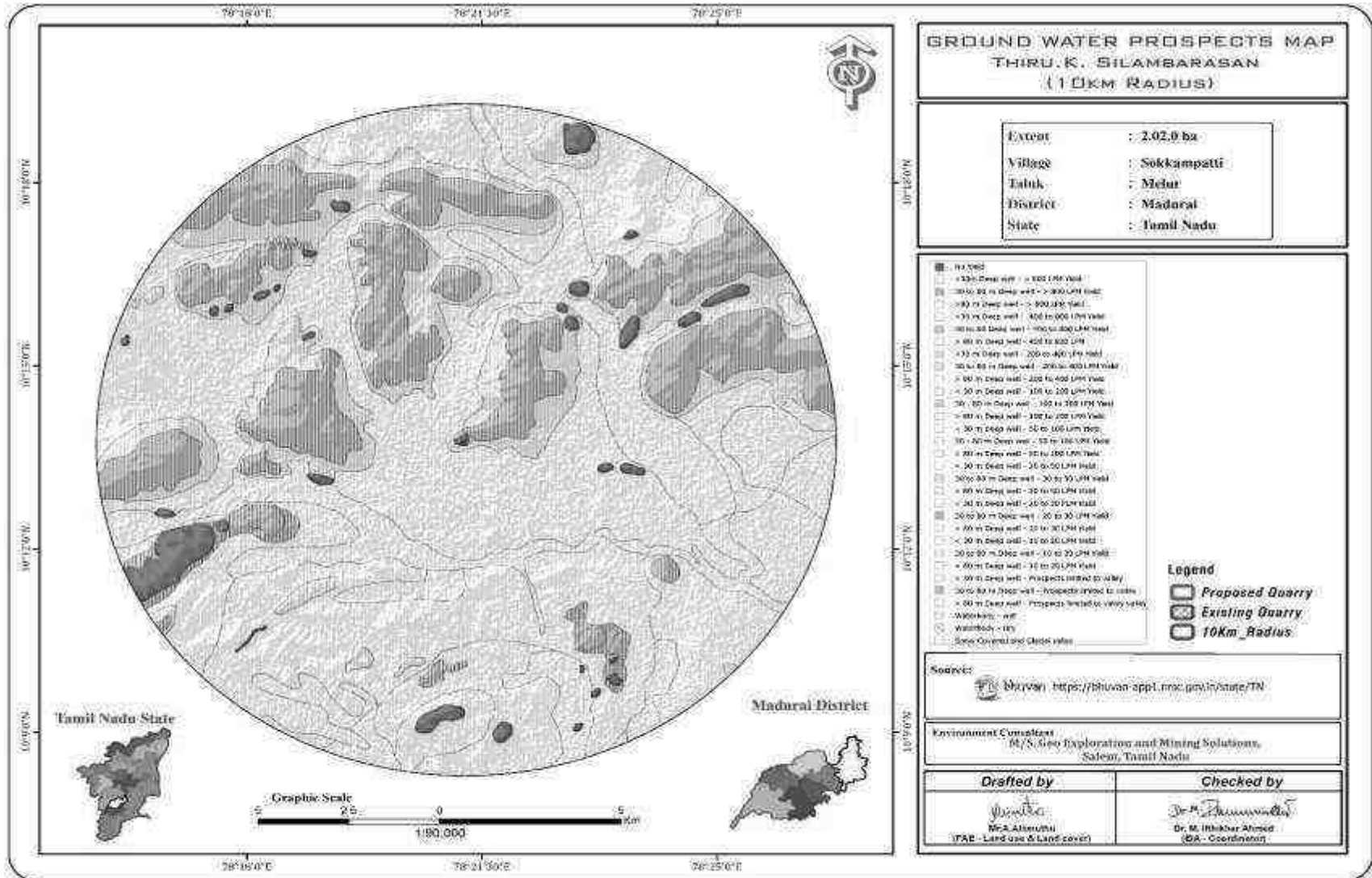


FIGURE 3.11: GROUND WATER LEVEL MAP



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 in homogeneities 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 in homogeneities 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

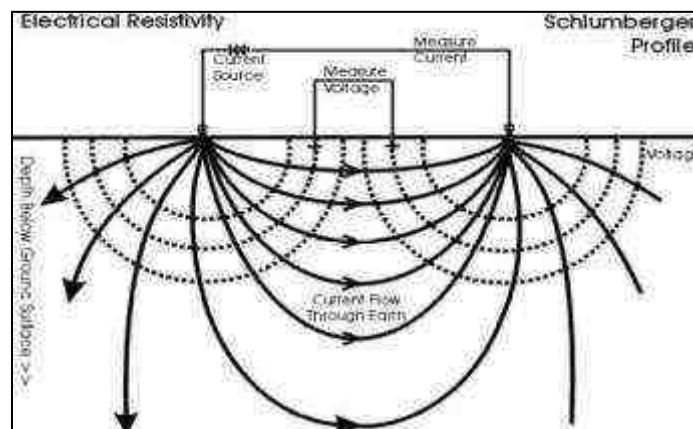
A = Constants with values ranging from 0.5 to 2.5

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 $[1, (1+2)/2, (1+2+3)/3 \dots (1+2\dots+16/16)]$ 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 60-65m. The maximum depth proposed in this cluster quarries 42 m 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 and Conclusion

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.

Based on the Geophysical interpretation water table fracture zone is expected above 60m bgl, Water level in the open well is ranges from 11.7m to 13.7m bgl it is only collected from the seepage water in shallow depth open wells are selected on the basis of suitable lineament and hydro fractures environment in shallow depth. Water level in the bore well is ranges from 64.0 to 67m bgl which will clearly evidence that the potential aquifer in the area is above 70-65m bgl. The depth of the mining operation is 41m bgl **hence this mining operation will not intersect the Ground water table**. Seepage water will be collected in the mine pit will be utilized for greenbelt development and dust suppression.

3.3 Air Environment

The ambient air quality with respect to the study area of 10 km radius including the cluster quarries forms the baseline information. The prime objective of baseline air quality monitoring is to assess existing air quality of the area. This will also be useful in assessing the conformity to standards of the ambient air quality during the operations

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of Existing and proposed quarries within the radius of 500m.

The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

The baseline status of the ambient air quality has been assessed through scientifically designed ambient air quality network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions.
- Topography of the study area.
- Likely impact area.

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. The station was installed at a height of 4 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 climate here is tropical. The summers are much rainier than the winters in Madurai. This location is classified as Aw by Köppen and Geiger. In Madurai, the average annual temperature is 28.2 °C | 82.7 °F. In a year, the rainfall is 849 mm | 33.4 inch as per the meteorological records.
- The Madurai are located close to the equator, making the summers difficult to define. The most popular time to visit is January, February, March, September, November, December.
- The month with the least amount of precipitation is January exhibiting a mere 16 mm | 0.6 inch rainfall. The greatest amount of precipitation occurs in October, with an average of 180 mm | 7.1 inch.
- The month of May boasts the highest average temperature, with a recorded maximum of 31.0 °C | 87.8 °F. The lowest average temperatures in the year occur in December, when it is around 24.6 °C | 76.4 °F.

<https://en.climate-data.org/asia/india/tamil-nadu/madurai-5892/>

Rainfall –

The average annual rainfall and the 5 years rainfall is as follows:

TABLE 3.13 – RAINFALL DATA

Actual Rainfall in mm					Normal Rainfall in mm
2017	2018	2019	2020	2021	
904.6	734.1	671.9	915.5	1095.2	985

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

TABLE 3.14 – METEOROLOGICAL DATA RECORDED AT SITE

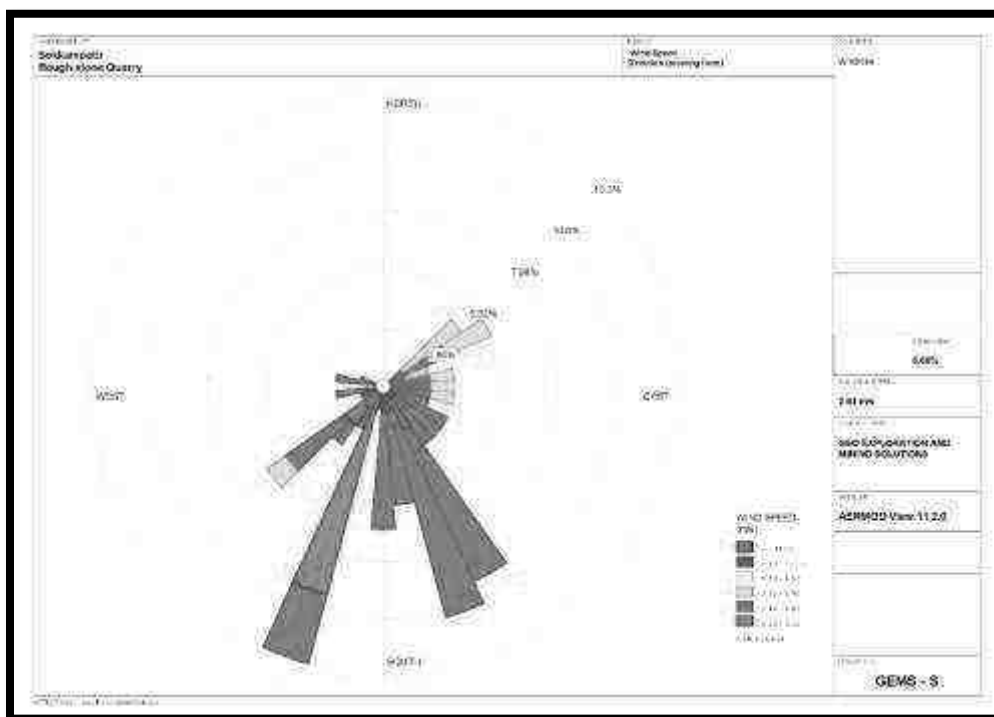
S.No	Parameters		Mar-2023	Apr-2023	May-2023
1	Temperature (⁰ C)	Max	30.39	33.12	31.36
		Min	25.41	27.15	26.37
		Avg	27.9	30.13	28.86
2	Relative Humidity (%)	Avg	61.87	63.28	74.93
3	Wind Speed (m/s)	Max	4.3	4.11	3.77
		Min	1.57	2.09	1.36
		Avg	2.93	3.1	2.56
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind Direction		SSE,ENE	SSE,S	SSW,SW

Source: On-site monitoring/sampling by Chennai Mettex Lab Private Limited 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 Madurai. A comparison of site data generated during the three months with that of IMD, Madurai agro reveals the following:

- The average maximum and minimum temperatures of IMD, Madurai agro. Showed a higher in respect of on-site data i.e. in Sökkampatti village.
- The relative humidity levels were lesser at site as compared to IMD, Madurai agro.
- The wind speed and direction at site shows similar trend that of IMD, Madurai agro.
- Windrose diagram of the study site is depicted in Figure. 3.12. Predominant downwind direction of the area during study season is North East to South West.

FIGURE 3.12: WINDROSE DIAGRAM

Environmental 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

1. Predominant winds were from NE- SW
2. Wind velocity readings were recorded between 0.50 to 3.60km / hour
3. Calm conditions prevail of about 0.00% of the monitoring period
4. Temperature readings ranging from 25.41⁰ to 33.12⁰C
5. Relative humidity ranging from 61.87 to 74.93 %
6. 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 3.15 – METHODOLOGY AND INSTRUMENT USED FOR AIR QUALITY ANALYSIS

Parameter	Method	Instrument
PM _{2.5}	Gravimetric Method Beta attenuation Method	Fine Particulate Sampler Make – Thermo Environmental Instruments – TEI 121
PM ₁₀	Gravimetric Method Beta attenuation Method	Respirable Dust Sampler Make –Thermo Environmental Instruments – TEI 108
SO ₂	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO _x	IS-5182 Part II (Jacob & Hochheiser modified method)	Respirable Dust Sampler with gaseous attachment
Free Silica	NIOSH – 7601	Visible Spectrophotometry

Source: Sampling Methodology followed by Chennai Mettex Lab Private Limited & CPCB Notification

TABLE 3.16 – 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 ($\mu\text{g}/\text{m}^3$)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	Nitrogen Dioxide ($\mu\text{g}/\text{m}^3$)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	Particulate matter (size less than 10 μm) PM ₁₀ ($\mu\text{g}/\text{m}^3$)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less than 2.5 μm) PM _{2.5} ($\mu\text{g}/\text{m}^3$)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

*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 values 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 seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March - May 2023. The baseline data of ambient air has been generated for PM₁₀, PM_{2.5}, Sulphur Dioxide (SO₂) & Nitrogen Dioxide (NO₂).

3.3.5 Ambient Air Quality Monitoring Stations

Seven (7) 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 3.17 – AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	AAQ-1	Core Zone	Project Area	10°13'51.32"N 78°21'15.47"E
2	AAQ-2	Chokkampatti	1km NE	10°14'25.52"N 78°21'24.55"E
3	AAQ-3	Kottampatti	2.8km SE	10°13'12.28"N 78°22'42.41"E
4	AAQ-4	Sambapatti	5.8km SW	10°12'47.18"N 78°18'5.63"E
5	AAQ-5	Sirugudi	6.2km NW	10°15'45.87"N 78°18'29.40"E
6	AAQ-6	Pudupatti	6.2km NE	10°15'44.68"N 78°24'9.29"E
7	AAQ-7	Ayyapatti	5.5km South	10°10'45.10"N 78°20'46.70"E

Source: On-site monitoring/sampling by Chennai Mettex Lab Private Limited in association with GEMS

FIGURE 3.13: SITE PHOTOGRAPHS OF AMBIENT AIR MONITORING



Source: Monitoring photographs from the FAE and Team Members

FIGURE 3.14 AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS

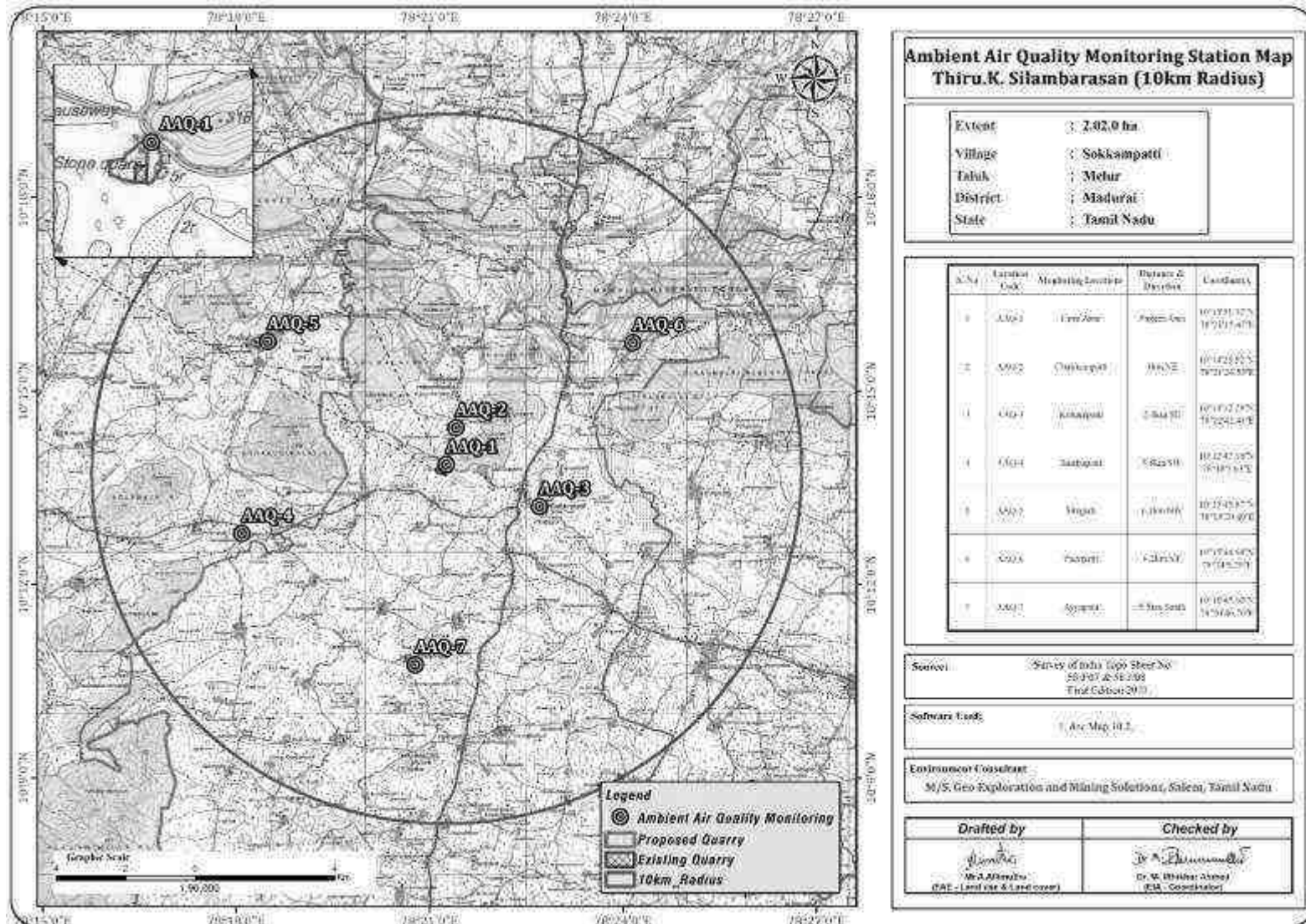


TABLE 3.18 – AAQ1- CORE ZONE

Period: March – May-2023

Location: AAQ1- Core Zone

Sampling Time: 24-hourly

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	66.7	22.7	43.3	6.7	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	65.2	24.3	41.7	7.3	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	67.8	23.9	42.9	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.5	22.5	43.3	6.8	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	66.9	21.7	42.7	7.4	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	65.8	22.6	41.6	7.2	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	66.7	23.3	44.8	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	64.4	22.4	42.7	6.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	65.9	21.6	43.3	5.3	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	66.5	23.3	43.9	6.8	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	67.3	22.9	41.5	7.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	65.8	21.4	41.7	6.8	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	66.6	22.5	42.6	7.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	67.8	23.8	41.5	8.9	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	65.3	23.6	42.4	7.3	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	66.9	23.7	41.9	7.1	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	64.3	21.4	42.6	6.8	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	65.4	22.3	43.3	5.4	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	65.8	23.8	44.1	6.3	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	66.3	21.9	42.7	8.9	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	66.8	22.3	43.3	5.2	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	66.4	21.7	42.4	7.3	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	66.5	22.3	41.6	7.9	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	67.9	21.9	43.9	6.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	65.8	21.8	44.5	7.8	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	66.8	22.3	42.5	8.6	21.6	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 3.19 – AAQ2 - CHOKKAMPATTI

Period: March – May-2023

Location: AAQ2- Chokkampatti

Time: 24-hourly

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	69.7	22.3	41.7	7.3	23.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	68.9	21.6	43.2	8.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	68.2	20.3	44.7	6.5	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	68.3	20.7	41.9	7.8	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	67.4	21.9	43.3	8.3	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	67.8	21.4	42.7	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	69.3	21.9	41.6	6.4	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	68.7	19.5	44.2	7.9	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	68.8	19.4	43.3	8.3	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	67.9	18.9	42.7	7.1	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	67.5	18.2	41.9	8.2	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	67.3	20.5	42.6	8.9	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	69.8	20.7	43.8	7.4	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	69.5	20.6	43.5	7.3	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	68.7	21.5	41.6	9.6	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	67.6	20.9	43.3	8.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.8	19.5	42.7	5.9	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	67.5	19.8	43.3	5.6	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	66.9	21.6	44.6	6.3	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	68.5	21.7	42.4	8.7	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	67.8	20.3	44.9	5.5	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	66.7	22.8	41.6	7.2	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	65.3	21.3	43.2	6.3	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	66.9	20.9	44.7	7.9	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	64.5	21.3	42.2	8.2	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	65.5	22.5	42.5	8.3	20.9	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 3.20 – AAQ3 – KOTTAMPATTI

Period: March – May-2023

AAQ3- Kottampatti

Sampling Time: 24-hourly

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	64.7	21.9	43.2	6.3	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	65.8	22.7	42.5	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	65.6	23.4	43.9	5.4	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.4	22.9	41.5	7.8	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	64.5	23.6	42.7	5.9	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	64.9	22.3	43.3	5.8	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	64.5	25.9	44.5	5.1	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	66.3	24.4	42.7	7.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	65.4	23.9	43.4	6.3	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	65.8	25.7	42.9	5.8	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	67.2	24.3	44.6	7.9	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.4.2023	7:15-7:15	66.9	23.9	42.5	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	66.7	25.7	44.7	8.5	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	65.5	24.4	43.3	5.9	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	63.4	23.3	42.5	6.9	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	64.8	25.7	41.8	8.7	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.3	26.6	42.7	5.3	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	65.1	25.8	42.5	6.9	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	65.9	24.3	43.6	5.8	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	66.7	25.7	42.5	6.3	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	67.3	24.4	44.9	5.9	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	66.8	23.9	44.1	7.4	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	65.5	22.3	43.7	6.2	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	65.5	22.7	43.5	5.6	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	66.4	22.3	42.2	7.2	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	65.8	23.5	42.9	6.9	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 3.21– AAQ4 – SAMBAPATTI

Period: March – May-2023

Location: AAQ4 - Sambapatti

Sampling Time: 24-hourly

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	69.7	22.1	41.7	8.3	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	67.1	24.4	43.3	9.1	24.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	68.9	22.3	42.7	5.3	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	69.3	23.9	41.8	6.7	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	68.4	21.5	42.5	5.8	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	68.8	23.6	43.6	6.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	69.5	25.7	41.2	8.4	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	69.9	23.5	43.9	5.3	24.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	68.9	21.4	43.3	9.3	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	68.3	22.5	42.5	6.2	24.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	69.5	23.3	43.6	5.7	23.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	67.3	23.8	44.5	5.3	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	69.5	21.5	41.4	8.4	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	68.9	22.6	42.7	6.7	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	67.5	23.4	43.3	8.5	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	67.2	21.9	42.9	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	67.4	23.6	41.7	9.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	68.3	21.5	41.2	5.3	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	68.6	23.4	43.2	5.6	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	69.5	24.9	43.9	5.2	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	67.9	21.5	42.5	5.7	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	68.5	23.3	43.9	6.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	68.4	21.4	42.5	9.8	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	67.8	22.8	41.3	8.1	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	69.8	23.5	42.8	7.6	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	68.5	23.8	41.5	7.5	20.7	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 3.22 – AAQ5 – SIRUGUDI

Period: March – May-2023

AAQ5- Sirugudi

Sampling Time: 24-hourly TABLE

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	64.2	23.6	43.4	6.3	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	65.9	24.1	42.6	7.5	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	64.4	23.5	41.8	6.4	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.6	22.6	42.5	6.6	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	64.7	23.7	43.9	6.5	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	65.6	24.4	43.7	7.6	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	63.5	23.6	41.4	7.2	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	64.9	21.9	42.5	7.1	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	65.4	24.4	43.4	7.6	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	64.3	22.8	42.7	7.4	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	65.8	23.6	41.8	7.9	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	66.5	23.5	42.9	7.2	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	65.9	25.4	41.6	6.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	64.4	23.7	43.4	6.6	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	65.5	22.8	42.8	7.1	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	64.9	23.6	42.6	7.8	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	65.7	24.4	43.5	7.6	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	67.4	23.5	41.7	7.6	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	66.3	22.9	42.9	6.8	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	65.8	24.4	43.2	6.4	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	64.7	23.6	41.6	7.2	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	63.5	22.7	42.7	7.5	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	64.6	24.4	41.3	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	65.1	23.8	42.8	6.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	63.8	22.8	42.5	6.9	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	67.7	22.6	41.9	6.7	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.

3.23 – AAQ6 - PUDUPATTI

Period: March – May-2023

Location: AAQ6 – Pudupatti

Sampling Time: 24-hourly

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	68.3	21.3	43.5	7.5	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	67.4	21.9	42.9	7.3	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	68.5	21.5	42.5	6.7	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	69.2	22.1	43.1	6.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	67.5	22.6	42.6	6.1	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	67.2	23.1	42.1	7.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	68.5	22.7	43.5	6.8	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	69.4	21.5	43.9	6.9	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	68.8	21.9	44.1	7.4	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	64.6	21.0	43.1	7.2	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	68.3	21.9	42.6	7.3	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	67.5	22.7	42.9	7.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	68.4	22.4	43.5	6.1	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	68.9	21.6	42.8	6.5	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	67.7	22.4	42.1	6.2	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	67.3	21.0	43.7	7.8	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.8	21.6	42.4	7.3	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	68.3	21.6	43.1	6.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	66.7	21.9	42.6	6.9	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	66.2	21.3	42.9	7.1	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	66.8	23.6	43.1	7.2	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	67.6	22.8	44.8	6.8	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	66.1	22.1	42.6	6.1	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	66.3	21.9	43.1	7.3	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	68.6	22.6	45.7	7.5	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	67.2	22.8	45.6	7.3	20.2	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 – AAQ7 - Ayyapatti

Period: March – May-2023

Location: AAQ7– Ayyapatti

Sampling Time: 24-hourly

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	65.6	22.3	41.5	6.3	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	68.3	21.1	42.4	5.9	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	65.4	22.8	42.8	6.2	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.6	21.9	42.3	6.0	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	68.9	22.4	43.5	5.9	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	65.1	21.3	41.1	5.3	21.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	66.9	22.1	42.9	5.9	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	64.7	21.7	41.5	6.2	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	66.3	21.5	42.6	6.3	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	63.4	22.0	41.3	5.9	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	65.8	20.6	42.2	5.6	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	65.1	20.9	42.8	6.3	19.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	65.5	21.1	41.9	6.8	21.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	66.9	21.7	41.5	5.6	18.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	64.8	22.3	42.8	5.4	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	63.9	20.4	43.5	5.8	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.1	21.9	42.6	5.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	65.2	21.4	43.1	5.9	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	64.8	21.8	43.2	6.3	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	65.3	22.1	42.7	6.7	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	64.5	20.6	43.8	6.3	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	64.6	22.7	42.5	6.1	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	65.8	20.3	41.3	5.8	18.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	66.9	21.6	41.1	5.5	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	64.6	21.6	42.6	6.5	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	65.6	21.6	42.5	6.7	20.2	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 – ABSTRACT OF AMBIENT AIR QUALITY DATA

1	Parameter	PM10	PM2.5	SO ₂	NO ₂
2	No. of Observations	260	260	260	260
3	10 th Percentile Value	41.5	20.9	5.6	20.3
4	20 th Percentile Value	41.9	21.5	5.9	20.7
5	30 th Percentile Value	42.5	21.7	6.2	21.1
6	40 th Percentile Value	42.6	21.9	6.4	21.4
7	50 th Percentile Value	42.7	22.4	6.8	21.6
8	60 th Percentile Value	42.9	22.7	7.1	21.9
9	70 th Percentile Value	43.3	23.4	7.3	22.3
10	80 th Percentile Value	43.5	23.6	7.8	22.8
11	90 th Percentile Value	44.1	24.4	8.3	23.7
12	95 th Percentile Value	44.7	25.7	8.9	24.2
13	98 th Percentile Value	45.2	25.8	9.5	24.7
14	Arithmetic Mean	43.2	23.1	7.3	22.2
15	Geometric Mean	43.2	23.0	7.2	22.2
16	Standard Deviation	1.1	1.7	1.3	1.5
17	Minimum	41.5	20.9	5.6	20.3
18	Maximum	45.2	25.8	9.5	24.7
19	NAAQ Norms*	100.0	60.0	80.0	80.0
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

Legend:PM_{2.5}-Particulate Matter size less than 2.5 µm; PM₁₀-Respirable Particulate Matter size less than 10 µm; SO₂-Sulphur dioxide; NO₂-Nitrogen Dioxide; CO-Carbon monoxide; O₃-Ozone; NH₃-Ammonia; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene & BaP- Benzo (a) pyrene in particulate phase levels were monitored below their respective detectable limits.

* NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Area.

TABLE 3.26 – SUMMARY OF AMBIENT AIR QUALITY DATA (AAQ1-AAQ7)

PM10	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	42.8	43.0	43.1	42.7	42.6	42.6	42.4
Minimum	41.5	41.6	40.5	41.2	41.3	42.1	41.1
Maximum	44.8	44.9	44.9	44.5	43.9	45.7	43.8
NAAQ Norms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

PM2.5	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	22.6	20.8	24.1	23.0	42.6	43.3	21.6
Minimum	21.4	18.2	21.9	21.4	21.9	21.0	20.3
Maximum	24.3	22.8	26.6	25.7	25.4	23.6	22.8
NAAQ Norms	60.0	60.0	60.0	60.0	60.0	60.0	60.0

SO₂	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	7.0	7.4	6.5	7.0	7.0	7.0	6.0
Minimum	5.2	5.5	5.1	5.2	6.2	6.1	5.3
Maximum	8.9	9.6	8.7	9.8	7.9	7.8	6.8
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

NO_x	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	21.5	22.4	21.5	23.1	22.6	21.0	20.2
Minimum	20.2	20.9	20.1	20.7	20.3	20.2	18.1
Maximum	22.7	24.2	22.9	24.9	25.5	21.9	22.2
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

FIGURE 3.15 : BAR DIAGRAM OF SUMMARY OF AIRQUALITY DATA

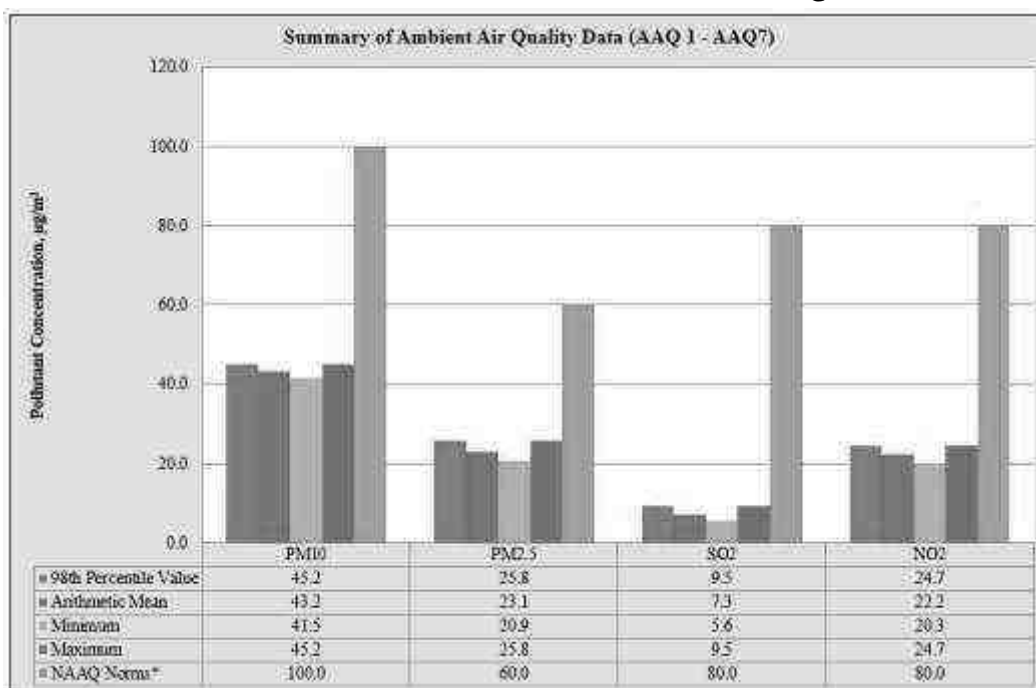


FIGURE 3.16 : BAR DIAGRAM OF PARTICULATE MATTER (PM₁₀)

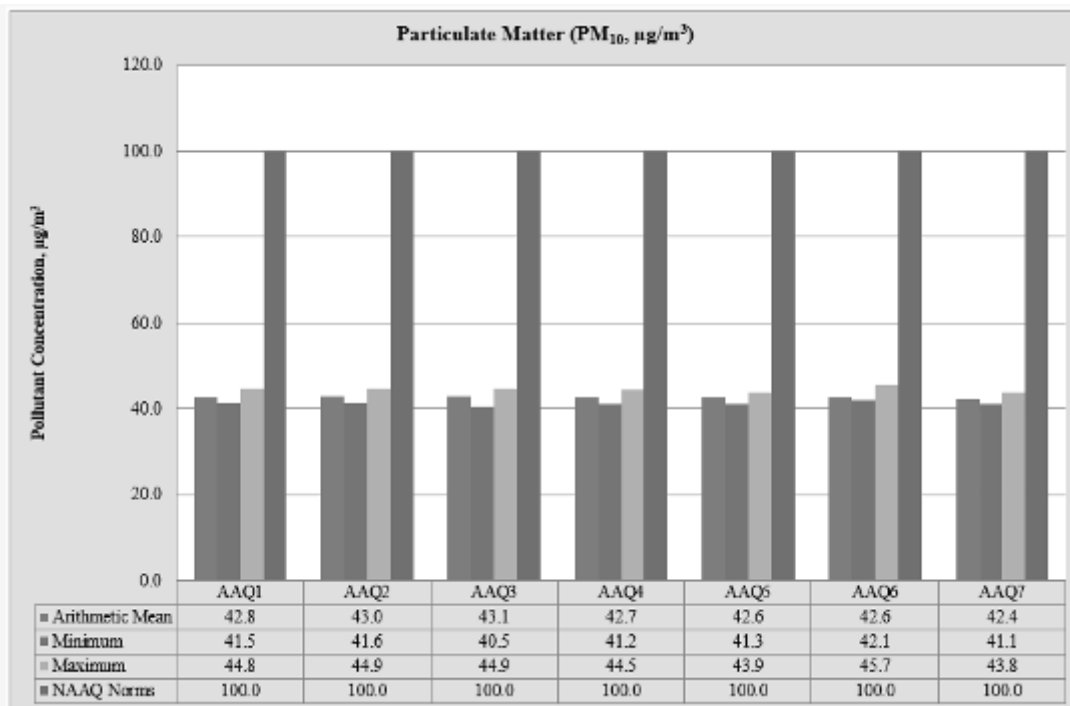


FIGURE 3.16A : BAR DIAGRAM OF PARTICULATE MATTER (PM_{2.5})

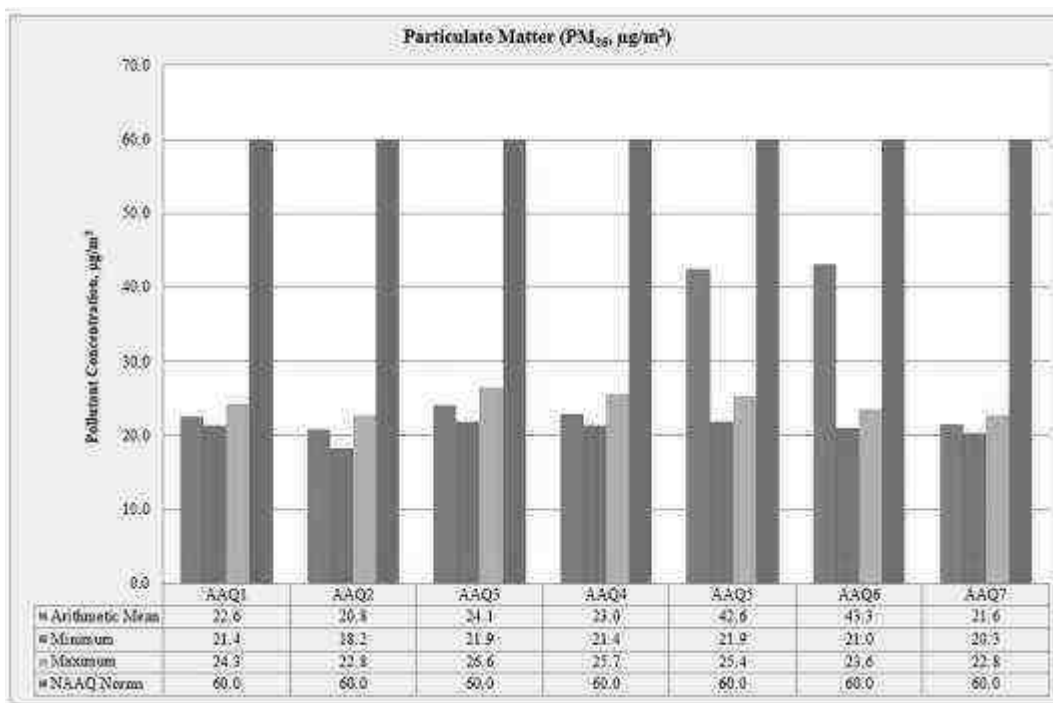


FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER (SO₂)

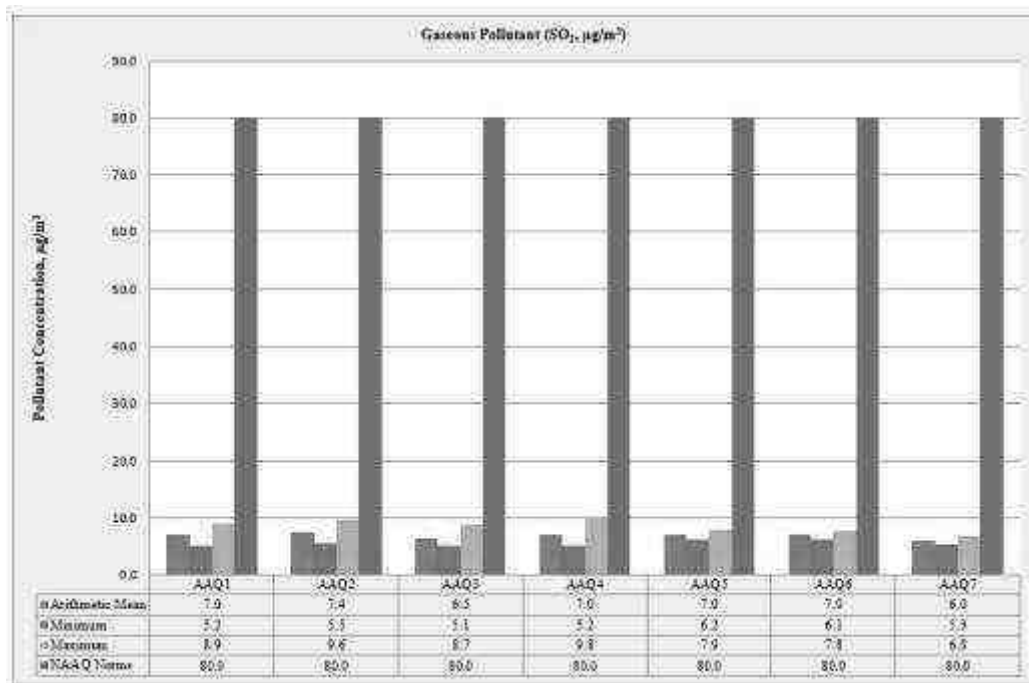
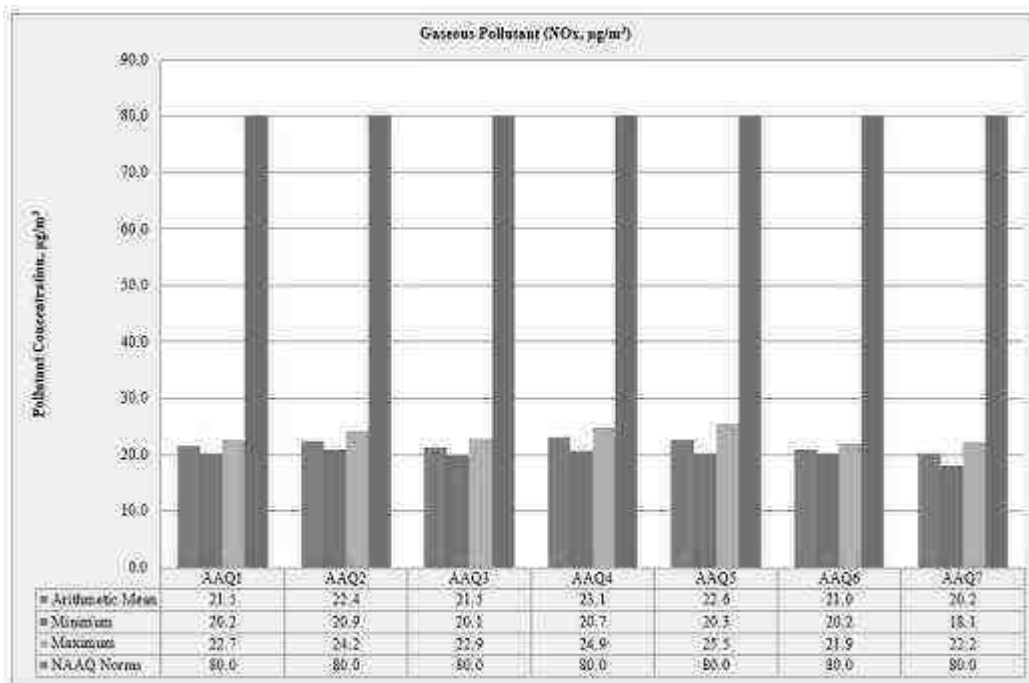


FIGURE 3.17A: BAR DIAGRAM OF PARTICULATE MATTER (NO_x)



3.3.6 Interpretations & Conclusion

As per monitoring data, PM₁₀ ranges from 41.5 µg/m³ to 45.2 µg/m³, PM_{2.5} data ranges from 20.9 µg/m³ to 25.8 µg/m³, SO₂ ranges from 5.6 µg/m³ to 9.5 µg/m³ and NO_x data ranges from 20.3 µg/m³ to 24.7 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

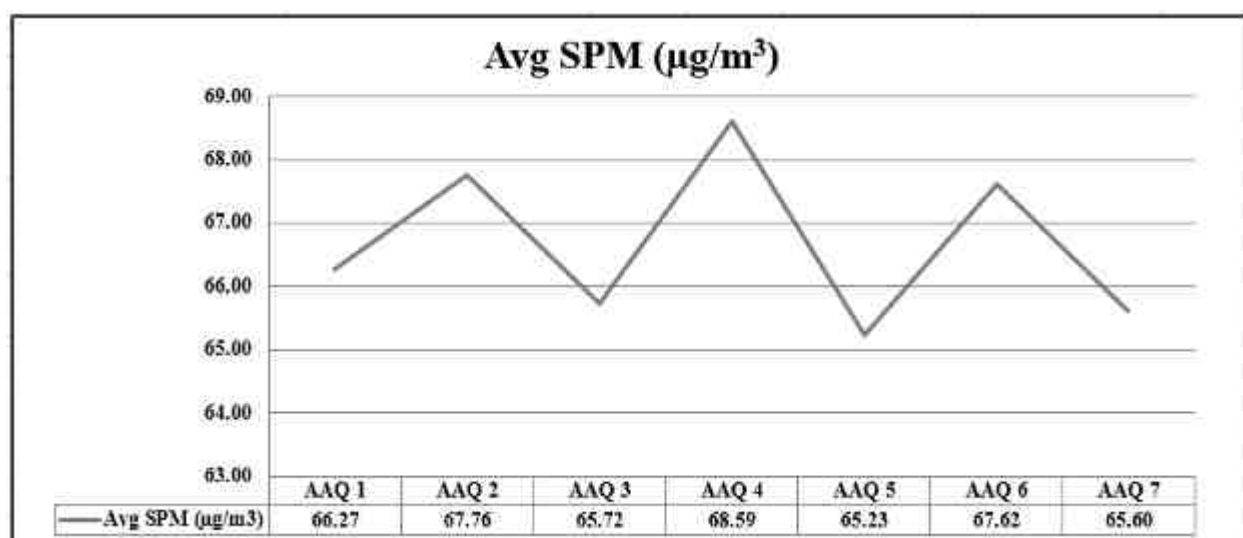
3.3.7 FUGITIVE DUST EMISSION –

Fugitive dust was recorded at 7AAQ monitoring stations for 30 days average during the study period.

TABLE 3.27– AVERAGE FUGITIVE DUST SAMPLE VALUES IN µg/m³

AAQ Locations	Avg SPM (µg/m ³)
AAQ 1	66.27
AAQ 2	67.76
AAQ 3	65.72
AAQ 4	68.59
AAQ 5	65.23
AAQ 6	67.62
AAQ 7	65.60

Source: Onsite monitoring/ sampling by Chennai Mettex Laboratories

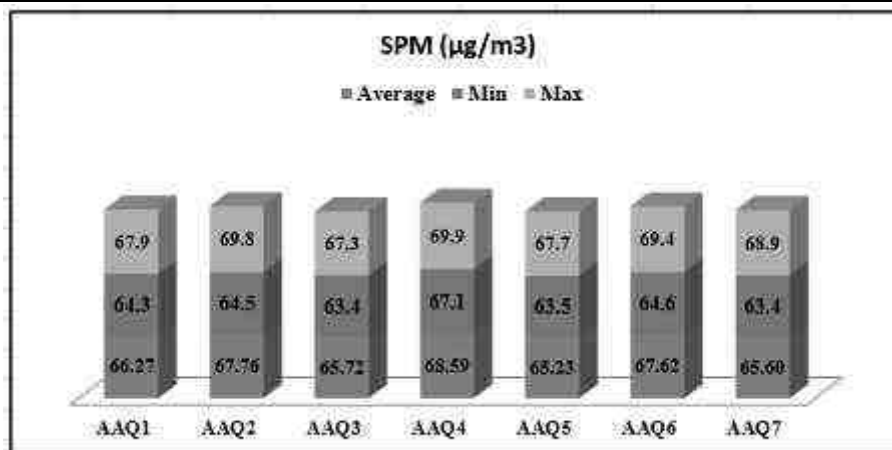


Source: Line Diagram of Table 3.20

TABLE 3.28– FUGITIVE DUST SAMPLE VALUES IN µg/m³ –

SPM (µg/m ³)	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Average	66.27	67.76	65.72	68.59	65.23	67.62	65.60
Max	64.3	64.5	63.4	67.1	63.5	64.6	63.4
Min	67.9	69.8	67.3	69.9	67.7	69.4	68.9

Source: Calculations from Lab Analysis Reports



Source: Bar Diagram of table 3.14

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 ten (7) 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 3.29 – DETAILS OF SURFACE NOISE MONITORING LOCATIONS

S. No	Location code	Monitoring Locations	Distance & Direction	Coordinates
1	N-1	Core Zone	Project Area	10°13'50.28"N 78°21'14.87"E
2	N-2	Chokkampatti	1km NE	10°14'26.20"N 78°21'24.27"E
3	N-3	Kottampatti	2.8km SE	10°13'12.07"N 78°22'42.33"E
4	N-4	Sambapatti	5.8km SW	10°12'46.92"N 78°18'5.39"E
5	N-5	Sirugudi	6.2km NW	10°15'45.74"N 78°18'28.77"E
6	N-6	Pudupatti	6.2km NE	10°15'44.45"N 78°24'9.10"E
7	N-7	Ayyapatti	5.5km South	10°10'45.43"N 78°20'47.09"E

Source: On-site monitoring/sampling by Chennai Mettix Lab Private Limited 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.

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

Where L = Sound pressure level at function of time dB (A)

T = Time interval of observation

3.4.3 Analysis of Ambient Noise Level in the Study Area

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 3.6

Day time : 6:00 hours to 22.00 hours.

Night time : 22:00 hours to 6.00 hours

TABLE 3.30 – NOISE MONITORING RESULTS IN CORE AND BUFFER ZONE

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	48.7	39.4	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Chokkampatti	47.2	39.0	
3	Kottampatti	45.4	38.5	
4	Sambapatti	46.0	38.0	
5	Sirugudi	46.9	38.5	
6	Pudupatti	47.5	37.4	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
7	Ayyapatti	47.8	39.5	

Source: On-site monitoring/sampling by Chennai Mettix Lab Private Limited in association with GEMS

FIGURE 3.18: NOISE MONITORING STATIONS AROUND 10 KM RADIUS

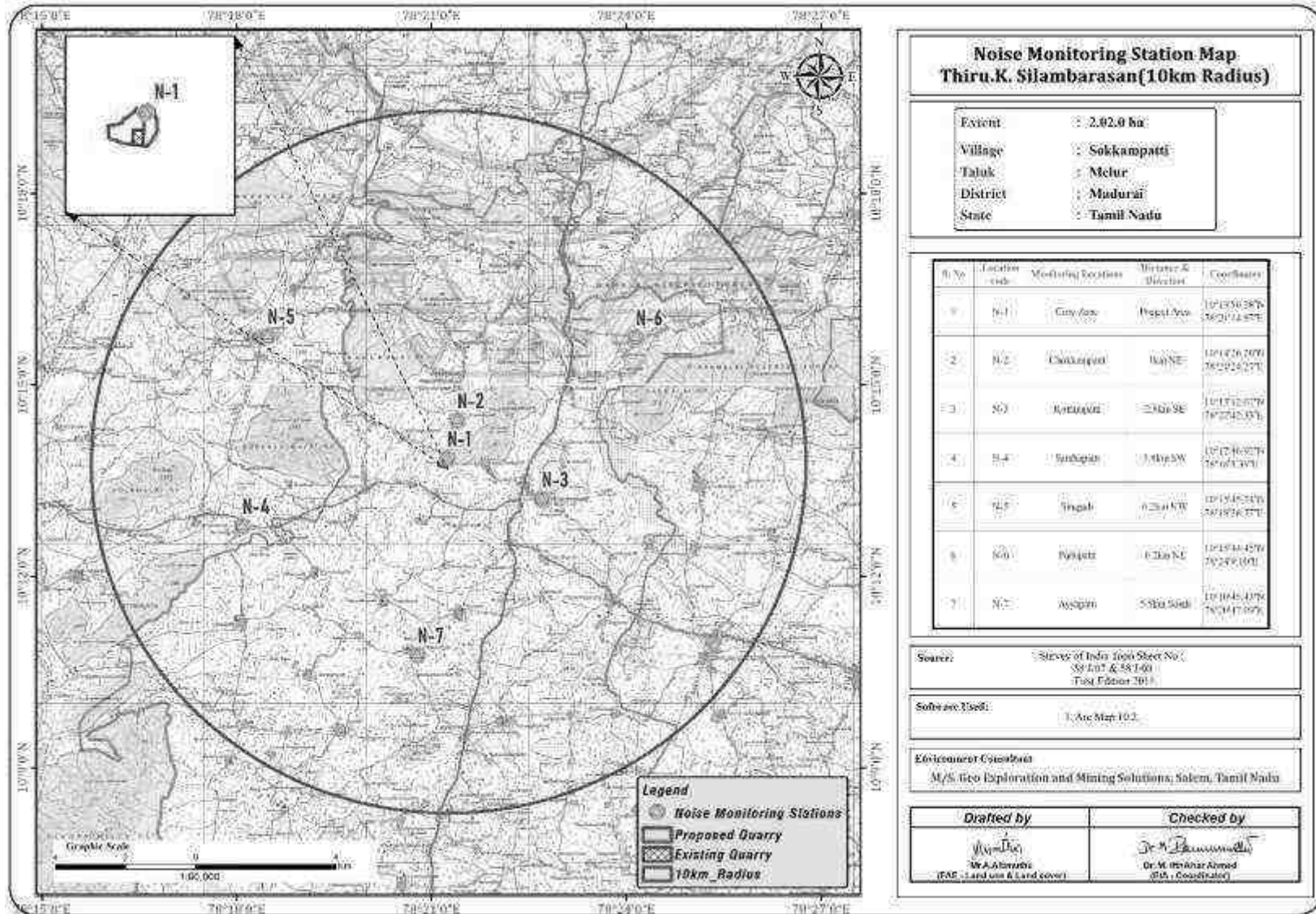
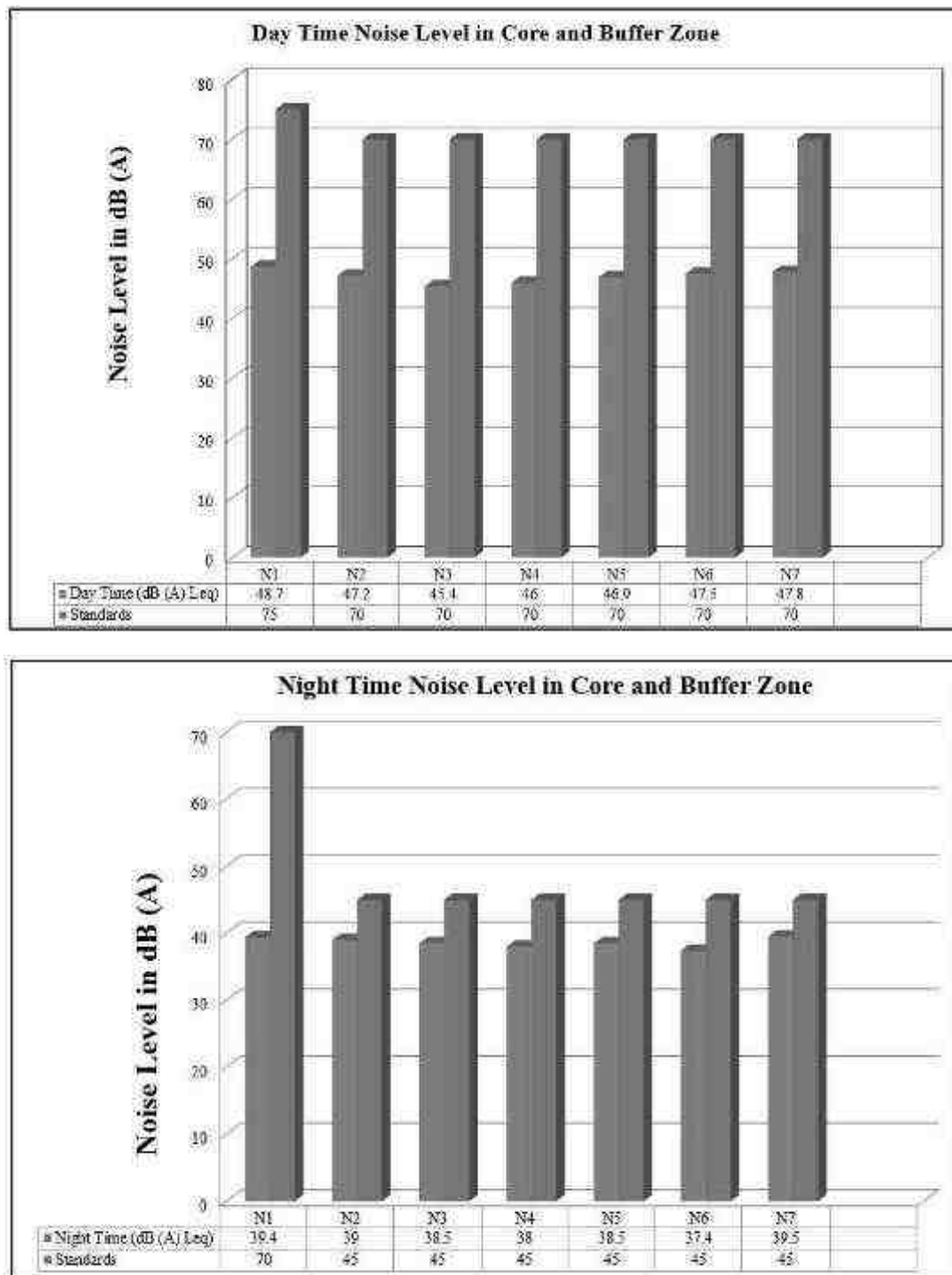


FIGURE 3.19: DAY & NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE



3.4.4 Interpretation & Conclusion

Ambient noise levels were measured at 7 (Seven) locations around the project area considering cluster quarries. Noise levels recorded in core zone during day time were from 48.7 dB (A) Leq and during night time were from 39.4 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 45.4–47.8 dB (A) Leq and during night time were from 37.4–39 dB (A) Leq.

3.5 Ecological Environment

3.5.1. Study area Ecology

The core area extent of 2.02.0 Ha of Rough Stone quarry has an impact on the diversity of flora and fauna of the surrounding area. But present work was carried out on detailed study of the impacts of the Rough stone quarry on the ecology and biodiversity of the core lease area with the proper mitigation and sustainable management plan. The Core mining area is situated with exhibits an undulated topography. whereas in the buffer zone some places agricultural land is dominated. The following methods were applied during the baseline study of flora, fauna, and diversity assessment.

3.5.2. Objectives of Biological Studies

- a) Identification and listing of flora and fauna which are important as per the Wildlife (Protection) Act 1972.
- b) Suggest Wildlife conservation (species specific/habitat specific) and management plan for the threatened (critically endangered & endangered species - schedule I) faunal species if any reported within the study area.
- c) To identify the impacts of mining on agricultural lands and how it affects.
- d) Proper collection of information about wildlife Sanctuaries/ national parks/ biosphere reserves of the project area.
- e) 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 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).

3.5.3.1. 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.

3.5.3.2. 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.

3.5.3.3. 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.

3.5.3.4. Observations from Sampling

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

3.5.3.5. 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 of 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 for 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 coloured 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).

3.5.5. 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: 3.31 Flora in the Core zone of lease area

Sl.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Neem or Indian lilac	Vembu maram	Azadirachta indica	Meliaceae
2.	Velvet mesquite	Mullu maram	Prosopis juliflora	Fabaceae
3.	Sugar apple	Sitapalam	Annona squamosal	Annonaceae
4.	Gum arabic tree	Karuvelam	Vachellia nilotica	Fabaceae
5.	Millettia pinnata	Pongam oiltree	Pongamia pinnata	Fabaceae
6.	Banyan	Ala maram	Ficus benghalensis	Moraceae
7.	Pala indigo	Pala maram	Wrightia tinctoria	Apocynaceae
8.	Indian mulberry	Nuna maram	Morinda tinctoria	Rubiaceae
9.	Bitter Albizia	Arappu Tree	Albizia amara	Fabaceae
Shrubs				
1.	Milk Weed	Erukku	Calotropis gigantea	Apocynaceae
2.	Tanner's cassia	Avaram	Senna auriculata	Fabaceae
3.	Hopbush	Virali chedi	Dodonaea viscosa	Sapindaceae
4.	Triangular spruge	Chaturakalli	Euphorbia antiquorum	Euphorbiaceae
5.	Night shade plan	Sundaika	Solanum torvum	Solanaceae
6.	Puriging nut	Kattamanakku	Jatropha curcas	Euphorbiaceae
Herbs				
1.	Indian nettle	Nayuruvi	Achyranthes aspera	Amaranthaceae
2.	Coat buttons	Thatha poo	Tridax procumbens	Asteraceae
3.	Indian doab	Arugampul	Cynodon dactylon	Poaceae
4.	Goatweed	Kallurukki	Scoparia dulcis	Plantaginaceae
5.	Holy basil	Thulasi	Ocimum tenuiflorum	Lamiaceae
6.	Bindii	Nerunji mullu	Tribulus terrestris	Zygophyllaceae
7.	Common leucas	Thumbai	Leucas aspera	Lamiaceae
8.	Asthma-plant	Amman pacharisi	Euphorbia hirta	Euphorbiaceae
Climber/ Creepers				
1.	Stemmed vine	Perandai	Cissus quadrangularis	Vitaceae
2.	Stinking passionflower	Poonai puduku chedi	Passiflora foetida	Passifloraceae
3.	Wild Bitter gourd	Pavakkai	Momordica charantia	Cucurbitaceae
Grasses				
1.	Eragrostis	Pullu	Eragrostis ferruginea	Poaceae
2.	Nut grass	Korai	Cyperus rotundus	Poaceae
3.	Great brome	Thodappam	Bromus diandrus	Poaceae
4.	Sedges	Korai Pul	Carex solandri	Cyperaceae
5.	Narrowleaf cattail	Sambu	Typha angustifolia	Typhaceae
Cactus				
1.	Prickly pear	Nagathali	Opuntia dillenii	Cactaceae

Sources: Species observation in the field study

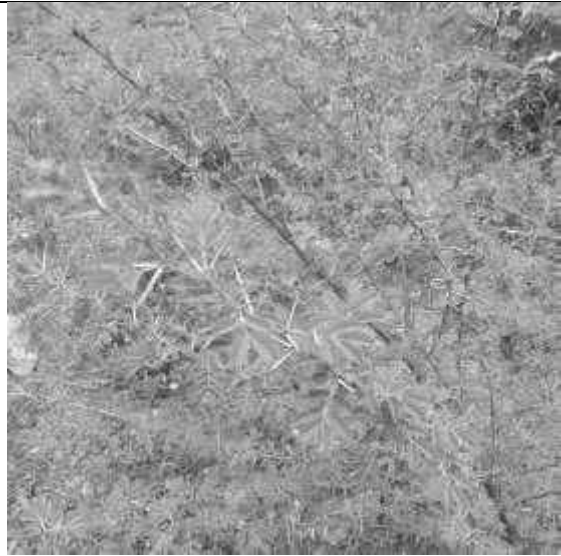
3.5.6. Flora's Composition of the Core Zone

Taxonomically a total of 32 species have been recorded from the core mining lease area. Based on the habitat classification of the enumerated plants the majority of species were Trees 9 followed by Herbs 8,

Shrubs 5, Grasses 5, Climber/Creepers 3, and Cactus 1. The result of the core zone of flora studies shows that Fabaceae and Poaceae, Lamiaceae are the main dominating species in the study area mentioned in Table No.3.3 No species were found in the threatened category.



a. *Tridax procumbens*



b. *Vachellia nilotica*



c. *Jatropha curcas*



d. *Typha angustifolia*



e. *Prosopis juliflora*



f. *Calotropis gigantea*



g. *Ficus benghalensis*



h. *Passiflora foetida*



i. *Euphorbia hirta*



j. *Senna auriculata*



k. *Wrightia tinctoria*



l. *Opuntia dillenii*

Fig No: 3.20 Flora species observation in the Core zone area

Table No: 3.32 Flora in the Buffer zone of the Cluster study area.

Si.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Neem or Indian lilac	Vembu	Azadirachta indica	Meliaceae
2.	Common fig	Athi Maram	Ficus Carica	Anacardiaceae
3.	Frywood	Vaagai	Albizia lebbek	Mimosaceae
4.	Indian plum	Elanthai maram	Ziziphus mauritiana	Rhamnaceae
5.	Mango	Manga	Mangifera indica	Anacardiaceae
6.	Oil cake tree	Wunja	Albizia amara	Fabaceae
7.	Chinaberry	Malai vembu	Melia azedarach L	Meliaceae
8.	Velvet mesquite	Mullu maram	Prosopis juliflora	Fabaceae
9.	Indian rosewood	Shisham	Dalbergia sissoo	Fabales
10.	Madras thorn	Kudukapuli	Pithecellobium dulce	Fabaceae
11.	Portia tree	Poovarasam	Thespesia Populnea	Malvaceae
12.	Royal poinciana	Cemmayir Konra	Delonix regia	Fabaceae
13.	Bitter Albizia	Arappu Tree	Albizia amara	Fabaceae
14.	Lemon	Ezhumuchaipalam	Citrus lemon	Rutaceae
15.	Jamun Fruit Plant	Naval maram	Syzygium cumini	Myrtaceae
16.	Gum arabic tree	Karuvelam	Vachellia nilotica	Fabaceae
17.	Kassod Tree	ManjalKonrai	Cassia siamea	Fabaceae
18.	Pala indigo	Pala maram	Wrightia tinctoria	Apocynaceae
19.	Asian Palmyra palm	Panai maram	Borassus flabellifer	Arecaceae
20.	Bamboo	Moongil	Bambusoideae	Poaceae
21.	Teak	Thekku	Tectona grandis	Verbenaceae
22.	Indian mulberry	Nuna maram	Morinda tinctoria	Rubiaceae
23.	Banyan	Alai	Ficus benghalensis	Moraceae
24.	Cashew	Munthiri	Anacardium occidentale	Anacardiaceae
25.	Coconut	Thennai maram	Cocos nucifera	Arecaceae
26.	Horsetail She-oak	Savukku maram	Casuarina equisetifolia	Casuarinaceae
27.	Eucalyptus	Thailam maram	Eucalyptus tereticornis	Myrtaceae
28.	Creamy peacock flower	Perungondrai	Delonix elata	Fabaceae
29.	Pongamia pinnata	Pongam	Millettia pinnata	Fabaceae
30.	Indian bael	Vilvam	Aegle marmelos	Rutaceae
31.	Indian gooseberry	Nelli	Phyllanthus emblica	Phyllanthaceae
32.	Guava	Koyya	Psidium guajava	Myrtaceae
33.	Tamarind	Puliyamaram	Tamarindus indica	Legumes

34.	Drumstick tree	Murunga maram	Moringa oleifera	Moringaceae
35.	Sugar apple	Sitapalam	Annona squamosal	Annonaceae
36.	Papaya	Pappali maram	Carica papaya L	Caricaceae
37.	Banana tree	Vazhaimaram	Musa acuminata	Musaceae
38.	Jack fruit	Palamaram	Artocarpus heterophyllus	Moraceae
Shrubs				
1.	Solanum pubescens	Malaisundai	Solanum pubescens Willd	Solanaceae
2.	West Indian Lantana	Unni chedi	Lantana camara	Verbenaceae
3.	Bellyache bush	Kaatamanaku	Jatropagossypifolia	Euphorbiaceae
4.	Stachytarpheta urticifolia	Rat tai	Stachytarphaurticifolia	Verbenaceae
5.	Bush Morning Glory	Neiveli Kattamani	Ipomoea carnea	Convolvulaceae
6.	Avaram	Avarai	Senna auriculata	Fabaceae
7.	Hopbush	Virali chedi	Dodonaea viscosa	Sapindaceae
8.	Triangular spruge	Chaturakalli	Euphorbia antiquorum	Euphorbiaceae
9.	Indian mallow	Thuthi	Abutilon indicum	Meliaceae
10.	Indian mallow	Maanikham	Abutilon indicum	Meliaceae
11.	Castor bean	Amanakku	Ricinus communis	Euphorbiaceae
12.	Milk Weed	Erukku	Calotropis gigantea	Apocynaceae
13.	Touch-me-not	Thottalchinungi	Mimosa pudica	Mimosaceae
14.	Shoe flower	Chemparuthi	Hibiscu rosa-sinensis	Malvaceae
15.	Night shade plan	Sundaika	Solanum torvum	Solanaceae
16.	Indian Oleander	Arali	Nerium indicum	Apocynaceae
17.	Devil's trumpet	Umathai	Datura metel	Solanaceae
Herbs				
1.	Purple pitcher plant	Kavali	Tephrosia purpurea	Fabaceae
2.	Chamber bitter	Malai Kizhanelli	Phyllanthus urinaria	Euphorbiaceae
3.	Carrot grass	Vishapoandu	Parthenium hysterophorus	Asteraceae
4.	Billygoat weed	Pumpillu	Ageratum conyzoides	Asteraceae
5.	Aloe barbadensis	Katrazhai	Aloe vera	Asphodelaceae
6.	Indian Mercury	Kuppamani	Acalypha indica	Euphorbiaceae
7.	Indian nettle	Nayuruvi	Achyranthes aspera	Amaranthaceae
8.	Indian doab	Arugampul	Cynodon dactylon	Poaceae
9.	Europeanblack nightshade	Manathakkali	Solanumnigrum	Solanaceae
10.	Cleome viscosa	Nai kadugu	Celome viscosa	Capparidaceae
11.	Common leucas	Thumbai	Leucas aspera	Lamiaceae
12.	Asthma-plant	Amman pacharisi	Euphorbia hirta	Euphorbiaceae
13.	Poor land flatsedg	Kunnakora	Cyperus compressus	Cyperaceae

14.	Indian mint	Karpura valli	Coleus amboinicus	Lamiaceae
15.	Holy basil	Thulasi	Ocimum tenuiflorum	Lamiaceae
16.	Bright eyes	Nithiyakalyani	Catharanthus roseus	Apocynaceae
17.	Tridax daisy	Thatha poo	Tridax procumbens	Asteraceae
18.	Gale of the wind	Keelaneeli	Phyllanthus niruri	Phyllanthaceae
Climber/ Creepers				
1.	Ivy gourd	Kovai	Coccinia grandis	Cucurbitaceae
2.	Bitter apple	Peikkumatti	Citrullus colocynthis	Cucurbitaceae
3.	Wild water lemon	Poonai puduku chedi	Passiflora foetida	Passifloraceae
4.	Bitter apple	Peikkumatti	Citrullus colocynthis	Cucurbitaceae
5.	Butterfly pea	Sangu poo	Clitoria ternatea	Fabaceae
6.	Rosary Pea	Gundumani	Abrus precatorius	Fabaceae
7.	White pumpkin	Poosanaikkaai	Cucurbitaceae	Cucurbitaceae
8.	Stemmed vine	Perandai	Cissus quadrangularis	Vitaceae
9.	Wild bitter	Pavarkai	Momordica charantia	Cucurbitaceae
Grass				
1.	Eragrostis	Pullu	Eragrostis ferruginea	Poaceae
2.	Windmill grass	Chevvarakupul	Chloris barbata	Amaranthaceae
3.	Great brome	Thodappam	Bromus diandrus	Poaceae
4.	Narrowleaf cattail	Sambu	Typha angustifolia	Typhaceae

Sources: [Species observation in the field study and secondary data](#)

3.5.7. Economically important Flora of the study area

Agricultural crops: The main agricultural crops are maize and paddy. The locals also cultivate a variety of vegetables and fruits, including brinjal, drumsticks, onion, and coriander, as well as fruits like banana, papaya, mangoes, and guava.

Medicinal species: Several more medicinal plants commonly found in wastelands are also present in the nearby area. *Azadirachta indica* (Neem), *Ocimum tenuiflorum* (Holy basil), etc., and others are common medicinal plants in the area.

Rare and endangered floral species: There are no rare or endangered or threatened (RET) species in the study area. During the vegetation survey, there are no species that are endangered or threatened under IUCN (International Union for Conservation of Nature and Natural resources) guidelines.

3.5.8. Flora Composition in the Buffer Zone

Similar habitats may be found in the buffer area as well, although there is a wider variety of plants there than in the core zone area. The buffer zone has some forests located away from the proposed project site and there are 86 species in the buffer zone study area in total, based on records. The floral (86) varieties among them Trees 38, herbs 18, shrubs 17, Climbers/Creepers 9, and Grasses 4 were identified. The result of the buffer zone of flora studies shows that Fabaceae and Cucurbitaceous, Euphorbiaceous are the main dominating species in the study area mentioned in Table No.3.2. There are no impacts due to this mining activity. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. 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. 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 3.35 and their % distribution is shown in Figure 3.35

Table 3.33. Number of floral life forms in the Study Area

S. No	Plant Life Form	Number of Species
1	Trees	38
2	Shrubs	17
3	Herbs	18
4	Climber/ Creepers	9
6	Grass	4
Total No. of Species		86

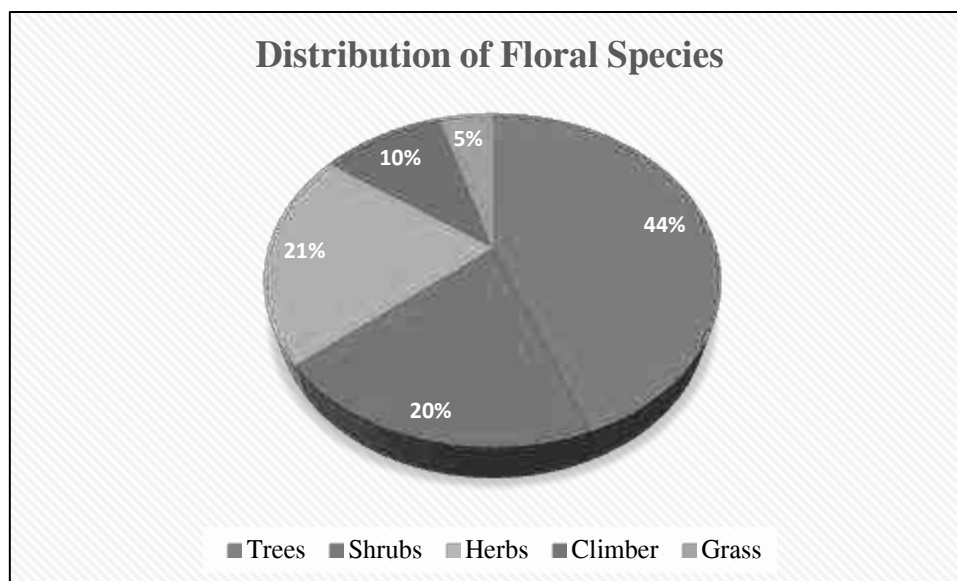


Fig No. 3.21 diagram showing % distribution of floral life forms

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

The distance particulars related to the Reserve Forest, 1. The aerial distance nearest the Reserved Forest is Valaiseripatti RF and it is 0.075km (75m) away from the proposed site. 2. The proposed site is at distance of 79.7km from the protected area of Srivillipur Megamalai Tiger Reserve outside of Elumalai Reserved Forest. 3. The Proposed site is an aerial distance of 20.40 km from the Vettangudi Bird Sanctuary. 4. The proposed site is not within 25km radius of the Wildlife Sanctuary/Protected Area/Tiger Sancturay. Kindly refer to the additional documents of Forest Range Officer, Madurai C/No 35/2023 dated, 02.03.2023. 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. No Wildlife Sanctuary in the study area. In addition, No Biosphere Reserves, Wildlife corridors, or, Tiger / Elephant reserves within 10 km of the project area. No protected (PF) forests either in the mine lease area or in the buffer zone.

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.

3.5.10 Fauna

3.5.10.1. Fauna Composition in the Core Zone

A total of 23 varieties of species were observed in the Core zone of Sökkampatti Village, Rough stone quarry (Table No.3.4) among them numbers of Insects 8, Reptiles 3, Mammals 2, and Avian 10. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species according to the Indian Wildlife Act 1972. A total of 10 species of bird were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No: 3.34 Fauna in the Core zone of lase area, rough stone quarry

SI. No	Scientific Name	Common Name	IUCN Red List data
Insects			
1.	Agriansp	Dragonfly	-
2.	Musca domestica	House fly	-
3.	Hieroglyphus sp	Grasshopper	LC
4.	Danaus genutia	Common Tiger	NL
5.	Danaus genutia	Striped Tiger	LC
6.	Danaus chrysippuschrysippus	Plain Tiger	LC
7.	Apisindica	Honey Bee	-
8.	Hamitermes silvestri	Termite	LC
Reptiles			
1.	Calotes versicolor	Garden lizard	LC
2.	Mabuya carinatus	Common skink	LC
3.	Ahaetulla nasuta	Green vine snake	NL
Mammals			
1.	Mus booduga	Indian Field Mouse	NL
2.	Herpestes javanicus	Asian Small Mongoose	LC
Aves			
1.	Acridotheres tristis	Common myna	LC
2.	Laniusexcubitor	Shikra	LC
3.	Corvussplendens	House crow	LC
4.	Eudynamys	Koel	LC
5.	Psittacula krameri	Rose-ringed parkeet	LC
6.	Coturnix coturnix	Common quail	LC
7.	Dicrurus macrocercus	Drongo	LC
8.	Bubulcus ibis	Cattle egret	LC
9.	Saxicoloides fulicata	Indian Robin	LC
10.	Ardeo labacchus	Pond-Heron	LC

*NL- Not listed, LC- Least Concern

(Sources: [Species observation in the field study](#))

3.5.11. Fauna Composition in the Buffer Zone

As the 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.

Kindly refer to the additional documents of Forest Range Officer, Madurai C/No 35/2023 dated, 02.03.2023. There are no Sanctuaries, National Parks, Tiger Reserves or Biosphere Reserve or Elephant Corridors or other protected areas within 10 km radius of 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 was free from any endangered

animals. There were no resident birds other than common bird species such as, Bee-eaters, Indian blue robin, Common Mynas, Black drangos, Crows, Woodpecker birds etc.

The list of bird species recorded during the field survey and literature from the study area is given in Table 3.36 The list of reptilian species recorded during the field survey and literature from the study area are given in Table 3.38. The list of insect species recorded during field survey and literature from the study area are given in Table 3.37 and the List of Butterflies identified from the project site and their conservation status is given in Table No.3.39 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 67 species were identified from the project site. Based on habitat classification the majority of species were Insects 5, followed by birds 25, Reptiles 8, Mammals 6, amphibians 3, and Butterflies 20. A total of 25 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 insects, and three were observed during the extensive field visit *Sphaerotheca breviceps*, *Euphyctis hexadactylus*, *Bufo melanostictus*, there is no schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table 3.35 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 norvegicus</i>	Brown rat	LC
6.	<i>Lepus nigricollis</i>	Rabbit	LC

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

Table No. 3.36 Listed birds

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Bubulcus ibis</i>	Cattle Egret	LC
2.	<i>Passer domesticus</i>	House Sparrow	LC
3.	<i>Streptopeliachinensis</i>	Spotted Dove	LC
4.	<i>Accipiter badius</i>	Shikra	LC
5.	<i>Ardeola grayii</i>	Indian Pond Heron	LC
6.	<i>Coraciasbenghalensis</i>	Indian Roller	LC
7.	<i>Dinopiumjavanense</i>	Common Golden-backed Woodpecker	LC
8.	<i>M. maderaspatensis</i>	White-browed Wagtail	LC
9.	<i>Cinnyris asiaticus</i>	Purple Sunbird	LC
10.	<i>Acridotherestrictis</i>	Common Myna	LC
11.	<i>Wagtail Motacilla flava</i>	Western Yellow	-
12.	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	LC
13.	<i>Dicrurusmacrocerus</i>	Drongo	LC
14.	<i>Halcyon smyrnensi</i>	White-throated Kingfisher	LC
15.	<i>Hirundo rustica</i>	Barn Swallow	LC
16.	<i>Cecropis daurica</i>	Red-rumped Swallow	LC
17.	<i>Milvus migrans</i>	Black Kite	LC

18.	Corvus splendens	House Crow	LC
19.	Eudynamys	Koel	LC
20.	Clamator jacobinus	Pied Cuckoo	LC
21.	Psittacula krameni	Rose ringed parakeet	LC
22.	Merops philippinus	Blue-tailed Bee-eater	LC
23.	Athene brama	Spotted Owlet	LC
24.	Turdoides affinis	Yellow-billed Babbler	LC
25.	Alcedo atthis	Common Kingfisher	LC
26.	Columba livia	Rock pigeon	LC
27.	Pitta brachyura	Indian Pitta	LC
28.	Anastomus oscitans	Asian Openbill	LC
29.	Ceryle rudis	Pied Kingfisher	LC
30.	Pycnonotus cafer	Red vented Bulbul	LC
31.	Milvus migrans	Black kite	LC
32.	Merops orientalis	Small Bee-eater	LC
33.	Orthotomus sutorius	Common Tailorbird	LC

Not Evaluated (NE) Least Concern (LC) Near Threatened (NT) Endangered (E), Reference: Sathasivam, K., 2015. The birds of Madurai city. Indian BIRDS 10 (2): 29–34.

Sl. No	Scientific Name	Common Name	IUCN Conservation Status
1.	Apis cerana	Indian honey bee	-
2.	Hamitermes silvestri	Termite	LC
3.	Hieroglyphus sp	Grasshopper	LC
4.	Camponotus Vicinus	Ant	NL
5.	Ceratogomphus pictus	Dragonfly	-

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

Sl. No	Scientific Name	Common Name	IUCN Red List data
1.	Calotes versicolor	Oriental garden lizard	LC
2.	Hemidactylus flaviviridis	House lizards	NL
3.	Naja naja	Indian cobra	LC
4.	Vipera russeli	Russell's viper	NL
5.	Ahaetulla nasuta	Green vine snake	LC
6.	Ptyas mucosa	Rat snake	NL
7.	Bungarus caeruleus	Common krait	LC
8.	Mabuya carinatus	Common skink	LC

Table 3.38 List of Reptiles either spotted or reported from the study area

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

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 genutia</i>	Striped Tiger	LC
2.	<i>Danaus chrysippuschrysiippus</i>	Plain Tiger	LC
3.	<i>Acraea terpsicore</i>	Tawny Coster	LC
4.	<i>Papiliopolytespolytes</i>	Common Mormon	LC
5.	<i>Papiliopolytesromulus</i>	Common Mormon	LC
6.	<i>Papiliodemoleusdemoleus</i>	Lime Butterfly	LC
7.	<i>Hypolimnasmisippus</i>	DanaidEggfly	LC
8.	<i>Junoniahierta</i>	Yellow Pansy	LC
9.	<i>Junonialemonias</i>	Lemon Pansy	LC
10.	<i>Euchrysops pandava</i>	Plain cupid	LC
11.	<i>Phalantaphalanthia</i>	Common Leopard	LC
12.	<i>Junonia iphita iphita</i>	Chocolate pansy	LC
13.	<i>Terias hecabe</i>	Common grass yellow	LC
14.	<i>Junonia orythia</i>	Blue pansy	LC
15.	<i>Junonia lemonias</i>	Lime pansy	LC
16.	<i>Euploea core</i>	Common Crow	LC
17.	<i>Melanitisedaleda</i>	Common Evening Brown	LC
18.	<i>Jamidescelenoceleno</i>	Common Cerulean	LC
19.	<i>Everslacturnus</i>	Indian Cupid	LC
20.	<i>Pachlioptaaristolochiae</i>	Common Rose	LC

Reference: Butterflies of Madurai city Tamil Nadu- S.Baskaran and Solaiappan.

3.5.12 Aquatic Ecology

The study area has few seasonal small water bodies away from the proposed project site. But no major drainage system can be found within the study area. No Aquatic diversity is noticed in the core zone area. 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.

3.5.13. Objectives of Aquatic Studies

- Generating data through actual field collection in these locations over the study period.

3.5.14. Macrophytes

The macrophytes observed within the study area are tabulated in Table 3.40

Table No.3.40 Description of Macrophytes

Sl. No	Scientific name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Nymphaea nauchali</i>	Blue lotus	Alli	LC
	<i>Eichornia crassipe</i>	Water hyacinth	Agayatamarai	NA

2	Cyperus exaltatus	Tall Flat Sedge	Koraikizhangu	LC
3	Aponogeton natans	Floating laceplant	Kottikizhnagu	NA
4	Colocassia esculenta	Taro	Seppakizhangu	LC
5	Carex cruciata	Cross Grass	Koraipullu	NA
6	Cynodon dactylon	Scutch grass	Arugampul	LC
8	Nymphaea nouchali	Blue waterlily	Nellambal	LC

3.5.15 Aquatic Faunal Diversity

Amphibian species like the common Pond frog, and Skipper frog, Indian Pond Frog were sighted near the water bodies located in the study area.

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

Sl. No	Common Name	Zoological Name	WLPA, 1972	IUCN Red List data
1.	Indian Pond Frog	Euphlyctis hexadactylus	Schedule IV	LC
2.	Indian Toad	Bufo melanostictus	Schedule IV	LC
3.	Indian Skipper Frog	Euphlyctis cyanophlyctis	Schedule IV	LC

3.5.16. Other Aquatic Fauna

3.5.16.1. Fishes

The fish species were seen during the primary field investigation near the study's area. Table 3.44 lists fish species such as Rohu, Catla, Catfish, and others.

Table No. 3.42 Fish Species reported in the study area

S.No	Common name	Scientific name	Family
1.	Ponithia	Puntius sophore	Cyprinidae
	Rohu	Labeo rohita	Cyprinidae
2.	-	Cyprinus carpio	Cyprinidae
3.	Catla	Catla Catla	Cyprinidae
5.	Catfish	Siluriformes	-

3.5.17 Findings/Results

The assessment was carried out during the summer season. The inspection day was quite all right 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 was observed in the project area.

Migratory corridors and Flight paths

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

Breeding and spawning grounds

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

Kindly refer to the additional documents of Forest Range Officer, Madurai C/No 35/2023 dated, 02.03.2023. 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 are no endangered, endemic, and RET Species. There is no Schedule I species in the 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.

3.15.18 Conclusion

The observations and assessment of the overall ecological scenario involve details such as classification of 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 rough stone 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 assess the impact on socio-economic environment due to rough stone quarry project region.
- f) To analysis of impact of socio economic and Environmental Infrastructure facilities and road accessibility, etc.,

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 analysed.
- 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 analysed 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 Sökkampatti Village, Melur Taluk, Madurai 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 3.44 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 centres 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, Madurai, Cuddalore and Vellore. The alluvial plains of the Cauvery Delta extending over Thanjavur and part of Tiruchirappalli districts and dry southern plains in Madurai, Dindigul, Ramanathapuram, Sivaganga, Virudhunagar, 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 Tamil Nādu 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 – Madurai, Namakkal, 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
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3.10 Madurai District

Madurai district ranked 9th in terms of the highest population among the districts. Madurai District is situated in the South of Tamil Nadu state. It is bounded on the North by the districts of Dindigul, Thiruchirappalli and on the East by Sivagangai and on the West by Theni and South by Virudhunagar.

Geographical location: North Latitude: 9°30.00 and 10°30.00 East Latitude: 77°00.00 and 78°30.00

Madurai District consists of three Revenue Divisions viz., Madurai, Melur and Usilampatti Eleven Taluks viz., Madurai North, Madurai West, Thirupparankundram, Vadipatti, Melur, Madurai East, Madurai South, Usilampatti, Thirumangalam, Peraiyur and Kalligudi comprising of 665 Revenue Villages. The District has Thirteen blocks viz. Madurai East, Madurai West, Thirupparankundram, Melur, Kottampatti, Vadipatti, Alanganallur, Usilampatti, Chellampatti, T.Kallupatti, Sedapatti, Thirumangalam and Kallikudi comprising of 420 Village Panchayats. There are three Municipalities viz. Melur, Thirumangalam and Usilampatti Nine Town Panchayats viz. A.Vallalpatti, Alanganallur, Elumalai, Palamedu, Paravai, Peraiyur, Sholavandan, T.Kallupatti and Vadipatti and one Madurai Corporation.

Madurai is surrounded by several mountains. The Madurai city has 3 hills as its city boundary. Yanaimalai, Nagamalai, Pasumalai named after Elephant, Snake and Cow respectively. It is famous for Jasmine Flowers. Jasmine flowers are transported to other cities of India from Madurai.

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 Sockampatti Village, Melur Taluk, Madurai 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 3.45 Shows the socio-economic profile of the study area as compared to district, state and national level socio-economic profile

Particular	India	Tamil Nadu	Madurai District	Study Area (10km Radius)
Area (in sq. km.)	3,287,263	130058	3710	316
Population Density/ sq. Km.	368	554	819	376
No. of Households	249454252	13357027	794887	29516
Population	1210569573	72147030	3038252	118797
Male	623121843	36137975	1526475	59378
Female	587447730	36009055	1511777	59419
Scheduled Tribes	104281034	794697	11096	0
Scheduled Castes	201378086	14438445	408976	15499
Literacy Rate	72.99%	80%	75%	74%

Particular	India	Tamil Nadu	Madurai District	Study Area (10km Radius)
Sex Ratio (Females per 1000 Males)	943	996	990	1001

Source: Census of India, 2011

Table no 3.12.1 show demographic pattern of India, Tamil Nadu, Madurai District & Study area (10km Radius). In India had total area of 3.2 sqkm, State of Tamil Nadu area was 130058 sqkm, District of Madurai area was 3710 sqkm and study area is about 316 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 819 sqkm and study area density is about 376 sqkm. As per Census 2011, about 5.96percent of population in the state lives in areas. Madurai had comparing state wise 4.21 percent of population lives in the district. In study area has 4.36% around 10km radius. State, District and study area. In Tamil Nadu state SC categories people had about 19 %, district of Madurai about 13.46 % it has increasing to Study area about 13% increasing in the total population Similarly ST population is about 1.10%, 0.36% and 0% of the total population in the study area. State level Literacy rate is 80%, district level is 75% but study area has decreased about 74%. There is literacy rate is study area is decrease comparing district level is increased. Sex ratio female per thousand males about state level is 996, District level is 990 and study area is 1001.

The study area has population density 376persons per sq.km of total population about 118797 as per census 2011. There were about 50 percent male and 50% female population. Study area has literate rate is about 74%, District had about 75% of literate rate as per census 2011.

3.13 Population Projection of the Study Area

Madurai Population 2022 – 2023

The last census of Madurai was done in 2011 and next census of 2021 has been postponed or cancelled. But we can do projection of future Madurai 2023 Population on the basis likely Population Growth Rate.

Year	Projected Population (Estimation)
2001	2,578,201
2011	3,038,252
2021	3,490,000
2025	3,640,000
2031	3,740,000

Source: <https://www.census2011.co.in/census/district/45-madurai.html>

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.

A population projection gives a picture of what the future size and structure of the population by sex and age might look like. It is based on knowledge of the past trends, and, for the future, on assumptions made for three components: fertility, mortality and migration.

Table 3.46 Total Population of Study Area

Sl No.	Population in 2001	Population in 2011
1	104065	118797

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

Table 3.47 Population Projection of Study Area

S. No	Year	Projected Population (Approximately)
1.	2021	133529
2.	2031	148261
3.	2041	162993
4.	2051	177725

Source: Calculated by Excel Sheet-Forecast Method.

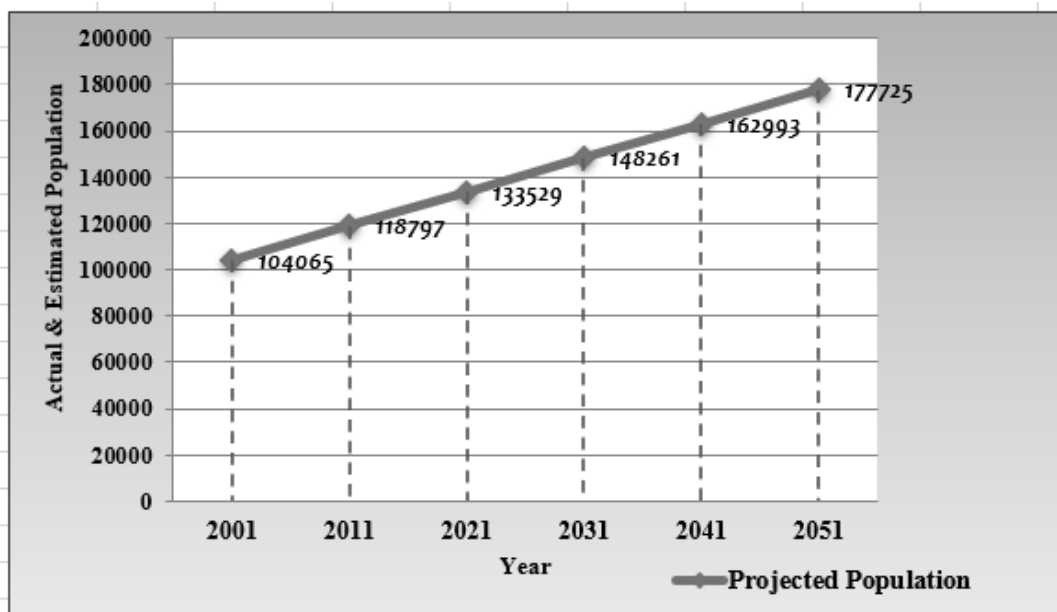


Fig 3.22 Graph Showing Population Projection

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 3.48 Population Growth rate in Study area

Year	Actual Population	Growth Rate %
2001	104065	-
2011	118797	11.42
2021	133529	11.24
2031	148261	11.10
2041	162993	10.99
2051	177725	10.90

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 104065 and 2011 it was 118797 if the population growth rate is 11.42%, it will approximately gradually an increase about 133529 in year 2021 and 177725 in the year of 2051. It has approximately population growth rate decline will be 10.90%.

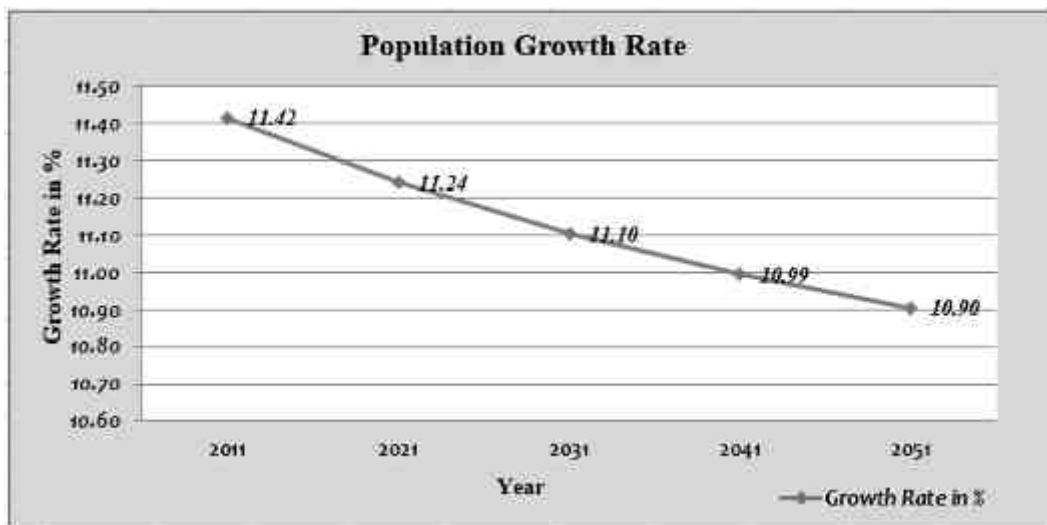


Fig.3.23 Graph Showing Population Growth Rate

Planning Analysis:

Calculating Growth Rates

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

Where:

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

PR=Percent Rate

V_{Present} =Present or Future Value

V_{Past} = Past or Present Value

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 118797 (for 10 km radius buffer zone). Total no. of household is 4006, 7652 and 17858 respectively, in primary, secondary and tertiary zone. Sex ratio is 1022,1016 and 990 (females per 1000 males) observed in primary, secondary and tertiary zone respectively. SC population distribution is 2470, 3258 and 9771 respectively in primary, secondary and tertiary zone. ST population distribution is very less 1,0 and 1 respectively in primary, secondary and tertiary. Average household size is 4. Zone wise Demographic profile of study area is given in the table 3.15.1 below:

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

Table 3.49 Zone wise Demographic Profile of Study Area

Zone	No. of Villages	Total Household	Total Population	Male Population	%	Female Population	%
Primary Zone (0 - 3 Km)	5	4006	15393	7613	49.46	7780	50.54
Secondary Zone (3 - 7 Km)	11	7652	30854	15307	49.61	15547	50.39
Tertiary Zone (7 - 10 km)	15	17858	72550	36458	50.25	36092	49.75
Study Area (0-10 km)	31	29516	118797	59378	49.98	59419	50.02

Source: Census of India, 2011

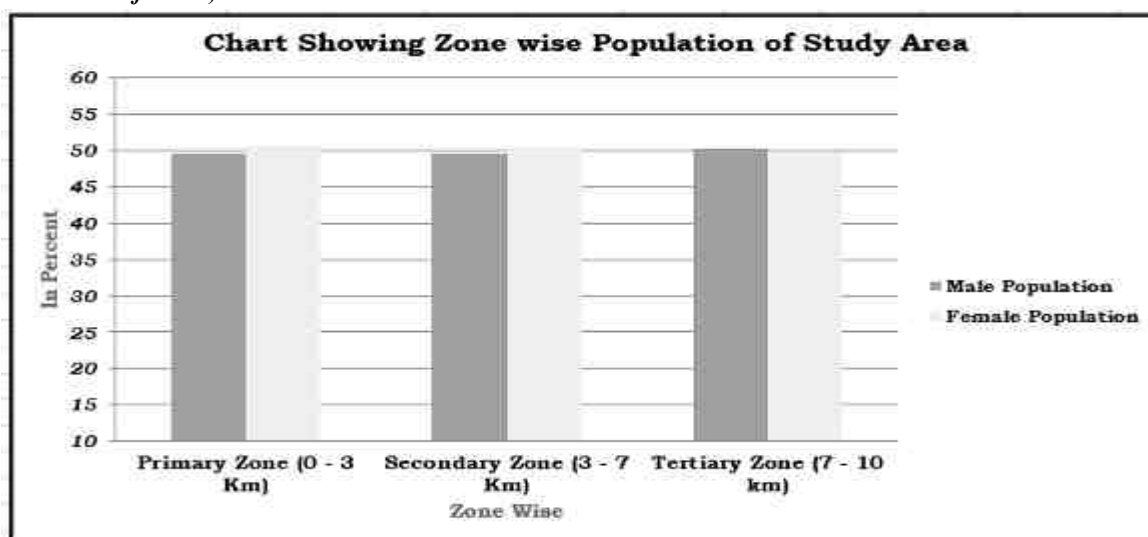


Figure 3.24 Population of study area

- ✓ 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 5villages where as much as 4,006 households with 15,393 population are located. Mostly lying on Built-up land for their livelihood and substance.
- ✓ Secondary and tertiary zone both comprise of 11 and 15 villages having a total population of 30,854 and 72,550 respectively.

Table 3.50 Village wise Demographic Profile of the Study Area 10km Radius (Core and Buffer Zone)

Sno	Name	TRU	No Household	Total Population	Male Population	Female Population	Person 0-6 yrs	Male 0-6 yrs	Female 0-6 yrs	SC Persons	ST Person	Literate Person	Male Literate	Female Literate	Total Workers	Main Workers	Marginal workers	Non Workers
0-3km																		
1	Kottampatti	Rural	1375	5406	2716	2690	531	275	256	1164	1	3959	2229	1730	2339	1964	375	3067
2	Valaichcherippatti	Rural	354	1408	685	723	130	71	59	249	0	1019	551	468	571	461	110	837
3	Chokkampatti	Rural	743	2789	1325	1464	292	146	146	286	0	1684	940	744	1610	1383	227	1179
4	Manappachcheri	Rural	1438	5441	2716	2725	578	311	267	611	0	3557	2073	1484	2743	1852	891	2698
5	Tarkakudi	Rural	96	349	171	178	33	15	18	160	0	244	135	109	134	134	0	215
		Total	4006	15393	7613	7780	1564	818	746	2470	1	10463	5928	4535	7397	5794	1603	7996
3-7km																		
1	Surappatti	Rural	397	1769	856	913	240	116	124	200	0	1131	638	493	868	743	125	901
2	Pottapatti	Rural	862	3382	1640	1742	341	178	163	415	0	2166	1242	924	2067	1855	212	1315
3	Tondilingapuram	Rural	445	1874	936	938	208	104	104	177	0	1152	693	459	1048	812	236	826
4	Pallapatti	Rural	912	3803	1882	1921	482	242	240	438	0	2309	1310	999	2024	1830	194	1779
5	Silambakkonepatti	Rural	129	560	286	274	61	32	29	0	0	282	166	116	321	269	52	239
6	Pandangudi	Rural	255	948	459	489	105	52	53	240	0	678	381	297	490	241	249	458
7	Chokkalingapuram	Rural	1934	7887	3963	3924	909	459	450	744	0	5391	3090	2301	3630	2872	758	4257
8	Ayanpandangudi	Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Ayyapatti	Rural	1230	4934	2470	2464	579	294	285	356	0	2965	1781	1184	2652	2599	53	2282
10	Kunnarampatti	Rural	803	3163	1575	1588	356	182	174	558	0	1961	1136	825	1709	850	859	1454
11	Malampatti	Rural	685	2534	1240	1294	276	159	117	130	0	1533	840	693	1520	1343	177	1014
		Total	7652	30854	15307	15547	3557	1818	1739	3258	0	19568	11277	8291	16329	12071	2915	14525
7-10km																		
1	Sekkipatti	Rural	1157	4436	2248	2188	461	248	213	1007	0	2626	1567	1059	2212	1543	669	2224
2	Kambur	Rural	1985	7925	3998	3927	975	512	463	652	0	4442	2663	1779	4459	3453	1006	3466
3	Tiruchchunai	Rural	456	1837	946	891	209	105	104	127	0	1147	687	460	1082	729	353	755
4	Karungalakudi	Rural	1708	6842	3475	3367	738	407	331	995	0	4748	2614	2134	2957	2848	109	3885
5	Sukkampatti	Rural	301	1107	557	550	105	48	57	36	0	701	396	305	675	585	90	432
6	Vanjinagaram	Rural	1216	4824	2422	2402	541	295	246	665	0	3063	1754	1309	2234	1531	703	2590
7	Kodukkampatti	Rural	829	3317	1710	1607	377	190	187	453	0	1932	1200	732	1971	1740	231	1346
8	Ayuthapatti	Rural	123	504	245	259	54	29	25	10	0	322	181	141	242	242	0	262
9	Thethur	Rural	578	2476	1247	1229	305	160	145	581	0	1508	908	600	1282	1150	132	1194
10	Piranpatti	Rural	1176	5334	2713	2621	688	336	352	200	0	3277	1903	1374	2535	1927	608	2799
11	Melavannariruppu	Rural	413	1829	938	891	172	86	86	0	0	1228	726	502	1339	298	1041	490
12	Piranmalai	Rural	966	4145	2087	2058	353	181	172	1102	0	2785	1599	1186	1997	1941	56	2148
13	Kirungakottai	Rural	910	3633	1782	1851	397	204	193	521	0	2431	1347	1084	1738	1473	265	1895
14	Singampunari North	Rural	1598	6198	3049	3149	672	357	315	1073	1	3876	2129	1747	2990	2692	298	3208
15	Singampuneri (TP)	Urban	4442	18143	9041	9102	1899	1013	886	2349	0	13815	7293	6522	7244	6539	705	10899
		Total	17858	72550	36458	36092	7946	4171	3775	9771	1	47901	26967	20934	34957	28691	6266	37593
		G.Total	29516	118797	59378	59419	13067	6807	6260	15499	2	77932	44172	33760	58683	46556	10784	60114

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

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 1001 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 31 villages lying in study area (buffer zone) as primary, secondary and tertiary zone.

Table 3.51 Sex ratio of the study area

S. No.	Buffer Zone	Sex Ratio of Study area Female/ 1000 Male
1	Primary Zone (0-3 km)	1022
2	Secondary zone (3-7 km)	1016
3	Tertiary Zone (7-10 km)	990

Source: Census of India, 2011

Figure 3.25 Sex Ratio within 10 Km study area

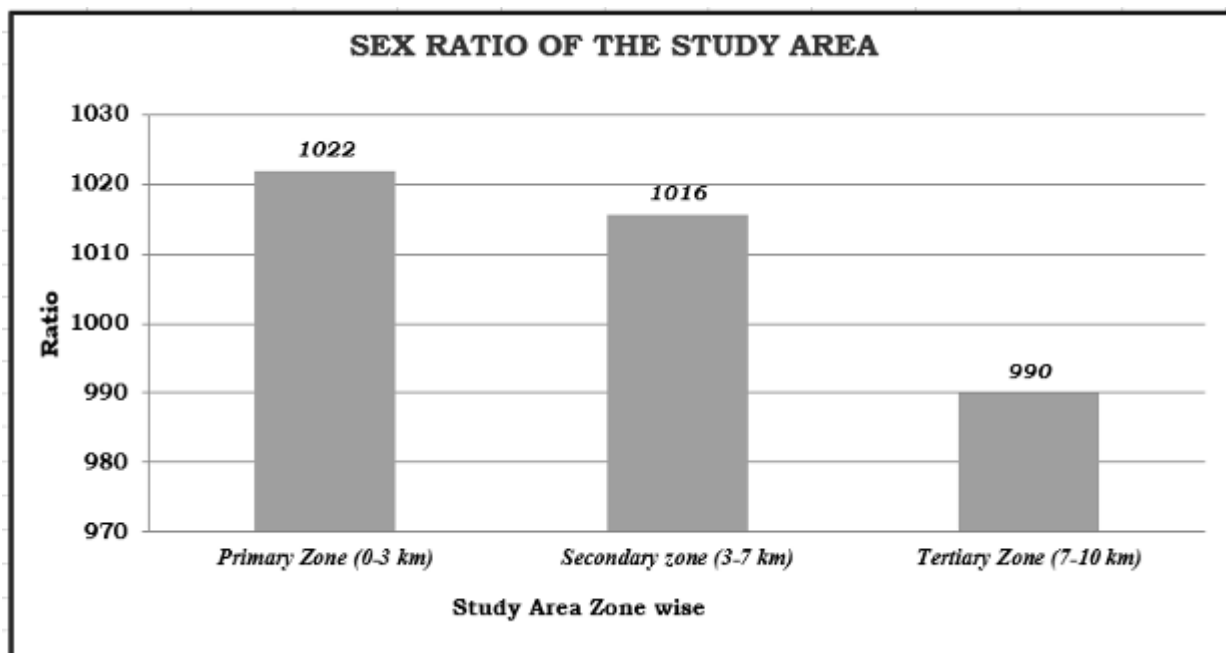
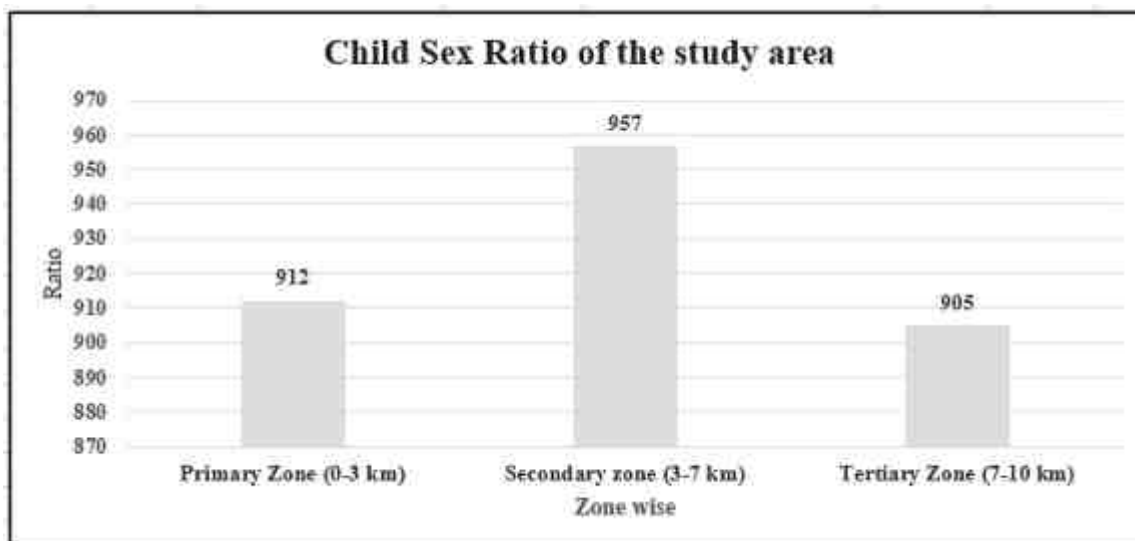


Table 3.51.1-b Child Sex ratio of the study area

S. No.	Buffer Zone	Sex Ratio of Study area Female/ 1000 Male
1	Primary Zone (0-3 km)	912
2	Secondary zone (3-7 km)	957
3	Tertiary Zone (7-10 km)	905

**Figure 3.26 Child 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 73.71% as per census data 2011. The male literacy rate in the study area indicates 84% whereas the female literacy rate, which is an important indicator for social change, is observed to be 63.5% as per the census data 2011. This needs to focus on the study area and enhance further development focusing on education. (Table no 3.17.1).

Table 3.52 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)	5	5928	87.24	4535	64.47	10463	75.66
Secondary Zone (3 - 7 Km)	11	11277	83.60	8291	60.04	19568	71.69
Tertiary Zone (7 - 10 Km)	15	26967	83.52	20934	64.78	47901	74.15
Study Area (0-10km)	31	44172	84.02	33760	63.51	77932	73.71

Source: Census of India, 2011

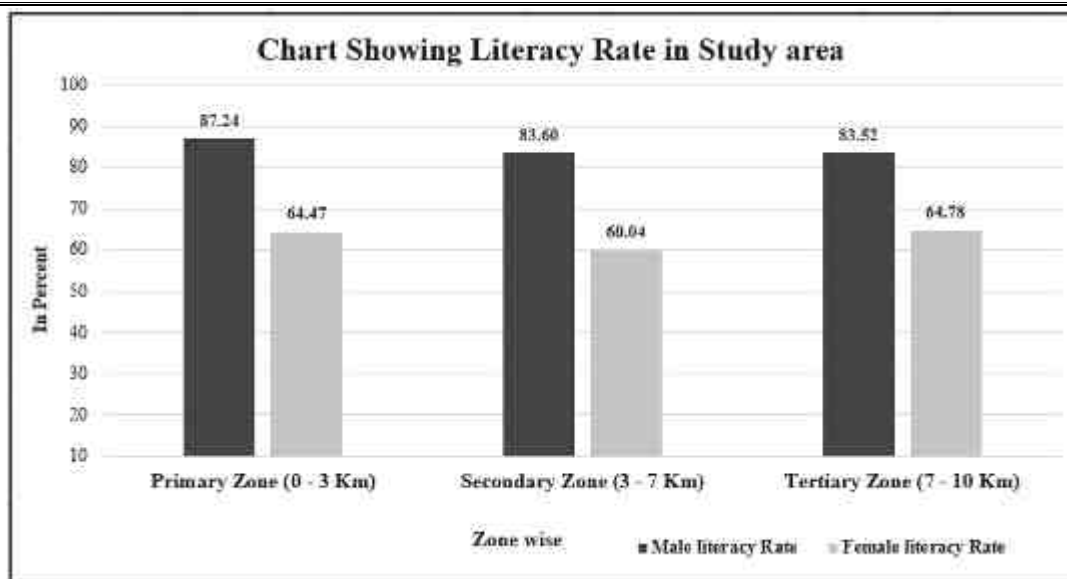


Figure 3.27 Gender wise Literacy Rate in the study area

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 4 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 13.05% and Schedule Tribe population 0.03%, Other Population is 86.95% in total study area.

Table 3.53 vulnerable groups of the study area

Zone	No. of Villages	Vulnerable Groups					
		SC Population	%	ST Population	%	Other Population	%
Primary Zone (0 - 3 Km)	5	2470	16.05	1	0.01	12922	83.95
Secondary Zone (3 - 7 Km)	11	3258	10.56	0	0.00	27596	89.44
Tertiary Zone (7 - 10 Km)	15	9771	13.47	1	0.00	62778	86.53
Total area (10km)	31	15499	13.05	2	0.00	103296	86.95

Source: Census of India, 2011

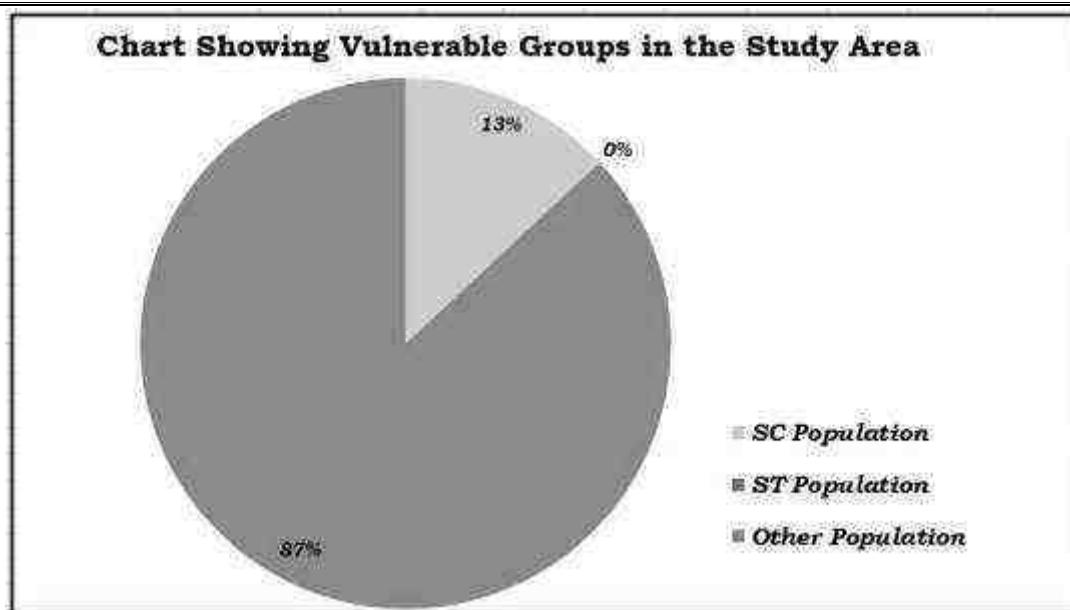


Figure 3.28 vulnerable groups

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 3.54 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)	5	7397	48.05	5794	37.64	1603	10.41	7996	51.95
Secondary Zone (3 - 7 Km)	11	16329	52.92	12071	39.12	2915	9.45	14525	47.08
Tertiary Zone (7 - 10 Km)	15	34957	48.18	28691	39.55	6266	8.64	37593	51.82
Study Area (10 Km)	31	58683	49.40	46556	39.19	10784	9.08	60114	50.60

Source: Census of India, 2011

The above table shows that out of the total working population, the percentage of main workers is 39.19% while 9.08% are marginal workers. Number of working populations is 49.40% and non-working population is 50.60% 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 enrol and earn sustain livelihood.



Figure 3.29 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 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, Madurai District (42km-SW) from site which by local transport.
- **Availability of** Government school, Kunnarampatti Village (4km-SE), Government school, Lekkadipatti Village (5.0km-NE), Kuruvarapatti Government school, (6.0km-NE), Government School, Soorapatti (9km-NE), Government Higher secondary school, Budagudi (5.0km-W) many Pre-primary school, Elementary school, and Training institute found in study area.
- **Health facilities** Government Hospital, Kottampatti (2.4km-E), GH Hospital, Singampunari (TP) (9km-SE), Government PHC, Karungalakudi Village (8km-S), GPHC, Piranmalai (9.0km-E), Buffer zone area like Government Hospital, other clinics at Melur Taluk, Madurai district. Other private clinics and Pharmacy available in the study area.

Table 3.55 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)	Private Senior Secondary School (Numbers)	Govt Arts and Science Degree College (Numbers)	Private Arts and Science Degree College (Numbers)
0-3km											
1	Kottampatti	0	0	2	0	1	0	1	0	0	0
2	Valaichcherippatti	0	0	0	1	0	0	0	0	0	0
3	Chokkampatti	5	1	2	0	0	0	0	0	0	0
4	Manappachcheri	0	0	0	0	0	0	0	0	0	0
5	Tarkakudi	1	0	1	0	0	0	0	0	0	0
	Total	6	1	5	1	1	0	1	0	0	0
3-7km											
1	Surappatti	7	1	2	1	1	1	1	0	0	0
2	Pottapatti	1	0	0	0	0	0	0	0	0	0
3	Tondilingapuram	0	0	0	0	0	0	0	0	0	0
4	Pallapatti	1	0	1	0	0	0	0	0	0	0
5	Silambakkonepatti	1	0	0	0	0	0	0	0	0	0
6	Pandangudi	1	0	1	0	0	0	0	0	0	0
7	Chokkalingapuram	2	1	0	0	0	0	0	0	0	0
8	Ayanpandangudi	1	0	0	0	0	0	0	0	0	0
9	Ayyapatti	0	0	0	0	0	0	0	0	0	0
10	Kunnarampatti	0	0	0	0	0	0	0	0	0	0
11	Malampatti	1	0	1	0	0	1	0	0	0	0
	Total	15	2	3	1	1	2	1	0	0	0
7-10km											
1	Sekkipatti	1	0	0	0	0	0	0	0	0	1
2	Kambur	1	0	0	0	0	0	0	0	0	0
3	Tiruchchunai	1	0	1	0	0	0	0	0	0	0
4	Karungalakudi	2	0	0	0	0	0	0	0	0	0
5	Sukkampatti	2	0	1	0	1	0	1	0	0	0

6	Vanjinagaram	0	0	0	0	0	0	0	0	0	0
7	Kodukkampatti	1	0	0	0	0	0	0	0	0	0
8	Ayuthapatti	3	1	2	0	2	0	2	0	0	0
9	Thethur	1	1	0	1	0	1	0	1	0	0
10	Piranpatti	0	0	0	0	0	0	0	0	0	0
11	Melavannariruppu	1	0	1	0	1	0	0	0	0	0
12	Piranmalai	2	0	0	0	0	0	0	0	0	0
13	Kirungakottai	4	0	3	0	0	0	0	0	0	0
14	Singampunari North	3	0	1	0	1	0	0	0	0	0
15	Singampuneri (TP)	1	0	0	0	0	0	0	0	0	0
	Total	23	2	9	1	5	1	3	1	0	1

Source: DCHB Census 2011, Tamil Nadu

Table 3.56 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 Others (Numbers)
0-3km										
1	Kottampatti	0	1	1	0	0	0	0	0	0
2	Valaichcherippatti	0	0	0	0	0	0	0	0	0
3	Chokkampatti	0	0	1	0	0	0	1	0	1
4	Manappachcheri	0	0	0	0	0	0	0	0	0
5	Tarkakudi	0	0	0	0	0	0	0	0	0
	Total	0	1	2	0	0	0	1	0	1
3-7km										
1	Surappatti	0	1	1	1	0	1	1	1	2
2	Pottapatti	0	0	0	0	0	0	0	0	0
3	Tondilingapuram	0	0	0	0	0	0	0	0	0
4	Pallapatti	0	0	1	0	0	0	1	0	0
5	Silambakkonepatti	0	0	0	0	0	0	0	0	0

6	Pandangudi	0	0	0	0	0	0	0	0	0
7	Chokkalingapuram	0	0	1	0	0	0	0	0	0
8	Ayanpandangudi	0	0	0	0	0	0	0	0	0
9	Ayyapatti	0	0	0	0	0	0	0	0	0
10	Kunnarampatti	0	0	0	0	0	0	0	0	2
11	Malampatti	0	1	1	1	0	1	1	1	0
	Total	1	2	4	2	1	2	3	2	4
7-10km										
1	Sekkipatti	0	1	0	0	0	0	0	0	0
2	Kambur	0	0	0	0	0	0	0	0	0
3	Tiruchchunai	0	0	0	0	0	0	0	0	0
4	Karungalakudi	0	1	1	0	0	0	0	0	0
5	Sukkampatti	1	0	1	0	0	0	1	0	0
6	Vanjinagaram	0	0	0	0	0	0	0	0	0
7	Kodukkampatti	0	0	0	0	0	0	0	0	0
8	Ayuthapatti	0	0	1	0	0	0	0	0	1
9	Thethur	0	0	0	0	0	0	0	0	0
10	Piranpatti	0	0	0	0	0	0	0	0	0
11	Melavannariruppu	0	0	1	0	0	0	0	0	0
12	Piranmalai	1	1	0	0	0	0	0	0	0
13	Kirungakottai	1	0	1	0	0	0	0	0	0
14	Singampunari North	0	0	0	0	0	0	1	0	0
15	Singampuneri (TP)	1	1	0	1	1	0	0	1	35
	Total	4	4	5	1	1	1	2	1	36

Source: DCHB Census 2011, Tamil Nadu

Table 3.57 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))	Others (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	Kottampatti	1	1	2	1	1	1	2	2	2	1	1	1	2
2	Valaichcherippatti	1	2	2	2	2	1	2	2	2	2	1	1	2
3	Chokkampatti	1	1	1	2	1	1	1	2	2	2	1	1	2
4	Manappachcheri	1	2	1	2	2	2	2	2	2	2	2	1	2
5	Tarkakudi	1	1	1	2	1	1	2	2	2	2	1	1	2
3-7km														
1	Surappatti	1	1	2	2	1	1	2	2	2	1	1	1	2
2	Pottapatti	1	1	2	2	2	1	2	2	2	2	1	1	2
3	Tondilingapuram	1	1	2	2	2	2	2	2	2	2	2	2	1
4	Pallapatti	1	2	2	2	1	1	2	2	2	2	1	1	2
5	Silambakkonepatti	2	1	1	1	2	1	2	2	2	2	1	1	2
6	Pandangudi	1	2	2	2	1	1	2	2	2	2	1	1	2
7	Chokkalingapuram	1	1	2	1	1	1	2	2	2	1	1	1	2
8	Ayanpandangudi	1	1	2	2	2	2	2	2	2	2	1	1	2
9	Ayyapatti	1	1	2	2	2	2	2	2	2	2	1	2	2
10	Kunnarampatti	1	1	2	2	2	1	2	2	2	2	2	1	2
11	Malampatti	1	1	2	2	1	1	2	1	2	2	1	1	2
7-10km														
1	Sekkipatti	1	1	1	1	2	1	2	2	1	1	1	1	2
2	Kambur	1	1	1	2	1	1	2	2	2	2	1	1	2

3	Tiruchchunai	1	1	2	2	2	1	2	2	2	2	1	1	2
4	Karungalakudi	1	1	2	1	2	1	1	2	2	2	1	1	2
5	Sukkampatti	1	1	2	1	1	2	1	1	1	2	1	1	2
6	Vanjinagaram	1	1	2	1	2	1	2	2	2	2	1	1	2
7	Kodukkampatti	1	1	1	2	2	1	2	2	2	2	1	1	2
8	Ayuthapatti	1	1	2	2	2	1	2	2	2	1	1	1	2
9	Thethur	1	1	1	2	1	1	1	2	2	1	1	1	2
10	Piranpatti	1	2	2	2	1	2	2	2	2	2	2	1	2
11	Melavannariruppu	1	1	2	1	2	1	2	2	2	2	1	1	2
12	Piranmalai	1	1	1	1	2	2	2	2	2	2	1	1	2
13	Kirungakottai	1	1	1	1	1	2	2	2	2	1	1	1	2
14	Singampunari North	1	2	1	2	2	2	2	2	2	2	1	1	2
15	Singampuneri (TP)	1	1	2	2	2	2	2	2	2	2	1	1	2

Source: DCHB Census 2011, Tamil Nadu

Index: A(1) means Available, NA(2) means Not Available in the village

3.58 Transport and Other Infrastructure Facilities in the Surveyed Area

Sn o	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))	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))	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	Kottampatti	1	1	2	2	1	1	2	1	2	2	2	2	2	1	2	1	1
2	Valaichcherippatti	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
3	Chokkampatti	1	1	2	1	1	2	2	1	2	2	2	2	2	2	2	2	2
4	Manappachcheri	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	Tarkakudi	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3-7km																		
1	Surappatti	1	1	2	1	2	2	2	1	2	1	2	2	2	2	2	1	1
2	Pottapatti	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
3	Tondilingapuram	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2
4	Pallapatti	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2
5	Silambakkonepatti	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
6	Pandangudi	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
7	Chokkalingapuram	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Ayanpandangudi	2	2	2	2	1	1	2	2	2	1	2	2	2	2	2	1	1
9	Ayyapatti	1	2	2	2	1	1	2	2	2	1	2	2	2	2	2	2	2
10	Kunnarampatti	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1
11	Malampatti	1	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	2
7-10km																		
1	Sekkipatti	2	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2
2	Kambur	2	2	2	2	1	2	2	1	2	2	2	2	2	2	2	2	1
3	Tiruchchunai	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
4	Karungalakudi	1	2	2	1	2	2	2	1	2	1	2	2	2	2	2	1	1
5	Sukkampatti	2	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2
6	Vanjinagaram	2	1	2	2	1	2	2	1	1	1	2	2	2	1	2	1	1
7	Kodukkampatti	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Ayuthapatti	2	1	2	2	2	2	2	1	1	1	2	2	2	1	1	1	1
9	Thethur	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Piranpatti	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
11	Melavannariruppu	2	1	2	2	1	2	2	1	2	1	2	2	2	2	2	2	2
12	Piranmalai	2	1	2	1	1	1	2	2	2	1	2	2	2	2	2	1	2
13	Kirungakottai	2	1	2	2	1	1	2	1	1	1	2	2	2	2	2	2	1
14	Singampunari North	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Singampuneri (TP)	1	2	2	1	2	2	2	1	1	1	2	2	2	1	2	2	2

Index: A(1) means Available, NA(2) means Not Available in the village

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.
8. Avoid Road damage during carriage by mine vehicles (tipper Lorry).
9. Use sprinkler water when loading mine materials, to avoid water pollution during dust emission.

3.23 Interpretation

Based on the data, following inferences could be drawn:

- Total literacy rate in the study area is 74%.
- 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% and Scheduled Caste forms 13% of the total population of study area.
- The Other Population forms 87% of the total population of study area.
- The study area is well connected by NH/SH/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 centre 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** –Transport connectivity to easiness accessibility to the region.

3.25 Conclusion

To evaluate the impacts of proposed rough stone 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 **Sokkampatti rough stone Cluster quarry** will adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas.

Socio Economic/ demographic status of the study area reveals that area further require improvement in the Economy and Infrastructure Development of the area. Hence it can be concluded that the present baseline environment status of the study area will not be affected by the proposed project.

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.

CHAPTER – 4: ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 *General*

The environmental impact can be categorized as either primary or secondary, primary impacts which are attributed directly by the project; secondary impacts are those which are indirectly induced. The open cast mining operations involve development of benches, Approach Road, Haul Road, Excavation and handling of material. If adequate control measures are not taken to prevent/mitigate the adverse environmental impacts/lead to damage of the eco-system.

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 for sustainable resource extraction. Based on the baseline environmental status at the existing mine site, the environmental factors that are likely to be affected (Impacts) are identified, quantified and assessed. The various anticipated impacts will be on

- Land environment
- Water Environment
- Air Environment
- Noise Environment
- Socio economic environment
- Solid waste
- Soil environment

In general, the main findings regarding the potential impacts of climate change are Land Use Type, Energy Use, Water use & Dust emission and Biodiversity & rehabilitation.

Whereas, this mining activity is restricted to a small-scale mining and the proposal falls in “B1” Category, the surrounding environment is already subjected to mining activities and based on the past weather data its inferred that there is no much of change in the climate data of the region and the district profile has no records or past history of climate change leading to Droughts and floods.

- The mine pit shall act as a rain water harvesting structure and formation of garland drains along the mine lease boundary to divert the surface runoff and collecting the runoff water for greenbelt development and dust suppression activities shall prove beneficial.
- The greenbelt development plan, all along the mine lease boundary, along with the budget allocation for the proposed mitigation measures shall prove beneficial to surrounding environment.
- Therefore, the implementation of proposed mitigation measures for winning of mineral may not have much of impact on the surrounding Climate Change

4.1 *Land Environment*

4.1.2 Anticipated Impact from all Proposed Projects

- 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
- Impact due to heritage site, Archaeological sites

4.1.2.1 Mitigation Measures for Proposed Projects

- 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 drain 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., 7.5m, 10m and 50 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.
- There are no Archaeological sites, heritage site in the vicinity of the project area, the topography will be changed due to excavation of Rough stone quarry.

4.1.3 Soil Environment

4.1.4 Impact on Soil Environment

The top layer of the project site in the form of Topsoil formation, the Topsoil will be directly loaded into tippers for the filling and levelling of low-lying areas. There is no disposal of Topsoil. The excavated rough stone will be directly loaded into dumpers to the needy customers.

There will be no disposal of waste water from the quarry operation, No discharge of toxic effluent from the proposed projects. The dust emission at working face and haul roads will be controlled by water sprinkling and plantation.

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).

4.1.5 Mitigation Measures

- 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

4.1.6 Waste Dump Management

There are no wastages anticipated in this rough stone quarrying operation. The entire quarried out materials will be utilized (100%). The overburden in the form of Topsoil formation the gravel will be also sold to needy customers for the filling and levelling of low-lying areas.

4.2 Water Environment

4.2.1 Anticipated Impact on Surface and ground water

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The quarrying activity will not intersect ground water table as the maximum depth of the quarry is 41m and water table is found at a depth of 70-65m BGL.

The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the project area. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project area.

TABLE 4.1: WATER REQUIREMENTS

Purpose	Quantity	Source
Domestic & Drinking purpose	1.0KLD	From Existing, bore wells and drinking water will be sourced from Approved Water vendors.
Dust Suppression	1.5KLD	From nearby tank
Green Belt	1.0KLD	From nearby tank
Total	3.5 KLD	

Source: Approved Mining Plan Pre-Feasibility Report

Total water requirement in the proposed project is about 3.5 KLD, the water for dust suppression and greenbelt development will be sourced from the mine pit water collected during rainy seasons, the water for domestic purpose and drinking will be sourced from the approved water vendors.

4.2.2 Mitigation measures:

- Garland drain, settling tank will be constructed along the 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 judicially utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- 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 months 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 months once) and analysing the quality of water in open well, bore wells and surface water.

Possibilities of water contamination and impact on an aquatic ecosystem health

- Anticipated impact from this proposed mining activity is surface runoff from cleared surfaces, or discharges from the quarry pit or floor, is likely to have elevated levels of sediment (both suspended and dissolved). The quality of the water discharged from the site can have impacts on downstream ecological communities and water users.
- Therefore, Run-off diversion is proposed – 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 with only clear water after the garland drains are eroded through settlement traps.
- And, the depth of the mining is maximum 41m bgl and the ground water level in the surrounding areas is about 70-65 m bgl and there are no possibilities of encountering any ground water aquifers system and hence no ground water table intersection is anticipated.
- After the completion of quarry operation, the quarried out open pit mine may utilized for pici-culture or temporary reservoir pit for use of water for domestic purpose during dry seasons.
- Therefore, its inferred that the implementation of proposed mitigation measures for winning of mineral may not have much of impact on the possibilities of water contamination and impact on an aquatic ecosystem health

4.3 Air Environment

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Rough Stone waste.

4.3.1. Anticipated

Impact

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

4.3.1.1. Modelling of Incremental Concentration from all Proposed Projects

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.

4.3.1.2 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 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 4.2.

TABLE 4.2: ESTIMATED EMISSION RATE FOR PROPOSED PROJECT

	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.085412519	g/s
	Blasting	Point Source	0.001099568	g/s
	Mineral Loading	Point Source	0.041776474	g/s
	Haul Road	Line Source	0.002490628	g/s/m
	Overall Mine	Area Source	0.052099679	g/s
Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.000589339	g/s
Estimated Emission Rate for NO _x	Overall Mine	Area Source	0.000026979	g/s

4.3.2 Frame work of Computation & Model details

The prediction included the impact of Excavation, Drilling, Blasting, 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

Air Pollution Dispersion Modelling.

Baseline Air Quality –

Baseline air quality has been measured at 1 location in the cluster and 6 locations within the buffer zone of the study area. The 24 - hourly average samples of particulate matters (PM₁₀ and PM_{2.5}), SO₂ and NO_x were measured following the National Ambient Air Quality Standards (NAAQS), 2009. Monitoring data of 7 sampling stations are given below –

Meteorological Data –

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 and monitored continually for study period without break. The station was installed at a height of 4m 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. A weather data was collected from IMD, Madurai agro for the month of March 2023 – May 2023 to correlate with site data and found not much of change in the parameters.

FIGURE 4.1: AERMOD TERRAIN MAP

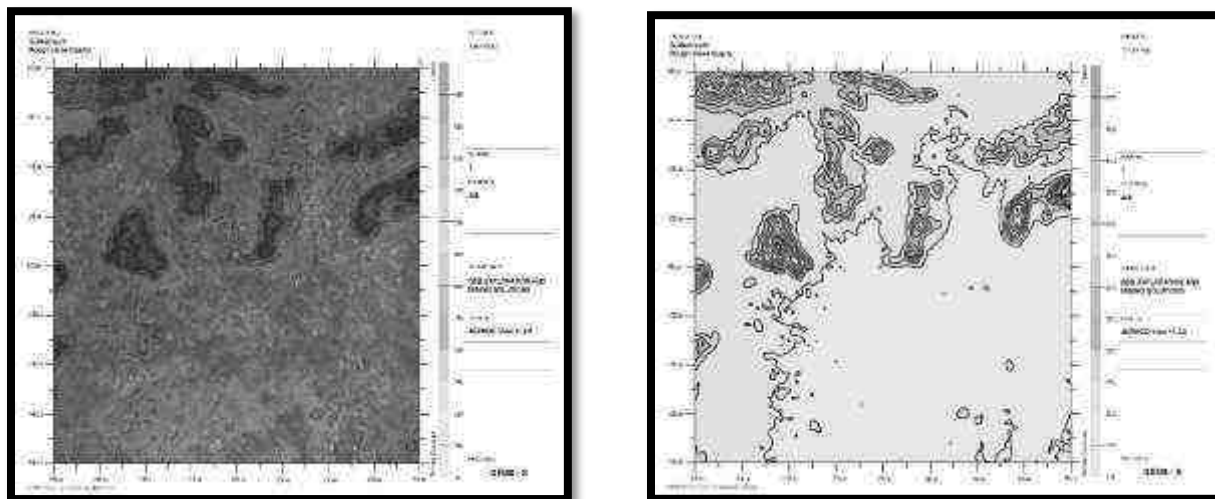


FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM₁₀

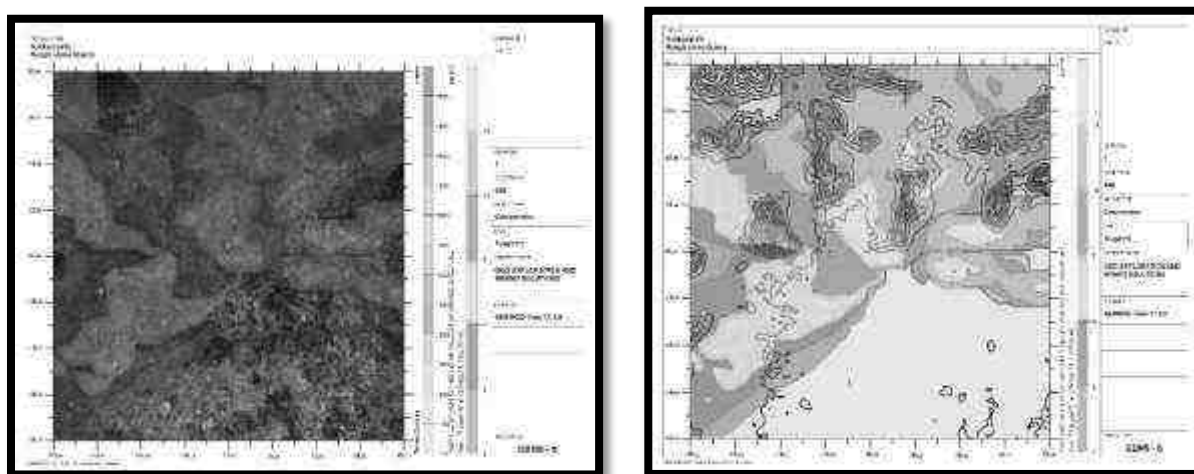


FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM_{2.5}

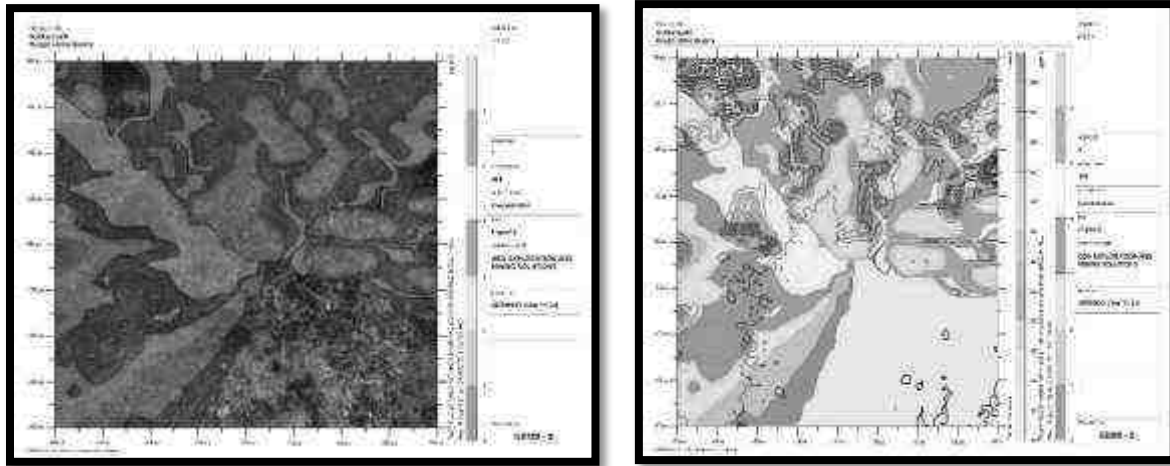


FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF SO₂

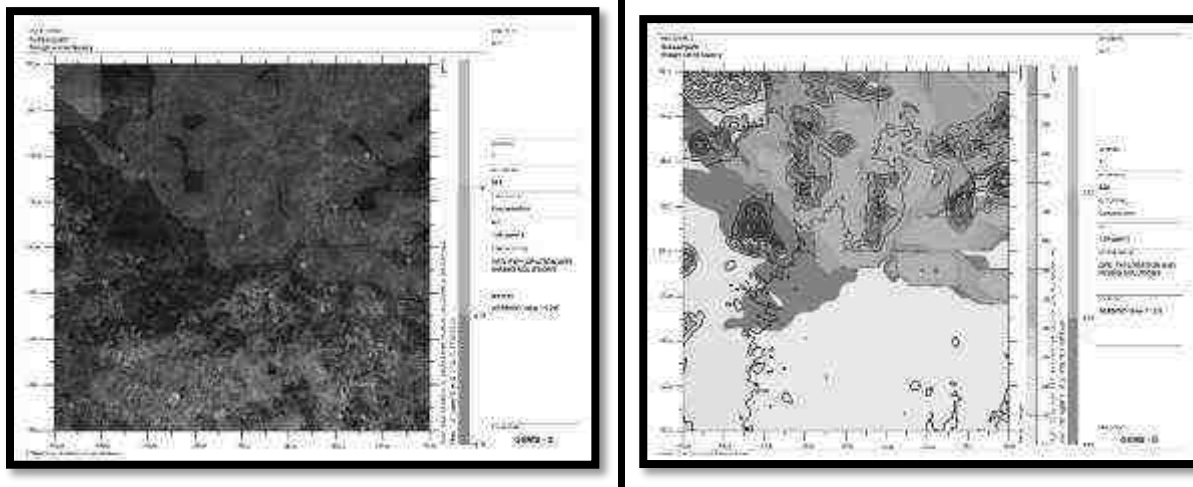


FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF NO_x

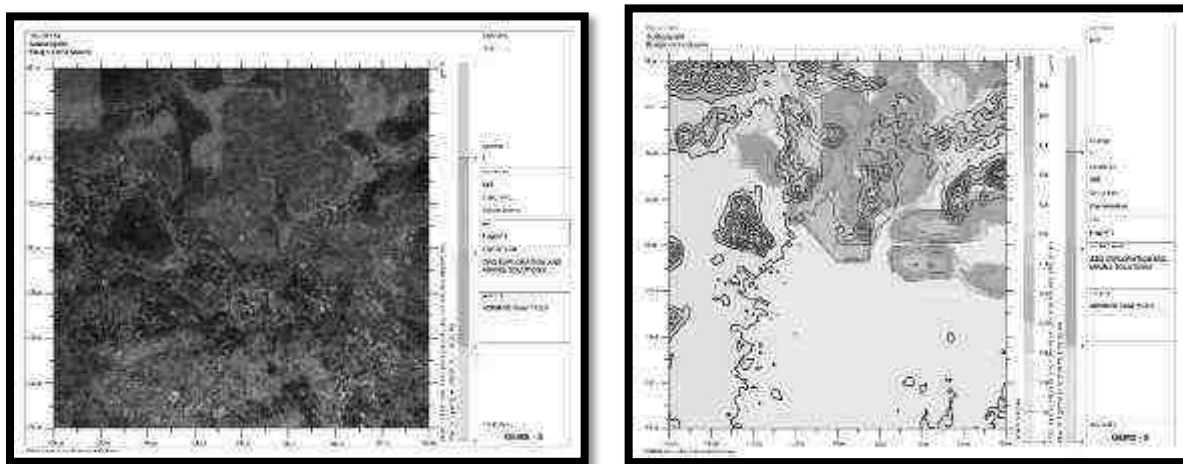
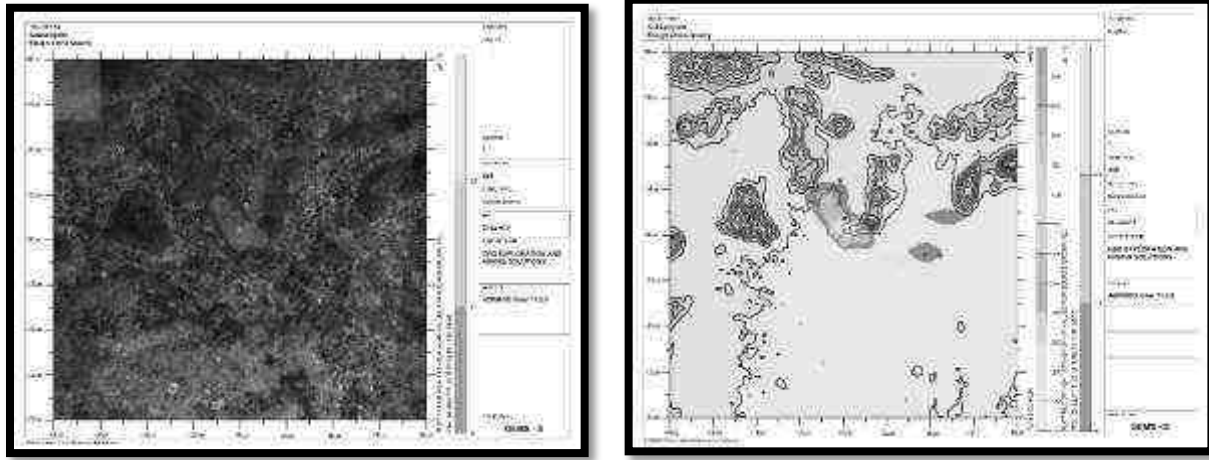


FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST



4.3.2.1 Model Results

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

TABLE 4.3: 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)
AAQ1	10°13'51.32"N 78°21'15.47"E	-7	114	42.8	13.80	56.6
AAQ2	10°14'25.52"N 78°21'24.55"E	274	1174	43.0	12.00	55.0
AAQ3	10°13'12.65"N 78°22'42.13"E	2648	-1076	43.1	3.29	46.4
AAQ4	10°12'47.18"N 78°18'5.63"E	-5827	-1867	42.7	6.40	49.1
AAQ5	10°15'45.87"N 78°18'29.40"E	-5103	3661	42.6	9.05	51.6
AAQ6	10°15'44.68"N 78°24'9.29"E	5317	3623	42.6	10.60	53.2
AAQ7	10°10'45.10"N 78°20'46.70"E	-891	-5647	42.4	0	42.4

TABLE 4.4: 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°13'51.32"N 78°21'15.47"E	-7	114	22.6	6.83	29.4
AAQ2	10°14'25.52"N 78°21'24.55"E	274	1174	20.8	6.18	27.0
AAQ3	10°13'12.65"N 78°22'42.13"E	2648	-1076	24.1	2.44	26.5
AAQ4	10°12'47.18"N 78°18'5.63"E	-5827	-1867	23.0	3.30	26.3
AAQ5	10°15'45.87"N 78°18'29.40"E	-5103	3661	42.6	4.79	47.4
AAQ6	10°15'44.68"N 78°24'9.29"E	5317	3623	43.3	5.51	48.8
AAQ7	10°10'45.10"N 78°20'46.70"E	-891	-5647	21.6	0.27	21.9

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF SO₂

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO ₂ (µg/m ³)	Incremental value of SO ₂ due to mining (µg/m ³)	Total SO ₂ (µg/m ³)
AAQ1	10°13'51.32"N 78°21'15.47"E	-7	114	7.0	1.59	8.6
AAQ2	10°14'25.52"N 78°21'24.55"E	274	1174	7.4	1.50	8.9
AAQ3	10°13'12.65"N 78°22'42.13"E	2648	-1076	6.5	0	6.5
AAQ4	10°12'47.18"N 78°18'5.63"E	-5827	-1867	7.0	0	7.0
AAQ5	10°15'45.87"N 78°18'29.40"E	-5103	3661	7.0	0.90	7.9
AAQ6	10°15'44.68"N 78°24'9.29"E	5317	3623	7.0	1.36	8.3
AAQ7	10°10'45.10"N 78°20'46.70"E	-891	-5647	6.0	0	6.0

TABLE 4.6: INCREMENTAL & RESULTANT GLC OF NO_x

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline Nox (µg/m ³)	Incremental value of Nox due to mining (µg/m ³)	Total Nox (µg/m ³)
AAQ1	10°13'51.32"N 78°21'15.47"E	-7	114	21.5	9.78	31.3
AAQ2	10°14'25.52"N 78°21'24.55"E	274	1174	22.4	5.63	28.0
AAQ3	10°13'12.65"N 78°22'42.13"E	2648	-1076	21.5	0	21.5
AAQ4	10°12'47.18"N 78°18'5.63"E	-5827	-1867	23.1	0	23.1
AAQ5	10°15'45.87"N 78°18'29.40"E	-5103	3661	22.6	0	22.6
AAQ6	10°15'44.68"N 78°24'9.29"E	5317	3623	21.0	1.62	22.6
AAQ7	10°10'45.10"N 78°20'46.70"E	-891	-5647	20.2	0	20.2

TABLE 4.7: INCREMENTAL & RESULTANT GLC OF FUGITIVE DUST

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline Fugitive ($\mu\text{g}/\text{m}^3$)	Incremental value of Fugitive due to mining ($\mu\text{g}/\text{m}^3$)	Total Fugitive ($\mu\text{g}/\text{m}^3$)
AAQ1	10°13'51.32"N 78°21'15.47"E	-7	114	66.27	23	89.3
AAQ2	10°14'25.52"N 78°21'24.55"E	274	1174	67.76	0	67.8
AAQ3	10°13'12.65"N 78°22'42.13"E	2648	-1076	65.72	0	65.7
AAQ4	10°12'47.18"N 78°18'5.63"E	-5827	-1867	68.59	0	68.6
AAQ5	10°15'45.87"N 78°18'29.40"E	-5103	3661	65.23	0	65.2
AAQ6	10°15'44.68"N 78°24'9.29"E	5317	3623	67.62	0	67.6
AAQ7	10°10'45.10"N 78°20'46.70"E	-891	-5647	65.60	0	65.6

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 $\mu\text{g}/\text{m}^3$ for PM_{10} , SO_2 & NO_x respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.3.4. Mitigation Measure

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

Climatic Changes:

- In general, the main findings regarding the potential impacts of climate change are Land Use Type, Energy Use, Water use & Dust emission and Biodiversity & rehabilitation.
- Whereas, this proposed mining activity is restricted to a small scale mining the proposals falls in a cluster situation where the surrounding environment is already subjected to mining activities and based on the past weather data its inferred that there is no much of change in the climate data of the region and the district profile has no records or past history of climate change leading to Droughts and floods.
- The project area with land use type of Government land for mining with 5 m height bench with 5 m width bench and Pollution Under Control Certified Machineries is proposed for wining of mineral by opencast mechanized mining method and water consumption are proposed with water tankers from nearby areas and the mine pit itself shall act as a rain water harvesting structure and formation of garland drains along the mine lease boundary to divert the surface runoff and collecting the runoff water for greenbelt development and dust suppression activities shall prove beneficial.
- The greenbelt development plan, all along the mine lease boundary @ 1010 Nos of trees, along with the budget allocation for the proposed mitigation measures shall prove beneficial to surrounding environment.
- Therefore, the implementation of proposed mitigation measures for winning of mineral may not have much of impact on the surrounding Climate Change leading Droughts and Floods etc.,

4.4 Noise Environment (Impact & Mitigation Measures)

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.

$A_{e1,2}$ is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

4.4.1 Anticipated Impact

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

- Source data
- Receptor data
- Attenuation factor

Source data has been computed considering of all the machinery and activities used in the mining process. Same has been listed in Table 4.8.

TABLE 4.8: 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 4.9: PREDICTED NOISE INCREMENTAL VALUES

Location ID	N1	N2	N3	N4	N5	N6	N7
Maximum Monitored Value (Day) dB(A)	56.2	52.1	50.3	51.6	57.1	55.5	57.1
Incremental Value dB(A)	54.08	40.10	31.16	24.83	24.25	24.25	25.29
Total Predicted Noise level dB(A)	58.28	52.37	50.35	51.61	57.10	55.50	57.10
NAAQ Standards	Industrial	Day Time- 75 dB (A)		Night Time- 70 dB (A)			
	Residential	Day Time- 55 dB (A)		Night Time- 45 dB (A)			

4.4.2 Mitigation Measures

The following noise mitigation measures are proposed for control of Noise.

- Time intervals for each quarries during blasting.
- Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas.
- Limiting time exposure of workers to excessive noise.
- Proper and regular maintenance of vehicles, machinery and other equipment's.
- The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipment's.
- Speed of trucks entering or leaving the quarry will be limited to moderate speed to prevent undue noise from empty vehicles.
- Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes (occasionally).
- Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment.
- Provision of Quiet areas, where employees can get relief from workplace noise.
- The development of green belts around the periphery of the quarry site to attenuate noise.

- 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 project area is located 1km Southeast in Sökkampatti village. The ground vibrations due to the blasting in proposed mine 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

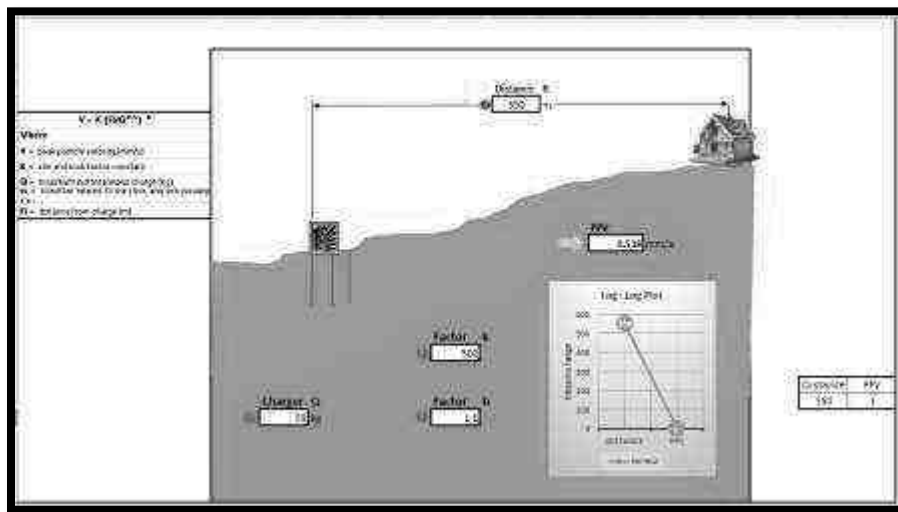
Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

TABLE 4.10: PREDICTED PPV VALUES DUE TO BLASTING

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	59	550	0.538



From the above graph, the Maximum charge per blast of 59 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. It is proposed to carry out blasting not exceeding 2 kg of Explosives per one blasting round. 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

- The blasting operations in this project will be 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 more 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 the Biological Environment

The developmental programs, policies, and projects operated or managed by government or private bodies can cause potentially significant changes in the physical, biological, and socio-economic environment. In some cases, the changes may be beneficial while in others they may be detrimental to the environment. Accordingly, environmental impact studies are required for systematic identification, qualification, and interpretation of the anticipated changes. The main environmental problems associated with mining activities are deforestation, land degradation (change in topography, soil erosion), visual intrusion, disturbance to the hydrological system, and water, air, and noise pollution which ultimately impact the floral and faunal status of the project area.

4.5.2. Impact on Flora

The proposed mine lease applied area exhibits an undulated topography and it is Government Poramboke land which is not fit for cultivation. It is mostly devoid of any considerable vegetation. The proposed mine lease area (core zone) does not encompass any designated forest land within it. The vegetation is very sparse and scanty. So, there will be no impact on flora from the mining operation. There will not be much contamination of soil or any other materials from the mining operation. No threatened plant species were reported in the core and buffer study area during the field survey.

4.5.2.1. Anticipated Impact on agricultural land associated with flora

- a) There are no impacts on the nearby agricultural land due to this mining activity.
- b) None of the plants will be cut during the operational phase of the mine.
- c) 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.
- d) 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.

4.5.3 Mitigation Measures

4.5.3.1. Green Belt Development Plan

Greenbelt means the planting of special types of plants suitable to that particular agroclimatic zone and soil characteristics in a place that will make the area cooler, reduce air pollution, prevent soil erosion, and further improve the soil fertility status. A green belt around the periphery of the boundary and roadside will be created to avoid erosion of soil, prevention of landslides, and minimize air pollution and noise pollution in the project area. Green plants are capable of absorbing air pollutants and forming sinks for pollutants. Leaves with their vast area in a tree crown, absorb pollutants on their surface, effectively reducing their concentration and noise level in the ambient.

4.5.3.2. Proposed Green Belt

Extensive green belt development will be started during the construction phase, which will continue till the operation of the plant. About 1500-2000 trees will be planted per hectare all around the plant, approach roads, and township premises. Locally available types of trees that are resistant to pollutants will be planted. In addition to the above, all open spaces available within the premises will be developed as nurseries, parks, gardens, and other forms of greenery. 5m wide greenbelt will be developed along the plant premises, as per land available.

a. Characteristic features of plants to be used for Absorption of pollutant gases

1. Plant species should be perennial and evergreen with thick canopy cover.
2. The crown of the tree (mass of foliage/leaves and branches growing outward from the trunk of the tree) should be either Round or Spreading for effective absorption of pollutant gases.
3. Plant should have foliage of longer duration.

Table No 4.11. List of plant species proposed for Greenbelt development

S. No	Scientific name	Tamil Name
1	Aegle marmelos	Vilva maram
2	Albizia lebbeck	Vaagai maram
3	Cassia fistula	Konrai tree
4	Lannea coromandelica	Othiyam
5	Limonia acidissima	Vila maram
6	Syzygium cumini	Naval maram
7	Toona ciliata	Santhana Vembu
8	Ficus hispida	Aththi maram
9	Borassus flabellifer	Panai-maram

(*Source: Term of Reference-ToR)

Table No 4.12. Species suitable for abatement of noise and dust pollution

S. No	Botanical name	Common name
1	Azadirachta indica	Vembhu maram
2	Ficus religiosa	Arasan maram
3	Ficus hispida	Aththi maram
4	Bombax ceiba	Mul Elavu
5	Syzygium cumini	Naval maram
6	Tamarindus indica	Puliyamaram
7	Mangifera indica	Manga maram
8	Harwickia binata	Anjan maram

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

The above-suggested list covers species with thick canopy cover, perennial green nature, native origin, and a large leaf area index. The proposed species will help in forming an effective barrier between the mine site area and the surroundings. These species need to be planted along the periphery of the lease area to absorb fugitive emissions and noise levels which are generated during mining activities.

Some of the important aspects to be considered are:

- ✓ The planting of trees in each row will be in staggered orientation.
- ✓ In the front row, shrubs will be grown.
- ✓ Since the trunks of the tall trees are generally devoid of foliage, it will be useful to have shrubs in front of the trees so as to give coverage to this portion.
- ✓ The spacing between the trees will be maintained slightly less than the normal spaces, so that the trees may grow vertically and slightly increase the effective height of the green belt.

4.5.4. Anticipated Impact on Fauna

- Since the terrestrial fauna in the study area is distributed away from the mine site, the impacts of the project are likely to be much low on the terrestrial fauna of the region. The proposed mining lease area is devoid of any significant vegetation, it is not suitable for permanent habitat for any specific wildlife.
- Habitat degradation and disturbance to the faunal group due to ground vibration and increase in noise level will be minimized or resolved by modern technologies. So, from the above facts, it is revealed that there will be no impact on fauna. No threatened fauna species were reported in the core and buffer study area.

4.5.4.1. Measures for protection and conservation of wildlife species

- Topsoil has a large number of seeds of native plant species in the mining area.
- Topsoil will be used for restoration and suitable surfaces for planted seedlings.
- 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 the Forest Department.
- A dust suppression system will be installed within the mine and periphery of the mine.

- Plantation around the mine area will help in creating habitats for small faunal species and create a better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

4.5.5. Impact on Aquatic Biodiversity

Mining activities will not disturb the 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, like wetlands, rivers streams, Odai, Vaari, Canal, Channel, lakes, ponds, tanks and farmer sites. There are few small seasonal water bodies located in the study area. There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. Kindly refer the Chapter 3, clause No 3.8. Aquatic biodiversity is observed in the study area.

TABLE 4.13: GREENBELT DEVELOPMENT PLAN

Year	No. of trees proposed to be planted	Survial %	Area to be planted	Name of the species
I	It is proposed to plant 1,010 Nos of trees in the 1 st year	80%	Safety barrier, Un utilized area's and nearby village roads	Neem, Pongamia,Pinnata, Cauarina etc.,

4.5.6 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.

4.5.6.1. 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.

4.5.6.2 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.

4.5.6.3 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.

4.5.7 Impact Assessment on Biological Environment

A detail of impact and assessments was mentioned in Table No 4.14.

TABLE 4.14: ECOLOGICAL IMPACT ASSESSMENTS

Sl.No	Attributes	Assessment
1	Activities of the project affect the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in the mining lease site. The fauna sighted mostly migrated from the buffer area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, or vulnerable species were sighted in the core mining lease area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/coastline/estuary/sea	No national park or eco-sensitive zone around 10km radius. Kindly refer the clause no 3.6.1 in the third chapter.
4	Proposed project restricts access to waterholes for wildlife	'NO'
5	Proposed mining project impact surface water quality that also provide water to wildlife	'NO' 'scheduled or threatened wildlife animal sighted regularly core in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management such as drains is constructed properly so there will be no siltation affect in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	'NO'
8	The project release effluents into a water body that also supplies water to a wildlife	No water body near to core zone so chances of water become polluted is low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	'NO'
10	Project likely to affect migration routes	'NO' 'migration route observed during monitoring period.
11	Project likely to affect flora of an area, which have medicinal value	'NO'
12	Forestland is to be diverted, has carbon high sequestration	'NO' 'There was no forest land diverted.
13	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.

4.6 Socio Economic

4.6.1 Anticipated Impact

- Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- Approach roads can be damaged by the movement of tippers
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region
- Due to the increase in the number of vehicles, traffic jams may occur
- Due to the vehicles passing through the villages, there is a disturbance to the people

4.6.2 Mitigation Measures

- Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly.
- From above details, the quarry operations will have highly beneficial positive impact in the area
- No villages in the proposed mineral transportation route
- Mineral loaded Vehicles will not be allowed during school hours (Morning 8AM to 10AM & Evening 4.30PM to 5.30PM)

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 quarries.

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

CHAPTER – 5: ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 Introduction:

Consideration of alternatives to a project proposal is a requirement of EIA process. This quarry is site specific. The site has been selected based on geological investigation and exploration and from the Existing quarry pits around the project site. Drilling, Blasting, Excavation, Loading & Transportation will be carried out in this quarrying operation.

- This area denotes the indicative of flow pattern of the rock mass in N30⁰E to S30⁰W with dipping SE60⁰.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility.
- Socio – economic background.

Enough infrastructure exists and lesser resources are required to be deployed. Since, any major construction for infrastructure is not required and hence does not affect the environment considerably.

5.1 Factors Behind the Selection of Project Site

Rough Stone Quarry Projects at Sökkampatti Village is site specific. The proposed mining lease area has 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 within the project areas.
- Availability of skilled, semi-skilled and unskilled workers in this region.
- All the basic amenities such as medical, fire-fighting, 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

5.2 Analysis of Alternative Site

The mineral deposits are site specific in nature; hence, question of seeking alternate site does not arise for this project.

5.3 Factors Behind Selection of Proposed Technology

Mechanized open cast mining operation with drilling and blasting method will be used to extract Rough Stone in the area. The quarry areas fall in the clusters has following advantages

- As the mineral deposition is homogeneous and batholith formation, therefore opencast method of working out deposit is preferred over underground method
- The material will be loaded after sprinkling with water 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.

5.4 Analysis of Alternative Technology

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

CHAPTER – 6: ENVIRONMENTAL MONITORING PROGRAMME

6.0 General

Environmental Monitoring will be taken up for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MoEF & Consent to Operate issued by the State Pollution Control Board. Monitoring reports will be submitted to regulator as per statutory requirements. The entire monitoring work will be carried out by MoEF & CC / NABL recognized laboratories.

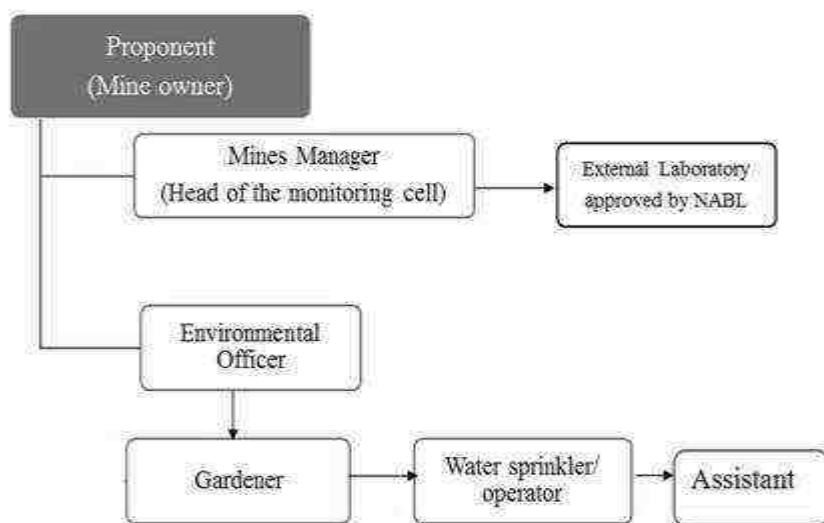
The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections.

6.1 Methodology of Monitoring Mechanism

Implementation of EMP and periodic monitoring will be carried out by the proponents and respective quarry owners in the cluster quarries. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project; Mine Management Level environmental protection measures like dust suppression, treatment and recycling of waste water, control of noise due to blasting and Ground vibration, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of other hand, implementation of area level protection measures like plantation and green Environmental Management Plan and environmental clearance conditions will be monitored by the proponent. On the belt development, environmental quality monitoring etc.,

An environment monitoring cell (EMC) will be constituted at the quarry consisting of following members to monitor the implementation of EMP and other environmental protection measures.

FIGURE 6.1 HIERARCHY OF ENVIRONMENTAL MONITORING CELL



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. 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 monthly, half-yearly and yearly. The half-yearly reports will be 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).

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

Sl No.	Recommendations	Time Period	Schedule
1	Land Environment Control Measures	Before commissioning of the project	Immediately after the commencement of the project
2	Soil Quality Control Measures	Before commissioning of the project	Immediately after the commencement of the 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

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 is detailed in Table 6.2

TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC

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 Environmental Policy of the Proponent

The project proponent committed to ensure that:

- Protect the environment by control and prevention of pollution and promote green environment.
- To operate the quarry with an objective of no injuries and accidents at the work place and provide a safe work place for our employees, contractors and others who perform their duties.
- Adequate health care will be taken to all the employees and create process to reduce the adverse effect of the operations on Health of the employees.
- Provide safety appliance and continuous training in safety to employees to ensure safe production and achieve the target of zero accidents.
- Develop safe working methods and practices, remove unsafe work conditions and consider all the aspects at the early stages of process development to provide safe working atmosphere.
- Communicate Safety, Health and Environmental Policy to all employees for better understanding and practice.

6.5 Budgetary Provision for Environmental Monitoring Programme

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 total cost for Environmental Monitoring Programme is Rs 3,80,000/-.

TABLE 6.3 ENVIRONMENT MONITORING BUDGET

Parameter	Capital Cost
Air Quality Meteorology Water Quality Hydrology Soil Quality	Rs.3,80,000/-

Noise Quality Vibration Study Greenbelt	
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Source: Approved Mining Plan

6.6 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 proponent with Environmental Monitoring cell and necessary corrective measures will be carried out. 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
- SEIAA, Chennai, Tamil Nadu

Besides the Mines Manager/Agent will submit the periodical reports to –

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

CHAPTER – 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
- Post-COVID Health Management Plan

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 cluster 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. 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 mining & allied activities with detailed analysis of causes and control measures for the mine is given in below Table 7.1.

TABLE 7.3 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; ▪ Entry of unauthorized persons will be prohibited; ▪ Fire-fighting and first-aid provisions in the mine office complex and mining area; ▪ Provisions of all the safety appliances such as safety boot, helmets, goggles etc., will be made available to the employees and regular check for their use. ▪ Working of quarry, as per approved plans and regularly updating the mine plans; ▪ Cleaning of mine faces shall be daily done

			<ul style="list-style-type: none"> 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& Blasting	<p>Due to 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.
3	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"> ▪ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely. ▪ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation. ▪ Shots are fired during daytime only. ▪ All holes charged on any one day shall be fired on the same day. ▪ The danger zone is and will be distinctly demarcated (by means of red flags).
4	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal & overtaking of vehicle</p> <p>Operator of truck</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-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

		leaving his cabin when it is loaded.	<ul style="list-style-type: none"> ▪ corners ▪ All vehicles should be fitted with reverse horn with one spotter at every tipping point ▪ Loading according to the vehicle capacity ▪ Periodical maintenance of vehicles as per operator manual
5	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> ▪ Escape Routes will be provided to prevent inundation of storm water ▪ Fire Extinguishers & Sand Buckets
6	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	<ul style="list-style-type: none"> ▪ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height.

7.3 Disaster Management Plan

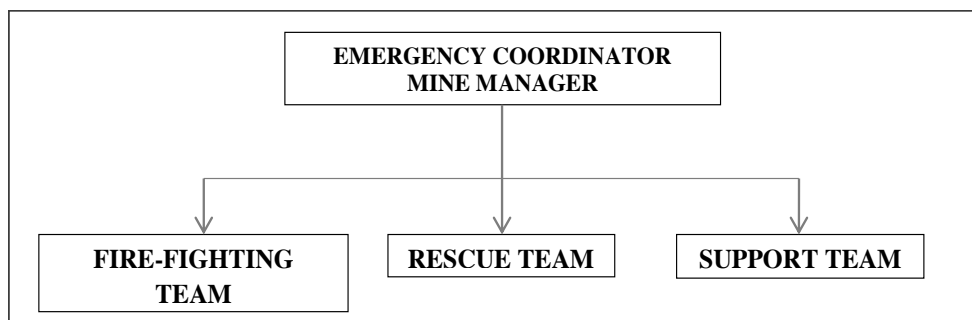
Natural disasters like Earthquake, Landslides has not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety 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 7.2: DISASTER MANAGEMENT TEAM LAYOUT



The emergency organization shall be headed by emergency coordinator who will be qualified competent 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 7.4: 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. 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

(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 is proposed at strategic locations within the quarry.

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

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.
- Firefighting and first-aid provisions in the mines office complex and mining area will be 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 the quarry in phase manner.

- Cleaning of mine faces will be carried out regularly.
- Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- A blasting SIREN will be used at the time of blasting for audio signal.
- Checking of blasting area for any un-blasted hole or material.
- Warning notice boards indicating the time of blasting and NOT TO TREESPASS will be displayed at prominent places.

7.4 CUMULATIVE IMPACT STUDY

Totally 3 quarries within the cluster, there are 2 Nos of Proposed quarries, 1 existing quarry, fall in the cluster. The list of quarries is as below –

PROPOSED QUARRIES				
CODE	Name of the Proponent and Address	S.F.Nos ,Village & Taluk	Extent in Ha	Status
P1	Thiru.K.Silambarasan	352/2 (P-1) Chokkampatti	2.02.0	Tor Obtained Lr No. SEIAA- TN/F.No.8692/SEAC/TOR- 1356/Dated :09.02.2023
P2	Thiru.S.Maheswaran	352/2 (P-3) Chokkampatti	3.20.0	EC Granted
Total			5.22.0	
EXISTING QUARRIES				
CODE	Name of the Proponent and Address	S.F.Nos	Extent in Ha	Lease Period
E-1	Thiru.C.Veeramalai	352 (P-2)	1.00.0	21.02.2019 to 20.02.2024
Total			1.00.0	
TOTAL CLUSTER EXTENT			6.22.0	

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

**TABLE 7.5: SALIENT FEATURES OF THE PROPOSED PROJECTS IN CLUSTER
SALIENT FEATURES OF THE PROPOSED PROJECTS -P1**

Name of the Mine	Thiru.K.Silambarasan Rough Stone Quarry	
Land Type	It is a Government Poramboke land	
S.F. Nos	352/2 (P-1)	
Extent	2.02.0 ha	
Proposed depth of mining As per Mining plan	41m (1m Topsoil + 40m Rough stone)	
Existing pit dimension (As per Ad Letter)	Pit-1: 180m (L) X 77m (W) X 10m (D) (6m AGL + 4m BGL)	
Geological Resources in m ³	Rough Stone	Topsoil
	7,59,392	9,122
Mineable Reserves	Rough Stone	Topsoil
	2,04,792	1,560
Year wise production	Rough Stone	Topsoil
	2,04,792	1,560
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	216m (L) x 77 m(W) x 41m (D) (6m AGL + 35m BGL)	
Toposheet No	58-J/08	
Latitude between	10° 13' 42.56"N to 10° 13' 52.06"N	
Longitude between	78° 21' 14.35"E to 78° 21' 17.52"E	

Topography	The lease applied area is exhibits an undulated topography. The area has gentle sloping towards South-eastern side. The altitude of the area is 193m (max) above Mean Sea level. The area is covered by 1m thickness of Topsoil and followed by Massive Charnockite which is clearly inferred from the existing quarry pits.	
Machinery proposed	Jack Hammer	6
	Compressor	2
	Excavator with Bucket and Rock Breaker	1
	Tipppers	2
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	24 Nos	
Water table	70-65m	
Water requirements	3.5 KLD	
Total Project Cost	Project cost	Rs 81,15,000/-
	Compliance Monitoring Cost	Rs 3,80,000/-
	Total	Rs 84,95,000/-
Proposed CER Cost	Rs. 5,00,000/-	

SALIENT FEATURES OF THE PROPOSED PROJECTS -P2

Name of the Mine	Thiru.S.Maheswaran Rough Stone Quarry	
Land Type	It is a Government Poramboke land, which is not fit for vegetation/ Cultivation.	
S.F. Nos	352/2(Part-3)	
Extent	3.20.0 ha	
Proposed depth of mining As per Mining plan	61m (1m Topsoil + 60m Rough stone)	
Existing pit dimension (As per Ad Letter)	Pit-1: 125m (L) X 75m (W) X 10m AGL (D)	
Geological Resources in m ³	Rough Stone	Topsoil
	19,46,000	24047
Mineable Reserves	Rough Stone	Topsoil
	6,93,420	18463
Year wise production	Rough Stone	Topsoil
	6,93,420	18463
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	224m (L) x 197 m(W) x 61m (D) (16m AGL + 45m BGL)	
Toposheet No	58-J/08	
Latitude between	10°13'42.26"N to 10°13'50.58"N	
Longitude between	78°21'06.29"E to 78°21'14.45"E	
Topography	The lease applied area is slightly elevated topography. The area has gentle sloping towards Southern side and altitude of the area is ranges from 201m to 186m above from Mean Sea level. The area is covered by Massive Charnockite which is clearly inferred from the existing quarry pits.	
Machinery proposed	Jack Hammer	6
	Compressor	2
	Excavator with Bucket and Rock Breaker	2
	Tipppers	6
	Wagon Drill	1
Blasting	Usage of Slurry Explosive with MSD detonators	

Manpower Deployment	36Nos	
Water table	70-65m	
Water requirements	3.5 KLD	
Total Project Cost	Project cost	Rs.1,74,69,000/-
	EMP Cost	Rs 3,80,000/-
	Total	Rs.1,78,49,000/-
Proposed CER Cost	Rs. 5,00,000/-	
Nearest Habitation	650m-E	

SALIENT FEATURES OF THE PROPOSED PROJECTS -E1

Name of the Mine	Thiru.C.Veeramalai Rough Stone Quarry	
Land Type	It is a Government Poramboke land	
S.F. Nos	352/2 (P-2)	
Extent	1.00.0 ha	
Proposed depth of mining As per Mining plan	45 m (10 m AGL + 35m BGL)	
Geological Resources in m³	Rough Stone	Topsoil
	4,10,390	-
Mineable Reserves	Rough Stone	Topsoil
	1,13,970	-
Mining Plan Period / Lease Period	5 Years	
Ultimate Pit Dimension	106m (L) x 56 m(W) x 45m (D)	
Toposheet No	58-J/08	
Topography	The lease applied area is exhibits almost plain topography. The altitude of the area is 186m (max) above.	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Excavator with Bucket and Rock Breaker	1
	Tipppers	2
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	12 Nos	
Water table	60-65m bgl	
Water requirements	4.5 KLD	
Total Project Cost	Project cost	Rs 57,40,000/-
	Compliance Monitoring Cost	Rs 7,05,000/-
	Total	Rs 64,45,000/-
Proposed CER Cost	Rs. 5,00,000/-	

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries (proposed and existing) within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting.

Impact on Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.5 & 7.6

TABLE 7.6 CUMULATIVE PRODUCTION LOAD OF ROUGH STONE IN CLUSTER

PROPOSED QUARRIES				
Quarry	Production for five-year plan period considering safety parameters m³	Per Year Production in m³	Per Day Production in m³	Number of Lorry Load Per Day @ 12m³ per load
P1	2,04,792	40,958	137	11 Trips /Day
P2	6,93,420	1,38,684	462	38 Trips /Day
EXISTING QUARRY				
Quarry	Production for five-year plan period	Per Year Production in m³	Per Day Production in m³	Number of Lorry Load Per Day @ 12m³ per load
E1	1,13,970	22,794	76	6 Trips /Day
TOTAL	10,12,182	2,02,436	675	55 Trips /Day

TABLE 7.7: CUMULATIVE PRODUCTION OF TOPSOIL IN CLUSTER

PROPOSED QUARRIES				
Quarry	Production for One-year plan period considering safety parameters m³	Per Year Production in m³	Per Day Production in m³	Number of Lorry Load Per Day @ 12m³ per load
P1	1560	1560	5	1 Trips /Week
P2	18463	18463	62	5 Trips /Day
EXISTING QUARRY				
Quarry	Production for five-year plan period	Per Year Production in m³	Per Day Production in m³	Number of Lorry Load Per Day @ 12m³ per load
E1	-	-	-	-
TOTAL	20,023	20,023	67	6 Trips /Day

Based on the above production quantities the emissions due to various activities in all the 3 mines includes various activities like ground preparation, excavation, handling and transport of mineral. 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 7.7.

TABLE 7.8: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER

PM₁₀ in µg/m³	
Location	AAQ1 – CORE
Background (average)	42.8
Anticipated Incremental due to the proposals	13.8
Resultant	56.6
NAAQ Norms	100 µg/m ³
PM_{2.5} in µg/m³	
Background (average)	22.6
Highest Incremental	6.83
Resultant	29.4
NAAQ Norms	60 µg/m ³
SO₂ in µg/m³	
Location	AAQ1 – CORE
Background (average)	7.0
Anticipated Incremental due to the proposals	1.59

Resultant	8.6
NAAQ Norms	80 $\mu\text{g}/\text{m}^3$
NO _x in $\mu\text{g}/\text{m}^3$	
Location	AAQ1 – CORE
Background (average)	21.5
Anticipated Incremental due to the proposals	9.78
Resultant	31.3
NAAQ Norms	80 $\mu\text{g}/\text{m}^3$

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 7.9: 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 East from the cluster 550m for P1	47.5	45.3	50.3	55
Habitation Near East from the cluster 650m for P2	46.8	43.8	48.6	
Habitation Near East from the cluster 650m For E1	45.2	42.6	48.6	

Source: Lab Monitoring Data

The incremental noise level is found within the range of 42.6 – 45.3 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 3 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 3 mines is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease areas. 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 Cluster is tabulated in Table 7.9

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 7.10: GROUND VIBRATIONS AT CLUSTER MINES

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	59	550	0.538
P2	200	650	1.094
Existing quarry			
E1	33	660	0.169

Source: PPV Calculation

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 3 mines shall provide employment and revenue will be created to government

TABLE 7.11: SOCIO ECONOMIC BENEFITS FROM CLUSTER MINES

Proposed Quarries			
Code	Employment	Project Cost	CER
P1	24	Rs 84,95,000/-	Rs 5,00,000/-
P2	36	Rs.1,78,49,000/-	Rs 5,00,000/-
Existing Quarry			
Code	Employment	Project Cost	CER
E1	12	Rs 57,40,000/-	Rs 5,00,000/-
TOTAL	72	Rs 3,20,84,000/-	Rs 15,00,000/-

A total of 72 people will get employment due to this cluster, in this already employed in the existing quarries. For the Existing quarries Corporate Environment Responsibility (CER) allocated as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018.

For the proposed projects it is recommended to spent Rs 5,00,000/- towards CER Activities in the nearby Government School for Renovation or reconstruction of Existing Toilet, Providing Note books to the school library and Plantation in the school ground any other recommendations by the School Head masters.

- In this cluster from the 2 Proposal, it is proposed and 1 Existing to spent Rs 15,00,000/- for CER activities

Considering 500 Nos of trees per hectare it is proposed to plant About 1010 nos. of saplings in the proposed projects for the Mining plan period in safety barrier, Un utilized area and village roads with survival rate 80%

(Anticipated). 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 7.12: GREENBELT DEVELOPMENT BENEFITS FROM CLUSTER

Proposed projects				
CODE	No of Trees proposed to be planted	Survival %	Area to be covered	Name of the Species
P1	1010	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Pinnata, Causarina, etc.,
P2	1600	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Pinnata, Causarina, etc.,
E1	500	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Pinnata, Causarina, etc.,
Total	3,110			

It is anticipated that there shall growth of native species of Neem, Pongamia, Pinnata, Causarina, etc in the Cluster at a rate due to these proposals 3,110 Trees Planted over a period of 5 Years with Survival Rate of 80%. Besides every individual lease holder will plant Saplings in the School ground as part of CER activities.

7.5 PLASTIC WASTE MANAGEMENT PLAN

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 7.13: 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 from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste	Mines Manager
3	Collection of plastic waste	Mines Foreman
4	Setting up of Material Recovery Facilities	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance	Mine Owner

Source: Proposed by FAE's and EC

Carbon Emission.

Carbon dioxide (CO₂): Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and other biological materials. Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH₄): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, land use and by the decay of organic waste in municipal solid waste landfills.

Nitrous oxide (N₂O): Nitrous oxide is emitted during agricultural, land use, and industrial activities; combustion of fossil fuels and solid waste; as well as during treatment of wastewater.

Therefore, the implementation of proposed mitigation measures for winning of mineral may not have much of impact on the surrounding environment leading to release of Greenhouse gases (GHC), rise in temperature & livelihood of local people.

Hydrothermal/Geothermal effect due to destruction in the Environment.

- Hydrothermal – relating to hot water —used especially of the formation of minerals by hot solutions rising from a cooling magma.
- Geothermal – relating to or produced by the internal heat of the earth.
- The proposed activity is for quarrying of rough stone by opencast mechanized mining method for an ultimate depth of 40 m bgl.
- The proposed mining area and the surrounding falls under hard rock formation i.e., Charnockite Formation and the district has not recorded any Hydrothermal / Geothermal effect and as per the Seismic Zonation Map of India, the district falls under the Zone II of seismic zones classification.
- The resultant of this open cast mining shall not have any Hydrothermal/Geothermal effect on the surrounding environment.

Bio-geochemical processes and its foot prints including environmental stress.

- Bio-geochemical cycle – any of the natural pathways by which essential elements of living matter are circulated. The term biogeochemical is a contraction that refers to the consideration of the biological, geological, and chemical aspects of each cycle.
- This proposed activity is for quarrying of rough stone quarry and maximum depth of mining is 41m bgl and the applied area for quarrying is a Government land with no major vegetation and it is proposed for greenbelt development all along the safety barrier and construction of garland drainage and implement the proposed EMP strictly to mitigate the impacts on surrounding environment.
- No Bio-geochemical processes and its foot prints including environmental stress are anticipated and at the end of life of mine the proposed quarry shall be left as an artificial reservoir structure and allowed to collect rain water and shall enrich the ecosystem.

Sediments geochemistry in the surface streams.

- Sedimentary Geochemistry has been in use to understand the conditions of deposition, climatic variations, tectonic setting, provenance, reservoir characteristics, etc.,
- The elemental composition of sediments in surface streams is the product of physical and chemical erosion of rocks, which is then transported across drainage networks.
- The project area when broken up lead to create void and land use pattern of the proposed area is alerted by ways of formation of open pit and as mitigation measure its proposed for garland drain all along the boundary barrier to ensure that no natural drainage pattern is disturbed and the garland drains are in turn

connected to settlement traps were its ensured that no debris are carried away and hence the proposed activity shall not lead to any deposition of sediments in the nearby surface streams.

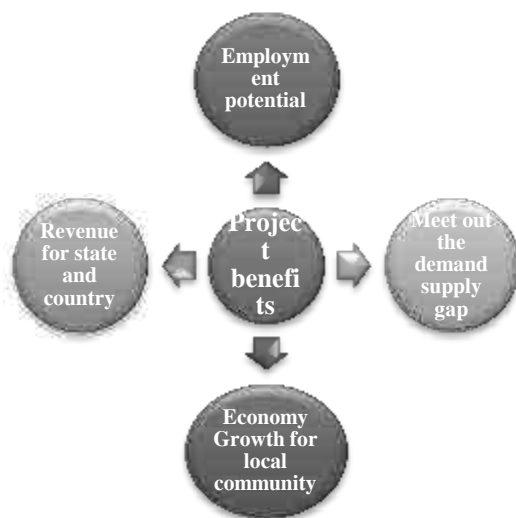
CHAPTER – 8: PROJECT BENEFITS

8.0 General

The proposed Rough Stone projects belongs to Thiru.K. Silambarasan aims to produce 2,04,792m³ Rough Stone over a period of 5 Years and 1,560 m³ Topsoil over a period of 1 Year. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits.

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

This proposed project falls in the cluster will provide employment opportunities to about 24 persons directly. 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 than negative 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 project site is located in Sökkampatti village, Melur taluk, Madurai 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 the cluster quarry projects.

- 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

The quarry projects in the region will have positive impact on the social economic condition of the area by way of providing employment to the local peoples; thereby increasing the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture.

- Social welfare program like Medical camps, Educational facilities to the poverty level students, Providing water supply from the quarries during drought seasons will be taken from the project proponent's.
- Supplementing Govt. efforts in health monitoring camps, social welfare and various Awareness programs among the rural population.

8.5 Other Tangible Benefits

The proposed quarry project 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 quarry site 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.,

CORPORATE SOCIAL RESPONSIBILITY

The 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 proponent 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

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 towards CER as per directions of EAC/SEAC.

TABLE 8.1: CER ACTION PLAN

Activity	Beneficiaries	Total In Rs
Improving Sanitation facilities to the Government school in	Government School Students	Rs 5,00,000/-
Plantation along the village roads		
Providing Environmental Related books to the School Library		

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

CHAPTER – 9: ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER - 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 Thiru.K. Silambarasan will –

- Meet the requirements of all laws, acts, regulations, and standards relevant to its operations and activities.
- 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 impact side.
- Implement a program to train employees in general environmental issues and individual workplace environmental responsibilities.
- 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 –

Land degradation is one of the major adverse impacts of opencast mining in the form of excavated voids and contamination of soil affects the viability of the soil resource. Total area of extent is 2.02.0ha, Area at the end of life of quarry is 2.02.0Ha.

Soil contamination then has a number of flow-on effects like, Inhibition of plant growth, and death of existing plants in contaminated areas and contamination of soil also has potential to impact on a surface water quality and groundwater resources.

TABLE 10.1: PROPOSED CONTROLS FOR LAND ENVIRONMENT

CONTROL	RESPONSIBILITY
Designing vehicle wash-down system so that all washed water is captured and passed through grease and oil separators.	Mines Manager
Re fueling will be carried out in a safe location, away from vehicle movement pathways	Mine Foreman & Mining Mate
Greenbelt development and its maintenance	Environment Officer
Garland drains with catch pits to be provided all around the project area to prevent run off affecting the surrounding lands.	Environment Officer
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
Thick plantation using native flora species will be carried out on the top benches.	Mines Manager
There will be formation of a small surface water body in the mined out area, which can be used for watering the greenbelt at the conceptual stages.	Environment Officer

Source: Proposed by FAE's & EIA Coordinator

10.3 Soil Management

Top Soil Management –

- There is top soil within the project area thin layer of soil will be utilized for Greenbelt purpose.

Overburden / Waste and Side Burden Management –

- The overburden in the form of Topsoil formation, the Topsoil 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.

TABLE 10.2: PROPOSED CONTROLS FOR SOIL MANAGEMENT

CONTROL	RESPONSIBILITY
Garland drains are to be paved around the quarry pit area to arrest possible wash off in the rainy seasons	Mines Manager
Surface run-off from the surface water 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	Environment Officer
keeping records of mitigation of erosion events, to improve on management techniques	Environment Officer
A monitoring map with information including their GPS coordinates, erosion type, intensity, and the extent of the affected area, as well as existing control measures and assessment of their performance	Environment Officer
Empty sediment from sediment traps Maintain, repair or upgrade garland drain system	Environment Officer
Test soils for pH, EC, chloride, exchangeable cations, particle size and water holding capacity	Mines Manager

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 mine office.

The quarrying operation is proposed up to a depth of 41m BGL, the water table in the area is 70m – 65m 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 existing and proposed mining activities would result in the increase of particulate matter concentrations due to fugitive dust. Water sprinkling twice per day 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 Management

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and other allied 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 and 50m safety barrier) 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 access 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

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 1010 nos. of saplings is proposed to be planted for the Mining plan period in safety barrier and nearby village roads 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	tress	Area	to	be	Name of the species	Survival	rate
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	proposed to be planted	covered		expected in %
I	1010	Safety zone, Un utilized area & Village roads	Neem, Pungam, Pinnata, Causarina etc.,	80

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.	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 Proponent 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	20200	20200
	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 - 3 Units	150000	15000
	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	40400
	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 / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	532459
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 managment	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	20200	5000
	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	404000	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1010Trees - (300 Inside Lease Area & 700Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendmets, transplantation of saplings @ 200 per plant (capital) for	60000	9000

		plantation inside the lease area and @ 30 per plant maintenance (recurring)		
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	210000	21000
	4. Implementation of Final Mine Closure Atcitty 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	67500	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 Budge and not necessarily implemented in the Project Site	1208273	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	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) - 24 Employees	96000	24000
	Health checkup for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	24000

	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	4040
	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	101000	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			2531400	1672599.2

In order to implement the environmental protection measures, an amount of Rs.25.31 lakhs as capital cost and recurring cost as Rs. 16.72 lakhs as recurring cost is proposed considering present market price considering present market scenario for the proposed project.

Year	Total Cost (Rs)
1st	4203999.2
2nd	1756229.2
3rd	1844040.6
4th	1936242.6
5th	2100554.8
Total	118 Lakhs

10.10 CONCLUSION –

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

CHAPTER – 11: SUMMARY AND CONCLUSIONS

The Rough Stone quarry project belongs to Thiru.K. Silambarasan over an extent of 2.02.0 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.

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** (Baseline Data Used is as per MoEF & CC Office Memorandum No. J-11013/41/2006-IA-II (I) (Part) Dated 29th August 2017 & MoEF & CC Office Memorandum F.No.IA3-22/10/2022-IA.III [E 177258] Dated: 08.06.2022) 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 Final 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 as per market demand.

Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 24 people directly and indirectly around 50 people.

As discussed, it is safe to say that the proposed quarry is 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.K.Silambarasan** Rough Stone Quarry.

CHAPTER 12.0: DISCLOSURE OF CONSULTANTS

The Project Proponent's –

Thiru.K.Silambarasan, Rough Stone Quarry-Cluster (2.02.0Ha) 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.

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: infogeoexploration@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	A	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	Mr. N. Senthilkumar	Empanelled	38 28	B B	AQ WP RH	B B A
5	Mrs. Jisha parameswaran	In-house	-	-	SW	B
6	Mr. Govindasamy	In-house	-	-	WP	B
7	Mrs. K. Anitha	In-house	-	-	SE	A
8	Mrs. Amirtham	In-house	-	-	EB	B
9	Mr. Alagappa Moses	Empanelled	-	-	EB	A
10	Mr. A. Allimuthu	In-house	-	-	LU	B
11	Mr. S. Pavel	Empanelled	-	-	RH	B
12	Mr. J. R. Vikram Krishna	Empanelled	-	-	SHW RH	A A

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

Declaration by experts contributing to the EIA/EMP for Thiru.K.Silambarasan, Rough Stone Quarry-Cluster (2.02.0Ha) in Sökkampatti Village of Melur Taluk, Madurai 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:







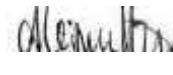


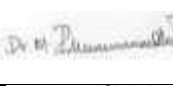


Period of Involvement: **January 2019 to till date**

Associated Team Member with EIA Coordinator:

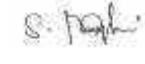
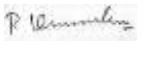


1. **Mr. S. Nagamani**
2. **Mr. Viswanathan**
3. **Mr. Santhoshkumar**
4. **Mr. S. Ilavarasan**



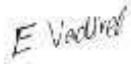


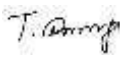
FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

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	
			Mr. N. Senthilkumar	
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. M. Ifthikhar Ahmed	
			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. 	Mrs. Amirtham	

		<ul style="list-style-type: none"> 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. N. Senthilkumar	
			Mr. S. Pavel	
			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. A. Jagannathan	
			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. Viswanathan	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 	

			<ul style="list-style-type: none"> ▪ Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan 	
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 	
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 	
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 	
8	Mr. D. Dinesh	NV	<ul style="list-style-type: none"> ▪ Site Visit with FAE ▪ Assist FAE and provide inputs on impacts due to proposed mine activity and suggest mitigation measures ▪ Assist FAE with prediction modelling 	
9	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 	
10	Mrs. Nathiya	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 	

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.K. Silambarasan Rough Stone Quarry-Cluster (2.02.0Ha) in Sökkampatti Village of Melur Taluk, Madurai District of Tamil Nadu. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature & Date

: 

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: 20.2.2023

Validity:

August 06, 2025

ANNEXURE

THIRU. K. SILAMBARASAN ROUGH STONE AND GRAVEL QUARRY

Sokkampatti Village,
Melur Taluk,
Madurai District

CLUSTER EXTENT =6.22.0 Ha

ToR obtained

Lr.No.SEIAA-TN/F.No.8692/SEAC/ToR-1356/2023 Dated: 09.02.2023

Project Proponent

Thiru. K.SILAMBARASAN,

S/o. Karuppusamy,

No.339, Mallakottai,

Thiruppathur,

Sivagangai District – 630 566

LIST OF ANNEXURES

ANNEXURE NO	DESCRIPTION	PAGE NO
P1 Thiru.K.Silambarasan,	COPY OF TERMS OF REFERENCE	1A – 24A
	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	25 A- 26A
	COPY OF MINING PLAN APPROVED LETTER	27A – 29A
	COPY OF APPROVED MINING PLAN WITH PLATES	30A – 115A
	COPY OF ADDITIONAL DOCUMENT	116A – 139A
P2 Thiru. S.Maheswaran,	COPY OF ENVIRONMENTAL CLEARANCE	140A – 178A
E1 Thiru.C.Veeramalai	COPY OF APPROVED MINING PLAN	179A -226A
	COPY OF BASE LINE MONITORING DATA	227A - 255A
	COPY OF NABET CERTIFICATE	256A



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.8692/SEAC/ToR-1356/Dated: 09.02.2023.

To

Thiru. K. Silambarasan,
S/o. Karuppusamy,
No.339, Mallakkottai,
Thiruppathur,
Sivagangai District – 630 566.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough Stone Quarry lease area over an extent of 2.02.0 ha at S.F.Nos. 352/2 (part -1) in Sakkampatti Village, Melur Taluk, Madurai District, Tamil Nadu by K. Silambarasan - 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/65995/2021 dated 24.07.2021
2. Your application submitted for Terms of Reference dated 06.08.2021
3. Minutes of the 245th SEAC meeting held on 11.02.2022.
4. Minutes of the 265th SEAC meeting held on 21.04.2022.
5. Minutes of the 345th SEAC meeting held on 10.01.2023.


MEMBER SECRETARY
SEIAA-TN

6. Minutes of the 590th SEIAA meeting held on 09.02.2023.

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

The proponent, Thiru. K. Silambarasan has submitted application for Terms of Reference (ToR) on 06.08.2021, in Form-I, Pre- Feasibility report for the Proposed Rough Stone Quarry lease area over an extent of 2.02.0ha at S.F.Nos. 352/2 (part-1) in Sökkampatti Village, Melur Taluk, Madurai District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

The proposal was placed in this 345th meeting of SEAC held on 10.01.2023. The details of the project are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The project proponent, Thiru.K.Silambarasan has applied for Terms of Reference for the proposed Rough Stone quarry lease over an extent 2.02.0 Ha at S.F.No.352/2 (Part-1) of Sökkampatti Village, Melur Taluk, Madurai 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 **2,04,792cu.m of rough stone and 1560 cu.m of topsoil** with an ultimate depth of 41m 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 for the restricted quantity of 1,95,882 cu.m of rough stone after removing 9th bench in section XY-CD & 6th bench in section XY-EF and 1,560 cu.m of top soil subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP shall furnish a letter from DFO on the proximity details of nearest RF with respect to the proposed project site.


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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.s
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.


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- h. Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
9. All corner coordinates of the mine lease area, superimposed on a HighResolution 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).
 10. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
 11. The PP shall furnish the revised manpower including the statutory & competent persons as required under the provisions of the MMR 1961 for the prosed quarry based on the volume of rock handled & area of excavation.
 12. 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.
 13. 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.
 14. 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.
 15. 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.
 16. 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


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- including traffic/vehicular movement study.
17. 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.
 18. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
 19. 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.
 20. 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.
 21. 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.
 22. 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.
 23. Impact on local transport infrastructure due to the Project should be indicated.
 24. 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.
 25. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
 26. Public Hearing points raised and commitments of the Project Proponent on the same along


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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.

27. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
28. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
29. 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.
30. 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.
31. 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
32. 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.
33. 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.
34. 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.


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35. 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.
36. 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.
37. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
38. 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.
39. 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.
40. 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.
41. 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.


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Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Aegle marmelos</i>	Vitvam	விவம்
2	<i>Adenanthera pavonina</i>	Marjadi	மஞ்சாடி ஆனாக்கத்தையம்மாள்
3	<i>Albizia lebbek</i>	Vaagai	வாளை
4	<i>Albiza amara</i>	Usal	உசல்
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>	Purnai	புள்ளை
13	<i>Cassia fistula</i>	Sarakondrai	சரக்கொன்றை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கொன்றை
15	<i>Chloroxylon swietenia</i>	Purasamaram	புரசு மரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Marjallavu	கோங்கு, மஞ்சள் இலவு
17	<i>Cordia dichotoma</i>	Naruvuli	நடுவளி
18	<i>Crotova adansonii</i>	Mavalingum	மாவலிங்கம்
19	<i>Dillenia indica</i>	Uva, Uzha	உவா
20	<i>Dillenia pentagyna</i>	SiruUva, Sitruzha	சீறு உவா
21	<i>Diospyro sebenuim</i>	Karungali	கருங்காளி
22	<i>Diospyro schloroxylon</i>	Vaganai	வாகளை
23	<i>Ficus amplissima</i>	Kallthu	கல் இச்சி
24	<i>Hibiscus tiliaceou</i>	Aatrupoovarasu	ஆற்றுப்பலகை
25	<i>Hardwickia binata</i>	Aacha	ஆச்சா
26	<i>Holoptelia integrifolia</i>	Aayili	ஆயா மரம், ஆயில்
27	<i>Lamna coronandolica</i>	Odhnam	ஒதியம்
28	<i>Lagerstroemia speciosa</i>	Poo Marudhu	பூ மருது
29	<i>Lepisanthus tetraphylla</i>	Neikottaimaram	நெய் கொட்டை மரம்
30	<i>Linoma acidissima</i>	Vila maram	வில்லா மரம்
31	<i>Litsea glutinos</i>	Pisimpattai	பிம்பட்டை பிச்சிப்பை
32	<i>Madhuca longifolia</i>	Illuppai	இலுப்பை
33	<i>Manilkara hexandra</i>	UlakkaiPaalai	உலக்கை பாலை
34	<i>Mimusops elengi</i>	Magizhamaram	மகிழ்மரம்
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	எச்சமரம்
39	<i>Pongamia pinnai</i>	Pungam	புங்கம்

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40	<i>Pennis setacea</i>	Munnai	முண்டை
41	<i>Pennis serratifolia</i>	Narumintaru	நடு முண்டை
42	<i>Pennis tenax</i>	Malipoovaraya	மலை முண்டை
43	<i>Prosopis cineraria</i>	Vattu maran	வட்டை மரம்
44	<i>Pterocarpus marsipium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vennangu, Tada	வேண்டாங்குடி
46	<i>Pterospermum indicum</i>	Polavu	பொலாவு
47	<i>Pulicaria latifolia</i>	Karipala	கரிபலா
48	<i>Salicornia peruviana</i>	Uga Maran	உகை மரம்
49	<i>Sapindus emarginatus</i>	Manipungan, Soapuka	மணிபுண்டி சோபுகா
50	<i>Sarcococa</i>	Asoci	அசோசி
51	<i>Strobilus asper</i>	Piray maran	பிரைய மரம்
52	<i>Strobilus nuxvomica</i>	Yeti	யேதி
53	<i>Strobilus potanensis</i>	Therthang Kottai	தேர்தங்க கோட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia bellerica</i>	Thandri	தாந்திரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேண்டா மரம்
57	<i>Tacca chrysantha</i>	Sandhana ventu	சாந்தானா வெந்து
58	<i>Thespesia populnea</i>	Puvarasu	புவாரசு
59	<i>Walsbya trifoliata</i>	valbura	வால்புரா
60	<i>Wrightia tinctoria</i>	Veppalai	வேப்பலை
61	<i>Pithecolobium dulce</i>	Kodakkapuli	கொடக்காபுலி

Discussion by SEIAA and the Remarks:-

The subject was placed in 591st authority meeting held on 09.02.2023. 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 following conditions and conditions mentioned in 'Annexure B' of this minutes.

- i) The proponent shall study in detail the impact of mining on the nearby river, agriculture/agricultural fields, ground water, water bodies, climate change, temperature, biodiversity and also sedimentation & erosion of water body .
- ii) A detailed hydrogeological study shall be furnished.


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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


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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.


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22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

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

Energy

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


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Climate Change

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

Mine Closure Plan

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

EMP

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

Risk Assessment

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

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/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.

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.


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40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

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



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infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other


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- 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).


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- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements; and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season) primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be


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SEIAA-TN

- given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
 - 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
 - 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
 - 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
 - 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
 - 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
 - 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.


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- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data


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- were collected and the sources should be indicated.
- d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
 - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
 - i) As per the circular no. J-11011/618/2010-IA.II (F) 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


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- solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
 4. Capital cost of the project, estimated time of completion.
 5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
 6. A detailed study of the lithology of the mining lease area shall be furnished.
 7. Details of village map, "A" register and FMB sketch shall be furnished.
 8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
 9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
 10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
 11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
 12. The EIA study report shall include the surrounding mining activity, if any.
 13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
 14. A study on the geological resources available shall be carried out and reported.
 15. A specific study on agriculture & livelihood shall be carried out and reported.
 16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
 17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of 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.


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20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro-geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.


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


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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, Madurai District.
7. Stock File.

From

To

Thiru.L.Sattanathan Sankar, M.Sc.,
Deputy Director,
Dept. of Geology and Mining,
Madurai.

Thiru K.Silambarasan,
S/o Karuppasmy
No.339,Mallakottai,
Thiruppathur,
Sivagangai.

Roc. No. 76/Mines/2021, dated.13.07.2021

Sub: Mines and Minerals - Minor Mineral - Rough Stone -
Madurai District - Melur Taluk - Sökkampatti Village
- Government land - in S.F. No.352/2 (Part-1) - Over
an extent of 2.02.0 Hects - Tender application
preferred by Thiru K.Silambarasan - Declared as
highest bidder - Precise area communicated - Draft
Mining Plan submitted - Approval accorded - Details
of quarries within 500 mts radius - Requested -
Regarding.

Ref: 1. Madurai District Gazette Notification No.17
dated.28.12.2020
2. Tender application preferred by Thiru
K.Silambarasan dated.20.01.2021.
3. Precise communication letter Roc
No.76/2021/Mines, dated.04.02.2021
4. Mining Plan approval letter Roc.No.
76/Mines/2021, dated.08.07.2021
5. Requisition letter received from Thiru
K.Silambarasan, dated.12.07.2021

In the reference 1st cited above, the District Collector, Madurai
has published the Madurai District Gazette Extraordinary Notification
No. 17, dated 28.12.2020 wherein the tender cum auction for 27
rough stone quarries on 20.01.2021 were notified.

One Thiru K.Silambarasan, S/o Karuppasmy, No.339,
Mallakottai, Thiruppathur, Sivagangai has declared as highest bidder
and precise area was communicated by the Assistant Director to the
highest bidder with a direction to submit the mining plan for the S.F.
No 352/2 (Part-1) over an extent of 2.02.0 hecets of Sökkampatti
Village, Melur Taluk, Madurai District as stipulated in rule 41 of Tamil

K. Silambarasan

Nadu Minor Mineral Concession Rules, 1959. Accordingly, Thiru K.Silambarasan has submitted the draft Mining Plan and the same have been approved on 08.07.2021.

In this connection the applicant has requested to furnish the details of quarry lease / mining lease situated within 500 mts radius from the subject quarry for obtaining Environment Clearance from the State level Environment Impact Assessment Authority.

In this connection it is stated that, the following existing / abandoned quarries are located within 500m radius distance from the proposed area for clearance.

a. Existing quarries


Sl No.	Name of the Owner	Village	S.F.No.	Extent (in hecets)	Collector's Proceedings No & date	Lease period
1.	C.Veeramalai	Chokkampatti	352 (Part-2)	1.00.0	Rcc.No.503/2018, Dt 21.02.2019	21.02.2019 20.02.2024

b. Abandoned / expired quarries

Sl No	Name of the Owner	Village	S.F.No.	Extent (in hecets)	Collector's Proceedings No & date	Lease period
1.	NIL					

c. Present proposed quarries

Sl No	Name of the Owner	Village	S.F.No.	Extent (in hecets)	Collector's Proceedings No & date	Lease period
1.	Thiru S.Maheswaran	Chokkampatti	352 (Part-3)	3.20.0	Proposed area	
2.	Thiru K.Silambarasan	Chokkampatti	352/2 (Part-1)	2.02.0	Proposed area	


Deputy Director,
Dept of Geology and Mining,
Madurai


R
12.7.2024


K. Silambarasan

From

Thiru.L.Sattanathan Sankar, M.Sc.,
Deputy Director,
Dept. of Geology and Mining,
Madurai.

To

Thiru K.Silambarasan,
S/o Karuppasmy
No.339,Mallakottai,
Thiruppathur,
Sivagangai.

Roc. No. 76/Mines/2021, dated.08.07.2021

Sir,

Sub: Mines and Minerals - Minor Mineral - Rough Stone - Madurai District - Melur Taluk - Sökkampatti Village - Government land - in S.F. No.352/2 (Part-1) - Over an extent of 2.02.0 Hects - Tender application preferred by Thiru K.Silambarasan - Declared as highest bidder - Precise area communicated - Draft Mining Plan submitted - Approval accorded - Regarding.

- Ref: 1. Madurai District Gazette Notification No.17 dated.28.12.2020
2. Tender application preferred by Thiru K.Silambarasan dated.20.01.2021.
3. Precise communication letter Roc No.76/2021/Mines, dated.04.02.2021
4. Letter dated.05.07.2021 received from Thiru K.Silambarasan along with draft mining plan.

In the reference 1st cited above, the District Collector, Madurai has published the Madurai District Gazette Extraordinary Notification No.17, dated 28.12.2020 wherein the tender cum auction for 27 rough stone quarries on 20.01.2021 were notified.

One Thiru K.Silambarasan, S/o Karuppasmy, No.339, Mallakottai, Thiruppathur, Sivagangai has declared as highest bidder and precise area was communicated by the Assistant Director to the highest bidder with a direction to submit the mining plan for the S.F. No 352/2 (Part-1) over an extent of 2.02.0 hecets of Sökkampatti Village, Melur Taluk, Madurai District as stipulated in rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

Accordingly Thiru K.Silambarasan has submitted the draft Mining Plan and the same has been examined in detail and it is found

K. Silambarasan

correct. The mining plan submitted by Thiru K.Silambarasan in respect of the subject area is approved subject to the following conditions:


- (i). 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.
- (ii). This approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884(Central Act IV of 1884) and the rules made there under the Tamil Nadu Minor Mineral Concession Rules, 1959.
- (iii). That the mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (iv). 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.
- (v). 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.
- (vi). Waste material should be dumped within the lease granted area as earmarked in the Mining Plan.
- (vii). Quarrying operations and production shall be carried out as per the approved Mining Plan and the applicant shall

K. Silambarasan

be liable to pay the cost of mineral if there is any deviation in the quantum indicated in the approved year wise quantum of production and any such cases as on date are to be dealt with as per Court direction.

- (viii). If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.
- (ix). The applicant shall strictly adhere to the statutory and safety requirements.

Encl: Approved Mining Plan.


Deputy Director,
Dept of Geology and Mining,
Madurai.

Copy To,

1. The Director,
Department of Geology and Mining,
Guindy, Chennai - 600 032.
2. Dr.P.Thangaraja, M.Sc., M.Ph.D.,
Qualified Person,
Regd. Off.No.17, Advaita Ashram Road,
Alagapuram,
Salem District - 636 004.


08/7/2021



**MINING PLAN AND PROGRESSIVE QUARRY
CLOSURE PLAN FOR SOKKAMPATTI
ROUGH STONE QUARRY**



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

Government Land / Lease Period = Five Years

IN

LOCATION OF THE QUARRY LEASE APPLIED AREA

EXTENT : 2.02.0ha
S.F.NOs : 352/2 (Part - 1)
VILLAGE : SOKKAMPATTI
TALUK : MELUR
DISTRICT : MADURAI
STATE : TAMIL NADU

FOR

APPLICANT

Thiru.K.Silambarasan,

S/o. Karuppusamy,

No.339, Mallakkottai,

Thiruppathur,

Sivagangai District - 630 566.

PREPARED BY

Dr. P. Thangaraju, M.Sc., Ph.D.,

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

K. Silambarasan



K.Silambarasan,
S/o. Karuppusamy,
No.339, Mallakkottai,
Thiruppathur,
Sivagangai District - 630 566.

CONSENT LETTER FROM APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Sockkampatti Rough stone Quarry in S.F.No.352/2 (Part - 1) over an extent of 2.02.0ha of Government land in Sockkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State has been prepared by

Dr. P. Thangaraju, M.Sc., Ph.D.,
Qualified Person

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

Dr. P. Thangaraju, M.Sc., Ph.D.,
Regd. Off. No. 17,
Advaitha Ashram Road,
Alagapuram, Salem District - 636 004.
Cell: +91 94422 78601 & 94433 56539.

I 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


K.Silambarasan

Place: Madurai
Date: 26.04.2021





K.Silambarasan,
S/o. Karuppusamy,
No.339, Mallakkottai,
Thiruppathur,
Sivagangai District – 630 566.

DECLARATION OF THE APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Sokkampatti Rough stone Quarry in S.F.No.352/2 (Part - 1) over an extent of 2.02.0ha of Government land in Sokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State has been prepared in full consultation with me.

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

Signature of the Applicant


K.Silambarasan

Place: Madurai

Date: 26.04.2021





CERTIFICATE

Certified that I am, **Dr. P. THANGARAJU**, M.Sc., Ph.D., having an office at Regd. Off. No. 17, Advaita Ashram Road, Alagapuram, Salem District – 636 004, holding a Post Graduate Degree in Geology (M.Sc. Geology) from Madras University, Chennai 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 Sökkampatti Rough stone Quarry in S.F.No.352/2 (Part - 1) over an extent of 2.02.0ha of Government land in Sökkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State for **Thiru.K.Silambarasan**, S/o, Karuppusamy, residing at No.339, Mallakkottai, Thiruppathur, Sivagangai District, Tamil Nadu State – 630 566. 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


Dr. P. Thangaraju, M.Sc., Ph.D.

Place: Salem

Date: 30.04.2021



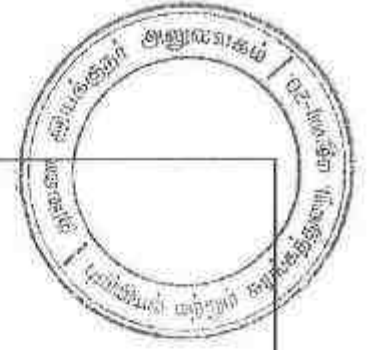
Dr. P. Thangaraju, M.Sc., Ph.D.,

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 Sokkampatti Rough stone Quarry in S.F.No.352/2 (Part - 1) over an extent of 2.02.0ha of Government land in Sokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State has been prepared for

Thiru. K.Silambarasan,

S/o. Karuppusamy,

No.339, Mallakkottai,

Thiruppathur,

Sivagangai District – 630 566.

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of the Assistant Director, Department of Geology and Mining, Madurai 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

Dr. P. Thangaraju, M.Sc., Ph.D.,

Place: Salem

Date: 30.04.2021

K. Silambarasan

Dr. P. Thangaraju, M.Sc., Ph.D.,

Regd. Off No. 17,

Advaitha 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 Sokkampatti Rough stone Quarry in S.F.No.352/2 (Part - 1) over an extent of 2.02.0ha of Government land in Sokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State has been prepared for

Thiru. K.Silambarasan,

S/o. Karuppusamy,

No.339, Mallakkottai,

Thiruppathur,

Sivagangai District – 630 566.

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

Dr. P. Thangaraju, M.Sc., Ph.D.,

Place: Salem

Date: 30.04.2021



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**MINING PLAN ALONG WITH PROGRESSIVE QUARRY CLOSURE PLAN
FOR SOKKAMPATTI ROUGH STONE QUARRY OVER AN EXTENT OF
2.02.0 Ha IN SOKKAMPATTI VILLAGE, MELUR TALUK, MADURAI
DISTRICT AND TAMIL NADU STATE.**

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

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

The Mining Plan and Environment Management Plan are prepared for **Thiru.K.Silambarasan**, S/o. Karuppusamy, residing at No.339, Mallakkottai, Thiruppathur, Sivagangai District, Tamil Nadu State – 630 566.

The Rough stone quarry lease applied area is a Government land. The applicant has preferred the application under Rule, 8 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the lease was granted through Tender Cum Auction and the highest bidder was awarded the lease as such **Thiru. K.Silambarasan**, has been successfully awarded tender for over an extent of **2.02.5 Ha** of Government land in S.F.No. 352/2 (Part - 1) of Sokkampatti Village, Melur Taluk, Madurai District under Rule 8 (6)(b) of Tamil Nadu Minor Mineral Concession Rules, 1959.

The application was processed by the Assistant Director, Department of Geology and Mining, Madurai District and passed a precise area communication letter vide **Rc.No.76/2021/Mines, Dated:04.02.2021** via Department of Geology and Mining, Madurai to submit an approved Mining Plan and to obtain Environment Clearance from the SEIAA of Tamil Nadu over an extent of **2.02.0 ha** of Government lands in S.F.No. 352/2 (Part - 1) of Sokkampatti Village, Melur Taluk, Madurai District for the period of five years with the conditions to provide:

1. The quarried out minerals should be transported after paid the necessary seniorage fee as per Appendix- II of Tamil Nadu Minor Mineral Concession Rules, 1959.
2. Should not cause any damage hindrance to the adjacent pattadhars.
3. Should not cause any damage hindrance to the adjacent village people, agricultural work while quarrying.

K. Silambarasan



4. The mining plan should include all the details mentioned in the Draft Minor Mineral Safety and Improvement Rules 2010.
5. The details in the mining plan should include all the details of the State Level Environmental Assessment Authority.
(Please refer Annexure No - I).

In order to ensure compliance of the order of the Honourable Supreme Court Dated: 27.02.2012 in I.A.No.12-13 of 2011 in Special Leave Petition SLP (C) No 19628-19629 of 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 Environment clearance mining project within the lease applied area up to less than 100Ha including projects or minor mineral with lease applied area less than 5ha would be treated as category B as defined in the EIA notification 2006 and will be considered by the state notified by MoEF and CC as prescribed procedure under EIA notification 2006.

In the above circumstances the applicant through his consultant is hereby preparing the mining plan and progressive quarry closure plan for Rough stone quarry to obtain approval and subsequent submission of Form-I, Form-IM and Pre-feasibility report to obtain Environment clearance from the SEIAA of Tamil Nadu. 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 Amended and judgments till 24.01.2019.

Short notes of Mining Plan:

- a. Village Panchayat - Sokkampatti
- b. Panchayat Union - Melur
- c. The Geological Resources are 7,59,392m³ of Rough stone and 9,122m³ of topsoil in the entire area.
- d. The Total Mineable Reserves are 2,04,792m³ of Rough stone and 1,560m³ of topsoil in the entire area.
- e. The proposed quantity of reserves/ (level of production) to be mined are 2,04,792m³ of Rough stone for the period of five years of the mining plan period.
- f. Total extent of the lease applied area = 2.02.0 Ha.
- g. Topography of the area = The area is an undulated topography.
- h. Proposed Depth of mining = 41m (6m above ground level + 35m below ground level)
- i. Mining Plan Period = Five years

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- j. It is a fresh lease application but, the applied area has been considered earlier. 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)
180	77	10m (R.L.193m to R.L.83m)

- k. Method of mining / level of mechanization.
Opencast mechanized method, the quarry operation involves shallow jack hammer drilling, slurry blasting.
- l. Type of machineries proposed in the quarrying operation.
Excavators attached with rock breaker (Rental Basis).
Jackhammer, Compressor (Diesel drive) (4 jack hammer capacity).
- 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 and the same will be maintained and utilized for Transportation of Rough stone.
- o. There is No Export of this Rough stone.
- p. Topo sketch covering 10Km and 1Km radius around the proposed area with markings of habitations, water bodies including stream, river, roads, major structure like bridges, wells, archeological importance, place of worship is marked and enclosed Plate Nos. IA and IB.
- q. The lease applied area is about 2.02.0 Ha bounded by nine corners; the corners are designated as 1 - 9 clockwise from the Northern side and the Co-ordinates for all the corners are clearly marked in the Plate No. II.
- r. The plans of proposed quarrying area showing the dimensions of the pit, their proposed depth and maximum area of proposed quarrying are enclosed in the Topography, Geological Plan and sections (Refer Plate No. III).
- s. General conditions will not applicable for the proposed area. The area applied for lease is 10Km away from the,
- Interstate Boundary,
 - Protected area under wild life protection ACT 1972,
 - Critically polluted areas as identified by CPCB,
 - Notified Eco sensitive areas.
- t. There is no wastage anticipated during this quarry operation, hence waste dump is not proposed in the lease applied area.
- u. Around 24 employees are deploying in the quarrying operation.

K. S. Kumar



- v. Total Cost of the project is about **Rs.86,65,000/-**.
- w. Infrastructures around the lease applied area given below in the table:

TABLE - 2

Particulars	Location	Approximate aerial distance and direction from lease applied area
Nearest Post Office	Kottampatty	2km - SW
Nearest School	Kottampatty	2km - SW
Nearest Dispensary	Natham	13km - West
Nearest Town	Natham	13km - West
Nearest Police Station	Natham	13km - West
Nearest Hospital	Natham	13km - West
Nearest D.S.P. Office	Melur	22km - South
Nearest Railway Station	Madurai	42km - SW
Nearest Airport	Madurai	42km - SW
Nearest Seaport	Thoothukudi	168km - SE
District Head quarters	Madurai	42km - SW

K. Sivanthi

**2.0 GENERAL INFORMATION**

2.1 a) **Name of the Applicant** : **Thiru.K.Silambarasan,**
S/o.Karuppusamy,

b) Address of the Applicant (With Phone No and Aadhaar Number):

Address : No.339, Mallakkottai,
Thirupathur,
Sivagangai District.

State : Tamil Nadu

Pin Code : 630 566

Mobile No : 9047874215 & 8056777917

Aadhaar Number : 5149 4660 8751

Email ID : megablucmetals@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 only.

b) Precise area communication letter details received from the competent authority of the Government:

The precise area communication letter was received from the Assistant Director, Department of Geology and Mining, Madurai District vide **Rc.No. 76/2021/Mines, Dated: 04.02.2021** to submit an approved mining plan and to obtain Environment Clearance from the SEIAA, Tamil Nadu.

c) Period of permission/ lease to be granted:

Five years.

d) Name, address & registered no. of the Qualified Person who preparing the Mining Plan:

Name : **Dr.P.Thangaraju, M.Sc., Ph.D.,**
Qualified Person

Address : No.17, Advaita Ashram Road,
Alagapuram, Salem - 636 004.

Mobile : 94422 78601 & 94433 56539

Telephone No. : 0427- 2431989

Email : infogeoexploration@gmail.com

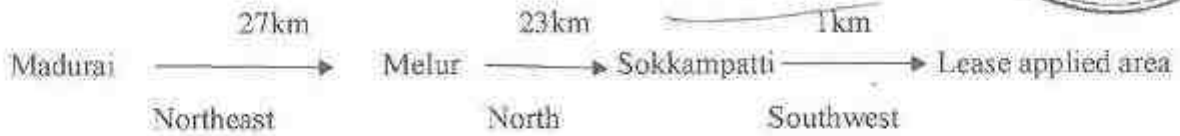
K. Silambarasan



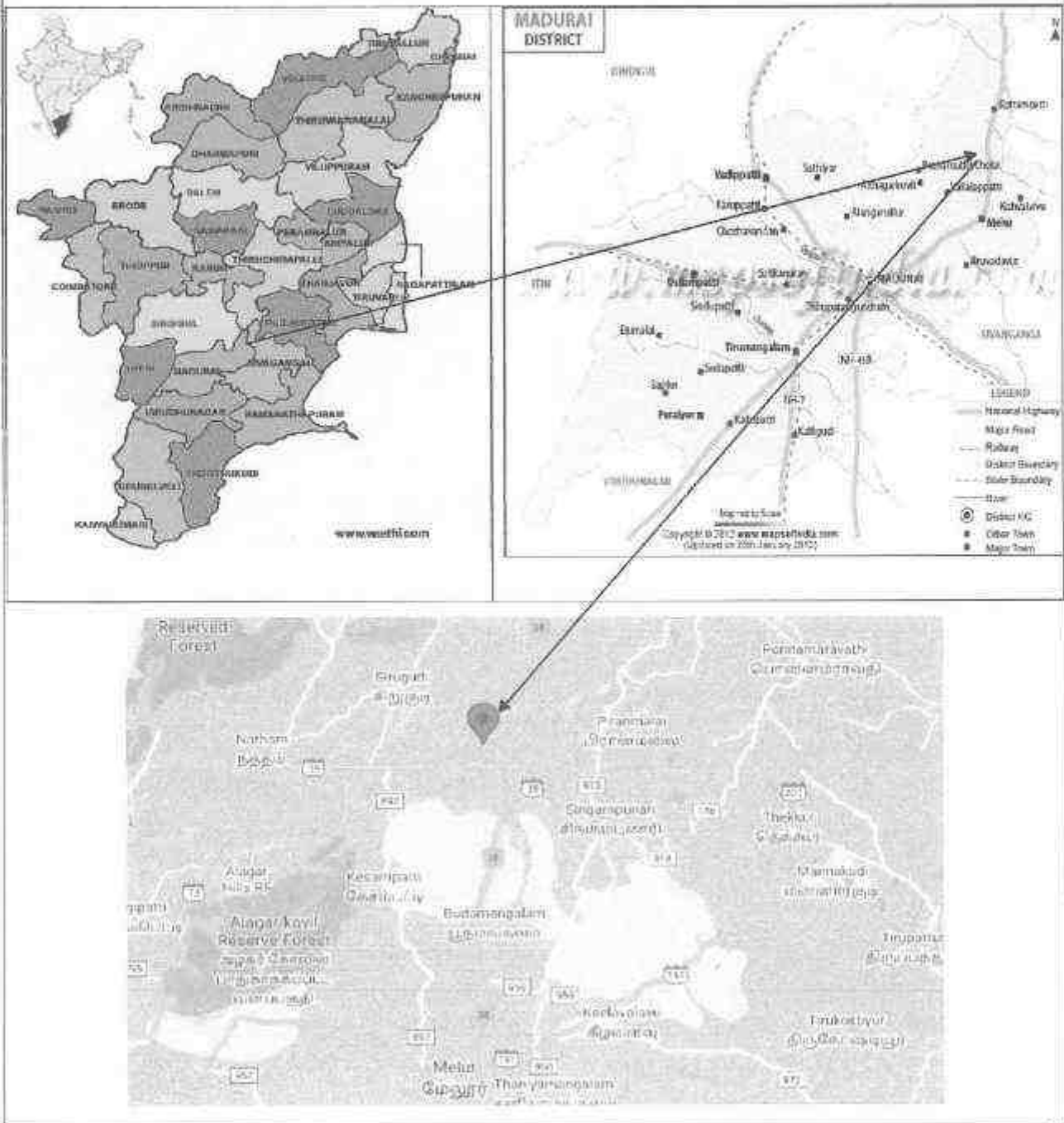
3.0 LOCATION

a) Details of the area with location map:

The lease applied area is located at a distance of 42km Northeastern side of Madurai, 22km Northern side of Melur and 1km Southwestern side of Sokkampatti Village.



Location Map of the Lease Applied Area



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TABLE - 3

District	Taluk	Village	S.F.No.	Area in Ha.	Classification
Madurai	Melur	Sokkampatti	352/2 (Part - 1)	2.02.0	Government land
Total Extent				2.02.0	

a) **Classification of the area (Ryotwari/ Poramboke / others):**

It is a Government Poramboke land, which is not fit for vegetation/ Cultivation.

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

It is a Government Poramboke land. The applicant has awarded tender from the Government.

b) **Toposheet No. with latitude and longitude:**

The lease applied area falls in the Toposheet No: 58 - J/08 Latitude between: 10° 13' 42.56"N to 10° 13' 52.06"N and Longitude between: 78° 21' 14.35"E to 78° 21' 17.52"E on WGS datum-1984. Please refer the Plate Nos. I to II.

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

The approach road is situated on the Northeastern side of the area which connects to the village road located on the Northeastern side of the area.

Multiple road access is available from the quarry to State Highways and National Highway, no towns are enrooted hence the traffic density is not much more due to 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 Madurai - Tiruchirapalli which is located about 33km on the Northwestern side of the area.

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 an undulated topography. The area has gentle sloping towards Southeastern side. The altitude of the area is 193m (max) above Mean Sea level. The area is covered by 1m thickness of Topsoil and followed by Massive Charnockite which is clearly inferred from the existing quarry pits. The Water table is found at a depth of 70m in summer and at 65m in rainy seasons. Average annual rainfall is about 928mm.

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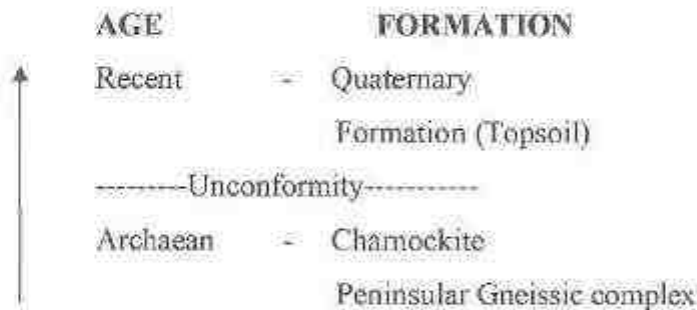


Topographical View of lease applied area



Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On the regional scale of the Charnockite body is N45°E – S45°W with dipping towards SE70°.

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 Madurai 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.

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**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 four sections have been drawn, one section is drawn Length wise as (X-Y) and other three cross section is drawn Width wise as (A-B, C-D and E-F) to cover the maximum area considered for calculation upto a depth of 41m.

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 are in terms of cubic meters (Volume) only and not in terms of tonnage.

Geological Resources (Plate No.III):

The Geological Resources of Rough stone are calculated to a maximum depth of 41m below from the elevated portion. The total Geological Resources are calculated after deduction of existing quarry pit (Refer Plate No. III):

TABLE - 4

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Geological Resources of Rough Stone (m ³)	Top soil (m ³)
XY-AB	i	58	69	1		4002
	ii	58	69	5	20010	
	iii	58	69	5	20010	
	iv	58	69	5	20010	
	v	58	69	5	20010	
	vi	58	69	5	20010	
	vii	58	69	5	20010	
	viii	58	69	5	20010	
	ix	58	69	5	20010	
Total					160080	4002
XY-CD	i	176	13	1		2288
	iii	176	13	4	9152	
	iii	176	90	1	15840	
	iv	176	90	5	79200	
	v	176	90	5	79200	
	vi	176	90	5	79200	
	vii	176	90	5	79200	
	viii	176	90	5	79200	
	ix	176	90	5	79200	
Total					500192	2288

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XY-EF	i	48	59	1		
	iii	48	59	5	14160	
	iv	48	59	5	14160	
	v	48	59	5	14160	
	vi	48	59	5	14160	
	vii	48	59	5	14160	
	viii	48	59	5	14160	
	ix	48	59	5	14160	
Total					99120	2832
Grand Total					759392	9122

Total Geological Resources of Rough stone : $7,59,392\text{m}^3$

Total Geological Resources of Topsoil : $9,122\text{m}^3$

Mineable Reserves:

The Mineable reserves are calculated after leaving the safety distance, bench loss and existing quarry pit to a maximum depth of 46m below from the elevated portion.

TABLE - 5

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Mineable Reserves of Rough Stone (m^3)	Top soil (m^3)
XY-CD	iii	176	62	1	10912	
	iv	171	62	5	53010	
	v	166	52	5	43160	
	vi	161	42	5	33810	
	vii	156	32	5	24960	
	viii	146	22	5	16060	
	ix	136	12	5	8160	
Total					190072	
XY-EF	i	40	39	1		1560
	iii	39	36	5	7020	
	iv	35	26	5	4550	
	v	30	16	5	2400	
	vi	25	6	5	750	
Total					14720	1560
Grand Total					204792	1560

Total Mineable Reserves of Rough Stone : $2,04,792\text{m}^3$

Total Mineable Reserves of Topsoil : $1,560\text{m}^3$

The Mineable reserves have been computed as $2,04,792\text{m}^3$ of Rough stone at the rate of 100% recovery and $1,560\text{m}^3$ of Topsoil to a maximum depth of 41m below from the elevated portion.

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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 jack hammer drilling, slurry 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 Jackhammer drilling and slurry 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.

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 Topsoil, the top soil ($1,560\text{m}^3$) will be safely removed and preserved within the applied area. After completion of quarry operation backfilled in the part of the quarry pit also spread out the quarried out top bench to facilitate the greenbelt development. The entire quarried out Rough stone will be consumed hence waste dump is not proposed. The composite Year wise Development and production plan and section indicating the Pit lay out, Green belt development are shown in Plate No - III.

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YEARWISE DEVELOPMENT AND PRODUCTION DETAILS
TABLE - 6

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Recoverable Reserve of Rough Stone (m ³)	Top soil (m ³)
I	XY-CD	iii	176	62	1	10912	
	XY-EF	i	40	39	1		1560
		iii	39	36	5	7020	
		iv	35	26	5	4550	
		Total					22482	1560
II	XY-CD	iv	171	62	5	53010	
		Total					53010
III	XY-CD	v	166	52	5	43160	
	XY-EF	v	30	16	5	2400	
		Total					45560
IV	XY-CD	vi	161	42	5	33810	
	XY-EF	vi	25	6	5	750	
		Total					34560
V	XY-CD	vii	156	32	5	24960	
		viii	146	22	5	16060	
		ix	136	12	5	8160	
		Total					49180
Grand Total						204792	1560

Total Proposed Reserves of Rough stone : **2,04,792m³**

The recoverable reserves have been computed as **2,04,792m³** of Rough stone for the period of five years @ 100% recovery upto a depth of 41m (1m Topsoil + 40m Rough stone) below from the elevated portion.

The company 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.



Mining Plan and PQCP

Sokkampattur Rough Stone Quarry

One lorry load	=	6m ³ (Approx)
Total Number of Working days	=	300 Days per year
Total quantity to be removed in this five years plan period	=	2,04,792m ³
Hence total lorry loads per day	=	2,04,792m ³ /6m ³
	=	34,132 Lorry loads
	=	34,132/5 years
	=	6,826/300 Days
	=	22 - 23 lorry loads 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	Jack hammer	6	30-35	1.2m to 2.0m	Compressed air
2	Compressor	2	-	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

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 Topsoil, the top soil will be safely removed (1,560m³) during the mining plan period. The quarried out topsoil will be preserved within the applied area and utilized for construction of bund and backfilled in the part of the quarry pit also spread out the quarried out top bench to facilitate the greenbelt development. There is no disposal of Topsoil. The excavated Rough stone will be directly loaded into Tippers to the needy customers.

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5.7. Brief notes on conceptual mining plan for the entire lease period based on the geological mining and environmental considerations:

A conceptual mining plan is prepared with an objective of long term systematic development of benches, layouts, selection of permanent structures, Maximum 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 (Max) (m)	Width (Max) (m)	Depth (Max) (m)
216	77	41m (AGL 6m + BGL 35m)

Greenbelt has proposed on the Panchayat roads by planting native species of Neem, Casuarina and Pongamia pinnata, etc., tree sapling. 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. 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.

Except topsoil, there is no wastage anticipated during the entire life of quarry. The quarried out topsoil will be preserved within the applied area and utilized for construction of bund and backfilled in the part of the quarry pit also spread out the quarried out top bench to facilitate the greenbelt development. The quarry area will be fenced with barbed wire fencing also safety bund constructed around the area to prevent inadvertent entry of public and cattle (Refer Plate No. IV).



6.0 **BLASTING**

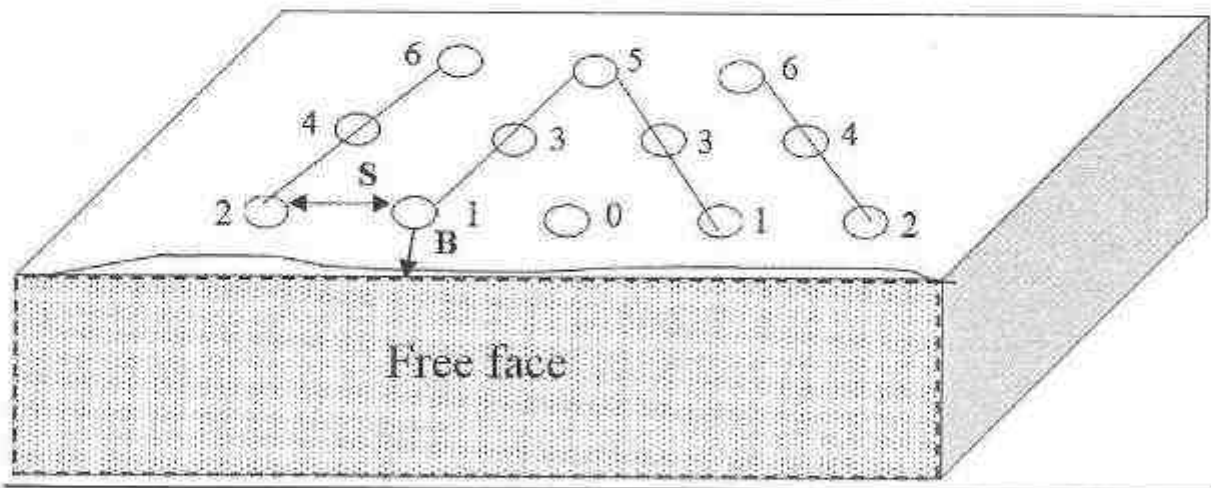
6.1 **Blasting pattern:**

The quarry operation is proposed to be carried out by Mechanized Opencast Method in conjunction with conventional method of mining using jack hammer drilling and slurry blasting for shattering effect and loosens 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	=	118 Holes

6.2 **Type of explosives to be used:**

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

K. Sivan



6.3 Measures proposed to minimize ground vibration due to blasting:

The quarry is situated more than 300m away from the nearby villages. Measures are being adopted for minimizing ground vibration and fly rock.

Shallow depths 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 into 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	= 118 Holes
Yield	= 354 Tons
Powder factor	= 6 Tons/Kg of explosives
Total explosive required	= 59 Kg-Slurry explosives
Charge/ hole	= 0.5 Kg
Blasting at day time only	= 12.00 noon – 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 having 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 70m in summer season and 65m in Rainy season which is observed from the nearby bore wells and the data obtained from 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.

TABLE - 9

Type	Distance & Direction	Location
Bore Well	950m Northern side	10°14'22.58"N 78°21'13.70"E

7.1. Arrangements and places where the mine water is finally proposed to be discharged:

The quarry operations are confined above the water table during the entire lease period. If water is encountered due to rain water seepage, the same will be pumped out by 5HP water pumps to facilitate the Greenbelt development areas in the either side of the approach road. 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 within 300m radius from the lease applied area.

8.2 Power Lines (HT/LT):

There is no EB(LT/HT) line or Housing area situated within 10m radius of the lease applied area.

8.3 Water bodies (river, ponds, lake, odai, canal, etc.):

Orani (S.F.No.352/3) is situated on the eastern side of the lease area, Hence 10m safety distance has been maintained. There is no other River, Pond, Lake, Canal, Reservoir located within 50m radius of the lease applied area.

8.4 Archaeological / historical monuments:

There is no Archaeological/historical monument located within 300m radius of the lease applied area.

8.5 Road (NH, SH):

The Nearest National Highway (NH-45B) Madurai – Tiruchirapalli Road is situated about 2km on the Southeastern side of the lease applied area.

The State Highway (SH-35) Dindigul – Tiruppathur is situated about 1.0km on the Southern side of the lease applied area.

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 / social forest / wild life sanctuary, Eco-Sensitive zone, etc., within 500m radius of the lease applied area.

K. S. Kumar



SALIENT FEATURES

TABLE - 10

S. No	Salient Features	Prescribed safety distance	If any present within prescribed distance, its actual distance and direction from the site																			
1.	Railways, Highways, Reservoirs or Canal	50m	None of the above situated within 50m radius.																			
2.	Village Road	10m	Village road is situated on the eastern side of the lease area, Hence 50m safety distance has been maintained.																			
3.	Habitation / Village	300m	There is no approved habitation located within 300m radius of the lease applied area (Refer Plate No I-B).																			
4.	Adjacent Patta Land / Govt. Land	7.5m/10m	<table border="1"> <thead> <tr> <th>Direction</th> <th>Classification</th> <th>Safety Distance</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>Govt. land / Road</td> <td>10m / 50m</td> </tr> <tr> <td rowspan="2">East</td> <td>Govt. land</td> <td>10m</td> </tr> <tr> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>South</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td rowspan="2">West</td> <td>Govt. land</td> <td>10m</td> </tr> <tr> <td>Patta land</td> <td>7.5m</td> </tr> </tbody> </table> <p>(Refer Plate No. II).</p>	Direction	Classification	Safety Distance	North	Govt. land / Road	10m / 50m	East	Govt. land	10m	Patta land	7.5m	South	Patta land	7.5m	West	Govt. land	10m	Patta land	7.5m
Direction	Classification	Safety Distance																				
North	Govt. land / Road	10m / 50m																				
East	Govt. land	10m																				
	Patta land	7.5m																				
South	Patta land	7.5m																				
West	Govt. land	10m																				
	Patta land	7.5m																				
5.	Housing area, EB line (HT & LT Line)	50m	There is no EB (LT/HT) line or Housing area situated within 50m radius of the lease applied area.																			
6.	Boundaries of the permitted area	7.5m/10m	<p>The boundaries of the permitted areas as follows:</p> <p>North - S.F.No. 359</p> <p>East - S.F.Nos. 352/3, 362 & 363</p> <p>South - S.F.No. 364</p> <p>West - S.F.Nos. 352/2(Part-2), 352/2(Part-3) & 358</p> <p>(Refer Plate No. II).</p>																			
7.	Reserve forest	60m	There is no reserved forest located within the radius of 60m 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).																			

K. Sivanappan



9.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES

9.1 **Employment potential (skilled, semi-skilled, un skilled):**

The following manpowers 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 mine's regulations, 1961.

a. Mine official & Competent Persons

Mines Manager/Mines Foreman	:	1
Mate/Blaster	:	1

b. Machinery Operators

Jack hammer operator	:	12
Excavator Operator	:	1
Tippers Driver	:	2

c. Ordinary Employee

Helper	:	3
Cleaner & Co-Operator	:	3
Security	:	1
Total	:	24

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 water vendors in Sokkampatti which is about 1.0km on the Northeastern side of the lease applied area.

b) **Sanitary Facilities:**

Hygienic modern Sanitary Facilities will be constructed within the safety area as semi-permanent structure and it will be maintained periodically.

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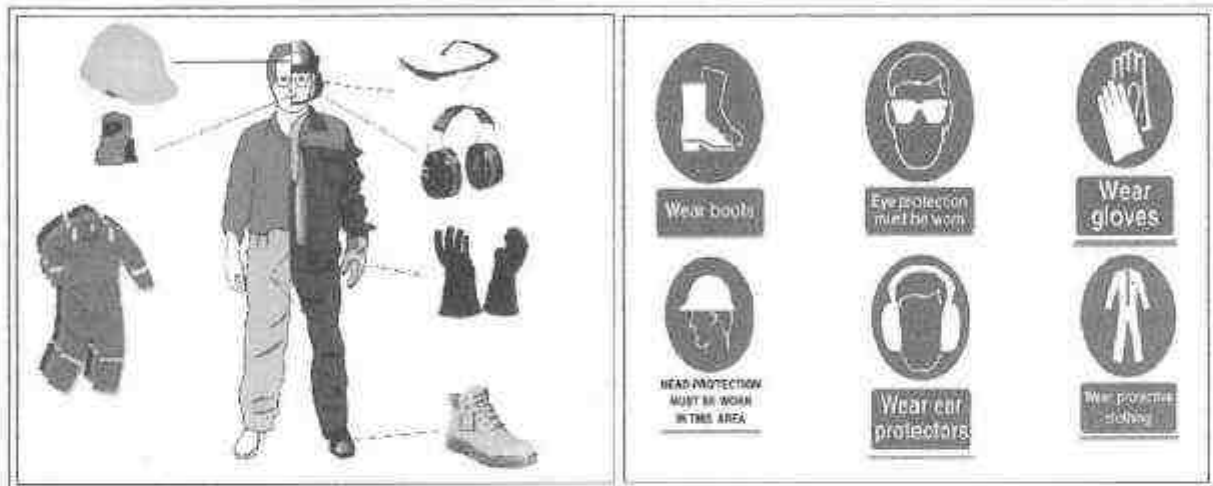
c) First aid facility:

First aid kits are kept in Mines office room, in case of such eventuality if the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager. He will be in charge of first aid and injured person will be taken to the hospital by the applicant's vehicle. Hospital is available in Natham located at a distance of 13.0km on the Western side.

d) Labour Health:

Before commencement of quarry also Periodical medical checkup related to occupational health safety will be conducted to all the workers by Applicant own cost.

e) Precautionary safety measures to the laborers:



- Helmets,
- Mine Goggles,
- Ear plugs,
- Ear muffs,
- Dust mask,
- Reflector jackets,
- Safety Shoes

All personnel protective device 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 & machinery and to create awareness about conventional opencast quarrying operations.

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**PART – B****10.0 ENVIRONMENT MANAGEMENT PLAN****10.1 Land use pattern:**

The lease applied area is situated an undulated topography. The area is a dry barren land also covered by rocky outcrops devoid of vegetation. Except quarry operation, the land has not used for any specific purpose.

Land Use Table – 11

Description	Present area (Ha)	Area at the end of this Mining plan period (Ha)
Area Under Quarrying	1.09.0	1.24.3
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.45.0
Unutilized Area	0.91.0	0.29.7
Grand Total	2.02.0	2.02.0

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>Cocos nucifera</i>	<i>Areaceae</i>	Coconut, Thennai	Tree	
2.	<i>Casuarina equisetifolia</i>	<i>Casuarinaceae</i>	Savukku	Tree	
3.	<i>Ziziphus jujube</i>	<i>Rhamnaceae</i>	Elandhai	Tree	
4.	<i>Capparis sepiaria</i>	<i>Capparaceae</i>	Karindu	Shrub	
5.	<i>Vitex negundo</i>	<i>Verbenaceae</i>	Nocchi	Shrub	

List of Fauna

S.No.	Scientific Name	Common Name	Picture
1.	<i>Papilio demoleus</i>	Lime butterfly	
2.	<i>Temenuchuspagodarum</i>	Brahmy myna	
3.	<i>Chameleon zeylanicus</i>	Indian chamaeleon	
4.	<i>Funambulus palmarum</i>	Indian palm squirrel	
5.	<i>Tateraindica</i>	Indian Gerbil	

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**10.4 Climatic Conditions:**

The area receives rainfall of about 928mm per annum and the rainy season is mainly from Oct - Jan during monsoon. The summer is hot with maximum temperature of 42°C and winter encounters a minimum temperature of 23°C.

10.5 Human settlement:

There are few villages located within 5.0km radius of the area; the approximate distance, direction and population are given below.

TABLE – 13

S. No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Sokkampatti	1.0km – NE	2800
2.	V.Pudhur	2.0km – SW	1500
3.	Kottampatty	2.0km – SE	5500
4.	Manappacheri	2.0km – SW	2000

Basic human welfare Amenities such as Health Centre, Schools, Communication Facilities, and Commercial Centres, etc., are available at Natham located at a distance of 13.0km on the Western 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 slurry blasting, 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 Mitigate 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**.

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.

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- Selection of new low – noise equipment's for the Rough stone quarry operation.
- Modifications of older equipment's.
- 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 Slurry 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 the 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:

Except topsoil, there is no wastage anticipated during this quarry operation. The entire quarried out materials will be utilized (100%). The quarried out topsoil will be preserved within the applied area and utilized for construction of bund and backfilled in the part of the quarry pit also spread out the quarried out top bench to facilitate the greenbelt development.

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 41m below from the elevated portion 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.1,98,000/-**.

K. Sivanthi

10.11 Programme of Greenbelt development (indicate extend, number, name of species to be afforested):

The safety zone along the side 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	100	80%	900	Neem, Pongamia pinnata, Casuarina, etc.,	80
II	100	80%	900		80
III	100	80%	900		80
IV	100	80%	900		80
V	100	80%	900		80

Nearly 4,500m² area is proposed to use under Greenbelt by planting 500 Numbers of trees during mining plan period with an anticipated survival rate of 80% (Please refer Plate No.III). The estimated budget for plantation and maintenance of Green belt development would be around Rs. 50,000/- for the period of five years.

The Greenbelt Development will be formed in around the approach road and Panchayat road of the lease applied area. The cost would be around Rs.40,000/-.

Proposed financial estimate / budget for (EMP) environment management:

Budget Provision for the Mining plan 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.

K. Sivanthi

A. Project cost / investment		
i) Land cost	It is a Government land, the tender cost is	= Rs. 51,15,000/-
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 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 cattle cost would be around	= Rs.1,98,000/-
iv) Labourers shed	Labour sheds will be constructed as semi-permanent structure. The cost would be around	= Rs.1,00,000/-
v) Sanitary facility	Adequate latrine and urinal accommodation shall be provided at conveniently accessible places the cost would be around	= Rs.80,000/-
vi) Others items	First aid room & accessories	= Rs.60,000/-
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. 1,00,000/-
viii) Sanitary arrangement	The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around	= Rs.60,000/-
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.50,000/-
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 drain	Construction of Garland drain with check dam to prevent surface run-off rain water in to the quarry pit, the construction cost is around	= Rs.1,62,000/-
xii) Greenbelt etc.	Greenbelt program will be carried out in quarried out benches the cost would be around	= Rs. 50,000/-
	Greenbelt program will be carried out in the Approach and Panchayat roads	=Rs.40,000/-.
Total Project Cost		= Rs.81,15,000/-

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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	81,15,000
B. EMP Cost	3,80,000
Total Project Cost (A+ B)	84,95,000
1. The applicant indents to involve corporate environment responsibilities (CER) activity like Water Purifier, Medicine Storage rack to the Dispensary and Water Purifier and Table facilities to the Government school at 2.0% from the total project cost. The Cost would be around Rs.1,70,000/-.	1,70,000
Total Cost	86,65,000
The Total cost would be around eighty six lakhs and sixty five thousand only.	



11.0 PROGRESSIVE QUARRY CLOSURE PLAN

11.1 Introduction:

The Progressive Quarry Closure Plan for Rough stone quarry lease applied area over an extent of 2.02.0 Ha of Government land in S.F.No. 352/2 (Part - 1) of Sokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu State has been prepared for Thiru.K.Silambarasan, S/o.Karuppusamy, residing at No.339, Mallakkottai, Thiruppathur, Sivagangai District, Tamil Nadu State - 630 566.

11.2 Present Land use pattern:

LAND USE TABLE - 16

Description	Present area (Ha)
Area Under Quarrying	1.09.0
Infrastructure	Nil
Roads	0.02.0
Green Belt	Nil
Unutilized Area	0.91.0
Grand Total	2.02.0

11.3 Method of Mining:

Open cast Mechanized Mining is being carried out with 5.0 meter height 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 jackhammer drilling and slurry blasting, hydraulic excavators is 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 entire lease period. The reason for closure will be discussed in the ensuing mining plan or final mine closure plan.

K. Silambarasan

**11.6 Statutory obligations:**

The company ensures to comply all the conditions were imposed before grant of quarry lease and during the course of quarry operations.

11.7 Progressive quarry closure plan preparation:

Name, address & registered no. of the Qualified Person who prepared the progressive closure plan and Name, address & registered no. of the executing agency who is involved in the preparation of progressive quarry closure plan.

Name : **Dr.P.Thangaraju, M.Sc., Ph.D.**
Qualified Person
Address : No.17, Advaita Ashram Road,
Alagapuram, Salem - 636 004.
Mobile : 94422 78601 & 94433 56539
Telephone No. : 0427- 2431989
Email : infogeoexploration@gmail.com

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:

There is no waste generated during entire life of quarry, hence backfilling is not possible in the quarried out pit. The entire quarry area is an active also no proposal given for Progressive quarry closure plan in the previous mining plan hence, the applicant has not taken any action for progressive quarry closure. Hence, review of implementation of progressive quarry closure does not arise at present. However, if any work done for progressive quarry closure plan during this plan period, it will be discussing in the ensuing Mining Plan.

11.9 Closure Plan:**(i) Mined Out Land:**

At the end of mining plan period, about 1.24.3 Ha of area will be mined out. Land use at various stages is given in the table below.

LAND USE TABLE-17

Description	Present area (Ha)	Area at the end of life of this quarry (Ha)
Area Under Quarrying	1.09.0	1.24.3
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.45.0
Unutilized Area	0.91.0	0.29.7
Grand Total	2.02.0	2.02.0

The Greenbelt Development will be formed in around the panchayat road of the lease applied area.

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**(ii) Water quality management:**

Following control measures will be adopted for controlling water pollution:

- Construction of garland drains to divert surface run-off from virgin area away from mining area.
- Construction of 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 in the approach road to prevent and control air pollution.

(iv) Top Soil and Waste Management:

The overburden is in the form of Top soil. The quarried out topsoil will be preserved within the applied area and utilized for construction of bund and backfilled in the part of the quarry pit also spread out the quarried out top bench to facilitate the greenbelt development. Except topsoil, there is no waste generated, hence waste management does not arise.

(v) Disposal of mining machinery:

All Machineries are engaged on rental basis. Hence, decommissioning or disposal of mining machinery does not arise.

K. S. Kumar

**(vi) Safety & Security:**

Safety measures will be implemented to prevent access in the excavation area an unauthorized person 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 for precautionary action of 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.

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- 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 quarried out benches, Greenbelt Development will be formed in around the top benches of the lease applied area.

(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.

K. S. Srinivasan

(ix) Economic Repercussion of Closure of Quarry and manpower Retrenchments:

The quarrying lease is granted for a maximum period of five years. For the production Programme envisaged, there will be no effect on the man power as the majority of persons belong 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.

(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, cost is assessed as given below:

LAND USE TABLE-18

ACTIVITY	YEAR					RATE	AMOUNT (INR)
	I	II	III	IV	V		
Plantation under safety zone(In Nos.)	100	100	100	100	100	@100 Rs Per sapling	Rs.50,000/-
Plantation Cost	10000	10000	10000	10000	10000		Rs.40,000/-
Plantation in quarried out bench and approach road (In Nos.)	80	80	80	80	80	@300 Rs Per Meter	Rs.1,98,000/-
Plantation Cost	8,000	8,000	8,000	8,000	8,000		Rs.1,62,000/-
Wire Fencing (In Mtrs) 660 Mtrs	1,98,000	-	-	-	-	@300 Rs Per Meter	Rs.1,62,000/-
Garland drain (In Mtrs) 540 Mtrs	1,62,000	-	-	-	-	@300 Rs Per Meter	Rs.1,62,000/-
TOTAL							Rs. 4,50,000/-



12.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT:

This Mining plan for Rough stone (Charnockite) 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 operation, 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

Dr.P.Thangaraju, M.Sc.,Ph.D.,

Qualified Person

Place: Madurai

Date: 30.04.2021

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan Approval Roc. No. 76/2021 Date. 30.04.2021

This Mining Plan is approved based on incorporation of the particulars specified under sub rule (7) (i) to (7) (vii) & 8 of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959 and subject to the future fulfillment of the conditions laid down under sub rule (9) of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

Deputy Director,
Geology and Mining,
Madurai. 3/4
R
28/07/21
B
08/07/21

K. Sivan



புவியியல் மற்றும் சுரங்கத்துறை

ந.க.எண். 76/2021 - கனிமம்

மாவட்ட ஆட்சியர் அலுவலகம் மற்றும் மதுரை

நாள்.04.02.2021

குறிப்பாணை

பொருள்: கனிமங்களும், சுரங்கங்களும் - மதுரை மாவட்டம் - மேலூர் வட்டம் - சொக்கம்பட்டி கிராமம் - புல எண்.352/2 (Part-1) -- 2020 ஹெக்டேர் பரப்பளவில் கல்குவாரி குத்தகை உரிமம் டெண்டர் இணைந்த ஏலம் முறையில் வழங்குவது - 20.01.2021 அன்று நடைபெற்று டெண்டர்/ஏலத்தில் உயர்ந்தபட்ச ஏலத் தொகையாக ரூ.51,15,000/- திரு.K.சிலம்பரசன் என்பவரால் ஏலம் கோரப்பட்டது - ஏலத்தொகை முழுவதும் செலுத்தப்பட்டது - கல்குவாரி செய்ய தகுதிசெய்த பரப்பாக தெரிவித்தல் - தொடர்பாக

- பார்வை
1. அரசாணை எண். 169, தொழில் (எம்.எம்.சி.1) துறை, நாள். 04.08.2020
 2. வருவாய் கோட்டாட்சியர், மேலூர் துவர்களின் ந.க.எண்.12/2020/ஆ1, நாள்.06.11.2020.
 3. மதுரை மாவட்ட அரசுதழ் சிறப்பு வெளியீடு எண்.17, நாள். 28.12.2020
 4. திரு.K.சிலம்பரசன் மற்றும் 12 நபர்கள் ஆகியோரின் ஏல / டெண்டர் விண்ணப்பம் நாள்- 20.01.2021.
 5. இவ்வலுவலக குறிப்பாணை எண். 76/2021-கனிமம் நாள். 20.01.2021
 6. திரு.K.சிலம்பரசன் என்பவரின் கடித நாள். 03.02.2021 உடன் செலுத்துச்சீட்டு மற்றும் வங்கி வரைவோலைகள்.

பார்வை 3-ல் கண்ட மதுரை மாவட்ட அரசுதழ் சிறப்பு வெளியீட்டின்படி அறகப் பறம்போக்கு புலங்களில் அமைந்துள்ள கல்குவாரிகளுக்கு டெண்டர் இணைந்த ஏல முறையில் குத்தகை உரிமம் வழங்கும் பொருட்டு அறிவிக்கை செய்யப்பட்டது. அதன்படி 20.01.2021 அன்று வருவாய் கோட்டாட்சியர், மேலூர், மற்றும் இணை இயக்குநர் / உதவி இயக்குநர் (பொ), புவியியல் மற்றும் சுரங்கத்துறை, மதுரை ஆகியோரால் டெண்டர் இணைந்த ஏலம் நடத்தப்பட்டது.

K. Sivan



அன்று பாரத ஸ்டேட் வங்கியில் ஓரசக் கணக்கில் செலுத்தி அதன் செலாவண சமர்ப்பித்துள்ளார்.

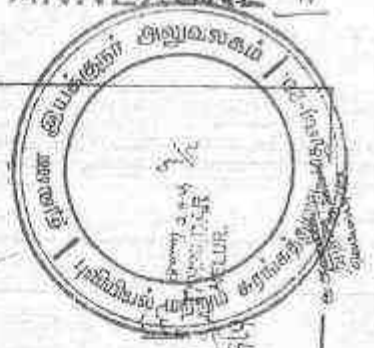
எனவே, மதுரை மாவட்டம், மேலூர் வட்டம், சோக்கம்பட்டி கிராமம், புல எண் 352/2 (Part-1) -ல் 2020 நேரகடேர் பரப்பில் அமைந்துள்ள புறம்போக்கு கல்குவாரியினை 1959-ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதி 8(8)-ன்படி உயர்நீதபட்ச ஏலதாரரான திரு.K.சீலம்பரசன் என்பவர் பெயரில் ஊர்ஜிதம் செய்து ஐந்து வருட காலத்திற்கு உடைகல் / ஐஸ்லி / சக்கை குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதி திரு.K.சீலம்பரசன் என்பவருக்கு தேசினிக்கப்படுகிறது.

நிபந்தனைகள்:

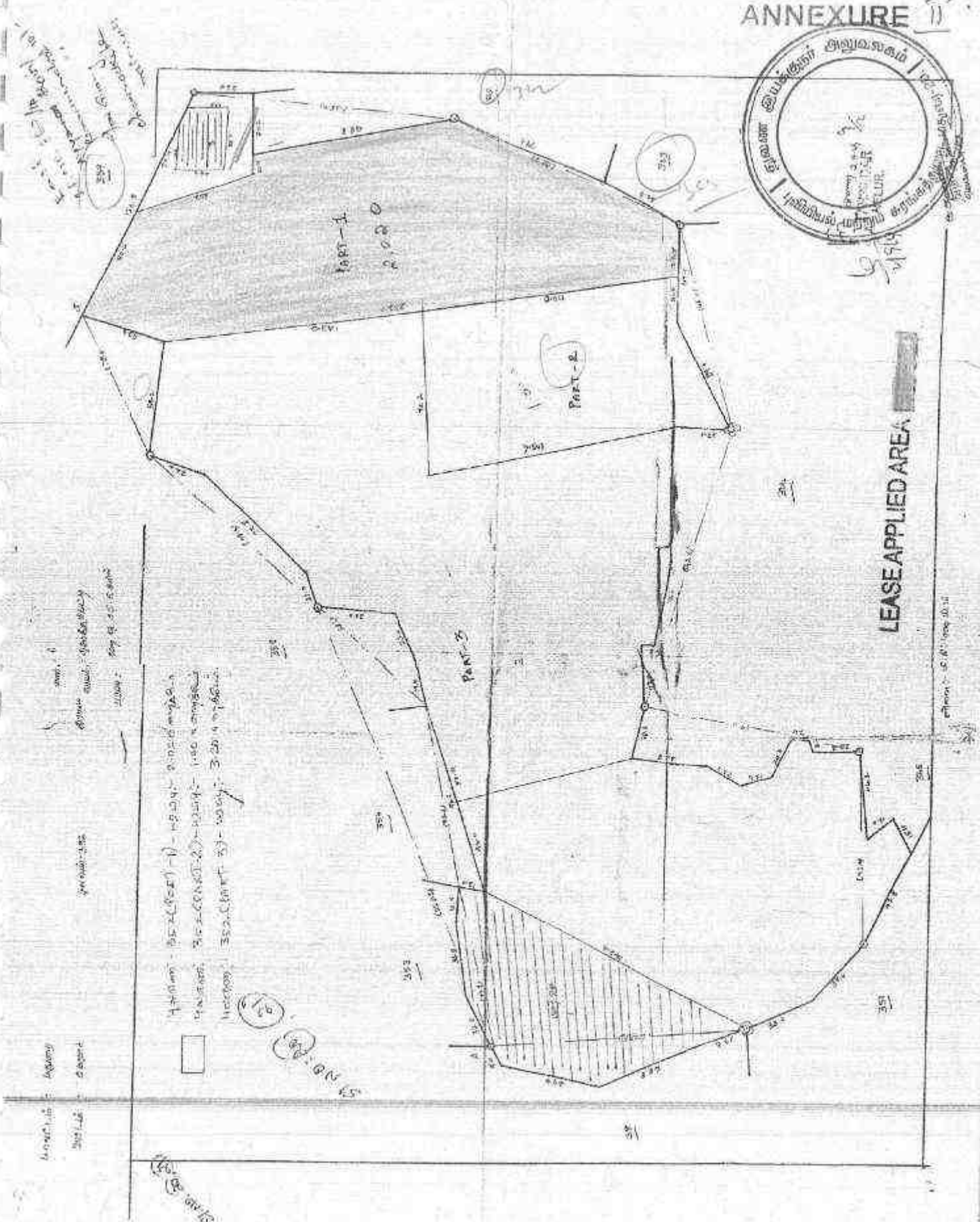
1. 1959 தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை IIல் கண்டுள்ளபடி குவாரி செய்ப்படும் கனிமங்களுக்குரிய சீனியரேஜ் தொகை அவ்வபோது செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.
2. அருகிலுள்ள பட்டாதாரர்களுக்கு எவ்வித இடையூறும் ஏற்படாத வண்ணம் குவாரிப் பணி மேற்கொள்ள வேண்டும்.
3. அருகிலுள்ள கிராம மக்களின் இருப்பிற்கும் இயக்கத்திற்கும் விவசாய பணிகளுக்கும் எவ்வித இடையூறும் ஏற்படாவண்ணம் குவாரி பணி மேற்கொள்ள வேண்டும்.
4. சுரங்கத் திட்டமானது வரைவு சிறுகனிம பாதுகாப்பு மற்றும் மேம்படுத்தாதல் விதிகள் 2010ல் சொல்லப்பட்ட அனைத்து விபரங்களையும் உள்ளடக்கி இருக்க வேண்டும்.
5. சுரங்கத் திட்டத்தில் உள்ள விபரங்கள் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் அனைத்து விபரங்களையும் உள்ளடக்கி இருக்க வேண்டும்.

மேலும் 1959-ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள் விதி எண் 21 மற்றும் 42-ன்படி குவாரிய்பணி மேற்கொள்வது தொடர்பாக இக்குரியபாணை விடைக்கப் பெற்ற 3 (மூன்று) மாத காலத்திற்குள் வரைவு சுரங்கத் திட்டத்தினை சமர்ப்பிக்குமாறும், மதுரை புவியியல் மற்றும் சுரங்கத்துறை

K. Sivan

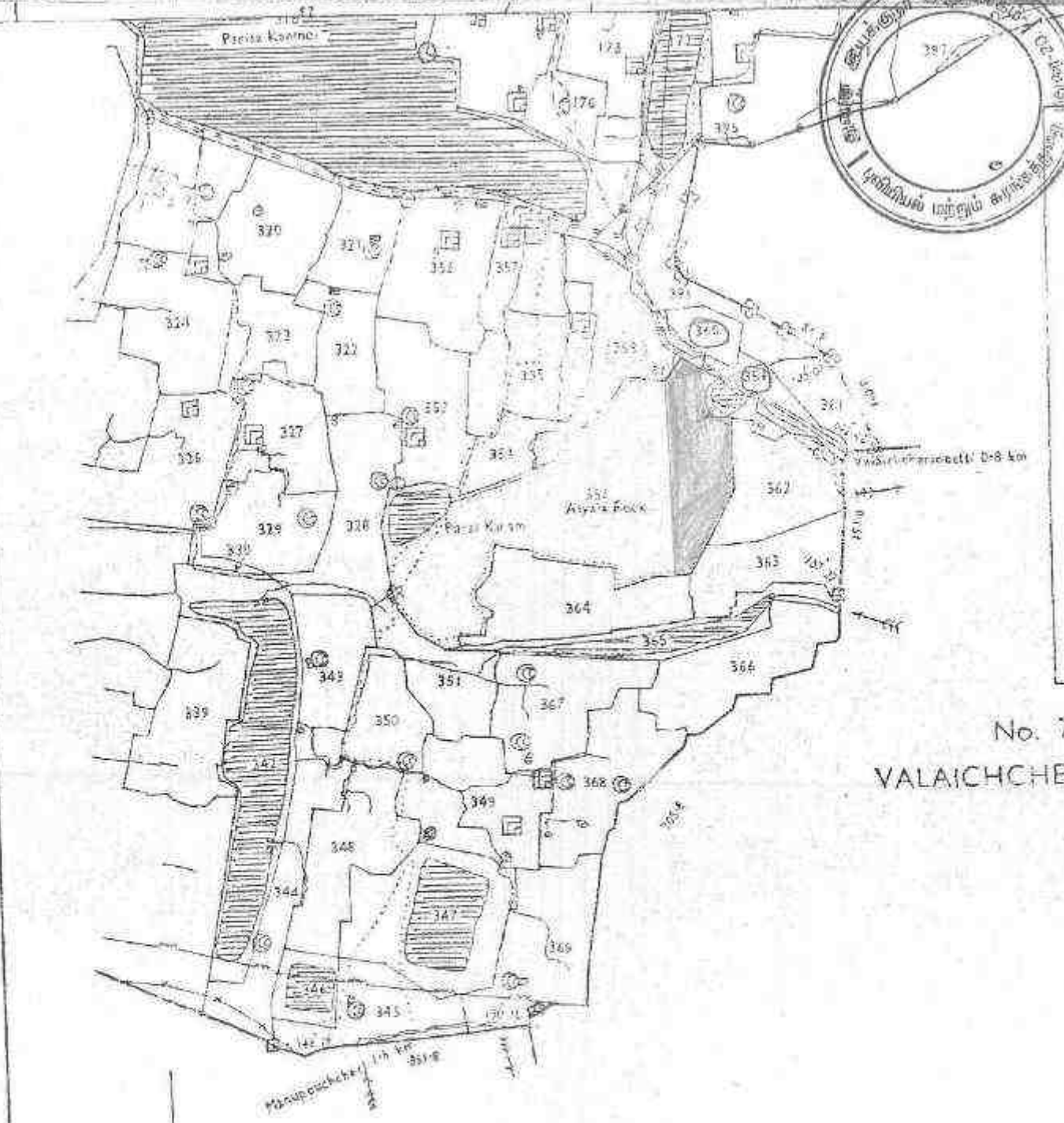
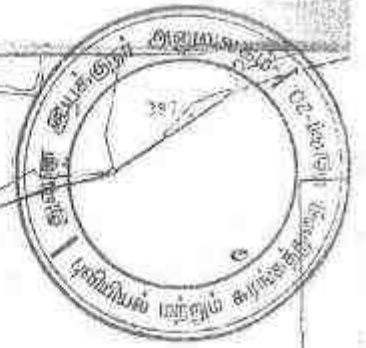


LEASE APPLIED AREA



Handwritten notes in Malayalam:
 1. പാർട്ട് - I - 2.020 ഏക്കർ
 2. പാർട്ട് - II - 1.00 ഏക്കർ
 3. പാർട്ട് - III - 3.20 ഏക്കർ

K. S. S. S.



No. 7
VALAICHCHI

சென்னை
சென்னை சிவில் அலுவலர்
ச. சேனாசாமி அய்யர்
சென்னை 61.0

LEASE APPLIED AREA

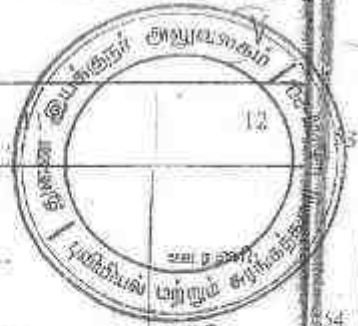
K. Sivan

நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					சாகுபடி யாளர் பெயர்.	முதல் கோவை.						
(1) நில முள்ளை எண்.	(2) உட்பிரிவு எண்.	(3) பரப்பு.	(4) தீர்வை.	(5) ஒரு கோவை அல்லது இரண்டு கோவை.		(6) கைப்பற்று தாரகுடைய பெயரும் என்னும் அல்லது அனுபேக தாரகுடைய பெயர்.	(7) நிலத்தின் எந்த பகுதி யாகவு சாகுபடியாளர் பயிரிடப்பட்டுள்ளது.	(8) எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	(9) பயிரின் பெயர்.	(10) பயிரான / அறுவடையான பெயர்.	(11) ச. சிவசுப்பிரமணியன் துணை இயக்குநர் அலுவலகம் / மெலூர் வட்டம்.	(12) விசைத்துறை அளவு விவரம்.
352	2	8/20	-	-	சுரே							
					12 ஊக்கம் பசல் /							



R. Sankar
 கிராம நிர்வாக அலுவலர்
 சி.சொக்கம்பட்டி கிராமம்
 மேலூர் வட்டம்

K. Sivan



1	2	3	4	5	6	7	8	9	10	11	12					
							கு. பை.	தொ-அர்ஸு.	பை.							
352	1	352-1	#	புற	...	...	...	0	73-0	...	...			
	2	-2	#	நி. ச. த.	...	...	...	8	12-0	...	...			
	3	-3	#	புற	...	...	...	0	20-5	...	...			
								9	05-5	...	...			
353	1	353-1	#	த(CC)	...	7-1	3	20	06	0	14-5	2	32	256	வே. கண்ணழக நாதன் செட்டியார்.	
	2	-2	#	த(CC)	...	7-1	3	20	06	0	14-0	2	34	1248	ரா. மணிகேசன் செட்டியார் (1) ரா. சின்னவரன் செட்டியார் (2)	
	3	-3	#	த(CC)	...	7-1	3	20	06	0	01-5	0	32	...	தரிசு.	
	4	-4	#	த(CC)	...	7-1	3	20	06	0	33-5	6	82	154	ரா.ம. உடைமய்யன்.	
	5A	-5A	#	த(CC)	...	7-1	3	20	06	0	12-0	2	43	152	ரா.ம. உடைமய்யன்.	
	5B	-5B	#	த(CC)	...	7-1	3	20	06	0	10-5	2	12	53	ரா.ம. தொங்க விங்கன்.	
	6	-6	#	த(CC)	...	7-1	3	20	06	0	09-0	1	79	154	ரா.ம. உடைமய்யன்.	
	7A	-7A	#	த(CC)	...	7-1	3	20	06	0	03-5	0	68	655	வி. பழனிச்சாமி.	
	7B	-7B	#	த(CC)	...	7-1	3	20	06	0	04-0	0	78	39	அ. அழகம்பன்.	
	8A	-8A	#	த(CC)	...	7-1	3	20	06	0	08-5	1	71	655	வி. பழனிச்சாமி.	
	8B	-8B	#	த(CC)	...	7-1	3	20	06	0	10-5	2	11	39	அ. அழகம்பன்.	
	9	-9	#	த(CC)	...	7-1	3	20	06	0	22-0	4	38	39	அ. அழகம்பன்.	
	10	-10	#	த(CC)	...	7-1	3	20	06	0	23-5	4	71	273	க. சரள அம்மன்.	
	11	-11	#	த(CC)	...	7-1	3	20	06	0	11-0	2	19	39	அ. அழகம்பன்.	
	12	-12	#	த(CC)	...	7-1	3	20	06	0	16-5	3	53	370	க. சிதம்பரம்.	
	13	-13	#	த(CC)	...	7-1	3	20	06	0	18-0	3	57	316	அ. சிதம்பரம் அம்மன்.	

19 ஜனவரி 1961
 கிராம நிர்வாக அலுவலர் (CC)-பரிசீலனைக்காகப் முன்னராகத் தயார் செய்யப்பட்டது.

K. Sivanappan

தமிழ்நாடு அரசு
2020



மதுரை மாவட்ட அரசிதழ்

சிறப்பு வெளியீடு

ஆணையின்மடி வெளியிடப்பட்டது



மதுரை, டிசம்பர் 28, 2020
மார்கழி 13, சார்வரி, திருவள்ளூர் ஆண்டு-2051

[எண் 17

மாவட்ட ஆட்சியர் அறிவிக்கை

(ந.க.எண். 446/2020 - கனிமம், நாள். 24.12.2020)

மதுரை மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் தேர்வு செய்யப்பட்டுள்ள கல் குவாரியிலிருந்து சாதாரண பொது உபயோக சிறு கனிமங்களைக் குவாரி செய்து எடுத்து செல்வதற்கான குத்தகை உரிம வழங்க வேண்டி மூடி முத்திரையிட்ட டெண்டர் விண்ணப்பங்கள் கோருதல் மற்றும் பொது ஏல அறிவிப்பு.

(அ) 1959 ஆம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி 8-ன் உள்விதி (1)-ன்படி இந்த அறிவிக்கையுடன் இணைக்கப்பட்டுள்ள அட்டவணையில் குறிப்பிடப்பட்டுள்ள அரசுப் புறம்போக்கு நிலங்களில் அமைந்துள்ள கல்குவாரிகளிலிருந்து கட்டுமானப் பணிக்குப் பயன்படும் சாதாரண உடைகல், குண்டுக்கல், சக்கைக்கல், ஜல்லி வெட்டி எடுத்துச் செல்ல ஏற்கனவே கல் உடைக்கப்பட்ட குவாரிக்கு ஐந்து ஆண்டு காலத்திற்கும், கல் உடைக்கப்படாத குவாரிக்கு பத்து ஆண்டு காலத்திற்கும் குத்தகை பெற மூடி முத்திரையிடப்பட்ட மறைமுக டெண்டரூடன் இணைந்த திறந்த முறை ஏலத்தின் மூலம் குவாரி குத்தகை கோரும் டெண்டர் மனுக்கள் முப்பிரதிகளில் மதுரை மாவட்ட ஆட்சியரால் 19.01.2021 காலை 5.00 மணி வரையிலும் வரவேற்கப்படுகிறது.

(ஆ) திறந்த முறை ஏலம் மற்றும் மறைமுக டெண்டர் உறைகள் திரும்ப ஆகிய நடைமுறைகள் மதுரை மாவட்ட ஆட்சியர் அலுவலக வளாகத்தில் உள்ள கூட்ட அரங்கில் 20.01.2021 ஆன்று காலை 11.00 மணிக்கு தொடங்கி நடத்தப்படும்.

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K. Sivan



பகுதி - I மனு செய்வதற்கான நிபந்தனைகள்

1. இவ்வறிக்கை தொடர்பான குவாரி குத்தகை கோரும் டெண்டர் மனுக்கள் 1968 ஆம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் இணைப்பு VI-ல் கண்டுள்ள படிவத்தில் அசல் மற்றும் இரண்டு நகல்களுடன் கொடுக்கப்பட வேண்டும். அதன் மாநிரிப்படிவம் இவ்வறிக்கையின் கடைசியில் இணைக்கப்பட்டுள்ளது. பிறசேர்க்கையில் பிரசுரிக்கப்பட்டுள்ள படிவம் VI-ன்படி பூர்த்தி செய்து அனுப்பப்படாத விண்ணப்பங்கள் ஏற்றுக்கொள்ளப்படமாட்டாது. மேற்படி படிவம் VI-ன்படி உரிய இணைப்புகளுடன் இல்லாத விண்ணப்பங்கள் மாவட்ட ஆட்சியரால் நிராகரிக்கப்படும்.

2. இந்த அறிவிக்கையின் இறுதியில் கண்டுள்ள அட்டவணையில் கொடுக்கப்பட்ட ஒவ்வொரு இனத்திற்கும் தனித்தனியாக மனுக்கள் கொடுக்கப்பட வேண்டும்.

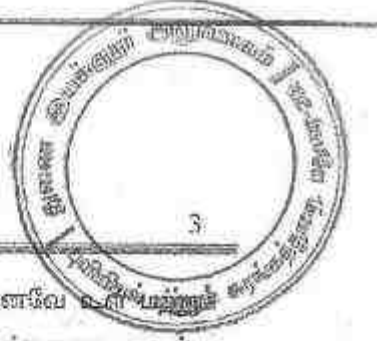
3. டெண்டர் மனுவுடன் கீழ்க்கண்ட சான்றிதழ்கள் மற்றும் ஆவணங்கள் அசல் மற்றும் இரண்டு நகல்களில் முறையே அசல் மற்றும் நகல் மனுக்களுடன் இணைத்து கொடுக்கப்பட வேண்டும்.

(அ) திரும்பப்பெற இயலாத விண்ணப்ப படிவ கட்டணமான ரூ.1500/-ஐ அரசு கருவூலத்தில் செலுத்திய சலான் மனுவுடன் இணைக்க வேண்டும் அல்லது ஏதேனும் ஒரு தேசியமயமாக்கப்பட்ட வங்கியில், வங்கி வரைவோலை (Demand Draft) "மாவட்ட ஆட்சியர், மதுரை" என்ற பதவி குறிப்பிட்டு எடுத்து இணைக்கப்பட வேண்டும்.

(ஆ) பிணை வைப்புத் தொகையாக (Earnest Money Deposit) ரூ.25,000/- மட்டும் மாவட்ட ஆட்சியர், மதுரை என்ற பெயருக்கு ஏதேனும் ஒரு தேசிய மயமாக்கப்பட்ட வங்கியில் வங்கி வரைவோலை (Demand Draft) பெற்று மனுவுடன் இணைக்கப்பட வேண்டும். தனி நபர் பெயருக்கு எடுத்துக் கொடுக்கப்படும் வங்கி வரைவோலை ஏற்றுக்கொள்ளப்பட மாட்டாது.

(இ) டெண்டர் மனுதாரர், தான் மறைமுகமாக குறிப்பிடும் அதிகபட்ச டெண்டர் தொகையில் 10 சதவீதம் தொகைக்கான வங்கி வரைவோலையை (Demand Draft) ஏதேனும் ஒரு தேசியமயமாக்கப்பட்ட வங்கியில் "மாவட்ட ஆட்சியர், மதுரை" என்ற பெயரில் மனுவுடன் இணைக்க வேண்டும்.

(ஈ) டெண்டர் மனுதாரர் தனியாகவோ அல்லது மற்றவருடன் கூட்டாகவோ இணைந்து தமிழ்நாட்டில் எந்தவொரு மாவட்டத்திலும் (i) ஏற்கனவே காலாவதியான குவாரி குத்தகை விபரம், (ii) நடப்பில் உள்ள குவாரி குத்தகை விபரம், (iii) குத்தகை கோரி மனு செய்யப்பட்டு, நிலுவையில் உள்ள மனுக்கள் விபரம் மற்றும் (iv) தற்போதைய மனுவுடன் ஒரே நேரத்தில் வேறு பகுதியில் குத்தகை கோரும் மனுக்கள் விபரம் ஆகியவைகள் அடங்கிய ஆணை உறுதி ஆவணத்தை, சான்று உறுதி அலுவலரின் ஒப்புதல் பெற்று இணைக்க வேண்டும்.



(உ) டெண்டர் மனுதாரர் நியந்தனை (ஈ) யில் கண்ட விபரப்படி ஏற்கனவே உள்ள மற்றும் மேலும் மேலாண்மை அதிகாரிகளில் குவாரி குத்தகை பெற்றிருப்பவரையின் கரங்க வரியினங்களான, ராயல்டி, சீரியரேஜ் தொலைக, முடக்குவரி, பரப்புவரி, எந்தலவரி மற்றும் எந்தல வரிக்கான கூடுதல் வரி மற்றும் அபராதம் ஏதேனும் விதிக்கப்பட்டிருப்பின் அந்த தொகைகளை செலுத்தியதற்கான "கரங்க வரி நிலுவையில்லா சான்று" பெற்று ஒப்படைக்க வேண்டும்.

(ஊ) டெண்டர் மனுதாரர், வருமானவரி செலுத்துபவராக இருப்பின், செல்லுபடியாகத்தக்க வருமானவரிச் சான்று பெற்று ஒப்படைப்பதுடன் (i) நாளது தேதிவரை வருமான வரி தொடர்பான கணக்குகளை அத்துறைக்கு சமர்ப்பித்ததாகவும், (ii) 1964-ம் ஆண்டு வருமான வரிச் சட்டத்தின்படி சய கணக்கீடு செய்து அதன் அடிப்படையில் வருமான வரி செலுத்தியதாகவும் குறிப்பிட்டு, ஆணை உறுதி ஆவணத்தில் ஒப்பமிட்டு சான்று உறுதி அலுவலரின் ஒப்புதல் பெற்று மனுவுடன் இணைக்க வேண்டும்.

(எ) மேற்கண்ட ஆணை உறுதி வாக்குமூலங்கள் (Affidavit) ரூ.20/- மதிப்புள்ள முத்திரைத்தாள்களில் நோட்டரி பப்ளிக் முன்பு கையொப்பமிட்டதாக இருக்க வேண்டும்.

4. மேற்கண்ட இணைப்புகளுடன், அசல் மனு மற்றும் இரண்டு நகல்கள் ஆகியவற்றை எழுத்துக்கள் தெரியாத வகையில் உள்ள காசிக் உறையிலிட்டு, அதில் வேண்டிய இடங்களில் அரக்கு கொண்டு சீல் வைத்து பின்னர் உறையின் மேல் அட்டவணையில் கண்ட குவாரி வரிசை எண், கிராமம் மற்றும் புல எண்வரைக் குறிப்பிட்டு, குத்தகை கோரும் டெண்டர் மனு என்று தலைப்பிட்டு, அதன் கீழ் டெண்டர் மனுதாரரின் பெயர் மற்றும் சரியான முகவரி எழுதியும், பெறுநர், "மாவட்ட ஆட்சியர், மதுரை மாவட்டம்" என்று தெளிவாகவும் எழுதி கீழ் குறிப்பிடப்பட்ட அலுவலருக்கு 19.01.2021 அன்று மாலை 5.00 மணிக்குள் கிடைக்குமாறு அனுப்பி வைக்க வேண்டும்.

உதவி இயக்குநர்,
புவியியல் மற்றும் கரங்கத்துறை,
மாவட்ட ஆட்சியர் அலுவலகம்,
மதுரை

5. நேரடியாக அலுவலகத்தில் கொடுக்கப்படும் முத்திரை இடப்பட்ட டெண்டர் உறைகளை பெற்றுக் கொண்டமைக்கான தமிழ்நாடு சிறுகணிம சலுகை விதிகள், 1959-ன் பின்னிணைப்பு IX-ல் கண்ட படிவத்தில் ஒப்புதல் கடிதம் வழங்கப்படும். பதிவுத்தபாலில் அனுப்பி வைக்கப்படும் உறைகளுக்கு, அவை அலுவலகத்தில் கிடைக்கப்பெறும் நாளிலிருந்து மூன்று தினங்களுக்குள் ஒப்புதல் கடிதம் அனுப்பி வைக்கப்படும்.

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6. குறிப்பிட்ட காலக்கெடு முடிந்த பின்னர், அலுவலரால் பெறப்பட்டு முத்திரை வைக்கப்படாத டெண்டர் உறைகள் மற்றும் உறையின் கீழ் பெறுநர் "மாவட்ட ஆட்சியர், மதுரை மாவட்டம்" எனக் குறிப்பிடப்படாத டெண்டர் உறைகள் ஏற்றுக்கொள்ளப்படாமலேயே டெண்டர் மனுதாரருக்கு திருப்பப்படும்.

7. டெண்டர் விண்ணப்பப்படிவத்தில் மனுச் செய்யும் நபர்கள் தாங்கள் மனுச் செய்யும் குவாரிக்கு குத்தகையாகச் செலுத்த விரும்பும் தொகையை விண்ணப்பத்தில் குறிப்பிடாமல் இருந்தாலோ, அல்லது பிணை வைப்புத் தொகைக்கான காசோலைகளை விண்ணப்பத்தில் இணைக்காமல் இருந்தாலோ, விண்ணப்பதாளில் விண்ணப்பதாரர் தன் கையொப்பம் செய்யாமல் இருந்தாலோ, தமிழ்நாடு சிறு கனிம சலுகை விதிகளில் கூறப்பட்ட ஆணை உறுதி வாக்கு மூலங்கள் எதுவும் இணைக்கப்படாமல் இருந்தாலோ, மேற்படி டெண்டர் விண்ணப்பம் மாவட்ட ஆட்சியரால் அல்லது அவரால் அங்கீகரிக்கப்பட்ட அலுவலரால் நிராகரிக்கப்படும்.

8. மேற்குறிப்பிட்டவாறு விண்ணப்பம் நிராகரிக்கப்பட்ட டெண்டர் விண்ணப்பதாரர்களுக்கு டெண்டர் திறக்கும் சமயத்தில் அவர் இருந்திருப்பின் மாவட்ட ஆட்சியர் அல்லது அவரது அங்கீகாரம் பெற்றுள்ள அலுவலரால் விண்ணப்பதாரிடம் தக்க ஒப்புதல் பெற்று காசோலை திருப்பி வழங்கப்படும். டெண்டர் திறக்கும் சமயத்தில் ஆஜரில் இல்லாத நபருக்கு பதிவஞ்சல் கடிதத்தில் கேட்பு காசோலை (Demand Draft) தனியே அனுப்பி வைக்கப்படும். ஆனால் அவ்வாறான விண்ணப்பதாரர் ஏலத்தில் அதிகத் தொகைக்கு ஏலம் கேட்டிருந்து, ஏற்கனவே பிணை வைப்புத் தொகையும் செலுத்தியிருப்பின் அவரது விண்ணப்பம் ஏற்றுக் கொள்ளப்படும்.

9. முன் குறிப்பிடப்பட்ட நிபந்தனைகளின்படி பெறப்பட்ட டெண்டர் உறை அனுப்பிய மனுதாரர்கள் டெண்டர் உறைகள் திறக்கப்படும் போது ஏல அரங்கில் இருக்க அனுமதிக்கப்படுவர்.

10. அலுவலரால் பெறப்பட்ட முத்திரை இடப்பட்ட டெண்டர் உறைகள் திறக்கப்படுவதற்கு முன் இந்த அறிவிக்கையுடன் இணைக்கப்பட்டுள்ள அட்டவணையில் குறிப்பிடப்பட்ட ஒவ்வொரு இணைங்களுக்கும் திறந்த முறை போது ஏலம் 20.01.2021 அன்று காலை 11.00 மணியளவில் தொடங்கி தொடர்ந்து நடத்தப்படும்.

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பகுதி - II திறந்த முறை பொது ஏலத்தில் கலந்து கொள்வதற்கான நிபந்தனைகள்

1. பொது ஏலத்தில் கலந்து கொள்ள விரும்புவர் பகுதி I-ல் குறிப்பிடப்பட்டவாறு மனு மற்றும் ஆவணங்களை அசல் மற்றும் இரண்டு நகல்களுடன் ஏல நாளான 20.01.2021 அன்று காலை 11.00 மணிக்கு ஒவ்வொரு கல்குவாரிக்கும் பொது ஏலம் நடக்கும் போது நேரிடையாக பொது ஏலத்தில் கலந்து கொள்ளலாம்.

2. திறந்த முறை ஏலத்தில் கலந்து கொள்ள மனு கொடுப்போர், மனுவின் இனம் 9-ல் கண்டுள்ள வினாவில் டெண்டர் / கேட்புத் தொகை குறிப்பிடத் தேவையில்லை.

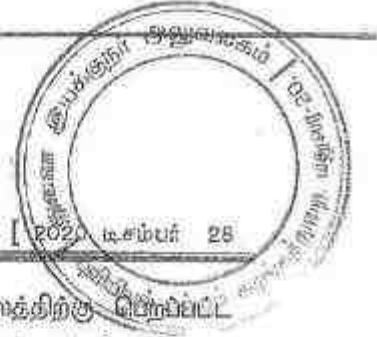
3. மூடி முத்திரையிடப்பட்ட உறையின் மூலம் டெண்டர் மனு கொடுத்துள்ள நபர் இரண்டாம் முறைபாக மனு கொடுக்க தேவையில்லை. ஆனால் அவர்கள் நேரடியாக திறந்தமுறை பொது ஏலத்திலும் கலந்து கொள்ளலாம்.

4. முத்திரை இடப்பட்ட டெண்டர் உறை கொடுத்துள்ள மனுதாரர் மற்றும் பொது ஏலத்தில் கலந்து கொள்ள உள்ள மனுதாரர் ஆகியோர், பொது ஏலத்தில் கலந்து கொள்ள இயலாத நிலையில் அவர்களது நியமனம் பெற்ற மற்றொரு நபர் மனுதாரரின் ஒப்புதல் கடிதம் பெற்று அதனை சான்று உறுதி அலுவலரின் மேலொப்பம் பெற்று அதனையும், விண்ணப்பம் கொடுத்ததற்கான அலுவலரிடமிருந்து பெறப்பட்ட அசல் ஒப்புதல் கடிதத்தையும் ஏலம் நடத்தும் அலுவலரிடம் ஒப்படைத்துவிட்டு, ஏலத்தில் கலந்து கொள்ள வேண்டும். ஏலம் முடிவடைந்தவுடன் அலுவலர் கொடுத்த ஒப்புதல் கடிதம் மட்டும் திரும்ப ஒப்படைக்கப்படும்.

5 (அ) மாவட்ட ஆட்சியரோ அல்லது அவரது அதிகார அனுமதி பெற்ற அலுவலரோ குவாரி குத்தகை தொடர்பாக திறந்தமுறை ஏலம் நடத்துவார். அப்போது திறந்தமுறை ஏலத்திற்கு மனு கொடுத்தவர்கள் மற்றும் டெண்டர் உறை கொடுத்தவர்களும் தான் கொடுக்க விரும்பும் ஏலத்தொகையை கூற அனுமதிக்கப்படுவர்.

(ஆ) மனுதாரர் அல்லது அவரது அதிகாரம் பெற்ற நபர் யாரேயினும் ஏலத்தில் கலந்து கொள்ளாதபோதும், ஏலம் நடத்தப்பட்டு டெண்டர் உறைகள் திறக்கப்பட்டு விதிமுறைகளின்படி, மேல்நடவடிக்கை தொடரப்படும்.

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6. ஏலம் முடிந்தபின் ஏலம் நடத்தும் அலுவலர், திறந்தமுறை ஏலத்திற்கு வெற்றிபெட்ட மொத்த மனுக்களின் எண்ணிக்கை மறு கொடுத்துள்ளவர்களின் பெயர், அதிகபட்சமாக கூறப்பட்ட ஏலத் தொகையை குறிப்பிட்டு ஏலம் கூறிய நபர் மற்றும் முகவரி ஆகியவற்றை ஏலம் நடத்தப்படும் இடத்திலேயே அறிவிப்பார்.

7. பின்னர் குத்தகை கோரி பெறப்பட்ட எல்லா மூல முத்திரை இடப்பட்ட டெண்டர் உறைகளும் திறக்கப்பட்டு, அவற்றில் உள்ள மனுக்கள், ஏலதாரர்கள் மற்றும் டெண்டர்தாரர்கள் முன்னிலையில் ஆய்வு செய்யப்படும்.

8. பகுதி-I-ல் கண்ட நிபந்தனை 3-ல் குறிப்பிடப்பட்டுள்ள ஆவணங்கள் மற்றும் தொகைக்கான வரைவோலைகள் இணைக்கப்படாத மனுக்களும், மனுவின் இனம் 9-ல் டெண்டர் தொகைக்கான குறிப்பிடாத மனுக்களும், டெண்டர்தாரரின் கையொப்பம் இடப்படாத மனுக்களும் தவறான விபரங்கள் எழுதப்பட்ட மனுக்களும் செல்லத்தகாதவை என்று முடிவு செய்யப்பட்டு ஏலக்கூட்டத்திலேயே அறிவிக்கப்படும். இதற்கான தனியே எழுத்து மூலமாக ஆணை ஏதும் பிறப்பிக்கப்பட மாட்டாது. இதுபற்றி மனுவின் மீது விபரம் எழுதப்பட்டு டெண்டர்தாரரின் ஒப்புதல் பெறப்படும்.

9. செல்லாததாகத்தக்க மனுக்கள் ஆய்வு செய்யப்பட்டு அவற்றில் அதிகபட்ச டெண்டர் தொகை குறிப்பிடப்பட்டுள்ள டெண்டர்தாரரின் பெயர் மற்றும் முகவரி ஆகியவை ஏலக்கூட்டத்தில் அறிவிக்கப்படும்.

10. ஒவ்வொரு குவாரிக்கும் பெறப்பட்ட டெண்டர் விண்ணப்பங்களில் குறிப்பிடப்பட்டுள்ள அதிகபட்சமான குத்தகைத்தொகை அல்லது ஏலத்தின் மூலம் கேட்கப்படும் அதிகபட்ச ஏலத்தொகை இவற்றில் ஏது அதிகமோ அந்த தொகைக்கு டெண்டர்/ஏலம் கேட்ட நபர் குத்தகை பெற தகுதியானவர் என ஏல ஆரங்கில் மாவட்ட ஆட்சியர் அல்லது மாவட்ட ஆட்சியரால் அங்கீகரிக்கப்பட்ட அலுவலரால் அறிவிக்கப்படும்.

11. முதல் நிலை பொது ஏலத்தில் கூறப்பட்ட அதிகபட்ச ஏலத் தொகையைவிட அதிகமாக மறைமுக டெண்டர் முறையில் இரண்டு அல்லது அதற்கு மேற்பட்ட நபர்கள் ஒரே டெண்டர் தொகை குறிப்பிட்டுருந்தால் அவ்வாறு குறிப்பிட்ட டெண்டர்தாரர்களிடையே இரண்டாம் நிலை திறந்த முறை பொது ஏலம் நடத்தப்பட்டு, அதில் அதிகத்தொகை செலுத்த முன் வருபவர் குவாரி குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்படுவார்.

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12. முதல் நிலை திறந்த முறை பொது ஏலத்தில் கூறப்பட்ட அதிகபட்ச ஏலத் தொகையும் மன்றமுக டெண்டர் முறையில், குறிப்பிட்ட அதிகபட்ச டெண்டர் தொகையும், ஒரே தொகையாக இருந்தால் அவ்விரு தொகைகளை கூறிய நபர்களிடையே இரண்டாம் நிலை திறந்த முறை ஏலம் நடத்தப்பட்டு அதில் அதிகத்தொகை செலுத்த முன்வருபவர் குவாரி குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்படுவர்.

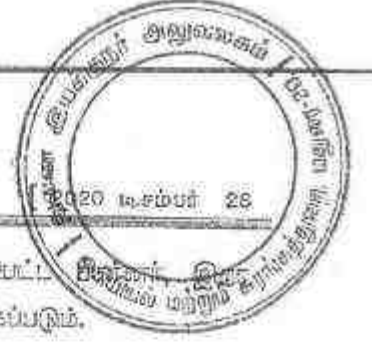
13. (அ) அதிகபட்ச ஏலத் தொகை கோரி குவாரி குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்பட்ட நபர், அதிகபட்ச ஏலத் தொகையில் 10% சதவீத தொகையை உடனடியாக ஏலம் நடத்திய அலுவலரிடம் செலுத்தி ஒப்புநல் கடிதம் பெற்றுக் கொள்ள வேண்டும். மீதி 90% சதவீதத் தொகையை ஏலம் நடைபெறும் நாளிலிருந்து ஏழு நாட்களுக்குள் செலுத்தக் கோரி அறிவிப்பு ஒப்புநல் கடிதத்திலேயே குறிப்பிடப்பட்டிருக்கும்.

(ஆ) மேலே குறிப்பிட்டவாறு அந்தந்த குவாரிக்கான ஏலக்கேப்பு முடிவு செய்யப்பட்ட உடன் 10% சதவீத தொகை செலுத்தாத பட்சத்தில் அந்த நபரால் ஏற்கனவே அரசுக்கு வங்கி வரைவோலை மூலம் செலுத்தியுள்ள தொகைகள் அரசுமையாக்கப்படும்.

14. (அ) நிபந்தனை 13-ன்படி அதிகபட்ச ஏலத் தொகை கூறி குத்தகை பெறத் தகுதியானவர் என்று அறிவிக்கப்பட்ட நபர் உடனடியாக 10% சதவீத தொகை செலுத்தாத நிலையில், அவருக்கு அடுத்தபடியாக அதிக ஏலத் தொகை அல்லது டெண்டர் தொகை குறிப்பிட்ட நபரின் ஏலத்தொகை ஏற்படையதாக இருக்கும் பட்சத்தில் குத்தகை பெறத் தகுதியானவர் என்று அறிவிக்கப்பட்டு அவர் குறிப்பிட்டுள்ள குத்தகைத் தொகையில் பத்து சதவீதத் தொகையை உடனே செலுத்துமாறு கோரப்படுவார். உரிய தொகையை அவர் அரசுக்குச் செலுத்தினால் அவர் குத்தகை பெறத் தகுதியானவர் என்று அறிவிக்கப்படுவார்.

(ஆ) மேற்கண்டவாறு குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்பட்ட இரண்டாவது நபரும் 10% சதவீத தொகை செலுத்தாத போது மேற்கண்ட வழிமுறையை மாவட்ட ஆட்சியர் மீண்டும் நடைமுறைப்படுத்தலாம் அல்லது ஏலத் தொகை ஏற்படையது அல்ல என்று மாவட்ட ஆட்சியர் கருதினால் உரிய குவாரியை மறு டெண்டர் / ஏலம் மூலம் குத்தகைக்கு விடலாம்.

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15. குவாரி குத்தகை பெற தகுதியானவர் பெயர் அறிவிக்கப்பட்ட மனுதாரருக்கு வரைவோலைவலைய தீரும் வழங்க பின்னர் நடவடிக்கை எடுக்கப்படும்.

16. (அ) குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்பட்ட நபர் நிலுவையில் இல்லாத 90% சதவீத குத்தகைத் தொகையை ஏலம் நடைபெறும் நாளிலிருந்து ஏழு நாட்களுக்குள் அதனை அரசுக்கு செலுத்த வேண்டும்.

(ஆ) உயர்ந்த பட்ச ஏலதாரர்/டெண்டர்தாரர் என அறிவிக்கப்படும் நபர் குத்தகை தொகை செலுத்தவதான, குத்தகை தொகைக்கு உண்டான வருமான வரி 2% செலுத்தப்படவேண்டும். செலுத்தப்பட்ட வருமானவரிக்கு 10% கூடுதல் வரி செலுத்தப்பட வேண்டும். மேலும் செலுத்தப்பட்ட வருமானவரி மற்றும் கூடுதல் வரிக்கு 3% தீர்வை செலுத்தப்படவேண்டும்.

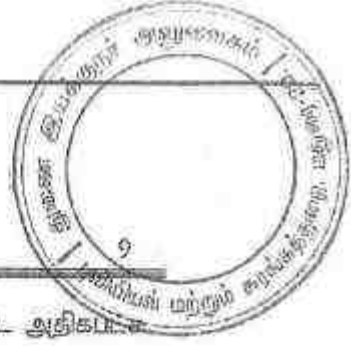
(இ) மேற்குறிப்பிட்ட 90% சதவீதத் தொகை குறிப்பிட்ட காலத்திற்குள் செலுத்தப்படாவிட்டால், குத்தகை கோரும் நபர் ஏற்கனவே செலுத்தியுள்ள 10 சதவீத தொகை மற்றும் முன்வையு தொகையான ரூ.25,000/- ஆகியவை அரசுடனமையாக்கப்படும்.

(ஈ) நிபந்தனை 16(அ)-ன்படி குத்தகைத் தொகை செலுத்தப்படாதபோது தொகை செலுத்தக் கோரப்பட்ட நபருக்கு அடுத்தபடியாக அதிக தொகை செலுத்த டெண்டர் / ஏலம் கூறிய நபர் குத்தகை பெறத் தகுதியானவர் என்று எழுத்து மூலம் அறிவிக்கப்பட்டு அவர் கூறிய பொத்த ஏலத்தொகையை பத்து நாட்களுக்குள் அரசுக்கு செலுத்துமாறு கோரப்படும்.

(உ) நிபந்தனை 16(இ)-ன்படியும் கோரப்பட்ட குத்தகைத் தொகை செலுத்தப்படா விட்டால், தொடர்புடைய கல்சுவாரி டெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு விட மறு அறிவிப்பு செய்யப்பட்டு நடவடிக்கை தொடரப்படும்.

17. (அ) குவாரி குத்தகை கோரி ஒரே ஒரு மறைமுக டெண்டர் மனு கொடுக்கப்பட்டு திறந்த முறை பொது ஏலத்தில் கலந்து கொள்ள யாரும் முன்வரவில்லையெனில், டெண்டர் தொகை அரசுக்கு ஆதாயமானது என்று மாவட்ட ஆட்சியர் கருதினால், அந்த டெண்டர் மனுதாரருக்கு குவாரி குத்தகை வழங்க மாவட்ட ஆட்சியர் ஒப்புதல் அளிக்கலாம். டெண்டர் தொகை அரசுக்கு ஆதாயமானதல்ல என்று மாவட்ட ஆட்சியர் கருதும் பட்சத்தில், மனுவைத் தள்ளுபடி செய்து ஆணையிடப்பட்டு மறு ஏலத்தின் மூலம் குவாரி குத்தகை வழங்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

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(ஆ) இரண்டு அல்லது அதற்கு அதிகமான மனுக்கள் பெறப்பட்டாலும் கூட அதிகபட்ச டெண்டர் / ஏலத்தொகை அரசுக்கு ஆதாயமானதல்ல என்று மாவட்ட ஆட்சியர் கருதினால் மனுவை தள்ளுபடி செய்து மறு ஏலம் நடத்த மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

பகுதி - III குவாரி குத்தகை பெறுவதற்கான நிபந்தனைகள்

1. (அ) தமிழ்நாட்டில் எல்லா மாவட்டங்களிலும் சேர்த்து ஒரு மனுக்காரருக்கு இரண்டு கல் குவாரி குத்தகைக்கு மேல் வழங்கப்பட மாட்டாது. தவறான தகவல் தந்து இரண்டுக்கு மேற்பட்ட குத்தகைகள் பெறப்பட்டிருப்பது பின்னர் தெரியவந்தால் கடைசியாக கொடுக்கப்பட்ட குத்தகையை ரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.

(ஆ) குவாரி உரிமம் பெறுவது தொடர்பாக உயர்ந்தபட்ச டெண்டர் / ஏலதாரர் 100% சதவீத தொகையைச் செலுத்தி அதற்குரிய சலாணை மாவட்ட ஆட்சியரிடம் ஒப்படைத்த பின்பு குவாரி உரிமம் வழங்க உத்தேசிக்கப்பட்டுள்ள பரப்பாக கருதி உத்தரவை வழங்கி சுரங்கத்திட்ட அறிக்கை மற்றும் மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையில்லாச் சான்று பெற்று சமர்ப்பிக்குமாறு அறிவுறுத்தப்படும்.

(இ) மேற்படி உத்தரவைப் பெற்ற அதிக தொகை செலுத்த டெண்டர் / ஏலம் கோரிய நபர் தகுதியான சுரங்கத்திட்ட அறிக்கையை அளிக்கரிக்கப்பட்ட (ROP) நபரிடமிருந்து தயார் செய்து சமர்ப்பிக்கப்பட்ட துணை இயக்குநரின் ஒப்புதலுக்கு 90 நாட்களுக்குள் சமர்ப்பிக்க வேண்டும்.

(உ) உயர்ந்தபட்ச டெண்டர் / ஏலதாரர் சமர்ப்பித்த சுரங்கத்திட்டத்தினை பரிசீலனை செய்து திட்டத்தில் மாற்றம் இருப்பின் திருத்தி அமைக்கும் பொருட்டும் சுரங்கத்திட்டம் புவியியல் மற்றும் சுரங்கத்துறை துணை இயக்குநரால் ஒப்புதல் செய்யவும், சுரங்கத்திட்டம் பெறப்பட்ட நாளிலிருந்து 90 நாட்கள் கால அவகாசமாகும்.

(ஊ) சமர்ப்பிக்கப்பட்ட துணை இயக்குநரால் ஒப்புதல் செய்யப்பட்ட சுரங்கத்திட்ட அறிக்கையை அதிக தொகை செலுத்த டெண்டர் / ஏலம் கூறிய நபர் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று கோரி விண்ணப்பித்து தடையின்மை சான்று பெற்று சமர்ப்பிக்கும் பட்சத்தில் மாவட்ட ஆட்சித்தலைவர் அவர்களால் அதிக தொகை செலுத்த டெண்டர் / ஏலம் கூறிய நபருக்கு குவாரி உரிமம் வழங்க நடவடிக்கை எடுக்கப்படும்.

K. Sivan



2020 டிசம்பர் 28]

மதுரை மாவட்ட அரசிதழ் சிறப்பு வெளியீடு

3. (அ) கோரப்படும் ஆவணங்களை மற்றும் தொகைகளை குத்தகை பெறவுள்ள மாறுதாரர் அரசுக்குச் செலுத்தியபின், அறிவிக்கை மூலம் தெரிவிக்கப்படும் நாளில் மேற்படி குத்தகைதாரர் மாவட்ட ஆட்சியரின் முன்பு ஆஜராகி குத்தகை ஒப்பந்த ஆவணங்களில் கையெழுத்திட்டபின் குத்தகையாளராக அறிவிக்கப்படுவார்.

(ஆ) குத்தகை ஒப்பந்தப்பத்திரம் மற்றும் குத்தகை புலப்படும் ஆகியவற்றை மேற்படி குத்தகையாளர் கையொப்பம் இட்ட பின்னர், அவைகளில் மாறுதல் செய்வவோ, அவற்றின் மீது மாற்றுக்கருத்து தெரிவிக்கவோ குத்தகைதாரர் அனுமதிக்கப்படமாட்டார்கள்.

4. (அ) குத்தகை காலம் ஏற்கனவே கல் உடைக்கப்பட்ட கல்குவாரிகளுக்கு ஐந்து ஆண்டுகள் மற்றும் கல் உடைக்கப்படாத கல்குவாரிகளுக்கு பத்து ஆண்டுகள் மட்டுமே, குத்தகை காலத்தின் ஆரம்பம் மற்றும் முடிவு தேதிகள் ஒப்பந்த ஆவணத்தில் தெளிவாக எழுதப்பட்டிருக்கும்.

(ஆ) ஒப்பந்த ஆவணத்தில் குறிப்பிட்டுள்ளபடி குத்தகை முடிவுறும் தேதிக்கு பின்னர் குத்தகை கால நீட்டிப்பு எந்த கோரிக்கையின் அடிப்படையிலும் செய்யப்படமாட்டாது.

(இ) குத்தகை முடிவடைவதற்கு இக்குத்தகை பூர்த்திக்கப்படமாட்டாது. இது குறித்து பூர்த்தித்தல் மனு அளிக்கப்பட்டால் அது விசாரணையின்றி தள்ளுபடி செய்யப்படும்.

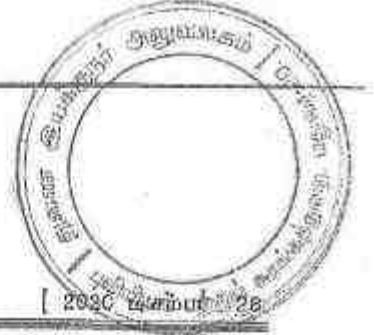
5. குவாரி குத்தகை ஒப்பந்தப் பத்திரத்தில் மாவட்ட ஆட்சியருடன் மாறுதாரர் கையொப்பம் இடுவதற்கு முன் குத்தகை பரப்பில் உடைகல், ஜல்லி, கட்டக்கல் போன்ற கனிமங்கள் வெட்டியெடுத்தாரானால் அப்பணி குத்தகை பெறாமல் செய்ததாக கருதப்பட்டு விதிமுறைகளின்படி மேல்நடவடிக்கை தொடரப்படும்.

6. (அ) குவாரி குத்தகை காலம் முடிவடைந்தவுடன் குத்தகைதாரர் குத்தகை பரப்பை அரசுக்கு திரும்ப ஒப்படைத்து அதற்கான கடிதத்தை உரிய கிராம நிர்வாக அலுவலர் வசம் ஒப்பளித்து அதற்கான ஆணை உறுதி ஆவணம் தயாரித்து மாவட்ட ஆட்சியரிடம் ஒப்படைக்க வேண்டும்.

பகுதி - IV குவாரிப்பணி செய்வது தொடர்பான விதிமுறைகள்

1. (அ) குவாரிப்பணி செய்தவற்கான பொது விதிமுறைகள், மாவட்ட ஆட்சியருடன் குத்தகைதாரர் கையொப்பமிடும் குத்தகை ஆவணத்தில் குறிப்பிடப்பட்டிருக்கும்.

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(ஆ) கல் குவாரி குத்தகைக்காலம் குத்தகை ஒப்பந்தப்பத்திரம் நிறைவேற்றப்பட்ட நாளிலிருந்து அனுமதி காலமாக கருதப்படும்.

(இ) மேலும், 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் அனுபந்தம் 1ல் கண்ட நபுணாவில் உரிய முத்திரைத்தாளில் குத்தகை ஒப்பந்த பத்திரம் நிறைவேற்றி அதனை அவரது சொந்த செலவில் பதிவு செய்து கொடுக்க வேண்டும்.

(ஈ) செலுத்தப்பட்ட குத்தகை தொகை தவிர, தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959-ன் பின்னிணைப்பு II-ல் கண்டவாறு குவாரியிலிருந்து வெளியில் கொண்டு செல்லப்படும் கனிமத்திற்கு அரசால் அவ்வப்போது திருத்தி நிர்ணயிக்கப்படும் சீனியரேஜ் தொகை அல்லது ஒவ்வொரு ஆண்டிற்கான முடக்குவரி இவற்றில் எது அதிகமோ அது செலுத்தப்பட வேண்டும். அவ்வாறு செலுத்தப்படாவிட்டால் குவாரி குத்தகையை ரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.

2. மேலும் ஒவ்வொரு தனி குத்தகை புலத்திற்கும், சிறப்பு நிபந்தனைகள் ஏதும் இருக்குமானால் அவைகள் மாவட்ட ஆட்சியரால் வழங்கப்படும் பணி அனுமதி ஆணையில் குறிப்பிடப்படும். குத்தகை பெற்றவர் அவ்வனுமதி ஆணையையும் ஏற்று நடக்க வேண்டும்.

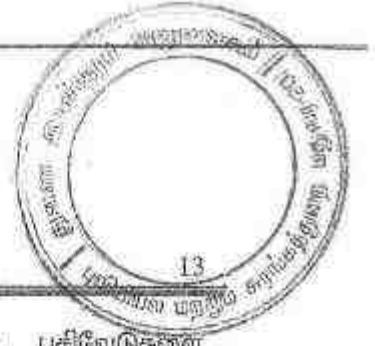
3. மேற்குறிப்பிட்டவை தவிர பின்வரும் சிறப்பு நிபந்தனைகளும் குத்தகைதாரரால் குத்தகை காலத்தில் கடைபிடிக்கப்பட வேண்டும்.

i. குத்தகையாளர் ஏற்பாடு செய்யப்பட்ட சுரங்கத்திட்டத்தின்படி குவாரிப்பணி மேற்கொள்ள வேண்டும். தவறும் பட்சத்தில் தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி 41 (10) (ii)-ன்படி நடவடிக்கை மேற்கொள்ளப்படும்.

ii. அனுமதி பெறாமல் குவாரியில் வெடிமருந்துகள் பயன்படுத்தக்கூடாது. வெடிபொருட்கள் சட்டம் கண்டிப்பாக கடைபிடிக்கப்பட வேண்டும். குவாரியில் வெடி பொருட்கள் பயன்படுத்துவர் தொடர்பாக சென்னை மண்டல சுரங்க பாதுகாப்பு இயக்கக பொது இயக்குநர் அவர்களின் வழிகாட்டு நெறிமுறைகளை பின்பற்றி குறைந்த அழுத்தமுள்ள வெடிமருந்துகளை பயன்படுத்தி குவாரிப்பணி செய்ய வேண்டும்.

iii. குத்தகையாளர் குத்தகைப் பகுதியில் வெட்டியெடுத்து வெளியில் அனுப்பும் சிறுவகைக் கனிமத்திற்கு உரிய கணக்குகளை மதுரை மாவட்ட புவியியல் மற்றும் சுரங்கத்துறை துணை இயக்குநர் குறிப்பிடும் படிவத்தில் சுரங்க விபரப்பதிவேடு ஏற்படுத்தி விபரங்கள் எழுதி பிரதி மாதம் 5-ம் தேதிக்குள் துணிக்கைக்கு சமர்ப்பிக்க வேண்டும்.

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iv. குத்தகை காலத்தில் ஏற்படுத்தப்பட்ட சுரங்க விராய் பதிவேடுகளை குத்தகையாளர் குத்தகைக்காலம் முடிந்த பின்னரும் பாதுகாத்து அரசு அலுவலர்கள் ஆய்வுக்கு கேட்கும் போது ஒப்படைக்க வேண்டும்.

v. குத்தகையாளர் கனிமங்களை வெளியில் அனுப்ப அனுப்புகை சீட்டுகளில் (பில்புக்) துணை இயக்குநர் ஒப்புதல் பெற வரும்போது, சீனியரேஜ் தொகையை செலுத்தி, அலுவலகத்திலிருந்து வழங்கப்படும் மொத்த இசைவாணைச்சீட்டுடன் அனுப்புகை சீட்டுகளில் உரிய அலுவலரின் மேலொப்பம் பெற்றுச் சென்று பயன்படுத்த வேண்டும்.

vi. கனிமங்களை குத்தகைப் பகுதியிலிருந்து வெளியில் அனுப்பும் போது அனுப்பப்படும் கனிமத்தின் வகை, அதன் அளவு, கனிமம் எடுத்துச் செல்லும் வாகனத்தின் வகை மற்றும் பதிவு எண், கனிமம் கொண்டு சேர்க்கப்படும் இடம், குவாரியிலிருந்து வாகனம் புறப்படும் நேரம் மற்றும் சென்றடைய உத்தேச நேரம் ஆகிய விபரங்களை அசல் சீட்டில் ஒரே பேனாவாலும் நகலை கார்பன் பேப்பர் அழுத்தம் மூலமும் எழுதி அசலை வாகனத்துடன் அனுப்பி நகலை (அடிக்கட்டு) அடுத்தமுறை அனுமதிபெற வரும்போது ஆய்வுக்கு காண்பித்துவிட்டு திரும்ப பெற்றுச் சென்று பாதுகாப்பாக வைத்திருக்க வேண்டும்.

vii. அனுப்புச் சீட்டில் எல்லா விபர வினாக்களுக்கும் விபரங்கள் எழுதப்படாமலோ அல்லது திருத்தப்பட்டோ அல்லது மேல் எழுத்தப்பட்டோ அல்லது வெவ்வேறு மையினால் எழுதப்பட்டிருப்பின் அந்த அனுப்புகைச் சீட்டுடன் எடுத்துச் செல்லப்படும் கனிமம், அனுமதியின்றி எடுத்துச் செல்லப்படுவதாக கருதி, விதிமுறைகளின்படி நடவடிக்கை எடுக்கப்படும்.

viii. குத்தகை பகுதிக்குச் சென்றுவர பாதைவசதி குத்தகைதாரர், தனது சொந்த பொறுப்பில் ஏற்படுத்திக் கொள்ள வேண்டும். கல்குவாரிப்பணியில் குழந்தை தொழிலாளர்களை பயன்படுத்தக்கூடாது.

ix. குவாரிகளுக்கு அருகில் உள்ள போக்குவரத்துச் சாலைகள், குடியிருப்பு வீடுகள், வண்டியாதைகள், பின் கம்பங்கள், டிரான்ஸ்பார்மர்கள் மற்றும் இதர நிலையான அமைப்புகள் இவற்றிலிருந்து நிர்ணயிக்கப்பட்ட பாதுகாப்பு இடைவெளிவிட்டு மீதமுள்ள இடத்திற்குள்ள்தான் குவாரி செய்யும் பணி செய்யப்பட வேண்டும். மேற்கண்ட பொதுமக்கள் உபயோகிக்கும் இடங்கள், குடியிருப்புகள், பட்டா நிலங்கள் அல்லது பொதுச் சொத்துக்கள் ஆகியவற்றிற்கு சேதம் ஏதும் தெரிட்டால் அதற்கு குத்தகைதாரரே முழுப் பொறுப்பேற்க வேண்டும். இந்நேரவில் பாதுகாக்கப்பட்ட புராதனச்சின்னங்களிலிருந்து 300 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு குவாரிப்பணி மேற்கொள்ள வேண்டும்.

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- x. குத்தகைதாரரை மேற்குறிப்பிட்ட நிபந்தனைகளும் 1959-ஆம் ஆண்டில் தமிழ்நாடு சிறுகனிம சலுகை விதிகள் மற்றும் சுரங்கங்கள் மற்றும் கனிமங்கள் (அபிவிருத்தி மற்றும் ஒழுங்குமுறை) சட்டம், 1957 மற்றும் அரசால் அவ்வப்போது கொண்டு வரப்படும் ஆணைகளும், விதிகளும் கட்டுப்படுத்தும்.
- xi. உலகுவாரிகளிலிருந்து சாதாரண கல், சக்கைக்கல், கட்டுக்கல், ஜல்லிக்கற்கள் ஆகிய பொது உபயோக சிறு கனிமங்களை மட்டுமே குவாரி செய்ய வேண்டும். இவ்வனுமதியை பயன்படுத்தி வெளிநாட்டிற்கு ஏற்றுமதி செய்வதற்கும், அலங்கார வகை மற்றும் பெருகேற்றம் செய்வதற்கும் பயன்படும் வகையில் பெரிய/சிறிய கிராண்ட் கந்துண்டங்களை வெட்டி எடுக்கக்கூடாது.
- xii. குத்தகை விடப்படும் குவாரிகளை நீக்கவோ, புதிதாக சேர்க்கவோ, குவாரிப் பரப்பளவை மாற்றவோ, மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. நிர்வாக சூழல் காரணமாக ஏவத்தகுந்தது செய்ய மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.
- xiii. குத்தகை உரிமம் கோரும் முன் சம்பந்தப்பட்ட குவாரியினை தேரில் பார்வையிட்டு பாதை வசதி, கனிமத்தின் தரம், கனிமத்தின் இருப்பு ஆகியவற்றை ஆராய்ந்து பின்னர் குத்தகை உரிமங்கோரி விண்ணப்பிக்க வேண்டும். பின்னாளில் இது தொடர்பான எந்த ஒரு பின் திகர்வுக்கும் மாவட்ட நிர்வாகம்/அரசு பொறுப்பல்ல.
- xiv. 1959-ஆம் ஆண்டு தமிழ்நாடு சிறு கனிம சலுகை விதிகள் அட்டவணை படிவம் 1-ல் கண்ட ஒப்பந்தப் பத்திரத்தில் தேவையான அளவுக்கு நிபந்தனைகளை புதியதாக சேர்க்கவோ, நீக்கவோ, மாற்றிபமைக்கவோ மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகைப் பத்திரம் ஏற்படுத்திய பின்பு புலனணர் மற்றும் குவாரி செய்ய ஒதுக்கப்பட்ட பரப்பு குறித்து எவ்வித தாலாவும் செய்ய குத்தகைதாரருக்கு உரிமை கிடையாது.
- xv. விண்ணப்பதாரர் குத்தகை தொகையைச் செலுத்தாமலும் முத்திரைத்தாளில் ஒப்பந்தப் பத்திரம் மாவட்ட ஆட்சியரிடம் நிகறவேற்றி சார்பதிவாளர் அலுவலகத்தில் பதிவு செய்து தராமலும் குவாரிப் பணியை ஆரம்பிக்கக்கூடாது. அவ்வாறு செய்தால் கள்ளத்தனமாக குவாரி செய்ததாகக் கருதப்பட்டு 1959-ஆம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகளின்படி அபராதம் விதிக்கப்படும்.
- xvi. ஒரு மனுதாரருக்கு மாநிலத்தில் இரு குவாரி குத்தகைக்கு மேல் குத்தகை வழங்கப்பட மாட்டாது.

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xvii. மேற்படி சிறு கனிமங்கள் எடுக்கும் இடத்தில் சிறு கனிமங்கள் எடுப்பதில் அப்பாற்படுத்துவதிலாவது மேற்படி குத்தகைதாரருக்கு ஏற்படக்கூடிய யாதொரு நஷ்டங்களுக்கான சலுகை எதுவும் அரசினரால் அளிக்கப்பட மாட்டாது.

xviii. டெண்டர் அறிவிக்கை பிரகரிக்கப்பட்ட பின்னரோ அல்லது குத்தகை உறுதி ஆணை பிறப்பிப்பதற்கு முன்னரோ நிபந்தனைகளை மாற்றவோ அல்லது ரத்துச் செய்யவோ மற்றும் மட்டியலில் கண்டுள்ள எல்லா குவாரிகளுக்கு குத்தகை உரிமம் கோரும் டெண்டர் மனுக்களை எக்காரணத்தையும் காட்டாமல் இரத்து செய்யவோ அல்லது மூடி முத்திரையிட்ட உறைகளை திறக்கும் நான், நேரம் ஆகியவைகளைத் தள்ளி வைக்கவோ, நிறுத்தி வைக்கவோ மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

xix. டெண்டர் விளம்பரத்தின்படி ஏதாவது காரணத்தால் மூடி முத்திரையிடப்பட்ட உறைகள் திறக்கும் நான் மற்றும் நேரம் ஆகியவை ஒத்தி வைக்க நேர்ந்தால் அதற்கு மனுதாரர்கள் நஷ்ட ஈடு கேட்க உரிமையில்லை. மனுதாரர் ஒவ்வொரு குவாரிக்கும் தனித் தனியே ஒரு ஒப்பந்தப்புள்ளி மனுவை உரிய இணைப்புகளோடு அனுப்ப வேண்டும். ஒரே மனுவில் ஒரு குவாரிக்கு மேல் பல குவாரிகளைக் குறிப்பிட்டு மனு செய்தால் அம்மனு நிராகரிக்கப்படும்.

xx. 1959-ஆம் ஆண்டு தமிழ்நாடு சிறு கனிம சலுகை விதிகளில் கண்டுள்ள அனைத்து சார்புகளையும் மாவட்ட அரசிதழில் கண்டுள்ள அனைத்து நிபந்தனைகளையும் நன்கு தெரிந்து கொண்டபின் டெண்டர் மனுக்களை அனுப்ப வேண்டும். மனு அனுப்பிய பிறகு விதிகள் மற்றும் குத்தகை நிபந்தனைகள் பற்றி சரியாகத் தெரியாது என மனுதாரர் வாதிட்டால் அது ஏற்றுக் கொள்ளப்பட மாட்டாது.

xxi. உறுதி செய்யப்பட்ட குத்தகை உரிமத்தை சம்பந்தப்பட்ட உயர் அலுவலர்கள் டெனது நன்மையைக் கருதி ரத்துச் செய்ய நேரிட்டால் அதனால் ஏற்படும் இழப்புக்கு ஈடுகோ குத்தகைதாரருக்கு உரிமையில்லை.

xxii. குத்தகைதாரர் குவாரியை வேறு யாருக்கும் மாற்றவோ, உள் குத்தகைக்கு விடவோ கூடாது. அப்படி ஏதாவது செய்திருப்பது தெரியவந்தால் மேற்படி குத்தகை ரத்து செய்யப்படுவதுடன் அவர் செலுத்திய தொகையும் அரசுக்கு பறிமுதல் செய்யப்படும்.

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xxiii. குத்தகைக்கு விடப்பட்ட புலத்தில் புல வளர்ப்புத் திட்டம் செய்ப்பட்டுள்ள இடத்திலும், விஸ்தீரணத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். அதற்குக் கூடுதலான விஸ்தீரணத்தில் குவாரி செய்வது தெரியவந்தால் குத்தகை ரத்துச் செய்யப்படும்.

xxiv. அனுமதிக்கப்படாத பிற இடங்களில் முறைகேடாக குத்தகைதாரர் குவாரி செய்து அதனால் அவர் மீது வழக்கு தொடரப்பட்டாலோ, அல்லது அரசுக்கு நஷ்டம் ஏற்பட்டாலோ, வழக்கிற்கான செலவுத் தொகை அல்லது நஷ்டாடு முழுவதும் குத்தகைதாரரிடமிருந்து வசூல் செய்யப்படும்.

xxv. குத்தகைதாரர் உரிய அனுப்புகைச் சீட்டை குத்தகைக்கு வழங்கப்பட்ட குவாரியில் இருந்துகாண் வாகனங்களுக்கு கொடுத்தனுப்ப வேண்டும்.

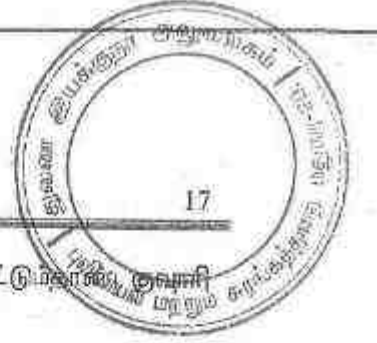
xxvi. உரிய அதிகாரிகள் ஒப்புதல் பெறப்படாத அனுப்புகைச்சீட்டுடன் கொண்டு செல்லப்படும் சிறு கனிமங்கள் முறையற்ற வகையில் எடுத்ததாகக் கருதப்பட்டு உரிய சட்டத்தின்படி கைப்பற்றப்பட்டு அபராதம் விதிக்கப்படும்.

xxvii. புவியியல் மற்றும் சுரங்கத்துறை அலுவலர்கள் அல்லது வருவாய்த்துறை அலுவலர்கள் முதலானோர் தணிக்கை செய்யும் போது உரிய கணக்குகள் மற்றும் அனுப்புகைச் சீட்டு முதலானவைகளை குவாரி உரிமம் பெற்றவர்கள் அவர்களுக்கு காண்பிக்க வேண்டும்.

xxviii. அனுப்புகைச் சீட்டில் உள்ள காலங்கள் பூர்த்தி செய்யப்படாமலோ அல்லது தவறாக எழுதப்பட்டோ அல்லது திருத்தங்காண்டனோ வாகனங்களுக்கு கொடுக்கப்பட்டிருந்தால் குத்தகைதாரர் மற்றும் சிறு கனிமம் கொண்டு செல்லும் வாகன உரிமையாளர் ஆகியவர்களுக்கு அபராதம் விதிக்கப்பட்டு வசூல் செய்யப்படும்.

xxix. ஏலதாரர் ஒவ்வொரு நாளும் குவாரியில் எவ்வளவு சிறு கனிமங்கள் எடுக்கப்பட்டது என்பதையும், எந்த அளவு கனிமங்கள் லாசி/வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விவரத்தையும் காட்டும் பதிவேடு பராமரித்து வர வேண்டும்.

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xxx. குவாரி செய்வதற்கு அனுமதிக்கப்பட்டுள்ள இடத்தில் மட்டும்கூட குவாரி செய்ய உரிமையுள்ளது.

xxxii. அரசு மற்றும் மாவட்ட ஆட்சியரால் இது விஷயமாக ஏற்படுத்தப்பட்டுள்ள மற்றும் அவ்வப்போது ஏற்படுத்தப்படும் சட்ட திட்டங்களுக்கும், நிபந்தனைகளுக்கும் குத்தகைதாரர் கட்டுப்பட்டு நடக்க வேண்டும்.

xxxiii. குவாரியில் வேட்டு வைப்பதிலும், கட்டைப்போட்டு சுடுவதிலும் யாதொரு அபாயமும் நேரிடாமல் இருக்க வேண்டியதைப் பற்றி குத்தகைதாரர் உஷாராக இருக்க வேண்டியது. அப்படி வேட்டு வைப்பதிலோ அல்லது கட்டைப் போட்டு சுடுவதிலோ அரசு சொத்துக்களுக்காவது அல்லது பிறர் சொத்துக்களுக்காவது அல்லது வேறு எந்த நபருக்காவது அபாயம் அல்லது சேதம் நேர்ந்தால் குத்தகைதாரர் அவ்விதம் நேரக்கூடிய சேதங்களை தங்கள் செலவிலேயே நிவர்த்தி செய்து கொடுக்க வேண்டியதோடு, அந்த நபருக்கு நஷ்ட ஈடு கொடுக்க குத்தகைதாரர் கடமைப்பட்டவர் ஆவார்.

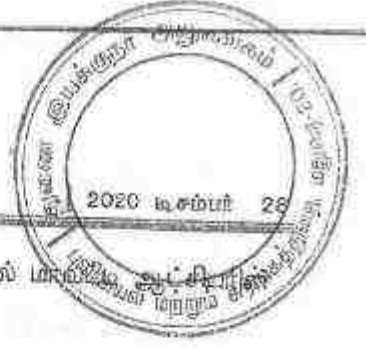
xxxiiii. குவாரியில் வேலை செய்யும் தொழிலாளர்களுக்கும் மற்றும் இகர நபர்களுக்கும் விபத்து ஏற்பட்டால் அதற்கு அரசு பொறுப்பில்ல. முழுப்பொறுப்பும் குத்தகைதாரரைச் சேரும்.

xxxiv. குத்தகை பகுதிக்குச் சென்றுவர பாதைவசதி குத்தகைதாரர், தனது சொந்த பொறுப்பில் ஏற்படுத்திக் கொள்ள வேண்டும்.

xxxv. அருகில் அமைந்துள்ள விவசாய நிலங்களுக்கு எவ்வித பாதிப்பும் இல்லாத வகையில் குவாரிப்பணி மேற்கொள்ள வேண்டும்.

xxxvi. தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரிய மாவட்ட சுற்றுச்சூழல் இசைவாணையை குவாரிப்பணி தொடங்கும் முன் பெற்று சமர்ப்பிக்க வேண்டும்.

xxxvii. குத்தகை எடுத்தவர் குத்தகையை அனுபவிக்காவிட்டாலும், செலுத்தப்பட்ட குத்தகைத் தொகை எக்காரணத்தை முன்னிட்டும் வாயஸ் செய்யப்படமாட்டாது.



xxxviii. குவாரியில் எல்லைகள் பற்றிய பிரச்சனைகள் ஏற்பட்டால் மாவட்ட ஆட்சியர் தீர்ப்பே இறுதியானது.

xxxix. குத்தகைக்காலம் முடிந்தபின் குத்தகைதாரர்கள் குத்தகைக்கு விடப்பட்ட பகுதிகளில் எந்தவிதமான உரிமையும் கொண்டாடக்கூடாது.

xl. குவாரி குத்தகை வழங்குவது மற்றும் சம்பந்தப்பட்ட எவ்வித நடவடிக்கைகளும் மாவட்ட ஆட்சியர் அவர்களின் முடிவுக்கு கட்டுப்பட்டதாகும்.

xli. டெண்டரில் கோரப்படும் கல்குவாரிகளின் பேரில் நீதிமன்றத்தில் ஆணை/தடையாணை பெறப்பட்டால் சம்பந்தப்பட்ட குவாரிக்கு குத்தகை உரிமை வழங்குவது குறித்து மாவட்ட ஆட்சியரின் முடிவே இறுதியாகும்.

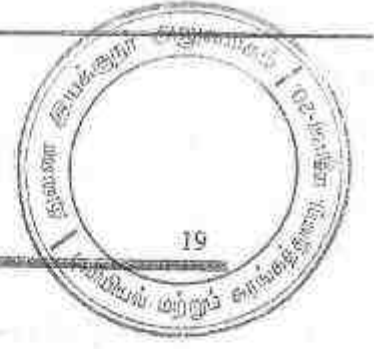
xlii. குத்தகைக்கு எடுத்தவர் எந்த காரணத்தை முன்னிட்டும் தனக்கு இழப்பு ஏற்பட்டதாக தெரிவித்து நஷ்டஈடு கேட்கக் கூடாது.

xliii. குவாரியில் வேலை செய்யும் தொழிலாளர்களுக்கும் மற்றும் இதர நபர்களுக்கும் விபத்து ஏற்பட்டால் அதற்கு அரசு பொறுப்பில்ல. முழுப்பொறுப்பும் குத்தகைதாரரைச் சேரும்.

xliv. குத்தகைதாரர் குவாரியில் புல எண், பாப்டு குத்தகைதாரர் பெயர், குத்தகை ஆணை எண், குத்தகை தொகை போன்ற விபரங்கள் குறிக்கப்பட்ட தகவல் பலகையை தமது சொந்த செலவில் வைக்க வேண்டும்.

xlv. குத்தகைதாரர் குவாரியில் எல்லைகளை தெளிவாக தெரியும்படியாக கல் ஊன்றி அடையாளமிட்டு வைத்த பின் குவாரி செய்ய வேண்டும். எல்லைக்கற்களை குத்தகைக் காலம் முழுமைக்கும் நன்கு பராமரிக்க வேண்டும்.

xlvi. குத்தகைக்கு வழங்கப்பட்ட குவாரிகளிலிருந்து அரசு வேலைகளுக்கு கனிமங்கள் வெட்டி எடுத்துச் செல்ல அரசுக்கு சகல உரிமையும் உண்டு.



xlvii. (அ) சிறப்பு நிபந்தனைகள்:

i. இந்த டெண்டர் மற்றும் ஏலமுறையில் கலந்து கொள்ளும் விண்ணப்பதாரர்கள் அனைவரும் இந்திய அரசின் வருமான வரித்துறையினரால் வழங்கப்படும் நிரந்தர கணக்கு எண் (PAN CARD) அட்டையை பெற்றிருக்க வேண்டும்.

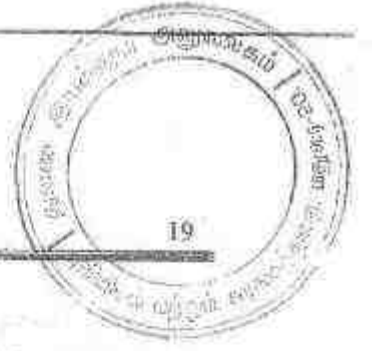
ii. மேலும் குத்தகை உரியம் பெற்ற பின்னர் கனிமங்களை எடுத்துச் செல்ல போக்குவரத்து அனுமதி சீட்டுபெற ஒவ்வொருமுறையும் செலுத்துகின்ற சீனியரேஜ் தொகையின் மீது 2.00 சதவீத வருமான வரி தொகை செலுத்த வேண்டும்.

iii. மேலும் குத்தகை உரியம் பெற்ற பின்னர் கனிமங்களை எடுத்துச் செல்ல போக்குவரத்து அனுமதி சீட்டுபெற ஒவ்வொருமுறையும் செலுத்துகின்ற சீனியரேஜ் தொகையின் மீது 10 சதவீத தொகை மதுரை மாவட்ட கனிம அறக்கட்டளையின் வங்கி கணக்கில் செலுத்த வேண்டும்.

கல் சுவாரி விவரம்

வ. எண்	வட்டம்	கிராமம்	புல எண்	பரப்பு (ஹெக்டேரில்)
1	வாழப்பட்டி	கச்சைகட்டி	1673 (Part - 6)	1.00.0
2	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part-1A)	0.81.0
3	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 2A)	1.00.0
4	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 2B)	1.00.0
5	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 3)	1.00.0
6	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 4)	1.00.0
7	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 5)	1.00.0
8	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part-8)	1.00.0

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xlvii. (அ) சிறப்பு நிபந்தனைகள்:

i. இந்த டெண்டர் மற்றும் ஏலமுறையில் கலந்து கொள்ளும் விண்ணப்பதாரர்கள் அனைவரும் இந்திய அரசின் வருமான வரித்துறையினரால் வழங்கப்படும் நிரந்தர கணக்கு எண், (PAN CARD) அட்டையை பெற்றிருக்க வேண்டும்.

ii. மேலும் குத்தகை உரிமம் பெற்ற பின்னர் கனிமங்களை எடுத்துச் செல்ல போக்குவரத்து அனுமதி கீட்டுபெற ஒவ்வொருமுறையும் செலுத்துகின்ற சீனியரேஜ் தொகையின் மீது 2.00 சதவீத வருமான வரி தொகை செலுத்த வேண்டும்.

iii. மேலும் குத்தகை உரிமம் பெற்ற பின்னர் கனிமங்களை எடுத்துச் செல்ல போக்குவரத்து அனுமதி கீட்டுபெற ஒவ்வொருமுறையும் செலுத்துகின்ற சீனியரேஜ் தொகையின் மீது 10 சதவீத தொகை மதுரை மாவட்ட கனிய அறக்கட்டளையின் வங்கி கணக்கில் செலுத்த வேண்டும்.

கல் சுவாரி விவரம்

வ. எண்	வட்டம்	கிராமம்	புல எண்	பரப்பு (ஹெக்டேரில்)
1	வாழப்பட்டி	கச்சைகட்டி	1673 (Part - 6)	1.00.0
2	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part-1A)	0.81.0
3	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 2A)	1.00.0
4	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 2B)	1.00.0
5	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 3)	1.00.0
6	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 4)	1.00.0
7	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 5)	1.00.0
8	வாழப்பட்டி	கொண்டையம்பட்டி	83 (Part - 8)	1.00.0

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9	வாடிப்பட்டி	கொண்டையம்பட்டி	83 (Part-9)	1.00.0
10	வாடிப்பட்டி	குலசேகரன்கோட்டை	63 (Part-II)	2.91.0
11	வாடிப்பட்டி	பாலமேடு	52/2 (Part-2)	2.00.0
12	வாடிப்பட்டி	சத்திரவெள்ளாலப்பட்டி	13 (Part)	2.00.0
13	வாடிப்பட்டி	விராலிப்பட்டி	43	1.00.0
14	வாடிப்பட்டி	இராஜாக்கன்பட்டி	1 (Part-I)	1.00.0
15	மேலூர்	அய்யாபட்டி	379	0.92.0
16	மேலூர்	அய்யாபட்டி	63	0.74.0
17	மேலூர்	சொக்கலிங்கபுரம்	471/1	2.70.0
18	மேலூர்	சொக்கம்பட்டி	352/2 (Part - 1)	2.02.0
19	மேலூர்	சொக்கம்பட்டி	352/2 (Part - 3)	3.20.0
20	மேலூர்	கம்பூர்	283/1 (Part-I)	0.81.0
21	மேலூர்	கம்பூர்	32/2 (Part-A)	1.10.0
22	மேலூர்	கம்பூர்	32/2 (Part-B)	1.10.0
23	மேலூர்	கம்பூர்	32/2 (Part-C)	1.60.0
24	மேலூர்	கம்பூர்	32/2 (Part - D)	2.00.0
25	மேலூர்	கம்பூர்	32/2 (Part - E)	3.00.0
26	மேலூர்	கருங்காலக்குடி	4	1.70.0
27	மேலூர்	கருங்காலக்குடி	619/5 (Part)	2.02.5

இடம் : மதுரை
நாள் : 24.12.2020

ஒப்பம்
மாவட்ட ஆட்சியர்,
மதுரை.

K. Sivan

இணைப்பு - VI

(தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதிகள் 1959-ன் விதி 8 ஐ காண்க)
 குவாரி குத்தகை கோரும் டெண்டர்/ ஏல விண்ணப்பம்
 (அசல் மற்றும் இரண்டு நகல்களில் கொடுக்கவும்)

அனுப்பநர்

அலுவலர் பயன்படுத்த
 அ) மனு பெறப்படும் நாள்

 ஆ) பெறப்படும் இடம்

ஒப்பம்

பெறுநர்

மாவட்ட ஆட்சியர்,
 மதுரை,
 மதுரை மாவட்டம்.

மாவட்ட அரசிதழ் எண்நாள்.....அல்லது.....
 செய்தித்தாள் விளம்பர நாள்.....ல் வெளியிடப்பட்டுள்ளது தொடர்பாக, தமிழ்நாடு சிறுவகைக்
 கனிமச் சலுகை விதிகள் 1959 இன் விதி 8-ன்படி நாள்/நாங்கள் இந்த விண்ணப்பத்தை
 சமர்ப்பிக்கிறேன்/ சமர்ப்பிக்கிறோம்.

தேவையான விவரங்கள் கீழே கொடுக்கப்படுகிறது:

1. மனுதாரர் பெயர் மற்றும் முழு முகவரி :
2. அ) மனுதாரர் தனி நபர்/தனியார் கம்பெனியர்/கூட்டு :
 நிறுவனமா (அல்லது) சட்டசபைமா.
 ஆ) மனுதாரர் தனி நபரானால் எந்த நாட்டினர். :
 இ) மனுதாரர் தனியார் கம்பெனி/வியாபார வ்துபணம் :
 அல்லது சங்கமாவின் அதன் இயக்குநர்/
 பங்குதாரர்கள்/உறுப்பினர்கள் எந்த நாட்டவர் என்ற
 விவரம் (சான்று இணைக்கப்பட வேண்டும்).
3. பிணை வைப்புத்தொகை செலுத்திய விவரம் (வங்கி :
 கேட்பு வரைவோலை எண் மற்றும் நாள் ஆகிய
 விவரங்களை அளிக்கவும்).

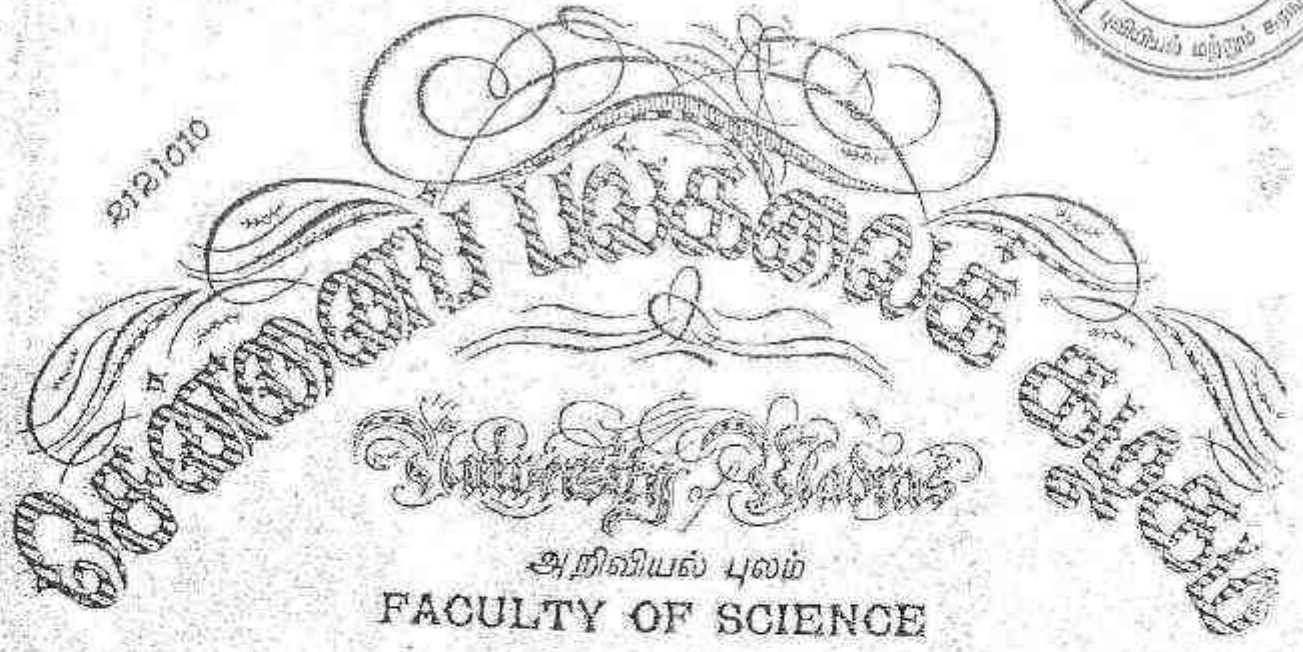
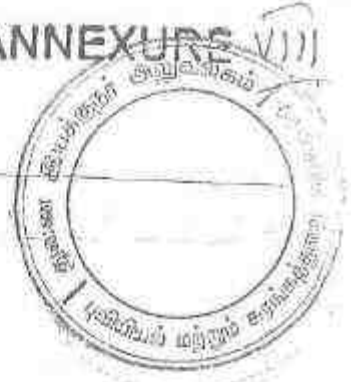
K. Sivan

	<p>இந்திய அரசாங்கம் Government of India சிவசம்பசனி கருப்புசாமி Sambasani Karuppusamy தந்தை - கருப்புசாமி Father - Karuppusamy பிறந்தவருடும் / Year of Birth: 1982 ஆண்பால் / Male</p>	
5149 4660 8751		
ஆதார் - சாதாரண மனிதனின் அதிகாரம்		



	<p>இந்திய தனித்துவ அடையாள ஆணையகம் Unique Identification Authority of India</p>	
<p>முகவரி: S/O. கருப்புசாமி, 339, மல்லக்கோட்டை, சிவசங்கை, மல்லக்கோட்டை, மல்லக்கோட்டை, சிவசங்கை, கருப்புத்தூர், தமிழ் நாடு - 630566</p>	<p>Address: S/O. Karuppusamy, 339, mallakkotti, SIVAGANGA, Mallakotia, Mallakotia, Sivaganga, Tiruathur, Tamil Nadu, 630566</p>	
5149 4660 8751		
		
1947 1947-2024	help@uidai.gov.in	www.uidai.gov.in

K. Sivan



அறிவியல் புலம்
FACULTY OF SCIENCE

சென்னைப் பல்கலைக் கழகப் பேரவை 1994

ஆண்டு அம்சம் மாற்றம் நடந்த கல்விமையால் தேர்வில்
..... மய, தங்குரைக் என்பவர் முதல் வகுப்பில்
தேர்ச்சி உட்பற்றா என்று தக்க சேர்வுகளை சான்றளித்தது. அறிவியல் நிகழ்வுள்
என்றும் M.L.L. தலை அலகுக்குப் பல்கலைக் கழக இலாசீலையின் வழங்கு கிறது!

The Senate of the UNIVERSITY OF MADRAS hereby
makes known that P. Thangaraja
has been admitted to the Degree of Master of Science, he/she
having been certified by duly appointed Examiners to be qualified
to receive the same in Geology and was placed in the
First Class, at the Examination held in April 1994.



Given under the seal of the University

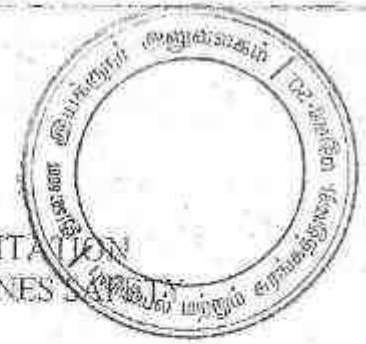
K. Sivanthi

சென்னை, சேப்பாடு
சென்னை, Madras
Date: 25-01-1999

Registrar

P.T. Thangaraj
100-A
The-Chancellor

GOVERNMENT OF INDIA
 MINISTRY OF LABOUR AND REHABILITATION
 OFFICE OF THE DIRECTOR GENERAL OF MINES



Certificate of Practical experience granted by the Manager to a candidate for a Manager's / Surveyor's / Foreman's / Over man's / Sirdar's / Mate's / Short firer's/ Blaster's Certificate of competency (Restricted) examination under the Metalliferous Mines Regulations 1961.

I **EVENKATARAJAGOPALAN** being the Mines Agent of **M/S.LIMENAPH CHEMICALS, RAJAPALAYAM OF LIMESTONE PRODUCTS** (Theamali Limestone Mine) do hereby certify that **Thiru. P.THANGARAJU**, son of **S.PERIASAMY** (whose signature is appended) worked as a Geologist in the above mine from **02.05.1994 to 30.12.1999**. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved continuous attendance at the mine and have been efficiently performed by him.

I believe him to be of good character and a fit and proper candidate to be examined for Certificate of Competency.

TRENELLAI LIME STONE MINES
 10/6/96
 (Signature with date and official Seal)
[EVENKATARAJAGOPALAN]

Mines Agent:

P.O. : **ARUKANGULAM**

District : **TIRUNELVELI**

State : **TAMIL NADU**

(Signature of Candidate)

(State name of Mineral) : **LIMESTONE**

S.No	Particulars of practical Experience (a)	Place of Experience (b)	Period of practical experience(c)		Total Experience (e)		
			From	To	Yr.	Month	Day
01	As a Trainee in Drilling Operation.	Semi Mechanised Open cast working	02.05.1994	15.07.1995	01	02	14
02	As a Trainee in Blasting Operation.		16.07.1995	10.12.1996	01	04	25
03	Exploration		11.12.1996	31.01.1998	01	01	20
04	Surveying		01.02.1998	25.06.1998	00	04	25
05	Sampling Quality control and		26.06.1998	28.07.1998	01	00	24
06	Supervision in MEMM Operation.		21.07.1999	30.12.1999	00	05	10
GRAND TOTAL					05	07	28
(Five Years Seven Months Twenty Eight Days Only)							

AVERAGE MONTHLY OUTPUT (d) / AVERAGE DAILY EMPLOYMENT (e) DURING THE ABOVE PERIOD IS GIVEN BELOW

In below ground working	In open - cast working	In all
Nil	35	35
Nil		

of CHERMALAI LIME STONE MINES


Signature of Candidate


Signature of Manager with Date (14/12/00)
[VENKATARAJAGOPALAN]

Name of the Mine

Instructions :-

01. State clearly the nature of duties
02. State whether on surface, in open cast workings or below ground
03. State specifically the period spent by the applicant in different mining operations, or surveying operations, as the case may be. If the employment has not been such as to involve continuous attendance of the applicant at the mine, it must be stated how many days a week he was employed at the mine, whether underground or above ground and in what capacity.
04. Delete if the mine is a Metalliferous mine.
05. Delete if the mine is a Coal mine.



10° 13' 52.06"N

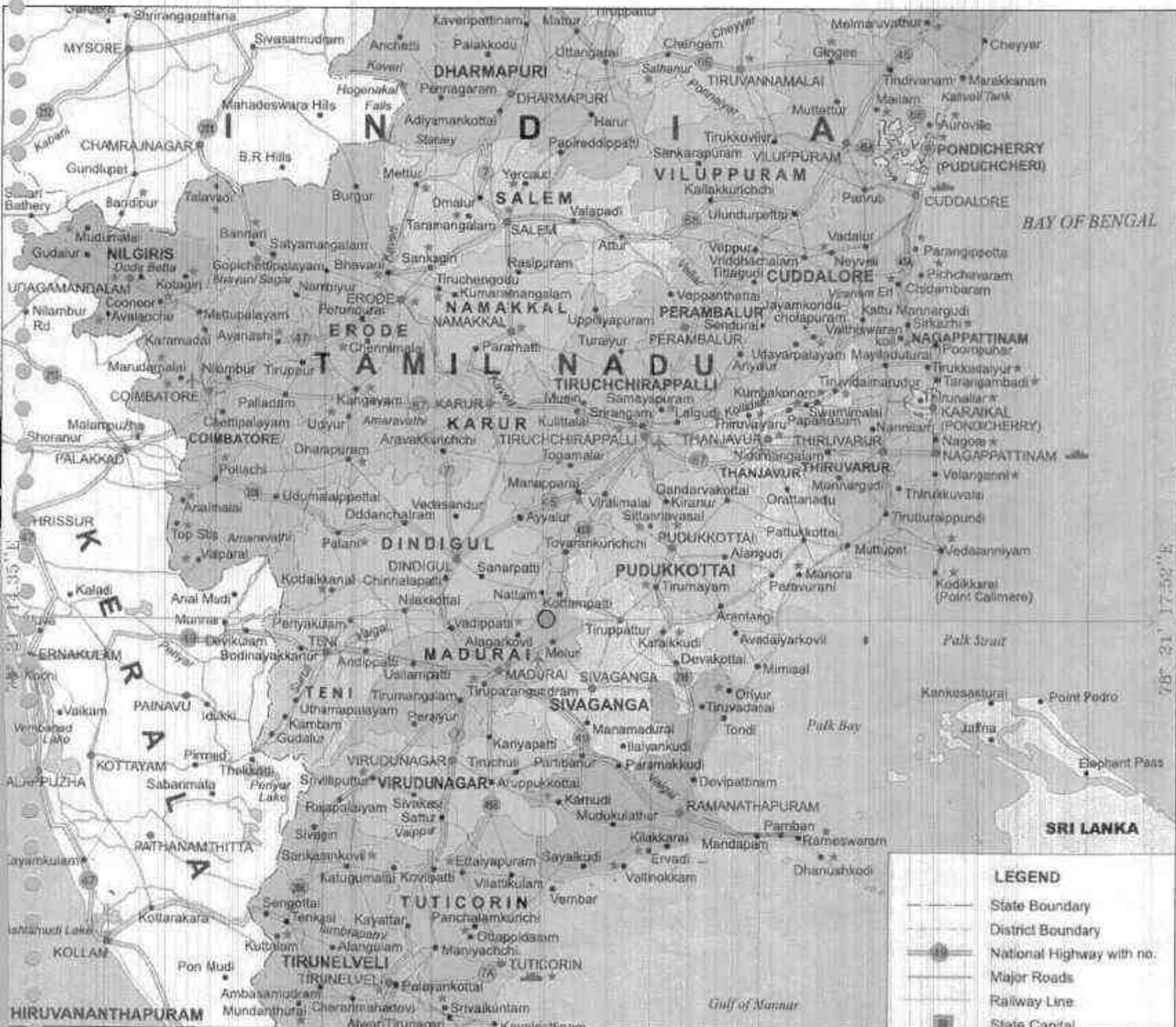


PLATE NO. I
 DATE OF SURVEY : 28.04.2021

APPLICANT:
 THIRU.K.SILAMBARASAN,
 S/O.KARUPPUSAMY,
 339,MALLAKKOTTAI,
 THIRUPATTUR,SMAGAGAI-630 566

LOCATION OF QUARRY LEASE APPLIED AREA:
 S.F.NO : 352/2(Part-1),
 EXTENT : 2.02.0 Ha.
 VILLAGE : SOKKAMPATTI,
 TALUK : MELUR,
 DISTRICT : MADURAI,
 STATE : TAMIL NADU.

INDEX
 Q. L. A. AREA : ●
 TOPO.SHEET NO.: 58 J/08
 LATITUDE : 10° 13' 42.56"N to 10° 13' 52.06"N
 LONGITUDE : 78° 21' 14.35"E to 78° 21' 17.52"E

LOCATION PLAN
 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 LESSEMAP
 AUTHENTICATED
 BY STATE GOVERNMENT

 SURVEYOR GENERAL
 103 A

10° 13' 42.56"N

PLATE NO: I-A

DATE OF SURVEY : 28.04.2021

APPLICANT:

THIRU.K.SILAMBARASAN,
S/O.KARUPPUSAMY,
339,MALLAKKOTTAI,
THIRUPATTUR,SIVAGANGAI 630 566.



LOCATION OF QUARRY LEASE

APPLIED AREA:

S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE: SOKKAMPATTI,
TALUK : MELUR,
DISTRICT, MADURAI,
STATE : TAMIL NADU.

INDEX

CONVENTIONAL SYMBOLS

Water (River, Canal, Pond, Lake, etc.)	
Roads (Metalled, Unmetalled, etc.)	
Boundaries (Village, Taluk, District, etc.)	
Buildings (Government, Private, etc.)	
Power Lines (High Voltage, Low Voltage, etc.)	
Telegraph Lines	
Telephone Lines	
Electricity Lines	
Canals	
Ditches	
Streams	
Drains	
Wells	
Handwritten notes	

TOPO SKETCH OF QUARRY LEASE AREA FOR 10KM RADIUS

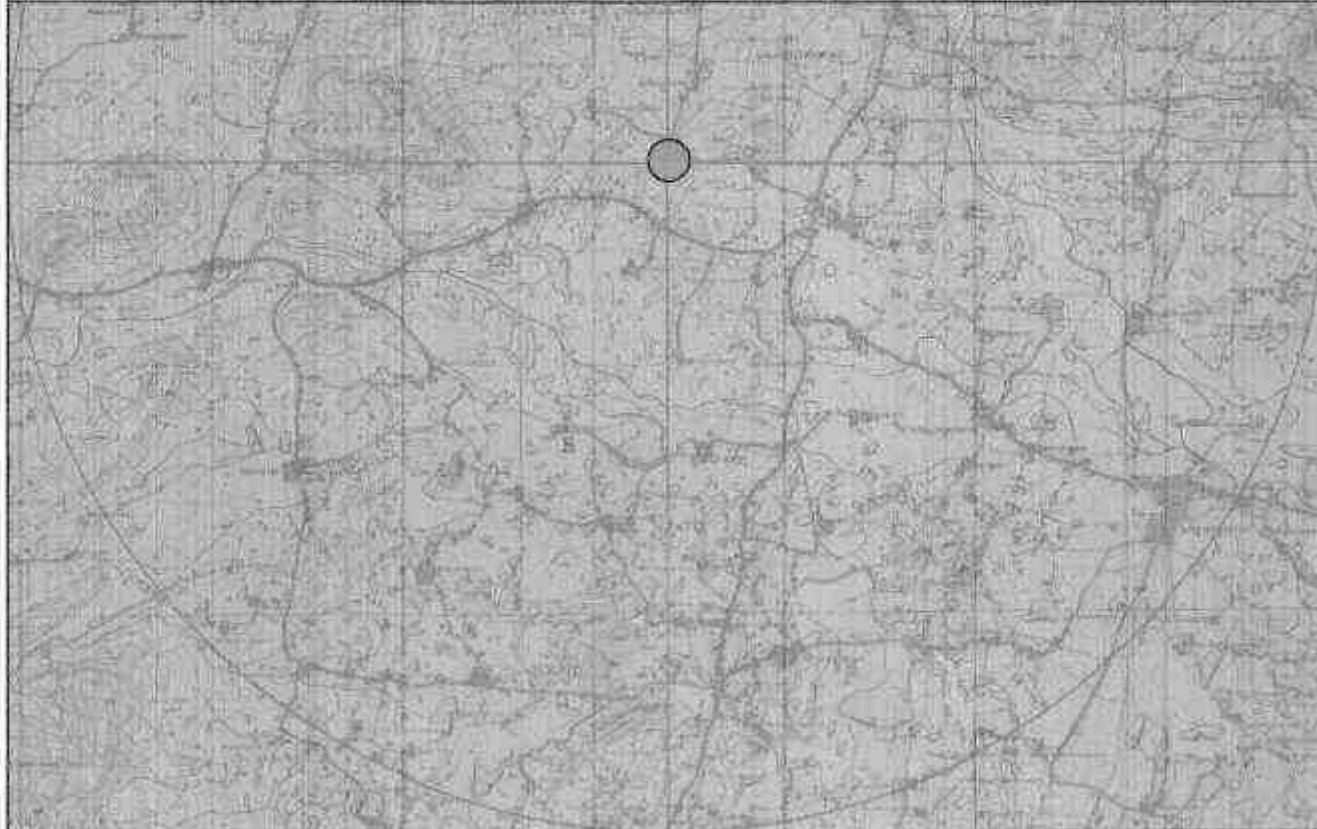
SCALE- 1:100000

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 LEASEMAP AUTHENTICATED BY STATE GOVERNMENT

[Signature]
D. PANANGARA, M. Sc., Ph.D.,
QUALIFIED PERSON

10° 19' 17.31"N



10° 08' 17.30"N

TOPO SHEET NO. : 58 J/08

LATITUDE : 10° 13' 42.56"N to 10° 13' 52.06"N

LONGITUDE : 78° 21' 14.35"E to 78° 21' 17.52"E

10KM RADIUS :

Q.LEASE AREA :

LANDUSE PATTERN	
DESCRIPTION	PERCENTAGE
ROADS	(05%)
HABITATION	(05%)
TREES	(10%)
AGRICULTURAL LAND	(50%)
PIT/TANK\HILLOCK	(30%)

OCTOBER TO DECEMBER

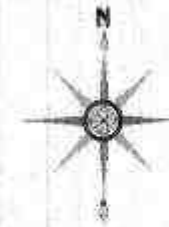


PLATE NO: 1-B

DATE OF SURVEY

1Km Radius

500m Radius

O.L. Area

TOPO SHEET NO.: 58 J/08

LATITUDE : 10° 13' 42.56" N to 10° 13' 52.06" N

LONGITUDE : 78° 21' 14.35" E to 78° 21' 17.52" E



APPLICANT:

THIRU.K.SILAMBARASAN,
S/O.KARUPPUSAMY,
339,MALLAKOTTAI,
THIRUPATTUR,SIVAGAGAI-630 566.

LOCATION OF QUARRY LEASE

APPLIED AREA:

S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE : SOKKAMPATTI,
TALUK : MELUR,
DISTRICT : MADURAI,
STATE : TAMIL NADU.

INDEX

APPROACH ROAD

VILLAGE ROAD

SH ROAD

HABITATION

TREES

BARREN LAND

PIT

WIND DIRECTION

R.F

GOVUNDAN NADHI

ENVIRONMENTAL AND

LANDUSE PLAN FOR 1Km RADIUS

SCALE - 1:10,000

PREPARED BY :

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AUTHENTICATED
BY STATE GOVERNMENT.

105
Dr. P. THANGARAJU, M.Sc., Ph.D.,
QUALIFIED PERSON

Towards
Badagudi

Towards
V.Pudur

78° 20' 41.52" E

78° 20' 37.04" E

Towards
V.Pudur

10° 13' 28.20" N

Towards
Kottampatti

10° 13' 10.63" N

Towards
Sokkampatti

10° 14' 24.58" N

10° 14' 06.02" N

78° 21' 33.93" E

78° 21' 50.35" E

Towards
Kottampatti

JULY TO SEPTEMBER

LANDUSE PATTERN	
DESCRIPTION	PERCENTAGE
ROADS	(05%)
HABITATION	(05%)
TREES	(10%)
AGRICULTURAL LAND	(50%)
PIT/TANK\R.F	(30%)

LANDUSE PATTERN	
DESCRIPTION	PERCENTAGE
ROADS	(05%)
HABITATION	(05%)
TREES	(10%)
AGRICULTURAL LAND	(50%)
PIT/TANK/HILLOCK	(30%)

OCTOBER TO DECEMBER

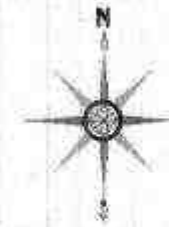


PLATE NO: I-B

DATE OF SURVEY

1Km Radius

500m Radius

G.L. Area

TOPO SHEET NO. : 56 J/08

LATITUDE : 10° 13' 42.56" N to 10° 13' 52.06" N

LONGITUDE : 78° 21' 14.35" E to 78° 21' 17.52" E



APPLICANT:

THIRU.K.SILAMBARASAN,
S/O.KARUPPUSAMY,
339,MALLAKKOTTAI,
THIRUPATTUR.SIVAGAGAI-630 566.

LOCATION OF QUARRY LEASE

APPLIED AREA:

S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE : SOKKAMPATTI,
TALUK : MELUR,
DISTRICT : MADURAI,
STATE : TAMIL NADU.

INDEX

APPROACH ROAD

VILLAGE ROAD

SH ROAD

HABITATION

TREES

BARREN LAND

PIT

WIND DIRECTION

R.F

GOVUNDAN NADHI

ENVIRONMENTAL AND

LANDUSE PLAN FOR 1Km RADIUS

SCALE - 1:10,000

PREPARED BY :

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AUTHENTICATED
BY STATE GOVERNMENT.

106
Dr. P. HANGARAJU, M.Sc., Ph.D.,
QUALIFIED PERSON

Towards
Badagudi

Towards
V.Pudur

78° 20' 41.52" E

78° 20' 37.04" E

Towards
V.Pudur

10° 13' 28.20" N

Towards
Kottampatti

10° 13' 10.63" N

LANDUSE PATTERN	
DESCRIPTION	PERCENTAGE
ROADS	(05%)
HABITATION	(05%)
TREES	(10%)
AGRICULTURAL LAND	(50%)
PIT/TANK/R.F	(30%)

JULY TO SEPTEMBER





PLATE NO: I-C

DATE OF SURVEY : 28.04.2021

APPLICANT:

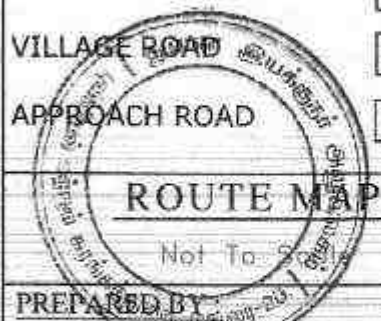
THIRU.K.SILAMBARASAN,
S/O.KARUPPUSAMY,
339,MALLAKKOTTAI,
THIRUPATTUR,SIVAGAGAI-630 566.

**LOCATION OF QUARRY LEASE
APPLIED AREA:**

S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE: SOKKAMPATTI,
TALUK : MELUR,
DISTRICT: MADURAI,
STATE : TAMIL NADU.

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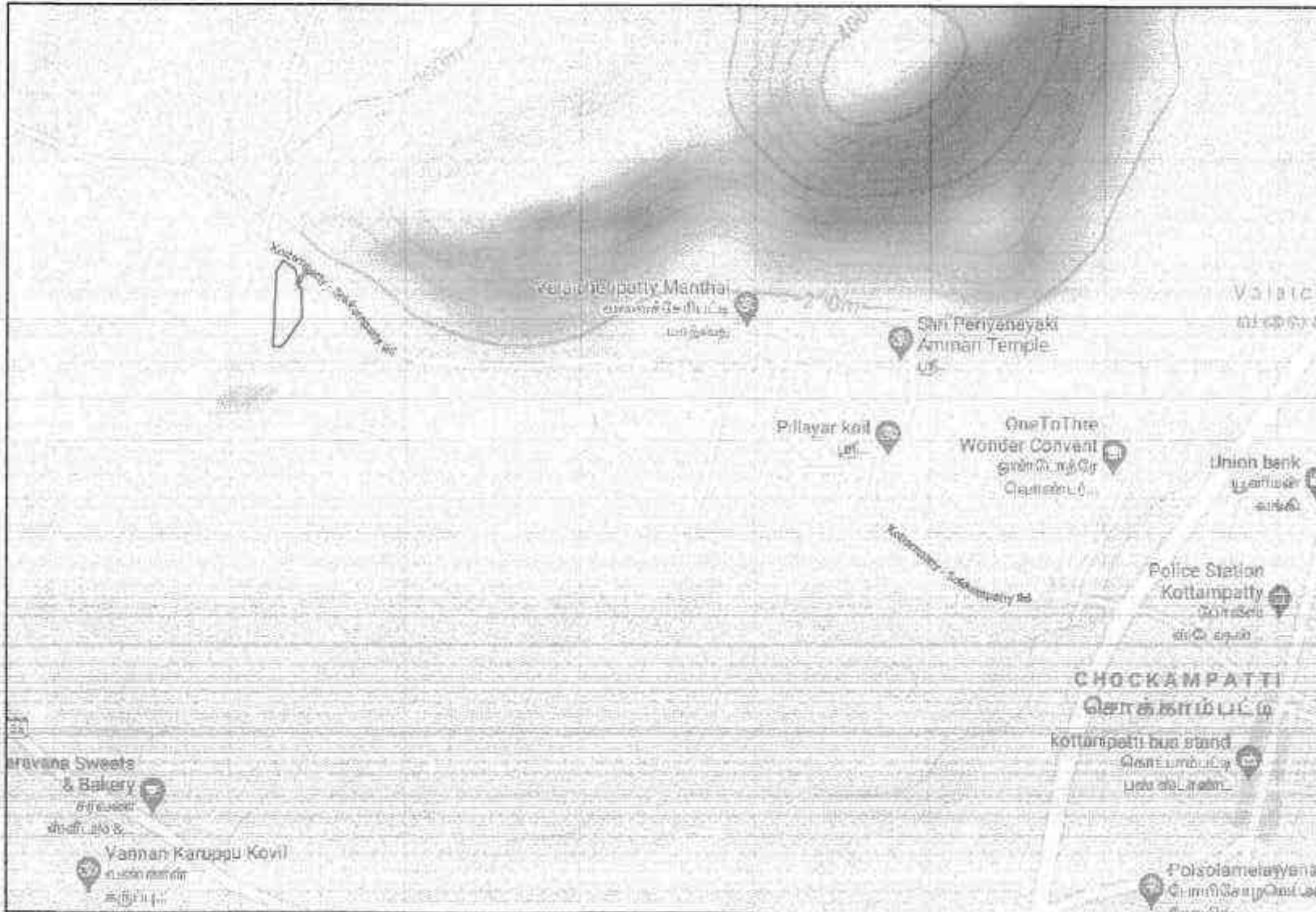
- Q.LEASE APPLIED AREA
- NH ROAD
- VILLAGE ROAD
- APPROACH ROAD



PREPARED BY:

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PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE LEASEMAP
AUTHENTICATED BY STATE GOVERNMENT

Dr. P. Thangaraj
Dr. P. THANGARAJ 107-A P.H.R.,
QUALIFIED PERSON



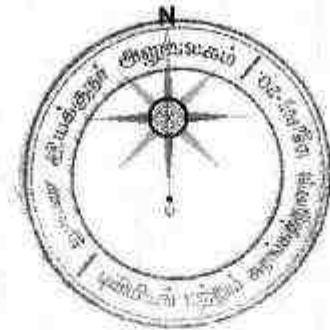


PLATE NO: I-D
DATE OF SURVEY : 28.04.2021

APPLICANT:

THIRU.K.SILAMBARASAN,
S/O.KARUPPUSAMY,
339.MALLAKKOTTAI,
THIRUPATTUR,SIVAGAGAI-630 566.

**LOCATION OF QUARRY LEASE
APPLIED AREA:**

S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE : SOKKAMPATTI,
TALUK : MELUR,
DISTRICT: MADURAI,
STATE : TAMIL NADU.

INDEX

QUARRY LEASE APPLIED AREA



500m RADIUS

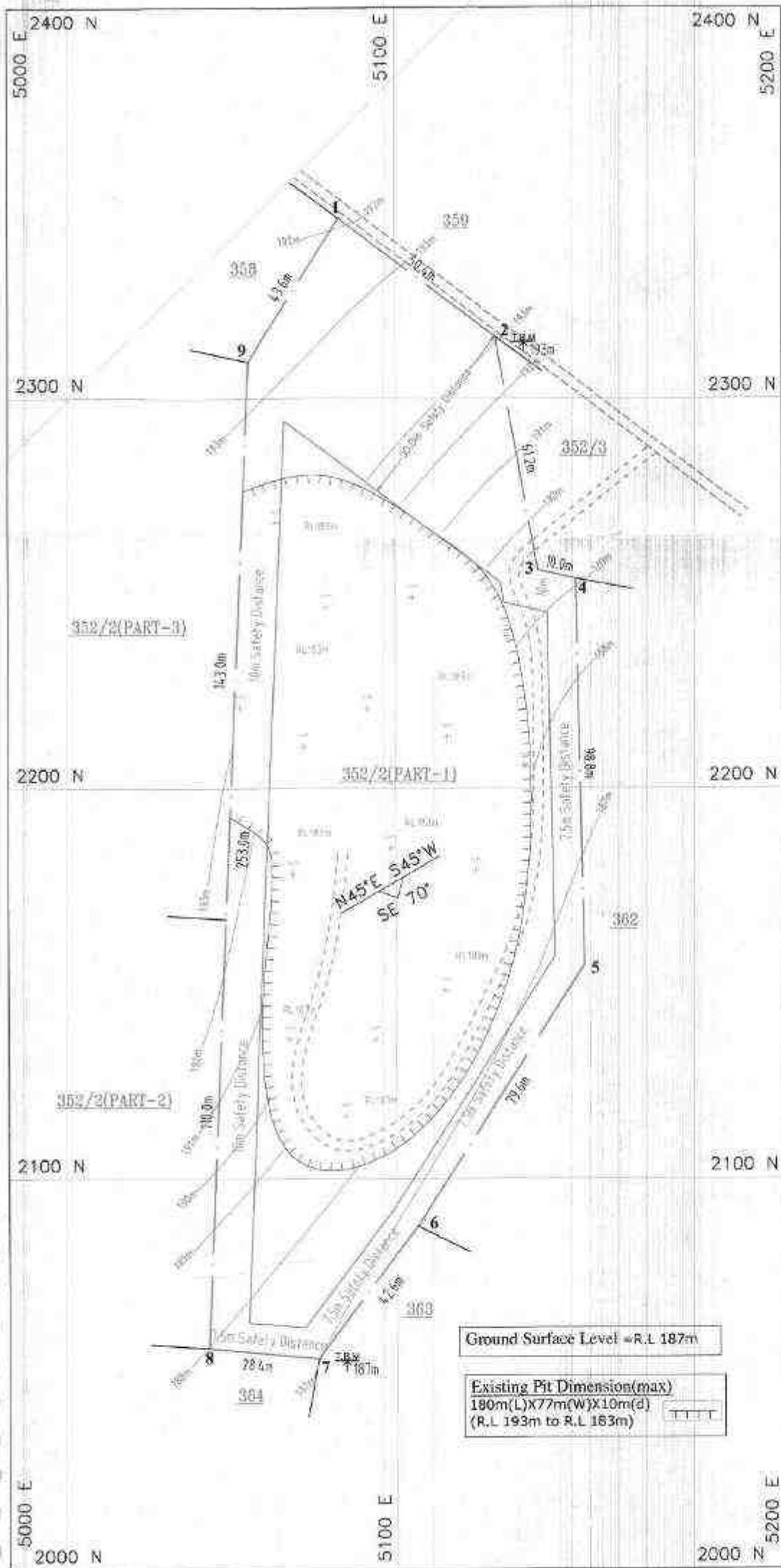


**SATELLITE IMAGE FOR
500m RADIUS**
SCALE - 1:5,000

PREPARED BY :

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AUTHENTICATED
BY STATE GOVERNMENT

Dr. P. Thanigaraaj
Dr.P.THANIGARAAJ, 108 Ad.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 13' 52.16"N	78° 21' 15.3"E
2	10° 13' 51.85"N	78° 21' 16.3"E
3	10° 13' 49.14"N	78° 21' 17.0"E
4	10° 13' 46.07"N	78° 21' 17.6"E
5	10° 13' 45.65"N	78° 21' 17.8"E
6	10° 13' 43.67"N	78° 21' 18.0"E
7	10° 13' 42.56"N	78° 21' 18.2"E
8	10° 13' 42.07"N	78° 21' 14.3"E
9	10° 13' 50.11"N	78° 21' 14.6"E

DATUM: WGS-84

PLATE NO-II

DATE OF SURVEY : 28/04/2021

APPLICANT:

THIRU K SILAMBARASAN,
S/O.KARUPPUSAMY,
339,MALLAKKOTTAI,
THRUPATTUR,SIVAGAI-630 566.

LOCATION OF QUARRY LEASE APPLIED AREA:

S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE : SOKKAMPATTI,
TALUK : MELLUR,
DISTRICT : MADURAI,
STATE : TAMIL NADU.

INDEX

- Q.L. APPLIED AREA BOUNDARY
- 7.5m, 10m & 50m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- STRIKE AND DIP
- ROUGH STONE
- TOPSOIL
- QUARRY PIT
- QUARRY ROAD
- APPROACH ROAD
- TAR ROAD

QUARRY LEASE & SURFACE PLAN
SCALE 1 : 1000

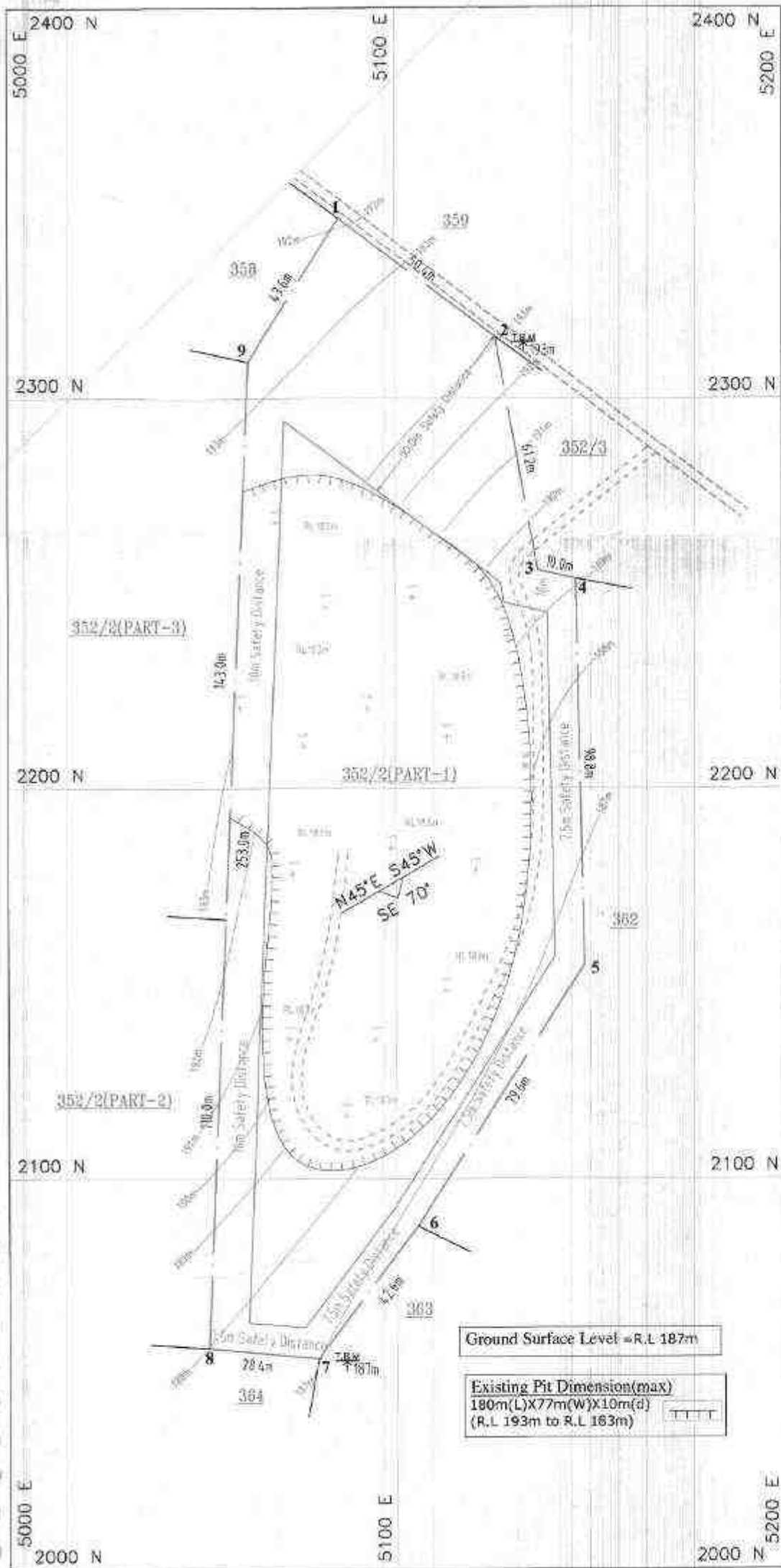
PREPARED BY:

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BEST OF MY KNOWLEDGE BASED UPON THE LEASERAP
AUTHENTICATED
BY STATE GOVERNMENT.

D.P. THANGARAJ
109 A
QUALIFIED PERSON

Ground Surface Level = R.L 187m

Existing Pit Dimension(max)
180m(L)X77m(W)X10m(d)
(R.L 193m to R.L 163m)



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 13' 52.86"N	78° 21' 15.3"E
2	10° 13' 51.05"N	78° 21' 16.2"E
3	10° 13' 49.14"N	78° 21' 17.0"E
4	10° 13' 47.07"N	78° 21' 17.8"E
5	10° 13' 45.05"N	78° 21' 18.6"E
6	10° 13' 43.07"N	78° 21' 19.4"E
7	10° 13' 41.06"N	78° 21' 20.2"E
8	10° 13' 41.07"N	78° 21' 14.3"E
9	10° 13' 50.51"N	78° 21' 14.6"E

DATUM: WGS-84

PLATE NO-II
DATE OF SURVEY : 28/04/2021

APPLICANT:
THIRU.K.SILAMBARASAN,
S/O.KARUPPUSAMY,
339,MALLAKOTTAI,
THIRUPATTUR,SIVAGAI-630 566.

LOCATION OF QUARRY LEASE APPLIED AREA:
S.F.NO : 352/2(Part-1),
EXTENT : 2.02.0 Ha.
VILLAGE : SOKKAMPATTI,
TALUK : MELLUR,
DISTRICT : MADURAI,
STATE : TAMIL NADU.

INDEX

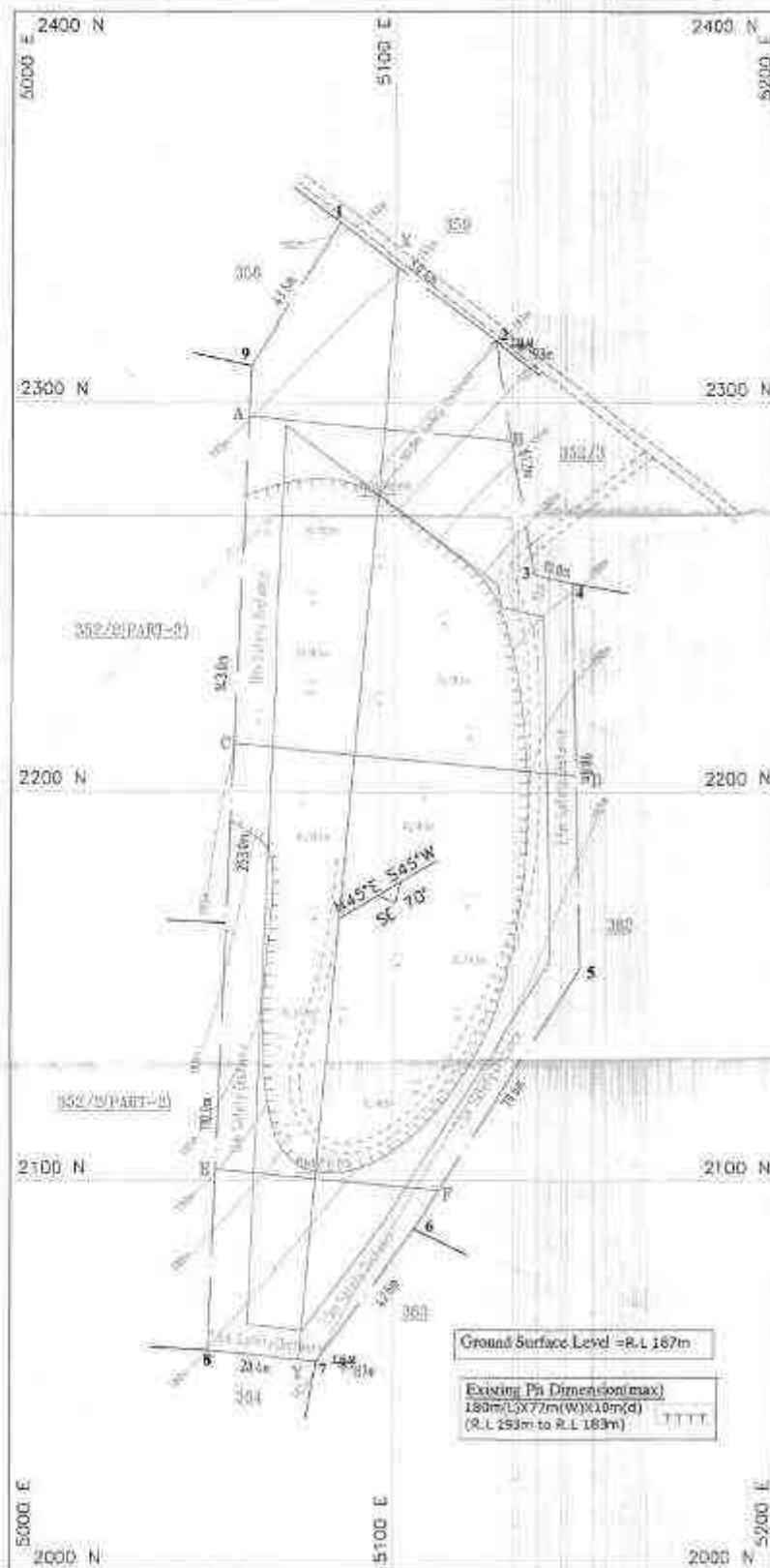
Q.L. APPLIED AREA BOUNDARY	
7.5m, 10m & 50m SAFETY DISTANCE	
TEMPORARY BENCH MARK	
STRIKE AND DIP	
ROUGH STONE	
TOPSOIL	
QUARRY PIT	
QUARRY ROAD	
APPROACH ROAD	
TAR ROAD	

QUARRY LEASE & SURFACE PLAN
SCALE 1 : 1000

PREPARED BY:
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Dr. P. THANGARAJULU 110-A
QUALIFIED PERSON

Ground Surface Level = R.L. 187m
Existing Pit Dimension(max)
180m(L)X77m(W)X10m(d)
(R.L. 193m to R.L. 163m)



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 12' 52.00" N	78° 21' 15.20" E
2	10° 12' 51.00" N	78° 21' 16.50" E
3	10° 12' 48.14" N	78° 21' 17.50" E
4	10° 12' 43.07" N	78° 21' 17.40" E
5	10° 12' 45.85" N	78° 21' 17.20" E
6	10° 12' 43.67" N	78° 21' 16.10" E
7	10° 12' 42.50" N	78° 21' 15.80" E
8	10° 12' 43.83" N	78° 21' 14.20" E
9	10° 12' 50.21" N	78° 21' 14.45" E

TOTAL 903.81

PLATE NO-III

DATE OF SURVEY : 28.04.2021

APPLICANT:

THIRU.K.SILAMBARASAN
SUKARUPUSAMY,
138, MALLAKHOTTA,
THIRUPATHI, SIVAKAMAM 666

LOCATION OF QUARRY LEASE APPLIED AREA:

S.F.NO : 352/2(PART-1)
EXTENT : 3.02 H. HA.
VILLAGE : SEINKAMPATTI,
TALUK : MELUR,
DISTRICT : MADURAI,
STATE : TAMIL NADU.

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- Q1. APPLIED AREA BOUNDARY
- 7.5m, 10m & 30m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- STRIKE AND DIP
- ROUGH STONE
- TOPSOIL
- QUARRY PIT
- QUARRY ROAD
- APPROACH ROAD
- TAR ROAD

GEOLOGICAL PLAN AND SECTION

SCALE 1:1000

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MVA
FOR MANGALAM ENGINEERING
QUARRY DESIGN

SECTION ALONG X-Y

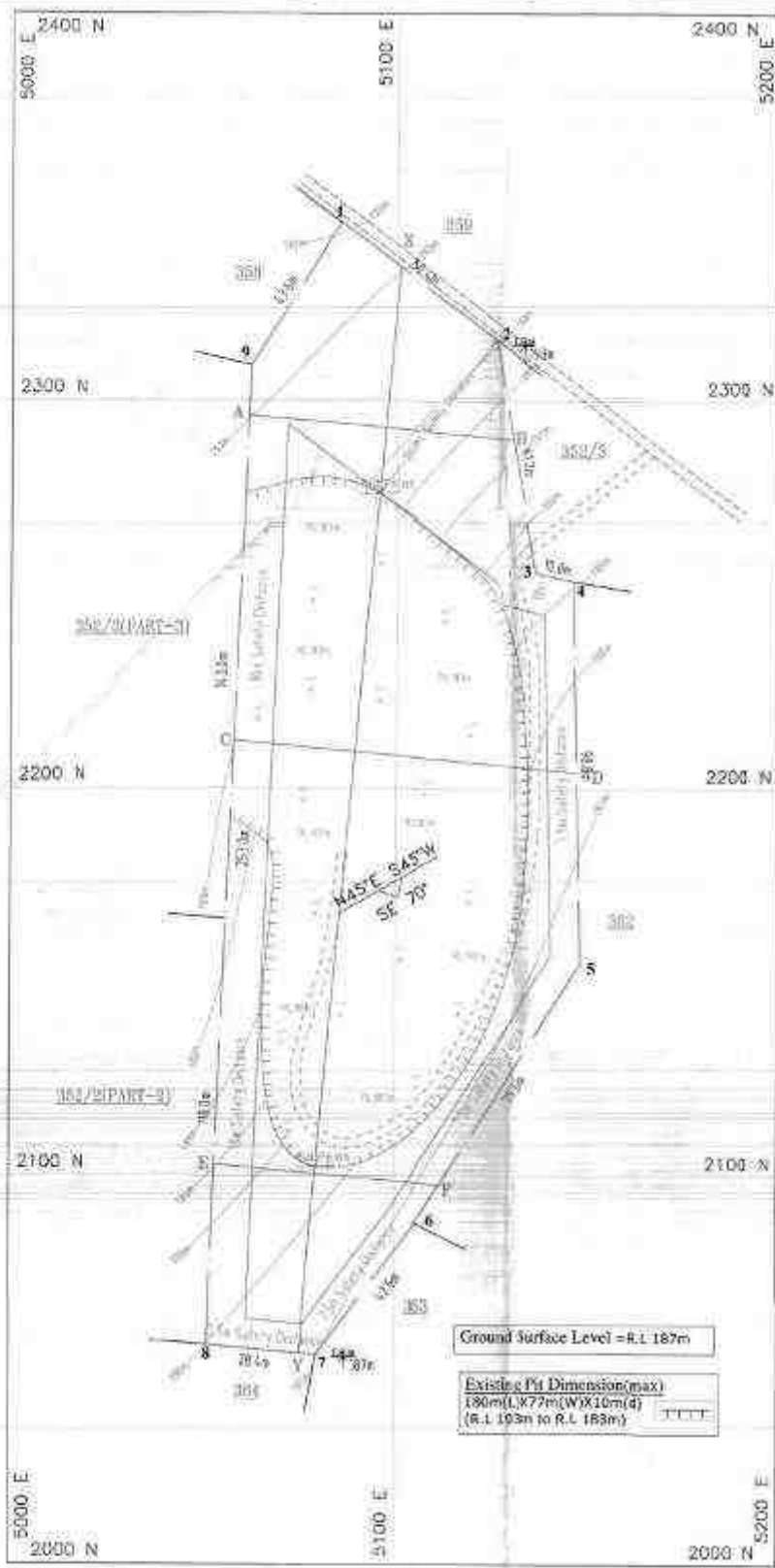


SECTION ALONG A-B

SECTION ALONG C-D

SECTION ALONG E-F





BOUNDARY CO-ORDINATES

S.N.	Latitude	Longitude
1	10° 17' 22.043"	76° 21' 5.567"
2	10° 17' 21.067"	76° 21' 5.733"
3	10° 17' 48.143"	76° 21' 11.025"
4	10° 17' 49.073"	76° 21' 11.647"
5	10° 17' 45.267"	76° 21' 11.117"
6	10° 17' 42.573"	76° 21' 9.123"
7	10° 17' 43.567"	76° 21' 10.287"
8	10° 17' 42.637"	76° 21' 9.337"
9	10° 17' 40.217"	76° 21' 14.457"

DATE: 02-04-2021

PLATE NO-IV
DATE OF SURVEY: 28.04.2021

APPLICANT:
THIRUK. S. LAKSHARASAN,
S/O KARUPUSAMY,
333 MALLAKOTTAI,
THIRUPATTUR, SIVAGANGAI-630 081.

LOCATION OF QUARRY LEASE APPLIED AREA:
S.F. NO.: 352/2(Part-I),
EXTENT: 2.00 Hrs.
VILLAGE: SONGASAPATI,
TALUK: MELLUR,
DISTRICT: MADURAI,
STATE: TAMIL NADU.

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Q.L. APPLIED AREA BOUNDARY	—————
7.5m, 10m & 20m SAFETY DISTANCE	—————
TEMPORARY BENCH MARK	⊕
STRIKE AND DIP	⚡
ROUGH STONE	⬢
TOPSOIL	⬢
QUARRY PIT	TTTTT
QUARRY ROAD	⬢
APPROACH ROAD	⬢
TAR ROAD	⬢

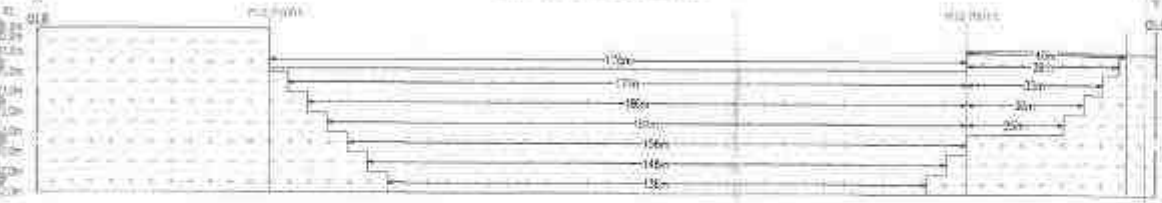
MINEABLE PLAN AND SECTION
SCALE 1 : 1000

PREPARED BY:

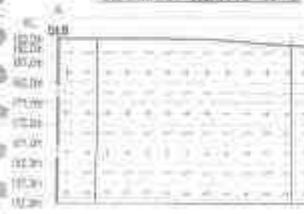
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112A

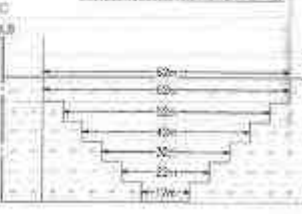
SECTION ALONG X-Y



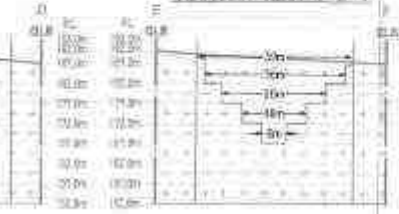
SECTION ALONG A-B

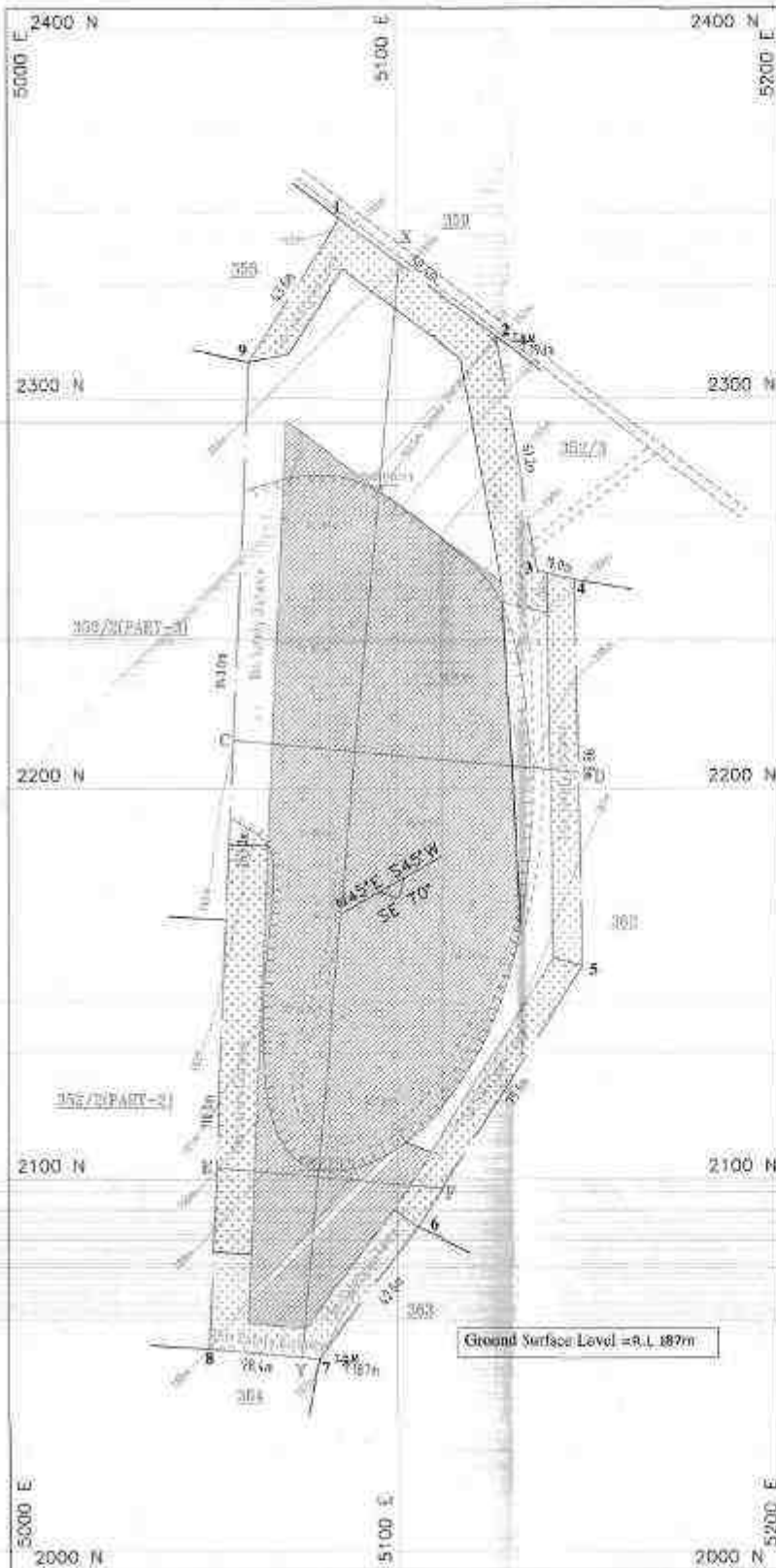


SECTION ALONG C-D



SECTION ALONG E-F





Landuse Pattern		
Description	Present area (Ha)	Area at the end of this Mining plan period (Ha)
Area Under Quarrying	1.09.0	1.24.3
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.45.0
Unutilised Area	0.91.0	0.29.7
Grand Total	2.02.0	2.02.0

I-Y PLANTATION	[Pattern]
E-Y PLANTATION	[Pattern]
H-Y PLANTATION	[Pattern]
M-Y PLANTATION	[Pattern]
V-Y PLANTATION	[Pattern]
I-Y EXCAVATION	[Pattern]
E-Y EXCAVATION	[Pattern]
H-Y EXCAVATION	[Pattern]
M-Y EXCAVATION	[Pattern]
V-Y EXCAVATION	[Pattern]

BOUNDARY CO-ORDINATES

S.No.	LATITUDE	LONGITUDE
1	10° 12' 32.03"N	78° 21' 15.89"E
2	10° 12' 51.29"N	78° 21' 16.53"E
3	10° 12' 48.74"N	78° 21' 17.10"E
4	10° 12' 49.07"N	78° 21' 17.42"E
5	10° 12' 45.85"N	78° 21' 17.02"E
6	10° 12' 45.07"N	78° 21' 16.34"E
7	10° 12' 42.50"N	78° 21' 15.28"E
8	10° 12' 42.93"N	78° 21' 14.55"E
9	10° 12' 50.21"N	78° 21' 14.45"E

SCALE: 1:5000

PLATE NO-V
DATE OF SURVEY: 28.04.2021

APPLICANT:
THIRU K. SLAMBARASAN,
S/O. KARUPPUSAMY,
338, MALLAKOTTAI,
THIRUPATTUR, SIVAGANGAI-630 608.

LOCATION OF QUARRY LEASE APPLIED AREA:
S.F. NO. - 365/2(Pa-1),
EXTENT - 2.02.0 Ha,
VILLAGE - SONKAMPATTI,
TALUK - MELLUR,
DISTRICT - MADURAI,
STATE - TAMIL NADU.

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Q.L. APPLIED AREA BOUNDARY	[Symbol]
2.5m, 10m & 20m SAFETY DISTANCE	[Symbol]
TEMPORARY BENCH MARK	[Symbol]
STRIKE AND DIP	[Symbol]
ROUGH STONE	[Symbol]
TOPSOIL	[Symbol]
QUARRY PIT	[Symbol]
QUARRY ROAD	[Symbol]
APPROACH ROAD	[Symbol]
TAR ROAD	[Symbol]

YEARWISE DEVELOPMENT AND PRODUCTION PLAN AND SECTION
SCALE 1:1000

PREPARED BY:

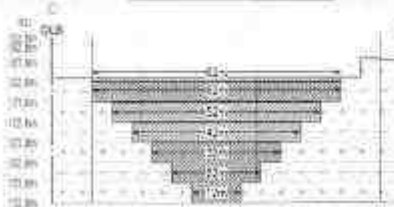
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113 *[Signature]*
S. SIVAKUMAR
SIVAGANGAI-630 608

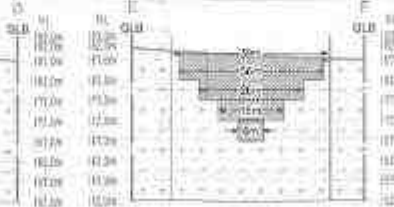
SECTION ALONG X-Y

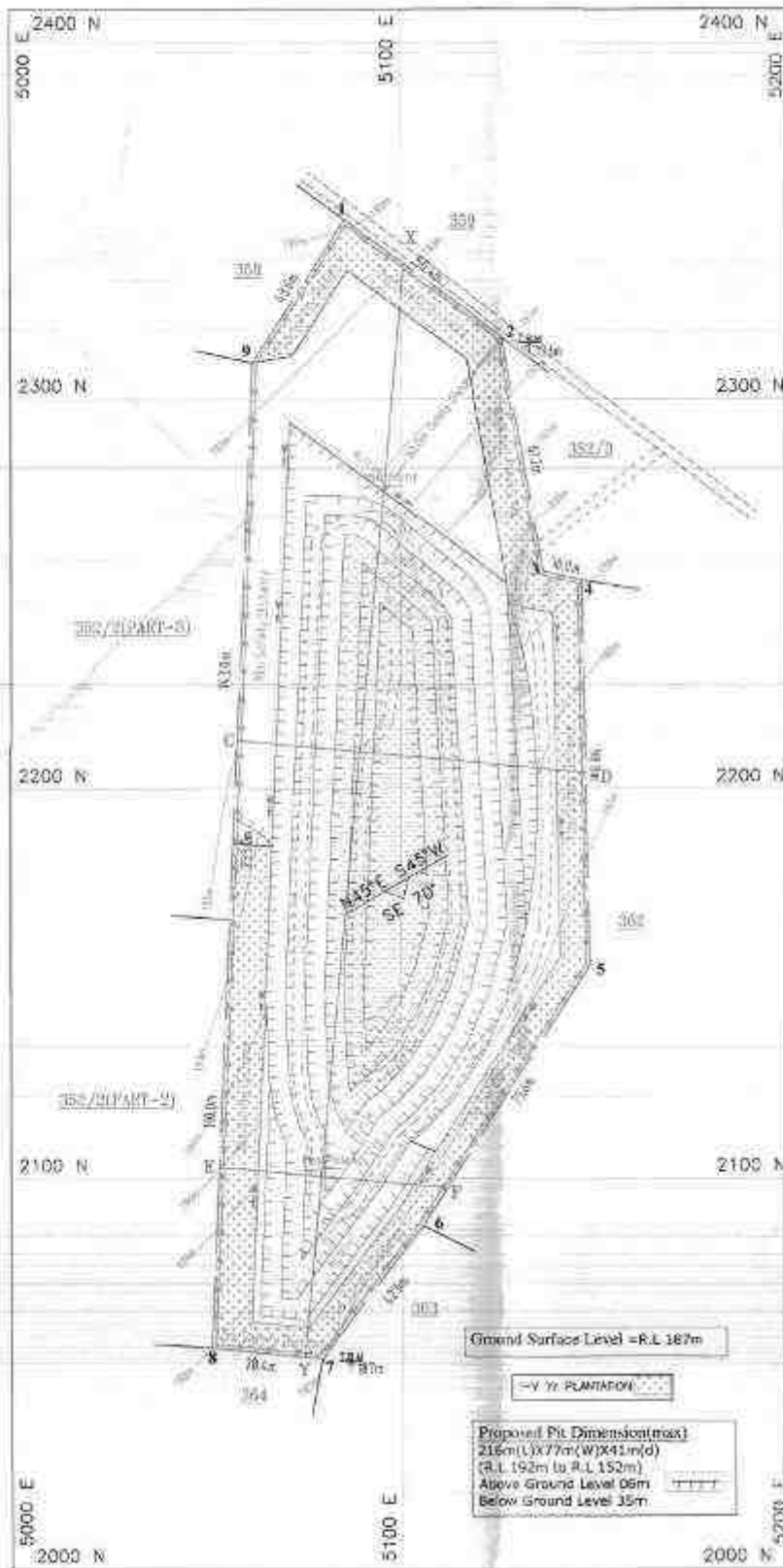


SECTION ALONG C-D



SECTION ALONG E-F





BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 13' 52.06" N	76° 21' 15.26" E
2	10° 13' 51.08" N	76° 21' 16.13" E
3	10° 13' 48.14" N	76° 21' 17.10" E
4	10° 13' 46.07" N	76° 21' 17.42" E
5	10° 13' 45.82" N	76° 21' 17.52" E
6	10° 13' 45.07" N	76° 21' 18.23" E
7	10° 13' 43.58" N	76° 21' 18.28" E
8	10° 13' 43.67" N	76° 21' 18.35" E
9	10° 13' 50.21" N	76° 21' 18.45" E

DATE: 05-01-21

PLATE NO-VI

DATE OF SURVEY - 28.04.2021

APPLICANT:

THIRU. K. SIVAMBARASAN,
50 KARUPPUSAMY,
33B MALLAKOTTAI,
THIRUPATTUR, SIVAGANGAI-600 569

LOCATION OF QUARRY LEASE APPLIED AREA:

S.F.NO : 350/2(Part-1),
EXTENT : 2.02.0 Hs,
VILLAGE : SOKKAMPATTI,
TALUK : MELLUR,
DISTRICT : MADURAI,
STATE : TAMIL NADU.

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Q/L APPLIED AREA BOUNDARY	---
7.5m, 10m & 30m SAFETY DISTANCE	---
TEMPORARY BENCH MARK	TM
STRIKE AND DIP	---
QUARRY PIT	TTTT
QUARRY ROAD	---
APPROACH ROAD	---
TAR ROAD	---
EXISTING LANDFORM	---
OLD SURFACE LEVEL	---
FINISHED SURFACE LEVEL	---
TREES	---
SOIL LAYER	---
FENCING	---
PROPOSED GARLAND DRAW	---
PROPOSED WATER STORAGE	---
REHABILITATED LANDFORM	---

SECTION ALONG X-Y



SECTION ALONG C-D



SECTION ALONG E-F

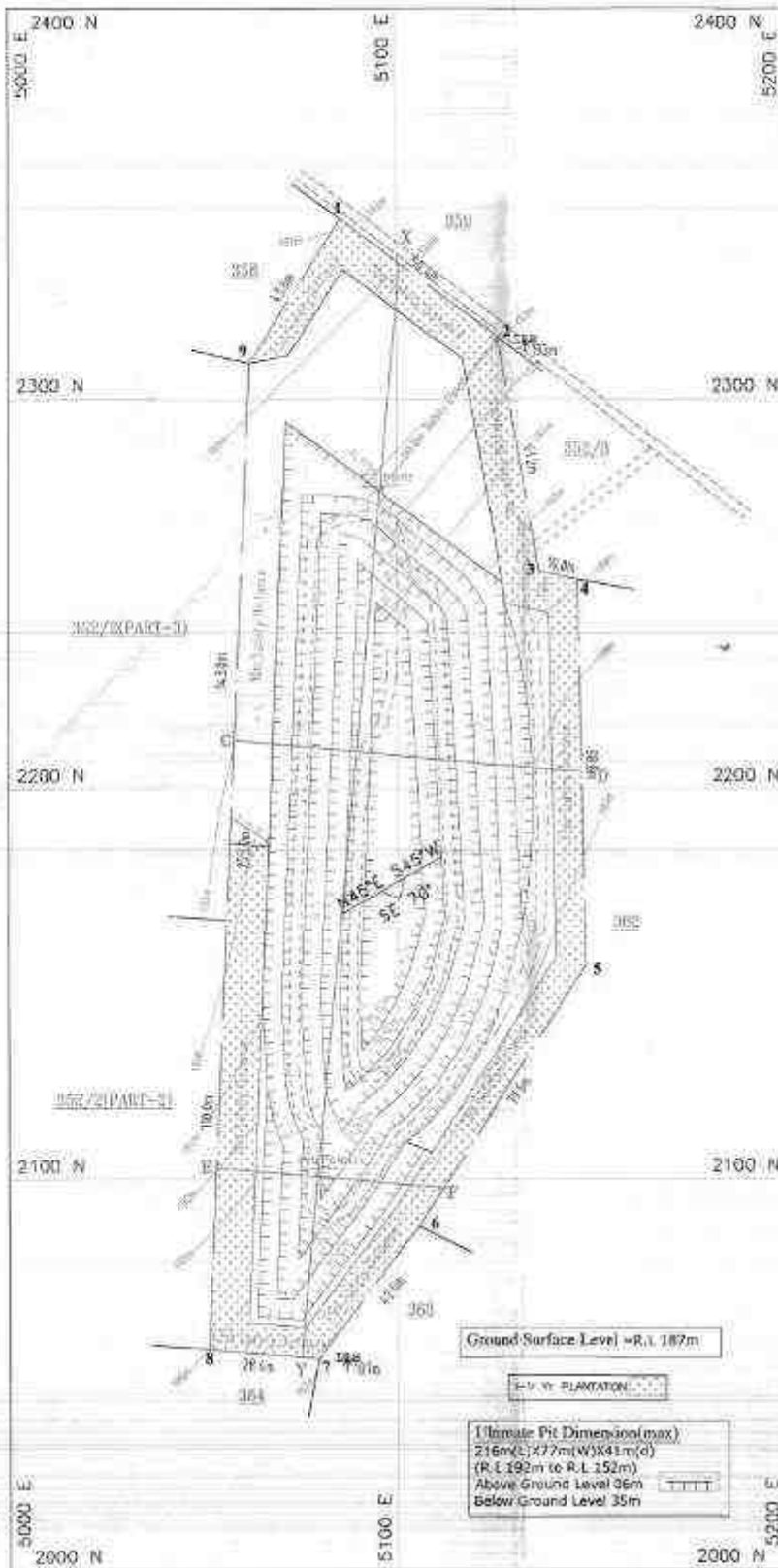


PROGRESSIVE QUARRY CLOSURE PLAN AND SECTION
SCALE 1 : 1000

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AUTHENTICATED
BY STATE GOVERNMENT.

114A/WV
S. P. SANKARANARAYANAN,
SURVEY ENGINEER



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	07° 13' 42.06"N	07° 21' 15.20"E
2	07° 12' 51.09"N	07° 21' 15.73"E
3	07° 13' 43.14"N	07° 21' 17.07"E
4	07° 13' 44.07"N	07° 21' 17.47"E
5	07° 12' 45.85"N	07° 21' 17.60"E
6	07° 12' 45.67"N	07° 21' 16.17"E
7	07° 12' 42.56"N	07° 21' 15.26"E
8	07° 13' 42.65"N	07° 21' 15.30"E
9	07° 13' 42.21"N	07° 21' 14.45"E

SCALE: 1:1000

PLATE NO-VII
DATE OF SURVEY: 28.04.2021

APPLICANT:
THIRU K. SR. AMBARASAN,
S/O KARUPPLASAMY,
339, MALLAKOTTAI,
THIRUPATTUR, SIVASAGAYAM 605 003.

LOCATION OF QUARRY LEASE APPLIED AREA:
S.F. NO: (352/2(PART-V))
EXTENT: 2.87.0 Ha.
VILLAGE: EOKKAMPATTI,
TALUK: MELLUR,
DISTRICT: MADURAI,
STATE: TAMIL NADU.

INDEX

Q.L. APPLIED AREA BOUNDARY	———
7.5m, 10m & 30m SAFETY DISTANCE	———
TEMPORARY BENCH MARK	TM
STRIKE AND DIP	SD
ROUGH STONE	———
TOPSOIL	———
QUARRY PIT	TTTT
QUARRY ROAD	———
APPROACH ROAD	———
TAR ROAD	———

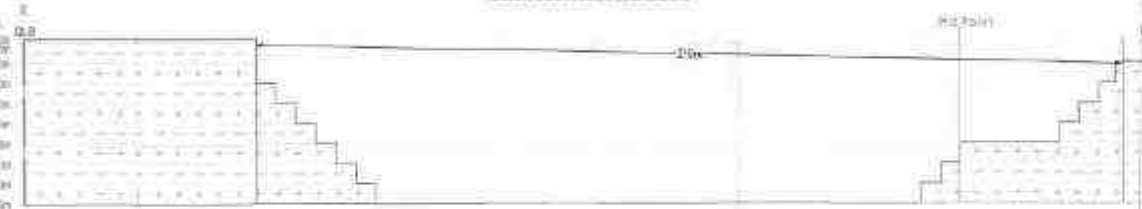
CONCEPTUAL PLAN AND SECTION
SCALE: 1:1000

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115 *Ambarasan*
S/O KARUPPLASAMY,
339, MALLAKOTTAI,
THIRUPATTUR, SIVASAGAYAM

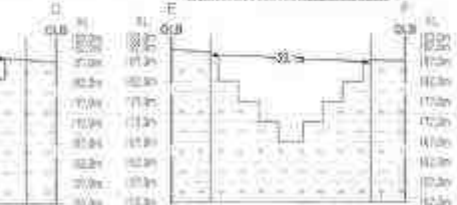
SECTION ALONG X-Y



SECTION ALONG C-D



SECTION ALONG E-F



Hydro Geological Report for

**Rough stone Quarry Over an
extent of 2.02.0ha in S.F.No. 352/2 (Part - 1) of Sockampatti
Village, Melur Taluk, Madurai District, Tamil Nadu.**

K. Sivanthi

HYDROGEOLOGICAL REPORT FOR SOKKAMPATTI

ROUGH STONE QUARRY

The Client requires detailed information on Ground Water Occurrences at Proposed Project Site of Rough Stone quarry. The objective of the present study is to assess the availability of groundwater and comment on aspects of depth to potential aquifers, aquifer availability and type, possible yields and water quality. For this purpose, all available hydrogeological information of the areas has been analyzed, and a geophysical survey was done.

1. INTRODUCTION

NAME OF THE APPLICANT WITH ADDRESS-

Name of the applicant : **Thiru.K.Silambarasan**
Address : S/o. Karuppusamy,
No. 339, Mallakkottai,
Thiruppathur,
Sivagangai District – 630 566.
State : Tamilnadu.

DETAILS OF THE AREA-

Land Classification : Patta Land
Survey No : 352/2 (Part - 1).
Extent : 2.02.0Ha.
Village : Sökkampatti,
Taluk : Melur,
District : Madurai.

The investigations involved hydrogeological, geophysical field investigations and a detailed study in which the available relevant geological and hydrogeological data were collected, analyzed, collated and evaluated within the context of the Client's requirements.

The data sources consulted were mainly:

- a) Central Ground Water Board (CGWB) Data
- b) State & District Geological and Hydrogeological Reports and Maps.
- c) Technical reports of the area by various organizations.

K. Silambarasan

2. SCOPE OF THE WORKS

The scope of works includes:

- ❖ Site visits to familiarize with the project areas. Identify any issues that might impact the Ground Water Scenario due to proposed mining activities.
- ❖ To obtain, study and synthesize background information including the geology, hydrogeology and existing borehole data, for the purpose of improving the quality of assessment and preparing comprehensive hydrogeological reports,
- ❖ To carry out hydrogeological evaluation and geophysical investigations in the selected sites in order to determine potential for groundwater at project site.
- ❖ To prepare hydrogeological survey reports in conformity with the provisions of the rules and procedure outlined by the Central Ground Water Board (CGWB), by Assessment of water quality and potential infringement of National standards, Assessment of availability of groundwater and Impact of proposed activity on aquifer, water quality and other abstractors.

3. BACKGROUND INFORMATION

Geographical information of the study area-

The investigated site falls in the Toposheet No: **58-J/08** Latitude between **10°13'42.56"N to 10°13'52.06"N** and Longitude between **78°21'14.35"E to 78°21'17.52"E** on WGS datum-1984.

4. GEOMORPHOLOGY

Geomorphology of Madurai District

The prominent geomorphic units in the district are structural and denudated land forms such as structural and denudational hills, residual wells, linear ridges, uplands and barred pediments.

Vaigai is the Main River within a curvilinear course, enters the district north of cholavandan from there it enters Sivaganga district and finally debouches into the Palk Strait in the east. The other ephemeral streams are Periyar River, Gundar River, Malattar and Govindan Ar. Rivers. The Geomorphology of Madurai district is characterized by alluvial landforms like active channel, levee and flood plain and denudation landforms like hill, valley and pediment / pediplain. The western half of the district is marked by a prominent northeasterly sloping valley-the cumbam valley –flanked on either side by the range of Western Ghats.

In the eastern half, the hills are restricted. The alluvial landforms are limited along the river courses. For the Major part of a year, the active channel is restricted along narrow zones in the river bed. The rest of the area forms the pediplain /Pediment with varying thickness of Soil cover. Towards Madurai North and further East, one enters the domain of manmade/ Natural tanks from augment water supply for both domestic and agricultural needs.

Soil

The district is characterized by red soil, Black clayey soil and alluvial soil. Red soil is found in all the blocks of the district while black clayey soil is found in Tirumangalam, Usilampatti and Peraiyur blocks of the district and alluvial soil is found along the courses of the river.

Climate and Rainfall

The district receives rainfall during NE monsoon (47%), SW monsoon (32%), summer (17%) and winter (4%). The normal annual rainfall varies from 806 mm (Sholavandan Rain Gauge Station) in the northern part to 964.1 mm (Melur Rain gauge Station) in the eastern part of the district. The entire district experiences a declining trend in annual rainfall except at Melur, where a rising trend is noticed. The climate is subtropical and the temperature varies from 15 to 41°C in the district. The relative humidity varies from 45 to 85% and is high during NE monsoon.

5. GEOLOGY

Regional Geology of Madurai District-

Madurai district is total area of 3860 sq.km. Is one of the trifurcated districts of the erstwhile composite Madurai and is situated between North latitudes 09°30'-10°16' and east longitudes 77° 15' - 78° 25'. It is bound by Theni district in the west, Dindigul district in the north, Karur and Sivaganga districts in the east and by Virudunagar district in the south. It comprises 10 taluks, viz., Madurai East, Madurai West, Thirupparankundram, Usilampatti, Tirumangalam, Madurai South, Madurai North, Vadipatti, Peraiyur and Melur taluks with Madurai City as the district headquarters. Madurai district is covered by granulite facies high grade metamorphic rocks and younger intrusive which fall under the following categories:

1. Metasedimentary group comprising quartzite, calc gneiss/crystalline limestone, garnet sillimanite ± biotite ± cordierite ± spinel gneiss, minor garnet-cordierite gneiss and garnetiferous quartzo-feldspathic gneiss (Khondalites and leptynite), magnetite and quartzite.
2. Charnockite Group consisting of acid charnockite and pyroxene granulite.

K. S. Kumar

3.Older Intrusive rocks consisting of amphibolite, pyroxenite and gabbro (mafics ultra mafics).

4.Migmatite group made up of banded hornblende biotite gneiss, grey granitic gneiss, pinkgranitic gneiss and grey hornblende granite.

5.Younger Acid Intrusive consisting of granite and pegmatite. Metasedimentary group: This consists of rocks of arenaceous, calcareous and argillaceous composition metamorphosed under granulite facies and represented by quartzite, calc gneiss/diopside granulite, marble, garnet sillimanite gneiss (Khondalite) with minor bands of garnet ferrous quartzo-feldspathic gneiss (leptynite), and garnet cordierite gneiss. These rocks occur as either individual bands or as 'enclaves' or as tectonic slices within the predominantly charnockite-migmatite country. Quartzite is the important member of the Metasedimentary Group and occupies the crest of the linear ridges in the district. Thickness of the individual quartzite bands varies from less than a metre to 150m. The quartzite is white or dirty white in colour and composed essentially of interlocking grains of quartz and Feldspar which is often kaolinised. Calc gneiss is grayish white, medium grained, granular or gneissose rock with typical ribbed weathering. It consists mainly of green diopside, white calcite and quartz with pinhead size garnets, green apatite and magnetite as accessory minerals. The thickness of calc gneiss varies from 1m to 30m. With the decrease of silicate minerals and increase of carbonates the calc gneiss grades into crystalline limestone at a few places. Garnet-sillimanite Gneiss (Khondalite) represents metamorphosed pelitic sediments. This rock shows a thickness varying from 1m to 50m. Development of garnet is very profuse and at times garnet rich layers (1 to 2 cm thick) alternate with quartz-Feldspar rich layers. Sillimanite occurs in varying amounts. Biotite is a common associate mineral. Development of cordierite is noticed in the garnetsillimanite gneiss in a few places. Minor bands of a few cm to a couple of metres wide, whitish looking quartzo-feldspathic gneiss (leptynite) with unevenly distributed pink garnets occur as interbands within garnet-sillimanite gneiss.

The charnockite group consists of acid to intermediate charnockite and the associated thin interbands and lenses of pyroxene granulite. The pyroxene granulite is dark grey granular to gneissic; medium grained and occurs mostly as unmappable bands within charnockite and hornblende biotite gneiss.

The charnockite is grey greasy, medium to coarse grained, massive or gneissic rock and occupies the major part of Madurai District. It occurs over the hills as well as the plains underlying the metasediments. The rock is chiefly made up of quartz, K Feldspar,

K. S. Kumar

plagioclase, and hypersthene with apatite and magnetite as accessories. Pink garnet upto 1 or 2 mm diameter are developed in a few places.

The charnockite group of rocks has been extensively migmatized due to later quartzofeldspathic influx resulting in banded hornblende- biotite gneiss, which with change in intensity of migmatization grade into granitic gneiss and grey hornblende granite. The garnetiferous quartzofeldspathic gneiss (Melur white) is considered as migmatitic product of Khondalitic group of rocks.

The hornblende biotite gneiss is medium to coarse, pale grey coloured rock and show banded structure with alternating quartz-Feldspar rich layers and hornblende biotite rich layers with individual layers ranging from 1mm to 1cm width, imparting a well-developed gneissosity to the rock. Granitic gneiss is grey, medium grained, well foliated rock with colour and compositional banding. It occurs mostly as band upto 15m wide, folded along with the metasediments. The rock is chiefly made up of quartz and orthoclase, which is mostly perthitic with plagioclase and biotite as the main accessories. The garnetiferous quartzofeldspathic gneiss (Melur white) is white or pale grey in colour, granoblastic and consists of colorless quartz, white K Feldspar, minor amount of plagioclase with pink garnets evenly distributed; biotite occurs in a small amount.

Younger Acid Intrusive that are noticed in the Madurai District are granite and thin veins of pegmatite. Pegmatite is coarse grained, mostly pink coloured with orthoclase and quartz as the main minerals. Biotite and magnetite occur in small amounts. Pockets of Tertiary marine sandstone, calcareous gritty sandstone and low level laterite capping with kankary veins are noticed east of Madurai, Quaternary alluvium is found on either side of River Vaigai around Madurai.

Three phases of folding are recognized with the earliest (F1) being tight to near isoclinal fold of reclined to recumbent type. The F2 fold is of close type with steep axial plane trending NE-SW with low southerly plunge. Third phase (F3) occur as open type along WNW-ESE axial trace. The main trend of the rocks South of River Vaigai is NW-SE to E-W with low to moderate southerly dip and north of the River Vaigai the rocks show a NE-SW trend with moderate north westerly dip. The area had undergone metamorphism of Upper amphibolite to granulite facies with subsequent retrogression due to migmatization and shearing.

Mineralization is known in the form of sulphide dissemination in calc gneiss north and NW of Usilampatti and NW of Tirumangalam. A few bands of crystalline limestone useful for cement industry also occur as seen north and NW of Usilampatti. Some of the

K. S. Kumar

quartzite bands, with the removal of impurities like garnet and biotite by mechanical separation may prove useful for ceramic and glass industry. The garnetiferous quartzo feldspathic gneiss in Melur area is being extensively quarried for dimension stone (Kashmiri white). White quartz veins and K-Feldsparrich pegmatite veins are quarried west of Cholavandan (Kalluttu) for glass and ceramic industries. Graphite dissemination with local concentrations within calc gneiss is also reported near Kalluttuand further west. The charnockite and granitic gneiss are extensively quarried for road metal, fencing blocks and building stones.

Leptynite

The rocks type around Melur can be broadly classified into Khondalite and Charnockite Groups of rocks. Khondalite Group in this area is essentially made up of calcgranulite/crystalline limestone and garnetiferoussillimanite gneiss, with minor bands of quartzite. Charnockite Group on the other hand includes the acid to intermediate charnockite with minor bands of two pyroxene granulite. Both the group of rocks were later migmatized and reconstituted giving rise to grey colouredmigmatite comprising hornblende biotite gneiss, aswell as garnetbiotite gneiss and garnetiferous quartzo-feldspathic granulite. The intrusions ofyounger pink granite as well as pink pegmatoidal granite had converted part of the greymigmatite into pink migmatitic gneiss and pink augen gneiss. The white garnetiferous quartzo feldspathic granulite occurring east of Melur is considered to be reconstituted garnetiferoussillimanite gneiss while the pink augen gneiss well developed near Tiruchchanai is due to blastic growth of pink potash Feldspar augens within the grey biotite gneiss. Anumber of minor pegmatite and quartz veins represent the last stage intrusive activity in thearea.

GEOLOGICAL FORMATION OF THE DISTRICT

Quaternary	Recent	Laterite and soil
Proterozoic	Acid intrusives	Pegmatite veins/ quartz veins Pink augen gneiss and migmatitePink medium grained granite/pegmatoidal granite.
	Grey Migmatite	Hornblende biotite gneiss/ Garnet biotite gneiss. Garnetiferousquartzofeldspathic granulite

K. S. Kumar

Archaean	Charnockite Group and Khondalite	Pyroxene Granulite Group Charnockite (acid to intermediate) Calc granulite/ Crystalline limestone Garnetiferous sillimanite gneiss/ Quartzite.
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6. GEOPHYSICAL INVESTIGATION METHODS

A variety of methods are available to assist in the assessment of geological sub-surface conditions. The main emphasis of the fieldwork undertaken was to determine the thickness and composition of the sub-surface formations and to identify water-bearing zones. This information was principally obtained in the field using, and vertical electrical soundings (VES). The VES probes the resistivity layering below the site of measurement. This method is described below.

Resistivity Method

Vertical electrical soundings (VES) were carried out to probe the condition of the sub-surface and to confirm the existence of deep groundwater. The VES investigates the resistivity layering below the site of measurement.

Basic Principles

The electrical properties of rocks in the upper part of the earth's crust are dependent upon the lithology, porosity, and the degree of pore space saturation and the salinity of the pore water. Saturated rocks have lower resistivity than unsaturated and dry rocks. The higher the porosity of the saturated rock, or the higher the salinity of the saturating fluids, the lower is the resistivity. The presence of clays and conductive minerals also reduces the resistivity of the rock.

The resistivity of earth materials can be studied by measuring the electrical potential distribution produced at the earth's surface by an electric current that is passed through the earth. Current is moved through the subsurface from one current electrode to the other and the potential difference is recorded as the current passes. From this information, resistivity values of various layers are acquired and layer thickness can be identified.

The apparent resistivity values determined are plotted as a log function versus the log of the spacing between the electrodes. These plotted curves identify thickness of layers. If there are multiple layers (more than 2), the acquired data is compared to a master curve to determine layer thickness.

This method is least influenced by lateral in-homogeneities and capable of providing higher depth of investigation.

K. S. [Signature]

The resistance R of a certain material is directly proportional to its length L and cross-sectional area A, expressed as:

$$R = R_s * L/A \text{ (in Ohm)}$$

Where R_s is known as the specific resistivity (characteristic of the material and independent of its shape or size)

With Ohm's Law,

$$R = dV/I \text{ (Ohm)}$$

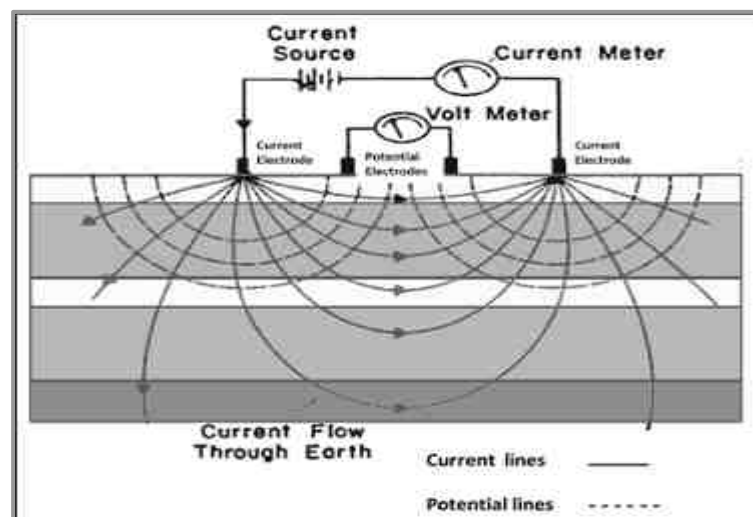
Where dV is the potential difference across the resistor and I is the electric current through the resistor. The specific resistivity may be determined by:

$$R_s = (A/L) * (dV/I) \text{ (in Ohm m)}$$

Vertical Electrical Sounding (VES)

When carrying out a resistivity sounding, current is led into the ground by means of two electrodes. With two other electrodes, situated near the center of the array, the potential field generated by the current is measured. From the observations of the current strength and the potential difference, and taking into account the electrode separations, the ground resistivity can be determined. During a resistivity sounding, the separation between the electrodes is step-wise increased (known as a Schlumberger Array), thus causing the flow of current to penetrate greater depths. When plotting the observed resistivity values against depth on double logarithmic paper, a resistivity graph is formed, which depicts the variation of resistivity with depth. This graph can be interpreted with the aid of a computer, and the actual resistivity layering of the subsoil is obtained. The depths and resistivity values provide the hydro geologist with information on the geological layering and thus the occurrence of groundwater.

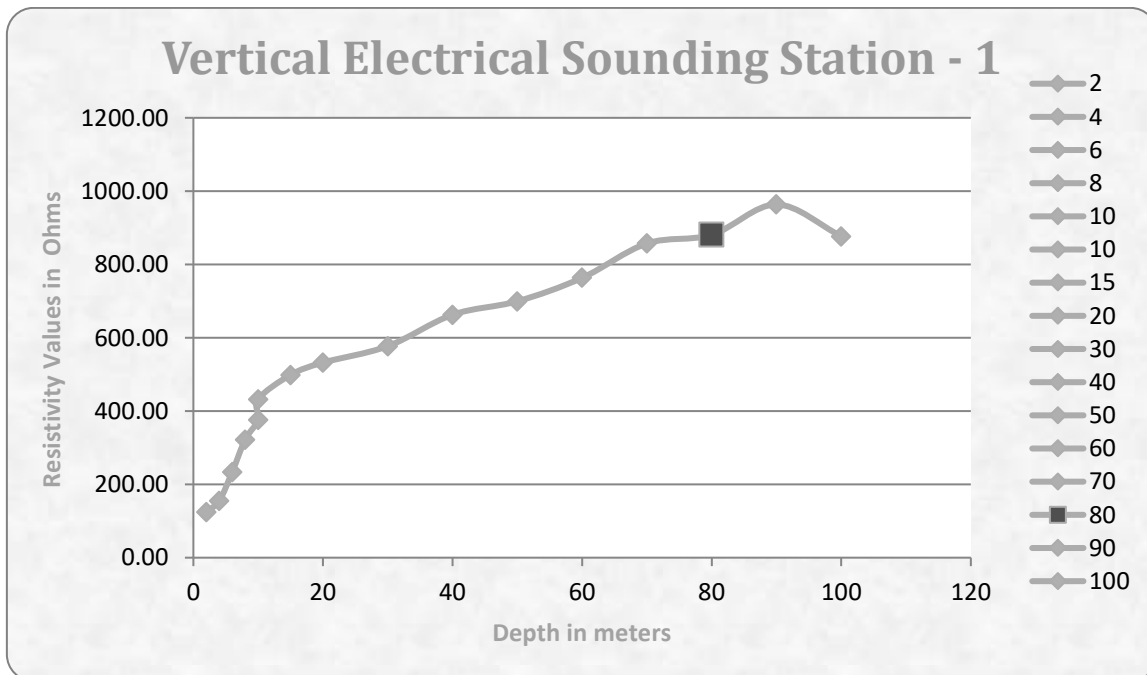
Vertical Electrical Sounding Method



K. S. Kumar

Geophysical Data's and Graphs Fracture Zone Levels

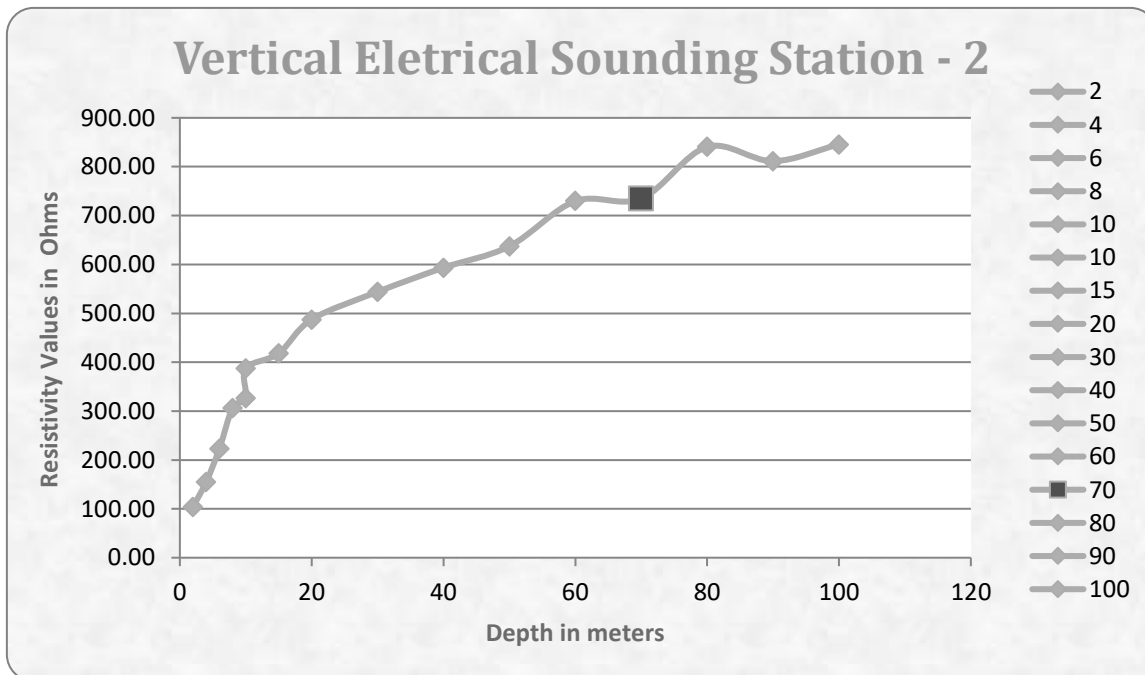
Vertical Electrical Sounding Station - 1					
GPS Coordinates - 10°13'50.90"N 78°21'15.58"E					
S.No	Ab/2(m)	Mn/2(m)	Geometrical Factor (G)	Resistance Value in Ohms [R]	Apparent Resistance in Ohms
1	2	1	4.71	26.56	125.10
2	4	1	23.55	6.60	155.43
3	6	1	54.95	4.26	234.09
4	8	1	98.91	3.26	322.45
5	10	1	155.45	2.42	376.19
6	10	5	23.55	18.36	432.38
7	15	5	62.80	7.94	498.63
8	20	5	117.75	4.52	532.23
9	30	5	274.75	2.10	576.98
10	40	5	494.55	1.34	662.70
11	50	5	777.15	0.90	699.44
12	60	5	1122.55	0.68	763.33
13	70	5	1530.75	0.56	857.22
14	80	5	2001.75	0.44	880.77
15	90	5	2535.55	0.38	963.51
16	100	5	3132.15	0.28	877.00



◆ Based on the vertical electrical sounding graphs shown purple color is fracture zone.

K. Sivanth

Vertical Electrical Sounding Station - 2					
GPS Coordinates - 10°13'43.53"N 78°21'15.20"E					
S.No	Ab/2(m)	Mn/2(m)	Geometrical Factor (G)	Resistance Value in Ohms [R]	Apparent Resistance in Ohms
1	2	1	4.71	22.16	104.37
2	4	1	23.55	6.59	155.19
3	6	1	54.95	4.06	223.10
4	8	1	98.91	3.10	306.62
5	10	1	155.45	2.10	326.45
6	10	5	23.55	16.46	387.63
7	15	5	62.80	6.66	418.25
8	20	5	117.75	4.14	487.49
9	30	5	274.75	1.98	544.01
10	40	5	494.55	1.20	593.46
11	50	5	777.15	0.82	637.26
12	60	5	1122.55	0.65	729.66
13	70	5	1530.75	0.48	734.76
14	80	5	2001.75	0.42	840.74
15	90	5	2535.55	0.32	811.38
16	100	5	3132.15	0.27	845.68

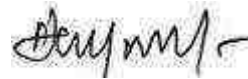


◆ This vertical electrical sounding graphs shown purple color is fracture zone.

K. S. Kumar

7. Conclusion

Based on the available information and the geophysical investigations it is concluded that the project area is considered to have medium groundwater potential. Productive aquifers are expected at depth of 75m to 80m where minor fractures are observed and shallow aquifers are expected above 65m-70m BGL. The ultimate pit limit as per the approved mining plan depth is 41m (6m above ground level + 35m below ground level) which will have no impact on the Ground Water.



Dr. P. Thangaraju, M.Sc., Ph.D.,

Govt. Approved Hydro Geologist

M/s. Geo Exploration and Mining Solutions,

Regd. Office: No. 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004, Tamil Nadu

Mobile: +91 - 94433 56539

E-Mail: infogeoexploration@gmail.com



SHRI MUTHU EXPLOSIVES

CELL:9442244664

9842422446

17/1651,NORTH SERPATTI,K.PERIYAPATTI-POST,MANAPPARAI TK,TRICHY DT.

LICENCE NUMBER: E/SC/TN/22/534(E40825)

Date: 06.05.2021

To:

Mr.K.SILAMBARASAN
S/o. KARUPPUSAMY,
NO.339,MALLAKOTTAI VILLAGE,
THIRUPATHUR TK,
SIVAGANGAI-630 566.

Sub: Blasting Work Using Explosives In Your Proposed Quarry-Reg

Sir,

We have explosives magazine in form LE-3 named in **SHRI MUTHU EXPLOSIVES**, L.NO.E/SC/TN/22/534(E40825),our office functioning at 12/157,North Serpatti, K.Periyapatti-Post, Manapparai Tk, Trichy Dt.

We are enacting 2 explosives vans for transporting explosives from our magazine to blasting site and we have well experienced licence blasters.certified second class managers and shot firer for safety blasting work.

We are willing to undertake blasting work on contract basis at your site,

S.F.No: 352/2(PART-1)

Village: **CHOKKAMPATTI**

Taluk: **MELUR**

District: **MADURAI**

Thanking You

Yours Faithfully

Enclosed. (i). Magazine Licence Copy.

(ii). Van Licence Copy.

(iii). Blaster Licence Copy.

For SHRI MUTHU EXPLOSIVES

V. Maniyandi
Managing Partner

K. Silambarasan

LICENCE FORM LE-7
(See article no 7 of Part 1 of Schedule IV of Explosives Rules, 2008)

Licence to : transport explosives in a road van

Licence No : E/SC/TN/25/950(E86201)
Annual Fee Rs.2500/-



1. Licence is hereby granted to : **V Pandian (Occupier : V Pandian)**
No.47B, North Serpatti, K.Periyapatti PO., Manapparai Tk,
Trichirappalli Dt PIN 621306,
District-TIRUCHIRAPPALLI, State-Tamil Nadu, Pincode-621306
2. Status of licensee : **Individual**
3. Particulars of the road van:

Registration No.	TN-45/BV-2737
Make and model of vehicle	MAHINDRA AND MAHINDRA
Unladen weight	1710 Kg(s)
Maximum laden weight	2960 Kg(s)
Maximum quantity of explosives permitted for transport	1250 Kg(s)
Engine No.	GHF1B16522
Chassis No.	MA1ZN2GHKF1B23526
Description of Other Fittings	As per the approved drawing attached
Quantity of Explosives permitted to carry	1250 Kg(s)

4. The licensed premises shall conform to the following drawing(s):
Drawing No : E/SC/TN/25/950(E86201) dated : 08/05/2015
5. The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed thereunder and the conditions and the following annexures...
(a) Drawings of the road van as stated in serial no.4 above.
(b) Conditions signed by the licensing authority.
6. This licence shall remain valid till **31st day of March 2025**

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, 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: 08/05/2015

Joint Chief Controller of Explosives
South Circle, Chennai

Amendments :

- Change in Carrying Capacity dated : 30/07/2013
Endorsement for renewal of licence:

Date of Renewal

Date of Expiry

Signature of Licensing authority

Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

K. Sivan



भारत सरकार | Government of India
 वाणिज्य और उद्योग विभाग | Ministry of Commerce & Industry
 पेट्रोलियम तथा विस्फोटक सुरक्षा समिति (प्रेसो) | Petroleum & Explosives Safety Organisation (PESO)
 पूर्व नाम: विस्फोटक विभाग | Formerly - Department of Explosives
 A और B-विंग ब्लॉक, I-8, दूसरा तल, शांति भवन, A & D-विंग ब्लॉक, I-8, इंदिरा गान्धी
 26 हाइड्रास रोड, नंगरसोकम चेन्नई 605006
 फोन (Phone) - 28281923 | फैक्स (Fax) - 28280848
 ई-मेल (Email) - pceso@onso.gov.in

संख्या / No. / 2802/2019/4003/4003/2019

दिनांक / Date: 23/01/2019

श्री. श्री. / Mr. / Mrs.

M. Mutha Explores,
 1st PVT, Nallabera, K. Periyappan Pillai, Manappuram Road, Tamil Nadu - Manappuram
 District-TIRUCHIRAPPALLI State-Tamil Nadu, Pincode - 621006

विषय / Subject

Survey No.514003/ संस्था K Periyappan(North), जिला TIRUCHIRAPPALLI राज्य Tamil Nadu में विस्फोटक के गोदामों में उपयोग के लिए कब्जा हेतु
 विस्फोटक विभाग, 2008 के अनुसूची IIE-3 में जारी अनुमति (सं. 2802/2019/4003/4003/2019) के नवीनीकरण संबंधी है।

Subject

Possession for Use of Explosives from magazine situated at Survey No.51, 4003, K Periyappan(North), Dist. TIRUCHIRAPPALLI, Tamil Nadu -
 Licence No. FUSE/TN/22/194/E40825) granted in Form IIE-3 of Explosives Rules, 2008 - Renewal regarding

संबंधित / In

आपका आवेदन विषय पर एक संख्या: दिनांक 20/01/2019 को प्राप्त किया गया है। विस्फोटक विभाग के कार्यालय पर 23/01/2019 को जारी अनुमति दिनांक 21/01/2019 को
 नवीनीकृत की गई थी।
 In your letter No. 2802/2019/4003/4003/2019 the subject licence/body renewed upto 31/03/2022 and issued in Form IIE-3 of Explosives Rules, 2008 is forwarded herewith
 अनुमति के अंतर्गत नवीनीकरण हेतु कृपया निम्नलिखित दस्तावेज दिनांक 31/03/2019 से पहले इस कार्यालय को भेजे जाएं
 For further renewal of licence, please submit the following documents so as to reach this office on or before 31/03/2019.

- प्रत्येक आवेदन में निम्नलिखित पूर्ण एवं हस्ताक्षरित आवेदन।
 Application in Form RE-1 duly filled in and signed.
- एक से पांच वर्षों की अनुमति शुल्क का बैंक ड्राफ्ट बैंक ड्राफ्ट किराी भी राष्ट्रीयकृत बैंक के नाम अर्थात् संयुक्त मुख्य विस्फोटक नियंत्रक, चेन्नई के पास में
 चेन्नई में देय हो।
 Licence fee for one to five years in the form of demand draft drawn on any Nationalized Bank in favour of J. Chief Controller of Explosives, Chennai payable
 at Chennai.
- अनुमति प्राप्त करने के साथ मूल अनुमति।
 Original licence with approved plan.
- कृपया इस संबंध में विस्फोटक नियंत्रक, 2008 के नियम 112 का भी ध्यान रखें।
 In this connection, please also refer to rule 112 of Explosives Rules, 2008.
- विस्फोटक के अन्य हेतु आवेदन (1) में मागपत्र (इंटर) आपूर्तिकर्ता को दिया जाए और उगी की एक प्रति इस कार्यालय को भेजी जाए। (अतिरिक्त) गोदाम के लिए
 अनुमति।
 Other for purchase of explosives shall be placed in RE-1 form and supplied and copy of the same shall be sent to this office. (Not applicable for fireworks store
 houses)
- कृपया विस्फोटक की वारंवारिक विवरण हर तिमाही के अंत में आवेदन में प्रस्तुत की जाए। विवरण इस कार्यालय के कार्यालय में आवेदन तिमाही के 10 तारीख
 से पहले प्रस्तुत करने चाहिए। (अतिरिक्त) गोदाम के लिए लागू नहीं है। Please submit quarterly returns of explosives to RE-1 in the office of every quarter so as to
 reach this office by 10th of the succeeding quarter. (Not applicable for fireworks store houses)
- सभी इलास्टिक आवेदनों एक सक्षम दस्ता की जायगी जो अपेक्षित विधियों के तहत एक वेप साइट पर या परमाणु धारण हो। हालांकि, वाम अधिनियम 1952 के
 अधीन अन्य कानूनों में इलास्टिक अपेक्षा करने वाले क्लाइंट की योग्यता उन्नी अधिनियम में निर्धारित है।
 All blasting operations shall be carried out by a competent person holding a valid shot firer's permit granted under above rules. However, blasting operations ar
 mious coming under the purview of the Mines Act 1952, the holder shall have qualifications prescribed in the regulations framed under the said Act.

आपका / Yours faithfully

विस्फोटक नियंत्रक / Controller of Explosives

संयुक्त मुख्य विस्फोटक नियंत्रक / For Joint Chief Controller of Explosives

दक्षिणभाग क्षेत्र / South Circle, Chennai

प्रतिरूपि प्रेषित / Copy forwarded to

1. जिला मजिस्ट्रेट (District Magistrate), TIRUCHIRAPPALLI (Tamil Nadu) सूचना के लिए (for information.)

संयुक्त मुख्य विस्फोटक नियंत्रक / For Joint Chief Controller of Explosives
 दक्षिणभाग क्षेत्र / South Circle, Chennai

(अधिक जानकारी के लिए आवेदन की स्थिति, शुल्क आदि के लिए हमारी वेबसाइट <http://peso.gov.in> देखें।
 For more information regarding status, fees and other details please visit our website <http://peso.gov.in>)

अनुमति पत्र फॉर्म ई-3 LICENCE FORM E-3

विस्फोटक नियम 2008 की अनुसूची 4 के भाग 4 के अनुच्छेद 3(क) से (या दृष्टिगोचर)
(See article 3(1) (c) of Part 4 of Schedule IV of Explosives Rules, 2008)

(या) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी श्रेणी में वर्ग 6 के विस्फोटक रखने
(Licence to possess) (2) for use explosives of class 1, 2, 3, 4, 5 or 7 in a magazine

अनुमति सं. (Licence No.): E/SCTN/22/534/140825
वार्षिक कीमत ₹500 (Annual Fee Rs.) 2200/-



Licence is hereby granted to

Shri Motba Explosives (अभिजागी) (Occupier: Shri V. Prudhhan, 157651, Northrupan, K. Periyappan-Peel, Manappara-taluk, Lower Village, Manappara, District-TIRUCHIRAPPALLI, State-Tamil Nadu, Pincode - 621206)

की अनुमति अनंददात की जाती है।

1 अनुमतिधारी की प्रकृति (Status of licensee/ Partnership Firm)

2 अनुमति निम्नलिखित प्रयोजनों के लिए विधिमाल्य है।
Licence is valid only for the following purpose.

posses for use of Safety Fuse, Nitrate-Mixture, Detonating Fuse, Electric and/or Ordinary Detonators. - के उपयोग के लिए

3 अनुमति विस्फोटकों के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमाल्य है।
Licence is valid for the following kinds and quantity of explosives - (क) (a)

क्र. सं. No.	नाम और विवरण Name and Description	वर्ग और प्रभाग Class & Division	उप-प्रभाग Sub-division	समाप्त किया गया समय में Quantity at any one time
1	Nitrate Mixture	7.0	0	2400 Kg
2	Detonating Fuse	6.2	0	15000 Mtrs
3	Electric and/or Ordinary Detonators	6.3	0	2000 Nos
4	Safety Fuse	6.1	0	5000 Mtrs

(क) किसी एक कक्ष में धारित जाने वाले विस्फोटकों की मात्रा (अनुच्छेद 3(क) और (ख) के अधीन अनुमति के लिए)
(b) Quantity of explosives to be purchased in a calendar month (applicable for licensee) (Article 3(1) (a) and (b))

3 निम्नलिखित रेखाचित्र (ड्राइंग) से अनुमति परिसर की पुष्टि होती है।
(The licensed premises shall conform to the following drawing)

रेखाचित्र सं. (Drawing No.) E/SCTN/22/534/140825
दिनांक (Date) 04/03/2016

4 अनुमति परिसर निम्नलिखित पते पर स्थित है। The licensed premises are situated at following address:
Survey No. 4005, राम (Lower Village), K. Periyappan (North)
जिला (District) TIRUCHIRAPPALLI राज्य (State) Tamil Nadu
पिनकोड (Pincode) 621306
दूरभाष (Phone) ई-मेल (E-Mail)

पुलिस थाना (Police Station): Manappara
पिनकोड (Pincode) 621306
फैक्स (Fax)

5 अनुमति परिसर में निम्नलिखित सुविधाएं प्रदान हैं।
The licensed premises consist of following facilities:

Magazine, Nitro and Detonator room

6 अनुमति समग्र समय पर अध्यात्मोन्मुखित विस्फोटक अधिनियम 1989 और उसके अधीन विस्तृत विस्फोटक नियम 2008 के उपबंधों, शर्तों और प्रतिबंधित शर्तों और निम्नलिखित उपबंधों के अधीन रहते हुए अनंददात की जाती है।
The licence is granted subject to the provision of Explosives Act 1989 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexure.

- 1 उपर्युक्त फॉर्म में 1 से चर्चा कथित रेखाचित्र (स्थान, स्थिति, सीमा, सुविधाएं और अन्य विवरण) दर्शाते हुए।
Drawings (showing site, construction and other details) as stated in serial No. 3 above.
- 2 अनुमति अधिकारी द्वारा इस्तेमाल होने वाली अनुमति की शर्तें और प्रतिबंधित शर्तें।
Conditions and Additional Conditions of this licence as framed by the licensing authority.
- 3 दूरी पत्र (D-3) Distance Form D-3.

7 यह अनुमति सत्र 31 मार्च 2014 तक वैध रहेगी। This licence shall remain valid till 31st day of March 2014.

यह अनुमति अधिनियम या उसके अधीन विस्तृत नियमों या अनुसूची 4 के भाग 4 के प्रति विद्रोह, संश्लेषण के अधीन लाने उपस्थित इस अनुमति की शर्तों का उल्लंघन करने या यदि अनुमति परिसर संरचना या उससे सहमत रूप में दस्तावेज विवरण के अनुरूप नहीं पर जाने पर निरस्त या प्रतिबंधित की जा सकती है, जहां यह लागू हो।
This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under 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.

तारीख (Date - 04/03/2016)

संयुक्त मुख्य विस्फोटक नियंत्रक | Joint Chief Controller of Explosives
South Circle, Chennai

Amendments:

- Change in Postal Address dated: 01/04/2014
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated: 19/04/2013
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated: 30/07/2014
- Change in Authorized Signatory/Occupier/Partners/Concerns dated: 05/11/2014
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated: 04/03/2016

संवर्धन के पत्राचार के लिए स्थान
Space for Endorsement of Renewal

संवर्धन की तारीख
Date of Renewal

समाप्ति की तारीख
Date of Expiry

अनुमति अधिकारी के हस्ताक्षर और स्टांप
Signature of licensing authority and stamp

03/04/2016

31/03/2015

J. Chief Controller of Explosives, South Circle, Chennai.

K. S. Srinivasan



GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)
(Formerly Department of Explosives)

A & D - Wing, Block I-8, IInd Floor, Shastri Bhavan
26 Maddous Road, Nungambakkam Chennai 600006
Tele: 28281023 Fax: 28284848
Email: jteecechennai@explosives.gov.in

No.: E/SC/TN/25/950(E86201)

Dated:30/07/2015

To,
V.Pandian,

No.47B, North Serpatti, K.Periyapatti P.O., Manapparai Tk, Trichirappalli Dt PIN 621306, Town/Village - Manapparai
District-TIRUCHIRAPPALLI, State-Tamil Nadu, Pincode - 621306

Subject: Road Van for transport of Explosives by Vehicle Reg. No. : TN-45/BV-2737 Licence No.:
E/SC/TN/25/950(E86201) granted in Form LE-7 of Explosives Rules, 2008 -
Change in Carrying Capacity -

Sir(s),

Please refer to your letter No. X dated 27/07/2015 on the subject cited above.

The Licence No.: E/SC/TN/25/950(E86201) is forwarded herewith duly amended in respect of followings:

Change in Carrying Capacity

This Licence shall remain valid till 31st day of March 2025.

An amount of Rs. 1000/- balance is in your credit, which may be utilized for future transaction by quoting this reference.

For further renewal of licence, please follow the procedure under Rule 112 of Explosives Rules, 2008.
Receipt of this letter may please be acknowledged.

Enclosures :

Yours faithfully,

(Dr. P. K. Rana)
Controller of Explosives
For Joint Chief Controller of Explosives
South Circle, Chennai

Copy Forwarded to:

- 1.
2. Superintendent of Police, TIRUCHIRAPPALLI, Tamil Nadu

For Joint Chief Controller of Explosives
South Circle, Chennai

[For more information regarding status, fees and other details, please visit our web site <http://peso.gov.in>]



GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)
(Formerly Department of Explosives)

A & D - Wing, Block I-8, IInd Floor, Shastri Bhavan
26 Haddous Road, Nungambakkam Chennai 600006
Tele: 28281023 Fax: 28284848
Email: jtccechennai@explosives.gov.in

- 6 APR 2015

No.: E/SC/TN/25/845(E81205)

Dated: 25/03/2015

To,
V. Pandian,
47B, North Serpatti, K. Periyapatti, Manapparai Tk., Trichy Dt PIN 621306, Town/Village - TRICHY
District-TIRUCHIRAPPALLI, State-Tamil Nadu, Pincode - 621306

Subject: Road Van for transport of Explosives by Vehicle Reg. No. : TN-45/BX-7799 Licence No.: E/SC/TN/25/845
(E81205) granted in Form LE-7 of Explosives Rules, 2008 -
Change in Postal Address
Change In Registration No.
Change in Carrying Capacity.

Sir(s),

Please refer to your letter No. x dated 17/03/2015 on the subject cited above.

The Licence No.: E/SC/TN/25/845(E81205) is forwarded herewith duly amended in respect of followings :

Change in Postal Address as above
Change In Registration No.
Change in Carrying Capacity

This Licence shall remain valid till 31st day of March 2024.

An amount of Rs. 1000/- balance is in your credit, which may be utilized for future transaction by quoting this reference.

For further renewal of licence, please follow the procedure under Rule 112 of Explosives Rules, 2008.
Receipt of this letter may please be acknowledged.

Enclosures :

Yours faithfully,

P. K. Rana

(Dr. P. K. Rana)

Controller of Explosives
For Joint Chief Controller of Explosives
South Circle, Chennai

Copy Forwarded to:

- 1.
2. Superintendent of Police, TIRUCHIRAPPALLI, Tamil Nadu

For Joint Chief Controller of Explosives
South Circle, Chennai

(For more information regarding status, fees and other details, please visit our web site <http://peso.gov.in>)

K. S. Kumar

LICENCE FORM LE-7

(See article no 7 of Part 1 of Schedule IV of Explosives Rules, 2008)

Licence to : transport explosives in a road van



Licence No. : E/SC/TN/25/845(E81205)
Annual Fee Rs.2500/-

1. Licence is hereby granted to : **V Pandian (Occupier : V Pandian)**
47B, North Serpatti, K.Periyapatti, Manapparai Taluk, Tiruchy Dt PIN 621306,
District-TIRUCHIRAPPALLI, State-Tamil Nadu, Pincode-621306

2. Status of licensee : **Individual**
3. Particulars of the road van:

Registration No.	TN-45/BX-7799
Make and model of vehicle	MAHINDRA AND MAHINDRA/BOLERO
Unladen weight	1495 Kg(s)
Maximum laden weight	2620 Kg(s)
Maximum quantity of explosives permitted for transport	1125 Kg(s)
Engine No.	TAE4B89911
Chassis No.	MA1ZP2TAKE2C58877
Description of Other Fittings	As per approved drawings
Quantity of Explosives permitted to carry	1125 Kgs)

- The licensed premises shall conform to the following drawing(s):
Drawing No : E/SC/TN/25/845(E81205) dated : 21/05/2014
- The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed thereunder and the conditions and the following annexures....
(a) Drawings of the road van as stated in serial no.4 above.
(b) Conditions signed by the licensing authority.
- This licence shall remain valid till **31st day of March 2024**

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 , 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: 21/05/2014

R. Arava
Joint Chief Controller of Explosives
South Circle, Chennai

- Amendments :
- Change in Postal Address dated : 25/03/2015
 - Change in Carrying Capacity dated : 25/03/2015
 - Change in Registration No dated : 25/03/2015
- Endorsement for renewal of licence:

Date of Renewal	Date of Expiry	Signature of licensing authority
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Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

K. Sivan



GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PEESO)
(Formerly Department of Explosives)
A & D - Wing, Block 1-B, 1st Floor, Shastri Bhavan
26 Haddons Road, Nungambakkam, Chennai 600006
Tele: 28281023 Fax: 28284848
Email: jceechennai@explosives.gov.in

No. E/SC/TN/30/2062(E102632)

Dated: 11/09/2017

To,
T.KIRUBAHARAN S/O. A. THIANGARAJ
6/4A, PALAPATTI, SAMUTHIRAM POST, MANAPPARAI TALUK
Dist. TIRUCHIRAPPALLI, State, Tamil Nadu, Pincode-621306.

Subject: Shotfirer's Certificate No. E/SC/TN/30/2062(E102632) issued to T.KIRUBAHARAN S/O. A. THIANGARAJ, 6/4A, PALAPATTI, SAMUTHIRAM POST, MANAPPARAI TALUK granted in Form LE-10 of Explosives Rules, 2008 - Issue of Certificate regarding

Sir(s),

Please refer to your letter No. xx dated 11/09/2017 and the subsequent examination held on 20/06/2017. Please find enclosed herewith Shotfirer's Certificate No. E/SC/TN/30/2062(E102632) valid upto 11/09/2022 for the purpose of Class : (B), Category : General aboveground, All phases of aboveground blasting operation as per the provisions of Rule 107 of Explosives Rules, 2008

Conditions:

1) Blasting work in connection with well Sinking/Road Construction/Agricultural work etc.

It may please be noted that no explosives should be purchased on the strength of the above certificate. You are advised to strictly follow Rules 89 to 98 of Explosives Rules 2008 while undertaking blasting operations.

In case of validity of the certificate to be extended, application with following documents shall be submitted:

- a. Application in form AE-10
- b. Original Shot firer's Certificate in Form LE-10
- c. Security fee of revalidation Rs. 400/- DD shall be drawn in favour of Jt. Chief Controller of Explosives, Chennai payable at Chennai.
- d. Five copies of holder's colour passport size photographs duly signed 'in front' by black color indelible ink
- e. A physical fitness certificate from Registered medical practitioner
- f. A consent letter from the present employer holding licence in Form LE-3 and intending to hire the services of Certificate holder.
- g. The shot firer certificate holder has to present himself physically before reviewing/revalidating Authority.
- h. This certificate is liable to be cancelled/withdrawn on contravention of provisions of Explosive Rules, 2008 committed during blasting operations, resulting in loss of human life.

An amount of Rs. 100/- balance is in your credit, which may be utilized for future transaction by quoting this reference.

Enclosures:

Yours faithfully,

(Dr. Ashok Kumar)
Joint Chief Controller of Explosives
South Circle, Chennai

Copy Forwarded to:

1. Police Station, MANAPPARAI PS, TIRUCHIRAPPALLI, Tamil Nadu with reference to his No. No: XX Dated: 24/01/2017

Joint Chief Controller of Explosives
South Circle, Chennai

Please email information regarding status, delays or other details, on a regular basis, web site: <http://peeso.gov.in>



अनुसूची प्रथम धारा 10 | Form LE-10
शॉट फायर करने का प्रमाण-पत्र | Shot Firing Certificate
(अनुसूची IV के भाग I का अनुसूचक 10 देखें | See article 10 of Part I of Schedule IV.)
[विस्फोटक विनियम, 2008 का नियम 107(5) देखें | see rule 107(5) of Explosives Rules, 2008]

(खार अतिनियम, 1952 के अधीन न आने वाले क्षेत्र में विस्फोट करने के लिए सक्षमता प्रमाणपत्र)
(Certificate of competency to carry out blasting of explosives in area not coming under t



संख्या | No.: E/SC/TN/30/2062(E102632)

जांचित किया जाता है कि श्री T.KIRUBAHARAN S/O. A. THANGARAJ,
जिन्का जन्म 24/05/1985 को हुआ था, जो 6/4A, PALAPATTI, SAMUTHIRAM POST, MANAPPARAI TALUK, TIRUCHIRAPPALLI, Tamil Nadu
के निवासी है ने विस्फोटक विनियम, चेन्नई द्वारा तारीख 20/06/2017 को आयोजित शॉट फायर की परीक्षा तारीख को 20/06/2017 सफलतापूर्वक की है और वह विस्फोटक अधिनियम, 1884 और उसके अधीन विनियम
नियमों के उपबंधों के अधीन रहे हुए खार अतिनियम, 1952 की धारा के अधीन आनेवाले क्षेत्रों में अल्पव्यवधि में शॉट फायर करने हेतु विनियमित विस्फोटक का उपयोग करती हुए विस्फोटक प्रचालन करने के लिए अधिकृत है।
This is to certify that **Shri T.KIRUBAHARAN S/O. A. THANGARAJ**,
born on 24/05/1985, resident of 6/4A, PALAPATTI, SAMUTHIRAM POST, MANAPPARAI TALUK, TIRUCHIRAPPALLI, Tamil Nadu
passed the shotfirer's examination held on 20/06/2017 conducted by Controller of Explosives, Chennai and is authorised to conduct blasting
operations as mentioned below using explosives in areas other than mines coming under the purview of the Mines Act 1952, subject to the
provisions of the Explosives Act, 1884 and the rules framed thereunder.

विस्फोट करने के परिचित नाम, प्रकार और प्रकार :
श्रेणी: (B), श्रेणी: सामान्य जमीन के ऊपर, अधीन के ऊपर क्लॉस्टिंग आयोजन

Authorised class, category and type of blasting :
Class : (B), Category : General aboveground, All phases of aboveground blasting operation

[नियम 107 के उप-नियम (5) का स्पष्टीकरण देखें | See explanation of sub-rule (5) of rule 107]

यह प्रमाणपत्र 11/09/2022 (जारी करने की तारीख से पांच वर्षों तक) विधिवतमान होगा।
This certificate shall remain valid till 11/09/2022 (five years from the date of issue)

यह प्रमाणपत्र, अधिनियम या उसके अधीन विनियमित विनियमों अथवा इस प्रमाणपत्र की शर्तों का कोई उल्लंघन करने या कोई अनधिकृत आरंभ करने पर प्रत्येक प्रकार से ही पूर्णतया वैध नहीं रहेगा या रद्द किया जा सकता है।
This certificate is liable to be suspended or revoked for any violation of the Act or rules framed thereunder or the conditions of this certificate or if there is any discrepancy or deviation in the information or suppression of facts furnished by the applicant in his application form.

This certificate is liable to be suspended or revoked for any violation of the Act or rules framed thereunder or the conditions of this certificate or if there is any discrepancy or deviation in the information or suppression of facts furnished by the applicant in his application form.

स्थान | Place | चेन्नई | Chennai
दिनांक | Date | 11/09/2017

संयुक्त मुख्य विस्फोटक नियंत्रक | Joint Chief Controller of Explosives
क्षेत्रीय, चेन्नई | South Circle, Chennai

पुनर्विधायन के लिए अनुमति :
Endorsement for revalidation

पुनर्विधायन/अवकाश की तारीख
Date of Revalidation

अवधि की तिथि
Date of Expiry


अनुमति प्राप्ति/प्राप्ति के स्थानों
Signature of licensing authority

सांख्यिकी चेतावनी : विस्फोटकों का गलत रूप से प्रयोग या उनका दुरुपयोग विधि के अधीन गंभीर दंडित अपराध होगा।
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

K. S. [Signature]

சான்று

மதுரை மாவட்டம், மேலூர் வட்டம், சொக்கம்பட்டி கிராமத்தில் அமைந்துள்ள சர்வே எண்கள். S.F.No.352/2 (Part-1) மொத்த விஸ்தீரணம் 2.02.0 ஹெக்டேர் நிலங்களைச் சுற்றி 300 மீட்டர் சுற்றளவில் எவ்வித அங்கீகரிக்கப்பட்ட கட்டிடங்களோ, பள்ளிகளோ, கோயில் மற்றும் புரதான சின்னங்களோ இல்லை என்று சான்றளிக்கப்படுகிறது.


கிராம நிர்வாக அலுவலர்
6, சொக்கம்பட்டி கிராமம்
மேலூர் வட்டம்



**TOPOGRAPHICAL VIEW OF SOKKAMPATTI ROUGH STONE
QUARRY LEASE APPLIED AREA**



Name of the Applicant : **K.Silambarasan,
S/o. Karuppusamy,
No.339, Mallakkottai,
Thiruppathur,
Sivagangai District – 630 566.**

LOCATION DETAILS

Extent : 2.02.0 HA
S.F.No. : 352/2 (Part - 1)
Village : Sokkampatti
Taluk : Melur
District : Madurai
State : Tamil Nadu

Signature of the applicant


K. Silambarasan


கிராம நிர்வாக அலுவலர்
(Village Administrative Officer)
6, சொக்கம்பட்டி கிராமம்
Attestation
செய்த இடம்



C.No. D2/ 46/ 2023

District Forest Office,
Madurai Forest Division,
Madurai - 02
Date : 23.03.2023

Sub: Forest - Distance Certification - Thiru.K. Silambarasan,
S/o.Karuppasamy - Madurai District - Melur Taluk -
Chokkampatti Village - Survey No. 352/2(Part -1) -
Total area 2.02.0 Ha - proposed site for quarry activities -
distance from nearest Forest area - regd.

Ref: 1. Thiru. K. Silambarasan, S/o.Karuppasamy request dated:
28.12.2022.
2. Forest Range Officer, Madurai C.No. 35/ 2023 Dated:
02.03.2023.

Based on the request of the applicant, received to this office along with the details submitted by individual pertaining to quarry activities proposal at survey No. 352/2(Part 1), Total area 2.02.0 Ha . The distance particulars relating to Reserve Forests, Protected area is given below.

1. The aerial distance nearest Reserved forest is Valaiseripatti RF and it is 0.075 km (75m) away from the proposed site.
2. The proposed site is at distance of 79.7 km from Protected area of Srivilliputhur Megamalai Tiger Reserve in outside of Elumalai Reserved Forest.
3. The proposed site is aerial distance of 20.40 km from the Vettangudi Bird Sanctuary.
4. The Proposed site is not within 25km radius of the Wildlife Sanctuary/Protected Area / Tiger Sanctuary.


It is that this is only a distance certification of nearest Reserve Forests and protected areas does not imply any forest clearance by this office.

Sd/- Guruswamy Dabbala
District Forest Officer,
Madurai Forest Division, Madurai.

To :
Thiru. K. Silambarasan,
S/o.Karuppasamy
D.No.339, MallaKottai, Thirupattur,
Sivagangai District.

/ T.C.B.O /


Superintendent


22.3.23

23/3/2023



Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment
Authority(SEIAA), TAMIL NADU)

To,

The Owner
MAHESWARAN S
501,Thamarakki South Sivaganga -630562

Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the SEIAA vide proposal number SIA/TN/MIN/414539/2023 dated 26 Apr 2023. The particulars of the environmental clearance granted to the project are as below.

- | | |
|--|--|
| 1. EC Identification No. | EC23B001TN170619 |
| 2. File No. | 9737 |
| 3. Project Type | New |
| 4. Category | B |
| 5. Project/Activity including Schedule No. | 1(a) Mining of minerals |
| 6. Name of Project | S. Maheswaran, New Rough Stone Quarry Project over an Extent of 3.20.0Ha in S.F.No. 352/2(Part-3) of Chokkampatti Village, Melur Taluk, Madurai District, TamilNadu. |
| 7. Name of Company/Organization | MAHESWARAN S |
| 8. Location of Project | TAMIL NADU |
| 9. TOR Date | N/A |

The project details along with terms and conditions are appended herewith from page no 2 onwards.

Date: 25/09/2023

(e-signed)
Thiru.Deepak S.Bilgi
Member Secretary
SEIAA - (TAMIL NADU)

Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH. Please quote identification number in all future correspondence.

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

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY-TAMILNADU

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

ENVIRONMENTAL CLEARANCE

Lr.No. SEIAA-TN/F.No.9737/1(a)/EC. No:5945/2023, dated:30.08.2023.

Sir/Madam

Sub: SEIAA, TN Proposed Rough Stone quarry Lease over an extent of 3.20.0 Ha at S.F.No. 352/2 (Part-3) in Chokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu by Thiru. S. Maheswaran under project category – “B2” and Schedule S.No. 1(a) Mining of mineral Projects – Issue of Environmental Clearance – Regarding.

Ref: 1. Online Proposal No SIA/TN/MIN/414539/2023 dated.13.01.2023.
2. Application seeking Environmental Clearance dated:13.01.2023.
3. Minutes of the 372nd Meeting of SEAC held on 27.04.2023.
4. Minutes of the 619th Meeting of SEIAA held on 18.05.2023.
5. Proponent reply dated:25.08.2023.
6. Minutes of the 651st Meeting of SEIAA held on 30 .08.2023.

Details of Minor Mineral Activity: -

This has reference to your application 1st & 2nd cited, the proposal for obtaining Environmental Clearance for mining/quarrying of minor minerals based on the particulars furnished in your application as shown below.


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Sl. No	Details of the Proposal	Data Furnished
1	Name of the Owner/Firm	Thiru. S. Maheswaran, S/o. Sangaiah, Door No. 501, Thamarakki South, Thamarakki, Sivagangai District - 630 562.
2	Type of quarrying	Rough Stone Quarry
3	S.F No. of the quarry site	352/2 (Part-3)
4	Village in which situated	Chokkampatti
5	Taluk in which situated	Melur
6	District in which situated	Madurai
7	Extent of quarry (in ha.)	3.20.0ha
8	Latitude & Longitude of all corners of the quarry site	10°13'42.26"N to 10°13'50.58"N 78°21'06.29"E to 78°21'14.45"E
9	Topo Sheet No.	58-J/08
10	Type of mining	Opencast Mechanized Mining Method
11	Period of Current Mine Plan	5 years
12	Production (Quantity in m ³)	6,54,955m ³ of rough stone
13	Depth of mining	51m (16m above ground level + 35m below ground level)
14	Depth of water table	70m - 65m
15	Man Power requirement	36 Nos
16	Water requirement:	3.5 KLD
	1. Domestic & Drinking Purpose	1.0 KLD
	2. Dust suppression	1.5 KLD
	3. Green Belt	1.0 KLD
17	Power requirement	5,57,816 liters of HSD for the entire project life


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18	Precise area communication approved by Joint Director/ Assistant Director (i/c), Dept. of G&M with date	Roc.No.77/2021-Mines, dated: 05.02.2021.
19	Mining Plan approved by the Joint Director/Assistant Director (i/c), Dept. of Geology and Mining with date	Roc.No.77/2021-Mines, dated: 10.02.2021.
20	500m cluster letter issued by the Joint Director/ Assistant Director (i/c), Dept. of Geology and Mining with date	Roc.No.77/2021-Mines, dated:10.02.2021.
21	VAO certificate regarding habitations in 300m radius	Furnished (Dated Nil)
22	Project Cost (excluding EMP)	Rs.1,74,69,000/-
23	EMP cost	Capital Cost: Rs.31,87,000/- Recurring Cost: Rs.30,29,128/-
<p><u>Validity:</u></p> <p>This Environmental Clearance is accorded for of 6,54,955m³ of rough stone up to the depth of 51m (16m above ground level + 35m below ground level) and the annual peak production should not exceed 1,65,980m³ of rough stone.</p> <p>The Environmental Clearance issued is valid as per the approved mine plan period and as per MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022</p>		

AFFIDAVIT FURNHSED BY THE PROPONENT

I, S. Maheswaran, S/o. Sangaiah residing at Door No. 501, Thamarakki South, Thamarakki, Sivagangai District, Tamil Nadu State – 630 562, solemnly declare and sincerely affirm that:

I have apply for getting Environment Clearance to SEIAA, Tamil Nadu State for quarry lease for quarrying of Rough stone Quarry over an extent of 3.20.0Ha of Government Poramboke lands in S.F.No.352/2(Part-3) of Chokkampatti Village, Melur Taluk, Madurai District, Tamil Nadu.


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1. I swear to state and confirm that within 10km area of the quarry site, I have applied for environment clearance; none of the following is situated.
 - a. Protected areas notified under the wild life (Protection) Act, 1972,
 - b. Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and Control of Pollution) Act, 1974,
 - c. Eco-Sensitive areas as notified,
 - d. Interstate boundaries within 10km radius from the boundary of the proposed site.
2. I will spend the amount of Rs.5 Lakhs towards Corporate Environment Responsibility (Revised CER) for the following activities to the Government Higher Secondary School, Chokkampatti Village, Melur Taluk, Madurai District, before commencement of quarrying activities.

Sl. No.	Description	CER Cost INR
1	Renovation of Existing Toilets	Rs.5,00,000/-
2	Renovation of Floor in the Classrooms	
3	Painting of Classrooms	
4	Providing Drinking Water Facilities	
5	Plantation along the School Boundary @ 200 Nos	
6	Providing Environmental related books to School Library	

3. The total area of following quarries located within 500m radius from the periphery of my quarry site details as shown below:

a. Existing Quarries: -

Sl. No.	Name of the Owner	Village	S.F. No.	Extent (In hecets)	Collector's Proceedings No & date	Lease Period
1.	C. Veeramalai	Chokkampatti	352 (Part-2)	1.00.0	Roc.No.503/2018, Dt 21.02.2019	21.02.2019 - 20.02.2024


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b. Proposed Quarries: -

Sl. No.	Name of the Owner	Village	S.F. No.	Extent (In hecets)	Collector's Proceedings No & date	Lease Period
1.	--Nil--					

c. Present Proposed Quarries: -

Sl. No.	Name of the Owner	Village	S.F. No.	Extent (In hecets)	Collector's Proceedings No & date	Lease Period
1.	S. Maheswaran	Chokkampatti	352 (Part-3)	3.20.0	Proposed area	

4. There will not be hindrance or disturbance to the people living during quarrying activities and transportation of the mineral.
5. There is no approved habitation within 300m radius from the periphery of my quarry.
6. I swear that afforestation will be carried out during the course of quarrying operation and maintained.
7. The required insurance will be taken in the name of the laborers working in my quarry site.
8. Approach road belongs to local panchayat only and no other private patta roads encountered.
9. I will not engage any child labor in my quarry site and I aware that engaging child labor is punishable under the law.
10. All types of safety / protective equipment will be provided to all the laborers working in my quarry.
11. No permanent structures, temples etc., are located within 500m radius from the periphery of my quarry.

I ensure to do all the social and Environment commitment as mentioned in the scheme of mining to the best of my knowledge.

REVISED EMP BUDGET

Activities	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	32000	32000

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		yearly maintenance @ Rs. 10,000/- per hectare		
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	800000	50000
	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 - 6 Units	150000	15000
	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 - 6 Units	30000	1500
	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	64000
	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
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	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 / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	1798628
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	Provision made in Operating Cost	0	0


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lease on the land of owner itself			
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Mine Closure	1. Progressive Closure Activity - Surface Runoff managment	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	32000	5000
	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	640000	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1920 Trees - (370 Inside Lease Area & 1550 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendmets, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	74000	11100
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	465000	46500
	4. Implementation of Final Mine Closure Actiy 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	91350	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 Budge and not necessarily	# 4081502	0


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		implemented in the Project Site		
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions	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) - 36 Employees	144000	36000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	36000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	6400
	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	160000	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000


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	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 MoEF & CC OM	500000	0
TOTAL			3187000	3029128

EMP BUDGET SUMMARY BREAKUP YEAR WISE

Year	Total Cost
1 st	Rs. 62,16,128/-
2 nd	Rs. 31,80,584/-
3 rd	Rs. 33,39,614/-
4 th	Rs. 35,06,594/-
5 th	Rs. 38,64,624/-

DETAILS OF QUARRIES LOCATED WITHIN 500M RADIUS FROM THE PROPOSED QUARRY:

The Project Proponent has submitted a copy of the letter obtained from the Joint Director/ Assistant Director (i/c), Department of Geology & Mining, Madurai District. In his/her letter Roc.No.77/2021-Mines, dated:10.02.2021,he/she has stated that the details of other quarries within a radius 500m from the boundary of the proposed quarry site as follows:


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a. Existing Quarries: -

Sl. No.	Name of the Owner	Village	S.F. No.	Extent (In hecets)	Collector's Proceedings No & date	Lease Period
1.	C. Veeramalai	Chokkampatti	352 (Part-2)	1.00.0	Roc.No.503/2018, Dt 21.02.2019	21.02.2019 - 20.02.2024

b. Proposed Quarries: -

Sl. No.	Name of the Owner	Village	S.F. No.	Extent (In hecets)	Collector's Proceedings No & date	Lease Period
1.	--Nil--					

c. Present Proposed Quarries: -

Sl. No.	Name of the Owner	Village	S.F. No.	Extent (In hecets)	Collector's Proceedings No & date	Lease Period
1.	S. Maheswaran	Chokkampatti	352 (Part-3)	3.20.0	Proposed area	

DISCUSSION BY SELAA AND THE REMARKS: -

The subject was placed in the 651st authority meeting held on 30.08.2023. Earlier, the proposal was placed in the 619th authority meeting held on 18.05.2023. The authority noted that the subject was appraised in the 372nd SEAC meeting held on 27.04.2023. SEAC has furnished its recommendations to the authority for granting environmental clearance subject to the conditions stated therein.

The Authority, after detailed deliberations decided to consider the proposal after obtaining the following particulars from the project proponent:

1. Since this is a B2 category project with a project area of more than 3 hectares, the study in the Pre-feasibility report on Environmental impacts needs more details as follows, to cover project life:
 - a) Impact on the local population due to air pollution and dust.


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- b) Impact on the health of workers and people around, particularly skin, respiratory tract problems leading to Bronchitis and neurological issues, cardiovascular, pulmonary diseases, asthma and other air borne disease.
- c) Action plan for the protection and conservation of natural resources.
- d) Anticipated total particulate matters and PM₁₀ concentration during project period.
- e) Impact on waterbodies, lakes, borewells and water table due to the proposed mining activity.
- f) Impact of the proposed mining activity on temperature, Climate change and GHG emissions.
- g) Impact on Agriculture and Horticulture.
- h) Biomagnification effect through food chain on humans, Grazing animals and wildlife.

The proponent, vide letter dated.23.08.2023 furnished a reply for the above queries/details requested in the 619th authority meeting.

The Authority after examining the reply/details furnished by the proponent and also taking into account the recommendations of SEAC, the safety aspects and to ensure sustainable, scientific and systematic mining, decided to grant Environmental Clearance for the quantity of 6,54,955m³ of rough stone up to the depth of 51m (16m above ground level + 35m below ground level) and the annual peak production should not exceed 1,65,980m³ of rough stone. This is also subject to the conditions imposed by SEAC, normal conditions stipulated by MOEF&CC in addition to the following conditions and the conditions in Annexure 'A' of this minutes.

1. Keeping in view of MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022, this Environmental Clearance is valid as per the approved mine plan period.
2. The EC granted is subject to review by District Collector, Mines Dept. and TNPCB on completion of every mine plan period, till the project life. They should also review the EC conditions to ensure that they have all been adhered to and implemented.
3. The project proponent shall furnish a Certified Compliance Report obtained from MoEF&CC while seeking a renewal of the mining plan to cover the project life.
4. The progressive and final mine closure plan including the green belt implementation and environmental norms should be strictly followed as per the EMP.
5. As per the OM vide F. No. IA3-22/1/2022-IA-III [E- 172624] Dated: 14.06.2022, the Project Proponents are directed to submit the six-monthly compliance on the environmental conditions


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prescribed in the prior environmental clearance letter(s) through newly developed compliance module in the PARIVESH Portal from the respective login.

6. The amount allocated for EMP should be kept in a separate account and both the capital and recurring expenditures should be done year wise for the works identified, approved and as committed. The work & expenditure made under EMP should be elaborated in the bi-annual compliance report submitted and also should be brought to the notice of concerned authorities during inspections.

Annexure 'A'

a) EC Compliance

1. The Environmental Clearance is accorded based on the assurance from the project proponent that there will be full and effective implementation of all the undertakings given in the Application Form, Pre-feasibility Report, mitigation measures as assured in the Environmental Impact Assessment/ Environment Management Plan and the mining features including Progressive Mine Closure Plan as submitted with the application.
2. All the conditions as presented by the proponent in the PPT during SEAC appraisal should be addressed in Full.
3. The proponent shall submit Compliance Reports on the status of compliance of the stipulated EC conditions including results of monitored data. It shall be sent to the respective Regional Office of Ministry of Environment, Forests and Climate Change, Govt. of India and also to the Office of State Environment Impact Assessment Authority (SEIAA).
4. Concealing the factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

b) Applicable Regulatory Frameworks

5. The project proponent shall strictly adhere to the provisions of Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002, Biological diversity Rules, 2004 & TN Forest Act, 1882 and Rules made there under


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and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter

c) Safe mining Practices

6. The AD/DD, Dept. of Geology & Mining shall ensure operation of the proposed quarry after the submission slope stability study conducted through the reputed research & Academic Institutions such as NIRM, IITs, NITS Anna University, and any CSIR Laboratories etc.
7. The AD/DD, Dept. of Geology & Mining & Director General of Mine safety shall ensure strict compliance and implementation of bench wise recommendations/action plans as recommended in the scientific slope stability study of the reputed research & Academic Institutions as a safety precautionary measure to avoid untoward accidents during mining operation.
8. A minimum buffer distance specified as per existing rules and statutory orders shall be maintained from the boundary of the quarry to the nearest dwelling unit or other structures, and from forest boundaries or any other ecologically sensitive and archeologically important areas or the specific distance specified by SEIAA in EC as per the recommendations of SEAC depending on specific local conditions.

d) Water Environment – Protection and mitigation measures

9. The proponent shall ensure that the activity does not disturb the water bodies and natural flow of surface and groundwater, nor cause any pollution, to water sources in the area.
10. The proponent shall ensure that the activities do not impact the water bodies/wells in the neighboring open wells and bore wells. The proponent shall ensure that the activities do not in any way affect the water quantity and quality in the open wells and bore wells in the vicinity or impact the water table and levels. The proponent shall ensure that the activities do not disturb the river flow, nor affect the Odai, Water bodies, Dams in the vicinity.
11. Water level in the nearest dug well in the downstream side of the quarry should be monitored regularly and included in the Compliance Report.
12. Quality of water discharged from the quarry should be monitored regularly as per the norms of State Pollution Control Board and included in the Compliance Report.
13. Rain Water Harvesting facility should be installed as per the prevailing provisions of TNMBR/TNCDBR, unless otherwise specified. Maximum possible solar energy generation and utilization shall be ensured as an essential part of the project.


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14. Regular monitoring of flow rates and water quality upstream and downstream of the springs and perennial nallahs flowing in and around the mine lease area shall be carried out and reported in the compliance reports to SEIAA.
15. Regular monitoring of ground water level and water quality shall be carried out around the mine area during mining operation. At any stage, if it is observed that ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.
16. Garland drains and silt traps are to be provided in the slopes around the core area to channelize storm water. De-silting of Garland canal and silt traps have to be attended on a daily basis. A labour has to be specifically assigned for the purpose. The proponent shall ensure the quality of the discharging storm water as per the General Effluent Discharge Standards of CPCB.

e) Air Environment – Protection and mitigation measures

17. The activity should not result in CO₂ release and temperature rise and add to micro climate alternations.
18. The proponent shall ensure that the activities undertaken do not result in carbon emission, and temperature rise, in the area.
19. The proponent shall ensure that Monitoring is carried out with reference to the quantum of particulate matter during excavation; blasting; material transport and also from cutting waste dumps and haul roads.

f) Soil Environment – Protection and mitigation measures

20. The proponent shall ensure that the operations do not result in loss of soil biological properties and nutrients.
21. The proponent shall ensure that activity does not deplete the indigenous soil seed bank and disturb the mycorrizal fungi, soil organism, soil community nor result in eutrophication of soil and water.
22. The activities should not disturb the soil properties and seed and plant growth. Soil amendments as required to be carried out, to improve soil health.
23. Bio remediation using microorganisms should be carried out to restore the soil environment to enable carbon sequestration.
24. The proponent shall ensure that the mine restoration is done using mycorrizal VAM, vermin-composting, Biofertilizers to ensure soil health and biodiversity conservation.
25. The proponent shall ensure that the topsoil is protected and used in planting activities in the area.


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26. The proponent shall ensure that topsoil to be utilized for site restoration and Green belt alone within the proposed area.
27. The top soil shall be temporarily stored at earmarked place (s) and used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. At critical points, use of geotextile shall be undertaken for stabilization of the dump. Protective wall or gabions should be made around the dump to prevent erosion / flow of sediments during rains. The entire excavated area shall be backfilled.
28. Activities should not result in invasion of site by exotic and alien plant and animal species and disturb the native biodiversity and soil micro flora and fauna.

g) Noise Environment – Protection and mitigation measures

29. The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.
30. The sound at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Hence, the PP shall ensure that the biological clock of the villages are not disturbed because of the mining activity.

h) Biodiversity - Protection and mitigation measures

31. The proponent should ensure that there is no disturbance to the agriculture plantations, social forestry plantations, waste lands, forests, sanctuary or national parks. There should be no impact on the land, water, soil and biological environment and other natural resources due to the mining activities.
32. No trees in the area should be removed and all the trees numbered and protected. In case trees fall within the proposed quarry site the trees may be transplanted in the Greenbelt zone. The proponent shall ensure that the activities in no way result in disturbance to forest and trees in vicinity. The proponent shall ensure that the activity does not disturb the movement of grazing animals and free ranging wildlife. The proponent shall ensure that the activity does not disturb the biodiversity, the flora & fauna in the ecosystem. The proponent shall ensure that the activity does not result in invasion by invasive alien species. The proponent shall ensure that the activities do not disturb the resident and migratory birds. The proponent shall ensure that the


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activities do not disturb the vegetation and wildlife in the adjoining reserve forests and areas around.

33. The proponent shall ensure that the activities do not disturb the agro biodiversity and agro farms. Actions to be taken to promote agroforestry, mixed plants to support biodiversity conservation in the mine restoration effort.
34. The proponent shall ensure that all mitigation measures listed in the EIA/EMP are taken to protect the biodiversity and natural resources in the area.
35. The proponent shall ensure that the activities do not impact green lands/grazing fields of all types surrounding the mine lease area which are food source for the grazing cattle.

i) Climate Change

36. The project activity should not in any way impact the climate and lead to a rise in temperature.
37. There should be least disturbance to landscape resulting in land use change, contamination and alteration of soil profiles leading to Climate Change.
38. Intensive mining activity should not add to temperature rise and global warming.
39. Operations should not result in GHG releases and extra power consumption leading to Climate Change.
40. Mining through operational efficiency, better electrification, energy use, solar usage, use of renewable energy should try to decarbonize the operations.
41. Mining Operation should not result in droughts, floods and water stress, and shortages, affecting water security both on site and in the vicinity.
42. Mining should not result in water loss from evaporation, leaks and wastage and should support to improve the ground water.
43. Mining activity should be flood proof with designs and the drainage, pumping techniques shall ensure climate-proofing and socio-economic wellbeing in the area and vicinity.

j) Reserve Forests & Protected Areas

44. The activities should provide nature based support and solutions for forest protection and wildlife conservation.
45. The project activities should not result in forest fires, encroachments or create forest fragmentation and disruption of forest corridors.
46. There should be no disturbance to the freshwater flow from the forest impacting the water table and wetlands.


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47. The project proponent should support all activities of the forest department in creating awareness to local communities on forest conservation.
48. The project activities should not alter the geodiversity and geological heritage of the area.
49. The activities should not result in temperature rise due to increased fossil fuels usage disrupting the behaviour of wildlife and flora.
50. The activities should support and recognise the rights and roles of indigenous people and local communities and also support sustainable development.
51. The project activities should support the use of renewables for carbon capture and carbon storage in the project site and forest surrounds.
52. The project activities should not result in changes in forest structure, habitats and genetic diversity within forests.

k) Green Belt Development

53. The proponent shall ensure that in the green belt development more indigenous trees species (Appendix as per the SEAC Minutes) are planted.
54. The proponent shall ensure the area is restored and rehabilitated with native trees as recommended in SEAC Minutes (in Appendix).

l) Workers and their protection

55. The project proponent is responsible for implementing all the provisions of labour laws applicable from time to time to quarrying /Mining operations. The workers on the site should be provided with on-site accommodation or facilities at a suitable boarding place, protective equipment such as ear muffs, helmet, etc.
56. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
57. The workers shall be employed for working in the mines and the working hours and the wages shall be implemented/enforced as per the Mines Act, 1952.

m) Transportation

58. No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a bypass road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road


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movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.

59. The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.

n) Storage of wastes

60. The project proponent shall store/dump the waste generated within the earmarked area of the project site for mine closure as per the approved mining plan.

o) CER/EMP

61. The CER should be fully implemented and fact reflected in the Half-yearly compliance report.

62. The EMP shall also be implemented in consultation with local self-government institutions & Govt. departments.

63. The follow-up action on the implementation of CER Shall be included in the compliance report.

p) Directions for Reclamation of mine sites

64. The mining closure plan should strictly adhere to appropriate soil rehabilitation measures to ensure ecological stability of the area. Reclamation/Restoration of the mine site should ensure that the Geotechnical, physical, chemical properties are sustainable that the soil structure composition is buildup. during the process of restoration.

65. The proponent shall ensure that the mine closure plan is followed as per the mining plan and the mine restoration should be done with native species, and site restored to near original status.


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The proponent shall ensure that the area is ecologically restored to conserve the ecosystems and ensure flow of goods and services.

66. A crucial factor for success of reclamation site is to select sustainable species to enable develop a self-sustaining eco system. Species selected should easily establish, grow rapidly, and possess good crown and preferably be native species. Species to be planted in the boundary of project site should be un palatable for cattle's/ goats and should have proven capacity to add leaf-litter to soil and decompose. The species planted should be adaptable to the site conditions. Should be preferably pioneer species, deciduous in nature to allow maximum leaf-litter, have deep root system, fix atmospheric nitrogen and improve soil productivity. Species selected should have the ability to tolerate altered pit and toxicity of and site. They should be capable of meeting requirement of local people in regard to fuel fodder and should be able to attract bird, bees and butterflies. The species should be planted in mixed association.
67. For mining area reclamation plot culture experiments to be done to identify/ determine suitable species for the site.
68. Top soil with a mix of beneficial microbes (Bacteria/Fungi) to be used for reclamation of mine spoils. AM Fungi (Arbuscular mycorrhizal fungi), plant growth promoting Rhizo Bacteria and nitrogen fixing bacteria to be utilized.
69. Soil and moisture conservation and water harvesting structures to be used where ever possible for early amelioration and restoration of site.
70. Top soil is most important for successful rehabilitation of mined sites. Topsoil contains majority of seeds and plant propagation, soil microorganism, Organic matter and plant nutrients. Wherever possible the topsoil should be immediately used in the area of the for land form reconstruction, to pre mining conditions.
71. Over burdens may be analyzed and tested for soil characteristics and used in the site for revegetation. Wherever possible seeds, rhizome, bulbs, etc of pioneering spices should be collected, preserved and used in restoring the site.
72. Native grasses seeds may be used as colonizers and soil binders, to prevent erosion and allow diverse self- sustaining plant communities to establish. Grasses may offer superior tolerance to drought, and climatic stresses.
73. Reclamation involves planned topographical reconstruction of site. Care to be taken to minimize erosion and runoff. Topsoils should have necessary physical, chemicals, ecological, properties and therefore should be stored with precautions and utilized for reclamation process.


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Stocked topsoil should be stabilized using grasses to protect from wind. Seeds of various indigenous and local species may be broad casted after topsoil and treated overburden are spread.

74. Alkaline soils, acidic soils, Saline soils should be suitably treated/amended using green manure, mulches, farmyard manure to increase organic carbon. The efforts should be taken to landscape and use the land post mining. The EMP and mine closure plan should provide adequate budget for re-establishing the site to pre-mining conditions. Effective steps should be taken for utilization of over burden. Mine waste to be used for backfilling, reclamation, restoration, and rehabilitation of the terrain without affecting the drainage and water regimes. The rate of rehabilitation should be similar to rate of mining. The land disturbed should be reshaped for long term use. Mining should be as far as possible be eco-friendly. Integration of rehabilitation strategies with mining plan will enable speedy restoration.
75. Efforts should to taken to aesthetically improve the mine site. Generally, there are two approaches to restoration i.e Ecological approach which allows tolerant species to establish following the succession process allowing pioneer species to establish. The other approach i.e plantation approach is with selected native species are planted. A blend of both methods may be used to restore the site by adding soil humus and mycorrhiza.
76. Action taken for restoration of the site should be specifically mentioned in the EC compliances.

CONDITIONS IMPOSED BY SEAC:

1. The prior Environmental Clearance granted for this mining project shall be valid for the project life including production value as laid down in the mining plan approved and renewed by competent authority, from time to time, subject to a maximum of thirty years, whichever is earlier **vide MoEF&CC Notification S.O. 1807(E) dated 12.04.2022.**
2. The PP shall inform the notice of opening of the quarry to the Director of Mines Safety (DMS)/Chennai Region and get the necessary statutory permission under the MMR 1961 pertaining to the mine working operations in the proposed quarry from the DMS, Chennai before obtaining the CTO.
3. The mine manager and other statutory competent persons such as blaster (or) mine mate shall be appointed as per the provisions of Mines Act 1952 and Metalliferous Mines Regulations, 1961 before the obtaining the CTO from the DEE/TNPCB.


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4. The proponent shall maintain the 'S3 (or) G2' type of fencing all around the boundary of the proposed working quarry with gates for entry/exit before the commencement of the operation as recommended in the DGMS Circular, 11/1959 and shall furnish the photographs showing the same before obtaining the CTO from TNPCB.
5. Further, the PP shall maintain the garland drain with proper size, gradient and length along the boundary of the pit leaving behind the mandatory safety zone of 7.5 m as it is designed to take care of run-off water (size, gradient and length) before obtaining the CTO from TNPCB.
6. The PP shall ensure that the following provisions are provided due to the existence of Reserved Forest/Reserve Land at a distance of less than 1km from the project site:
 - i. Since the R.F is located very close to the proposed quarry site, the PP shall develop Green Belt (Thick Tree plantation in two rows) along the boundary of the mine lease area before obtaining the CTO from the TNPCB.
 - ii. The proponent shall construct and maintain proper fencing all around the boundary of the proposed working quarry adjacent to the direction of the location of the Reserved Forest before the commencement of the operation and shall furnish the photographs showing the same before obtaining the CTO from TNPCB.
 - iii. The PP shall take steps so that the overburden, waste rock, rejects and fines generated during the mining operations shall be stored in separate dumps positioned in opposite direction to the location of the reserved forest.
 - iv. The PP shall ensure that such waste/reject dumps shall be properly secured to prevent escape of material there from in harmful quantities which may cause degradation of environment and to prevent causation of floods.
 - v. The PP shall select the site for dumps on impervious ground to ensure minimum leaching effects due to precipitations.
 - vi. The PP shall take necessary steps that wherever possible, the waste rock, overburden etc. shall be back-filled into the mine excavations with a view to restoring the land to its original use as far as possible.
 - vii. Wherever back-filling of waste rock in the area excavated during mining operations is not feasible, the PP shall take adequate steps in discussion with the concerned DFO to suitably terrace the waste dumps placed within the lease hold area ensuring the stability through vegetation to consolidate the green belt development in the areas adjacent to the reserved forest location.


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- viii. The PP shall carry out the scientific investigations in order to keep the ground and noise vibrations caused by blasting operations and movement of HEMM such as Excavators, Trucks within safe limit.
- ix. The PP shall not perform secondary breakage involving the drilling & blasting in the quarrying operations and it can be replaced with non-conventional methods such as noise-controlled rock breakers, usage of non-explosive expansive materials/chemicals, Hydraulic Splitting based on the suitable scientific studies carried out by any reputed scientific and academic institutions.
- x. The PP shall take adequate steps to control the air pollution due to fines, dust, smoke or gaseous emissions during the quarrying operations within 'Permissible Limits' specified under the environmental laws.
- xi. The Quarrying and Mining activities shall be restricted in the Eco-sensitive Zone of 60 m from the boundary of the Reserved area and hence the PP shall not even indulge in constructing the haul roads in these areas.
- xii. No development on existing steep hill slopes or slopes with a high degree of erosion shall be permitted. Hence, the PP shall not carry out the quarrying on steep hill slopes with a gradient of 20° or more / areas with a high degree of erosion on forestland.
- xiii. The PP shall give an affidavit at the time of lease execution that there will be no felling of trees (or) any encroachment will not be made on these Reserved Forest lands and also within the Eco- sensitive Zone of 60 m without the prior permission of the State Government in case of reserve forest land as per the procedures laid down by the State Government.
- xiv. The PP shall not use plastic carry bags within the quarry area.
- xv. The PP shall ensure that all the haul roads within the quarry lease shall be provided with adequate number of road side drains and these drains shall be kept free from blockage for runoff disposals. This run off from the road side drainage shall relate to the natural drainage system in the area.
- xvi. The PP shall adhere to the provisions of the MoEF had issued Notification No. S.O. 1545 dated 25th June 2009 regulating certain activities in the eco-sensitive zone to conserve and protect the reserved forest area from ecological and environmental point of view.


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7. The PP shall carry out maximum of only one round of controlled blast per day, restricted to the maximum of 50 to 60 number of holes per round with maintaining maximum charge per delay in such a manner that the blast-induced ground vibration level (Peak Particle Velocity) measured in the houses/structures located at a distance of 500 m shall not exceed 2.0 mm/s and no fly rock shall travel beyond 20 m from the site of blasting. The PP shall also ensure that the blasting operation shall be carried out once in 2 days to reduce the environmental impacts effectively.
8. No 'Deep-hole large diameter drilling and blasting' is permitted in the proposed quarry.
9. Within one year from the commencement of mining operations, the PP shall carry out the scientific studies on 'Design of Blast parameters for reducing the impact of blast-induced ground/air vibrations and fly rock caused due to operation of the quarry by adopting appropriate controlled blasting techniques', by involving a reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research (CIMFR) / Dhanbad, NIRM, IIT-Madras, NIT-Dept of Mining Engg, Surathkal and Anna University – CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance.
10. The PP shall use the jack hammer drill machine fitted with the dust extractor for the drilling operations such that the fugitive dust is controlled effectively at the source.
11. The PP shall ensure that the blasting operations are carried out by the blaster/Mine Mate/Mine Foreman employed by him in accordance with the provisions of MMR 1961 and it shall not be carried out by the persons other than the above statutory personnel.
12. The PP shall carry out the scientific studies to assess the slope stability of the benches and quarry wall when the depth of the quarry working touches 30 m (or) after the completion of 3 years of operation whichever is earlier, by involving a reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research (CIMFR) / Dhanbad, NIRM, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus, etc. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation.
13. Since the quarry site lies in close proximity to the habitations & roads, the PP shall furnish a Standard Operating Procedure for carrying out the safe method of carrying out the blasting operation to the concerned DEE/TNPCB before obtaining the CTO from the TNPCB.


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14. The PP shall ensure that the blasting operations shall be carried out during a prescribed time interval with a prior notice to the habitations situated around the proposed quarry after having posted the sentries/guards adequately to confirm the non-exposure of public within the danger zone of 500 m from the boundary of the quarry.
15. The PP shall meticulously carry out the mitigation measures as spelt out in the revised EMP.
16. The Project Proponent shall ensure that the funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to the MoEF& CC Ministry and its Integrated Regional Office (IRO) located in Chennai.
17. The Project Proponent shall send a copy of the clearance letter marked to concerned Panchayat from whom any suggestion/representation has been received while processing the proposal.
18. 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 adhere EMP furnished.
19. As accepted by the Project proponent the CER cost is Rs. 5 lakhs and the amount shall be spent towards the Government Higher Secondary School, Chokkampatti Village, Melur Taluk, Madurai District for the committed activities, before obtaining CTO from TNPCB.
20. The proponent shall mandatorily appoint the required number of statutory officials and the competent persons in relevant to the proposed quarry size as per the provisions of Mines Act 1952 and Metalliferous Mines Regulations, 1961.
21. The proponent shall erect fencing all around the boundary of the proposed area with gates for entry/exit before the commencement of the operation and shall furnish the photographs/map showing the same before obtaining the CTO from TNPCB.
22. Perennial maintenance of haulage road/village / Panchayat Road shall be done by the project proponent as required in connection with the concerned Govt. Authority.
23. The Project Proponent shall adhere to the working parameters of mining plan which was submitted at the time of EC appraisal wherein year-wise plan was mentioned for total excavation i.e. quantum of mineral, waste, over burden, inter burden and top soil etc.. No change in basic mining proposal like mining technology, total excavation, mineral & waste production, lease area and scope of working (viz. method of mining, overburden & dump management, O.B & dump mining, mineral transportation mode, ultimate depth of mining etc.) shall not be carried out without prior approval of the Ministry of Environment, Forest and Climate Change, which entail adverse environmental impacts, even if it is a part of


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approved mining plan modified after grant of EC or granted by State Govt. in the form of Short Term Permit (STP), Query license or any other name.

24. The reject/waste generated during the mining operations shall be stacked at earmarked waste dump site(s) only. The physical parameters of the waste dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by DGMS w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of waste dumps.
25. The proponent shall ensure that the slope of dumps is suitably vegetated in scientific manner with the native species to maintain the slope stability, prevent erosion and surface run off. The gullies formed on slopes should be adequately taken care of as it impacts the overall stability of dumps.
26. Perennial sprinkling arrangement shall be in place on the haulage road for fugitive dust suppression. Fugitive emission measurements should be carried out during the mining operation at regular intervals and submit the consolidated report to TNPCB once in six months.
27. The Project Proponent shall carry out slope stability study by a reputed academic/research institution such as NIRM, IIT, Anna University for evaluating the safe slope angle if the proposed dump height is more than 30 meters. The slope stability report shall be submitted to concerned Regional office of MoEF&CC, Govt. of India, Chennai as well as SEIAA, Tamilnadu.
28. The Proponent shall ensure that the Noise level is monitored during mining operation at the project site for all the machineries deployed and adequate noise level reduction measures undertaken accordingly. The report on the periodic monitoring shall be submitted to TNPCB once in 6 months.
29. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.
30. 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.


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31. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper escapements 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.
32. **Noise and Vibration Related:** (i) The Proponent shall carry out only the Controlled Blasting operation using NONEL shock tube initiation system during daytime. Usage of other initiation systems such as detonating cord/fuse, safety fuse, ordinary detonators, cord relays, should be avoided in the blasting operation. The mitigation measures for control of ground vibrations and to arrest fly rocks should be implemented meticulously under the supervision of statutory competent persons possessing the I / II Class Mines Manager / Foreman / Blaster certificate issued by the DGMS under MMR 1961, appointed in the quarry. No secondary blasting of boulders shall be carried out in any occasions and only the Rock Breakers (or) other suitable non-explosive techniques shall be adopted if such secondary breakage is required. The Project Proponent shall provide required number of the security sentries for guarding the danger zone of 500 m radius from the site of blasting to ensure that no human/animal is present within this danger zone and also no person is allowed to enter into (or) stay in the danger zone during the blasting. (ii) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs. (iii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone.
33. Ground water quality monitoring should be conducted once in every six months and the report should be submitted to TNPCB.
34. The operation of the quarry should not affect the agricultural activities & water bodies near the project site and a 50 m safety distance from water body should be maintained without carrying any activity. The proponent shall take appropriate measures for "Silt Management" and prepare a SOP for periodical de-siltation indicating the possible silt content and size in case of any agricultural land exists around the quarry.
35. The proponent shall provide sedimentation tank / settling tank with adequate capacity for runoff management.
36. The proponent shall ensure that the transportation of the quarried materials shall not cause any hindrance to the Village people/Existing Village Road and shall take adequate safety


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- precautionary measures while the vehicles are passing through the schools / hospital. The Project Proponent shall ensure that the road may not be damaged due to transportation of the quarried rough stones; and transport of rough stones will be as per IRC Guidelines with respect to complying with traffic congestion and density.
37. To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation.
 38. After mining operations are completed, the mine closure activities as indicated in the mine closure plan shall be strictly carried out by the Proponent fulfilling the necessary actions as assured in the Environmental Management Plan.
 39. The Project proponent shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition that is fit for the growth of fodder, flora, fauna etc.
 40. The Project Proponent shall comply with the provisions of the Mines Act, 1952, MMR 1961 and Mines Rules 1955 for ensuring safety, health and welfare of the people working in the mines and the surrounding habitants.
 41. The project proponent shall ensure that the provisions of the MMRD, 1956, the MCDR 2017 and Tamilnadu Minor Mineral Concession Rules 1959 are complied by carrying out the quarrying operations in a skillful, scientific and systematic manner keeping in view proper safety of the labour, structure and the public and public works located in that vicinity of the quarrying area and in a manner to preserve the environment and ecology of the area.
 42. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be informed to the District AD/DD (Geology and Mining) District Environmental Engineer (TNPCB) and the Director of Mines Safety (DMS), Chennai Region by the proponent without fail.
 43. The Project Proponent shall abide by the annual production scheduled specified in the approved mining plan and if any deviation is observed, it will render the Project Proponent liable for legal action in accordance with Environment and Mining Laws.
 44. Prior clearance from Forestry & Wild Life including clearance from committee of the National Board for Wildlife as applicable shall be obtained before starting the quarrying operation, if the project site attracts the NBWL clearance, as per the existing law from time to time.


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45. All the conditions imposed by the Assistant/Deputy Director, Geology & Mining, concerned District in the mining plan approval letter and the Precise area communication letter issued by concerned District Collector should be strictly followed.
46. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
47. The Project proponent shall install a Display Board at the entrance of the mining lease area/abutting the public Road, about the project information as shown in the **Appendix –II** of this minute.

Appendix - I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Aegle marmelos</i>	Vilvam	விவம்
2	<i>Adenanthera pavonina</i>	Manjadi	மஞ்சரி, ஆமனத்தெருமணி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Usal	உசல்
5	<i>Bauhinia purpurea</i>	Mantharai	மந்தாரை
6	<i>Bauhinia racemosa</i>	Aatha	ஆதா
7	<i>Bauhinia tomentosa</i>	Iruvathu	இருவத்தி
8	<i>Buchanania axillaris</i>	Kattuma	கட்டிமர
9	<i>Borassus flabellifer</i>	Panai	பனை
10	<i>Butea monosperma</i>	Murukkamarai	முருக்கமரம்
11	<i>Bobax caiba</i>	Ilavu, Sevulavu	இலவு
12	<i>Calophyllum inophyllum</i>	Puzhai	புழை
13	<i>Cassia fistula</i>	Sarakondrai	சரகண்டரை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கண்டரை
15	<i>Chloroxylon swietenia</i>	Purasamarai	புரசாமரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Marjallavu	கொங்கு, மரச்சா
17	<i>Cordia dichotoma</i>	Naruvuli	நரவூலி
18	<i>Cretova adansonii</i>	Mavalungum	மாவலங்கம்
19	<i>Dillenia indica</i>	Uva, Uzha	உவா
20	<i>Dillenia pentagyna</i>	SruUva, Sitruzha	சீறு உவா
21	<i>Diospyro ebenum</i>	Karungali	கரங்கலி
22	<i>Diospyro schloroxylon</i>	Vaganai	வகை
23	<i>Ficus amplicornis</i>	Kallitchi	கல் இச்சி
24	<i>Hibiscus tiliaceus</i>	Aathrupoovarai	ஆதர்ப்புவரை
25	<i>Hardwickia binata</i>	Aacha	ஆச்சா
26	<i>Holoptelia integrifolia</i>	Aavili	ஆவிலி
27	<i>Lannea coromandelica</i>	Odhiam	ஒடியம்
28	<i>Lagerstroemia speciosa</i>	Foo Marudhu	பூ மரத்து
29	<i>Lepisanthus tetraphylla</i>	Neikottainaram	நெய் கொட்டை மரம்
30	<i>Limonia acidissima</i>	Vilamaram	விளா மரம்
31	<i>Litsea glutinosa</i>	Pozampattai	பொழை பிச்சிலி
32	<i>Madhuca longifolia</i>	Illupai	இலுபை
33	<i>Manilkara hexandra</i>	UlaikaiPaalai	உலகை பழை
34	<i>Mimosa elengi</i>	Magizhamaram	மகிழாமரம்
35	<i>Mitracyna parvifolia</i>	Kadambu	கடம்பு
36	<i>Morinda pubescens</i>	Nura	நுரை
37	<i>Morinda citrifolia</i>	Vellai Nura	வெள்ளை நுரை
38	<i>Phoenix sylvestris</i>	Eschai	ஏசை
39	<i>Pongamia pinnat</i>	Pungam	புங்கம்

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40	<i>Premna mollissima</i>	Murugai	முனைளை
41	<i>Premna serratifolia</i>	Narumiyurai	நறு முனைளை
42	<i>Premna tomentosa</i>	Malapoovaram	மலை பூவரசு
43	<i>Prosopis cinerea</i>	Vanu maram	வளை மரம்
44	<i>Pterocarpus marsipium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vennangu, Tada	வெண்ணாங்கை
46	<i>Pterospermum xylocarpum</i>	Polavu	பூவடி
47	<i>Puthranjita roxburghii</i>	Karipala	கரிபலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus emarginatus</i>	Manipungan, Soapukai	மணிப்புங்கை, சோபுகாய்
50	<i>Saraca asoca</i>	Asoca	அசோகா
51	<i>Streblus asper</i>	Piray maram	பிராய மரம்
52	<i>Strychnos nuxvomica</i>	Yetti	எட்டி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேத்தான் கொட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Tharudi	தாண்டி
56	<i>Terminalia arjuna</i>	Ven narudhu	வெண் மருது
57	<i>Toona cilute</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Theopesia populnea</i>	Puvarasu	பூவரசு
59	<i>Walsura trifoliata</i>	valsura	வால்சூரா
60	<i>Wrightia tinctoria</i>	Veppalai	வெப்பலாலை
61	<i>Pithecolobium dulce</i>	Kodukkapuli	கொடுக்காப்புளி

Appendix -II
Display Board
(Size 6' x5' with Blue Background and White Letters)

கரங்கம்

கரங்கத்தில் குவாரி செயல்பாடுகளுக்கான சுற்றுச்சூழல் அழகுநதி கீழ்க்கண்ட நிபந்தனைகளுக்கு உட்பட்டு வழங்கப்படும் (செயல்பாட்டு, தேயிலாட்டு, சுற்றுச்சூழல் அழகுநதி தேகு வளர் செயலாக்கத்திற்கான உட்பாட்டு)

பசுமை பகுதி வார்ப்பு செயல்பாடுகளைக் கண்காணக்கும் திட்டம்	குவாரியின் எல்லைகளையும் சுற்றி வேலி அமைக்க வேண்டும். கால்கப்பலாக்கலின் கீழும் தளப்பகுதியிலும் மீட்டிங் மிஸ்டர் இடங்க வேண்டும். சுற்றுநிலை மாற்றம் ஏற்படாதவாறு கரங்க பணிகளை மேற்கொள்ள வேண்டும்.
நட்புபட்டு பராமரிக்கப்பட வேண்டிய மரங்கள் எண்ணிக்கை	வாகைகள் செல்லும் பாதையில் மாசு ஏற்படாத அளவிற்கு தளவிலே முழுமையாக தளவிலே வார்ப்புகள் மூலமாக அகலப்படுத்த வேண்டும். இளைச்சல் அமைப்பும் ஊசி மரப்பகுதியும் குவாரியிலிருந்து குவாரியின் எல்லைகளையும் சுற்றி அடர்த்தியான பசுமை பகுதியை ஏற்படுத்த வேண்டும்.
கரங்கத்தில் வெடி வைக்கும்பொழுது நிலத்திலிருந்து ஏற்படாதவாறும் மற்றும் கரங்க பரக்காதவாறும் பாதுகாப்பு நடவடிக்கைகளை உடனடியாக செயல்படுத்தப்பட வேண்டும்.	கரங்கத்தில் இருந்து ஏற்படும் இளைச்சல் அல்லது டி. சி. சி. (DCA) அளவிற்கு மேல் ஏற்படாதவாறு தடுக்க உட்பாடுகளை மேற்கொள்ள வேண்டும்.
கரங்க எட்டி விதிகள் மீறும் கீழ் கரங்கத்தில் உடனடி பணியாற்றுவதற்கு தகுந்த பாதுகாப்பு கருவிகள் வழங்குவதோடு க்காற்றமுள்ள கரங்கத்தை வசதிக்களை செய்து தர வேண்டும்.	
கரங்கம் அல்லது பசுமைக்கு வாய்ப்பாக வாசல்களை செல்லும் சாலைகளை மேல் கீழ் நகர பராமரிக்க வேண்டும்.	
கரங்கப்பணிகளால் அழகில் உடனடி விவசாயப் பணிகள் மற்றும் திருவிளையாடல் பகுதிகளைக் காப்பது.	
இந்தியாவின் பாதிக்கப்பட்ட மரம் இடப்பாடு உருதி செயல்பட வாய்ப்பில் இருந்து தடுக்க வேண்டும். கரங்கத்தில் இருந்து வளம் பெறும் மரங்களை மேல் கீழ் நகர பராமரிக்க வேண்டும்.	
கரங்கப்பணிகள் முடிக்கப்பட்ட பின்னர் கரங்கம் குட்டி தர உடனடியாக கரங்கத்தின் மூல வேண்டும்.	
கரங்க நடவடிக்கைகளை முடித்தபின்னர் கரங்கம் பகுதி மற்றும் கரங்க நடவடிக்கைகளை மேல் கீழ் நகர ஏற்பாடுகளை மேல் கீழ் பகுதியையும் மற்ற உடனடி பணிகளை செய்து தரவேண்டும். விவசாயிகள் ஆய்வாளர்கள் வார்ப்புகளுக்கு ஏற்ற வகையில் பசுமைப்பகுதியை உருவாக்க வேண்டும்.	
முழுமையான நிபந்தனைகளை கரங்க பராமரிப்பு (http://www.seiaa.in) வளங்கு இணையதளத்தைப் பார்வையிடும். மேலும் விவசாய சுற்றுச்சூழல் உள்ள பணிகளுக்கு செயல்படும் உடனடி சுற்றுச்சூழல் மற்றும் வளர் அமைச்சுத்தின் குருகிணங்கை உடனடி சுற்றுச்சூழல் (044 - 28222323) (அல்லது) கமிட்டிக்கு மாசு கட்டுப்பாடு வாரியத்தின் மூலம் சுற்றுச்சூழல் பொறுப்பாளர் அனுப்பும்.	


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STANDARD CONDITIONS

Part-A: Conditions to be Complied before commencing mining operations:-

1. The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that
 - I. The project has been accorded Environmental Clearance.
 - II. Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.
 - III. Environmental Clearance may also be seen on the website of the SEIAA.
 - IV. The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.
2. Mining activity should be reviewed by the District Collector after three years and decide for further extension.
3. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
4. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
5. A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.
6. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
7. The proponent shall ensure that First Aid Box is available at site.
8. The excavation activity shall not alter the natural drainage pattern of the area.
9. The excavated pit shall be restored by the project proponent for useful purposes.
10. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details:
11. The quarrying operation shall be restricted between 7AM and 5 PM.


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12. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
13. A minimum distance of 50mts. from any civil structure shall be kept from the periphery of any excavation area.
14. Depth of quarrying should be as per approved mining plan.
15. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
16. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
17. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
18. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.
19. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
20. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF& CC, Gol on 16.11.2009.
21. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
 - i. Roads shall be graded to mitigate the dust emission.
 - ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
22. The following measures are to be implemented to reduce Noise Pollution
 - i. Proper and regular maintenance of vehicles and other equipment
 - ii. Limiting time exposure of workers to excessive noise.
 - iii. The workers employed shall be provided with protection equipment and earmuffs etc.
 - iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.


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- v. All noise generating machinery the compressor, generator to be enclosed in acoustic enclosure so as to reduce noise in working area.
23. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoEF& CC, Govt to control noise to the prescribed levels.
24. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
25. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
26. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
27. The following measures are to be adopted to control erosion of dumps:-
- Retention/ toe walls shall be provided at the foot of the dumps.
 - Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.
28. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous& other wastes (Management, and Trans Boundary Movement) Rules, 2016 and its amendments thereof to the recyclers authorized by TNPCB.
29. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
30. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
31. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.


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32. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out, District Collector/mining officer shall ensure this.
33. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
34. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.
35. It shall be ensured that the total extent of nearby quarries(existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 5 hectares within the mining lease period of this application.
36. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 300m radius from the periphery of the quarry site.
37. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
38. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
39. Bunds to be provided at the boundary of the project site.
40. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.
41. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
42. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
43. The Project Proponent shall provide solar lighting system to the nearby villages.
44. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.

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45. Safety equipments to be provided to all the employees.
46. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai
47. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
48. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.
49. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
50. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
51. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
52. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
53. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
54. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 3m height.
55. The fugitive emissions should be monitored during the mining activity and should be reported to TNPCB once in a month and the operation of the quarry should no way impact the agriculture activity & water bodies near the project site.
56. All the commitment made by the project proponent in the proposal shall be strictly followed.
57. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

Part B: General Conditions:

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent from the TNPC Board before commencing the activity.


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3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.


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14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.
16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance
18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.
19. The SEIAA, Tamil Nadu may cancel the Environmental Clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this Environmental Clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the Environmental Clearance.
20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002 and Biological diversity Rules, 2004 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.
22. Any other conditions stipulated by other Statutory/Government authorities shall be complied.


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23. Any appeal against this Environmental Clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
24. The Environmental Clearance is issued based on the documents furnished by the project proponent. In case any documents found to be incorrect/not in order at a later date the Environmental Clearance issued to the project will be deemed to be revoked/ cancelled.


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Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Industries Department, Tamil Nadu.
4. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
5. The Chairman, TNPC Board, 76, Mount Salai, Guindy, Chennai-32
6. The District Collector, Madurai District
7. The Commissioner of Geology and Mines, Guindy, Chennai-32
8. Assistant Director, Department of Geology & Mining Madurai District.
9. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. File Copy

Signature Not Verified

Digitally signed by Thiru.Deepak
S.Bilgi
Member Secretary
Date: 9/25/2023 6:15:12 PM
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9. Factors which should be considered (such as consequential development) which could lead to environmental effects to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.

S. No	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
9.1	Lead to development of supporting cities, ancillary development or development stimulated by the project which could have impact on the environment	No	Living standard will be improved of the nearby villagers. The proposed project shall directly/indirectly develop the area by providing employment, tax to government, development of ancillary units, shopkeeper, supermarket, mechanic shed etc. The workers are available from the nearby villages, hence the project will not attract housing development, Extractive Industries, supply industries or any other activities.
9.2	Lead to after-use of the site, which could have an impact on environment	No	The land does not used after the completion of quarrying operation the fencing will be constructed around the quarried pits to prevent the inherent entry of public and cattle
9.3	Set a precedent for later developments	No	A better after use scenario with increase in greenery, besides the quarried pit will act as a temporary reservoir which will enhance the static level of the Ground water in the nearby wells.
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	No cumulative impacts are envisaged.

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4	Precise Area Communication Letter from the District Collector.	203
5	Certificate from the VAO stating the details of Habitation & RI Letter For Inter State Boundary.	
6	Letter from the Department of Geology and Mining of other quarries within 500m Radius from the proposed quarry site.	
7	Explosive Certificate	
8	Affidavit from the Applicant regarding general Conditions, Habitation, other quarry, Permanent structure, Child Labour, etc., - Notary Public	
9	Documents of Village records, FMB and 500m & 10Km Radius Map.	185,207

1.25	Transport of personnel or materials for construction, operation or decommissioning?	No	<p>During operation phase, after grant of lease quarrying personnel will be brought from surrounding villages by applicant's jeep or van.</p> <p>The materials and tools shall be transported by trucks and tippers, the existing road and infrastructure facilities are sufficient. No construction operation or decommissioning envisaged.</p>
1.26	Long-term dismantling or decommissioning or restoration works?	No	No Dismantling and decommissioning is proposed in this project.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	There is no such type of activities involved in this project.
1.28	Influx of people to an area in either temporarily or permanently?	Yes	<p>During operational phase, the manpower requirement will be around 12 peoples will be directly and 8 peoples will be indirectly benefit to this project. Local people are envisaged in this quarry operation. Inherent entry of public will be strictly prevented.</p> <p>No child labor will be deployed for any type of quarrying operation. All the labors engaged for quarrying operations will be trained, equipped with protective devices and insured till the end of life of quarry.</p>
1.29	Introduction of alien species?	No	There is no proposal to introduce alien species.
1.30	Loss of native species or genetic diversity?	No	There will be no loss of native species or genetic diversity taken during the quarry operation as the lease area is devoid of Plantation, vegetation and agriculture.
1.31	Any other actions?	No	<p>Temporary approach road will be formed and maintain within the lease area.</p> <p>Tippers will be transport the Rough Stone is to Customer / other buyers by existing road, (already in good condition)</p> <p>No long term dismantling or decommissioning is involved in this project. This project is sites specific and may not have any significant impact on the environment.</p>

4.6	Sewage, sludge or other effluent treatment	Yes	Sanitary facilities will be constructed as semi-permanent structure and the sewage waste will be disposed as per the norms.
4.7	Construction or Demolition Wastes	No	There are no Construction or demolition wastes involved in this quarry.
4.8	Redundant machinery or equipment	No	No redundant machineries involved in this project, only Excavator and tipper are involved in this quarry operation.
4.9	Contaminated soils or other materials	No	There is no contaminated material or soil observed in the quarry area.
4.10	Agricultural wastes	No	There is no agricultural waste anticipated.
4.11	Other solid wastes	No	There is no other solid waste anticipated.

5.0. Release of pollutants or any hazardous, toxic or noxious substances to air (kg/hr)

S. No	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	The emissions of SO ₂ (Sulphur dioxide), & NO _x (Nitrogen dioxide) may be due to use of diesel operated quarry machinery and vehicles. Better maintenance of equipment in good condition will help to reduce such emissions.
5.2	Emissions from production processes	Yes	Dust is the main pollutant produced in the proposed activity. Emission from loading and plying of tippers can take place but they will be maintained within limits by proper maintenance and sprinkling of water on haul roads. Tarpaulin covers during Transportation.
5.3	Emissions from materials handling including storage or transport	Yes	Fugitive dust will be generated from material handling activities. Dust suppression by water sprinkling will be provided to prevent the fugitive dust emissions during loading. Tarpaulin covers will be covered in vehicles during transportation.
5.4	Emissions from construction activities including plant and equipment	No	There is no major construction activities are envisaged.

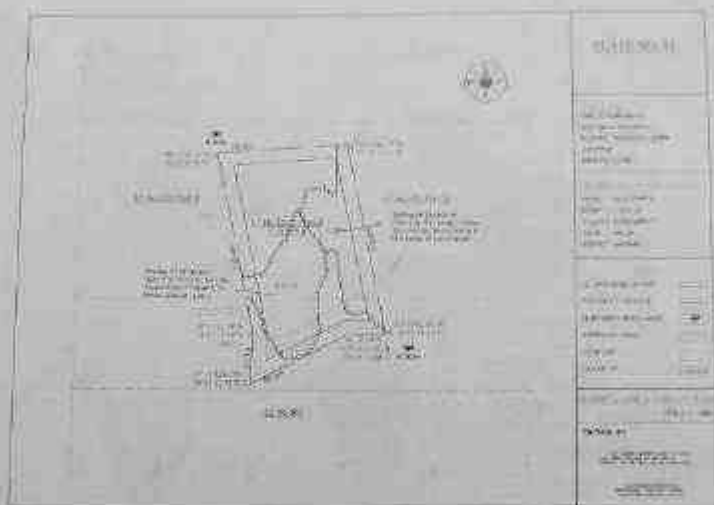
11	Nearest Town, City, Madurai District Headquarters along with distance in kms	Nearest Town: Kattampatty - 2.2km SE Nearest City: Madurai - 41.0km - SW District: Madurai - 41.0km - SW
12	Village Panchayats, Zila Parishad, Municipal Corporation, Local body (Complete postal addresses with telephone nos. to be given)	Village Panchayat - Sakkampatti Panchayat Union - Melur Taluk - Melur District - Madurai
13	Name of the Applicant	Thiru. C. Veeramalai
14	Registered Address	S/o. Chinnakaruppan, No. 2/387, Pandikovil Street, Vandiyur, Madurai District - 625 020
15	Address for correspondence	Thiru. C. Veeramalai
	Designation (Owner/Partner/CEO)	Proprietor/Owner
	Address	S/o. Chinnakaruppan, No. 2/387, Pandikovil Street, Vandiyur, Madurai District - 625 020
	Pin code	625 020
	E-mail	
	Telephone No.	9865744880
	Fax No.	-
16	Details of Alternative Sites examined, if any. Location of these sites should be shown on a Topo sheet	There is no alternative site examined. The project is site specific.
17	Interlinked Projects	There is no interlinked projects
18	Whether separate application of interlinked project has been submitted?	As there is no interlinked project, no application has been submitted
19	If yes, date of submission.	As there is no interlinked project hence no application has been submitted.
20	If no, reason	The project involves Rough Stone Quarry only.
21	Whether the proposal involves approval/ clearance under: if yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980? (b) The Wildlife (Protection) Act, 1972? (c) The C. R. Z. Notification, 2011?	<ul style="list-style-type: none"> ❖ Budagudi Reserve Forest - 2.7 Km - Western Side ❖ Karumalai Reserve Forest - 2.2 Km - Northwestern Side ❖ Nadumalai Reserve Forest - 7.3 Km - Southwestern Side ❖ Nedunkuttu Reserve Forest - 7.8 Km - Northwestern Side ❖ Vellimalai Reserve Forest - 6.7 Km - Northern Side

1.3	Creation of new land uses?	No	<p>The total quarrying activity is proposed to carry out within the quarry lease applied area. Hence, there is no proposal for creating of new land uses. Temporary approach road within the project area will be form for the easy access of man and machinery which will be well maintained.</p> <p>The excavated Rough Stone will be directly loaded into tipper to the nearby crusher to nearby customers for road project and construction works for filling and leveling of low lying areas.</p>
1.4	Pre-construction investigations e.g. bore holes, soil testing?	No	<p>The massive Charnokite formation is clearly visible to existing pit, hence pre-construction investigation and soil testing is not proposed before quarrying operation.</p>
1.5	Construction works?	Yes	<p>There will be no major civil works, other than the following infrastructure: office building, storeroom, toilet and first aid room will be provided on permanent structures within the quarry lease applied area in the safety barrier. After the grant of lease.</p>
1.6	Demolition works?	No	<p>There are no existing building within the lease applied area hence no demolition work is involved.</p>
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	<p>Sites service on semi-permanent structure will be constructed only after grant of quarry lease within 7.5m & 10m safety barrier.</p>
1.8	Above ground buildings, structures or Gravel works including linear structures, cut and fill or excavations	No	<p>There are no tall buildings or linear structure found within the quarry site. There is no requirement of cutting and filling in the site.</p>
1.9	Underground works including mining or tunneling?	No	<p>Open cast method or semi mechanized quarrying will be adopted. No underground mining or tunneling is proposed.</p>
1.10	Reclamation works?	No	<p>There is no reclamation works is proposed. In the proposed mining plan only a maximum depth of 36.0m (below ground level), has been envisaged as workable depth for safe & economic mining during the lease period. Hence, after quarry reaches ultimate pit limit (for this lease period) of 36.0m below ground level, fencing will be constructed around the quarried pits to prevent inherent entry of the public and cattle.</p>

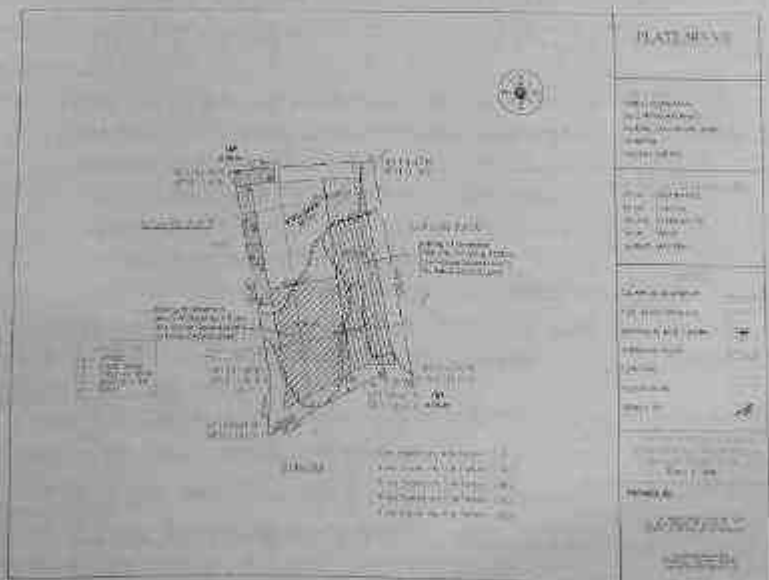
(I) Environmental Sensitivity

S. No	Areas	Name/ Identity	Aerial distance (within 10 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	No protected areas to be identified within 10km distance.
2	Areas which are important or sensitive for ecological reasons- Wetlands, water resources, coastal zone, biospheres, mountains, forests	No	<ul style="list-style-type: none"> ◆ Badagudi Reserve Forest - 2.7Km - Western Side ◆ Kammala Reserve Forest - 2.2Km - Northwestern Side ◆ Nallamala Reserve Forest - 7.3Km - Southeastern Side ◆ Nedunkattu Reserve Forest - 7.8Km - Northwestern Side ◆ Vellimala Reserve Forest - 5.7Km - Northern Side
3	Areas used by protected important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration	No	There is no protected sensitive species identified within the 10km radius.
4	Inland, coastal, marine or underground waters	No	There is no inland, coastal, marine or underground water around the site.

DRAWING SHOW THE QUARRY LEASE & SURFACE PLANK WITH CO-ORDINATES



DRAWING SHOW THE YEARWISE DEVELOPMENT OF PRODUCTION PLAN AND SECTION PLAN



5.5	Dust or odors from handling of materials including construction materials, sewage and waste.	No	Minor Dust will be generated during loading of material, transportation of rough stone and it will be controlled. However, there is no possibility of any odor generation as there are no organic solvents/processes involved.
5.6	Emissions from incineration of waste.	No	The Rough Stone Quarrying does not produce any toxic effluents.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris).	No	There is no such type of activities involved in this project.
5.8	Emissions from any other sources	No	Emissions from other sources are not envisaged.

6.0. Generation of Noise and Vibration, and Emissions of Light and Heat:

S. No	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	<p>Due to operation of machineries there is likely hood of some increase in noise level. The noise level at site will be maintained below permissible limit. Measures like lubrication & preventive maintenance shall be taken to control noise from the machineries.</p> <p>The vibration during the moment of machinery will be minimal for a short span that will be well within the prescribed limits.</p>
6.2	From industrial or similar processes	No	There is no proposal of processing plant.
6.3	From construction or demolition	No	No construction or demolition work takes place.
6.4	From blasting or piling	No	The quarrying activity will be carried out blasting for shattering effect and loosen the Rough Stone. However, controlled blasting measures will be adopted for minimizing ground vibration.

6.5	From construction or operational traffic	Yes	The transport of Rough Stone through tippers can produce noise but will be maintained within permissible limits, by keeping machinery in proper condition as per PTO & TRGS Norms and maintenance under experience and qualified mechanics.
6.6	From lighting or cooling systems	No	The quarry operation will be carried out at the day time only hence the lighting and cooling system are not required.
6.7	From any other sources	No	The quarrying project is site specific which is operated by Jackhammer drilling and limited blasting; hydraulic excavators are used for loading the Rough Stone hence external power other than HSD is not involved in this project.

7.0. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface water, ground water, coastal water or the sea:

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	No hazardous materials will be used in the process. Oiling and lubrication of hauling vehicles will be done by using oil tray to prevent spillage of oil. Vehicles and machinery will be well maintained to prevent leakage of oil.
7.2	The discharge of sewage will be collected on soak pits will be discharge to a place authorized by municipal authorities as per guidelines	No	The discharge of sewage will be collected on soak pits and will be discharge to a place authorized by Municipal Authorities as per guidelines.
7.3	By deposition of pollutants emitted to air into the land or into water	No	There is likely hood of increase of particulate matter due to quarrying operations. Regular sprinkling of water will suppress dust at plants/places of generation.
7.4	From any other sources	No	An efficient and effective management plan is proposed for the project; hence it may not have any significant impact on the surrounding environment.
7.5	Is there a risk of long term buildup of pollutants in the environment from these sources?	No	There is no such type of activities involved in this quarry.

(v) Amenities/Facilities

The simple methods adopted and the limited scale of activities involved in Rough Stone does not require High Tension Electric Power supply or huge workshop facilities. The quarrying work is restricted to one general shift during daytime 9:00am to 5:00pm with 1:00pm -- 2:00pm lunch break. Major Machinery repair works are attended at Kottampatty repairs are carried out by the nearby mechanics. All facilities and amenities are available in Kottampatty which is 2.2km on Southeastern side of the lease applied area. Drinking water is available from the nearby agriculture land or water vendors. Mine office, store room, toilet and first-aid room will be provided on permanent structures within the lease area after the grant of lease.

6. PROPOSED INFRASTRUCTURE

(i) Industrial Area (Processing area)

There is no processing area proposed within the lease applied area.

(ii) Residential area (Non-processing area)

There is no residential area within 300m of the lease applied area.

(iii) Green Belt

All along the boundary barrier is selected for Green belt development by planting and maintaining native species. The total area for proposed for Green belt is around 1.00.0Ha.

(iv) Social Infrastructure

About 12 employees will be directly benefited and 8 persons will be indirectly benefited, the lease ensure to share all responsible for special benefits like water, health care, Education benefits, and promotion of socio cultural activities of the nearby villages.

(v) Connectivity (traffic and transportation road/ Rail/ Metro/ Water ways etc.)

- ◆ There is an existing road from the area leads Pachudayampatti road at the Eastern side of the area.
- ◆ SH-35 Natham to Thirupatur road is located which is about 1.0Km on the Southern side of the area.
- ◆ NH-45B Trichy to Madurai road is located which is about 1.9Km on the Eastern side of the area.
- ◆ The Nearest Railway line is Kalpattichatram station line which is about 34.6 Km on the Northwestern side of the area.

I. Basic information

S. No	Item	Details						
1	Name of the projects	Sokkampatti, Rough Stone Quarry project						
2	S. No. in the schedule	1 (a)						
3	Proposed capacity/Area/Length/ tonnage to be handled / command area/lease area/number of wells to be drilled.	<p>Proposed capacity = 1,13,970m³ of Rough Stone for a period of (Five) 5 Years only.</p> <p>Area = 1.00.0Ha</p> <p>Dimensions of the area:</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Length(m)</th> <th>Width (m)</th> <th>D(m) bgl</th> </tr> </thead> <tbody> <tr> <td>106</td> <td>56</td> <td>45m</td> </tr> </tbody> </table> <p>The command area = 0.70.3Ha (effective quarrying area after leaving safety distance). It is a shallow open cast quarry.</p>	Length(m)	Width (m)	D(m) bgl	106	56	45m
Length(m)	Width (m)	D(m) bgl						
106	56	45m						
4	New/ Expansion/ Modernization	It's an New Project (Sokkampatti Rough Stone Quarry)						
5	Existing capacity / Area etc.,	The Geological resources of 4,10,390m ³ of Rough Stone formation. Mineable Reserves is estimated at 1,13,970m ³ of Rough stone. The proposed capacity is about 1,13,970m ³ of Rough Stone formation for 45m below ground level. Afforestation has been proposed on safety barrier and nearby village's, Village roads, school by planting trees. Area: 1.00.0Ha.						
6	Category of project i.e. 'A' or 'B'	Category - B (B2)						
7	Does it attract the general condition? If yes, please specify.	7.5m & 10m safety distance is should be maintained.						
8	Does it attract the specific condition? If yes, please specify.	The project does not attract any specific condition.						
9	Location	Sokkampatti Village, Melur Taluk and Madurai District.						
	Plot/ Survey/ Khasra No.	352/2 (Part - 2)						
	Village	Sokkampatti						
	Taluk	Melur						
	District	Madurai						
	State	Tamilnadu						
10	Nearest Railway station/Airport along with direction & distance in km.	Kalpattichatram Railway station - 34.6km -NW Madurai Airport - 52.0 km - SE						

5	State, National boundaries	No	There is no State and National boundary around the site.																									
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Yes	There is no Tourist, pilgrim areas within 10km radius.																									
7	Defense installations	No	No defense installation found 10km near the site.																									
8	Densely populated built-up area	Yes	<p>Sragudi is a densely populated village which is about at a distance 6.2 Km SW side.</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Name of the Village</th> <th>Approximate distance</th> <th>Direction from lease applied area</th> <th>Approximate population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Kottampatty</td> <td>2.1km</td> <td>SE</td> <td>100</td> </tr> <tr> <td>2</td> <td>Mozzappachen</td> <td>1.8 Km</td> <td>SW</td> <td>150</td> </tr> <tr> <td>3</td> <td>Sragudi</td> <td>6.2 Km</td> <td>NW</td> <td>350</td> </tr> <tr> <td>4</td> <td>Sekkamattu</td> <td>1.4 km</td> <td>NE</td> <td>170</td> </tr> </tbody> </table>	S. No	Name of the Village	Approximate distance	Direction from lease applied area	Approximate population	1	Kottampatty	2.1km	SE	100	2	Mozzappachen	1.8 Km	SW	150	3	Sragudi	6.2 Km	NW	350	4	Sekkamattu	1.4 km	NE	170
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4	Sekkamattu	1.4 km	NE	170																								
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Yes	Kottampatty is having all the facilities, which are at a distance of 2.2km on the Southeastern side from the lease applied area.																									
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	The quarry operation is restricted to only 36.0m below ground level. Hence the ground water will not be affected beside the area, devoid of agriculture, Forestry, Tourist place etc.,																									

Estimation of Reserves

I. GEOLOGICAL RESOURCES :

The Geological resources are estimated as 4,10,390m³ for Rough Stone up to depth of 50m calculated by cross sectional method.

Table No-1

GEOLOGICAL RESOURCES					
Section	Length in (m)	Width in (m)	Depth in (m)	Volume m ³	Geological Resources in m ³
XY-AB (Above Ground Level)	57	43	10	25370	25370
XV-AB (Below Ground Level)	59	43	50	126850	126850
XY-CD (Below Ground Level)	63	40	45	113400	113400
XIYI-AB (Above Ground Level)	35	18	10	6300	6300
XIYI-AR (Below Ground Level)	35	18	10	6300	6300
	35	28	40	39200	39200
XIYI-CD (Below Ground Level)	11	11	20	1210	1210
	74	31	40	91760	91760
TOTAL					410390

II. AVAILABLE MINEABLE RESERVES :

The available Mineable Reserves are calculated by deducting 7.5m safety distance and bench loss of bench height 5.0m and bench width 5.0m.

Table No-2

MINEABLE RESERVES						
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m ³	Mineable Reserves of Rough stone in m ³
XY-AB (Above Ground Level)	196-191	46	41	5	9890	9890
	191-186	57	43	5	12255	12255
XY-AB (Below Ground Level)	186-181	51	36	5	9180	9180
	181-176	46	31	5	7130	7130
	176-171	41	26	5	5330	5330
	171-166	36	21	5	3780	3780
	166-161	31	16	5	2480	2480

8.0. Risk of accidents during construction or operation of the project, which could affect human health or the environment.

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
8.1	From explosions, spillages, fires etc., from storage, handling, use or production of hazardous substances	No	The drilling and blasting are involved in the project for liberation and splitting of Rough Stone. The explosive materials will be brought from authorized explosive license holder during blasting. There is no proposal of storage of explosives after the grant of quarry lease.
8.2	From any other causes	Yes	The risks of accidents are envisaged in quarry operators, failure of quarry pit slopes, excavators, tipper movement, etc. However, all safety measures shall be taken to prevent any accidents. The quarrying activities will be monitored under the supervision of experienced and qualified competent mines mgt. manager.
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, Earth quakes, landslides, cloudburst etc.)?	No	There is no Earth quake, floods, Landslides, cloudburst recorded in the lease applied area. It's an opencast quarrying, hence this project could not affect severely due to the natural disasters.

3.3	Affect the welfare of people e.g. by changing living conditions?	No	Welfare of people will get positive change due to the project, where a number of Welfare activities are being undertaken. Due to increase of the employment earning of local people and lifestyle of the people will enhance, around 12 peoples will be directly benefit to this project. No child labor will be engaged for any type of quarrying operation. All the labor will be insured and the salary and benefits will be paid as per the Labor enforcement officers (Ministry of labor and welfare) Norms.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children's, the elderly etc.	No	There is no effect envisaged for the vulnerable groups of people who could be affected by the project.
3.5	Any other causes	No	There is no other cause are envisaged.

4.0 Production of solid wastes during construction or operation or decommissioning (MT/ mounts)

S. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
4.1	Spoil, overburden or mine wastes	No	The Rough Stone Quarrying does not produce any waste. The entire Rough Stone and Gravel will be excavated. There are no wastages encountered during the quarrying period (Five) 5 Years only.
4.2	Municipal waste (domestic and or commercial wastes)	Yes	Small quantity of Municipal waste will be generated which shall be disposed as per guidelines.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	No	In this quarrying activities waste oil will be generated during the operation period it will be sent to authorize Re-Circulars as per SPCB/ CPCB norms. Care and maintenance of vehicles by experience qualified mechanics will be undertaken to prevent breakdown and spillage of oils and tubes.
4.4	Other industrial process wastes	No	Industrial wastages are not generated during the quarrying operation.
4.5	Surplus product	No	There is no such type of activities in this quarry.

1.11	Dredging?	No	There is no such type of activities involved in this opencast method of semi mechanized quarrying operation.
1.12	Offshore structures?	No	There is no such type of activities involved. It is an inland quarrying project.
1.13	Production and manufacturing processes?	No	<p>No production or manufacturing is involved in this Rough Stone Quarrying. The quarry operation involves Manual jecrhammer drilling, slurry explosives blasting, and transportation of Rough building stone to the needy Residential & Industrial customers.</p> <p>The removed mass is manually dressed into small building stones for foundation purpose and then loaded manually into Tippers for transportation to the Own crusher & needy customers.</p>
1.14	Facilities for storage of goods or materials?	No	There is no proposal for storage of material within the quarry lease applied area. The removed mass is manually dressed into small building stones for foundation purpose and then loaded manually into 10 Tons/Tippers for transportation to the Own crusher & needy customers.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	No	<p>The entire quarried Rough Stone will be consumed. The anticipated waste will be very negligible the entire Rough Stone irrespective of size has a good commercial market at present market scenario.</p> <p>Domestic waste water will be treated in Septic Tank followed by soak pit. The manure will be treated and used for green belt development. The Rough Stone will not produce toxic effluence in the form of solid, liquid or gas. No waste water will be discharged by quarry operation.</p>
1.16	Facilities for long term housing of operational workers?	No	The proposed project is 1.00.0Ha for a period of (Five) 5 Years only. The minimum employees are available in the nearby villages, hence long term housing of operational workers are not proposed. Rest shelter will be constructed on semi permanent structure within the lease area on boundary barrier after the grant of quarry lease.

II. Activity

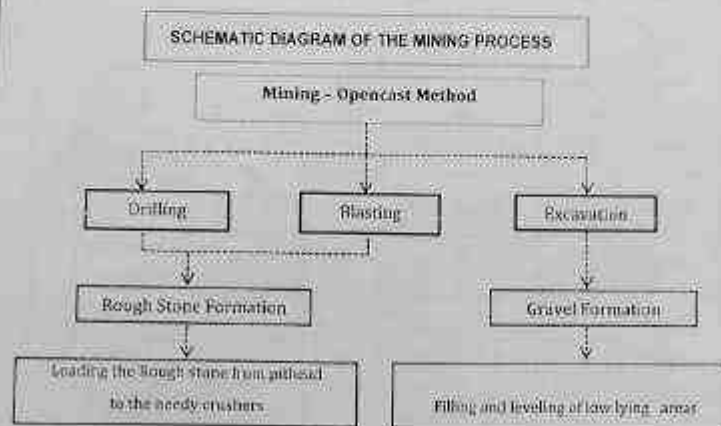
1. Construction operation or decommissioning of the project involving actions, which will cause physical changes in the locality (Topography, land use changes in water bodies, etc.)

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
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1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	<p>The topography will be changed after the quarrying of Rough Stone as per the Mining plan, Conventional Opencast method of semi-mechanized mining with 5.0m vertical bench width of the bench is not less than bench height. The ultimate pit dimensions are given below. The depth of the quarry is restricted up to depth 36.0m below the ground level.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Length(m)</th> <th style="text-align: center;">Width (m)</th> <th style="text-align: center;">D(m)Bgl</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">308</td> <td style="text-align: center;">56</td> <td style="text-align: center;">36.0m</td> </tr> </tbody> </table> <p>Topography will change in respect to overburden excavation. However, measures will be implemented as per mining Plan. As the area of the quarry remains the same, there will not be any increase in intensity of local land use.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">S. No</th> <th style="text-align: center;">Land Use</th> <th style="text-align: center;">Present Area (Hec)</th> <th style="text-align: center;">Area in use during the quarrying period (Hec)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Quarrying Pit</td> <td style="text-align: center;">0.34.0</td> <td style="text-align: center;">0.57.0</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Infrastructure</td> <td style="text-align: center;">Nil</td> <td style="text-align: center;">0.01.0</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Roads</td> <td style="text-align: center;">0.05.0</td> <td style="text-align: center;">0.01.0</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Green Belt</td> <td style="text-align: center;">Nil</td> <td style="text-align: center;">9.10.0</td> </tr> <tr> <td style="text-align: center;">5</td> <td>deutilized</td> <td style="text-align: center;">0.85.0</td> <td style="text-align: center;">0.30.0</td> </tr> <tr> <td colspan="2" style="text-align: center;">Total</td> <td style="text-align: center;">1.00.0Ha</td> <td style="text-align: center;">1.00.0Ha</td> </tr> </tbody> </table>	Length(m)	Width (m)	D(m)Bgl	308	56	36.0m	S. No	Land Use	Present Area (Hec)	Area in use during the quarrying period (Hec)	1	Quarrying Pit	0.34.0	0.57.0	2	Infrastructure	Nil	0.01.0	3	Roads	0.05.0	0.01.0	4	Green Belt	Nil	9.10.0	5	deutilized	0.85.0	0.30.0	Total		1.00.0Ha	1.00.0Ha
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5	deutilized	0.85.0	0.30.0																																		
Total		1.00.0Ha	1.00.0Ha																																		

1.2	Clearance of existing land, vegetation and building?	No	<p>There is no vegetation and building in this project lease applied area, hence there is no requirement of clearing the vegetation and building. There is an existing road-leads to the quarry. This has 5.0m carriage way width.</p>
-----	--	----	--

- ❖ 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 a considerable volume of the parent rock mass by jackhammer drilling and blasting, hired excavators are used for loading the Rough stone from pithead to the nearby crushers,



III. RECOVERABLE RESERVES:

The Year wise Recoverable Reserves are calculated by deducting 7.5m safety distance and bench loss bench height 5.0m and bench width 5.0m below ground level.

Table No. 3

YEARWISE DEVELOPMENT & PRODUCTION RESERVES							
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m ³	Recoverable Reserves of Rough stone in m ³
I	XY-AB (Above Ground Level)	196-191	46	43	5	9890	9890
		191-186	57	43	5	12255	12255
	TOTAL:							22145
II	X1Y1-AB (Above Ground Level)	196-191	29	18	5	2610	2610
		191-186	34	18	5	3060	3060

**Form-1M as per EIA Notification 2006 for
Sokkampatti Rough Stone Quarry of
Thiru. C.Veeramalai, Sokkampatti Village, Melur Taluk and
Madurai District, Tamilnadu**

Form-1M

**Application Form for Obtaining Environment Clearance from
District Level Environment Impact Assessment Authority (DEIAA),
Tamil Nadu**

(ii) Land Form, Land use and Land ownership

The entire project area is about 1.00 Ha, which is non irrigated and devoid of Vegetation and Habitations.

Table-2

District	Taluk	Village	S.F Nos	Area	Classification
Madurai	Melur	Sakkampatti	357/2 (Part-2)	1.00.00ha	It is a Government Patta Land

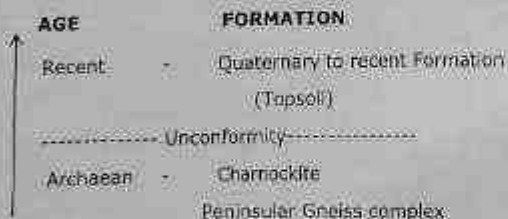
(iii) Topography (along with map)

- The lease applied area exhibits almost plain topography covered by rough stone formation. The massive Charnockite formation is clearly visible to nearby quarry area followed by the 1.0m (Avg) Topsoil and gentle sloping towards southeastern side of the area, the altitude of the area is above 186.0m (maximum) from MSL.
- No major river is found nearby the lease applied area.
- Water table is found at a depth of 60m to 65m below ground level; 60m in Rainy seasons and 65m in summer seasons by monitoring nearby bore hole.
- Temperature of the area is reported to be 18°C to a maximum of 42°C during summer.
- Rainfall of this area is about 800mm to 900 mm during the both NE & SW monsoons.

Regional geology:

The 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 N70°W to S70°E with dipping NE70°.

Regional stratigraphic sequence:



(vi) Drinking Water management (Source & Supply of water)

This proposed Rough Stone project does not require huge water either for beneficiation or processing. Water required for domestic consumption for labours is around 1.0KLD. The packaged Drinking water for this will be brought from nearby open well or bore hole on agriland.

- | | |
|--------------------------------------|---|
| 1. Drinking Water & Domestic purpose | - 1.0 KLD (source: through nearby open well or bore hole) |
| 2. Dust Suppression | - 1.0 KLD (source: from existing borehole or nearby the quarry) |
| 3. Green Belt Development | - 1.5 KLD (source: from existing borehole or nearby the quarry) |

Total - 4.5 KLD

(vii) Sewerage System

Toilets will be constructed as permanent structure and sewage will be discharged once in three months. The sewage waste will be collected in soak pit and discharged as manure after treatment for the Green belt development.

(viii) Industrial Waste Management

No industrial waste will be generated from the project.

(ix) Solid Waste Management

The waste generated during quarrying activity is negligible rock mass during handling and re-handling. Hence, there is no waste in this quarrying operation. There is no solid waste generation during the quarrying operation.

(x) Power Requirement & Supply / source

The proposed Rough Stone quarrying does not required any power supply for the quarrying operation. It is proposed to operate in day time only from 9 Am to 5Pm with 1-Hour lunch interval between 1Pm to 2Pm.

7.0 REHABILITATION AND RESETTLEMENT (R & R PLAN)

(i) Policy to be adopted (Central/State) in respect of the project affected persons including home owners, langoustes and landless laborers (a brief outline to be given)

It is Registered Government land the applicant has obtained tender from the Government and there is no surface rights to the Lease applied area. The applicant has got surface rights to the quarry lease applied area. Please refer Annexure-IV. Hence there is no Rehabilitation and resettlement is involved. The deployed labours will be insured as per the Government norms till the end of the life of the quarry. Periodical medical test will be conducted for the labours to monitor the occupational disease. The salaries and benefits will be paid as specified by the instruction given by the labor enforcement officers.

9. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

(1) Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area

There are no tribal populations in and around the area about 12 persons directly and 8 persons indirectly will be benefited by these projects, besides the government will get good revenue by taxes, cesses, fees etc.

The socio - Economic conditions of the village and distance will enhance due to the project, hence the project should be allowed after considering all the parameters.



Signature of the Applicant

Thiru. C. Veeramalai,
S/o. Chinakaruppan,
No.2/387, Pandikovil Street,
Vandiyur, Madurai District - 625 020.



Signature of the Recognised Qualified Person

S. LAKSHMIKANTHAN
Recognised Qualified Person
Reg. No. RQP/MAS/262/2014/A

Place : Salem

Date : 13.11.2018

Population Benefit

The social responsibilities like providing School Note books, Uniforms to the Students below poverty level beside if the villages require any borehole for public use it will ensure to do so.

As a part of corporate social responsibility it is ensured to take part and contribute the native cultural activities in the nearby villages. During summer seasons packaged drinking water will be kept in the village for public and for trespassers.

MINE CLOSURE PLAN:

Steps proposed for phased reclamation, reclamation of already mined out areas:

After the exploitation the Topsoil Bund and fencing will be constructed around the pit to prevent inherent entry of public. The quarried pit will be allowed to collect rain and seepage water which will act as a Reservoir which will enhance the Ground water level of the nearby wells.

There is no proposal for back filling, reclamation and rehabilitation. The quarry pit will be fenced to prevent inherent entry of public. The green belt development will be maintained.

Measures to be undertaken on mine closure as per Act & Rules:

Measure will be taken as per Act & Rules.

Mitigation measure to be undertaken for safety and restoration / reclamation of the already mined out areas:

Drilling will be carrying out by wet drilling to control the dust into the air. Blasting will be carrying out on limited scale. Mist spray on haul road will be proposed to prevent the dust propagation into the air.

The plantation will be carried out on the safety barriers to prevent Noise, besides wet drilling will be practiced to prevent dust. All the machineries will be maintained in good conditions as per RTO and TNPCB Norms to prevent Noise, Smoke and vibration.

Machineries will be periodically maintained by experienced mechanic to minimize noise, Smoke and ground vibration.

(ii) Population projection

There is no habitation within 500m radius. There are few villages located in this area within 5.0 km radius of quarry site, the approximate distance and population are given below.

Table - 3

S. No.	Name of the Village	Approximate distance	Direction from lease applied area	Approximate population
1.	Kottampatty	2.1 Km	South - East	100
2.	Manappacheri	1.8 Km	South - West	150
3.	Sirugudi	6.2 Km	North - West	350
4.	Sokkampatti	1.4 Km	North - East	170

Basic human welfare Amenities such as Health Center, Schools, Communication Facilities, and Commercial Centers etc are available at Kottampatty at a distance of 2.2km on the Southeastern side of the area.

(iii) Land use planning (breakup along with green belt etc.)

The land use planning of the quarry area of the total extent of 1.00.0 Ha is given below.

Table-4


S. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	0.34.0	0.57.0
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.15.0
5.	Unutilized	0.65.0	0.30.0
	Total	1.00.0Ha	1.00.0Ha


(iv) Assessment of Infrastructure Demand (Physical & Social)

The existing road facilities are already available which shall be used and maintained. The labors requirement is drawn from the nearest villages. The labours will be brought by jeeps and vans to the quarry site. Medical facilities are available near the project site, Government and private hospitals and other basic amenities and infrastructure facilities like communication centres, school supermarket, and bus stand are also available in Kottampatty distance of 2.2Km Southeastern side of the area. This quarry project will provide employment for about 12 persons directly and 8 peoples indirectly.

11	Areas already subjected to pollution or environmental damage, (those where existing legal/ environmental standards are exceeded)	No	This is existing quarry land area.
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (Earth quakes, subsidence, landslides, erosion, flooding or extreme or adverse climate)	No	The area is not susceptible to natural hazards like landslides, Earth quake. It is a high stable land.

I hereby give undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.


 Signature of the applicant
C. Veeramalai
 S/o. Chinnakaruppan,
 No. 2/287, Pandikoval Street,
 Vandiyur, Madurai District - 625 020


 Signature of the Recognised Qualified Person
S. LAKSHMIKANTHAN
 Recognised Qualified Person
 Reg. No. RQP/MAS/262/2018/A

Place : Salem
 Date : 13.11.2018

XIV-AB (Below Ground Level)	166-161	7	10	5	350	350
XIV-CD (Below Ground Level)	166-161	50	13	5	3640	3640
	161-156	51	0	5	2040	2040
XIV-AB (Below Ground Level)	161-156	2	5	5	50	50
XY-CD (Below Ground Level)	161-156	36	13	5	2340	2340
XY-AB (Below Ground Level)	161-156	20	11	5	1430	1430
	156-151	21	6	5	630	630
XY-AB (Below Ground Level)	156-151	31	8	5	1240	1240
XIV-CD (Below Ground Level)	156-151	13	3	5	645	645
TOTAL					18535	
GRAND TOTAL					113970	

- ❖ The Mineral of Rough Stone Production is proposed to the lease period of (Five) 5 Years only.
- ❖ Recoverable Reserves are estimated **1,13,970m³** of Rough stone up to depth of **45m** (10m above ground level and 35m below ground level) for a lease period of (Five) **5 Years** only.

Machinery Required:

It is proposed to use the following machineries on rental basis for the development and production work in this quarrying operation,

S.No	Type	Nos	Dia Hole mm	Size capacity	Make	Motive Power
1	Jack Hammer	2	32	1.2m to 6m	Atlas Copco	Compressed air
2	Compressor	1	-	400psi	Atlas Copco	Diesel Drive

2.4	Construction material Stone, aggregates, and/Soil (expected source-MT)	No	The proposed Rough Stone Quarry project does not require any construction material. This project itself will produce Rough Stone.
2.5	Forests and timber (source-MT)	No	There are no forests and timber material is proposed.
2.6	Energy including electricity and fuels (source, competing users) unit: fuel (MT), Energy (MW)	Yes	The limited scale of activities adopted in Rough Stone Quarrying does not require high-tension electric power supply. The quarrying operation is only for daytime. The electricity will be used only for mine office and lighting around the quarry during night time. The existing electric line near the quarry site will be used. It is manual mining hence, Fuels are not used for quarrying process. Hired Tipper is used for only transportation purpose (from the quarry to needy customers).
2.7	Any other natural resources (use appropriate standard units)	No	No other natural resource will be required.

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data
3.1	Use of substances or materials, which are hazardous (as per MSHC rules) to human health or the environment (flora, fauna, and water supplies)	No	There is no proposal for storage, handling or transportation of any hazardous material or substances as per MSHC rules in this Rough Stone Quarry project.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	The Rough Stone does not produce any toxic effluent in the form of solid, liquid and gas, hence the diseases related to insect or water borne diseases is not envisaged.

north east monsoon. The summer is hot with maximum temperature of 38°C and during winter encounters a minimum temperature of 42°C.

(viii) Social infrastructure available

There is no social infrastructure within the radius of 1km like schools, universities, hospitals, prisons and community housing etc.

5. PLANNING BRIEF

(i) Planning Concept (type of industries, facilities, transportation etc)

Town and Country Planning/Development authority Classification

Open cast Semi Mechanized mining is adapted to in the Rough Stone. The excavated Rough Stone will be transported to Needy own crushers & Needy customers. Facilities such as power, Transportation and commodities infrastructure facilities are locally available near the project site. There are no habitations or villages en-route between the quarry and crushing site the loaded vehicles are allowed to move only below 40Kms per hour on the roads. The haul roads are sprinkled periodically to prevent dust.

Transportation

- ❖ There is an existing road from the area leads Pachudayampatt road at the Eastern side of the area.
- ❖ SH-35 Netham to Thirupattur road is located which is about 1.0Km on the Southern side of the area.
- ❖ NH-45B Trichy to Madurai road is located which is about 1.9Km on the Eastern side of the area.
- ❖ The Nearest Railway line is Kalpettichatram station line which is about 34.6 Km on the Northwestern side of the area.

The total area of the project is about **1.00.0Ha**. Open cast semi mechanized method of quarrying by deploys jackhammer drilling and blasting, air driven compressor, and excavators attached with buckets are used for loading and unloading the Rough Stone from pithead to needy own crushers and needy customers.

The project land is devoid of vegetation and lies in the backward town of Madurai District. There are no specific industries or factories in and around the project area. The available Mineable Reserves is estimated at **1,13,970m³ of Rough stone** the applicant proposed to (Five) 5 Years only.

22	Whether there is any Government Order/ Policy relevant/ relating to the site?	The applicant has obtained procege area communication from the District Collector, Madurai vide R.c.No.503/2018 - Kanimam dated 28.03.2018. The Mining Plan was got approval by the Assistant Director, Department of Geology and Mining, Madurai vide R.c.No.503/2018 - Kanimam dated 04.10.2018.
23	Forest land involved (hectares)	There is no forest land involved within this lease area.
24	Whether there is any litigation pending against the project and/ or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders/ directions of the Court, if any and its relevance with the proposed project.	There is no court case pending, litigations relating to the project directly and indirectly.

Labours, Skilled, Semi-Skilled & Un-skilled

a. Skilled (Operators- Excavator & Jackhammer)	: 4 Nos
b. Semi-skilled (Driver)	: 1 Nos
c. Unskilled (Muddoor/Labours, Cleaners & Watch man)	: 1 Nos
Total : 12 Nos	

Allowing 10% absenteeism, the no. of men of roll will be around 8 Nos.

It is been ensured that, **Child Labours under 18 Years of age will not be engaged for any quarrying operation.**

Necessary Life Insurance policies will be taken by the applicant to all the employees up to the end of the lease period.

(iv) Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.

The quarry lease applied area exhibits almost plain terrain topography. The area is a dry barren land devoid of Agriculture and Habitations. The land is not used for any specific vegetation. The massive Chhotekote formation is clearly visible to nearby existing quarry pit. The Ground water occurrence in this quarry area is 60m to 65m depth below ground level.

The quarrying is restricted up to depth **45.0m** below ground level; hence the quarry operation will not be affected by the ground water. The region experiences

Semi - humid climate and there is scanty growth of vegetation in and around the lease applied area (seasonal vegetation is mostly practiced).

- No CRZ within the radius of 10km
- There is no interstate boundary from the lease applied area.
- No Western Ghats within the radius of 10km
- No Forest Conservation Act, 1980

(v) Existing Infrastructure

This is a Rough Stone project hence there is no existing infrastructure in the proposed quarry area.

(vi) Soil Classification

The Rough Stone are clearly visible to nearby quarry pit. This land does not sustain any type of vegetation or Agriculture

(vii) Climatic data form secondary sources

The area receives rainfall of about 800mm to 900mm/per annum and the rainy season is mainly from Oct - Dec receives rain both in south west and

	165-156	26	11	5	1430	1430
	156-151	21	6	5	430	430
	TOTAL					52105
XY-CD (Below Ground Level)	185-176	56	33	5	9240	9240
	176-171	51	28	5	7140	7140
	171-166	46	24	5	5290	5290
	166-161	41	19	5	3690	3690
	161-156	36	14	5	2340	2340
	156-151	31	8	5	1240	1240
	TOTAL					28940
X1Y1-AB (Above Ground Level)	196-191	20	18	5	2610	2610
	191-186	34	18	5	3060	3060
X1Y1-AB (Below Ground Level)	186-181	27	18	5	2430	2430
	181-176	22	18	5	1980	1980
	176-171	17	26	5	1700	1700
	171-166	12	15	5	900	900
	166-161	7	10	5	350	350
	161-156	2	5	5	50	50
	TOTAL					13080
	186-181	4	11	5	320	320
X1Y1-CD (Below Ground Level)	181-176	4	11	5	320	320
	176-171	56	23	5	7390	7390
	171-166	51	18	5	5490	5490
	166-161	56	13	5	3640	3640
	161-156	51	8	5	2040	2040
	156-151	43	3	5	645	645
	TOTAL					19845
	GRAND TOTAL					113970

The available Mineable Reserves is computed as 1,13,970m³ of Rough Stone formation at the rate of 100% recovery upto a depth of 45m (10m above ground level & 35m Below ground level).

Method of Mining:

- ❖ The Rough stone is proposed to quarry at 5m bench height & width with conventional Opencast Mechanized Method.
- ❖ The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough stone to the needy crusher.

Satellite Image Showing the Lease Boundary Area



(iii) Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations done into should be highlighted

There is no alternative sites are examined, The entire Rough Stone will be directly loaded into tipper to the needy own crushers to needy customers for road project and construction works for filling and leveling of low lying areas.

(iv) Size or magnitude of operation

The total area of the project is about 1.00.0Ha. It is proposed to excavate Production Schedule is proposed an average production of 1,33,970m³ (18,438 Lorry Loads) of Rough stone up to a depth of 45.0m (10m above ground level and 35m below ground level) for the period of below ground level by Opencast, Semi-mechanized Mining with a bench height of 5.0m and bench width of 5.0m is proposed; Machineries like Fractor mounted compressor attached with Jack hammers are proposed to deploy for quarrying operation.

PRE FEASIBILITY REPORT OF ROUGH STONE QUARRY LEASE APPLIED AREA FOR OVER AN EXTENT 1.00.8Ha IN SOKKAMPATTI VILLAGE, MELUR TALUK, MADURAI DISTRICT AND TAMILNADU OF THIRU. C. VEERAMALAI

(This report has been prepared before the Government and Legislative Council of the provisions of the Environment Protection Act, 1986 and the Environmental Protection Act, 1986 and 2004-05 and the Environmental Protection Act, 1986.)

1.1 Executive Summary of the project

- ◆ The total extent of the Area is 1.00.8Ha, Government land in Sakkampatti Village of Melur Taluk, Madurai District.
 - ◆ The category of project is B2. It is a new quarry in Sakkampatti Village.
 - ◆ The area applied for quarry lease is exhibits almost plain topography.
 - ◆ The quarry operation is proposed to carry out with open cast semi mechanized mining with 5.8m vertical bench width of the bench is not less than bench height.
 - ◆ Quarrying operation is carried out Spitting 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 pithead to the ready crushers. Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting.
 - ◆ The quarry operation is proposed up to depth for **45.0m**
 - ◆ Geological Resources is estimated at 4,10,390m³ of Rough stone and Mineable Reserves is estimated at 1,13,970m³ of Rough stone should be maintained safety distance from the lease boundary of the lease applied quarry area and relevant mining laws in force.
 - ◆ Production Schedule is proposed an average production of 1,13,970m³ (20136 Lorry Loads) of **Rough stone** up to a depth of **45.0m** (10m above ground level and 35m below ground level) for the period of (Five) **5 Years** only.
 - ◆ Mining license applied for period of (Five) 5 Years only.
 - ◆ Life of the quarry is five years.
- The Prefeasibility report preparing for following condition of Government of India Ministry of Environment and Forests (No. L-12011/47/2011 -IA-II (M) Dated: 24th June, 2013)*
- ◆ The project area does not fall in HACA region.
 - ◆ There is no Interstate boundary from the lease applied area.

LOCATION OF THE LEASE APPLIED AREA

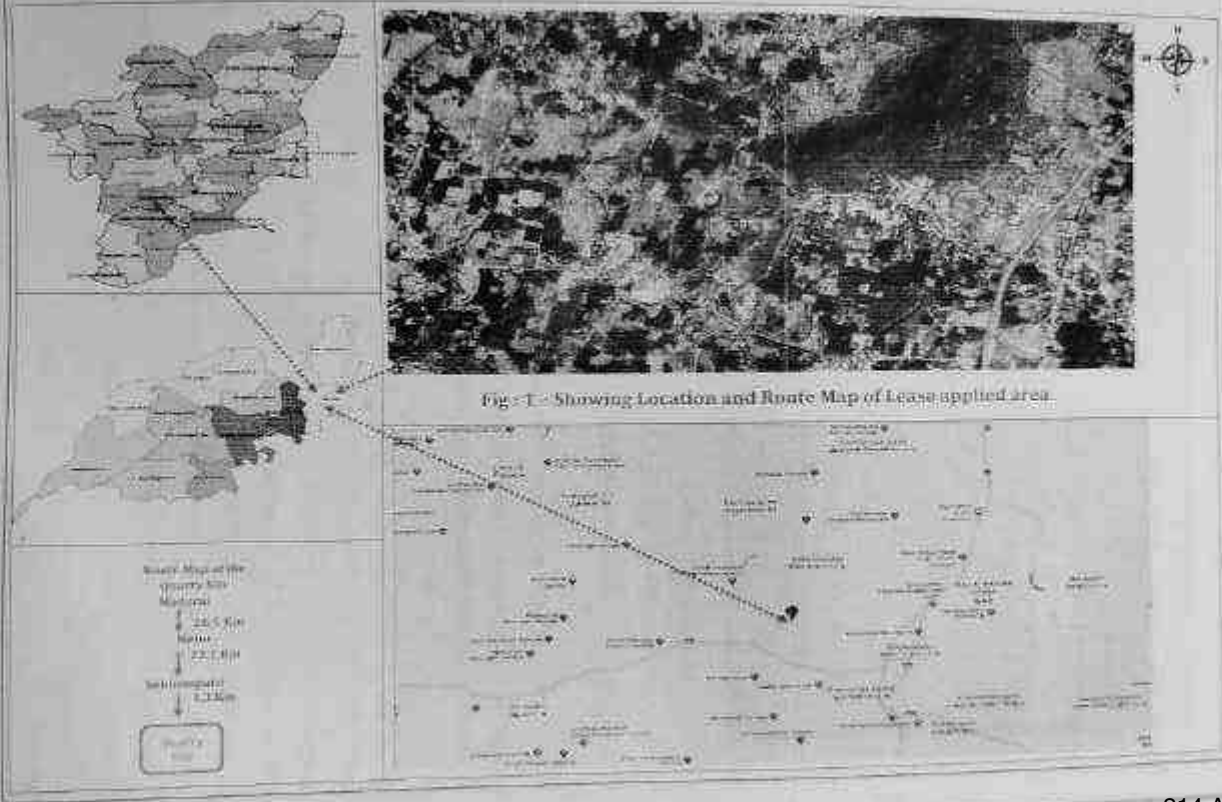


Fig: 1: Showing Location and Route Map of Lease-applied area.

www.zameer.com.pk
www.zameer.com.pk

redtime Shot by ZAYYAN

www.zameer.com.pk

	XYI-AB (Below Ground Level)	186-181	27	10	3	2430	2430
		181-176	22	18	3	1980	1980
	XY-AB (Below Ground Level)	186-181	51	36	5	9180	9180
		181-176	20	31	5	3700	3700
TOTAL							22360
III	XY-AB (Below Ground Level)	181-176	26	31	5	4030	4030
		181-176	56	33	5	9240	9240
	XY-CD (Below Ground Level)	176-171	51	28	5	7140	7140
		XY-AB (Below Ground Level)	176-171	41	26	5	5330	5330
TOTAL							25740
IV	XYI-AB (Below Ground Level)	176-171	17	20	5	1700	1700
		186-181	4	11	5	220	220
	XYI-CD (Below Ground Level)	181-176	4	11	5	220	220
		176-171	66	23	5	7590	7590
		171-166	61	18	5	5490	5490
	XYI-CD (Below Ground Level)	171-166	12	15	5	900	900
	XY-AB (Below Ground Level)	171-166	36	21	5	3780	3780
XY-CD (Below Ground Level)	171-166	46	23	5	5290	5290	
TOTAL							35190
V	XY-CD (Below Ground Level)	166-161	41	18	5	3690	3690
	XY-AB (Below Ground Level)	166-161	31	16	5	2480	2480

(viii) Availability of water its source, Energy/power requirement and source should be given

This Rough Stone and quarry project does not require huge water and Electricity for the project.

WATER BALANCE CHART

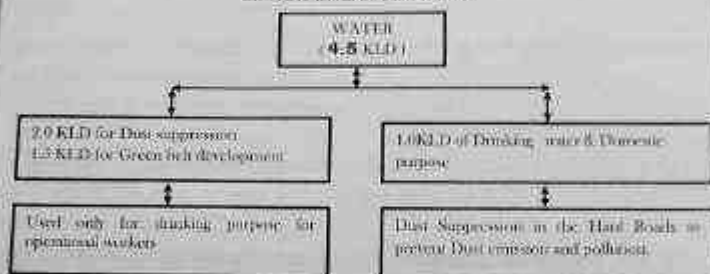


Table-1

Purpose	Quantity	Sources
Drinking & Domestic Purpose	1.0KLD	Drinking water is available in nearby open well of agriland in Sakkampatti Village which is about 1.4Km on Northeastern side of the area.
Dust suppression	2.0KLD	From Existing Borehole on nearby the quarry.
Green belt	1.5 KLD	From Existing Borehole on nearby the quarry.

Energy

The Electricity for Mines office and Lights only at nights (working is restricted on day time only between 9Am to 5Pm). Diesel (HSD) will be used for quarrying machineries around **91,184 Liters of HSD** will be used for the entire project life. Diesel will be brought from nearby diesel pumps. No power is required for the project. Lightings on the Night will be taken from nearby electric poles after obtaining permission from concerned authorities.

1. Rough stone:

- The Excavator will consume = 16 Liters / 1 hour
- The Excavator will excavate = 20m³ of Rough stone
- Rough stone quantity = 1,13,970/20
- = 5,699 hours

1.17	New road, rail or sea traffic during construction or operation?	No	<p>No new roads, rail or sea traffic is proposed during operation. The existing road will be utilized for transportation of the Rough Stone and Gravel. There is no habitations or villages en-route between the stone quarries to the nearby customers.</p> <p>However, internal roads within the quarry lease applied area will be developed and maintained. As per statutory norms.</p>
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	No	<p>There is no such type of activities involved in this project.</p> <p>Existing road will be utilized for the transportation of The excavated Rough Stone will be directly loaded intoopper to the Customer / other buyers for road project and construction works for filling and leveling of low lying areas.</p>
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	<p>The project will not cause any changes and hindrance in the existing traffic movements.</p> <p>There is no habitation or villages en-route between the stone quarry to the nearby Customer / other buyers.</p>
1.20	New or diverted transmission lines or pipelines?	No	<p>The project does not involve diversion of transmission/pipe lines.</p>
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	<p>The quarry operation is proposed upto a depth of 36.0m below ground level. Hence the quarrying operation may not affect the ground water. Ground water occurrence in this area is 60m in summer and 85m in rainy seasons. Hence there is no damage for ground water hydrology or aquifers.</p>
1.22	Stream crossings?	No	<p>There is no stream crossing within the lease applied area.</p>
1.23	Abstraction or transfers of water from ground or surface waters?	No	<p>The proposed quarrying does not require any abstraction or transfer of water from the Ground or surface water bodies.</p>
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	<p>The quarry operation is restricted up to a depth of 36.0m below ground level. Quarry operation will not affect the drainage pattern of the lease applied area.</p> <p>There is no change in water bodies or the land surface affected during run off.</p>

- ❖ There is no CRZ within the radius of 10kms from project area.
- ❖ There is no Western Ghats within the radius of 10Kms from project area.
- ❖ There are no Bird Sanctuaries, wild life sanctuaries as per Wild Life Protection Act 1972, within the radius of 10 km.
- ❖ The project area does not fall in Forest Conservation Act, 1980.
- ❖ There is no habitation situated within 300m in the project area.
- ❖ Totally 4.5 KLD water requirements, 1.0KLD of water for labor drinking and domestic purpose will be available from nearby village through open well or bore hole on agriland.

2.0KLD and 1.5KLD for dust suppression in haul roads and Green belt during the course of quarrying will be taken from the existing Borehole or near the quarry.

2.0 INTRODUCTION OF THE PROJECT OR BACKGROUND INFORMATION

The Rough Stone is proposed to excavate by opencast semi mechanized method in of Sakkampatti Village, Melur Taluk and Madurai District. Over an extent of 1.00.0.0Ha. The Category of project-B2

(i) Identification of project and project proponent: In case of mining project, a copy of mining lease/letter of intent should be given.

- I. Precise area communication was issued by the District Collector Madurai District vide R.O.No.503/2018 - *Kanmam dated 28.03.2018.*
- II. The Mining Plan was approved by the Assistant Director, Department of Geology and Mining, Madurai R.O.No.503/2018 - *Kanmam dated 04.10.2018.*

III. Owner name and address of the Project Proponent:

Name of owner	: Thiru. C.Veeramalai
Address	: S/o.Chinniahuppan, No.2/387, Pandikova Street, Vandiyur.
District	: Madurai.
Pin code	: 625 020
Phone no	: 9865744580
e-mail	:

Location of the Lease Applied Area:

Name of the quarry	: Rough Stone quarry
S.F.No	: 352/2 (Part - 2)
Extent	: 1.00.0 Ha
Village	: Sakkampatti
Taluk	: Melur

District	Madurai
State	Tamil Nadu
Ownership	It is Registered Government land, the applicant has obtained tender from the Government and there is no surface rights to the lease applied area. Please refer Annexure-III.

(ii) Brief description of nature of the project:

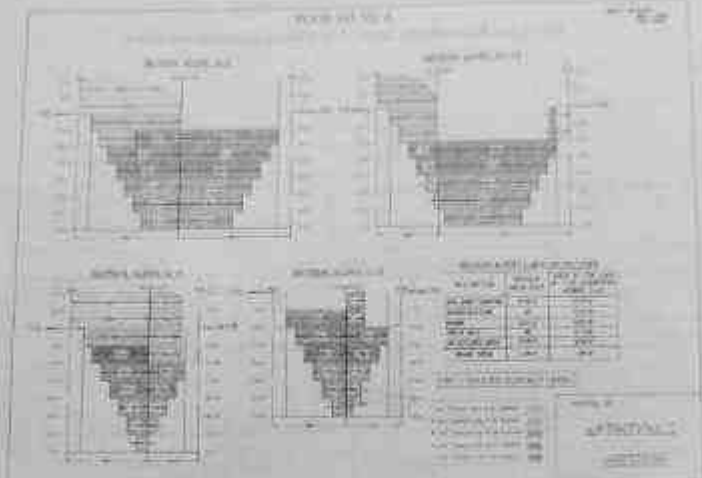
- ◆ The Rough Stone operation is proposed to carry out by efficient semi-mechanized method by formation of benches. The width of each bench is proposed not less than the height. The lease applied area exhibits almost plain topography covered by Rough Stone formation. The massive Charnockite formation is clearly visible to nearby quarry area exhibits partly elevated topography sloping towards southeastern side of the area, the altitude of the area is above 186.0m (maximum) from MSL.
- ◆ The total quantity of Mineable reserve **1,13,970m³** of Rough Stone for a period of (Five) **5 Years** only. The excavated Rough Stone will be directly loaded into tipper to the customer / other buyers for road project and construction works for filling and leveling of low lying areas. The quarrying operation is proposed up to a depth of **45.0m**.

The quarrying rough Stone of inspection of sizes has a good market at present scenario.

(iii) Need for the project and its importance to the country and or region

- ◆ The Rough Stone is important building material to our country and Region, it's a vital material for construction industries and the Rough Stone project falls in the area of Madurai District, where plenty of Road widening projects are been carried being under massive development hence a lot of Rough Stone is required for (Granular sub-base GSB) and also for the culverts and bridges. Besides catering domestic construction projects.
- ◆ Other infrastructure projects like building, Bridges are also under progress hence there is a huge demand of Rough Stone for public sector companies and local private sector projects also.
- ◆ The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good industries and factories

QUARRYING PROJECT FOR THE PROPOSED QUARRYING PROJECT FOR THE YEAR 2023-24



(v) Project description with process details (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given):

The reserves and resource are arrived based upon the Geological investigation

- REMOVAL OF TOPSOIL BY EXCAVATORS AND DIRECTLY LOADED INTO TIPPER.
- REMOVAL OF ROUGH STONE BY EXCAVATORS BY DRILLING AND BLASTING.
- SHALLOW DRILLING WITH JACKHAMMER 32-43 mm Dia.
- MINIMUM BLASTING WITH CLASS 2 EXPLOSIVES.
- LOADING OF ROUGH STONE BY EXCAVATORS INTO TIPPER.
- TRANSPORTATION BY TIPPER TO NEEDY CUSTOMERS/OTHER BUYERS.

(vi) Raw material required along with estimated quantity, likely source, marketing area of final products, Mode of transport of raw Material and Finished Products

This is a quarrying project for exploiting Rough Stone; hence, there is no requirement for raw material. The final product of Rough Stone irrespective of sizes will be sold to needy customers & needy Customers.

(vii) Resource optimization/recycling and reuse envisaged in the project, if any, should be briefly outlined.

No optimization/Recycling and Reuse envisaged in the proposed Rough Stone.

are growing up. Through this project, will give employment opportunities to 12 employees directly and 8 employees indirectly.

- Mineral Industries of the state of Tamil Nadu provides employment opportunities for the people of the state as well as in the specific project area. The Quarrying is one among the major core sector for industries, which plays a vital process of country's economic development.

(iv) Demand and supply gap

There is a huge demand of Rough Stone in Madurai District as many National Road projects is under massive development for its widening and strengthening operation apart from this many bridges and fly overts are also being under construction. There is a huge demand of Rough Stone for infrastructure development of the state; hence the project is significant to the state.

The Railway line is also under progress where huge Demand of Rough Stone is required as Ballast. Other Internal panchayat Roads, State Highway roads and Major District Roads are also under progress, besides all these public works projects the Rough Stone is widely used for domestic construction project like Hospital, School, Government Building and Housing Construction. It is worth mentioning that the Rough Stone of Madurai District,

(v) Imports vs indigenous production

There is no import of Rough Stone at present in India.

(vi) Export Possibility

There are no possibilities for export.

(vii) Domestic/Export Markets

After obtaining the lease the applicant will fetch a domestic market as mentioned earlier. It is propose to the excavated Rough Stone will be directly loaded intoopper to the needy crushers to needy customers for road project and construction works for filling and leveling of low lying area.

(viii) Employment Generation (Direct and Indirect) due to the project

It is proposed to deploy about 12 directly and 11 persons will be indirectly benefited. The tentative man power required for the proposed Rough Stone shall be as follows:

Management and Supervisor:

- | | |
|---|--------|
| 1. Mines Manager (with valid statutory qualification) | : 1 No |
| 2. Mines Foreman (with valid statutory qualification) | : 1 No |
| 3. Mines Mate (with valid statutory qualification) | : 1 No |
| 4. Blaster | : 1 No |

Diesel consume = 5699 hours x 16 liters
 Total diesel consumption = 91,184 Liters of HSD will be utilized for Rough Stone
 Total consumption for Rough stone is around = **91,184 Liters of HSD** for the entire period of life of the quarry.

(ix) Quantity of wastes to be generated (liquid and solid) and scheme for their management/disposal

The entire quarried Rough Stone of irrespective of sizes will be consumed in the needy crushers as even the dust is sold nowadays as M sand. Hence, there is no waste in this quarrying operation. There is no toxic effluent expected to generate in the form of solid or liquid and gases and the no requirement of treatment of waste.

(x) Schematic representations of the feasibility drawing which give information of EIA purpose



4.0 SITE ANALYSIS

(i) Connectivity

- ❖ There is an existing road from the area leads Bagavandapuram to Menalur road at the Eastern side of the area.
- ❖ SH-73 Melur to Dindigul road is located which is about 3.5 Km on the Eastern side of the area.
- ❖ NH-49 Madurai to Theni road is located which is about 5.3 Km on the Northern side of the area.
- ❖ The Nearest Railway line is Thirumangalm station line which is about 8.4 Km on the Southeastern side of the area.

2. Use of Natural resources for construction or operation of the project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with sources of information data										
2.1	Land especially undeveloped or agricultural land (ha)	No	<p>Total quarry lease applied area is 1.00.0Ha, it is Registered Government land the applicant had obtained tender from the Government and there is no surface rights to the Lease applied area. Please refer Annexure-V.</p> <p>The lease applied area & exhibits almost plain topography covered by Rough stone formation. The massive Charookite formation is clearly visible to nearby quarry area followed by the 1.0m (Avg) Gravel and gentle sloping towards southeastern side of the area, the altitude of the area is above 186.0m (maximum) from MSL.</p>										
2.2	Water (expected source & competing users) unit/ KLD	Yes	<p>The project does not require huge water for quarrying operation, about 4.5 KLD of water will be used for the project.</p> <table style="margin-left: 20px;"> <tr> <td>1. Drinking Water</td> <td style="text-align: right;">- 1.0 KLD</td> </tr> <tr> <td>& Domestic purpose</td> <td></td> </tr> <tr> <td>2. Dust Suppression</td> <td style="text-align: right;">- 2.0 KLD</td> </tr> <tr> <td>3. Green belt</td> <td style="text-align: right;">- 1.5 KLD</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: right;">- 4.5 KLD</td> </tr> </table> <p>1.0 KLD of Drinking water and Domestic purpose will be brought from the nearby open well or bore hole in Sakkampatti which is about 1.4km on the Northeastern side of the area 2.0 KLD of water for dust suppression and 1.5 KLD of water for Green developments will be brought from existing borehole on nearby quarry.</p> <p>Total requirement for the project is around 4.5 KLD.</p>	1. Drinking Water	- 1.0 KLD	& Domestic purpose		2. Dust Suppression	- 2.0 KLD	3. Green belt	- 1.5 KLD	Total	- 4.5 KLD
1. Drinking Water	- 1.0 KLD												
& Domestic purpose													
2. Dust Suppression	- 2.0 KLD												
3. Green belt	- 1.5 KLD												
Total	- 4.5 KLD												
2.3	Minerals (MT)	No	No minerals used for construction purposes?										

**FORM-1M, PRE FEASIBILITY AND APPROVED
MINING PLAN FOR SOKKAMPATTI
ROUGH STONE QUARRY**

LEASE IN GOVERNMENT LAND

S.F. Nos : 352/2 (Part-2)

Sokkampatti Village, Millur Taluk

Madurai District, Tamil Nadu State

QUARRY LEASE AREA - 1.00 Ha.

Rough Stone Production - 1,13,970m³

PERIOD - FIVE YEARS

APPLICANT

Thiru. C. Veeramalai.

S/A, Chinnakaruppan

No. 2/367, Pandikottai Street,

Vandiyur,

Madurai District - 625 020

Cell No: 9845744880

Recognised By

S. LAKSHMIKANTHAN, M.Sc.

Recognised Qualified Person.

Reg. No. RQP / MAS / 262 / 2014 / A

First Mt. Manali Puzh. Dist. Puzh. No. 7

Harizan Main Road, Kozhikode

Ph. 0471-32661027. Cell No. 9845744880

www.chinnakaruppan.org

www.sokkampatti.org

(ii) Production Capacity

Rough Stone:-

The production 1,13,970m³ of Rough Stone up to depth of 45m (30m above ground level and 35m below ground level) / 5 Years only.

Max. No. of effective working days

Per Year would be around = 260 days per Year x 5 Years

Quantity of Rough Stone to be excavated per day = 1,13,970m³ / 20,136 Lorry Loads

= 1,13,970/1300days

Maximum lorry loads per day would be = 54m³ or 9 Lorry Loads per day.

8. PROJECT SCHEDULE & COST ESTIMATES

(i) Likely date of start of construction and likely date of completion

(Time schedule for the project to be given)

The proposed quantity is around 1,13,970m³ of Rough Stone formation for the period of (five) 5 Years only.

(ii) Estimated project cost along with analysis in terms of economic viability of the project.

I. Fixed Asset Cost :-

- | | |
|---------------------------|-------------------|
| 1. Land cost | = Rs. 46,00,000/- |
| 2. Refilling/Fencing cost | = Rs. 40,000/- |
| 3. Rest shelter | = Rs. 50,000/- |
| 4. Sanitary Facility | = Rs. 50,000/- |

II. Machinery Cost = Rs. 10,00,000/-
Total Project Cost = Rs. 57,40,000/-

Expenditure :

- | | |
|--------------------------|------------------|
| 1. Drinking water | = Rs. 75,000/- |
| 2. Sanitary Arrangements | = Rs. 60,000/- |
| 3. Safety kits | = Rs. 20,000/- |
| 4. Water Sprinkling | = Rs. 1,20,000/- |
| 5. Afforestation cost | = Rs. 60,000/- |
| 6. | |

Environment Monitoring / 5 Years :

- | | |
|---------------------------|------------------|
| 1. Air Quality Sampling | = Rs. 2,00,000/- |
| 2. Water Quality Sampling | = Rs. 1,00,000/- |
| 3. Noise Level Monitoring | = Rs. 20,000/- |
| 4. Ground vibration test | = Rs. 50,000/- |

EMP Cost Total = Rs. 7,05,000/-

(Expenditure Including EMP Studies)

Total Project Cost = Rs. 57,40,000/-

EMP Cost = Rs. 7,05,000/-

Labourers, Skilled, Semi-skilled & Un-skilled

A. Skilled (Operator) - Excavator & Jackhammer	4 Nos
B. Semi-skilled (Driver)	4 Nos
C. Unskilled (Miscellaneous Labourers, Cleaners & Watch men)	18 Nos
Total	26 Nos

The above man power is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and also to comply with the statutory provisions of quarry safety regulation.

It is been ensured that the labours will not be deployed less than 18 years. No child labours will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured till the end of life of quarry.

3.8 PROJECT DESCRIPTION

(i) **Type of project including interlinked and interdependent projects, if any**

- ◆ There is no interlinked & interdependent project. This is a quarrying project for average **Production Schedule** is proposed an average production of **1,13970m³** (20,136 Lorry Loads) of **Rough stone** up to a depth of **45.0m** (10m above ground level and 35m below ground level) for the period of (Five) **5 Years** only.
- ◆ The project is site specific. The excavated Rough Stone will be directly loaded into tipper to the Customer / other buyers for road project and construction works for filling and leveling of low lying areas.

(ii) **Location (map showing general location, specific location, and project boundary & project site layout) with coordinates**

- ◆ It is Registered Government land and the applicant has obtained tender from the Government and there is no surface rights to the lease applied area.
- ◆ The applicant has got surface rights to the quarry lease applied area. Please refer Annexure-III
- ◆ The area is mentioned in GS1 Toposheet No, 38-1/99.
- ◆ The latitude between of 10°13'42.04"N to 10°13'46.57" N.
- ◆ The longitude between of 78°21'12.16"E to 78°21'15.31" E WGS 1984 datum.



CHENNAI METTEX LAB PRIVATE LIMITED[®]

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K. Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18322 Test Certificate Date : 06.06.2023
Sample Description : Ambient Air Monitoring
Location of Sampling : AAQ1 Core Zone - 10° 13'51.32"N 78°21'15.47"E
Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/01 & 29.11.2023
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/02 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	66.7	22.7	43.3	6.7	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	65.2	24.3	41.7	7.3	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	67.8	23.9	42.9	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.5	22.5	43.3	6.8	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	66.9	21.7	42.7	7.4	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	65.8	22.6	41.6	7.2	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	66.7	23.3	44.8	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	64.4	22.4	42.7	6.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	65.9	21.6	43.3	5.3	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	66.5	23.3	43.9	6.8	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	67.3	22.9	41.5	7.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	65.8	21.4	41.7	6.8	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	66.6	22.5	42.6	7.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	67.8	23.8	41.5	8.9	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	65.3	23.6	42.4	7.3	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	66.9	23.7	41.9	7.1	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	64.3	21.4	42.6	6.8	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	65.4	22.3	43.3	5.4	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	65.8	23.8	44.1	6.3	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	66.3	21.9	42.7	8.9	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	66.8	22.3	43.3	5.2	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	66.4	21.7	42.4	7.3	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	66.5	22.3	41.6	7.9	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	67.9	21.9	43.9	6.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	65.8	21.8	44.5	7.8	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	66.8	22.3	42.5	8.6	21.6	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.

End of Report

For Chennai Mettex Lab Private Limited



[Signature]

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is prohibited and may result in legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days from the completion date of testing, except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related reagent samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be used in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the terms and conditions of the Chennai Mettex Lab and its Customer.

Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorized Signatory



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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18323

Test Certificate Date : 06.06.2023

Sample Description : Ambient Air Monitoring

Location of Sampling : AAQ 2 – Chokkampatti - 10°14'25.52"N 78°21'24.55"E

Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07

Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/03 & 29.11.2023

Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/04 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	69.7	22.3	41.7	7.3	23.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	68.9	21.6	43.2	8.2	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	68.2	20.3	44.7	6.5	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	68.3	20.7	41.9	7.8	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	67.4	21.9	43.3	8.3	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	67.8	21.4	42.7	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	69.3	21.9	41.6	6.4	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	68.7	19.5	44.2	7.9	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	68.8	19.4	43.3	8.3	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	67.9	18.9	42.7	7.1	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	67.5	18.2	41.9	8.2	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	67.3	20.5	42.6	8.9	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	69.8	20.7	43.8	7.4	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	69.5	20.6	43.5	7.3	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	68.7	21.5	41.6	9.6	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	67.6	20.9	43.3	8.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.8	19.5	42.7	5.9	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	67.5	19.8	43.3	5.6	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	66.9	21.6	44.6	6.3	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	68.5	21.7	42.4	8.7	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	67.8	20.3	44.9	5.5	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	66.7	22.8	41.6	7.2	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	65.3	21.3	43.2	6.3	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	66.9	20.9	44.7	7.9	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	64.5	21.3	42.2	8.2	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	65.5	22.5	42.5	8.3	20.9	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.

End of Report

For Chennai Mettex Lab Private Limited



Signature

Reviewed & Authorized By:

A. KAVITHA
Technical Manager
Authorized Signatory

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CHENNAI METTEX LAB PRIVATE LIMITED[®]

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18324

Test Certificate Date : 06.06.2023

Sample Description : Ambient Air Monitoring
Location of Sampling : AAQ3 - Kottampatti - 10°13'12.28"N 78°22'42.41"E
Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/05 & 29.11.2023
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/06 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	64.7	21.9	43.2	6.3	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	65.8	22.7	42.5	5.9	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	65.6	23.4	43.9	5.4	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.4	22.9	41.5	7.8	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	64.5	23.6	42.7	5.9	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	64.9	22.3	43.3	5.8	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	64.5	25.9	44.5	5.1	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	66.3	24.4	42.7	7.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	65.4	23.9	43.4	6.3	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	65.8	25.7	42.9	5.8	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	67.2	24.3	44.6	7.9	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.4.2023	7:15-7:15	66.9	23.9	42.5	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	66.7	25.7	44.7	8.5	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	65.5	24.4	43.3	5.9	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	63.4	23.3	42.5	6.9	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	64.8	25.7	41.8	8.7	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.3	26.6	42.7	5.3	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	65.1	25.8	42.5	6.9	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	65.9	24.3	43.6	5.8	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	66.7	25.7	42.5	6.3	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	67.3	24.4	44.9	5.9	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	66.8	23.9	44.1	7.4	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	65.5	22.3	43.7	6.2	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	65.5	22.7	43.5	5.6	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	66.4	22.3	42.2	7.2	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	65.8	23.5	42.9	6.9	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.

End of Report

For Chennai Mettex Lab Private Limited



[Signature]

Reviewed & Authorized By

[Signature]

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18325

Test Certificate Date : 06.06.2023

Sample Description : Ambient Air Monitoring

Location of Sampling : AAQ4 -Sambapatti- 10°12'47.18"N 78°18'5.63"E

Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07

Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/07 & 29.11.2023

Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/08 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	69.7	22.1	41.7	8.3	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	67.1	24.4	43.3	9.1	24.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	68.9	22.3	42.7	5.3	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	69.3	23.9	41.8	6.7	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	68.4	21.5	42.5	5.8	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	68.8	23.6	43.6	6.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	69.5	25.7	41.2	8.4	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	69.9	23.5	43.9	5.3	24.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	68.9	21.4	43.3	9.3	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	68.3	22.5	42.5	6.2	24.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	69.5	23.3	43.6	5.7	23.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	67.3	23.8	44.5	5.3	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	69.5	21.5	41.4	8.4	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	68.9	22.6	42.7	6.7	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	67.5	23.4	43.3	8.5	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	67.2	21.9	42.9	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	67.4	23.6	41.7	9.4	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	68.3	21.5	41.2	5.3	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	68.6	23.4	43.2	5.6	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	69.5	24.9	43.9	5.2	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	67.9	21.5	42.5	5.7	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	68.5	23.3	43.9	6.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	68.4	21.4	42.5	9.8	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	67.8	22.8	41.3	8.1	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	69.8	23.5	42.8	7.6	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	68.5	23.8	41.5	7.5	20.7	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.

End of Report



For Chennai Mettex Lab Private Limited

Reviewed & Authorized By

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18326

Test Certificate Date : 06.06.2023

Sample Description : Ambient Air Monitoring
Location of Sampling : AAQ5 - Sirugudi-10°15'45.87"N 78°18'29.40"E
Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/09 & 29.11.2023
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/10 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	64.2	23.6	43.4	6.3	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	65.9	24.1	42.6	7.5	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	64.4	23.5	41.8	6.4	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.6	22.6	42.5	6.6	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	64.7	23.7	43.9	6.5	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	65.6	24.4	43.7	7.6	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	63.5	23.6	41.4	7.2	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	64.9	21.9	42.5	7.1	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	65.4	24.4	43.4	7.6	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	64.3	22.8	42.7	7.4	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	65.8	23.6	41.8	7.9	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	66.5	23.5	42.9	7.2	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	65.9	25.4	41.6	6.3	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	64.4	23.7	43.4	6.6	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	65.5	22.8	42.8	7.1	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	64.9	23.6	42.6	7.8	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	65.7	24.4	43.5	7.6	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	67.4	23.5	41.7	7.6	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	66.3	22.9	42.9	6.8	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	65.8	24.4	43.2	6.4	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	64.7	23.6	41.6	7.2	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	63.5	22.7	42.7	7.5	23.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	64.6	24.4	41.3	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	65.1	23.8	42.8	6.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	63.8	22.8	42.5	6.9	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	67.7	22.6	41.9	6.7	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.

End of Report

For Chennai Mettex Lab Private Limited



[Signature]

Reviewed & Authorized By

P. KAVITHA
Technician/MAO/ADP
Authorized Signatory

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Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459
Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18327

Test Certificate Date : 06.06.2023

Sample Description : Ambient Air Monitoring
Location of Sampling : AAQ 6 - Pudupatti- 10°15'44.68"N 78°24'9.29"E
Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/11 & 29.11.2023
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/12 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	68.3	21.3	43.5	7.5	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	67.4	21.9	42.9	7.3	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	68.5	21.5	42.5	6.7	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	69.2	22.1	43.1	6.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	67.5	22.6	42.6	6.1	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	67.2	23.1	42.1	7.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	68.5	22.7	43.5	6.8	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	69.4	21.5	43.9	6.9	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	68.8	21.9	44.1	7.4	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	64.6	21.0	43.1	7.2	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	68.3	21.9	42.6	7.3	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	67.5	22.7	42.9	7.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	68.4	22.4	43.5	6.1	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	68.9	21.6	42.8	6.5	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	67.7	22.4	42.1	6.2	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	67.3	21.0	43.7	7.8	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.8	21.6	42.4	7.3	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	68.3	21.6	43.1	6.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	66.7	21.9	42.6	6.9	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	66.2	21.3	42.9	7.1	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	66.8	23.6	43.1	7.2	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	67.6	22.8	44.8	6.8	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	66.1	22.1	42.6	6.1	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	66.3	21.9	43.1	7.3	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	68.6	22.6	45.7	7.5	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	67.2	22.8	45.6	7.3	20.2	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.

End of Report

For Chennai Mettex Lab Private Limited



[Signature]

Reviewed & Authorized By

P. KAVITHA

Technical Analyst

Signature

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18328

Test Certificate Date : 06.06.2023

Sample Description : Ambient Air Monitoring

Location of Sampling : AAQ7 – Ayyapatti - 10°10'45.10"N 78°20'46.70"E

Sampling Plan & Procedure: IS 5182 Part 14:2000 & CML/LAB/ENV/SOP/07

Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/13 & 29.11.2023

Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/14 & 29.11.2023

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM _{2.5}	PM ₁₀	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	60	100	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
03.03.2023	7:00-7:00	65.6	22.3	41.5	6.3	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.03.2023	7:15-7:15	68.3	21.1	42.4	5.9	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.03.2023	7:00-7:00	65.4	22.8	42.8	6.2	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.03.2023	7:15-7:15	65.6	21.9	42.3	6.0	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.03.2023	7:00-7:00	68.9	22.4	43.5	5.9	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.03.2023	7:15-7:15	65.1	21.3	41.1	5.3	21.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.03.2023	7:00-7:00	66.9	22.1	42.9	5.9	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.03.2023	7:15-7:15	64.7	21.7	41.5	6.2	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.03.2023	7:00-7:00	66.3	21.5	42.6	6.3	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.04.2023	7:15-7:15	63.4	22.0	41.3	5.9	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.04.2023	7:00-7:00	65.8	20.6	42.2	5.6	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.04.2023	7:15-7:15	65.1	20.9	42.8	6.3	19.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.04.2023	7:00-7:00	65.5	21.1	41.9	6.8	21.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.04.2023	7:15-7:15	66.9	21.7	41.5	5.6	18.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.04.2023	7:00-7:00	64.8	22.3	42.8	5.4	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.04.2023	7:15-7:15	63.9	20.4	43.5	5.8	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.04.2023	7:00-7:00	66.1	21.9	42.6	5.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.04.2023	7:15-7:15	65.2	21.4	43.1	5.9	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2023	7:00-7:00	64.8	21.8	43.2	6.3	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.05.2023	7:15-7:15	65.3	22.1	42.7	6.7	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2023	7:00-7:00	64.5	20.6	43.8	6.3	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.05.2023	7:15-7:15	64.6	22.7	42.5	6.1	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2023	7:00-7:00	65.8	20.3	41.3	5.8	18.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.05.2023	7:15-7:15	66.9	21.6	41.1	5.5	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2023	7:00-7:00	64.6	21.6	42.6	6.5	20.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.05.2023	7:15-7:15	65.6	21.6	42.5	6.7	20.2	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.

End of Report

For Chennai Mettex Lab Private Limited



[Signature]
Reviewed & Authorized By

R. KAVITHA

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sökkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18329

Test Certificate Date : 06.06.2023

Sample Description : Ambient Noise Monitoring
Location of Sampling : N1 – Core zone - 10°13'50.28"N 78°21'14.87"E
Location of Sampling : N2 – Chokkampatti - 10°14'26.20"N 78°21'24.27"E
Sampling Plan & Procedure: IS 9989:1981 & CML/LAB/ENV/SOP/10
Sampling Instrument : CML/ENV/SLM/001 & CML/ENV/SLM/002

Sampling Date: 27.03.2023

Location	N1 – Core zone			N2 – Chokkampatti		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	41.6	45.6	44.0	42.3	45.6	44.3
07:00-08:00	41.8	47.6	45.6	41.8	44.3	43.2
08:00-09:00	42.3	54.2	51.5	46.2	47.5	46.9
09:00-10:00	42.8	55.6	52.8	47.1	50.2	48.9
10:00-11:00	45.8	56.2	53.6	47.2	51.5	49.9
11:00-12:00	46.1	54.2	51.8	47.8	50	49.0
12:00-13:00	44.7	55.5	52.9	41.5	51.5	48.9
13:00-14:00	43.8	55.1	52.4	40.2	48.5	46.1
14:00-15:00	43.1	49.1	47.1	40.1	47.3	45.0
15:00-16:00	43.8	47.2	45.8	41.5	47.2	45.2
16:00-17:00	48.5	54.5	52.5	47.6	46.5	47.1
17:00-18:00	47.6	55.6	53.2	47.4	49.9	48.8
18:00-19:00	47.4	52.5	50.7	47.4	50.2	49.0
19:00-20:00	46.2	51.3	49.5	46.2	51.7	49.8
20:00-21:00	41.6	45.5	44.0	41.2	52.1	49.4
21:00-22:00	41.8	42.7	42.3	42.1	48.2	46.1
22:00-23:00	37.1	39.7	38.6	38.2	47.8	45.2
23:00-00:00	37	38.5	37.8	37.2	44.5	42.2
00:00-01:00	36.5	43.5	41.3	36.9	42.5	40.5
01:00-02:00	37.2	42.8	40.8	36.5	41.5	39.7
02:00-03:00	37.9	41.5	40.1	36.2	39.5	38.2
03:00-04:00	37.1	40.5	39.1	36.5	39.7	38.4
04:00-05:00	37	38.6	37.9	35.5	38.9	37.5
05:00-06:00	36.5	39.8	38.5	35.4	37.8	36.8
Result	Day Means		48.7	Day Means		47.2
	Night Means		39.4	Night Means		39.0

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

For Chennai Mettex Lab Private Limited



P. Kavitha
Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorized Signatory

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TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18330

Test Certificate Date : 06.06.2023

Sample Description : Ambient Noise Monitoring
Location of Sampling : N3 - Kottampatti - 10°13'12.07"N 78°22'42.33"E
Location of Sampling : N4 - Sambapatti - 10°12'46.92"N 78°18'5.39"E
Sampling Plan & Procedure: IS 9989:1981 & CML/LAB/ENV/SOP/10
Sampling Instrument ID : CML/ENV/SLM/003 & CML/ENV/SLM/004

Sampling Date : 27.03.2023

Location	N3 - Kottampatti			N4 - Sambapatti		
	Min	Max	Result	Min	Max	Result
Parameter						
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	38.5	42.5	40.9	41.2	46.8	44.8
07:00-08:00	39.6	45.6	43.6	42.1	46.2	44.6
08:00-09:00	40.5	48.5	46.1	45.2	47.3	46.4
09:00-10:00	41.5	49.2	46.9	45.3	48.2	47.0
10:00-11:00	42.6	48.7	46.6	46.7	50.2	48.8
11:00-12:00	44.3	50.3	48.3	47.2	49.2	48.3
12:00-13:00	41.6	47.6	45.6	41.2	47.6	45.5
13:00-14:00	41.8	48.1	46.0	42.3	45.5	44.2
14:00-15:00	42.3	48.2	46.2	41.6	46.6	44.8
15:00-16:00	42.8	48.1	46.2	41.8	48.5	46.3
16:00-17:00	41.2	47.6	45.5	47.5	50.5	49.3
17:00-18:00	41.6	48.6	46.4	47.9	51.6	50.1
18:00-19:00	41.8	49.2	46.9	45.8	49.1	47.8
19:00-20:00	42.5	45.6	44.3	46.7	48.2	47.5
20:00-21:00	43.5	47.2	45.7	41.2	46.1	44.3
21:00-22:00	42.1	44.6	43.5	41.5	43.7	42.7
22:00-23:00	37.2	44.8	42.5	36.4	41.2	39.4
23:00-00:00	37.9	42.5	40.8	36.4	41.5	39.7
00:00-01:00	37.1	40.2	38.9	36.7	40.5	39.0
01:00-02:00	37.0	39.7	38.6	37.5	38.1	37.8
02:00-03:00	36.5	38.5	37.6	37.5	39.5	38.6
03:00-04:00	36.4	37.4	36.9	37.9	38.5	38.2
04:00-05:00	36.9	38.6	37.8	35.1	37.8	36.7
05:00-06:00	36.7	39.8	38.5	35.8	36.4	36.1
Result	Day Means		45.4	Day Means		46.0
	Night Means		38.5	Night Means		38.0

Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18331

Test Certificate Date : 06.06.2023

Sample Description : Ambient Noise Monitoring
Location of Sampling : N5 - Sirugudi -10°15'45.74"N 78°18'28.77"E
Location of Sampling : N6 - Pudupatti -10°15'44.45"N 78°24'9.10"E
Sampling Plan & Procedure: IS 9989:1981 & CML/LAB/ENV/SOP/10
Sampling Instrument : CML/ENV/SLM/001 & CML/ENV/SLM/002

Sampling Date : 09.05.2023

Location Parameter	N5 - Sirugudi			N6 - Pudupatti		
	Min dB(A)	Max dB(A)	Result dB(A)	Min dB(A)	Max dB(A)	Result dB(A)
Time						
06:00-07:00	42.1	46.2	44.6	41.2	48.5	46.2
07:00-08:00	41.0	48.2	45.9	41.5	49.8	47.2
08:00-09:00	44.2	57.1	54.3	46.2	50.2	48.6
09:00-10:00	45.8	49.5	48.0	47.1	54.6	52.3
10:00-11:00	47.5	47.1	47.3	47.2	55.5	53.1
11:00-12:00	46.2	48.2	47.3	47.8	51.3	49.9
12:00-13:00	41.0	48.5	46.2	45.1	51.0	49.0
13:00-14:00	42.8	47.5	45.8	44.3	48.2	46.7
14:00-15:00	41.8	47.2	45.3	42.8	45.2	44.2
15:00-16:00	41.5	49.2	46.9	43.5	44.7	44.1
16:00-17:00	45.1	48.7	47.3	48.5	52.2	50.7
17:00-18:00	45.6	47.5	46.7	47.6	50.3	49.2
18:00-19:00	45.8	51.9	49.8	47.2	52.7	50.8
19:00-20:00	47.8	51.2	49.8	47	48.9	48.1
20:00-21:00	42.1	46.9	45.1	41.2	47.7	45.6
21:00-22:00	42.1	45.5	44.1	42.1	42.6	42.4
22:00-23:00	38.1	44.9	42.7	37.5	41.8	40.2
23:00-00:00	37.0	41.5	39.8	37.9	40.2	39.2
00:00-01:00	37.1	40.2	38.9	36.1	39.7	38.3
01:00-02:00	36.5	39.5	38.3	36.4	38.1	37.3
02:00-03:00	36.2	38.7	37.6	36.2	36.9	36.6
03:00-04:00	36.1	40.2	38.6	35.5	37.7	36.7
04:00-05:00	35.8	37.8	36.9	35.4	36.8	36.2
05:00-06:00	38.1	39.8	39.0	35.1	38.9	37.4
Result	Day Means		46.9	Day Means		47.5
	Night Means		38.5	Night Means		37.4

Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

End of Report

For Chennai Mettex Lab Private Limited



P. Kavitha
Reviewed & Authorized By

P. KAVITHA
Technical Manager
Authorised Signatory



CHENNAI METTEX LAB PRIVATE LIMITED[®]

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TEST REPORT

ISSUED TO: Thiru. K.Silambarasan, Extent : 2.02.0 Ha
S.F.No : 352/2 (Part-1), Sakkampatti Village,
Melur Taluk, Madurai District.

Test Certificate No : CML/23-24/18332

Test Certificate Date : 06.06.2023

Sample Description : Ambient Noise Monitoring
Location of Sampling : N7 - Ayyapatti - 10°10'45.43"N 78°20'47.09"E
Sampling Plan & Procedure: IS 9989:1981 & CML/LAB/ENV/SOP/10
Sampling Instrument ID : CML/ENV/SLM/003 & CML/ENV/SLM/004

Sampling Date : 09.05.2023

Location		N7 - Ayyapatti		
Parameter	Min	Max	Result	
Time	dB(A)	dB(A)	dB(A)	
06:00-07:00	41.2	46.2	44.4	
07:00-08:00	41.5	48.2	46.0	
08:00-09:00	46.2	57.1	54.4	
09:00-10:00	47.1	49.5	48.5	
10:00-11:00	47.2	47.1	47.2	
11:00-12:00	47.8	48.2	48.0	
12:00-13:00	45.1	48.5	47.1	
13:00-14:00	44.3	47.5	46.2	
14:00-15:00	42.8	47.2	45.5	
15:00-16:00	43.5	49.2	47.2	
16:00-17:00	48.5	48.7	48.6	
17:00-18:00	47.6	56.4	53.9	
18:00-19:00	47.2	56.8	54.2	
19:00-20:00	47.0	56.9	54.3	
20:00-21:00	41.2	47.1	45.1	
21:00-22:00	42.1	44.9	43.7	
22:00-23:00	36.4	40.0	38.6	
23:00-00:00	36.4	44.8	42.4	
00:00-01:00	36.7	43.5	41.3	
01:00-02:00	37.5	42.5	40.7	
02:00-03:00	37.5	40.1	39.0	
03:00-04:00	37.9	38.6	38.2	
04:00-05:00	35.1	39.6	37.8	
05:00-06:00	35.8	38.5	37.4	
Result	Day Means		47.8	
	Night Means		39.5	

Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

End of Report

For Chennai Mettex Lab Private Limited




Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory

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TEST REPORT

Page No.1 of 2

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18333

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016981

Analysis Completed On : 06.06.2023

Sample Description : Surface Water (SW-1) -Tank Near Chokkampatti
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff.2017)	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff.2017)	7.65
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff.2019)	1095 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff.2017)	2.5 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff.2017)	645 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff.2019)	200.82 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff.2019)	32.7 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff.2019)	29 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff.2019)	210.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff.2019)	166.1 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff.2019)	95 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff.2019)	0.21 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff.2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.16 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff.2019)	10.3 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.005 mg/l)

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Lab No: 24016981 T.C No: CML/23-24/18333 Dated : 06.06.2023 Page No. 2 of 2

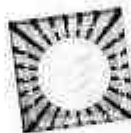
TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff. 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 - 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	8.1 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	36 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.6 mg/l
Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	12 mg/l
Discipline: Biological		Group: Water
Total Coliform	APHA 23 rd Edn. 2017:9221B	980 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	110 MPN/100ml
Note : APHA - American Public Health Association, BDL - Below Detection Limit, DL - Detection Limit, MPN - Most Probable Number.		

End of Report

For Chennai Mettex Lab Private Limited

G.S. Radha

G.S. RADHA
 Technical Manager
 Authorised Signatory



P. Kavitha
 Reviewed & Authorized By
P. KAVITHA
 Technical Manager
 Authorised Signatory



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TEST REPORT

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C Date : 06.06.2023

T.C No : CML/23-24/18334

Date Of Receipt : 25.05.2023

Analysis Commenced On: 25.05.2023

Analysis Completed On : 06.06.2023

Cust. Ref : SRF Dated : 24.05.2023.

Lab No : 24016982

Sample Description : Surface Water (SW-2) – Palar River
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff:2017)	10 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.06
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1198 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	2.8 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	706 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	210.25 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	40.6 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	26.5 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	226.1 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	205 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	89 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.31 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.11 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	10.9 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)

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Lab No: 24016982 T.C No: CML/23-24/18334 Dated : 06.06.2023

Page No. 2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 - 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	5.8 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	28 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.9 mg/l
Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
Ammonia total ammonia-N) (as	IS 3025 Part 34-1988 (Reaff. 2019)	1.6 mg/l
Sulphide as H ₂ S	IS 3025 Part 29-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	8.6 mg/l
Discipline: Biological		Group: Water
Total Coliform	APHA 23 rd Edn. 2017:9221B	1600 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	170 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.		

End of Report

For Chennai Mettex Lab Private Limited


G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory

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TEST REPORT

Page No.1 of 2

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Meiur Taluk, Madurai District.

T.C No : CML/23-24/18335

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016983

Analysis Completed On : 06.06.2023

Sample Description : Ground Water (WW-1) –Near Project Area
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.65
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	856 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	505 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	153.90 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	27.9 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	20.5 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	170 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	102 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	71.5 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.22 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.26 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	4.7 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)

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Email : test@mettexlab.com | Web : www.mettexlab.com

Lab No: 24016983 T.C No: CML/23-24/18335 Dated : 06.06.2023

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TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
Phenolic compounds C ₆ H ₅ OH as	IS 3025 Part 43-1992(Reaff. 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 - 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff 2017)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 29-1986 (Reaff. 2019)	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water
Total Coliform	APHA 23 rd Edn. 2017:9221B	130 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory



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TEST REPORT

Page No.1 of 2

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18336

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016984

Analysis Completed On : 06.06.2023

Sample Description : Ground Water (WW-2) – Ayyapatti
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff.2017)	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff.2017)	7.06
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff.2019)	1153 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff.2017)	1.0 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff.2017)	680 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff.2019)	220.15 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff.2019)	38.8 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff.2019)	30.0 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff.2019)	250 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff.2019)	188.6 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff.2019)	73 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff.2019)	0.35 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff.2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.25 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff.2019)	6.4 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff.2019)	BDL (DL:0.005 mg/l)

...Contd....2

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Lab No: 24016984 T.C No: CML/23-24/18336 Dated : 06.06.2023

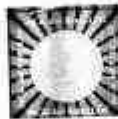
Page No. 2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 - 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
Discipline: Biological Group: Water		
Total Coliform	APHA 23 rd Edn. 2017:9221B	110 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml
Note : APHA - American Public Health Association, BDL - Below Detection Limit, DL - Detection Limit, MPN - Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorized By
P. KAVITHA
Technical Manager
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TEST REPORT

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ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18337.

Cust. Ref : SRF Dated : 24.05.2023.

Date Of Receipt : 25.05.2023

Lab No : 24016985

Analysis Commenced On: 25.05.2023

Analysis Completed On : 06.06.2023

Sample Description : Ground Water (BW-1) -Valacheripatti
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.91
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	746 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	440 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	175.00 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	30.1 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	24.3 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	122 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	99.4mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	60.7 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.15 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.32 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	8 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)

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Lab No: 24016985 T.C No: CML/23-24/18337 Dated : 06.06.2023

Page No. 2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 - 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 29-1986 (Reaff. 2019)	BDL (DL:1.0 mg/l)
Discipline: Biological		
Group: Water		
Total Coliform	APHA 23 rd Edn. 2017:9221B	80 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml
Note : APHA - American Public Health Association, BDL - Below Detection Limit, DL - Detection Limit, MPN - Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited

G.S. RADHA
Technical Manager
Authorised Signatory


Reviewed & Authorized By

P. KAVITHA
Technical Manager
Authorised Signatory



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TEST REPORT

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ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18338

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016986

Analysis Completed On : 06.06.2023

Sample Description : Ground Water (BW-2) –Sirugudi
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.06
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	891 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	526 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	183.80 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	32.8 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	24.8 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	170 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	112.4 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	74 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.19 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017-4500 F,D	0.22 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	6.1 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)

...Contd....2

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Email : test@mettexlab.com | Web : www.mettexlab.com

Lab No: 24016986 T.C No: CML/23-24/18338 Dated : 06.06.2023

Page No. 2 of 2


TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 - 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 29-1986 (Reaff. 2019)	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water
Total Coliform	APHA 23 rd Edn. 2017:9221B	110 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorized By

P. KAVITHA
Technical Manager
Authorised Signatory



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TEST REPORT

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District

T.C No : CML/23-24/18339

Cust. Ref : SRF Dated : 24.05.2023.

Date Of Receipt : 25.05.2023

Analysis Commenced On: 25.05.2023

Lab No : 24016987

Analysis Completed On : 06.06.2023

Sample Description : Soil - 1 - Core Zone
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.01
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff: 2016)	325 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	31.6 %
	Sand		35.9 %
	Silt		32.5 %
04	Water Holding Capacity	By Gravimetric Method	47.8 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm ³
06	Porosity	By Gravimetric Method	47.1 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	98.6 mg/kg
08	Magnesium as Mg		60.7 mg/kg
09	Manganese as Mn		21.3 mg/kg
10	Zinc as Zn		1.5 mg/kg
11	Boron as B		1.08 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	47.6 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.016 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	25 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	2.6 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	380.2 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.77 mg/kg
21	Iron as Fe		2.06 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.05 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.19 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	42.8 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



[Signature]
Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory

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TEST REPORT

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18340

Cust. Ref : SRF Dated : 24.05.2023.

Date Of Receipt : 25.05.2023

Lab No : 24016988

Analysis Commenced On: 25.05.2023

Analysis Completed On : 06.06.2023

Sample Description : Soil - 2 - Chokkampatti
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff.2016)	8.88
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	401 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	27.5 %
	Sand		36.4 %
	Silt		36.1 %
04	Water Holding Capacity	By Gravimetric Method	46.7 %
05	Bulk Density	By Cylindrical Method	1.10 g/cm ³
06	Porosity	By Gravimetric Method	46.1 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	101 mg/kg
08	Magnesium as Mg		75.8 mg/kg
09	Manganese as Mn		16.2 mg/kg
10	Zinc as Zn		1.61 mg/kg
11	Boron as B		0.84 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	90.4 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff.2015)	0.0014 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	34 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	2.1 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	409 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.28 mg/kg
21	Iron as Fe		1.09 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.81 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.05 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	35.2 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



P. Kavitha
Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory

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TEST REPORT

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18341

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016989

Analysis Completed On : 06.06.2023

Sample Description : Soil - 3 - Sambapatti
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff.2016)	8.19
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	440 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	30.2 %
	Sand		31.9 %
	Silt		37.9 %
04	Water Holding Capacity	By Gravimetric Method	47.6 %
05	Bulk Density	By Cylindrical Method	0.97 g/cm ³
06	Porosity	By Gravimetric Method	48.8 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	94.6 mg/kg
08	Magnesium as Mg		70.6 mg/kg
09	Manganese as Mn		24 mg/kg
10	Zinc as Zn		3.8 mg/kg
11	Boron as B		1.15 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	80.2 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff.2015)	0.0018 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	27.5 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff. 2019)	1.68 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff.2019)	400 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.75 mg/kg
21	Iron as Fe		2.67 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff. 2015)	2.32 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff. 2015)	1.35 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	40.1 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



P. Kavitha
Reviewed & Authorized By
P. KAVITHA
Technical Manager
Authorised Signatory

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TEST REPORT

ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F No : 352/2 (Part-1), Sakkampatti
 Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18342

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016990

Analysis Completed On : 06.06.2023

Sample Description : Soil - 4 - Sirugudi
 (as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff.2016)	8.65
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff. 2016)	564 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	32.7 %
	Sand		31.7 %
	Silt		35.6 %
04	Water Holding Capacity	By Gravimetric Method	48.4 %
05	Bulk Density	By Cylindrical Method	1.09 g/cm ³
06	Porosity	By Gravimetric Method	45.5 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	110 mg/kg
08	Magnesium as Mg		81.6 mg/kg
09	Manganese as Mn		33.8 mg/kg
10	Zinc as Zn		3.1 mg/kg
11	Boron as B		1.05 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	30.7 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff.2015)	0.0015 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	27 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff. 2019)	1.55 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff.2019)	359 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.16 mg/kg
21	Iron as Fe		1.08 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff. 2015)	2.75 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff. 2015)	1.60 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	42.87 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



[Signature]
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P. KAVITHA
 Technical Manager
 Authorised Signatory

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ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18343

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016991

Analysis Completed On : 06.06.2023

Sample Description : Soil - 5 -Pudupatti
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff.2016)	8.04
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	375 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	31.6 %
	Sand		34.8 %
	Silt		33.8 %
04	Water Holding Capacity	By Gravimetric Method	47.6 %
05	Bulk Density	By Cylindrical Method	1.16 g/cm ³
06	Porosity	By Gravimetric Method	46.7 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	80.6 mg/kg
08	Magnesium as Mg		70 mg/kg
09	Manganese as Mn		25.9 mg/kg
10	Zinc as Zn		3.55 mg/kg
11	Boron as B		1.13 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	61.8 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff.2015)	0.0013 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	90 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff. 2019)	2.36 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff.2019)	490 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.48 mg/kg
21	Iron as Fe		1.06 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff. 2015)	1.98 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff. 2015)	1.15 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	40.1 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



[Signature]
 Reviewed & Authorized By
P. KAVITHA
 Technical Manager
 Authorised Signatory

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ISSUED TO : Thiru. K.Silambarasan, Extent : 2.02.0 Ha

T.C Date : 06.06.2023

S.F. No : 352/2 (Part-1), Sakkampatti
Village, Melur Taluk, Madurai District.

T.C No : CML/23-24/18344

Date Of Receipt : 25.05.2023

Cust. Ref : SRF Dated : 24.05.2023.

Analysis Commenced On: 25.05.2023

Lab No : 24016992

Analysis Completed On : 06.06.2023

Sample Description : Soil - 6 - Ayyapatti
(as stated by customer)

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)	254 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	35.5 %
	Sand		31.7 %
	Silt		32.8 %
04	Water Holding Capacity	By Gravimetric Method	45.2 %
05	Bulk Density	By Cylindrical Method	1.19 g/cm ³
06	Porosity	By Gravimetric Method	48.16 %
07	Calcium as Ca	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	130 mg/kg
08	Magnesium as Mg		71.6 mg/kg
09	Manganese as Mn		30.5 mg/kg
10	Zinc as Zn		1.17mg/kg
11	Boron as B		0.23 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	102 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.019 %
14	Potassium as K	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	26.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	3.66 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	405.6 mg/kg
17	Cadmium as Cd	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		0.19 mg/kg
21	Iron as Fe		1.03 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.08 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.21 %
24	Cation Exchange Capacity	USEPA 9080 - 1986	42.6 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



[Signature]
Reviewed & Authorized By
Technical Manager
Authorised Signatory

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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

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