DRAFT ENVIRONMENTAL IMPACT ASSESSMENT

&

ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

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

"B1" CATEGORY (Cluster) – MINOR MINERAL – CLUSTER –

PATTA LAND- FRESH QUARRY

TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY

Cluster Extent – 7.60.50 Ha

Project Proponent

Tmt.V. Maheswari,

W/o. Vasudevan,
No. 220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram, Tiruppur District – 638 657

PROJECT LOCATION	PROPOSED PRODUCTION
S.F. Nos. 863(P) Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu **Extent: 3.00.0 Ha**	**Reserves:** 5,28,150m^3 of Rough Stone, & 45,968 m^3 of Gravel Peak Production = 62,150m^3 of Rough Stone =19,584 m^3 of Gravel Proposed Depth = **47m bgl** Lease Period/Mining plan period- 10 years
ToR Obtained vide **Lr.No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023**	
Environmental Consultant **GEO EXPLORATION AND MINING SOLUTIONS** **Old No. 260-B, New No. 17,** **Advaitha Ashram Road, Alagapuram,** **Salem – 636 004, Tamil Nadu, India** **Accredited for sector 1 Cat 'A', sector 31 & 38 Cat 'B'** **Certificate No : NABET/EIA/2225/RA 0276** Phone: 0427-2431989, Email: infogeoexploration@gmail.com **Web: www.gemssalem.com**	**Laboratory** **EHS 360 LABS PRIVATE LIMITED,** **10/2 Ground floor, 50th street, 7th Avenue,** **Ashok Nagar, Chennai – 600 083.**
Baseline Monitoring Period **OCT TO DEC 2023**	
AUGUST 2024	

UNDERTAKING

I Tmt.V.Maheshwari given undertaking that this EIA & EMP report prepared for our Rough stone and Gravel quarry situated in S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu based on the ToR issued by the State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu vide ToR obtained vide Lr.No.SEIAA-TN/F.No.8785/SEAC/TOR-1329/2023 Dated: 09.02.2023 hereby assured that the Data's submitted and information given by me is true and correct to the best of my knowledge.

Signature of the Project Proponent

V.Maheshwari

Place: Tiruppur
Dated:

DECLARATION

I Dr. M.Ifthikhar Ahmed – EIA Coordinator declare that the EIA & EMP report prepared for our Rough stone and Gravel quarry situated in S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District has been prepared by Geo Exploration and Mining Solutions, Salem, Tamil Nadu.

The Data's provided in the EIA report are true and correct to the best of my knowledge.

Signature of the EIA Coordinator

Dr. M. Ifthikhar Ahmed

Managing Partner

M/s. Geo Exploration and Mining Solutions

Place : Salem
Dated:

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

PROPOSED QUARRY					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
P1	Tmt.V.Maheshwari	Manakadavu	**863(P)**	**3.00.0**	ToR obtained vide Lr.No. SEIAA-TN/F.No. 8785/ SEAC /TOR-1329/2023 Dated: 09.02.2023
	TOTAL EXTENT			**3.00.0**	
EXISTING QUARRIES					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
E-1	Thiru.C.K.Chellamuthu	Manakadavu	872/2 NP	2.64.0	Lease Period; 24.04.2018 to 23.04.2023
E-2	Thiru. N. Rama lingam	Manakadavu	872/2 SP	1.96.5	Lease Period; 07.06.2021 to 06.06.2026
	TOTAL EXTENT			**4.60.5**	
	TOTAL CLUSTER EXTENT			**7.60.50**	

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

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR – Lr. No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023

TOR ADDITIONAL CONDITIONS		
1	The PP shall furnish a letter from DFO on the proximity details of nearest RF with respect to the proposed Project site.	The nearest forest is Dalavaipattinam RF – 9.29 km – NW. The DFO letter will be submitted in the final EIA report.
2	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m shall be enumerated with details such as dwelling houses with number of occupants, places of worship, industries, factories. sheds' etc.	Structure study has been conducted covering 0-300m radius with type of Structure, number of occupants are detailed in the Chapter No.3
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.	Not applicable, it is a fresh lease.
4	The Proponent shall submit a conceptual 'Slope Stability' 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.	Not applicable, it is a fresh lease. Site specific slope stability study will be conducted when it reaches 30m.
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 l96l such as blaster, mining mate, mine foreman, IUI Class mines manager appointed by the proponent.	The proponent shall make an affidavit that blasting shall be carried out by a competent person as per MMR 1961.
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.	The Blasting will be carried out by controlled blasting adopting muffle blasting and line drilling. The cost for the controlled blasting is allotted in the EMP, Chapter No.10 Table No. 10.10
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.	No other Abandoned and proposed quarries in the name of proponent.
8	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent sha, 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.	Not applicable, Since it is a fresh proposal.

	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 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)	Coordinates for all the boundaries are given in the Chapter No.2 Table No.2.2
10	The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Drone video survey covering the Cluster, Greenbelt and fencing will be submitted during appraisal.
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.	The Manpower in the Employment potential is given in the Chapter No.2
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.	Greenbelt and fencing will be submitted during appraisal.
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.	The Total Mineable Reserves of Rough stone is 5,28,150m^3 For First Five Year Production 2,76,400m^3 of Rough stone & 45,968m^3 of Gravel For Second Five Year Production 2,51,750m^3 of Rough stone Peak Production 62,150m^3 of Rough Stone & 19,584m^3 of Gravel Details of Reserves and methodology of mining is given in the Chapter No.2
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.	Noted and agreed. Detailed under 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 groundwater. 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 of open wells and borewells within 1km radius along with water level is given in the Chapter No.3

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. The details of Baseline study are given in the Chapter No. 3.
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 air pollution, water pollution. & Health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	The Cumulative impact study due to mining operations is explained in Chapter No.7.
18	Rain water harvesting management with recharging details along with water balance (both) monsoon & non-monsoon) be submitted.	The rain water will be collected in the mine pit at the lower point later it will be utilized for the haul road maintenance, Greenbelt development etc.,
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.	Land use Land cover study within the radius of 10km is detailed in the Chapter No. 3.
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.	Not applicable, There are no wastages anticipated, the entire quarried out Rough stone material will be utilized.
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	The area is not declared as Critically polluted area, no court case pending against the project. Proponent obtained Precise area communication letter, Approval for the Mining plan.
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	The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression.
23	Impact on local transport infrastructure due to the Project should be indicated.	There is no group of Houses, Schools in the proposed transportation route. Proposed Transportation route with mitigation measures is given in the Chapter No.2
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.	The Flora study in the core zone has been carried out and the details are given in the Chapter No.3

25	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	The mine closure plan is detailed in the Chapter No.4 .The budget for the mine closure is included in the Environmental Management plan in Chapter No.10, Table:10.10.
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.	Noted and agreed. This Draft EIA report is prepared for the Public Hearing. The Public hearing Comments along with action plan will be submitted in the Final EIA and EMP report.
27	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Noted and agreed
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 and agreed
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.	The Flora and Fauna study around the vicinity of the site is carried out by the Functional area experts along with Local School Students.
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.	The plantation in the project site will be carried out using native and mixed plantation. The recommended species for the plantation is given in the Chapter No.4 Table No.4.10.
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 and agreed. The plantation in the project site will be carried out using native and mixed plantation. The recommended species for the plantation is given in the Chapter No.4 Table No.4.10.
32	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Disaster management Plan is detailed in the Chapter No.7.
33	A Risk Assessment and management Plan shall be prepared and included in the ELA/EMP Report.	A Risk Assessment and management Plan detailed in the Chapter No.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.	Occupational Health impacts of the project with mitigation measures are detailed in the Chapter No.7. Details of Periodical Medical Examination given in the Chapter No.10
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.	The details of the population in the impact zone (within 500m radius) are detailed in the Chapter No.3.
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 covering 10 km radius is detailed in the Chapter No.3.
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.	No court case and litigation pending against the project.
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	It is explained in Chapter -3- socio economic study
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.	Not applicable, the project is fresh proposal.
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.	The EMP has been prepared for the entire life of the mine. Proponent given affidavit stating the EMP will be submitted during the appraisal after completion of public hearing.

ADDITIONAL CONDITIONS-Annexure-B		
1	The project proponent shall prepare mine closure plan considering mineable quantity of Topsoil, Weathered rock & mineral reject/waste. If any.	The mine closure plan is detailed in the Chapter No.4. The budget for the mine closure is included in the Environmental Management plan in Chapter No.10, Table:10.10.
2	Copy of valid mining lease approval obtained from the competent Authority.	Noted & agreed
3	Copy of approved review of scheme of mining plan by the competent authority (Dept. or Geology and Mining / IBM).	Not applicable, it is a fresh lease application.
4	Derails of habitations around the proposed mining area and latest VAO certificate regarding	The nearest habitation is 740m on South East side and VAO letter was obtained regarding the location of habitations within 300m radius. There is no

	the location of habitations within 300m radius from the periphery of the site.	structure other than the crusher and its shed and a windmill.
5	The DFO letter stating that the proximity distance of Reserve Forests, protected Areas. Sanctuaries, Tiger reserve etc., up to a radius of25 km from the proposed site.	The nearest forest is Dalavaipattinam RF – 9.29 km – NW. The DFO letter will be submitted in the final EIA report.
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.	Details chapter 7 salient features of quarry with existing quarry.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling. tree plantation, blasting etc..	Noted & agreed
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	Noted & agreed
4	Detailed operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	Transport details in chapter-2
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan	Noted & agreed
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	Noted & agreed
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	Noted & agreed
8	The committee shall furnish the Emergency Management within the cluster.	Details discussed in chapter 7.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	Details discussed in chapter 10.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Noted & agreed
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	Detailed discussed in chapter 7.
Impact study of mining		
12	Detailed study shall be caried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise arca communication order issued from reputed research institutions on the following a) Soil health & bio-diversity	Species Recommended for Plantation in chapter 3&10.

	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.	
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining Area.	Detailed discussed in chapter 4.
14	Impact on soil flora & vegetation around the project site.	Detailed discussed in chapter 4.
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Details in Chapter 2,3 and 7
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora. fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	Details in Chapter 3
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	Noted & agreed
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The project area is bounded by Existing quarries on the East side. Proponent proposed to erect green mesh along with fencing on the North and West side besides, Budgetary allocation given in the Chapter No. 10.
Forests		
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	Hydro-geological study considering the contour map of the water table detailing Chapter-3

	in this regard may be provided, covering the entire mine lease period.	
24	Erosion Control measures.	Noted & agreed
25	Detailed study shalt be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, water-bodies/ Rivers. & any ecological fragile areas.	Details in Chapter 2
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Details in Chapter 2 and 4 impact of bio diversity
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment by the activities.	Noted & agreed
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	Noted & agreed. Detailed under Chapter 3.
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil, physical, chemical components and microbial components.	Details in Chapter 3 Soil environment.
30	The Environmental impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	An Environmental Impact Assessment will be taken up during the evaluation of the final EIA report.
Energy		
31	The measures taken to control Noise. Air, Water. Dust Control and steps adopted too 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 int the Chapter No.4
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	Details in Chapter-3 for meteorological and climate/weather data representation of graphs.
Mine Closure Plan		
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Details in Chapter 2 mine closure plan
EMP		
35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Detailed under Chapter 10
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	Details in Green belt development in chapter 4
Risk Assessment		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Detailed under Chapter 7
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 in 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.,	The nearest habitation is 740m on South East side and VAO letter was obtained regarding the location of habitations within 300m radius. There is no structure other than the crusher and its shed and a windmill.
40	As per the MoEF& CC office memorandum tr.No.22-65/2017-lA.lll 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.** This is not a violation category project. This proposal falls under B1 Category
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The applied land for quarrying is a Patta Land. Document is enclosed along with Approved Mining Plan as Annexure Volume 1.
3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	**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 the land use and other ecological features of the study area (core and buffer zone).	Map showing – Project area is with adjacent quarries details is enclosed in Figure No1.1 Project area boundary coordinates superimposed on Toposheet – Figure No. 1.1A Toposheet of the project area covering 10km radius – Figure No. 1.2 Geology map of the project area covering 10km radius - Figure No. 2.11
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	**Map showing –** Geology map of the project area covering 10km radius - Figure No. 2.11 Geomorphological features are incorporated in the Toposheet map covering 10km radius around the project area Figure No. 2.12
6	Details about the land proposed for mining activities should be given with information as to	The applied area was inspected by the officers of Department of Geology along with revenue officials

	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.	and found that the land is fit for quarrying under the policy of State Government.
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The proponent has framed their Environmental Policy and the same is discussed in the Chapter No 10.1.
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an opencast quarrying operation proposed to operate in Mechanized method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90^0 bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	**Noted & agreed.** The study area considered for this study is 10 km radius and all data contained in the EIA report such as waste generation etc., is for the Life of the Mine / lease period.
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	**Not Applicable.** There is no waste anticipated during this quarry operation. The entire quarried out rough stone will be transported to the needy customers. No Dumps is proposed outside the lease area.
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of	**Not Applicable.** There is no Forest Land involved in the proposed project area. The proposed project area is a Patta land. Approved Mining Plan is enclosed as Annexure Volume 1.

	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.	**Not Applicable.** The proposed project area does not involve any Forest Land.
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	**Not Applicable.** The project doesn't attract Recognition of Forest Rights Act, 2006.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No Reserve Forest within the Study Area.
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	**Not Applicable.** There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 KM of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	**Not Applicable.** There are no National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
18	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and discussed under Chapter No. 3. There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
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:	**Not Applicable.** The project doesn't attract The C. R. Z. Notification, 2018.

	The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	**Not Applicable.** There are no approved habitations within a radius of 300 meters. Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project.
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	Baseline Data were collected for Post Monsoon Season (October to December 2023) as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3.
23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD Model. Details in Chapter No. 4,
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.	Total Water Requirement for this project is given in the chapter No 2, Table No 2.13.
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water for dust suppression, greenbelt development and domestic use will be obtained from accumulated rainwater/seepage water in mine pits. Drinking water will be sourced from the approved water vendors, No 2, Table No 2.13.

26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression.
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact Studies and Mitigation Measures of Water Quality discussed in Chapter No. 4.
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	The ground water table is at 68m – 73m below ground level. The ultimate depth of this projects is 47m from the general ground profile. Maximum depth is proposed in this EIA project is 47m.
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Highest elevation of the project area is 290m A (max) AMSL Ultimate depth of the mine is 47m BGL Water level in the area is 68m - 73m BGL
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	Progressive greenbelt development plan has been prepared and discussed along with Recommended Species details are given in the Chapter 4, Table No.4.9
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Traffic density survey was carried out to analyse the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no much significant impact due to the proposed transportation from the project area. Details in Chapter 2.
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of 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.
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Discussed in chapter No 2.

34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Details in Chapter 10.
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details in Chapter 10.
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Details in Chapter 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.	Environment Management Plan Chapter 10.
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.	The outcome of public hearing will be updated in the final EIA/EMP report
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.	No litigation is pending in any court against this 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.	The proposed capital cost for Environmental Monitoring Programme is Rs 3,80,000/- and the recurring cost is Rs 76,000/- per annum. Details in Chapter 6.
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.	Details in Chapter 10.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details in Chapter 7.
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Details in Chapter.8.
44	**Besides the above, the below mentioned general points are also to be followed: -**	
A	Executive Summary of the EIA/EMP Report	Encloses as separate volume
B	All documents to be properly referenced with index and continuous page numbering.	All the documents are properly referenced with index and continuous page numbering.
C	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of Tables and source of the data collected are given properly.
D	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC / NABL accredited laboratories. All the original analysis/testing	Baseline monitoring reports are enclosed with mining plan

	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.	Will be enclosed along with Final EIA /EMP Report.
G	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) Dated: 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) Dated: 4th August, 2009 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	Noted & agreed.
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.	Surface Plan – Figure No. 2.2. Geological Plan – Figure No 2.9. Working Plan – Figure No 2.9. Closure Plan – Figure No.2.10.

TABLE OF CONTENTS

1.INTRODUCTION 1

1.0 PREAMBLE 1

1.1 PURPOSE OF THE REPORT 1

1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENTS 3

1.3 BRIEF DESCRIPTION OF THE PROJECT 4

1.4 ENVIRONMENTAL CLEARANCE 5

1.5 TERMS OF REFERENCE (ToR) 5

1.6 POST ENVIRONMENT CLEARANCE MONITORING 6

1.7 GENERIC STRUCTURE OF EIA DOCUMENT 6

1.8 THE SCOPE OF THE STUDY 6

2. PROJECT DESCRIPTION 8

2.0 GENERAL 8

2.1 DESCRIPTION OF THE PROJECT 8

2.2 LOCATION OF THE PROJECT 8

2.3 GEOLOGY 14

2.4 RESOURCES AND RESERVES 20

2.5 METHOD OF MINING 25

2.6 GENERAL FEATURES 26

2.7 PROJECT REQUIREMENT 29

2.8 EMPLOYMENT REQUIREMENT: 30

2.9 PROJECT IMPLEMENTATION SCHEDULE 30

3. DESCRIPTION OF ENVIRONMENT 31

3.0 GENERAL 31

3.1 LAND ENVIRONMENT 33

3.2 WATER ENVIRONMENT 39

3.3 AIR ENVIRONMENT 48

3.4 NOISE ENVIRONMENT 58

3.5 BIOLOGICAL ENVIRONMENT 61

3.6 SOCIO ECONOMIC ENVIRONMENT 85

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES 93

4.0 GENERAL 93

4.1 LAND ENVIRONMENT: 93

4.2 WATER ENVIRONMENT 94

4.3 AIR ENVIRONMENT 95
4.4 NOISE ENVIRONMENT 101
4.5 IMPACT ON THE BIOLOGICAL ENVIRONMENT 105
4.6 SOCIO ECONOMIC 108
4.7 OCCUPATIONAL HEALTH AND SAFETY 110
4.8 MINE WASTE MANAGEMENT 111
4.9 MINE CLOSURE 111
5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE) 113
5.0 INTRODUCTION 113
5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE 113
5.2 ANALYSIS OF ALTERNATIVE SITE 113
5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY 113
5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY 113
6. ENVIRONMENTAL MONITORING PROGRAMME 114
6.0 GENERAL 114
6.1 METHODOLOGY OF MONITORING MECHANISM 114
6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES 115
6.3 MONITORING SCHEDULE AND FREQUENCY 116
6.4 BUDGETARY PROVISION FOR EMP 116
6.5 REPORTING SCHEDULES OF MONITORED DATA 117
7. ADDITIONAL STUDIES 118
7.0 GENERAL 118
7.1. PUBLIC CONSULTATION 118
7.2 RISK ASSESSMENT 118
7.3 DISASTER MANAGEMENT PLAN 120
7.4 CUMULATIVE IMPACT STUDY 123
7.5 PLASTIC WASTE MANAGEMENT PLAN 130
8. PROJECT BENEFITS 131
8.0 GENERAL 131
8.1 EMPLOYMENT POTENTIAL 131
8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED 131
8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE 131
8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE 131
8.5 OTHER TANGIBLE BENEFITS 131
9. ENVIRONMENTAL COST BENEFIT ANALYSIS 133

10. ENVIRONMENTAL MANAGEMENT PLAN – TMT.V.MAHESHWARI 134

10.0. GENERAL 134

10.1. ENVIRONMENTAL POLICY 134

10.2. LAND ENVIRONMENT MANAGEMENT – 135

10.3. SOIL MANAGEMENT 135

10.4. WATER MANAGEMENT 135

10.5. AIR QUALITY MANAGEMENT 136

10.6. NOISE POLLUTION CONTROL 136

10.7. GROUND VIBRATION AND FLY ROCK CONTROL 137

10.8. BIOLOGICAL ENVIRONMENT MANAGEMENT 137

10.9. OCCUPATIONAL SAFETY & HEALTH MANAGEMENT 139

10.10.: CONCLUSION – 145

11. SUMMARY AND CONCLUSION 146

12. DISCLOSURE OF CONSULTANT 147

LIST OF TABLES

TABLE 1.1: DETAILS OF PROJECT PROPONENT 3
TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT 3
TABLE 1.3: ENVIRONMENT ATTRIBUTES 6
TABLE 2.2: CO-ORDINATES – PROJECT BOUNDARY 8
TABLE 2.3: LAND USE PATTERN 14
TABLE 2.4: RESOURCES AND RESERVES 14
TABLE 2.5: RANGE OF AQUIFER PARAMETERS 18
TABLE 2.6: GROUND WATER LEVEL VARIATIONS OF TIRUPPUR DISTRICT 18
TABLE 2.7: RESOURCES AND RESERVES 20
TABLE 2.8: YEAR-WISE PRODUCTION PLAN FOR FIRST FIVE YEARS 20
TABLE 2.8A: YEAR-WISE PRODUCTION PLAN FOR SECOND FIVE YEARS 20
TABLE 2.9: ULTIMATE PIT DIMENSION 23
TABLE 2.10 PROPOSED MACHINERY DEPLOYMENT 26
TABLE.2.11: TRAFFIC SURVEY LOCATIONS 27
TABLE 2.12: EXISTING TRAFFIC VOLUME 27
TABLE 2.13: ROUGH STONE & GRAVEL HOURLY TRANSPORTATION REQUIREMENT 27
TABLE 2.14: SUMMARY OF TRAFFIC VOLUME 28
TABLE 2.15: WATER REQUIREMENT FOR THE PROJECT 29
TABLE 2.16: PROPOSED MANPOWER DEPLOYMENT 30
TABLE 2.17: EXPECTED TIME SCHEDULE 30
TABLE 3.1: MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING 32
TABLE 3.2: LAND USE / LAND COVER TABLE 10 Km RADIUS 33
TABLE 3.4: NEARBY WATER BODIES FROM THE PROPOSED PROJECT SITE 36
TABLE 3.5: SOIL SAMPLING LOCATIONS 36
TABLE 3.6: METHODOLOGY OF SAMPLING COLLECTION 36
TABLE 3.7: SOIL QUALITY OF THE STUDY AREA 38
TABLE 3.8: WATER SAMPLING LOCATIONS 40
TABLE 3.9: GROUND WATER SAMPLING RESULTS 41
TABLE 3.10: SURFACE WATER SAMPLING RESULTS 42
TABLE 3.11: POST-MONSOON SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS 44

TABLE 3.12: POST-MONSOON SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS 45

TABLE 3.13: RAINFALL DATA 49

TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE 49

TABLE 3.15: METHODOLOGY AND INSTRUMENT USED FOR AAQ ANALYSIS 51

TABLE 3.16: NATIONAL AMBIENT AIR QUALITY STANDARDS 51

TABLE 3.17: AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS 52

TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 7 53

TABLE 3.19: ABSTRACT OF AMBIENT AIR QUALITY DATA 54

TABLE 3.20: FUGITIVE DUST SAMPLE VALUES IN $\mu g/m^3$ 57

TABLE 3.21: DETAILS OF SURFACE NOISE MONITORING LOCATIONS 58

TABLE 3.22: AMBIENT NOISE QUALITY RESULT 60

TABLE NO: 3.69 DESCRIPTION OF MACROPHYTES 83

TABLE NO. 3.70. AMPHIBIANS OBSERVED/RECORDED FROM THE STUDY AREA 83

TABLE NO: 3.71. BASED ON ACTUAL SIGHTING, BASED ON INPUTS FROM LOCALS AND PERUSED FROM SECONDARY DATA 84

TABLE 3.32: DEMOGRAPHIC CHARACTERISTICS – MANAKKADAVU VILLAGE 86

TABLE 3.34: POPULATION DATA OF STUDY AREA 87

TABLE 3.35: WORKERS PROFILE OF STUDY AREA 88

TABLE 3.36: EDUCATIONAL FACILITIES IN THE STUDY AREA 89

TABLE 3.37: MEDICAL FACILITIES IN THE STUDY AREA 90

TABLE 4.1: ESTIMATED EMISSION RATE 96

TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM_{10} 99

TABLE 4.3: INCREMENTAL & RESULTANT GLC OF PM2.5 99

TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO2 99

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NO_X 100

TABLE 4.6: INCREMENTAL & RESULTANT GLC OF FUGITIVE DUST 100

TABLE 4.7: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY 102

TABLE 4.8: PREDICTED NOISE INCREMENTAL VALUES 102

TABLE 4.9: PREDICTED PPV VALUES DUE TO BLASTING 104

TABLE 4.13: RECOMMENDED SPECIES FOR GREENBELT DEVELOPMENT PLAN 108

TABLE 4.14: GREENBELT DEVELOPMENT PLAN 108

TABLE 4.15 IMPACT EVALUATION 109

TABLE 6.1 IMPLEMENTATION SCHEDULE 115
TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC FOR P1 116
TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET 116
TABLE 7.1 RISK ASSESSMENT& CONTROL MEASURES 118
TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION 120
TABLE 7.3: PROPOSED FIRE EXTINGUISHERS AT DIFFERENT LOCATIONS 122
TABLE 7.4: LIST OF QUARRIES WITHIN 500 METER RADIUS 123
TABLE 7.5: SALIENT FEATURES OF PROPOSAL “P1” 123
TABLE 7.6: SALIENT FEATURES OF PROPOSAL “E1” 124
TABLE 7.7: SALIENT FEATURES OF PROPOSAL “E2” 125
TABLE 7.8: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE 126
TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL/TOPSOIL 126
TABLE 7.10: EMISSION ESTIMATION FROM CLUSTER QUARRIES WITHIN 500 METER RADIUS 126
TABLE 7.11: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER 127
TABLE 7.12: PREDICTED NOISE INCREMENTAL VALUES FROM QUARRY 128
TABLE 7.13: NEAREST HABITATION FROM CLUSTER QUARRIES 128
TABLE 7.14: GROUND VIBRATIONS AT CLUSTER QUARRIES 129
TABLE 7.15: SOCIO ECONOMIC BENEFITS FROM CLUSTER QUARRIES 129
TABLE 7.16: EMPLOYMENT BENEFITS FROM CLUSTER QUARRIES 129
TABLE 7.17: GREENBELT DEVELOPMENT BENEFITS FROM CLUSTER QUARRIES 129
TABLE 7.18: ACTION PLAN TO MANAGE PLASTIC WASTE 130
TABLE 8.1 CER – ACTION PLAN 132
TABLE 10.1. PROPOSED CONTROLS FOR LAND ENVIRONMENT 135
TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT 135
TABLE 10.3. PROPOSED CONTROLS FOR WATER ENVIRONMENT 136
TABLE 10.4. PROPOSED CONTROLS FOR AIR ENVIRONMENT 136
TABLE 10.5.: PROPOSED CONTROLS FOR NOISE ENVIRONMENT 137
TABLE 10.6.: PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK – P1 137
TABLE 10.7: PROPOSED GREENBELT ACTIVITIES 138
TABLE 10.8. RECOMMENDED SPECIES FOR THE PLANTSAITON 139
TABLE 10.9. MEDICAL EXAMINATION SCHEDULE 139
TABLE 10.10: EMP BUDGET FOR PROPOSED PROJECT 141

LIST OF FIGURES

FIGURE 1.1 SATELLITE IMAGERY CLUSTER QUARRIES 2

FIGURE 1.2 LOCATION MAP OF THE PROJECT SITE 5

FIGURE 1.3: TOPOSHEET MAP OF THE STUDY AREA 10 KM RADIUS 3

FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS 4

FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA 9

FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA 10

FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE 11

FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS 12

FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS 13

FIGURE 2.7: GROUND WATER LEVEL VARIATIONS OF TIRUPPUR DISTRICT 18

FIGURE 2.8: REGIONAL GEOLOGY MAP 19

FIGURE 2.9: GEOMORPHOLOGY MAP 19

FIGURE 2.10: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS FOR FIRST FIVE YEARS 21

FIGURE 2.10A: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS FOR SECOND FIVE YEARS 22

FIGURE 2.11: CLOSURE PLAN AND SECTIONS 24

FIGURE.2.12: MINERAL TRANSPORTATION ROUTE MAP 28

FIGURE 3.1: PIE DIAGRAM OF LAND USE AND LAND COVER 33

TABLE 3.3: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER 34

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS 35

FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS 35

FIGURE 3.5: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS 37

FIGURE 3.6: SOIL MAP 37

FIGURE 3.8: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS 40

FIGURE 3.9: OPEN WELL CONTOUR MAP (OCT TO DEC 2023) 44

FIGURE 3.10: BOREWELL CONTOUR MAP (OCT TO DEC 2023) 45

FIGURE 3.11: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE 46

FIGURE 3.12: GROUND WATER PROSPECT MAP 46

FIGURE 3.13: WINDROSE DIAGRAM 50

FIGURE 3.15: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS 52

FIGURE 3.16: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ7 54
FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER $PM_{2.5}$ 55
FIGURE 3.18: BAR DIAGRAM OF PARTICULATE MATTER PM_{10} 55
FIGURE 3.19: BAR DIAGRAM OF GASEOUS POLLUTANT SO_2 56
FIGURE 3.20: BAR DIAGRAM OF GASEOUS POLLUTANT NO_x 56
FIGURE 3.21: LINE DIAGRAM OF AVERAGE SPM VALUES 57
FIGURE 3.22: BAR DIAGRAM OF SPM VALUES 57
FIGURE 3.24: NOISE MONITORING STATIONS AROUND 10 KM RADIUS 59
FIGURE 3.25: DAY TIME NOISE LEVELS IN CORE AND BUFFER ZONE 60
FIGURE 3.26: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE 60
FIGURE 4.1: AERMOD TERRAIN MAP 97
FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM_{10} 97
FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM_{25} 97
FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO_X 98
FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF So2 98
FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST 98
FIGURE 4.6: GROUND VIBRATION PREDICTION 104
FIGURE 6.1: PROPOSED ENVIRONMENTAL MONITORING CELL 115
FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT 120
FIGURE 10.1.: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS 140

1.INTRODUCTION

1.0 PREAMBLE

Project History: -

The project proponent Tmt. V. Maheshwari applied for Rough Stone and Gravel Quarry over an extent of 3.00.0Ha in S.F.Nos. 863 (P) Manakkadavu Village, Dharapuram Taluk, Tiruppur District

- Proponent applied for Rough stone and Gravel quarry lease on 26.11.2020.
- Precise area communication letter was issued by the Assistant Director vide Rc.No.1512/Mines/2020, Dated: 23.07.2021.
- The Mining plan has been prepared by the Qualified person and got approval vide Letter Rc.No.1512/Mines/2020, Dated: 03.08.2021.
- The Mining plan has been approved for the quantity of 5,28,150m^3 of Rough stone & 45,968m^3 of Gravel up to the depth of 47m bgl for the period of Ten years.

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries – 1 proposal and 2 Existing quarries forming Cluster Category {Total Extent of the Cluster is 7.60.50Ha}- Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/67510/2021 dated 11.09.2021 and the ToR Obtained vide Lr.No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023
- Based on the ToR Baseline Monitoring study has been carried out for one season i.e., **Oct to Dec 2023** and this EIA/EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

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.

1.1 PURPOSE OF THE REPORT

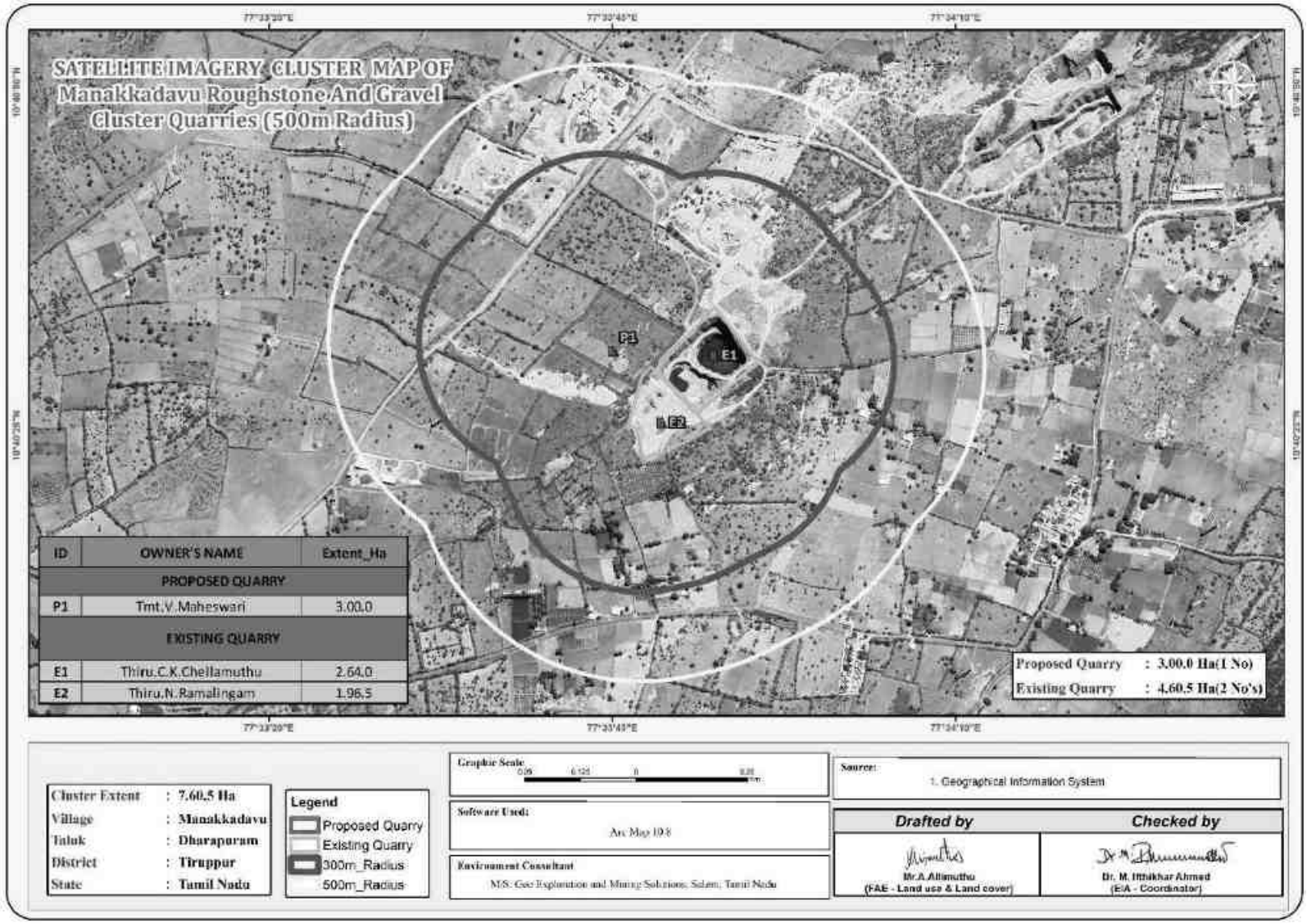
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 1886(E) of 20thApril 2022, Mining Projects are classified under two categories i.e. A (> 250 Ha) and B (≤ 250 Ha), and 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 B1 and appraised by SEAC/ SEIAA as well as for cluster situation.

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

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

FIGURE 1.1 SATELLITE IMAGERY CLUSTER QUARRIES



1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENTS

1.2.1 Identification of Project Proponent

TABLE 1.1: DETAILS OF PROJECT PROPONENT

Name of the Project Proponent	Tmt.V. Maheswari
Address	W/o. Vasudevan, No. 220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram, Tiruppur District – 638 657
Mobile	+91 94432 41410
Email	Vasudevan4252@gmail.com
Status	Individual

1.2.2 Identification of Project

TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT

Name of the Project	Tmt.V. Maheswari Rough Stone and Gravel Quarry	
S.F. No.	863(P)	
Extent	3.00.0 ha	
Village Taluk and District	Manakkadavu Village, Dharapuram Taluk, Tiruppur District.	
Land Type	Patta land	
Land Ownership	It is a Patta lands. Jointly Registered in the name of the applicant (Tmt.V. Maheshwari) & Thiru.R.Vasudevan, vide Patta Nos. 1411. The applicant has obtained consent from the other pattadhars	
Toposheet No	58 - F/10	
Latitude between	**10° 46' 28.65"N to 10° 40' 35.70"N**	
Longitude between	**77° 33' 40.78"E to 77° 33' 49.94"E**	
Elevation of the area	290m(Max) AMSL	
Lease period	10 Years	
Mining Plan period	10 years	
Proposed Depth of Mining	47m Bgl	
	Rough Stone in m^3	Gravel m^3
Geological Resources	13,18,275	58,590
Mineable Reserves	5,28,150	45,968
Year wise Production (Ten Years)	5,28,150	45,968
Peak Production	62,150	19,584
Ultimate Pit Dimension	171m(L) x 138m(W) x 47m(D) (BGL)	
Water Level in the region	68m – 73m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is exhibits plain topography. The area has gentle sloping towards North-eastern side. The altitude of the area is 290m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation. Massive Charnockite is found after 2m Gravel which is clearly inferred from the existing quarry pits.	
Machinery proposed	Jack Hammer	6 Nos
	Compressor	2 Nos
	Excavator with Bucket and Rock Breaker	2 Nos
	Tippers	4 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	

Proposed Manpower Deployment	35 Nos	
Project Cost	Rs.57,30,000/-	
EMP Cost	Rs. 7,60,000/-	
Total Project Cost	Rs.64,90,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Amaravathi River	4.7km – NW
	Nallathangal Odai	4.4 km - SE
	Paruthiyur Velar Lake	5.0km - SE
	Nallathangal Odai Reservoir	5.5 km - NE
Greenbelt Development Plan	Proposed to plant 1500Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	3.0 KLD	
Nearest Habitation	740m – South East	
Nearest Reserve Forest	Dalavaipattinam RF – 9.29 km - NW	
Nearest Wild Life Sanctuary	Kodaikanal Wildlife Sanctuary – 32.0 km - South	

Source: Approved Mining & Land Documents.

1.3 BRIEF DESCRIPTION OF THE PROJECT

1.3.1 Nature and Size of the Project

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

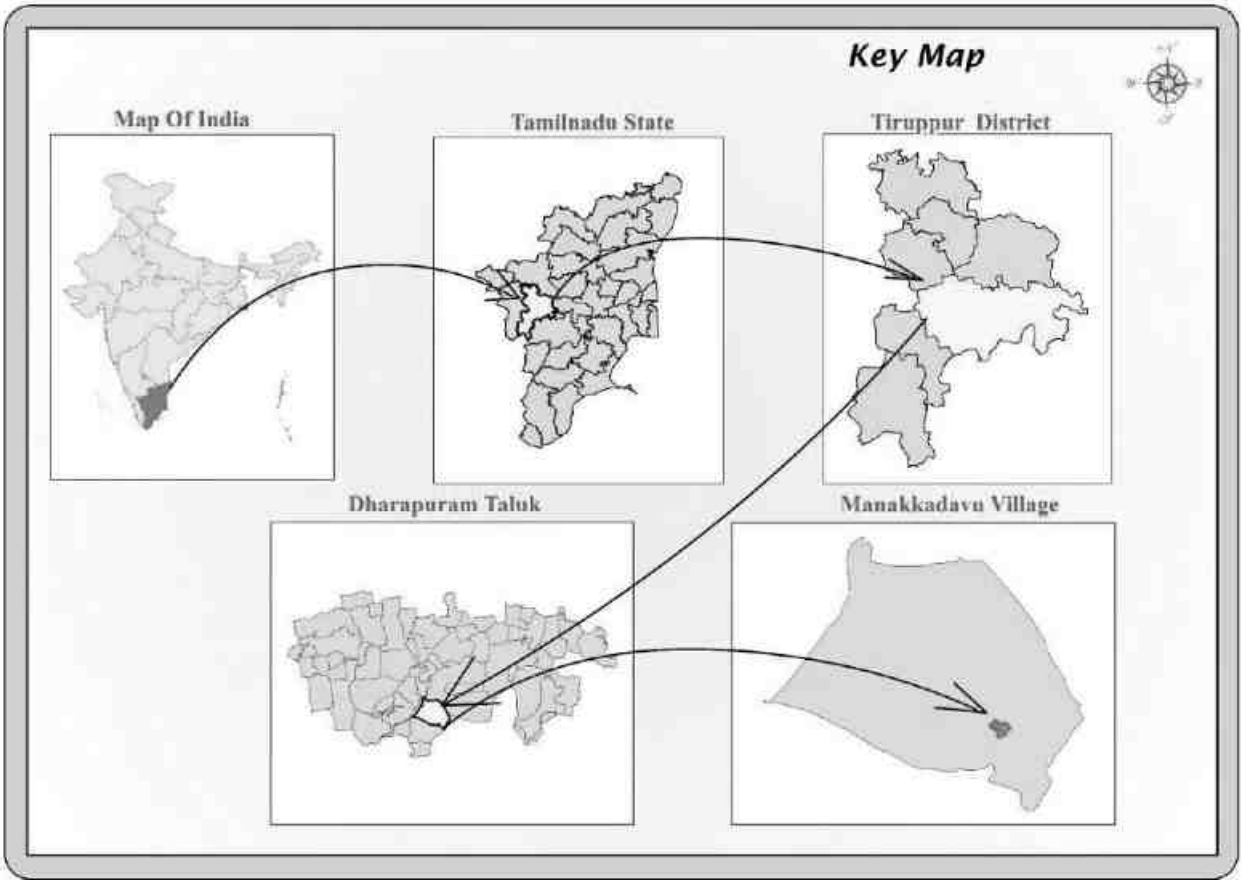
The peak production of Rough stone is 62,150m^3 and Gravel is 19,584 m^3 maximum in a year for rough stone is 207m^3 per day/ 17 Tippers per day considering 12m^3 per load. The depth of the mining is 47m bgl.

1.3.2 Location of the Project

- The project site is located in Manakkadavu Village, Dharapuram Taluk, Tiruppur District.
- The lease applied area is located about 51.0 km Southeast side of Tiruppur, 8.0 km Southeastern side of Dharapuram town and 2km Eastern side of Manakkadavu Village.

	47km		6km		2km	
Tiruppur	⟶	Dharapuram	⟶	Manakkadavu	⟶	Lease applied area
	Southeast		Southeast		East	

FIGURE 1.2 LOCATION MAP OF THE PROJECT SITE



Source: Survey of India Toposheet 58-F/10

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

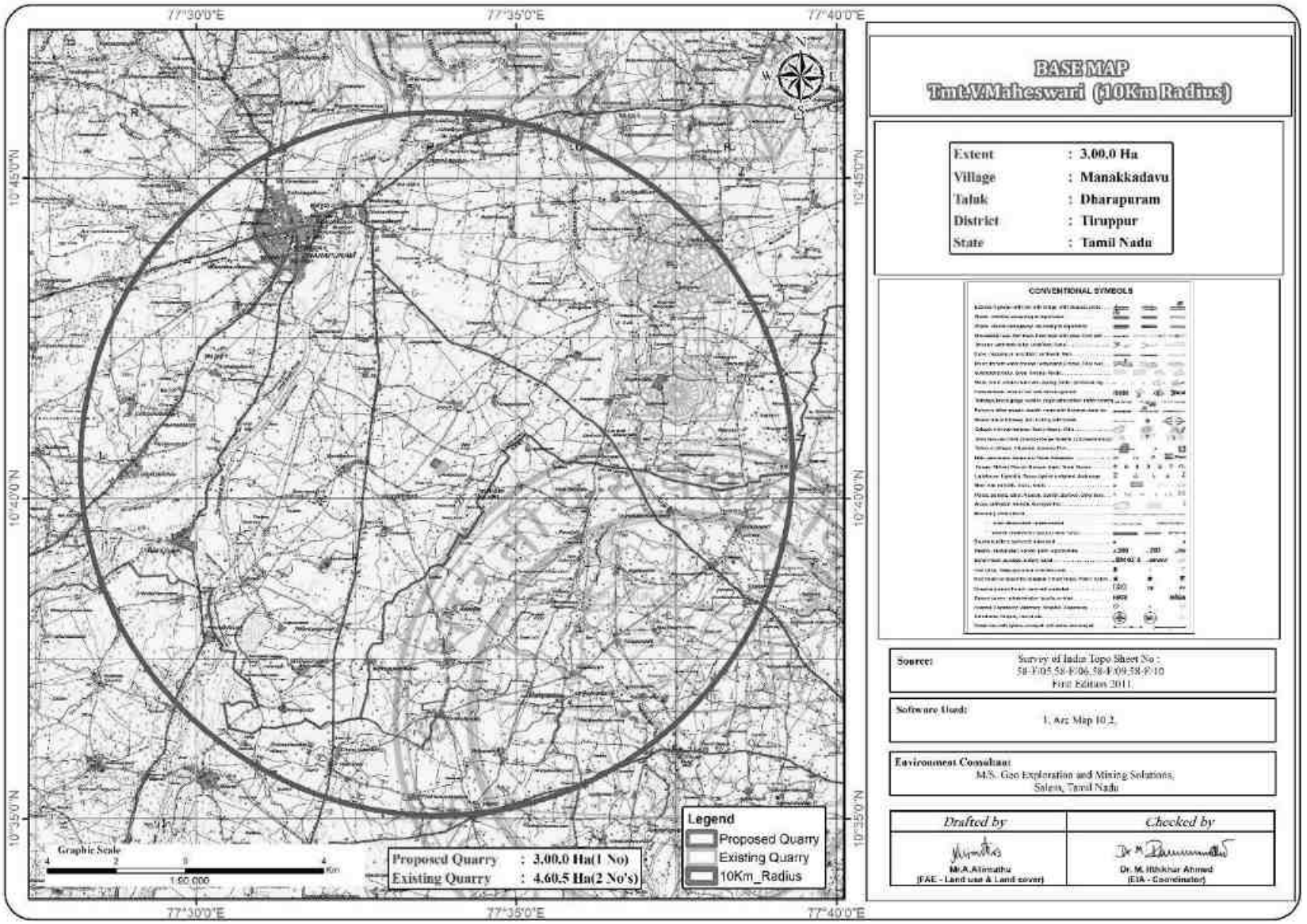
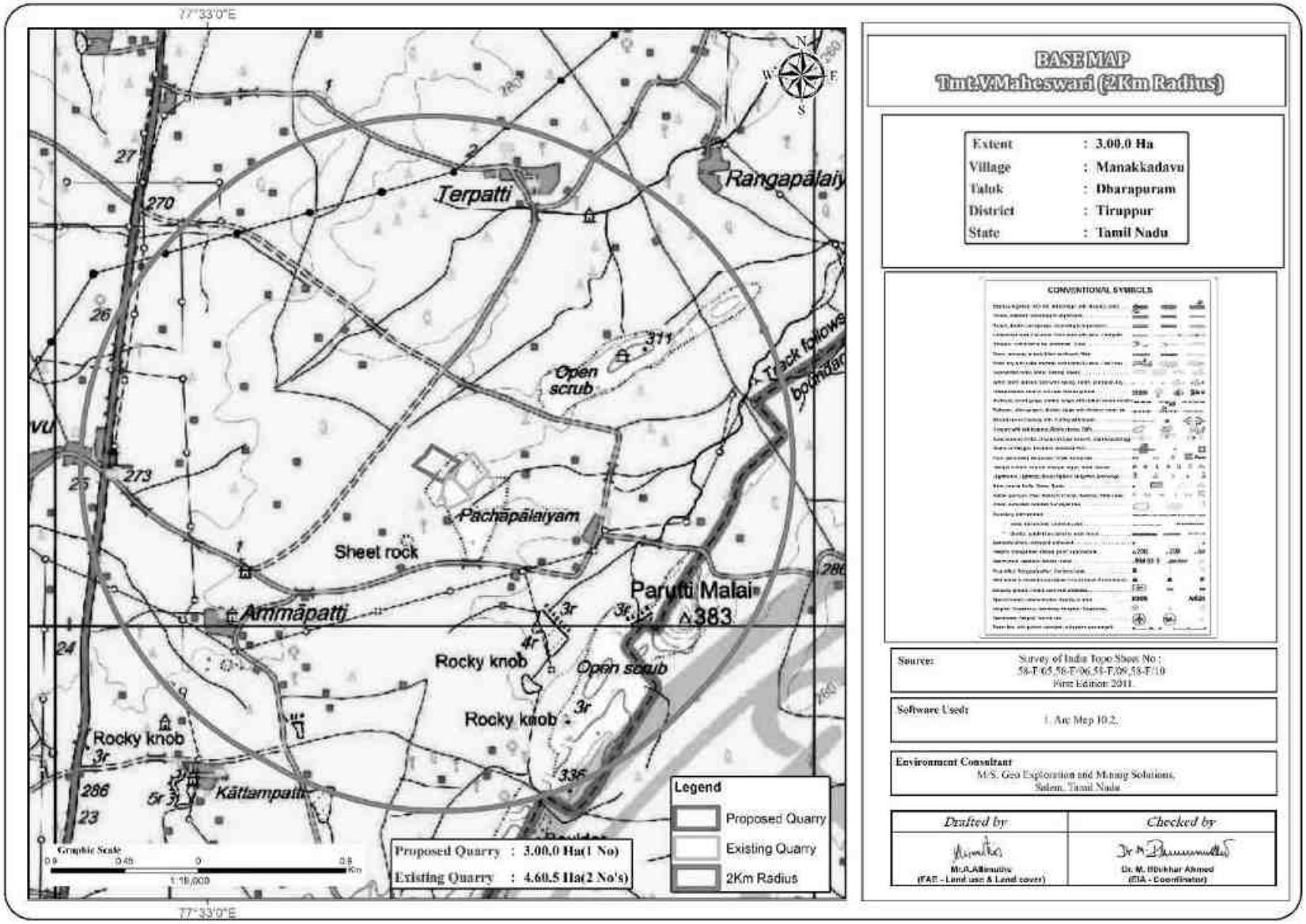


FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS



1.4 ENVIRONMENTAL CLEARANCE

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

- Screening,
- Scoping
- Public consultation &
- Appraisal

SCREENING:

- Proponent applied for Rough stone and Gravel quarry lease on 26.11.2020.
- Precise area communication letter was issued by the Assistant Director vide Rc.No.1512/Mines/2020, Dated: 23.07.2021.
- The Mining plan has been prepared by the Qualified person and got approval vide Letter Rc.No.1512/Mines/2020, Dated: 03.08.2021.
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/67510/2021 dated 11.09.2021

SCOPING:

- The proposal was placed in 345th SEAC meeting held on 10.01.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 590th SEIAA meeting held on 09.02.2023, issued ToR vide Lr.No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 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 is submitted along with this Draft EIA/ EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

APPRAISAL –

Appraisal is the detailed scrutiny by the State Expert Appraisal Committee (SEAC) of the application and other documents like the final EIA & EMP Report, outcome of the Public Consultations including Public Hearing Proceedings, submitted by the proponent to the regulatory authority concerned for grant of environmental clearance.

1.5 TERMS OF REFERENCE (ToR)

- The ToR was issued by the SEIAA vide ToR Obtained vide Lr.No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023**.** The Details of the ToR Compliance is given in the Page No. I- XV

1.6 POST ENVIRONMENT CLEARANCE MONITORING

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

1.7 GENERIC STRUCTURE OF EIA DOCUMENT

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the "Environmental Impact Assessment Guidance Manual for Mining of Minerals" published by MoEF & CC.

1.8 THE SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the Post Monsoon season (Oct to Dec 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 1.3: ENVIRONMENT ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM_{10}, PM $_{2.5}$, SO_2, NO_2	Continuous 24-hourly samples twice a week for three months at 7 locations (1 Core & 6 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 6 locations – 2 Surface water and 4 Ground water samples; once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was collected from the Forest department.
5	Noise levels	Noise levels in dB(A)	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 analysis done for the risk associated with mining.

Source: Field Monitoring Data

1.8.1 Regulatory Compliance & Applicable Laws/Regulations for all Proposed Quarries

- Application for Quarrying Lease as per Tamil Nadu Minor Mineral Concession Rules, 1959.
- Obtained Precise Area Communication Letter as per Tamil Nadu Minor Mineral Concession Rules, 1959 for Preparation of Mining Plan and obtaining Environmental Clearance.
- The Mining Plan has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959.
- ToR Obtained vide Lr.No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023

****

2. PROJECT DESCRIPTION

2.0 GENERAL

The Proposed Rough Stone and Gravel Quarry require Environmental Clearance. There are 1 proposed and 2 existing quarries forming a cluster; calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 7.60.50 ha.

As the extent of cluster are more than 5 ha, the proposal falls under B1 Category as per the Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018, and requirement for EIA, EMP and Public Consultation for obtaining Environmental Clearance.

2.1 DESCRIPTION OF THE PROJECT

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from this project. Method of mining is 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 project site is located in Manakkadavu Village, Dharapuram Taluk, Tiruppur District.
- The lease applied area is located about 51.0 km Southeast side of Tiruppur, 8.0 km Southeastern side of Dharapuram town and 2km Eastern side of Manakkadavu Village.

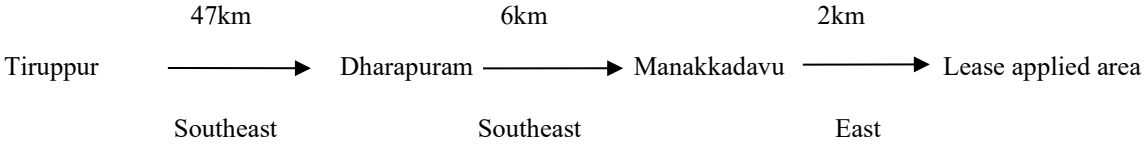


TABLE 2.1: SITE CONNECTIVITY

Nearest Roadway	NH 209 – Coimbatore – Dindigul- 22.0 km – South west SH -83 Dharapuram – Palani– 2.0km –West
Nearest Village	Manakkadavu- 1.77m-West
Nearest Town	Dharapuram– 8.0 km-NW
Nearest Railway Station	Palani– 26.0 km – South West
Nearest Airport	Coimbatore– 77.0 km –North West
Seaport	Kochi– 164.0 km – South West

Source: Survey of India Toposheet

TABLE 2.2: CO-ORDINATES – PROJECT BOUNDARY

Corner Nos.	Latitude	Longitude
1	10° 40' 31.83"N	77° 33' 40.78"E
2	10° 40' 32.47"N	77° 33' 41.53"E
3	10° 40' 33.05"N	77° 33' 42.06"E
4	10° 40' 33.54"N	77° 33' 42.92"E

5	10° 40' 35.70"N	77° 33' 44.31"E
6	10° 40' 35.65"N	77° 33' 44.45"E
7	10° 40' 32.36"N	77° 33' 49.94"E
8	10° 40' 28.65"N	77° 33' 46.48"E
Datum: UTM-WGS84		

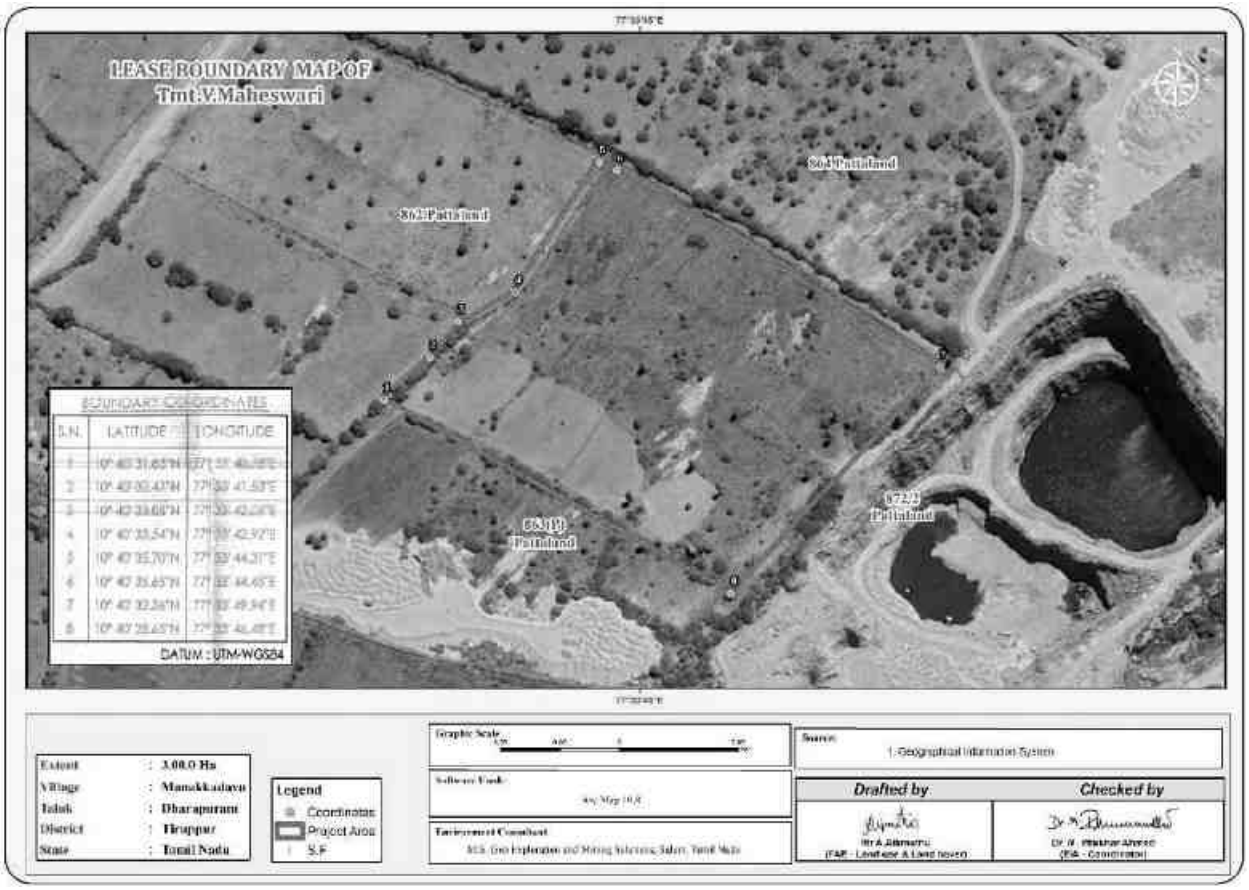
Source: Approved Mining Plan

FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA

Project Site

Fencing at Project site

FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA



Source: Google Earth imagery

FIGURE 2.3: QUARRY LEASE PLAN / SURFACE PLAN

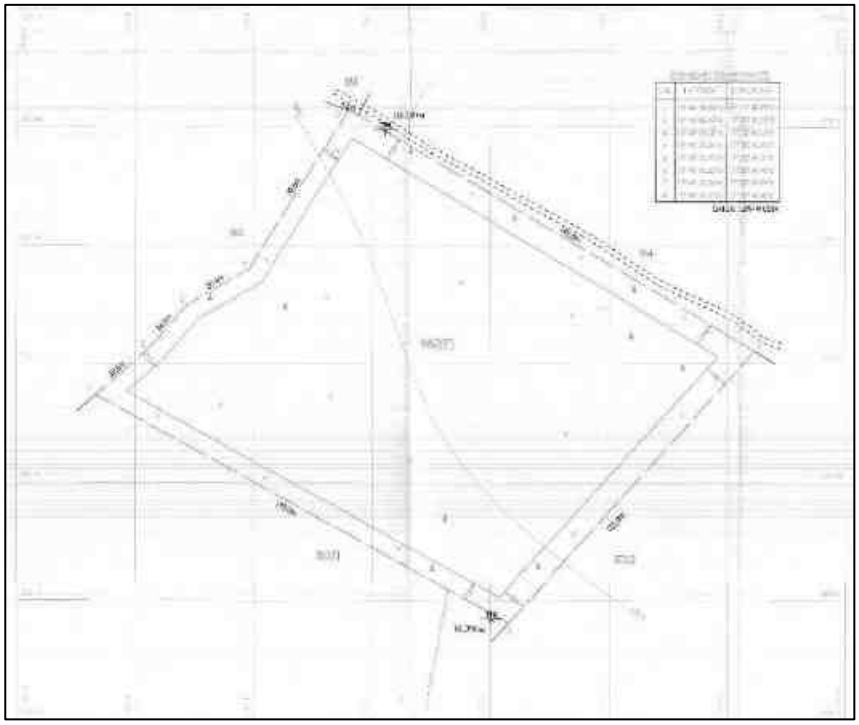


FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE

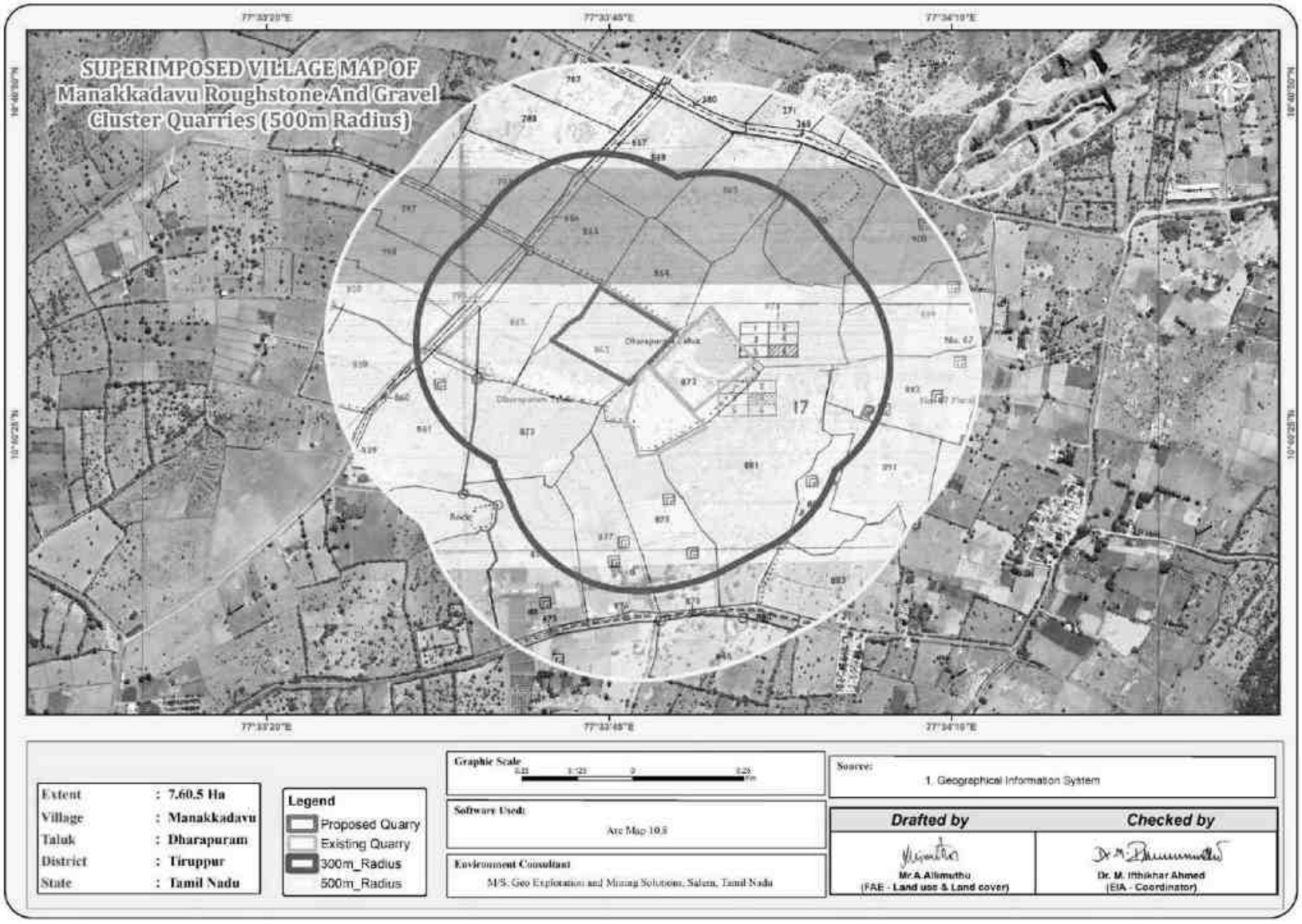


FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS

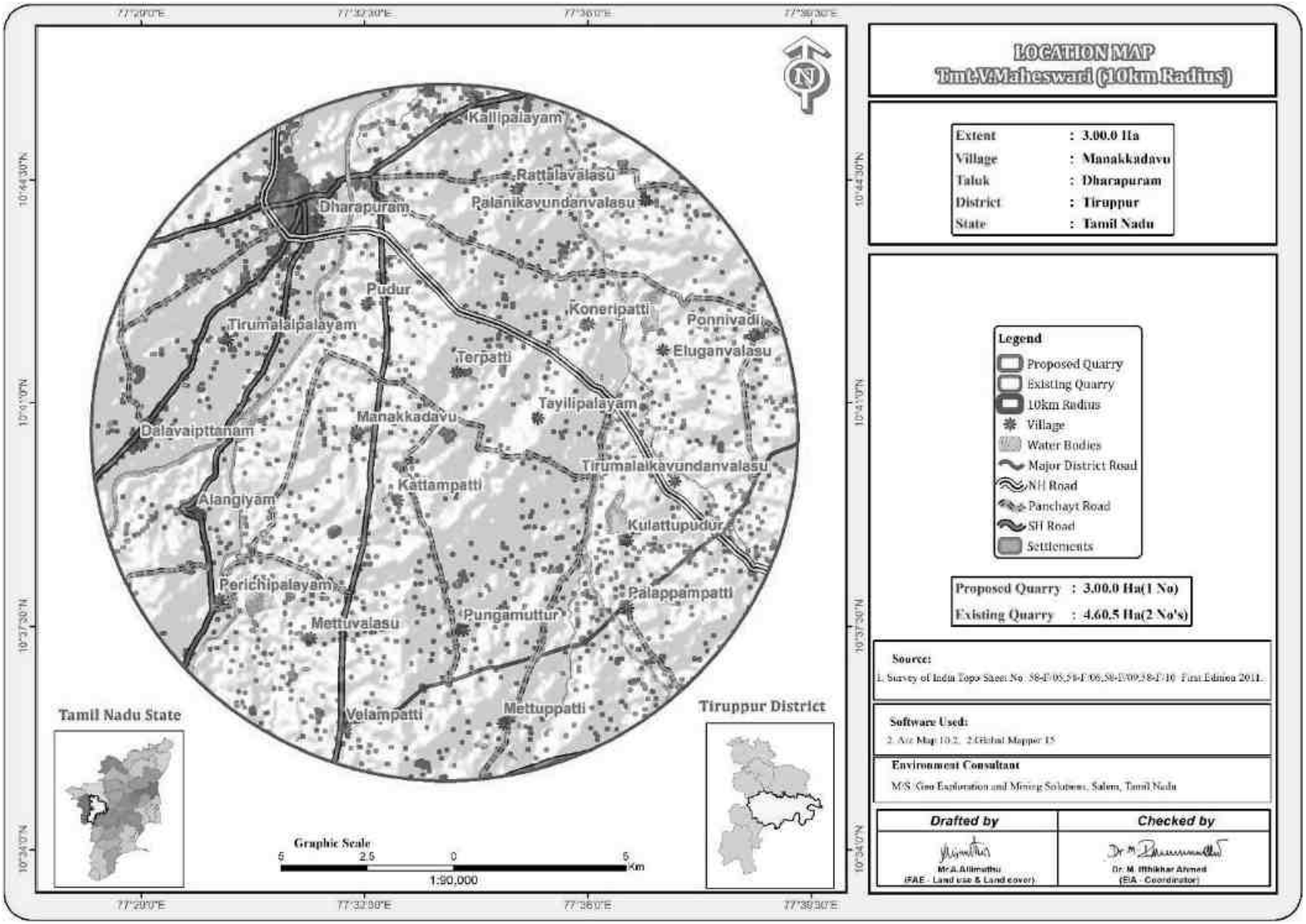
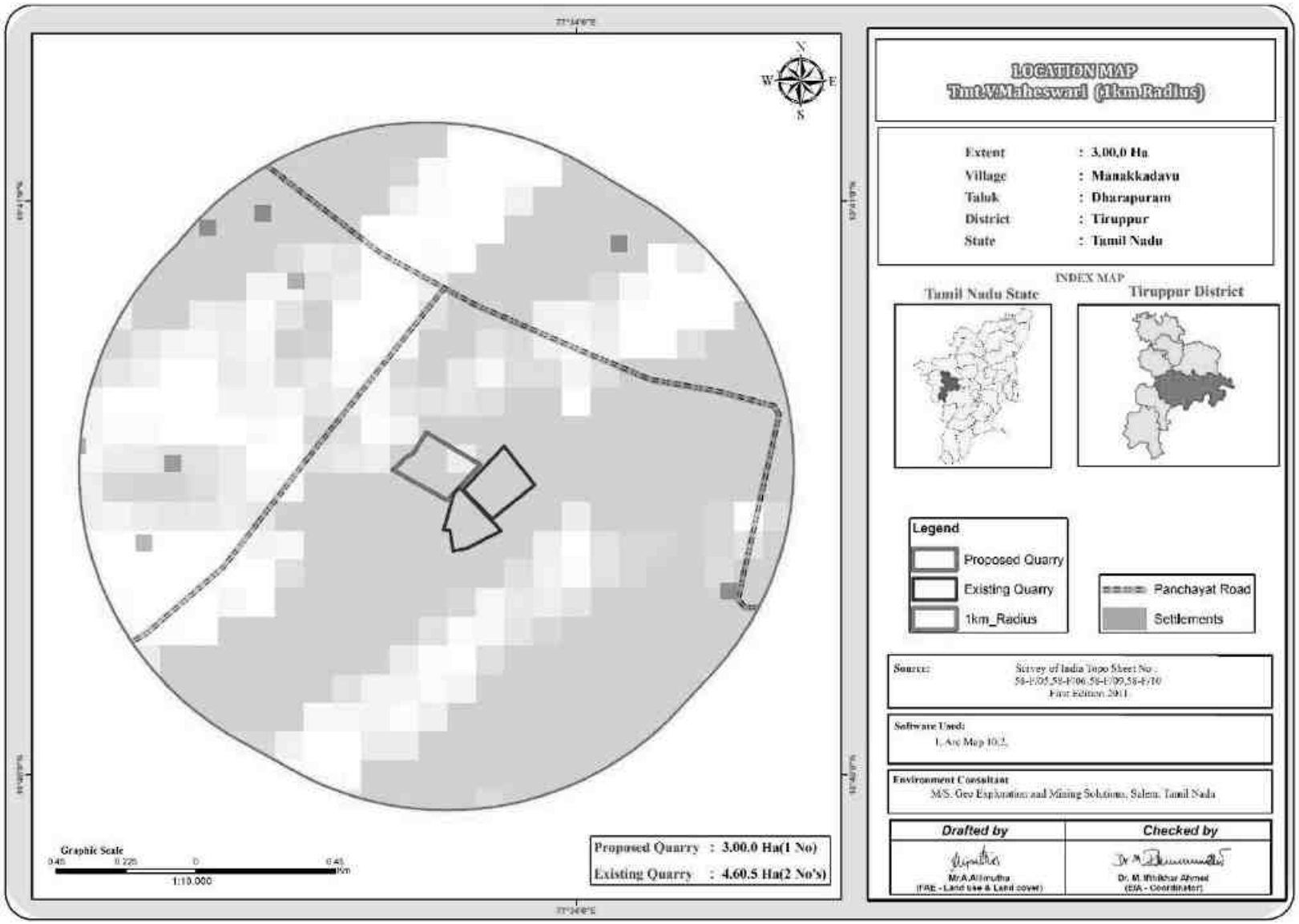


FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS



2.2.1 Project Area

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

TABLE 2.3: LAND USE PATTERN

Description	Present area (Ha)	Area at the end of this quarrying period (Ha)
Quarrying Pit	Nil	2.39.5
Infrastructure	Nil	0.01.0
Roads	Nil	0.02.0
Green Belt	Nil	0.25.0
Unutilized Area	3.00.0	0.32.5
Grand Total	**3.00.0**	**3.00.0**

Source: Approved Mining Plan

2.2.2 Size or Magnitude of Operation

TABLE 2.4: RESOURCES AND RESERVES

PARTICULARS	DETAILS	
	Rough Stone in m^3	Gravel in m^3 (3 year)
Geological Resources	13,18,275	58,590
Mineable Reserves	5,28,150	45,968
Production for first five-year plan period	2,76,400	45,968
Production for Second five-year plan period	2,51,750	-
Peak Production	62,150	19,584
Mining Plan Period / Lease Applied Period	10 Years	
Number of Working Days	300 Days	
Production per day	207	65
No of Lorry loads ($12m^3$ per load)	17	5
Total Depth of Mining	47m below ground level	

Source: Approved mining plan.

2.3 GEOLOGY

2.3.1 Regional Geology

Tiruppur 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 –

I. Charnockite Group represented by Charnockite, Pyroxene Granulite and Magnetite Quartzite,

II. Peninsular Gneissic Complex (II) comprising hornblende-biotite gneiss,

III. Basic intrusive include Pyroxinite / Dunite

IV. Younger intrusive comprising, Nepheline-Syenite, Pink Granite, Pegmatite and Quartz veins and

V. Quaternary sediments of Kankar and soil.

Stratigraphy of the area

Age	Group	Lithology
Holocene		Block cotton soil/clay±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 Gneissic Complex (II) PGC (II)	Pink Granite Gneiss Hornblende Biotite gneiss
Archaean	Charnockite Group	Charnockite (Unclassified) Pyroxene Granulite Banded Magnetite Quartzite

Tiruppur District is predominantly occupied by hornblende Biotite gneisses of PGC (II) with enclaves of Magnetite Quartzite, Pyroxene Granulite and Charnockite. The area exposes several bands of Pyroxene Granulite which is medium grained, medium to dark grey in colour and stand out prominently in the gneissic country generally parallel to regional foliation. Charnockite is coarse grained, massive, many places it is foliated, grey colored and greasy and exposed as boulder outcrops and small knolls. It is well exposed in Central, Western and Southern parts of the Tiruppur District. The general strike of foliation varies from ENE-WSW, E-W with dipping towards NW and N respectively.

Hornblende-Biotite gneiss is well foliated, medium to coarse grained, pale grey and exposed as sheets and small knolls. Pink Granite gneiss occurs as thin bands and lensoidal bodies. It is a medium grained rock composed of alternating bands of mafic (mainly of biotite and hornblende) and felsic (Feldspar and Quartz) minerals. It is well recognized in Avinasi area.

Basic intrusives such as pyroxinite/dunite occurs as Outcrop and lensoidal bodies in the country rock and mostly concordant to the regional foliation. Many basic intrusive are reported in south and south-east of Tiruppur town. The trend of these bodies is east-west.

Nepheline syenite is a leucocratic, coarse-grained rock and composed mainly of Feldspar with Nepheline and shows pitted appearance due to removal of Nepleline. This alkaline rock is available in and around Sivanmalai area only. Acid intrusives comprising pink granite, pegmatite and quartz veins are traversed country rocks in micro (cm wide-meter long) to meso-scale (few meters wide and several meter long) extend. Granite is exposed around 9 km SW of Avanashi. Small scale pegmatite and quartz veins are noticed almost in all the rock types. Acid intrusives are overlain by sediments of Quaternary age, represented by Kankar and black cotton soil with Gypsum. Most of the area is covered by brown and red brown soil. Some part of the area covered with black cotton soil contains Gypsum as lumps. Black cotton soil covers south-western part of the district.

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

https://cdn.s3waas.gov.in/s3d1f255a373a3cef72e03aa9d980c7eca/uploads/2019/05/2019052585.pdf

2.3.2 Local Geology: -

The lease applied area is a Plain terrain. The area has gentle sloping towards Northeastern side and altitude of the area is 290m (max) above from Mean Sea level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite which is clearly inferred from the existing quarry pit.

Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale of the Charnockite body is N40°E – S40°W with dipping towards SE70º.

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

AGE		FORMATION
Recent	-	Quaternary formation (Gravel)
---------Unconformity----------		
Archaean	-	Charnockite
		Peninsular Gneiss complex

2.3.3 Hydrogeology

Tiruppur District is underlain by crystalline metamorphic complex in the western parts of district and sedimentary tract in eastern side. An area of 4551 Sq.km is covered by crystalline rocks (63%) and 2671 Sq.km is covered by sediments (37%). The general geological sequence of formation is given below:

Quaternary - Laterites, Sands and Clays

Tertiary - Sandstone, Gravels and Clays

Cretaceous - Limestone, Calcareous Sandstone and Clay unconformity.

Archaean - Charnockites, Gneisses, Granites, Dolerites and Pegmatite

- The major part of the area is covered by metamorphic crystalline rocks of charnockite, granitic gneiss of Archaean age intruded by dolerite dykes and pegmatite veins. These rocks are highly metamorphosed and have been subjected to very severe folding, crushing and faulting.
- Ground Water occurs under the phreatic condition and wherever there are deep seated fractures, it occurs under semi-confined to confined conditions.
- Occurrence of Ground Water in hard rock depends upon the intensity and depth of weathering, fractures and fissures present in the rocks.
- Granites and gneisses yield moderately compared to the yield in Charnockites.
- Depth of well in hard rock generally ranges between 8 and 15m below ground level.
- Generally, yield in open wells ranges from 30 to 250m^3 /day and in bore well between 260 and 430 m^3 /day. The weathered thickness varies from 2.5 m to 42m in general there are 3 to 5 fracture zones within 100 m and 1 to 4 fracture zones between 100 and 200 m.

The Cretaceous formation is represented by Arenaceous Lime stone, Calcareous sand - stone and marl. The Tertiary formation is argillaceous comprising of Silty clay stones, argillaceous Lime stone.

The Quaternary deposits represented by the river deposits of Ponnaiyar and Varahanadhi spread over as patches in Tiruppur District. The alluvium consists of unconsolidated sands, gravelly sands, clays and clayey sands. The thickness of the sands ranges between 15 and 25m in the alluvial formation which also form potential aquifers. In some areas, sand stone of tertiary formation are the potential groundwater reservoirs.

Aquifer Systems:

Occurrence and storage of groundwater depend upon three factors viz., Geology, Topography and rainfall in the form of precipitation. Apart from Geology, wide variation in topographic profile and intensity of rainfall constitutes the prime factors of groundwater recharge. Aquifers are part of the more complex hydro geological system and the behaviour of the entire system cannot be interpreted easily. In hard rock terrain the occurrence of Ground Water is limited to top weathered, fissured and fractured zone which extends to maximum 30 m on an average it is about 10-15 m in Tiruppur District.

In Sedimentary formations, the presence of primary inter granular porosity enhances the transmitting capacity of groundwater where the yield will be appreciable. The sedimentary area which occupies the eastern part of the district along the coastal tract is more favourable for groundwater recharge. Ground Water occurs both in semi confined and confined conditions. A brief description of occurrence of groundwater in each formation is furnished below.

Alluvial Formations

In the river alluvium groundwater occurs under water table condition. The maximum thickness is 37m and the average thickness of the aquifer is approximately 12m. These formations are porous and permeable which have good water bearing zones.

Tertiary Cuddalore sandstone

Tertiary formations are represented by Cuddalore Sandstone and characterised as fluvial to brakish marine deposits. Predominantly this formation is divided into Lower and Upper Cuddalore formations. In the Upper Cuddalore formations the groundwater occurs in semi confined conditions, whereas in the Lower Cuddalore the groundwater occurs in confined condition with good groundwater potential.

Cretaceous Formations

Groundwater occurring in the lens shape in the sandy clay lenses and fine sand is underlain by white and black clay beds which constitute phreatic aquifer depth which ranges 10m to 15m below ground level. Phreatic aquifer in Limestone is potential due to the presence of Oolitic Limestone.

Hard Rock Formations

Groundwater occurs under water table conditions but the intensity of weathering, joint, fracture and its development are much less in other type of rocks when compared to gneissic formation. The groundwater potential is low, when compared with the gneissic formations.

Granitic Gneiss

Groundwater occurs under water table conditions in weathered, jointed and fractural formations. The pore space developed in the weathered mantle acts as shallow granular aquifers and forms the potential water bearing and yielding zones water table is shallow in canal and tank irrigation regions and it is somewhat deeper in other regions.

Charnockite

Groundwater occurs under water table conditions but the intensity of weathering, joint, fracture and its development are much less when compared to gneissic formations. The groundwater potential is low, when compared with the gneissic formations.

Aquifer Parameters

The thickness of aquifer in this district is highly erratic and varies between 15m to 40m below ground level. The inter granular 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 2.5: RANGE OF AQUIFER PARAMETERS

Name	Sp. Capacity (lpm/d)	Specific Yield (%)	T (m^2/d)	K (m/day)	Yield of wells (lps)
Alluvium	2.08	7.2	98	19.7	2.5
Tertiary	78-173	1.4-3.5	46-134	16-33	2-3.3
Cretaceous	33-782	0.3-2.56	33-782	10-66	1.1-3.5
Crystalline	27-224	0.8-2.5	16-60	5-20	1-2

Source: http://nwm.gov.in/sites/default/files/Notes%20on%20Trippur%20District.pdf

The Ground Water levels from the 38 number of observation wells of TWAD have been analyzed for Post-Monsoon and Pre-Monsoon.

FIGURE 2.7: GROUND WATER LEVEL VARIATIONS OF TIRUPPUR DISTRICT

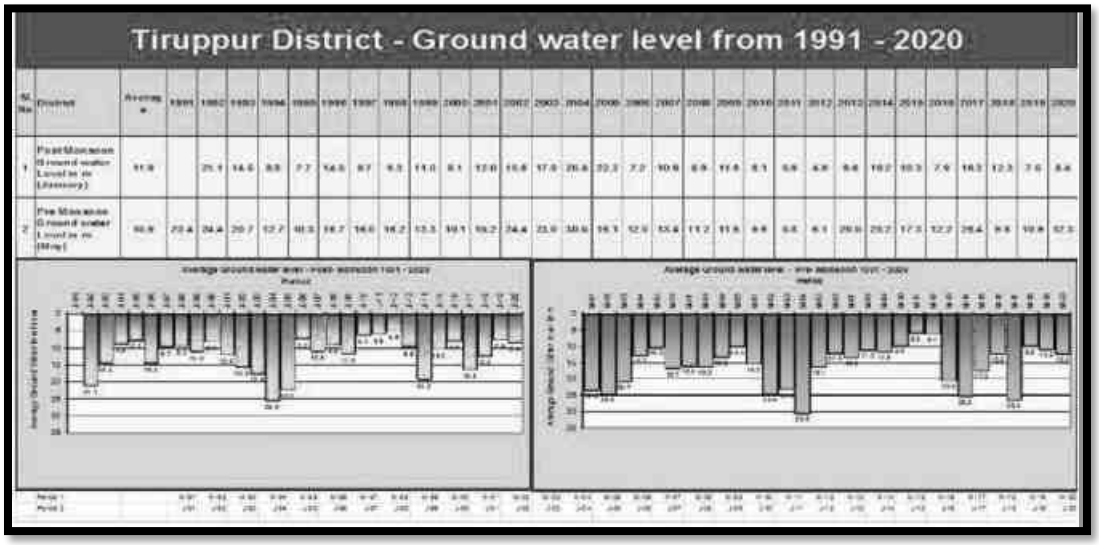


TABLE 2.6: GROUND WATER LEVEL VARIATIONS OF TIRUPPUR DISTRICT

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
16.3	26.4	12.4	9.8	7.6	10.9	8.4	12.3	7.1	10.6	11.9	8.8

Source: https://www.twadboard.tn.gov.in/content/tiruppur

FIGURE 2.8: REGIONAL GEOLOGY MAP

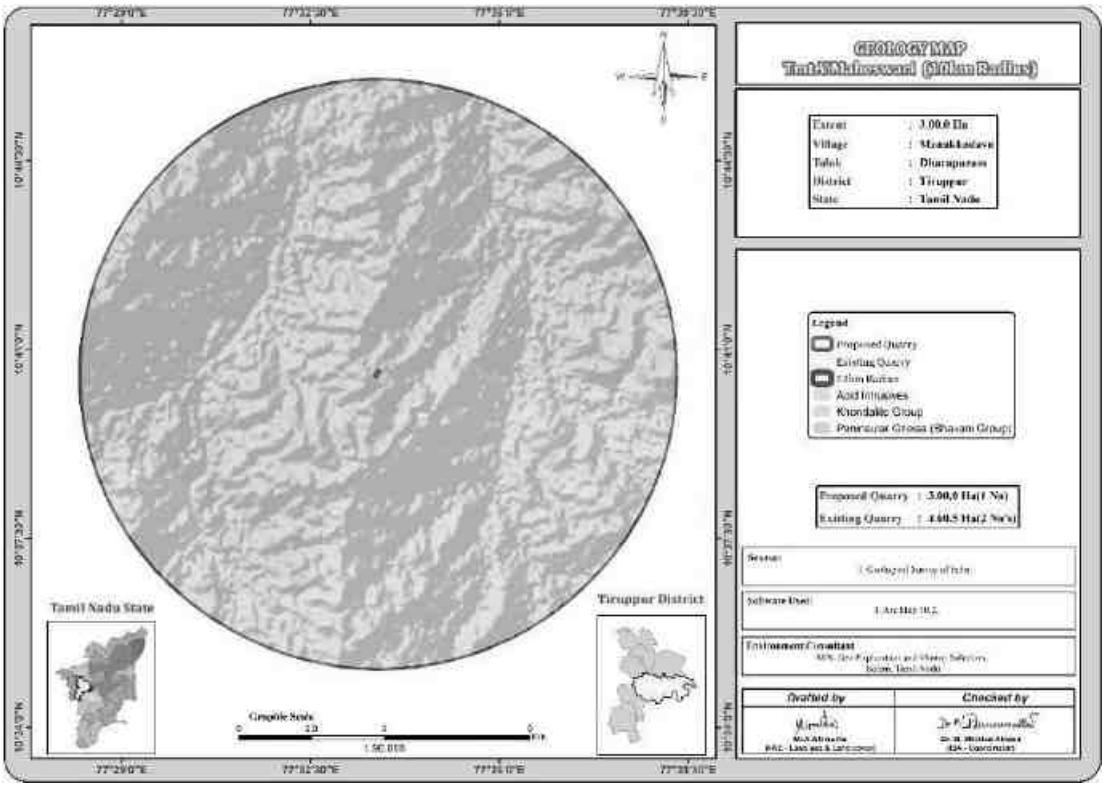
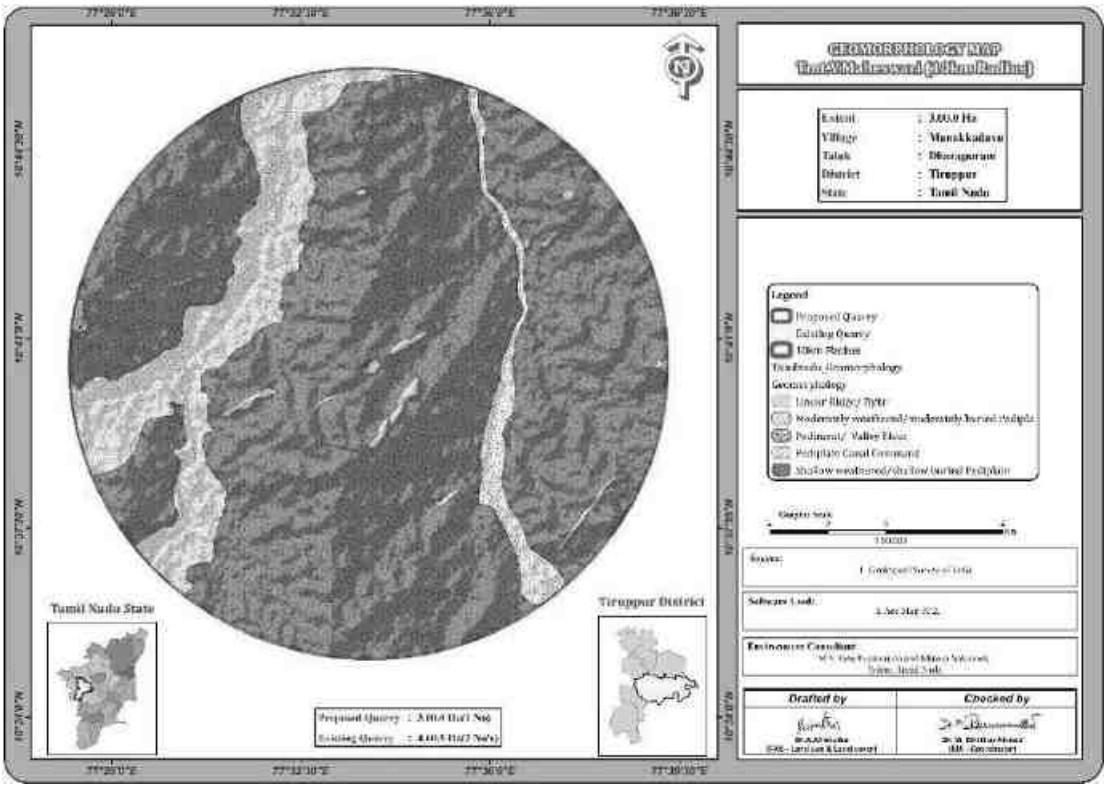


FIGURE 2.9: GEOMORPHOLOGY MAP



2.4 RESOURCES AND RESERVES

The Resources and Reserves of Rough Stone and Gravel were calculated based on Cross-Section Method by plotting sections to cover the maximum lease area. Based on the availability of Geological Resources the Mineable Reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m (Safety Barrier all around the applied area) and safety distance as per precise area communication letter and deducting the locked up reserves during bench formation (Also called as Bench Loss) and the Mineable Reserves is calculated considering there is no waste / overburden / side burden (100% Recovery Anticipated).

TABLE 2.7: RESOURCES AND RESERVES

Description	Rough Stone in m^3	Gravel in m^3 (3 year)
Geological Resource in m^3	13,18,275	58,590
Mineable Resource in m^3	5,28,150	45,968
Year wise production for Ten-year plan period	5,28,150	45,968
Peak Production	62,150	19,584

Source: Approved Mining Plan

TABLE 2.8: YEAR-WISE PRODUCTION PLAN FOR FIRST FIVE YEARS

Year	Rough Stone in m^3	Gravel in m^3
I	54,000	14,688
II	53,750	11,696
III	52,800	19,584
IV	53,700	-
V	62,150	-
Total	**2,76,400**	**45,968**

TABLE 2.8A: YEAR-WISE PRODUCTION PLAN FOR SECOND FIVE YEARS

Year	Rough Stone in m^3
I	52,500
II	52,250
III	52,300
IV	46,050
V	48,650
Total	**2,51,750**

Source: Approved Mining Plan

Disposal of Waste

The overburden in the form of Gravel is about 45,968 m^3 up to depth 2m. The quarried-out Gravel will be directly loaded into tippers for the filling and levelling of low-lying areas.

FIGURE 2.10: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS FOR FIRST FIVE YEARS

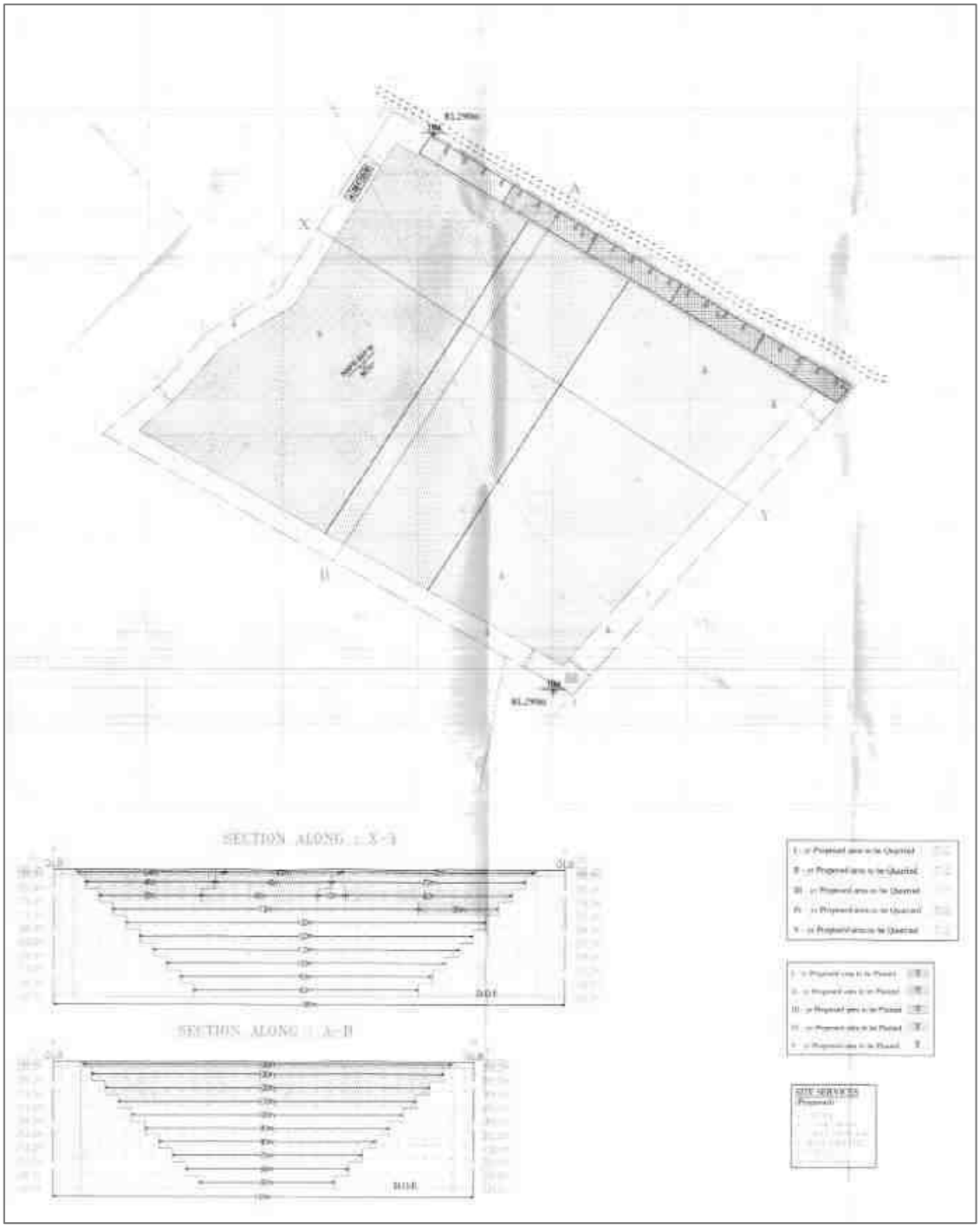
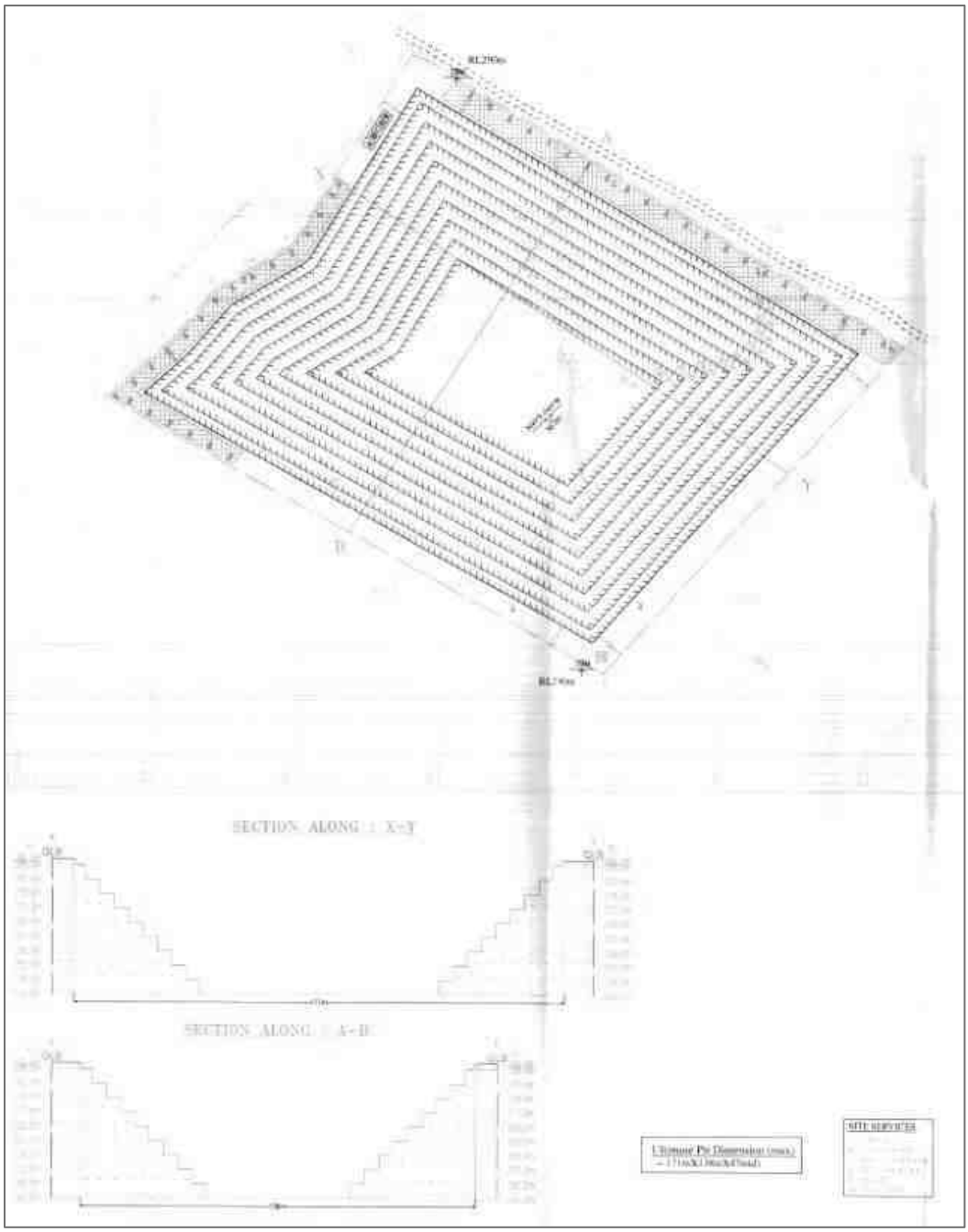


FIGURE 2.10A: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS FOR SECOND FIVE YEARS

Conceptual Mining Plan/ Final Mine Closure Plan



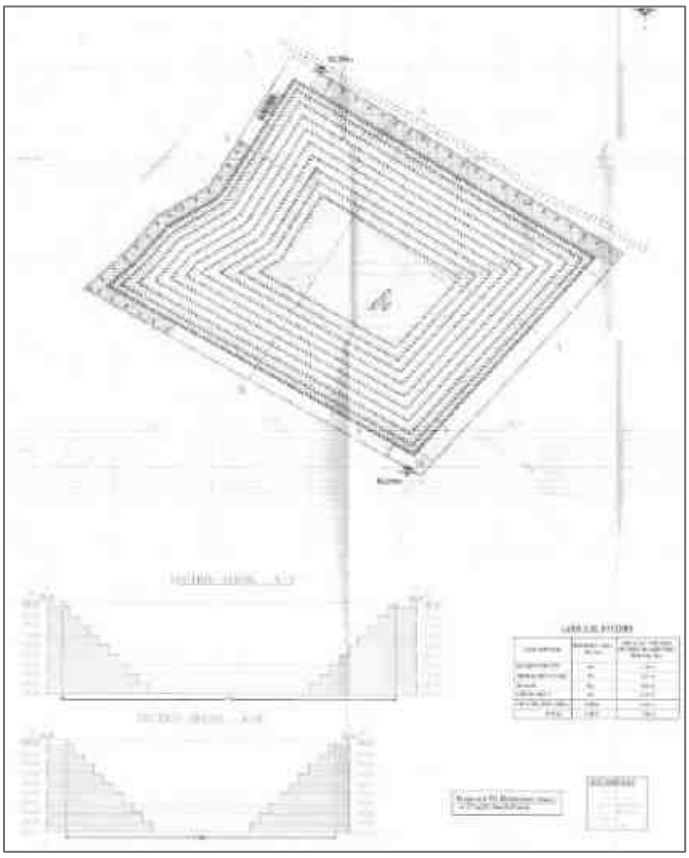
The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

TABLE 2.9: ULTIMATE PIT DIMENSION

	Length (Max) (m)	Width (Max) (m)	Depth (Max)
First Five years Proposed Pit Dimension	171	138	17m bgl
Ultimate Pit Dimension	171	138	47m bgl

Source: Approved Mining Plan

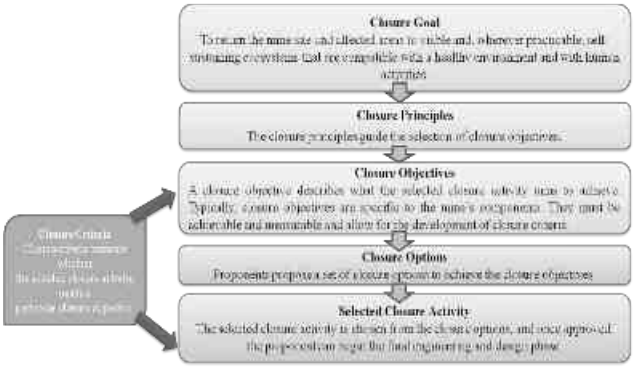
FIGURE 2.11: CLOSURE PLAN AND SECTIONS



Source: Approved Mining Plan

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

Closure Objectives –



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

Closure Planning & Options Considerations in Mine Design –

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

2.5 METHOD OF MINING

Opencast Mechanized Mining Method is proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. Bench slope will be maintained as 60^0.

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 Excavator attached with rock breaker/ bucket with tipper combination will be involved for the excavation/breaking of Rough stone after blasting. 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.

It is recommended to obtain necessary statutory permission from the Department of Geology and Mining for Using Heavy Earth Moving Machineries, Blasting and appointment of Mines Manager etc.,

2.5.1 Drilling & Blasting Parameters

Drilling will be carried out using Jack hammer and compressor, the depth of the hole will be maximum 1.5m Drilling & Blasting will be carried out as per parameters given below: -

Spacing	–	1.2m
Burden	–	1.0 m
Depth of hole	–	1.5 m
Charge per hole	–	0.50 – 0.75kg
Powder factor	–	6.0 tonnes/kg
Diameter of hole	–	32 mm
Peak production Capacity	=	207m^3 of Rough stone per day
Spacing X Burden X Depth	=	1.2m X 1.0m X 1.5m = 1.8m^3
	=	1.8m^3 X 2.6 (Bulk Density) = 4.6Ts per hole

hence for the peak production per day of 207m^3 (538Ts) = 180 Nos of holes to be drilled per day

Explosives per hole = ½ kg hence 90 kg of Explosives will be utilized maximum considering the peak production

Type of Explosives to be used –

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

Storage of Explosives –

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

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

2.5.2 Extent of Mechanization

TABLE 2.10 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	6	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	2	300	Diesel Drive
4	Tippers	4	20 Tonnes	Diesel Drive

Source: Approved Mining Plan

2.6 GENERAL FEATURES

2.6.1 Existing Infrastructures

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

2.6.2 Drainage Pattern

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

2.6.3 Traffic Density

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through

Traffic density measurements were performed at two locations

1. Panchayat Road_Pachapalayam Road
2. Panchayat Road_Manakadavu Road

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

TABLE.2.11: TRAFFIC SURVEY LOCATIONS

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Pachapalayam Road	1.4Km_NW	Panchayat Road
TS2	Manakadavu Road	1.7Km_SW	Panchayat Road

Source: On-site monitoring by GEMS FAE & TM

TABLE 2.12: EXISTING TRAFFIC VOLUME

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	90	270	80	80	150	75	425
TS2	160	480	110	110	180	90	680

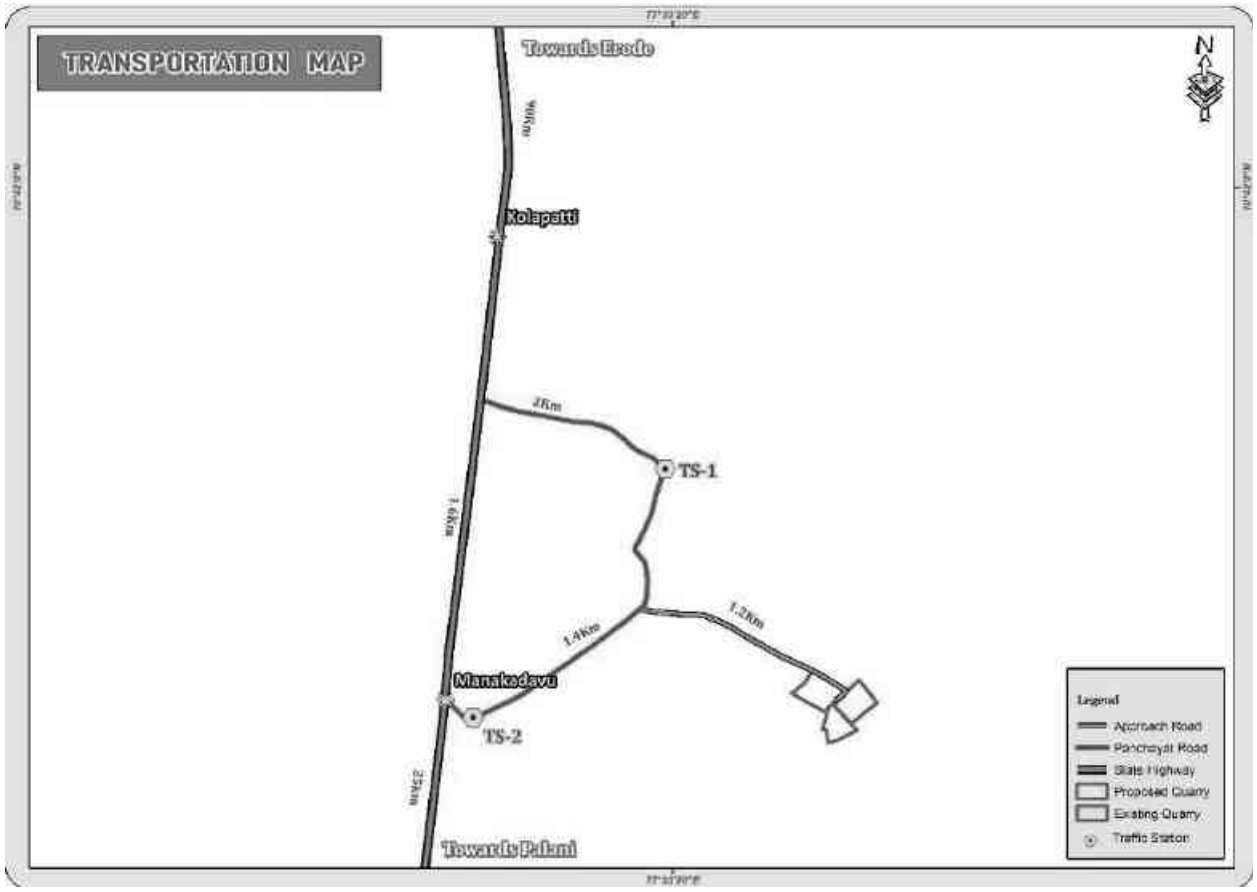
Source: On-site monitoring by GEMS FAE & TM

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

TABLE 2.13: ROUGH STONE & GRAVEL HOURLY TRANSPORTATION REQUIREMENT

Transportation of Rough Stone & Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
20 tonnes	22	66

FIGURE.2.12: MINERAL TRANSPORTATION ROUTE MAP



*Transportation of Rough Stone from quarry is to crusher located in North Eastern direction of the quarry.

TABLE 2.14: SUMMARY OF TRAFFIC VOLUME

Route	Existing Traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960guidelines
Panchayat Road_Pachapalayam Road	425	66	491	1200
Panchayat Road_Manakadavu Road	680	66	746	1500

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

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

2.6.4 Mineral Beneficiation and Processing

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

2.7 PROJECT REQUIREMENT

2.7.1 Water Source & Requirement

Detail of water requirements in KLD as given below:

TABLE 2.15: WATER REQUIREMENT FOR THE PROJECT

Purpose	Quantity	Source
Dust Suppression	0.7KLD	From the existing pit or from the water vendors
Green Belt	1.5KLD	From the existing pit or from the water vendors
Sanitation & Drinking	0.8KLD	From the existing pit or from the water vendors.
Total	**3.0 KLD**	

Source: Prefeasibility report

2.7.2 Power and Other Infrastructure Requirement

Power is not required for the mining operation; the mining operation will be carried out using Diesel Generator and Earth moving machineries using diesel. 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 by project proponent.

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

2.7.3 Fuel Requirement

One Excavator will excavate 25m^3 of Broken up Rough stone per hour and 60m^3 of Gravel per hour.

Peak production of Rough stone = 207m^3

Peak production of Gravel = 65m^3

Type of machinery	Working hours	Average Diesel consumption/ Hour	Quantity of Diesel in Ltrs
Working hours of Excavator (Aprx)	207m^3/20m^3=10hrs (Rough stone)	18 Ltrs	180
	65 m^3/60m^3 = 1 Hrs	18 Ltrs	18
Compressor	Working hours per day 2Hrs	8 Ltrs	16
Tippers, Motor pumps to drain water	Occasionally		20
Total Diesel Consumption			**234**

The Maximum diesel consumption is around 234Ltrs per day considering the peak production.

2.7.4 Project Cost

The Environmental Management plan has been prepared considering the mode of working, Safety of the employees and Monitoring periods the **Total cost is Rs.57,30,000/-.**

2.8 EMPLOYMENT REQUIREMENT:

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

TABLE 2.16: PROPOSED MANPOWER DEPLOYMENT

Designation	No of persons
Mines Manager/Mines Foreman	1
Mate/Blaster	1
Jack hammer operator	12
Tipper Driver& Excavator Operator	6
Labour & Helper	6
Cleaner & Co-operator	8
Security	1
Total	**35**

Source: Approved Mining Plan

2.9 PROJECT IMPLEMENTATION SCHEDULE

The mining operation will commence after the grant of Environmental Clearance, Consent to operate (CTO), Execution of Lease Deed and Obtaining permission from the DGMS (Notice of Opening).

TABLE 2.17: EXPECTED TIME SCHEDULE

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

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

3. DESCRIPTION OF ENVIRONMENT

3.0 GENERAL

The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering October to December 2023 with CPCB guidelines for the following attributes –

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

Environmental data has been collected with reference to cluster quarries by EHS 360 labs Pvt Ltd, – An accredited by ISO/IEC 17025:2017 (NABL) Laboratory

Study Area

An area of 10 km radius (aerial distance) from the periphery of the cluster is considered for EIA study. The study area has been divided into two zones viz **core zone** and **buffer zone**.

- Core zone is considered as cluster area
- 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 Post Monsoon i.e., October to December 2023.

Study Methodology

- The project area was surveyed in detail with the help of Total Station Survey instruments and pillars were marked. 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)
- Soil samples were collected and analysed for relevant physio-chemical characteristics in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development.
- Ground water samples were collected from the existing bore wells, Surface water was collected from water bodies in the buffer zone and analysed as per CPCB Guidelines.
- An onsite meteorological station was setup in cluster area, to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period.
- Air quality Data were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM_{10} and SO_2, NO_X with gaseous attachments & Fine Dust Samplers (FDS) for $PM_{2.5}$ and other parameters as per NAAQ norms and analysed for primary air pollutants to work out the existing status of air quality.
- The Noise level measurements were also made at various locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.
- Baseline biological studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area.

- Socio-Economic survey was conducted at village and household level in the study area to understand the present socio-economic conditions and assess the extent of impact due to the proposed mining project.

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

TABLE 3.1: MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data 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	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourlies twice a week (Oct to Dec 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 – Forest Working Plan
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

Source: On-site monitoring/sampling by EHS 360 labs Private Limited, in association with GEMS

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

3.1 LAND ENVIRONMENT

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

3.1.1 Land Use/ Land Cover

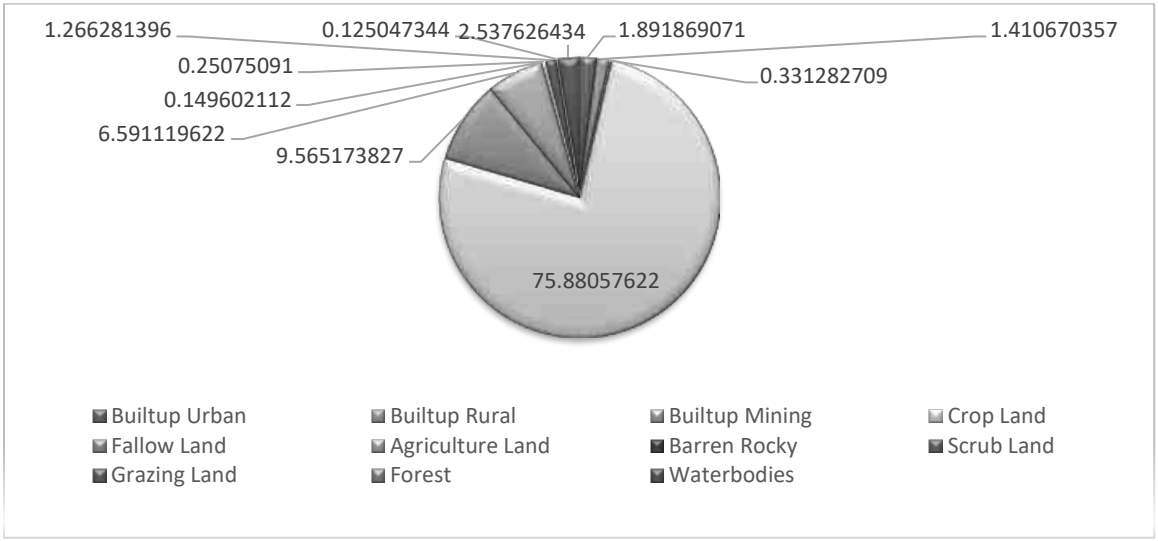
A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover.

TABLE 3.2: LAND USE / LAND COVER TABLE 10 Km RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
BUILTUP			
1	Builtup Urban	608.55	1.89
2	Builtup Rural	453.76	1.41
3	Builtup Mining	106.56	0.33
AGRICULTURAL LAND			
4	Crop Land	24408.06	75.88
5	Fallow Land	3076.77	9.57
6	Agriculture Land	2120.13	6.59
BARREN/WASTE LANDS			
7	Barren Rocky	48.12	0.15
8	Scrub Land	80.66	0.25
9	Grazing Land	407.32	1.27
FOREST			
10	Forest	40.22	0.13
WETLANDS/ WATER BODIES			
11	Waterbodies	816.26	2.54
TOTAL		32166.42	100.00

Source: Survey of India Toposheet and Landsat Satellite Imagery

FIGURE 3.1: PIE DIAGRAM OF LAND USE AND LAND COVER



From the above table and pie diagram, it is inferred that the majority of the land in the study area is crop land - 75.88 % followed by Built-up Urban – 9.56%, Agriculture land – 6.59%, and Water bodies 2.53%.

The total mining area within the study area is 106.56 ha i.e., 0.33%. The cluster area of 7.60.50 ha contributes about 7.13% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.1.2 Topography

The lease applied area is exhibits plain topography. The area has gentle sloping towards North Eastern side. The altitude of the area is 290m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation. Massive Charnockite is found after 2m (Gravel) which is clearly inferred from the nearby existing quarry pits.

3.1.3 Drainage Pattern of the Area

The drainage pattern of the area is dendritic – sub dendritic. Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. There are no streams, canals or water bodies crossing within the project area.

3.1.4 Seismic Sensitivity

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

3.1.5 Environmental Features in the Study Area

There is no Wildlife Sanctuaries, National Park and Archaeological monuments within project 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 proposed mine lease area i.e., 10 km radius, are given in the below Table 3.3.

TABLE 3.3: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER

Sl.No	Sensitive Ecological Features	Name	Arial Distance in km from Cluster
1	National Park / Wild life Sanctuaries	Kodaikanal Wildlife Sanctuary	32.0 km - South
2	Reserve Forest	Dalavaipattinam RF	9.29 km – North West
3	Tiger Reserve/ Elephant Reserve/ Biosphere Reserve	None	Nil within 10km Radius
4	Critically Polluted Areas	Coimbatore - SIDCO Industrial Estate	70km – North West
5	Mangroves	None	Nil within 10km Radius
6	Mountains/Hills	None	Nil within 10km Radius
7	Notified Archaeological Sites	None	Nil within 10km Radius
8	Industries/ Thermal Power Plants	None	Nil within 10km Radius
9	Defence Installation	None	Nil within 10km Radius

Source: Survey of India Toposheet

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS

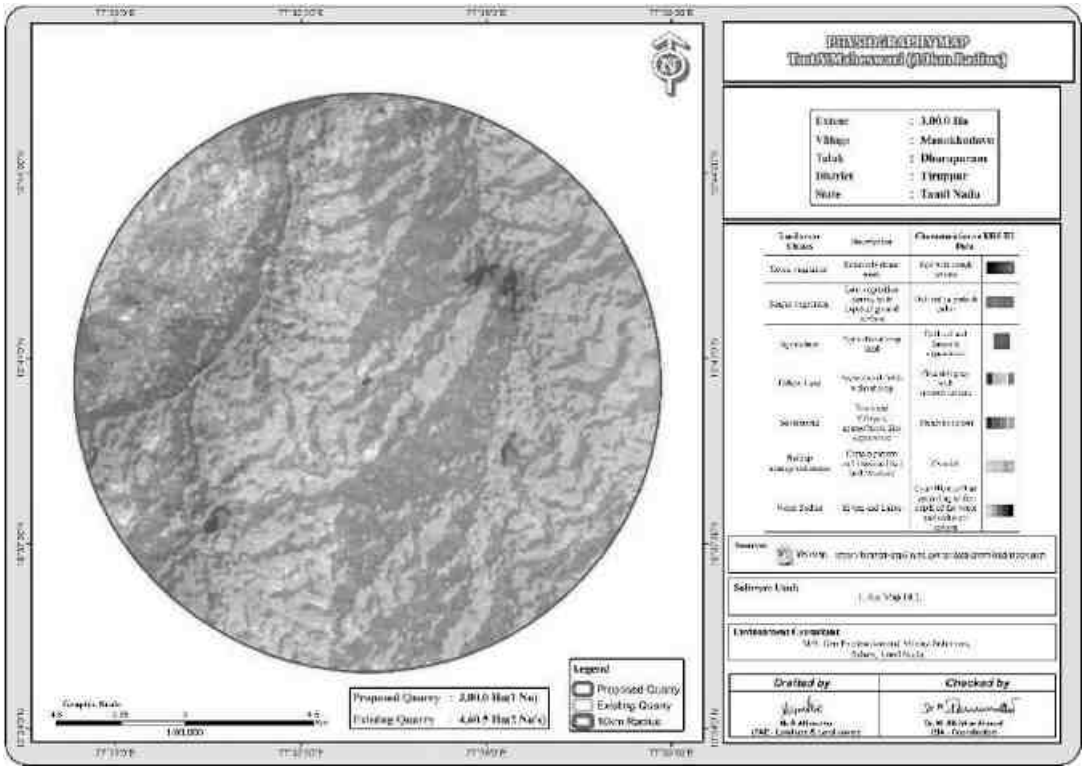


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS

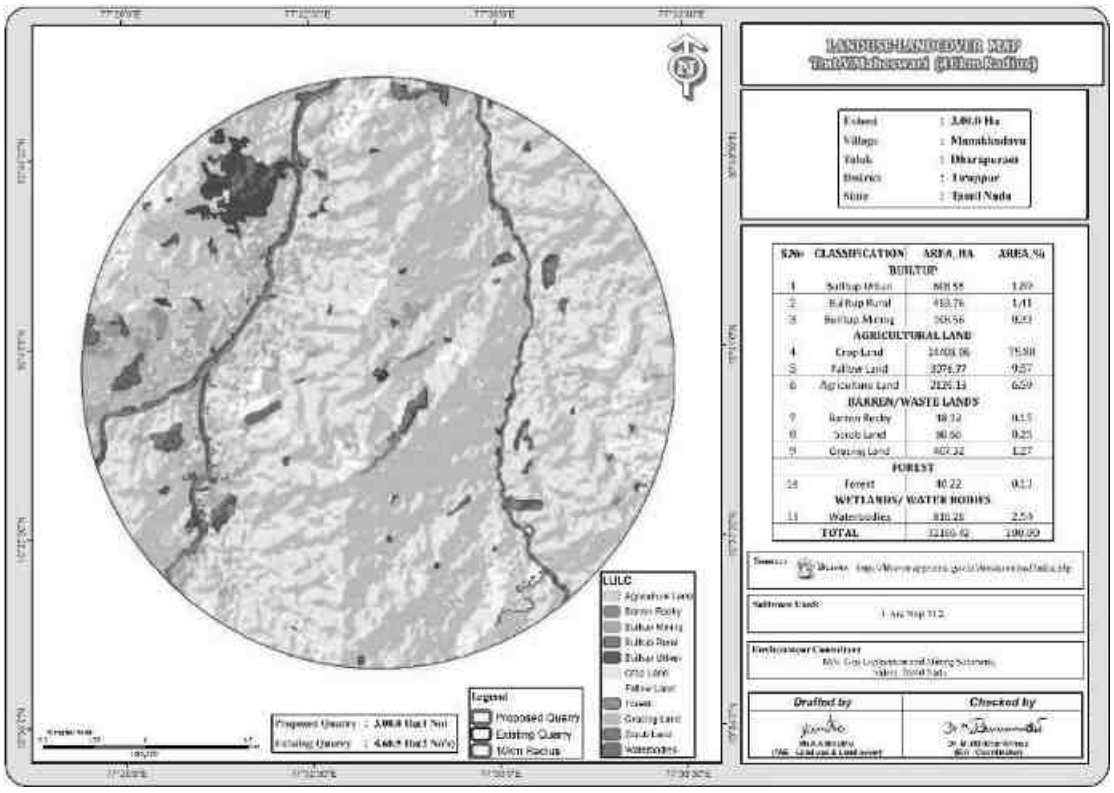


TABLE 3.4: NEARBY WATER BODIES FROM THE PROPOSED PROJECT SITE

Sl.No	NAME	DISTANCE & DIRECTION
1	Amaravathi River	4.7km – NW
2	Nallathangal Odai	4.4 km - SE
3	Paruthiyur Velar Lake	5.0km - SE
4	Nallathangal Odai Reservoir	5.5 km - NE

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 3.5 and Figure 3.5.

The objective of the soil sampling is -

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

TABLE 3.5: SOIL SAMPLING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	S-1	Core Zone	Project Area	10°40'30.62"N 77°33'44.23"E
2	S-2	Manakadavu	2.5km West	10°40'17.48"N 77°32'22.40"E
3	S-3	Pungamuthur	5.5km South	10°37'25.40"N 77°34'3.61"E
4	S-4	Elugamvalasu	6.3km NE	10°41'44.42"N 77°37'3.32"E
5	S-5	Achiyur Pudur	4.0km NW	10°42'30.50"N 77°32'35.16"E
6	S-6	Paruthiyur	4.5km SE	10°39'26.38"N 77°35'57.07"E

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

Methodology –

For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the project site representing various land use conditions. The samples were collected by auger boring into the soil up to 90-cm depth. Six (6) locations were selected for soil sampling on the basis of soil types, vegetative cover, industrial & residential activities including infrastructure facilities, which would accord an overall idea of the soil characteristics. The samples were analysed for physical and chemical characteristics. The samples were sent to laboratory for analysis. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology in respect are given in below Table 3.6.

TABLE 3.6: 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 EHS360 Labs 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, kjeldahl Nitrogen, Phosphorous and Potassium. The standard classifications of soil are presented below in Figure 3.5 and the physico-chemical caracteristics of the Soil & Test Results in Table 3.7.

FIGURE 3.5: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS

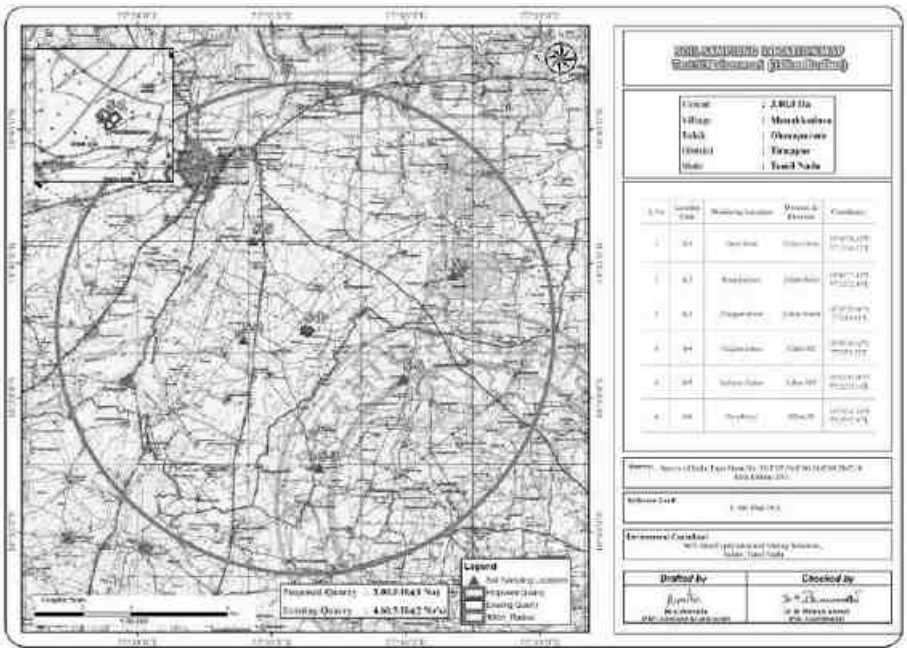


FIGURE 3.6: SOIL MAP

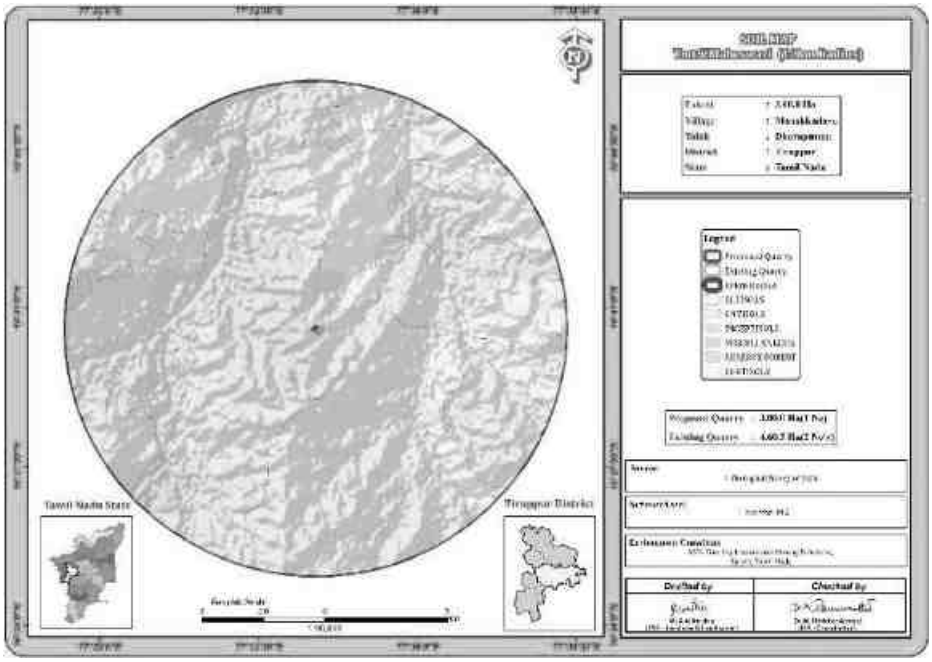


TABLE 3.7: SOIL QUALITY OF THE STUDY AREA

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	S-1 Project Area	S-2 Near Project Area	S-3 Karugampalayam	S-4 Naduvelampalayam	S-5 Pallapalayam	S-6 Kadampadi
1	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	-	8.61	8.55	8.17	8.06	8.03	8.05
2	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	µS/cm	453	401	350	542	256	400
3	Water Holding Capacity	By Gravimetric Method	%	45.8	47.7	46.1	47.2	44.2	45.5
4	Bulk Density	By Cylindrical Method	g/cc	1.06	1.05	1.01	1.05	1.10	1.05
5	Porosity	By Gravimetric Method	%	46.5	44.6	47.3	46.6	42.0	46.1
6	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	mg/kg	41.2	70	25.1	81.2	42.6	41.5
7	Magnesium as Mg	GLCS/SOP/S/009	mg/kg	28.4	60.5	29	63.0	27.5	25.0
8	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	mg/kg	38	17	21.5	35	21	34.2
9	Soluble Sulphate as SO_4	IS 2720 Part 27: 1977 (Reaff:2015)	%	0.0014	0.0015	0.0011	0.0026	0.0021	0.0015
10	Total Phosphorus as P	IS 10158: 1982 (Reaff: 2019)	mg/kg	4.01	5.11	2.93	2.10	2.56	3.88
11	Total Nitrogen as N	IS 14684: 1999 (Reaff:2019)	mg/kg	455.36	398	400.15	416.2	425.14	420
12	Organic Matter	IS: 2720 Part 22: 1972 (Reaff: 2015)	%	1.31	3.25	2.13	1.57	2.29	2.12
13	Organic Carbon	IS: 2720 Part 22: 1972 (Reaff: 2015)	%	0.76	1.89	1.24	0.91	1.33	1.23
14	Clay	By Gravimetric Method	%	32.5	30.9	34.2	33.2	30.5	31.7
15	Sand	By Gravimetric Method	%	30.9	31.6	31.5	32.6	32.9	30.0
16	Silt	By Gravimetric Method	%	36.6	37.5	34.3	34.2	36.6	38.3
17	Manganese as Mn	USEPA Method	mg/kg	11.2	20.5	14.5	17.2	11.2	22.7
18	Zinc as Zn	USEPA Method	mg/kg	2.66	8.0	4.2	4.10	1.23	3.14
19	Boron as B	USEPA Method	mg/kg	2.5	2.59	3.33	1.05	3.35	1.09
20	Potassium as K	USEPA Method	mg/kg	27.7	38	6.25	29.1	1.5	17
21	Cadmium as Cd	USEPA Method	mg/kg	BDL (DL: 1.0 mg/kg)					
22	Total Chromium as Cr	USEPA Method	-	1.52	BDL (DL: 1.0 mg/kg)	1.83	3.44	3.11	5.0
23	Copper as Cu	USEPA Method	mg/kg	BDL (DL: 1.0 mg/kg)					
24	Lead as Pb	USEPA Method	mg/kg	0.61	1.98	0.91	1.52	2.15	2.66
25	Iron as Fe	USEPA Method	mg/kg	4.10	1.44	5.65	2.16	9.54	3.43
26	Cation Exchange Capacity	USEPA 9080 – 1986	meq/100g of soil	39.5	35.5	45.1	33.2	40.2	40.1

Source: Sampling Results by EHS 360 labs Private Limited.

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 (30.5 % to 34.2%) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 1.01– 1.10 g/cc. The Water Holding Capacity is found to be medium i.e., ranging from 44.2 – 47.7 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.03 to 8.61
- The available Nitrogen content range between 398 to 455 mg/kg
- The available Phosphorus content range between 2.10 to 5.11 mg/kg
- The available Potassium range between 1.5 mg/kg to 38.0 meq/l

Observation:

The pH of the Soil indicates that the soil is Neutral and arid region and ideal for plant growth.

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:

Amaravathi River is the major surface water body in the study area and the rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of drinking water for few months after rainy season.

3.2.2 Ground Water Resources:

Groundwater occurs in all the crystalline formations of oldest Achaeans and Recent Alluvium. The occurrence and behaviour of groundwater are controlled by rainfall, topography, geomorphology, geology, structures etc., The weathering is controlled by the intensity of weathering and fracturing. Dug wells as wells as bore wells are more common ground water abstraction structures in the area. The diameter of the dug well is in the range of 7 to 10 m and depth of dug wells range from 7.2 to 13 m bgl. The dug wells yield up to 1 lps in summer months and few wells remains dry. The yield is adequate for irrigation for one or two crops in monsoon period.

3.2.3 Methodology

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

- Drainage pattern;
- Location of Residential areas representing different activities/likely impact areas; and
- Likely areas, which can represent baseline conditions

Two (2) surface water and Four (4) ground water samples were collected from the study area and were analysed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on surface and ground water. The samples were analysed as per the procedures specified by CPCB, IS-

10500:2012 and 'Standard methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA). The water sampling locations are given in Table 3.8 and shown as Figure 3.8.

TABLE 3.8: WATER SAMPLING LOCATIONS

S.NO	CODE	LOCATIONS	DISTANCE & DIRECTION	CO-ORDINATES
SURFACE WATER				
1	SW-1	Amaravathi River	6km West	10°40'35.61"N 77°30'25.62"E
2	SW-2	Paruthiyur Lake	5km SE	10°39'29.55"N 77°36'26.48"E
GROUND WATER				
3	WW-1	Near Project Area	360m South	10°40'17.27"N 77°33'45.42"E
4	WW-2	Achiyur Pudur	4.0km NW	10°41'46.25"N 77°37'4.74"E
5	BW-1	Near Project Area	200m NE	10°40'40.22"N 77°33'49.09"E
6	BW-2	Pungamuthur	5.5km South	10°37'28.56"N 77°33'46.45"E

Source: On-site monitoring/sampling by EHS 360 labs Private Limited in association with GEMS

FIGURE 3.8: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS

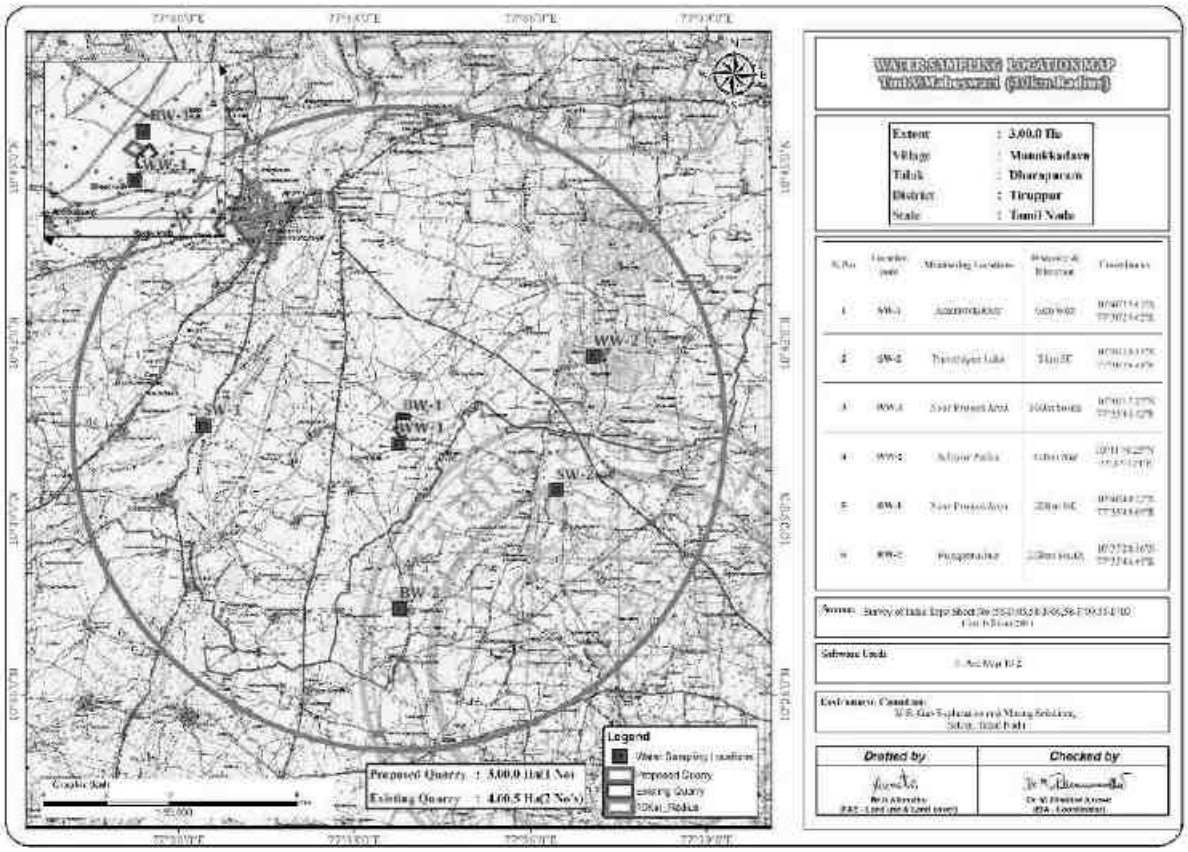


TABLE 3.9: GROUND WATER SAMPLING RESULTS

Sl. No.	TEST PARAMETERS	TEST METHOD	WW1-Near Project area	WW2- Achiyur Pudur	BW1- Near Project Area	BW2- Pungamuthur
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5	5	5	5
2	Odour	IS 3025 Part 5:2018	Agreeable	Agreeable	Agreeable	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	6.75	7.53	7.72	7.01
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	992 µmhos/cm	1059 µmhos/cm	835 µmhos/cm	986 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1.0 NTU	1.0 NTU	1.0 NTU	1 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	586 mg/l	625 mg/l	493 mg/l	582 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (Reaff:2019)	209.69 mg/l	204.39 mg/l	163.06 mg/l	177.97 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	37.9 mg/l	33.8 mg/l	29.1 mg/l	30.3 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	28.0 mg/l	29.2 mg/l	22.0 mg/l	24.9 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986 (Reaff:2019)	200 mg/l	205 mg/l	160 mg/l	188 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	110 mg/l	137 mg/l	84 mg/l	125.4 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986 (Reaff:2019)	75.1 mg/l	70.1 mg/l	52 mg/l	70 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.19 mg/l	0.21 mg/l	0.19 mg/l	0.13 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	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	APHA 23rd Edn. 2017:4500 F,D	0.24 mg/l	0.18 mg/l	0.36 mg/l	0.16 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988 (Reaff:2019)	3.10 mg/l	5.11 mg/l	5 mg/l	4.48 mg/l
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)			
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)			
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)			
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)			
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)			
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)			
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)			
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)			
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)			
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)			
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)			
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)			
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)			
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)			
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)			
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)			
33	Sulphide as H_2S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)			
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)			
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)			
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)			
36	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)			
37	Total Coliform	APHA 23rd Edn. 2017:9221B	175 MPN/100ml	105 MPN/100ml	130 MPN/100ml	150 MPN/100ml
38	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml

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

TABLE 3.10: SURFACE WATER SAMPLING RESULTS

Sl. No.	TEST PARAMETERS	TEST METHOD	**SW-1** Amaravathi River	SW-2 Paruthiyur Lake
1	Colour	IS 3025 PART 4	5 Hazen	5 Hazen
2	Odour	IS 3025 PART 5	Agreeable	Agreeable
3	pH at 25°C	IS 3025 PART11	7.55	7.27
4	Conductivity @ 25°C	IS 3025 PART14	895 µmhos/cm	864 µmhos/cm
5	Turbidity	IS 3025 PART10	6.3 NTU	5.1 NTU
6	Total Dissolved Solids	IS 3025 PART16	529 mg/l	510 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 PART 23	170.18 mg/l	186.52 mg/l
8	Calcium as Ca	IS 3025 PART 21	30.8 mg/l	32.9 mg/l
9	Magnesium as Mg	IS 3025 PART40	22.7 mg/l	25.4 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 PART 46	169 mg/l	164.2 mg/l
11	Chloride as Cl	IS 3025 PART 32	97.2 mg/l	95.7 mg/l
12	Sulphate as SO_4	IS 3025 PART24	58 mg/l	47.3 mg/l
13	Iron as Fe	IS 3025 PART 53	0.25 mg/l	0.18 mg/l
14	Residual Free Chlorine	IS 3025 PART 57	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
15	Fluoride as F	IS 3025 PART 26	0.15 mg/l	0.11 mg/l
16	Nitrate as NO_3	GLCS/SOP/W/015	12.2 mg/l	7.86 mg/l
17	Copper as Cu	IS 3025 PART 59	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 PART 34	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	IS 3025 PART 38	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 PART 44	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 PART 58	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 PART 34	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 PART 17	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 PART 43	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 13428	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 PART 27	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	GLCS/SOP/W/66	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	GLCS/SOP/W/62	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	GLCS/SOP/W/62	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	GLCS/SOP/W/62	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	GLCS/SOP/W/62	9.2 mg/l	7.8 mg/l
32	Chemical Oxygen Demand	GLCS/SOP/W/62	50 mg/l	30 mg/l
33	Dissolved Oxygen	GLCS/SOP/W/62	5.5 mg/l	5.45 mg/l
34	Barium as Ba	GLCS/SOP/W/62	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)
35	Ammonia (as total ammonia-N)	GLCS/SOP/W/62	1.8 mg/l	1.09 mg/l
36	Sulphide as H_2S	GLCS/SOP/W/62	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
37	Molybdenum as Mo	GLCS/SOP/W/62	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
38	Total Arsenic as As	GLCS/SOP/W/62	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
39	Total Suspended Solids	IS 1622	20.0 mg/l	15.3 mg/l
40	Total Coliform	Total Coliforms Organism MPN/100ml shall be 50 or less	490 MPN/100ml	640 MPN/100ml
41	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	100 MPN/100ml	150 MPN/100ml

Note: APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.

3.2.4 Interpretation& Conclusion

Surface Water

The pH varied from 7.27 to 7.55 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 510 to 529 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 95.7 –97.2 mg/l. Nitrates varied from 7.86 to 12.2 mg/l, while sulphates varied from 47.3 to 58 mg/l.

Ground Water

The pH of the water samples collected ranged from 6.75 to 7.72 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 493 – 625 mg/l in all samples. Total hardness varied between 163.06– 209.63 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-ATS Instrument by qualified Geo physicist with the help of IGIS software and it was inferred that the low resistance encountered at the depth between 68-73m. The maximum depth proposed out of proposed projects is 47m below ground level.

Ground water levels and Flow Direction based on the Bore well and open well Data's

In general, the ground water movement is based on the gradient i.e., water moves from the highest static ground water elevation to lowest static ground water elevation point. The ground water movement is important aspect to locating the recharge and discharge areas. Therefore, the data has been collected in the study area. Water level measured in the seven open wells and seven borewells.

The average water level in the open well is varies from = 10.9m to 12.66m bgl

The water level in the bore well is varies from = 56.01m -57.65 bgl

Based on the water level contour map of the open well and bore well the water flow direction in the particular region is towards North & South side.

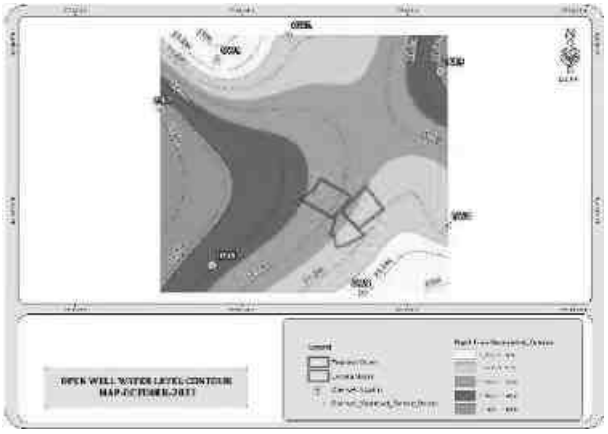
The water level in the area is above 73m-68m hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

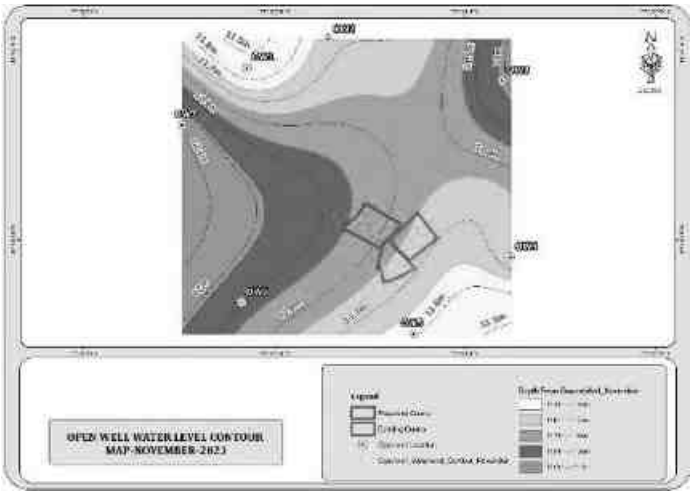
TABLE 3.11: POST-MONSOON SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS

S.NO	LABEL	LONGITUDE	LATITUDE	OCT	NOV	DEC
1	OW1	10° 40' 57.15"N	77° 33' 25.62"E	11	11.5	12
2	OW2	10° 41' 01.63"N	77° 33' 38.45"E	11.2	11.7	12.2
3	OW3	10° 40' 55.09"N	77° 34' 05.89"E	11.5	12	12.5
4	OW4	10° 40' 27.30"N	77° 34' 07.17"E	11.3	11.8	12.3
5	OW5	10° 40' 15.20"N	77° 33' 51.90"E	11.1	11.6	12.1
6	OW6	10° 40' 20.20"N	77° 33' 24.75"E	11.4	11.9	12.4
7	OW7	10° 40' 48.15"N	77° 33' 15.41"E	11.6	12.1	12.6

Source: Onsite monitoring data

FIGURE 3.9: OPEN WELL CONTOUR MAP (OCT TO DEC 2023)





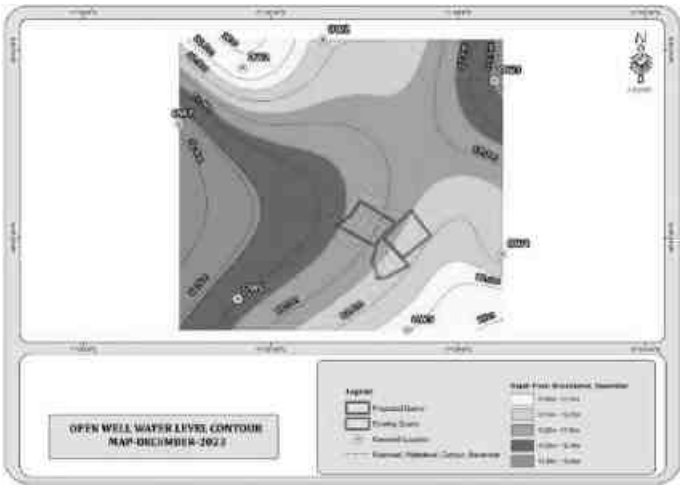
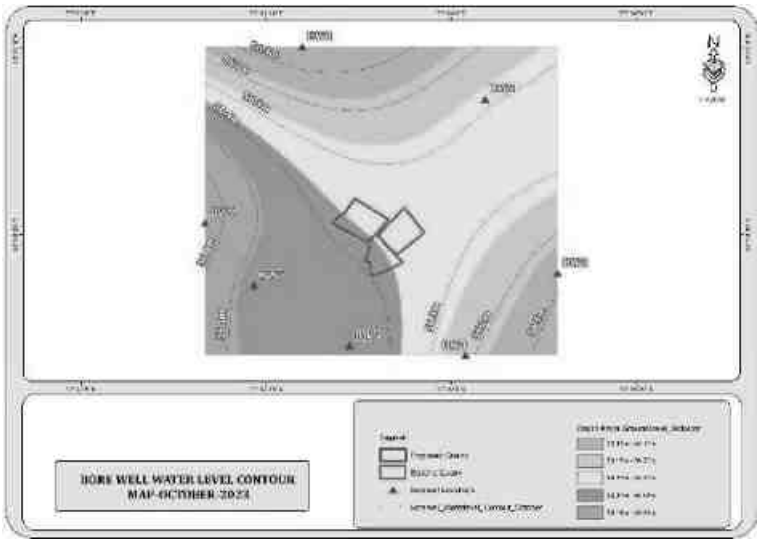


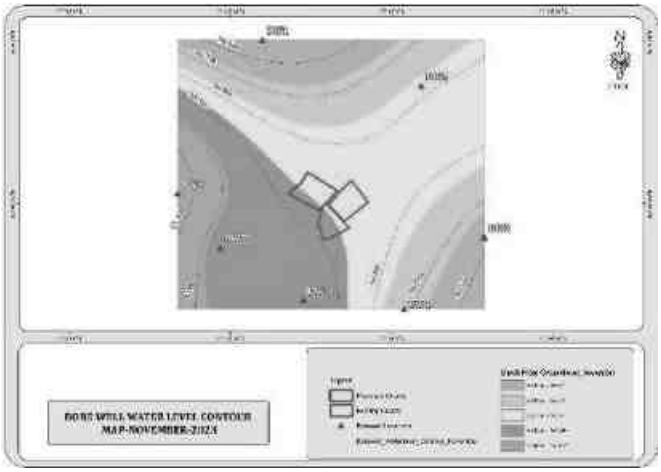
TABLE 3.12: POST-MONSOON SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS

S.NO	LABEL	LONGITUDE	LATITUDE	OCT	NOV	DEC
1	BW1	10° 41' 00.38"N	77° 33' 35.90"E	56	56.5	57
2	BW2	10° 40' 51.87"N	77° 34' 05.53"E	56.3	56.8	57.3
3	BW3	10° 40' 23.80"N	77° 34' 17.27"E	56.1	56.6	57.1
4	BW4	10° 40' 10.46"N	77° 34' 02.32"E	56.2	56.7	57.2
5	BW5	10° 40' 12.11"N	77° 33' 43.56"E	56.5	57	57.5
6	BW6	10° 40' 31.88"N	77° 33' 20.14"E	56.7	57.2	57.7
7	BW7	10° 40' 21.77"N	77° 33' 28.08"E	56.4	56.9	57.4

Source: Onsite monitoring data

FIGURE 3.10: BOREWELL CONTOUR MAP (OCT TO DEC 2023)





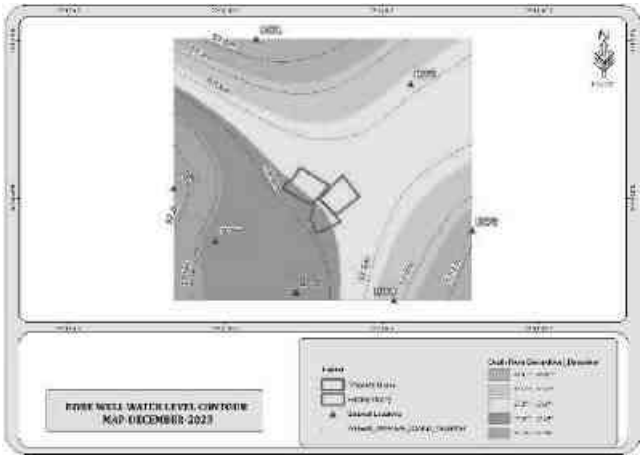
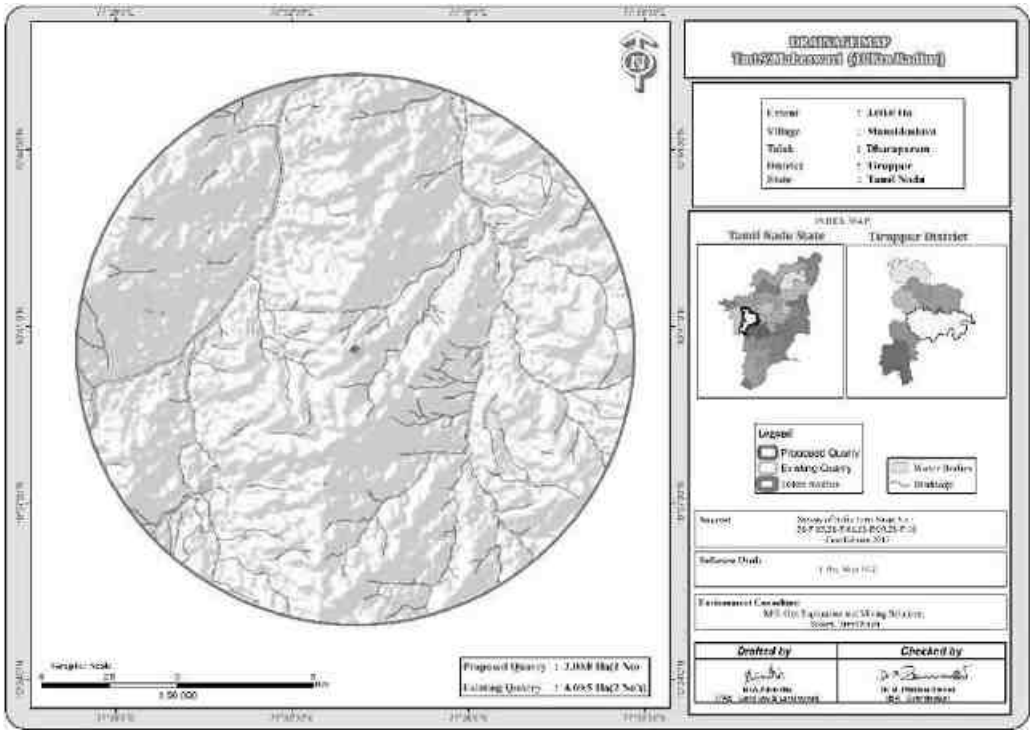
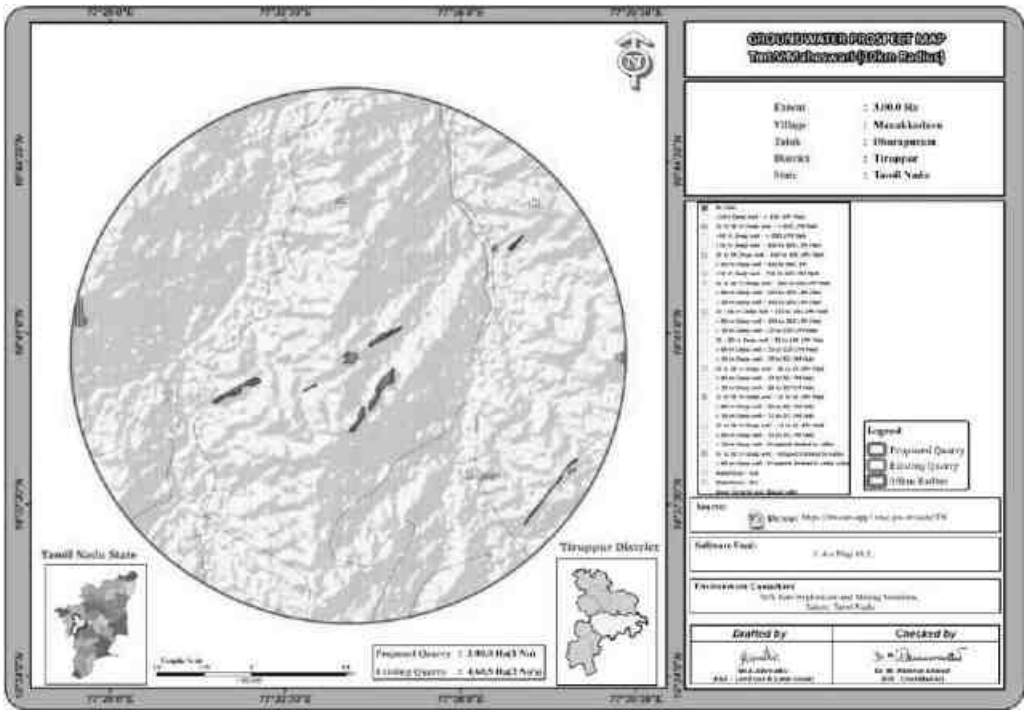


FIGURE 3.11: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE



Remarks: it is inferred that the area is dendritic to sub dendritic pattern

FIGURE 3.12: GROUND WATER PROSPECT MAP



Remarks: Water table in the area is 73m - 68m as per the Bhuvan Data

Geophysical Resistivity Survey

3.2.5.1 Methodology and Data Acquisition

The Geophysical Electrical Resistivity survey conducted in the area Schlumberger configuration, Vertical Electrical Sounding (VES) method. 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 farm 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,

$$\rho_r = F\rho_w = a\,Ø^m\rho_w$$

ρr = Resistivity of Rocks

ρw = Resistivity of water in pores of rock

F = Formation Factor

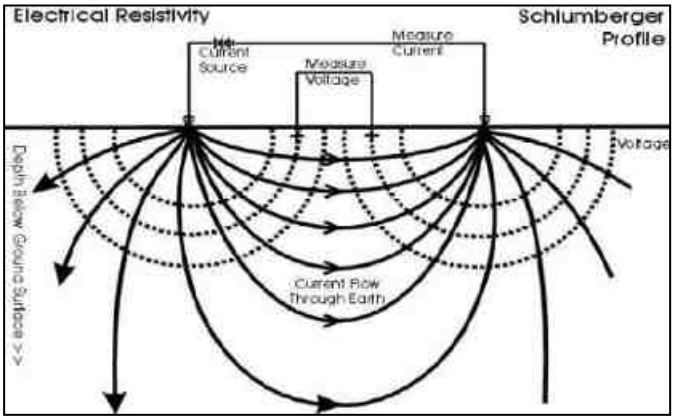
Ø = Fractional pore volume

A = Constants with values ranging from 0.5 to 2.5

3.2.5.2 Survey Layout

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 nose ration can be enhanced by √N where N is the number of stacked readings. This SSR meter in which running averages of measurements [1, (1+2)/2, (1+2+3)/3 … (1+2...+16/16)] up to the chosen stacks are displayed and the final average is stored automatically, in memory utilizing the principles of stacking to achieve the benefit of high signals to noise ratio. Based on these above significations the signal stacking resistivity meter was used for (VES) Vertical Electric Resistivity Sounding.

RESISTIVITY SURVEY PROFILE



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

3.2.5.3 Data Presentation

It was inferred that the low resistance encountered at the depth between 68-73m. The maximum depth proposed out of proposed projects 47m BGL. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

3.2.5.4 Geophysical Data Interpretation

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

It is inferred that the existing quarries in the surrounding area reaches maximum of 47m and the water table is not intersected, only the seepage water during rainy season encountered from the upper layer and it will be used for the Greenbelt development, Dust suppression and quarrying operation.

3.3 AIR ENVIRONMENT

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

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the cluster forms the baseline information. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed projects in cluster.

3.3.1 Meteorology & Climate

Meteorology is the key to understand the Air quality. The essential relationship between meteorological condition and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time, accomplish dispersion and strongly influence other processes associated with them.

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

Climate

- The atmospheric conditions prevailing in this region are of a tropical nature. In Tiruppur, the precipitation during summers is significantly higher in comparison to winters. This location is classified as Aw by Köppen and Geiger. In Tiruppur, the average annual temperature is 26.4 °C | 79.6 °F. Approximately 943 mm | 37.1 inch of rainfall occurs on a yearly basis.
- Due to its proximity to the equator, it is quite challenging to precisely delineate summers in Tiruppur. The period of January, February, March, June, July, August, September, October, November, December is widely regarded as the peak season for visitation.
- The month with the least amount of precipitation is January exhibiting a mere 13 mm | 0.5-inch rainfall. The maximum quantity of rainfall is observed during the month of October, exhibiting an average value of 209 mm | 8.2 inch.
- The month of April boasts the highest average temperature, with a recorded maximum of 30.0 °C | 86.0 °F. During the month of December, there is a notable drop in temperature, with an average low of approximately 23.7 °C | 74.7 °F.

https://en.climate-data.org/asia/india/tamil-nadu/tiruppur-2789/

Rainfall

TABLE 3.13: RAINFALL DATA

Actual Rainfall in mm					Normal Rainfall in mm
2017	2018	2019	2020	2021	
679.8	716.2	488.1	748.8	845.1	606.8

Source: https://www.twadboard.tn.gov.in/content/tiruppur

TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE

S.No	Parameters		Oct-2023	Nov-2023	Dec-2023
1	Temperature (^{0}C)	Max	26.73	24.58	25.48
		Min	23.18	22.68	20.98
		Avg	24.95	23.63	23.23
2	Relative Humidity (%)	Avg	77.84	86.5	86.25
3	Wind Speed (m/s)	Max	5.55	3.72	4.23
		Min	0.88	1.13	1.23

		Avg	3.21	2.42	2.73
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind Direction		ESE,WSW	ENE,ESE	ENE,E

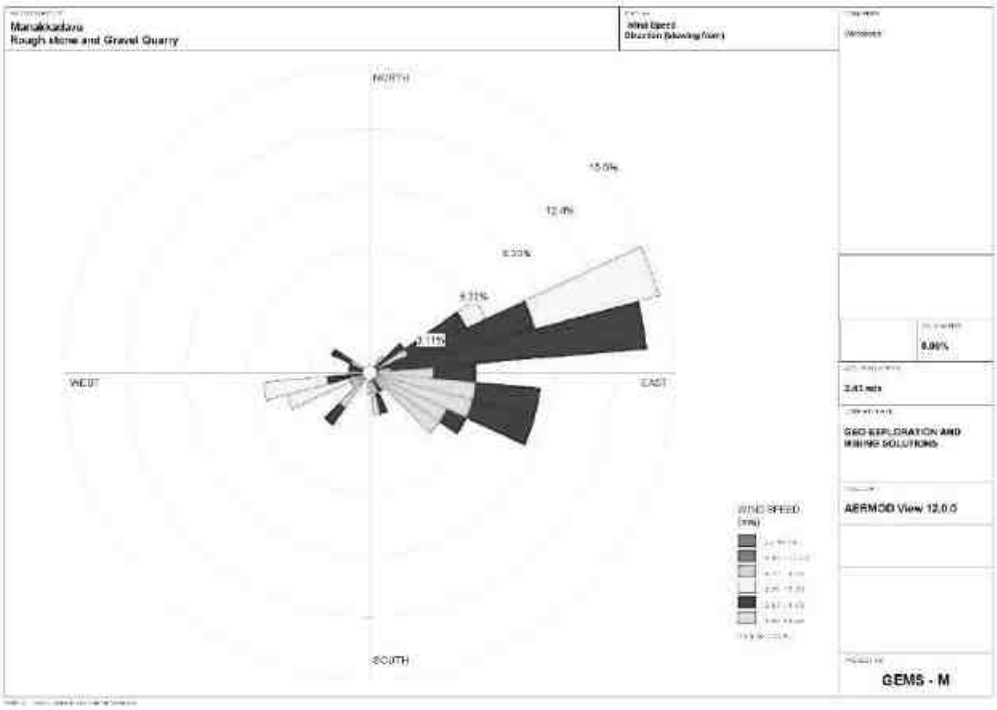
Source: On-site monitoring/sampling by EHS 360 labs Private Limited in association with GEMS

Correlation between Secondary and Primary Data

The average rain fall over the period of five years is 606.8mm. The meteorological data collected at the site is almost similar to that of secondary data collected from IMD Tiruppur_agro. A comparison of site data generated during the three months with that of IMD, Tiruppur_agro

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

FIGURE 3.13: WINDROSE DIAGRAM



In the abstract of collected data wind rose were drawn on presented in figure No.3.13 during the monitoring period in the study area

1. Predominant winds were from ESE, SE, WSW, W
2. Wind velocity readings were recorded between 0.50 to 8.80m/s
3. Calm conditions prevail of about 0 % of the monitoring period
4. Temperature readings ranging from 26.35 to 35.04 °C
5. Relative humidity ranging from 39.97- 64.40%
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 AAQ ANALYSIS

Parameter	Method	Instrument
PM2.5	Gravimetric Method Beta attenuation Method	Fine Particulate Sampler Make – Thermo Environmental Instruments – TEI 121
PM10	Gravimetric Method Beta attenuation Method	Respirable Dust Sampler Make –Thermo Environmental Instruments – TEI 108
SO2	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NOx	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 EHS 360 labs 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 (µg/m3)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	Nitrogen Dioxide (µg/m3)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	Particulate matter (size less than 10µm) PM10 (µg/m3)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less than 2.5 µm PM2.5 (µg/m3)	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 value as applicable shall be complied with 98 % of the time in a year. However, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

3.3.4 Frequency & Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at Seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period Oct to Dec 2023. The baseline data

of ambient air has been generated for PM_{10}, $PM_{2.5}$, Sulphur Dioxide (SO_2) & Nitrogen Dioxide (NO_2) Monitoring has been carried out as per the CPCB, MoEF guidelines and notifications.

The equipment was placed preferably at a height of at least 3 ± 0.5m above the ground level at each monitoring station, for negating the effects of wind-blown ground dust. The equipment was placed at open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

3.3.5 Ambient Air Quality Monitoring Stations

Seven (7) monitoring stations were set up in the study area as depicted in Figure 3.15 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°40'31.92"N 77°33'41.38"E
2	**AAQ-2**	Near Crusher Area	450m North	10°40'49.72"N 77°33'48.53"E
3	**AAQ-3**	Manakadavu	2.5km West	10°40'24.16"N 77°32'21.32"E
4	**AAQ-4**	Pungamuthur	5.5km South	10°37'24.58"N 77°34'2.30"E
5	**AAQ-5**	Elugamvalasu	6.5km NE	10°41'45.27"N 77°37'8.56"E
6	**AAQ-6**	Achiyur Pudur	4.0km NW	10°42'31.68"N 77°32'34.42"E
7	**AAQ-7**	Paruthiyur	4.5km SE	10°39'25.90"N 77°35'57.97"E

Source: On-site monitoring/sampling by EHS 360 labs Private Limited in association with GEMS.

FIGURE 3.15: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS

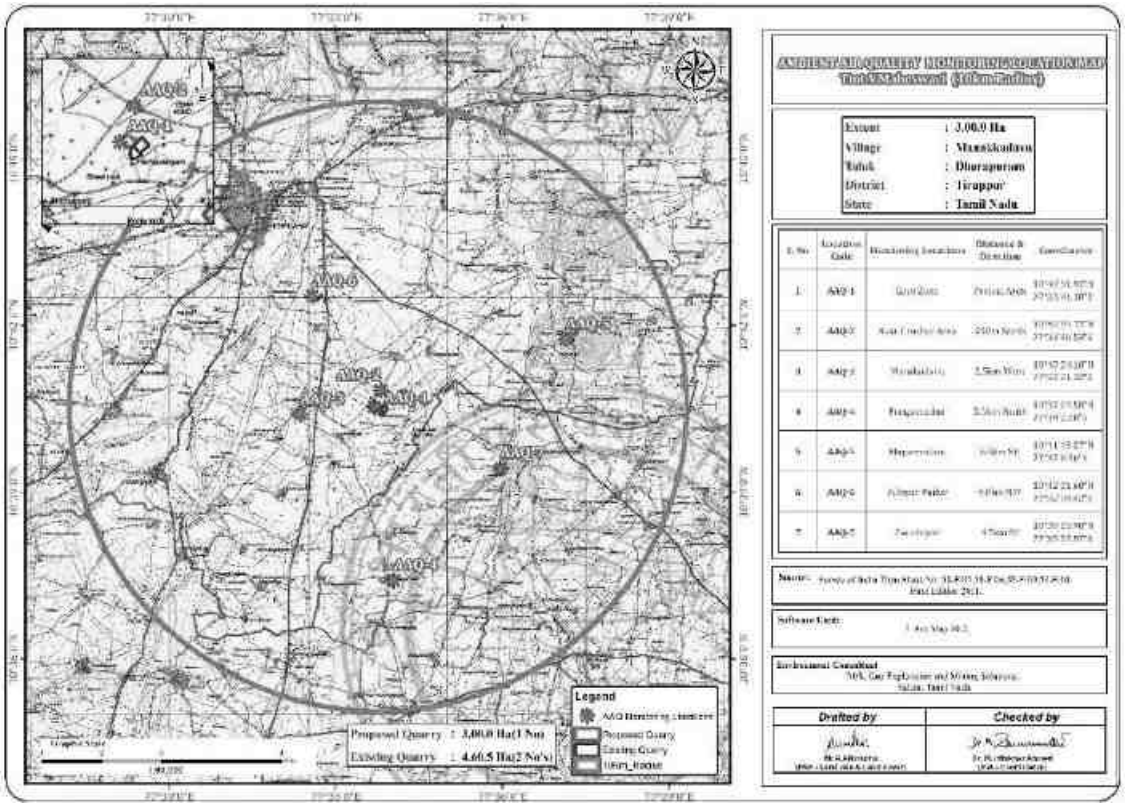


TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 7

PM10	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	46.3	42.8	43.2	43.1	43.4	42.8	43.3
Minimum	43.1	41.1	41.2	41.9	41.9	41.6	41.6
Maximum	48.9	44.2	45.1	44.2	46.6	44.9	44.6
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	20.8	19.9	20.5	20.4	23.6	21.1	20.9
Minimum	20.1	18.5	19.2	0.0	20.7	20.1	18.3
Maximum	21.8	21.9	22.9	0.0	26.4	22.6	23.5
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	7.4	6.9	6.5	7.0	6.5	6.4	6.6
Minimum	5.9	5.2	5.9	6.1	5.1	5.1	5.3
Maximum	8.8	8.4	7.2	7.9	8.5	7.8	7.9
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0
NO2	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	23.7	22.4	23.4	22.7	22.5	23.8	23.0
Minimum	22.1	20.1	22.3	21.4	20.4	22.1	21.5
Maximum	25.1	24.5	24.6	24.5	25.4	25.9	23.8
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

TABLE 3.19: ABSTRACT OF AMBIENT AIR QUALITY DATA

1	**Parameter**	**PM10**	**PM2.5**	**SO_2**	**NO_2**
2	No. of Observations	260	260	260	260
3	98th Percentile Value	45.4	26.2	8.4	25.6
4	Arithmetic Mean	43.4	21.8	7.0	23.5
5	Geometric Mean	43.4	21.7	6.9	23.4
6	Standard Deviation	1.1	2.1	0.8	1.2
7	Minimum	41.9	19.3	5.8	21.5
8	Maximum	45.4	26.2	8.4	25.6
9	**NAAQ Norms***	**100.0**	**60.0**	**80.0**	**80.0**
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

FIGURE 3.16: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ7

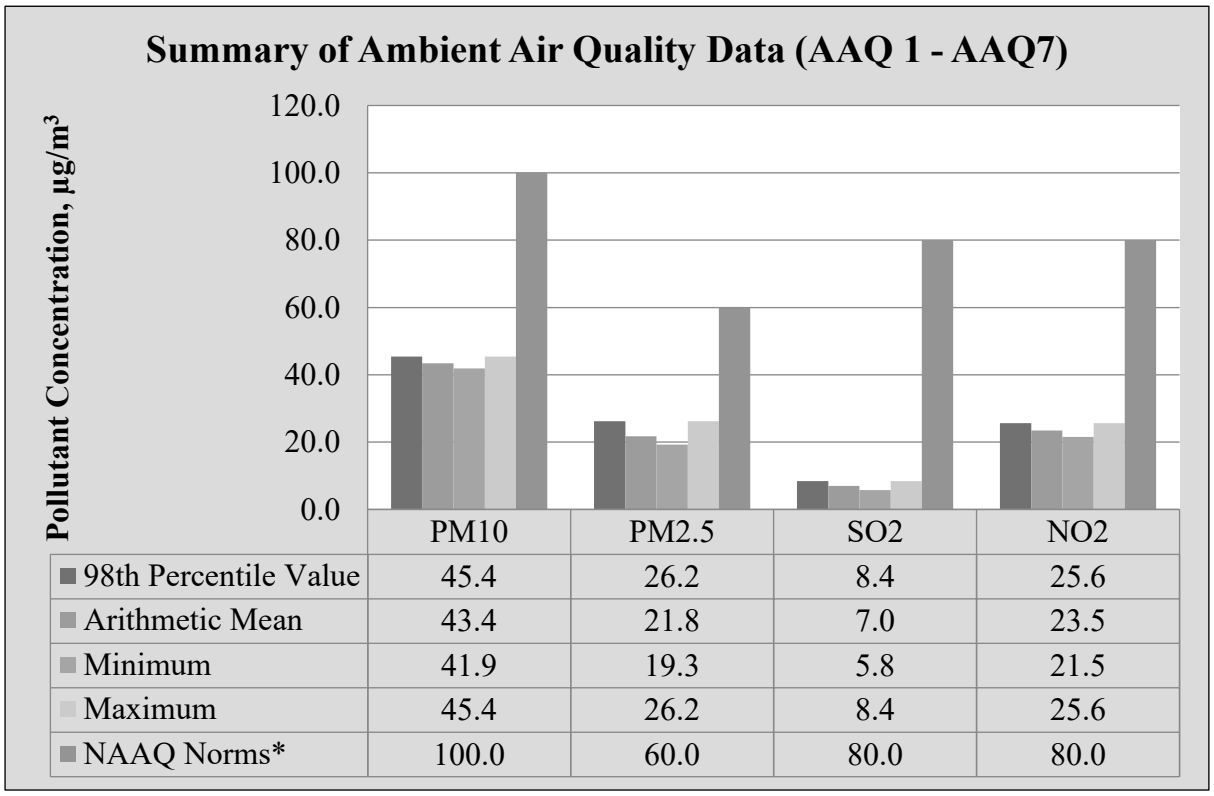
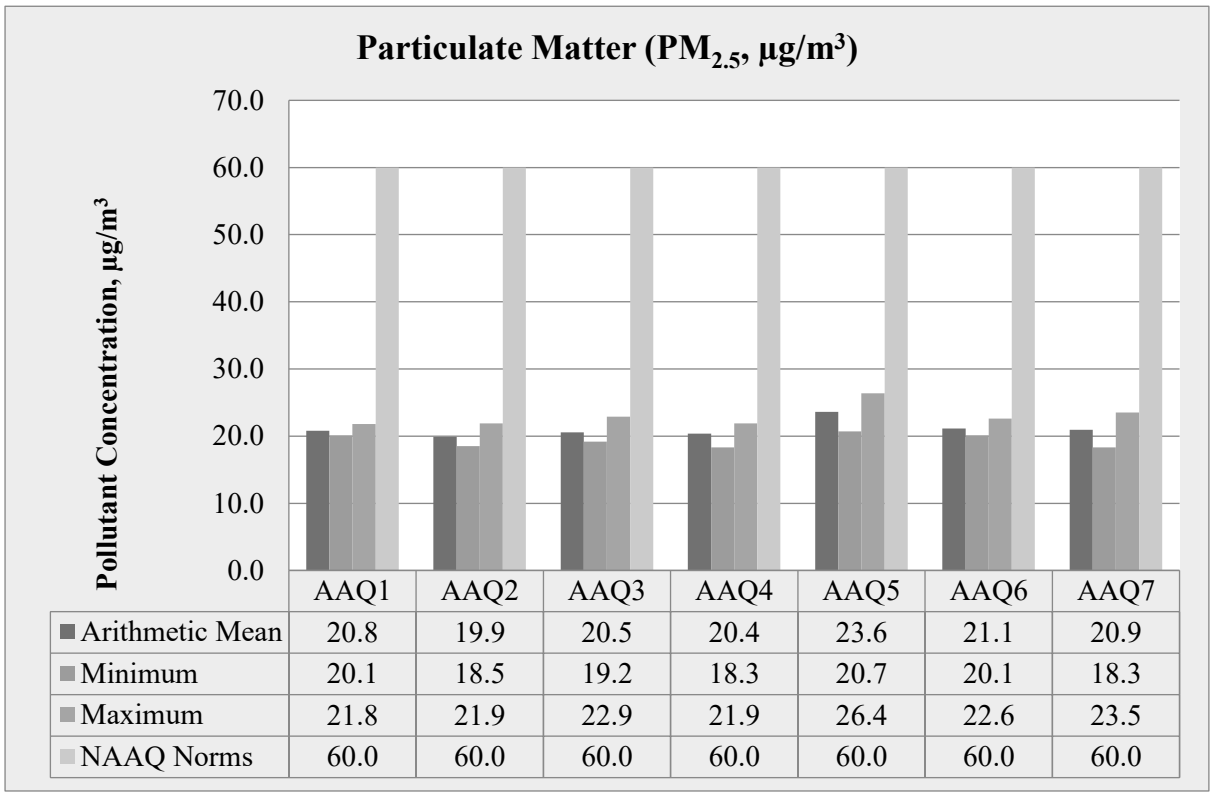
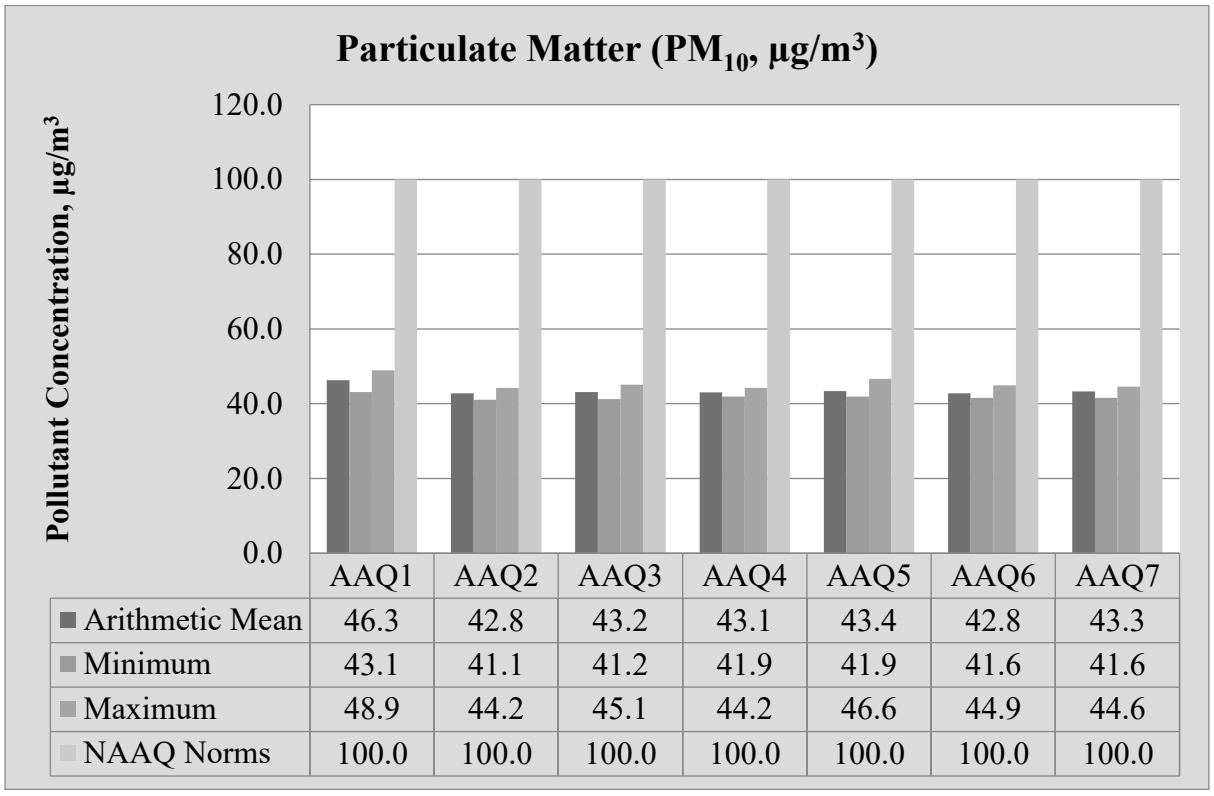


FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER $PM_{2.5}$



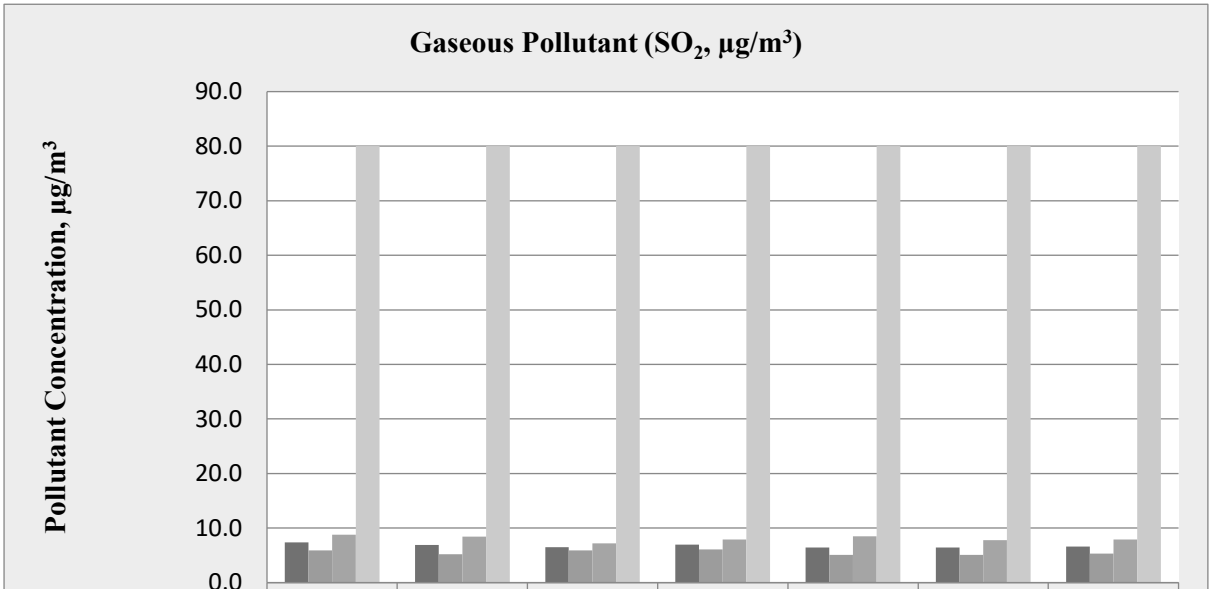
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	20.8	19.9	20.5	20.4	23.6	21.1	20.9
Minimum	20.1	18.5	19.2	18.3	20.7	20.1	18.3
Maximum	21.8	21.9	22.9	21.9	26.4	22.6	23.5
NAAQ Norms	60.0	60.0	60.0	60.0	60.0	60.0	60.0

FIGURE 3.18: BAR DIAGRAM OF PARTICULATE MATTER PM_{10}



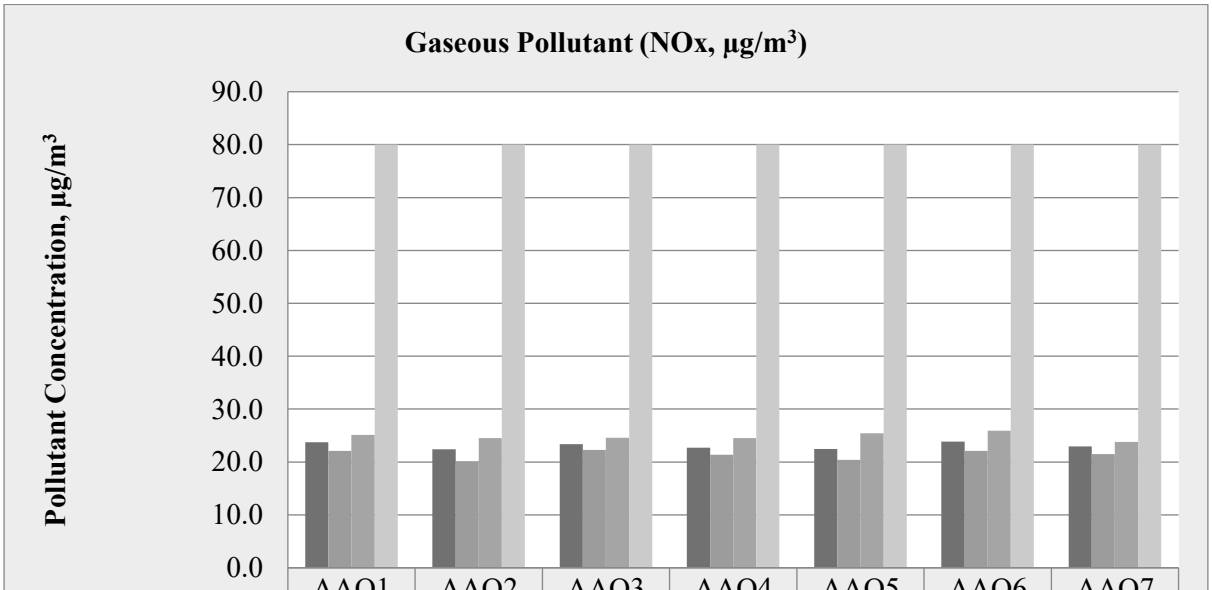
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	46.3	42.8	43.2	43.1	43.4	42.8	43.3
Minimum	43.1	41.1	41.2	41.9	41.9	41.6	41.6
Maximum	48.9	44.2	45.1	44.2	46.6	44.9	44.6
NAAQ Norms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

FIGURE 3.19: BAR DIAGRAM OF GASEOUS POLLUTANT SO_2



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	7.4	6.9	6.5	7.0	6.5	6.4	6.6
Minimum	5.9	5.2	5.9	6.1	5.1	5.1	5.3
Maximum	8.8	8.4	7.2	7.9	8.5	7.8	7.9
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

FIGURE 3.20: BAR DIAGRAM OF GASEOUS POLLUTANT NO_x



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	23.7	22.4	23.4	22.7	22.5	23.8	23.0
Minimum	22.1	20.1	22.3	21.4	20.4	22.1	21.5
Maximum	25.1	24.5	24.6	24.5	25.4	25.9	23.8
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

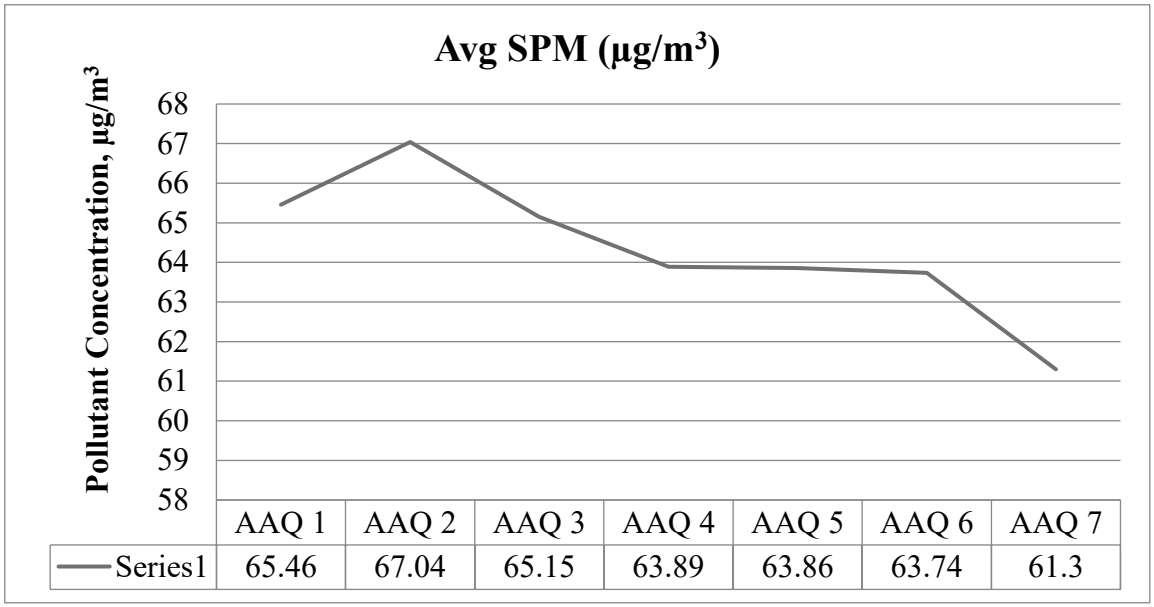
3.3.7 FUGITIVE DUST EMISSION –

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

TABLE 3.20: FUGITIVE DUST SAMPLE VALUES IN µg/m³

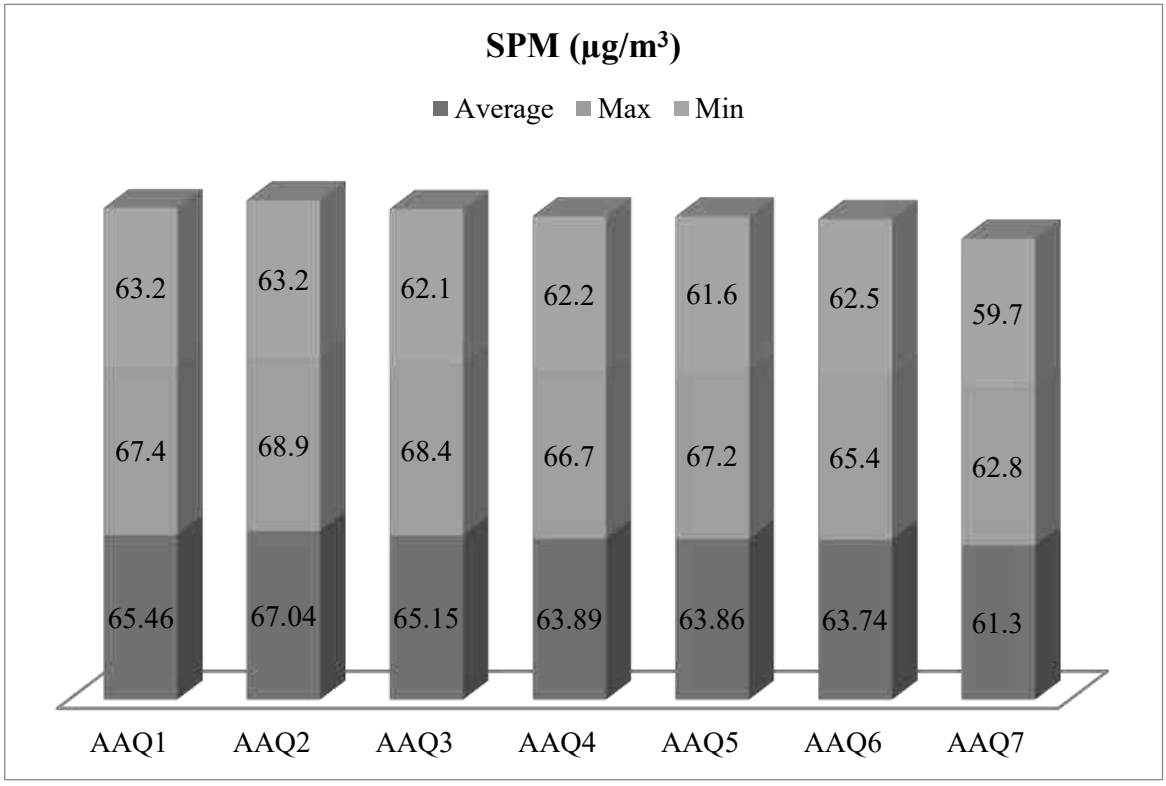
SPM (µg/m³)	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Average	65.46	67.04	65.15	63.89	63.86	63.74	61.3
Min	67.4	68.9	68.4	66.7	67.2	65.4	62.8
Max	63.2	63.2	62.1	62.2	61.6	62.5	59.7

FIGURE 3.21: LINE DIAGRAM OF AVERAGE SPM VALUES



Source: Calculations from Lab Analysis Reports

FIGURE 3.22: BAR DIAGRAM OF SPM VALUES



3.3.6 Interpretations & Conclusion

As per monitoring data, PM_{10} ranges from 41.1 µg/m^3 to 48.9 µg/m^3, $PM_{2.5}$ data ranges from 18.3 µg/m^3 to 26.4 µg/m^3, SO_2 ranges from 5.1 µg/m^3 to 8.8µg/m^3 and NO_2 data ranges from 20.1 µg/m^3 to 25.9 µg/m^3. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

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 Seven (7) locations. The noise level measurement was carried out at each ambient air quality station. The main aim of the noise level monitoring is

- To assess the ambient Noise level in the study area
- Type of noise pollution generated in the core zone
- To predict the temporal changes in the ambient noise level in the area

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 3.21: DETAILS OF SURFACE NOISE MONITORING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	N1	Core Zone	Project Area	10°40'29.72"N 77°33'45.46"E
2	N2	Near Crusher Area	450m North	10°40'50.39"N 77°33'48.69"E
3	N3	Manakadavu	2.5km West	10°40'23.57"N 77°32'21.30"E
4	N4	Pungamuthur	5.5km South	10°37'24.74"N 77°34'1.00"E
5	N5	Elugamvalasu	6.5km NE	10°41'45.22"N 77°37'7.41"E
6	N6	Achiyur Pudur	4.0km NW	10°42'32.08"N 77°32'34.43"E
7	N7	Paruthiyur	4.5km SE	10°39'25.64"N 77°35'58.22"E

Source: On-site monitoring/sampling by EHS 360 labs Private Limited in association with GEMS.

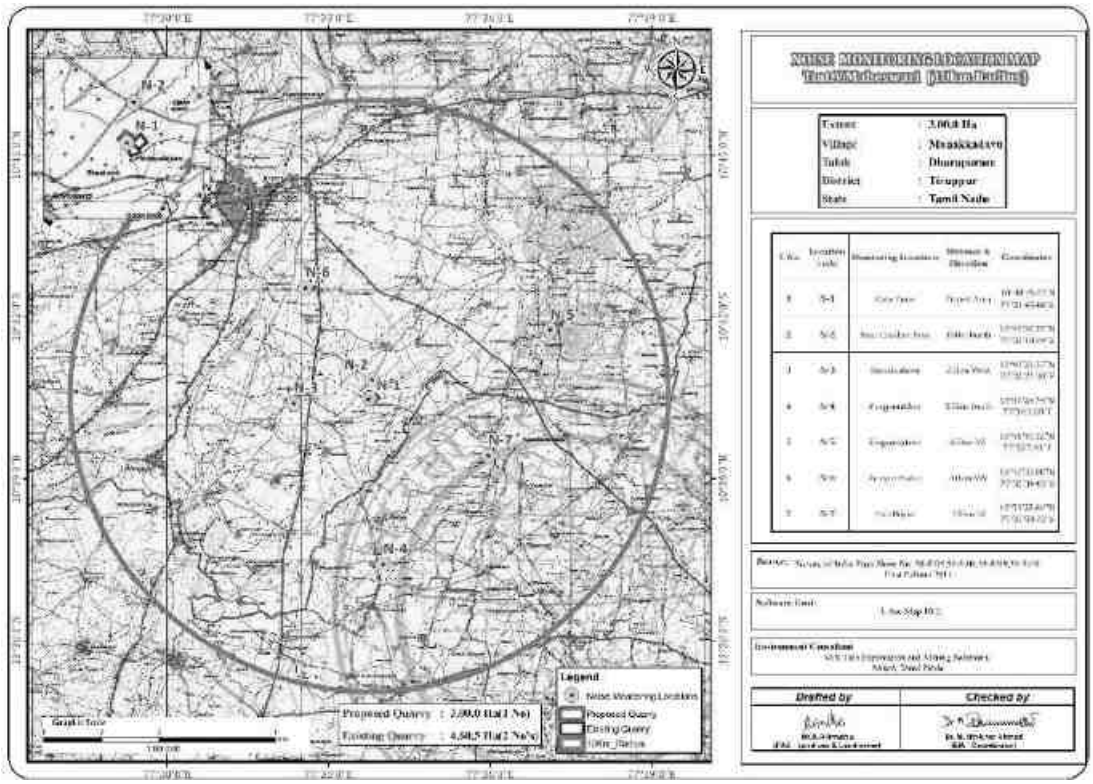
3.4.2 Method of Monitoring

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. The equivalent noise level is defined mathematically as,

Leq = 10 Log L / T∑ (10Ln/10)
Where L = Sound pressure level at function of time dB (A)
T = Time interval of observation

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

FIGURE 3.24: NOISE MONITORING STATIONS AROUND 10 KM RADIUS



3.4.3 Analysis of Ambient Noise Level in the Study Area

The Digital Sound pressure level has been measured by a sound level meter (Model: HTC SL-1352) An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in below Table 3.22.

Day time: 6:00 hours to 22.00 hours.

Night time: 22:00 hours to 6.00 hours.

TABLE 3.22: AMBIENT NOISE QUALITY RESULT

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Project Area	41.3	38.1	**Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)**
2	Near Project Area	39.4	35.4	
3	Karugampalayam Near School	41.7	36.6	
4	Naduvelampalayam School	41.9	39.3	
5	Pallapalayam (Hospital)	42.4	38.0	**Residential Day Time– 55 dB (A) Night Time- 45 dB (A)**
6	Kadampadi	39.9	37.8	
7	Semmipalayam	40.3	38.3	

Source: On-site monitoring/sampling by EHS 360 labs Private Limited in association with GEMS

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

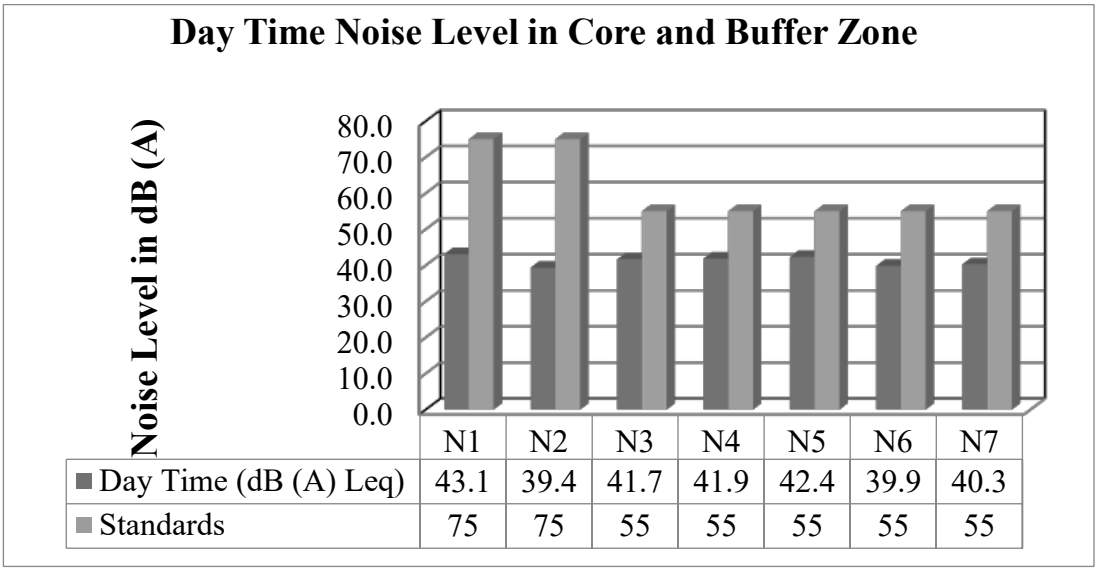
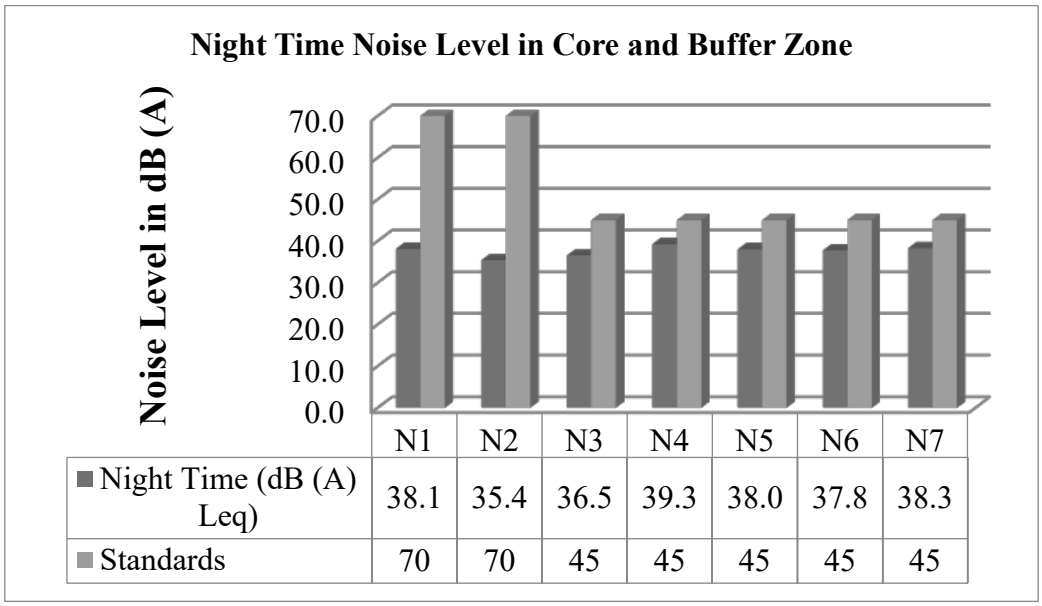


FIGURE 3.26: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE



3.4.4 Interpretation & Conclusion:

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 39.4 to 43.1 dB (A) Leq and during night time were from 35.4 to 38.1 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.9 to 42.4 dB (A) Leq and during night time were from 36.6 to 39.3 dB (A) Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.5 BIOLOGICAL ENVIRONMENT

3.5.1.Study area Ecology

The core area extent of 3.00 Ha of has an impact on the diversity of flora and fauna of the surrounding area. But present work was carried out on the detailed study of the impacts of the Rough stone and gravel quarry on the ecology and biodiversity of the core lease area with the proper mitigation and sustainable management plan. The proposed mine lease area is situated on a plain terrain. The following methods were applied during the baseline study of flora, fauna and diversity assessment.

3.5.2. Objectives of Biological Studies

a) To study the likely impact of the proposed mining project on the local biodiversity and to suggest mitigation measures, if required, for vulnerable biota.
b) Undertake intensive field survey to assess the status of floral & faunal component in different habitats in the core and buffer areas of the project site.
c) Identification and listing of flora and fauna which are important as per the Wildlife (Protection) Act 1972.
d) 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.
e) To identify the impacts of mining on agricultural lands and how it affects.
f) Proper collection of information about wildlife Sanctuaries/ national parks/ biosphere reserves of the project area.
g) Devise management & conservation measures for biodiversity.

3.5.3. Methodology of Sampling

Primary survey was conducted with established and accepted ecological methods in different habitats of study area. The field data collection mainly included biodiversity status assessment of different life forms habit of flora elements such as Trees, Shrubs, Climbers Herbs and Grass. Faunal diversity was assessed by inventorying the taxonomical groups like Mammals, Herpetofauna, birds and butterflies.

Nocturnal faunal species were searched by locating their calls during night time and by searching along the forest shrubs areas, dense dry bushes, below the stones, water bodies. During the study, to know more about the seasonal presence of flora and faunal species, information was obtained from local people and forest department.

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.

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).

The secondary baseline data of flora and fauna has been complied through the following data sources:

1. Forest working plan
2. Schedule I to V: Indian Wildlife (Protection) Act, 1972
3. Vivek Menon, Indian Mammals: A Field Guide. Hachette Book publishing India Pvt.Ltd., India.
4. Daniel J.C. The Book of Indian Reptiles and Amphibians, Bombay Natural History Society., India.
5. Ali, S and Ripley. handbook of the Birds of India and Pakistan together with those of Nepal, Sikkim and Bhutan, Oxford University Press, Bombay.
6. ENVIS Centre on Wildlife and Protected Area.
7. Birds Life Data Zone
8. Ebird.org
9. Global Biodiversity Information Facility

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.

3.5.3.1. 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.

3.5.4. Observations from Sampling

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

3.5.5. Field Equipment's/ References

Following tools/equipment were used for conducting phytosociological study.

- Ballpoint pen, Field bags, Field notebooks, field shoes, gloves, GPS, Measuring tapes and scales, Plant cutters, packet lens, ropes etc.
- 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.

3.5.6. Part I Field Sampling Techniques (Fauna Sampling)

3.5.6.1. Transect walk – Birds

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

3.5.6.2. 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.

3.5.6.3. Visual Encounter Survey (VES) - reptiles and Amphibians

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

3.5.6.4. Observational methods- Mammals

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

3.5.4.5. Multiple Stage Quadrat – Vegetation

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

3.5.5. Flora

3.5.5.1. Quadrat Sampling Method

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 for trees, Shrubs, and herbs respectively.

Fig No: 3.33. Nested quadrat sampling plots

3.5.5.1. Flora Composition in the Core Zone (Primary data)

Core zone flora samplings were conducted between 10.00 am to 11.00 am in three locations. The lease applied area is dry plain terrain, we used with quadrat sampling methods. Taxonomically a total of 15 species belonging to 9 families have been recorded from the core mining lease area. Based on habitat classification of the enumerated plants the majority of species were Herbs 5 (33%) followed by Shrubs 2 (13%), Trees 4 (27%), Grasses 3 (20%), and Climbers/Creepers1 (7%). Details of flora with the scientific name were mentioned in Table No. 3.53. The result of the core zone of flora studies shows that Fabaceae and Poaceae and Lamiaceae are the main dominating species in the study area mentioned in Table No.3.53. No species were found as a threatened category (Table No. 3.53).

Table No: 3.53. Flora in the Core zone of Manakkadavu Village, Rough stone and Gravel quarry, Dharapuaram Taluk, Tiruppur District (Primary data).

Sl. No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Neem	Vembu	*Azadirachta indica*	Meliaceae
2.	Mesquite	Mullu maram	*Prosopis juliflora*	Fabaceae
3.	White Bark Acacia	Vela maram	*Vachellia leucophloea*	Fabaceae
4.	Indian jujube	Elanthaimaram	*Ziziphus mauritiana*	Rhamnaceae
Shrubs				
1.	Milk Weed	Erukku	*Calotropis gigantea*	Apocynaceae
2.	Avaram	Avaram	*Senna auriculata*	Fabaceae
Herbs				
1.	Common leucas	Thumbai	*Leucas aspera*	Lamiaceae
2.	Indian Catmint Plant	Pei viratti	*Anisomelesmalabarica*	Lamiaceae
3.	Holy basil	Thulasi	*Ocimumtenuiflorum*	Lamiaceae
4.	Aloe	Katrazhai	*Aloe vera*	Asphodelaceae
5.	Coat buttons	Thatha poo	*Tridax procumbens*	Asteraceae
Creeper /Climbers				
1	Stemmed vine	Perandai	*Cissus quadrangularis*	Vitaceae
Grass				
1.	Eragrostis	Pullu	*Eragrostis ferruginea*	Poaceae
2.	Great brome	Thodappam	*Bromus diandrus*	Poaceae
3.	Nut grass	Korai	*Cyperus rotandus*	Poaceae

Sources: Species observation in the field study

a.Azadirachta indica

b. Calotropis gigantea

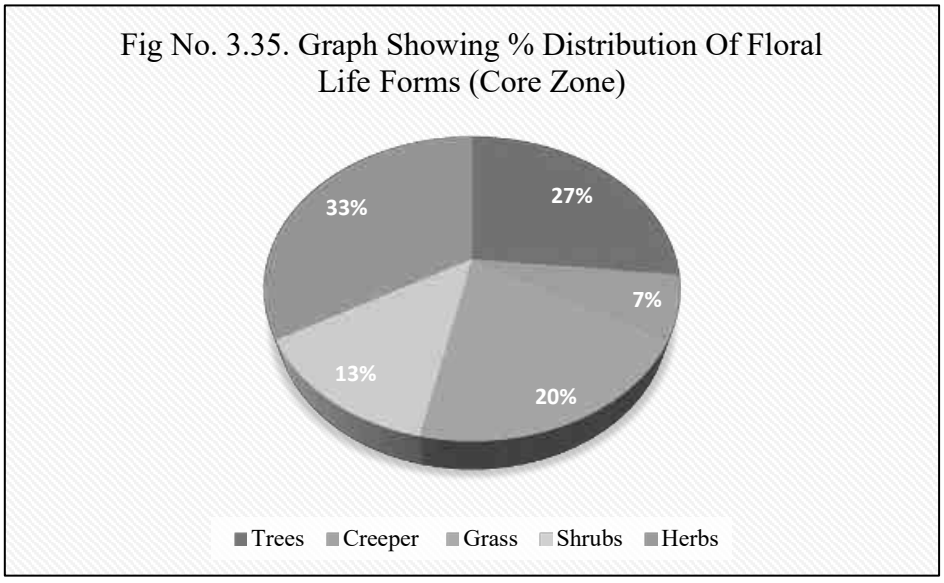
c. Ziziphus mauritiana

d. Vachellia leucophloea

e. Prosopis juliflora

f. Cissus quadrangularis

Fig No: 3.34. Flora species observation in the Core zone area



The trees surveys were conducted around 300m radius from the proposed project site cluster are of Manakkadavu village. This is the standard scientific method followed by various workers in respect of phytosociological studies (Cottom and Curtis 1956; Ralhan et al. 1982; Saxena and Sing 1982; Nayak et al. 2000; Lu et al. 2004; Nautiyal 2008). While sampling, circumference at breast Height (CBH) of tree species was measured at 1.37m from ground level, along with the name of the species, phenology (flowering, fruiting, and flushes), and

uses. After surveying areas, a detailed trees inventory has been compiled. A list of all plants from the study area was prepared and their habitats were recorded. The species of trees were documented during this base line survey. The dominant plant species growing in this area were Cocos nucifera Prosopis juliflora, etc. Please refer the Table No.3.54.

Table No: 3.54. Tree survey around 300m radius from the proposed project site (Primary data)

S. No	English Name	Vernacular Name	Scientific Name	No of trees
Trees				
1.	Acacia Nilotica	Karuvelammaram	*Vachellianilotica*	4
2.	Mesquite	Mullumaram	*Prosopis juliflora*	12
3.	Neem	Vembu	*Azadirachta indica*	31
4.	White Bark Acacia	Vela maram	*Vachellia leucophloea*	20
5.	Coconut	Thennai maram	*Cocos nucifera*	40

(**Sources**: Species observation in the field study)

Table No: 3.55. Flora in the Buffer zone of Manakkadavu Village, Rough stone and Gravel quarry, Dharapuram Taluk, Tiruppur District (Primary data & Secondary data).

Sl.No.	English Name	Vernacular Name	Scientific Name	Resource use type *(E,M,EM)
Trees				
1.	Mesquite	Sema Karuvelam	Prosopis juliflora	E
2.	Millettia pinnata	Pongamoiltree	Pongamia pinnata	E
3.	Tamarind	Puliyamaram	Tamarindus indica	EM
4.	Asian Palmyra palm	Panai maram	Borassus flabellifer	E
5.	White Bark Acacia	Vela maram	Vachellia leucophloea	E
6.	Coconut	Thennai maram	Cocos nucifera	EM
7.	River tamarind	Savundal	Leucaenaleucocephala	E
8.	Acacia Nilotica	Karuvelam maram	Vachellia nilotica	M
9.	Mango	Manga	Mangifera indica	E
10.	Banyan tree	Alamaram	Ficus benghalensis	E
11.	Neem or Indian lilac	Vembu	Azadirachta indica	M
12.	Creamy Peacock flower	Vadanarayani	Delonixelata	M
13.	Bitter Albizia	Arappu	Albizia amara	M
14.	Madras Thorn	Kodukapuli	Pithecellobium dulce	E
15.	Castor oil plant	Amanakku	Ricinus communis	M
16.	Gum arabic tree	Karuvelam	Acacia nilotica	NE
17.	False ashoka	Asoka maram	Polyalthia longifolia	E
18.	Monkey pod tree	Thungumoonchi	Samanea saman	E
19.	Lemon	Ezhumuchaipalam	Citrus lemon	EM
20.	Giant thorny bamboo	Perumungil	Bambusabambos	M
21.	Wood-apple	Vilamaram	Limoniaacidissima	M
22.	Black plum	Navalmaram	Sygygiumcumini	EM
23.	Eucalyptus	Eucalyptus	Eucalyptus globules	EM
24.	Custard apple	Seethapazham	Annona reticulata	E
25.	Indian gooseberry	Nelli	Emblica officinalis	EM
26.	Henna	Marudaani	Lawsoniainermis	EM

27.	Sacred fig	Arasan	Ficus religiosa	E
28.	Indian mulberry	Nuna	Morinda tinctoria	E
29.	Teak	Thekku	Tectona grandis	E
30.	Papaya	Pappali maram	Carica papaya	EM
31.	Chinese chaste tree	Nochi	Vitex negundo	E
32.	Peepal	Arasanmaram	Ficus religiosa	M
33.	Guava	Koyya	Psidium guajava	EM
34.	Curry tree	Karuveppilai	Murrayakoenigii	EM
35.	Bamboo	Moonghil	Bambusabambo	E
36.	Drumstick tree	Murunga maram	Moringa oleifera	EM
37.	Indian almond	Padam maram	Terminalia catappa	EM
Shrubs				
1.	Avaram	Avarai	Senna auriculata	M
2.	Night shade plan	Sundaika	Solanum torvum	EM
3.	Lantana	Unnichedi	Lantana camara	M
4.	Rough cocklebu	Ottarachedi	Xanthium strumarium	M
5.	Prickly pear	Nagathali	Opuntia dillenii	M
6.	Triangular spruge	Chaturakalli	Euphorbia antiquorum	NE
7.	Indian jujube	Elanthai	Ziziphus mauritiana	M
8.	Coffee senna	Kattuttakarai	Senna occidentalis	M
9.	Rosy Periwinkle	Nithyakalyani	Cathranthus roseus	M
10.	Bush Morning Glory	NeyvelikKattamanakku	Ipomoea carnea	E
11.	Chinese chastetree	Nochi	Vitex negundo	M
12.	Water spinach	Nalikam	Ipomoea aquatica	E
13.	Indian Oleander	Arali	Nerium indicum	M
14.	Shoe flower	Chemparuthi	Hibiscu rosa-sinensis	EM
15.	Puriging nut	Kattamanakku	Jatropha curcas	EM
16.	Columnar Cactus	Sappathikalli	Cereus pterogonus	M
17.	Thorn apple	Oomathai	Datura stramonium	E
18.	Century plant	Anaikathalai	Agave americana	M
19.	Jackal jujube	Sooraipazham	Ziziphus oenopolia	M
20.	Indian mallow	Thuthi	Abutilon indicum	M

21.	Flame of the Woods	Idlipoo	Xoracoccinea	M
22.	Peacock Flower	Mayil Kontai	Caesalpinia pulcherrima	M
23.	Datura metel	Uumaththai	Datura metel	NE
24.	Milk Weed	Erukku	Calotropis gigantea	M
25.	Cassava	Maravallikizhangu	Manihot esculenta	EM
26.	Hopbush	Virali	Dodonaeaviscosa	E
27.	Paper flower	Kahitha poo	Bougainvillea glabra	M
28.	Tiger nail	Eli verandi	Martynia annua	M
Herbs				
1.	Prickly chaff flower	Nayuruv	Achyranthes aspera	M
2.	Tridax daisy	Veetukaayapoondu	Tridax procumbens	M
3.	Indian doab	Arugampul	Cynodondactylon	E
4.	Copperleaf	Kuppaimeni	Acalypha indica	M
5.	Indian Catmint Plant	Pei viratti	Anisomelesmalabarica	M
6.	Cleome viscosa	Nai kadugu	Celome viscosa	M
7.	Common Wireweed	Arivalmanaipoondu	Sida acuta	M
8.	Punarnava	Mukkirattai	Boerhaaviadiffusa	EM
9.	Mexican prickly poppy	Kudiyotti	Argemone mexicana	M
10.	Common leucas	Thumbai	Leucas aspera	M
11.	Licorice weed	Kallurukki	Scoparia dulcis	M
12.	Chay root	Chaaya ver	Oldenlandiaumbellata	M
13.	Slender dwarf morning-glory	Vittunu-k-kiranti	Evolvulusalsinoides	M
14.	Marsh barbel	Neermulli	Hygrophila auriculata	M
15.	Yellow-fruit nightshade	Kandakathirika	Solanum surattense	M
16.	Shameplant	Thottachenunki	Mimosa pudica	M
17.	Water willow	Kodakasalai	Justicia procumbens	M
18.	Threadstem carpetweed	Parpatakam	Mollugocerviana	M
19.	Node Flower	Kumattikkirai	Allmanianodiflora	M
20.	Asthma-plant	Ammanpacharisi	Euphorbia hirta	M
21.	Pignut	Nattapoochedi	Hyptissuaveolens	M
22.	Holy basil	Thulasi	Ocimumtenuiflorum	M

23.	Madagascar Periwinkle	Nithykalyani	Catharanthus roseus	E
24.	Asian spiderflower	Naaikaduku	Cleome viscosa	M
25.	Digeria muricata	Thoiyakeerai	Digeria muricata	EM
26.	Carrot grass	Parttiniyam	Parthenium hysterophorus	NE
27.	Europeanblack nightshade	Manathakkali	Solanumnigrum	EM
28.	Mountain knotgrass	Thengaipookirai	Aerva lanata	M
29.	Bindii	Nerunchi	Tribulus terrestris	M
30.	Fish poison	Kolinchi	Tephrosia purpurea	M
31.	East Indian globe thistle	Kottakaranthai	Sphaeranthus indicus	M
32.	Tomato	Thakkali	Solanum lycopersicum	EM
33.	False daisy	Karisalankanni	Eclipta alba	M
34.	Chilli	Milakai	Capsicum annuum	EM
35.	Coat buttons	Thatha poo	Tridax procumbens	M
Climber/ Creeper				
1.	Stemmed vine	Perandai	Cissus quadrangularis	M
2.	Wild bitter	Pavarkai	Momordica charantia	EM
3.	Pointed gourd	Kovakkai	Trichosanthes dioica	EM
4.	Ivy gourd	Kovai	Coccinia grandis	M
5.	Bottle Guard	Sorakkai	Lagenaria siceraria	EM
6.	Ground Spurge	Sithrapaalavi	Euphorbia prostrata	EM
Grass				
1.	Jungle rice	KuthiraivaalKattuarusi	Echinochloacolona	NE
2.	Mauritian Grass	Moongilpul	Apludamutica	NE
3.	Swollen Windmill Grass	Kondai Pul	Chloris barbata	NE
4.	Needle Grass	Thodappam	Aristida adscensionis	E
5.	Eragrostis	Pullu	Eragrostis ferruginea	E
6.	Windmill grass	Chevvarakupul	Chloris barbata	NE

Sources: Species observation in the field study and secondary data

3.5.6. Flora Composition in the Buffer Zone (Primary data & Secondary data)

The Buffer zone flora samplings were conducted between 3.00 pm to 6.00 pm in different locations. 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 proposed project site there are 112 species in the buffer zone study area in total, based on records. The floral (112) varieties among them Trees 37, Herbs 35, Shrubs 28, Climbers/ Creepers 6, Grasses 6 were identified. The result of the buffer zone of flora studies shows that Fabaceae and Cucurbitaceous, Euphorbiaceae is the main dominating species in the study area mentioned in Table No.3.55. 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 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 No 3.56 and their % distribution is shown in Figure No 3.36.

Table No 3.56: Number of floral life forms in the Study Area

S. No	Plant Life Form	Number of Species
1	Trees	37
2	Shrubs	28
3	Herbs	35
4	Climber/Creepers	6
6	Grasses	6
Total No. of Species		**112**

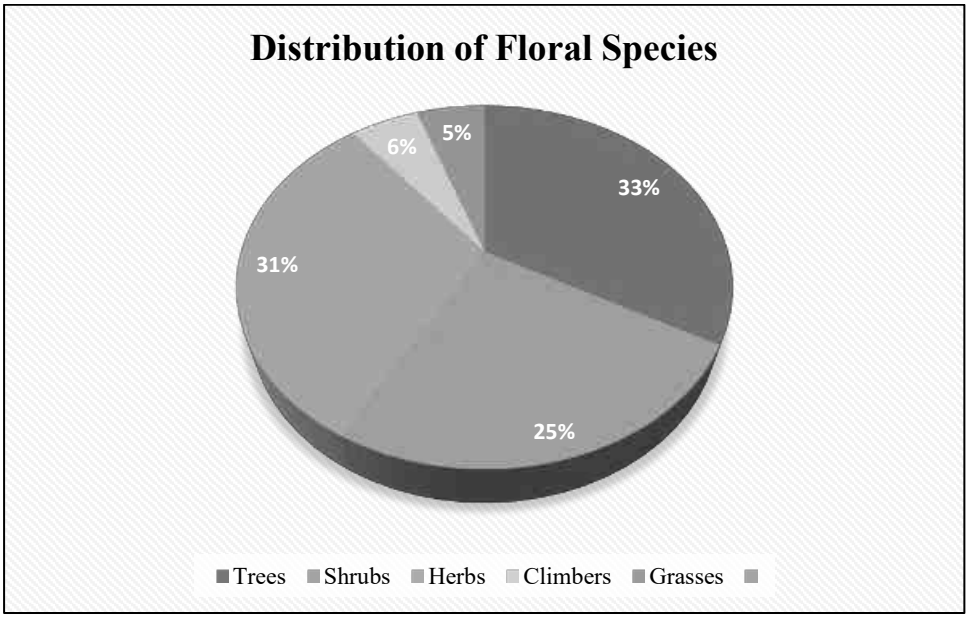


Fig No. 3.36: Diagram showing % distribution of floral life forms

a.Abutilon indicum

b. Prospis juliflora

c. Mangifera indica

d. Parthenium hysterophorus

e. Vachellia leucophloea

f. Cocos nucifera

g. Cissus quadrangularis

h. Psidium guajava

3.5.6.1. Calculation of species diversity by Shannon – wiener Index, Evenness and richness

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

3.5.6.2. Species Diversity

Shannon Diversity Index has been used for estimating the diversity among the eight sampling sites to highlight the most diverse site, and calculate the Shannon Wiener diversity index of each site using the formula:

$$H = - \sum Pi. \ln Pi.$$

Where, H' = Shannon index of diversity

$$Pi = \frac{\text{S= Number of individuals of one species}}{\text{N = Total number of all individuals in the sample}}$$

Table No: 3.57. Overall Shannon's diversity index

S.No	Particulars	Shannon diversity index	Evenness	Richness (number of species)	Total number of individuals	Average population size
1	Trees	3.42	0.948	37	208	5.62
2	Shrubs	3.12	0.937	28	183	6.54
3	Herbs	3.26	0.916	35	170	4.86

3.5.6.3. Interpretation

The community of trees appears to have greater diversity from the result below. While there is less diversity in the shrub ecosystem. Additionally, it has been noted that most quadrates feature plant species with older strands that are regulated generations. A more stable ecosystem containing more ecological niches is one where there is a higher diversity of plant species and a system where environmental change is less likely to be damaging to the ecosystem as a whole. When compared with communities of herbs, trees and herbs communities have higher species richness. In Table No. 3.57 the overall Shannon diversity index result is given above.

3.5.6.4. Major Agricultural Crops

Tiruppur district though an industrial district plays important role in Agriculture also. The food production required to be enhanced to provide food and nutritional security to the growing district population. In Tiruppur more than 80% of the farmers belong to small and marginal category and they play a key role in overall development in Agriculture. The total area of cultivation is around 2,28,556 hectares, mainly food and commercial crops. The chief food crops

are paddy, millets and pulses. The non-food or commercial crops in the district are cotton, oil seeds and coconut. Details of the major crops are given in Table No: 3.58.

Table No: 3.58. Major crops in Tiruppur District

S.No	Major crops	Scientific name	Families
1	Paddy	*Oryza sativa*	Grasses
2	Sorghum	*Sorghum bicolor*	Grasses
3	Maize	*Zea mays*	Grasses

(**Source:** Agriculture Contingency Plan– Tiruppur-2013)

3.5.6.5. Horticulture

Major horticulture crops cultivated in this district are fruits crops like mango, banana, aonla, sapota and papaya, vegetables like bhendi, tomato, brinjal, onion, tapioca, moringa, spices and condiments like chillies and turmeric, plantation crops like cocoa, flower crops like jasmine, tube rose, marigold, cock's comb and medicinal plants like gloriosa and coleus. Details of major field crops and horticulture in Tiruppur district is given in Table No: 3.59.

Table No: 3.59. Major Field crops & horticulture in Tiruppur District.

Sl.No	Common Name	Scientific Name	Family
Major Horticultural Crops			
1	Banana	*Musa*	Musaceae
2	Mango	*Mangifera indica*	Anacardiaceae
3	Jack	*Artocarpus heterophyllus*	Mulberry
4	Guava	*Psidium guajava*	Myrtle
5	Sapota	*Manilkara zapota*	Sapotaceae
6	Lemon	*Citrus × limon*	Rutaceae
Vegetables			
7	Onion	*Allium cepa*	Amaryllidaceae
8	Tapioca	*Manihot esculenta*	Spurges
9	Brinjal	*Solanum melongena*	Nightshade
10	Tomato	*Solanum lycopersicum*	Nightshade
11	Gourds	*Lagenaria siceraria*	Cucurbits
12	Bhendi	*Abelmoschus esculentus*	Mallows
13	Moringa	*Moringa oleifera*	Moringaceae
Medicinal and Aromatic Plants			
14	Gloriosa superba	*Colchicaceae*	Colchicaceae
15	Coleus	*Plectranthusscutellarioides*	Mints
Flowers			
16	Jasmine	*Jasminum*	Jasminaceae
17	Crossandra	*Crossandrainfundibuliformis*	
18	Crysanthimum	*Asteraceae*	Asteraceae
19	Rose & Jathi	*Rosa*	Rosaceae
20	Tuberose	*Polianthes tuberosa*	Asparagus
Spices and Condiments			
21	Chillies	*Capsicum frutescens*	Solanaceae
22	Turmeric	*Curcuma longa*	Zingiberaceae
23	Tamarind	*Tamarindus indica*	Legumes
24	Curry leaf	*Murrayakoenigii*	Rutaceae

Plantation Crops			
25	Cashew	*Anacardium occidentale*	Cashews
26	Cocoa	*Theobroma cacao*	Mallows

(**Source**: Statistical handbook of Tamil Nadu-2013)

3.5.6.5. of Irrigation

Irrigation is the artificial application of water to the soil for normal growth of plants. Water is an important determinant factor for production of crops in agriculture sector. Intensive and extensive cultivation of land depends mainly on the availability of water. Medium and minor irrigation schemes are implemented in the state for augmenting the water supply for agriculture. The various sources of irrigation are canals, tanks, tube wells, ordinary wells, springs and channels. The Following Table No: 3.60. Shows the area irrigated in Tiruppur District.

Table No: 3.60. Area irrigated in the district

S.No	Irrigation	Area ('000 ha)
1	Net irrigated area	119.3
2	Gross irrigated area	123.1
3	Rain fed area	72.9

(**Source:** Statistical handbook of Tamil Nadu-2013)

Dug wells are the major source of water for irrigation in Tiruppur district, accounting for about 59.97 percent of the total area irrigated in this district. Tube wells accounting for about 9.48 percent of the total area irrigated in this district. Of the net area irrigated, the canal irrigated area is only 29.45 percent. The area irrigated under tank is 1.10 percent.
(**Source**: Statistical handbook of Tamil Nadu-2013)

3.5.7. The vegetation in the RF / PF areas, ecologically sensitive areas

The Thalavaipattinam Reserve Forest is located about 9km on the West side. No protected (PF) forests either in the mine lease area or in the buffer zone. Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. There are no impacts due to this mining activity.

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. There are neither forests nor forest dwellers nor forest-dependent communities in the mine lease area. There shall be no forest-impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.

3.6. Fauna

The faunal survey has been carried out as per the methodology cited and listed out Mammals, birds, Reptiles, Amphibians, and Butterflies. All the listed species were compared with

the Red Data Book and the Indian Wildlife Protection Act, 1972. There are no rare, endangered, threatened (RET), and endemic species present in the core area.

3.6.1. Fauna Composition in the Core Zone

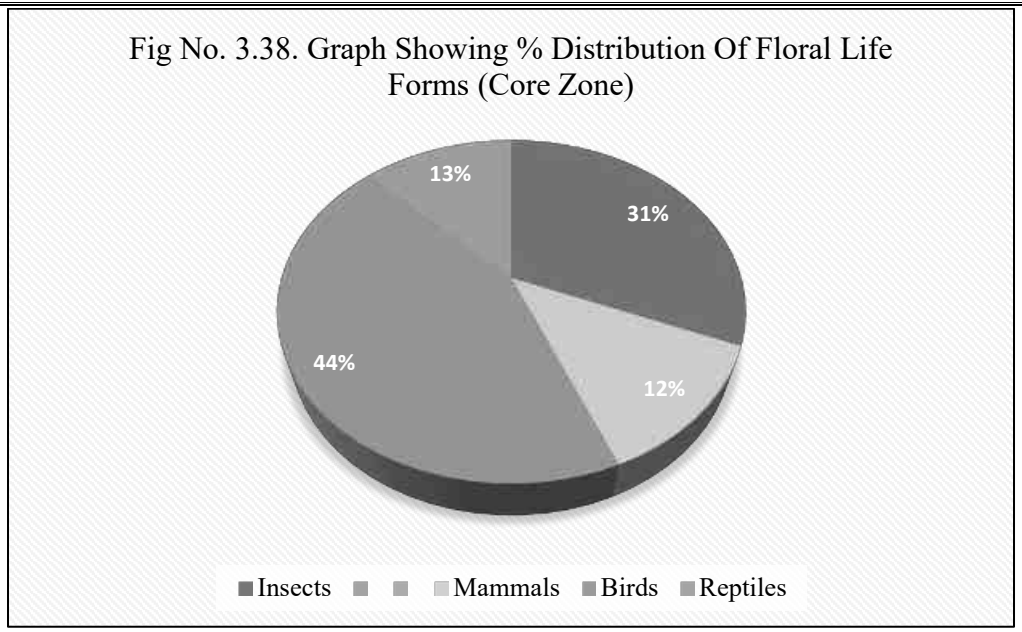
Core zone flora samplings were conducted between 10.00 am to 11.00 am in three locations. A total of 16 varieties of species were observed in the Core zone of Manakkadavu Village, Rough stone and gravel quarry (Table No.3.61) among them numbers of Insects 5 (31%), Reptiles 2 (13%), Mammals 2 (12%) and Avian 7 (44%). A total of 16 species belonging to 13 families have been recorded from the core mining lease area. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and six species are under schedule IV according to the Indian wild life Act 1972. A total of 7 species of bird were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table No. 3.61.

Table No: 3.61. Fauna in the Core zone of Manakkadavu Village, Rough stone and Gravel quarry, Dharapuram Taluk, Tiruppur District (Primary data)

SI. No	Common Name/English Name	Scientific Name	Schedule list wildlife Protection act 1972
Insects/ Butterflies			
1.	Mottled emigrant	Catopsiliapyranthe	NL
2.	Striped tiger	Danaus plexippus	Schedule IV
3.	Common Tiger	Danaus genutia	NL
4.	Red-veined darter	Sympetrum fonscolombii	NL
5.	Danaid egg fly	Hypolimnasmisippus	Schedule IV
Reptiles			
1.	Garden lizard	Calotes versicolor	Schedule IV
2.	Common skink	Mabuyacarinatus	Schedule IV
Mammals			
1.	Indian Field Mouse	Mus booduga	Schedule IV
2.	Common rat	Rattus rattus	Schedule IV
Aves			
1.	Common myna	Acridotheres tristis	Schedule IV
2.	House crow	Corvussplendens	Schedule IV
3.	Common quail	Coturnix coturnix	Schedule IV
4.	Koel	Eudynamys	Schedule IV
5.	Cattle egret	Bubulcus ibis	Schedule IV
6.	Asian green bee-eater	Meropsorientalis	Schedule IV
7.	Black drongo	Dicrurus macrocercus	Schedule IV

(Sources: Species observation in the field study)

Fig No. 3.38. Graph Showing % Distribution Of Floral Life Forms (Core Zone)



3.6.2. Fauna Composition in the Buffer Zone

The Buffer zone fauna samplings were conducted between 3.00 pm to 6.00 pm in different locations. As animals, especially vertebrates move from place to place in search of food, shelter, mate or other biological needs, separate lists for core and buffer areas are not feasible however, a separate list of fauna pertaining to core and buffer zone are listed separately. The Thalavaipattinam Reserve Forest is located about 9km on the West side. As such there are no chances of occurrence of any rare or endangered or endemic or threatened (REET) species within the core or buffer area.

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere reserves or Elephant Corridor or other protected areas within 10 km radius of from the core area. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. There were no resident birds other than common bird species such as Red-whiskered Bulbul, Asian Koel, House crow etc.

The list of Mammals (*directly sighted animals & Secondary data) is given in table No.3.62. The list of bird species recorded during the field survey and literature from the study area are given in Table No 3.63. The list of reptilian species recorded during the field survey and literature from the study area is given in Table No 3.64. The list of insect species recorded during the field survey and literature from the study area are given in Table No 3.65. The list of Butterflies species recorded during the field survey and literature from the study area are given in Table No 3.66. 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 59 species recorded were from the buffer zone area. Based on habitat classification the majority of species were birds 27, followed by Butterflies 12, Reptiles 6, Insects 5, Mammals 5, and Amphibians 4. There are two Schedule II species, two species are under the schedule III and forty-seven species are under Schedule IV according to the Indian Wildlife Act 1972. A total of 27 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, butterflies, and insects, and four amphibians was observed during the extensive field visit Sphaerothecabreviceps, Euphlyctishexadactylus, Bufomelanostictus, etc. There is no Schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No: 3.62. List of Fauna & Their Conservation Status, Mammals (*directly sighted animals & Secondary data)

SI. No	Common Name/English Name	Scientific Name	Schedule list wildlife Protection act 1972
1.	Indian palm squirrel	Funambulus palmarum	Schedule IV
2.	Indian Field Mouse	Mus booduga	Schedule IV
3.	Asian Small Mongoose	Herpestesjavanicus	Schedule (Part II)
4.	Indian hare	Lepus nigricollis	Schedule (Part II)
5.	Brown rat	Rattus norwegicus	Schedule IV

Table No: 3.63. Listed birds (Primary & Secondary data)

SI. No	Common Name/English Name	Scientific Name	Schedule list wildlife Protection act 1972
1.	Indian robin	Saxicoloidesfulicatus	Schedule IV
2.	Asian Koel	Eudynamys	Schedule IV
3.	Cattle egret	Bubulcus ibis	Schedule IV
4.	Rock pigeon	Columbidae	Schedule IV
5.	Common myna	Acridotheres tristis	Schedule IV
6.	House crow	Corvussplendens	Schedule V
7.	Red Vented Bulbul	Pycnonotuscafer	Schedule IV
8.	Small Bee Eater	Meropsorientalis	Schedule IV
9.	Purple sunbird	Cinnyris asiaticus	Schedule IV
10.	House sparrow	Passer domesticus	Schedule IV
11.	Brahminy myna	Temenuchuspagodarum	Schedule IV
12.	Small blue Kingfisher	Alcedo atthis	Schedule IV
13.	Rose-ringed parkeet	Psittaculakrameri	Schedule IV
14.	Common quail	Coturnix coturnix	Schedule IV
15.	Pond herons	Ardeolagrayii	Schedule IV
16.	Black drongo	Dicrurus macrocercus	Schedule IV
17.	Woodpecker bird	Picidae	Schedule IV
18.	Weaver bird	Ploceusphilippines	Schedule IV
19.	Two-tailed Sparrow	Dicrurus macrocercus	Schedule IV
20.	Grey drongo	Dicrurus longicaudatus	Schedule IV
21.	Grey Francolin	Francolinuspondicerianus	Schedule IV
22.	Wood Sandpiper	Tringaglareola	Schedule IV
23.	Blue-Tailed Bee Eater	Meropsphilippinus	Schedule IV
24.	Indian Roller	Coracias benghalensis	Schedule IV
25.	Common Swallow	Hirundo rustica	Schedule IV
26.	Purple Rumped Sunbird	Leptocomazeylonica	Schedule IV

27.	Purple Sunbird	Cinnyris asiaticus	NL

Reference: Ali, S. (2002). The Book of Indian Birds (13th revised edition). Oxford University Press, New Delhi. 326pp. https://ebird.org/region/IN-TN-TP

Table No: 3.64. List of Reptiles either spotted or reported from the study area (*indicates direct observations & Secondary data)

SI. No	Common Name	Scientific Name	Schedule list wildlife Protection act 1972
1.	Oriental garden lizard	Calotes versicolor	III
2.	House lizards	Hemidactylus flaviviridis	Schedule IV
3.	Green vine snake	Ahaetulla nasuta	Schedule IV
4.	Rat snake	Ptyas mucosa	III
5.	Common krait	Bungarus caeruleus	Schedule IV
6.	Common skink	Mabuyacarinatus	NL

Table No: 3.65. List of insects either spotted or reported from the study area

SI. No	Common Name	Scientific Name	Schedule list wildlife Protection act 1972
1.	Indian honey bee	Apis cerana	-
2.	Termite	Hamitermessilvestri	NE
3.	Grasshopper	Hieroglyphussp	NL
4.	Ant	Camponotus Vicinus	NL
5.	Dragonfly	Ceratogomphus pictus	-

Table No: 3.66. List of Butterflies reported from the study area and Secondary data

SI. No	Common Name	Scientific Name	Schedule
1.	Indian palm bob	Suastusgremius	Schedule IV
2.	Common Mormon	Papilio polytes	Schedule IV
3.	Common rose	Pachlioptaaristolochiaee	Schedule IV
4.	Spotless grass yellow	Euremalaeta	Schedule IV
5.	Common Tiger	Danaus genutia	Schedule IV
6.	Common emigrant	Catopsiliapomona	Schedule IV
7.	Crimson tip	Colotisdanae	Schedule IV
8.	Common Indian crow	Euploea core	Schedule IV
9.	Lime Butterfly	Papilio demoleus	Schedule IV
10.	Yellow Pansy	Junoniahierta	Schedule IV
11.	Chocolate Pansy	Junoniaiphita	Schedule IV
12.	Double-branded Black Crow	Euploeasylvester	Schedule IV

Sources: https://www.ifoundbutterflies.org/taxonomy/term/6734
https://www.inaturalist.org/places/tiruppur

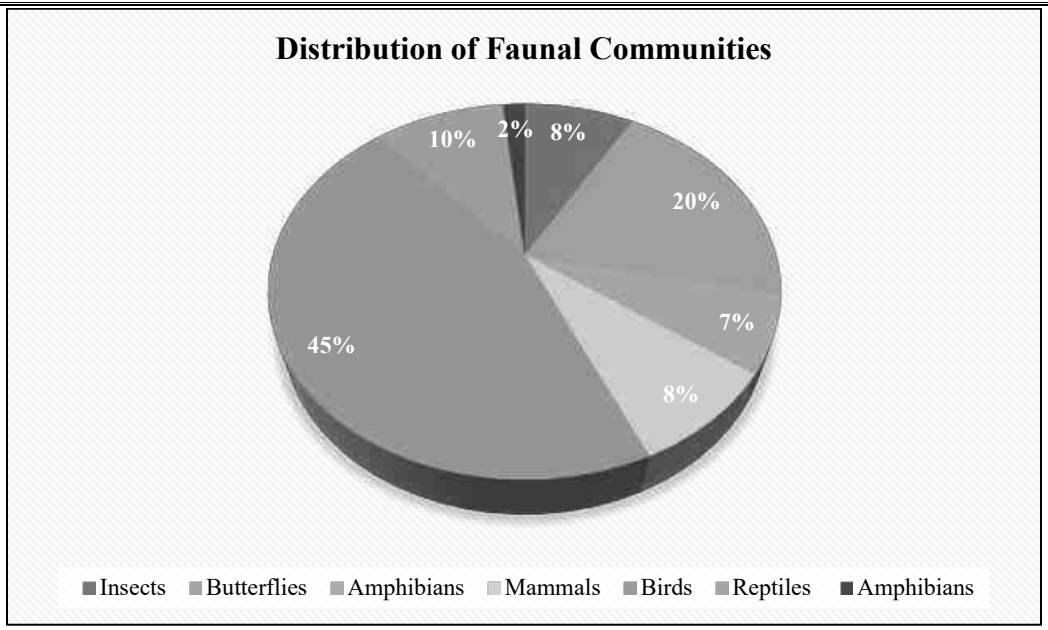


Fig No: 3.39. Diagram showing % distribution of faunal life forms

Livestock like cattle, buffalo, goat, poultry, duck and pig are reared for dairy products, meat, and egg and for agriculture purpose. Majority of cattle and buffalo are of local variety. Backyard poultry farms are mostly common in this area; however, some commercial poultry farms are also recorded in the study area. The study area is marked with moderate population of flora and fauna. With reference to the Wildlife Protection Act 1972 total number of wildlife tabulated in this study can be characterized as given in the Table No 3.67.

Table No: 3.67. Characterization of Fauna in the Study Area (As Per W.P Act, 1972)

S.No	Schedule of Wildlife Protection Act 1972	No. of species	Remark
1.	Schedule I	0	-
2.	Schedule II	2	-
3.	Schedule III	2	-
4.	Schedule IV	47	-
5.	Schedule V	1	-
6.	Schedule VI	0	-

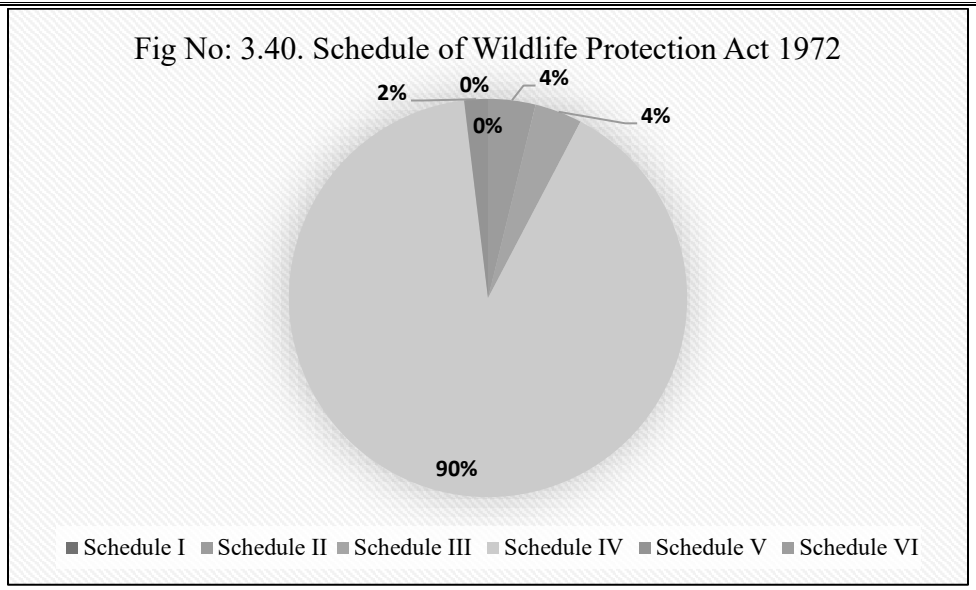


Table No: 3.68. Description of Flora & Fauna

S.No	Type of Species	Name	Local Name
Flora			
1.	Endangered species	None	None
2.	Threatened species	None	None
3.	Near Threatened species	None	None
4.	Vulnerable species	None	None
Fauna			
5.	Endangered species	None	None
6.	Threatened species	None	None
7.	Near Threatened species	None	None
8.	Vulnerable species	None	None
9.	Migratory Corridors & Flight Paths	No corridors & flight paths	-
10.	Breeding & Spawning grounds	None	-

A comprehensive Central Legislation Namely Wild Life (Protection) Act was enforced in 1972 to provide protection to wild animals. Schedule-I of this act contains the list of rare and endangered species, which are completely protected throughout the country. The list of wild animals and their conservation status as per Wild Life Act (1972) presented in Table No 3.67 are the species recorded/reported from the study area, out of which 2 species belongs to schedule-II, 2 species belong to schedule-III, 1 species belongs to Schedule-V and rest of the species belongs to schedule-IV of Wildlife Protection Act, 1972.

3.6.3. Aquatic Ecology

Few seasonal water bodies (River and pond and lake) located in the study area. Mining activities will not have an impact on aquatic ecosystems because no effluent discharge from the Rough stone and gravel quarry is planned. There are no natural perennial surface water bodies, such as marshes, rivers, streams, lakes, or agricultural sites, inside the mining lease area. The study

region contains a few seasonal bodies of water. There is no aquatic flora and, aquatic faun. Hence, it does not harbour any significant aquatic life. Therefore, the project is not likely to affect the aquatic ecology. 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.

3.6.3.1.Objectives of Aquatic Studies

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

3.6.3.2. Macrophytes

The macrophytes observed within the study area are tabulated in Table No 3.69

Table No: 3.69 Description of Macrophytes

Sl.No	Scientific name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1.	*Eichorniacrassipe*	Water hyacinth	Agayatamarai	NA
2.	*Aponogetonnatans*	Floating lace plant	Kottikizhnagu	NA
3.	*Nymphaea nouchali*	Blue water lily	Nellambal	LC
4.	*Typha angustifolia*	Sambu	Narrowleaf cattail	LC
5.	*Carexcruciata*	Cross Grass	Koraipullu	NA
6.	*Cyperus exaltatus*	Tall Flat Sedge	Koraikizhangu	LC

Sources: Species observation in the field study

3.6.3.3. Aquatic Faunal Diversity

Amphibian species like the common Indian Burrowing frog, and Green pond frog, and etc. were sighted near the water bodies located in the study area.

Table No. 3.70. Amphibians Observed/Recorded from the Study Area

SI. No	Common Name/English Name	Scientific Name	Schedule list wildlife Protection act 1972
1.	Indian Burrowing frog	Sphaerothecabreviceps	Schedule IV
2.	Green pond frog	Euphlyctishexadactylus	Schedule IV
3.	Indian Toad	Bufomelanostictus	Schedule IV
4.	Skipper	Euphlyctiscynophlyctis	Schedule IV

3.6.3.4. Other Aquatic Fauna

3.6.3.5. Fishes

The study area has low aquatic diversity, with few types of fish living. The species of fish reported during the primary visit are Rohu, Catla, Catfish, etc. Species of fish reported in the study area are given in Table No 3.71.

Table No: 3.71. Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data

S.No	Common name	Scientific name	Family
1.	Ponthia	Puntius sophore	Cyprinidae
2.	Catla	Catla Catla	Cyprinidae
3.	Catfish	Siluriformes	-
4.	Rohu	Labeorohita	Cyprinidae

3.7.Findings/Results

The assessment was carried out during the 25 Post monsoon season. The inspection day was quite alright with respectable weather. The details of the flora and fauna observed are given below.

Records of threatened species in the area

No threatened species were observed

Endangered Species as per Wildlife (Protection) Act

No Endangered fauna was recorded in the project area**.**

Endemic Species of the Project areas

No endemic species were observed in the project area.

Migratory species of the Project areas

No migratory fauna observed in project area.

Migratory corridors and Flight paths

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

Breeding and spawning grounds

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

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

There are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, Tiger/Elephant Reserves/(existing as well as proposed) within 10 km of the mine lease area. There are no protected forests within the project area. Hence submission of clearance from the National Board of Wildlife does not arise.

There is no endangered, endemic and RET Species. There is no Schedule I species in study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] The proposed project is not going to have any direct or indirect adverse impact on the species mentioned above.

3.8. Conclusion

The observations and assessment of the overall ecological scenario involve details such as classification of Biogeographic zone, eco-region, habitat types and land cover, distances from

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

Sources:

A_survey_on_the_floral_diversity_of_rural_areas_in_Udumalpet_Taluk_Tiruppur_District_Tamil_Nadu_India
https://www.academia.edu/49349854/Avenue_Trees_of_Urban_Landscape_Tiruppur_City_Tamil_Nadu
https://tnmines.tn.gov.in/pdf/dsr/22.pdf
https://www.sciencedirect.com/science/article/abs/pii/S1872203221001359
https://www.psgcas.ac.in/journals/search/issues/Volume-III-Issue_I/8.pdf
https://typeset.io/pdf/survey-of-wetlands-in-and-around-tiruppur-district-tamil-244pav3mvl.pdf
Invasive Alien Species | IUCN
https://ebird.org/region/IN-TN-TP/bird-list?rank=lrec&hs_sortBy=count
https://uk.inaturalist.org/check_lists/316687-Tiruppur-Check-List
Ali, S. (2002). The Book of Indian Birds (13th revised edition). Oxford University Press, New Delhi. 326pp.
Ali, S and Ripley, S.D. 1969.Handbook of the Birds of India and Pakistan together with those of Nepal, Sikkim, Bhutan and Ceylon,3. Stone Curlews to Owls. Oxford University Press, Bombay, 327pp.
Bird Life International 2012. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.

3.6 SOCIO ECONOMIC ENVIRONMENT

The major developmental activities in mining 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 and gravel quarry project is an important part of the EIA study. The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio economics and parameters of human interest due to the project.

3.6.1 Objectives of the Study

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

- To study the socio-economic status of the people living in the study area.
- To assess the impact of the project on Quality of life of the people in the study area.
- To recommend Community Development measures needs to be taken up in the study Area.

3.6.2 Scope of Work

- To study the Socio-economic Environment of the area from the secondary sources;

- Data Collection & Analysis
- Prediction of project impact
- Mitigation Measures

3.6.3 District Profile

Tirupur is a municipal corporation in the Indian state of Tamil Nadu. It is situated as the capital of the newly declared Tirupur district. The city excels in the ready-made garment industry. Tirupur, the seventh largest city in Tamil Nadu, is a rapidly developing industrial city. Around 20 lakh people live in and around Tirupur. It is one of the major cities in Tamil Nadu. It is also the 7th largest city in Tamil Nadu.

3.6.4 Study area:

Manakadavu Village-Population

Manakadavu village is situated in Teshil Dharapuram, District Tiruppur and in State of Tamil Nadu India. Village has population of 4946 as per census data of 2011, in which male population is 2469 and female population is 2477. Total geographical area of Manakadavu village is 2746.38 Hectares. Population density of Manakadavu is 2 persons per Hectares. Total number of house hold in village is 1466.

Sex Ratio of Manakadavu Village -Census 2011

As per the Census Data 2011 there are 1003 Femals per 1000 males out of 4946 total population of village. There are 920 girls per 1000 boys under 6 years of age in the village.

TABLE 3.32: DEMOGRAPHIC CHARACTERISTICS – MANAKKADAVU VILLAGE

Particulars	Total	Male	Female
Total No. of Houses	1466	-	-
Population	4946	2469	2477
Child (0-6)	432	225	207
Schedule Caste	1325	677	648
Schedule Tribe	0		
Literacy	2885	1662	1223
Total Workers	2797	1642	1155
Main Worker	2359	1418	941
Marginal Worker	438	224	214

Source: https://www.census2011.co.in/data/village/644630-manakkadavu -tamil-nadu.html

Literacy of Manakadavu Village

Out of total poplation total 2885 people in Manakadavu Village are literate, among them 1662 are male and 1223 are female in the village. Total literacy rate of of Manakadavu is 63.91%, for male literacy is 74.06% and for female literacy rate is 53.88%.

Worker's profile of Manakadavu Village

Total working population of Manakadavu is 2797 which are either main or marginal workers. Total workers in the village are 2797 out of which 1642 are male and 1155 are female. Total main workers are 2359 out of which female main workers are 1418 and male main workers are 941. Total marginal workers of village are 438.

TABLE 3.34: POPULATION DATA OF STUDY AREA

Sno	Name	TRU	No House Hold	Total Population	Male Population	Female Population	SC Population	ST Population	Total Literacy	Male Literacy	Female Literacy
1	Alangiyam	Rural	1879	6124	3026	3098	2130	1	4132	2294	1838
2	Appanuthu	Rural	300	952	466	486	314	0	619	351	268
3	Appayampatti	Rural	486	1631	824	807	241	0	1000	608	392
4	Appipalayam	Rural	188	604	301	303	165	0	373	221	152
5	Bommanallur	Rural	578	1867	952	915	538	0	1238	712	526
6	Chitravathanpalayam	Rural	2332	8089	4084	4005	1526	4	6002	3290	2712
7	Dalavoipattinam	Rural	2203	7310	3631	3679	4138	5	4231	2382	1849
8	Dharapuram South	Rural	43	136	70	66	70	0	89	51	38
9	Kolinjivadi	Rural	8	23	12	11	14	0	7	5	2
10	Kongur	Rural	800	2581	1295	1286	372	0	1426	863	563
11	Kothayam	Rural	1089	3569	1798	1771	991	0	2229	1278	951
12	Kottathurai	Rural	1015	3342	1643	1699	691	0	2091	1205	886
13	Manakadavu	Rural	1466	4946	2469	2477	1325	0	2885	1662	1223
14	Mettupatti	Rural	328	1064	537	527	293	0	610	372	238
15	Nallampalayam	Rural	613	1932	984	948	836	0	1131	681	450
16	Nanjiyampalayam	Rural	1315	3992	2017	1975	1368	0	2702	1514	1188
17	Palappampatti	Rural	345	1091	520	571	339	0	694	393	301
18	Paruthiyur	Rural	373	1223	609	614	428	0	767	435	332
19	Ponnivadi	Rural	2183	6978	3554	3424	2282	0	4362	2605	1757
20	Poosaripatti	Rural	549	1898	924	974	518	0	1170	670	500
21	Porulur	Rural	1316	4302	2174	2128	1073	0	2904	1682	1222
22	Pungamuthur	Rural	365	1165	583	582	253	0	799	422	377
23	Velampatti	Rural	457	1436	720	716	334	0	841	496	345
24	Verajimangalam	Rural	1150	3359	1605	1754	1903	0	2212	1212	1000

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

TABLE 3.35: WORKERS PROFILE OF STUDY AREA

Sno	Name	Total Workers Population	Male Workers	Female Workers	Total Main Workers	Main Workers Male	Main Workers Female	Main Cultivation Workers	Main Agriculture Workers	Margin Household workers	Margin Other Workers	Non-Worker Population
1	Alangiyam	3125	1904	1221	2955	1850	1105	242	1351	3	74	2999
2	Appanuthu	676	342	334	330	170	160	214	97	1	14	276
3	Appayampatti	1191	621	570	1178	613	565	780	333	0	5	440
4	Appipalayam	425	218	207	415	213	202	242	139	0	0	179
5	Bommanallur	1197	647	550	1043	577	466	431	472	1	16	670
6	Chitravathanpalayam	3887	2541	1346	3478	2321	1157	495	528	33	198	4202
7	Dalavoipattinam	4115	2376	1739	3089	1842	1247	317	1760	19	145	3195
8	Dharapuram South	77	49	28	68	46	22	16	24	0	2	59
9	Kolinjivadi	13	7	6	10	6	4	2	8	0	0	10
10	Kongur	1660	899	761	1371	756	615	682	517	6	78	921
11	Kothayam	2433	1267	1166	2290	1198	1092	1295	824	0	18	1136
12	Kottathurai	1810	1059	751	1693	1035	658	541	533	1	53	1532
13	Manakadavu	2797	1642	1155	2359	1418	941	688	587	16	212	2149
14	Mettupatti	609	375	234	606	374	232	187	310	0	1	455
15	Nallampalayam	1384	725	659	1119	611	508	425	588	0	38	548
16	Nanjiyampalayam	2352	1333	1019	1970	1135	835	473	596	6	226	1640
17	Palappampatti	737	382	355	542	291	251	362	134	1	34	354
18	Paruthiyur	768	417	351	633	350	283	259	261	1	11	455
19	Ponnivadi	4437	2397	2040	4163	2273	1890	1321	1990	21	49	2541
20	Poosaripatti	1213	647	566	1136	609	527	555	386	0	14	685
21	Porulur	2954	1555	1399	2593	1373	1220	1201	910	9	76	1348
22	Pungamuthur	789	416	373	557	303	254	432	42	3	24	376
23	Velampatti	695	486	209	628	449	179	317	151	0	40	741
24	Verajimangalam	2185	1139	1046	2096	1104	992	348	1324	1	35	1174

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

TABLE 3.36: EDUCATIONAL FACILITIES IN THE STUDY AREA

SI	Village Name	PPS		PS		MS		SS		SSS		DC		EC		MC		MI		PT		VTS		SSD	
		G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P
1	Alangiyam	1	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	Appanuthu	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	Appayampatti	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	Appipalayam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	Bommanallur	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	Chitravathanpalayam	1	2	1	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	Dalavoipattinam	1	2	1	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Dharapuram South	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Kolinjivadi	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Kongur	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	Kothayam	1	2	1	2	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	Kottathurai	1	2	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	Manakadavu	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	Mettupatti	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Nallampalayam	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	Nanjiyampalayam	1	2	1	2	1	2	1	2	2	2	2	1	2	1	2	2	2	2	2	1	1	2	2	2
17	Palappampatti	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	Paruthiyur	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19	Ponnivadi	1	1	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	Poosaripatti	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21	Porulur	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	Pungamuthur	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23	Velampatti	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24	Verajimangalam	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Abbreviations: PPS-Pre Primary School; SSS-Senior Secondary School; DC-Degree School; PT-Polytechnic; PS-Primary School; G-Government; EC-Engineering College; VTS-Vocational School /ITI; MS-Middle School; P-Private; MC-Medical College; SSD-Special School For Disabled; SS-Secondary School; MI-Management College/Institute;
Note – 1 - Available within the village; 2 - Not available

TABLE 3.37: MEDICAL FACILITIES IN THE STUDY AREA

SI. No.	Village Name	CHC	PHC	PHSC	MCW	TBC	HA	HAM	D	VH	MHC	FWC	NGM-I/O
1	Alangiyam	0	1	1	1	1	0	0	1	1	0	1	a
2	Appanuthu	0	0	0	0	0	0	0	0	0	0	0	a
3	Appayampatti	0	0	0	0	0	0	0	0	0	0	0	b
4	Appipalayam	0	0	0	0	0	0	0	0	0	0	0	a
5	Bommanallur	0	0	1	0	0	0	0	0	0	0	0	b
6	Chitravathanpalayam	0	0	1	0	0	0	0	0	0	0	0	b
7	Dalavoipattinam	0	1	1	1	1	0	0	1	0	0	1	a
8	Dharapuram South	0	0	0	1	0	0	0	0	0	0	0	b
9	Kolinjivadi	0	0	0	0	0	0	0	0	0	0	0	b
10	Kongur	0	0	1	0	0	0	0	0	1	0	0	b
11	Kothayam	0	0	1	0	0	0	0	0	0	0	0	b
12	Kottathurai	0	0	1	0	0	0	0	0	0	0	0	b
13	Manakadavu	0	0	1	0	0	0	0	0	1	0	0	b
14	Mettupatti	0	0	0	0	0	0	0	0	0	0	0	a
15	Nallampalayam	0	0	1	0	0	0	0	0	0	0	0	b
16	Nanjiyampalayam	0	0	1	0	0	0	0	0	1	0	0	c
17	Palappampatti	0	0	0	0	0	0	0	0	0	0	0	b
18	Paruthiyur	0	0	1	0	0	0	0	0	0	0	0	a
19	Ponnivadi	0	0	1	0	0	0	0	0	1	0	0	b
20	Poosaripatti	0	0	0	1	0	0	0	0	0	0	0	a
21	Porulur	0	0	1	0	0	0	0	0	1	0	0	b
22	Pungamuthur	0	0	0	0	0	0	0	0	0	0	0	b
23	Velampatti	0	0	0	0	0	0	0	0	1	0	0	a
24	Verajimangalam	0	0	1	1	0	0	0	0	0	0	0	c

Abbreviations: CHC-Community Health Centre; TBC-TB Clinic; VH- Veternity Hospital; PHC-Primary Health Centre; HA-Aallopathic Hospital; FWC-Family Welfare Centre; PHSC-Primary Health Sub Centre ; HAM-Alternative Medicine Hospital; MH-Mobile Health Clinic; MCW-Maternity and Child Welfare Centre; D-Dispensary; NGM-I/O-Non Government Medical Facilities In & Out Patient

Note – 1 - Available within the village; 2 - Not available a-facility available at <5kms b-facility available at>10kms

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

3.6.6 Recommendation and Suggestion

- The main activities in the area is quarry operation and 1 No are already in the Operation. Hence starting up of new mine in this region is necessary at current scenario
- Due to the project about 47 Nos of people will benefitted directly due to employment and more than 75 Nos of people and Crushers will benefitted through this project
- As part of CER activities proponent intends to spend Rs 10 Lakhs for the improvement of School sanitation facilities, Greenbelt development and other needs.
- At the end of the life of the mine the mined-out pit will act as temporary reservoir, the collected rain water in the mine pit may utilized for the nearby agriculture lands.

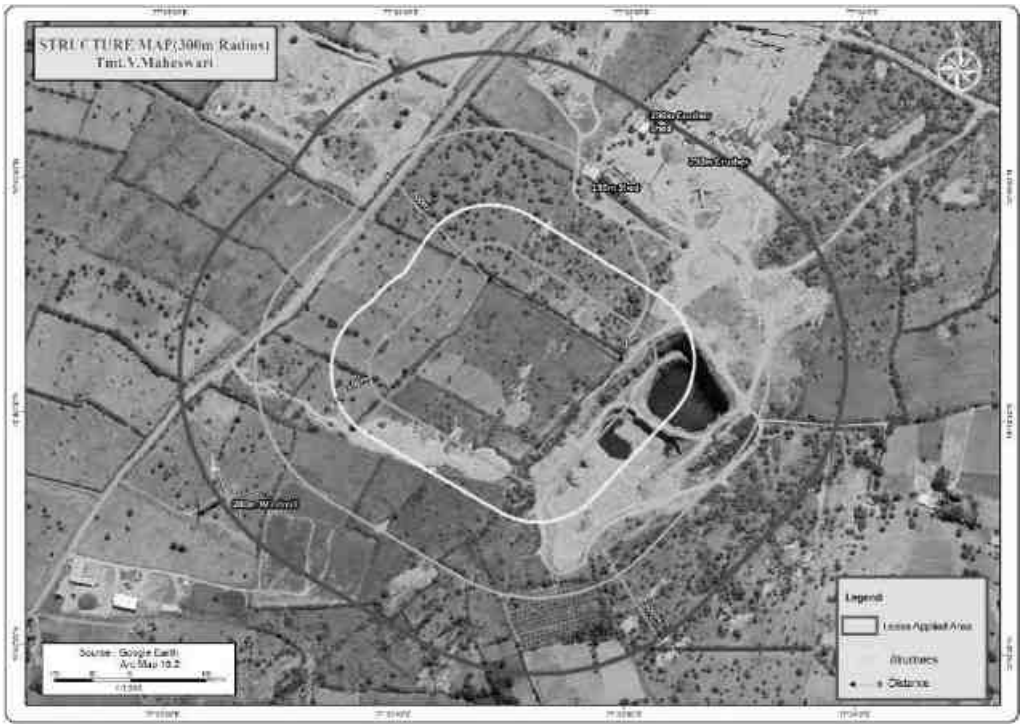
Apart from the following general activities will be conducted

- Awareness program to be conducted to make the population aware to get education and a better livelihood.
- Vocational training programme can be organized to make the people self - employed, particularly for women and unemployed youth.
- On the basis of qualification and skills local community may be preferred. Long term and short-term employments can be generated.
- While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

3.6.7 Summary & Conclusion

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

Structure MAP 300m Radius



Structure Numbers	Distance & Direction from the project site	Structure Details and Usage Purpose	Type of Structure Structures (Kutcha/ Brick/ Cement/ RCC/ Framed Structures)	No. of Occupants	Structure belongs to owner (Yes/No)	Remarks
1	190m - NE	Shed	Sheet & Brick Structure	3 Nos	Yes	Used to store mines materials – No Stay
2	280m - SW	Windmill	Framed Structure	-	No	Producing Electricity
3	290m - NE	Crusher	Framed Structure	Nil	No	Production of M-Sand, P-Sand & Jelly
4	290m - NE	Crusher Shed	Sheet & Brick Structure	3 Nos	No	Used to store mines materials – No Stay

3.25 Conclusion

To evaluate the impacts of proposed quarry project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the locality of the site. Hence it can be concluded that the present environment status of the study area will not be affected by the project as **Tmt. V. Maheswari Rough Stone and Gravel quarry 3.00.0 Ha** 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.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

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

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

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

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

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

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

4.1 LAND ENVIRONMENT:

4.1.2 Anticipated Impact

- 2.39.50 Ha of the land will be under mining since the Permanent or temporary change on land use and land cover will occur
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.

If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

4.1.2 Mitigation Measures

- The 2.39.5 Ha of the land will be converted into temporary reservoir which will full fill the water scarcity in the drought season and the nearby agriculture land will benefitted by the supply of water
- About 1500 Nos of trees will be planted in the lease area and approach road will retain the ecosystem
- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development in the production
- Construction of garland drains all around the quarry pits and construction of silt trap 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.,
- Fencing will be constructed before starting the mining operation and it will be maintained in the conceptual stage Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.1.3 Soil Environment

4.1.4 Impact on Soil Environment

- Removal of vegetation cover
- Soil Erosion in the project site during rainy season due to quarry operation

4.1.5 Mitigation Measures

- Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry. 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 (Silt Pond). 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 is no waste anticipated in this Rough Stone and gravel quarrying operation. The entire quarried out materials will be utilized (100%).

4.2 WATER ENVIRONMENT

4.2.1 Anticipated Impact

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

- Abstraction of water may lead to depletion of water table
- 3.0 KLD water will be utilized for the quarrying operation

4.2.2 Mitigation Measures

- Water for the quarrying operation such as sprinkling on haul roads, Greenbelt development will be sourced from the lower part of the mine pit which is specifically allotted to collect the rain water.
- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- De-silting will be carried out before and immediately after the monsoon season.

4.3 AIR ENVIRONMENT

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 PM_{10} & $PM_{2.5}$ and emissions of Sulphur dioxide (SO_2) & Oxides of Nitrogen (NOx) 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.

Prediction of impacts on air environment has been carried out taking into consideration cumulative production all the quarries fall in the Cluster. Air environment and net increase in emissions by Open pit source modelling in AERMOD Software AERMOD 12.

4.3.2.1 Emission Estimation

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

The general equation for emissions estimation is:

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

Where:
E = emissions;
A = activity rate;
EF = emission factor, and
ER =overall emission reduction efficiency, %

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

4.3.2 Frame work of Computation & Model details

Suspended Particulate Matter (SPM) is the major pollutant occurred during quarrying activities. The prediction included the impact of Excavation, Drilling, Blasting (Occasionally), loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and Cloud cover.

Impact was predicted over the distance of 10km 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 PM_{10} was observed close to the source due to low to moderate wind speeds. Incremental value of PM_{10} was superimposed on the base line data monitored at the proposed site to predict total GLC of PM_{10} due to combined impacts

TABLE 4.1: ESTIMATED EMISSION RATE

PM_{10}			
Activity	**Source type**	**Value**	**Unit**
Drilling	Point Source	0.099990480	g/s
Blasting	Point Source	0.001395877	g/s
Mineral Loading	Point Source	0.054187724	g/s
Haul Road	Line Source	0.002784553	g/s/m
Overall Mine	Area Source	0.201071071	g/s
So2	Point Source	0.001696641	g/s
Nox	Point Source	0.000210327	g/s

FIGURE 4.1: AERMOD TERRAIN MAP

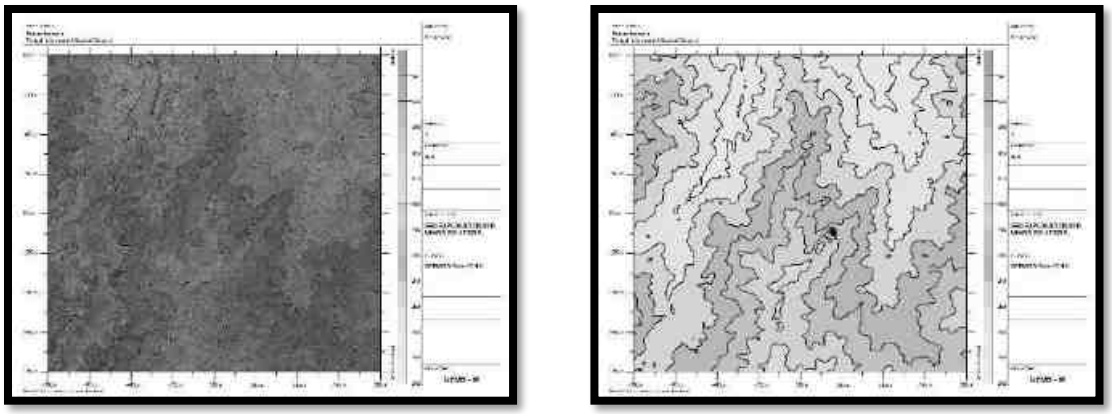


FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM_{10}

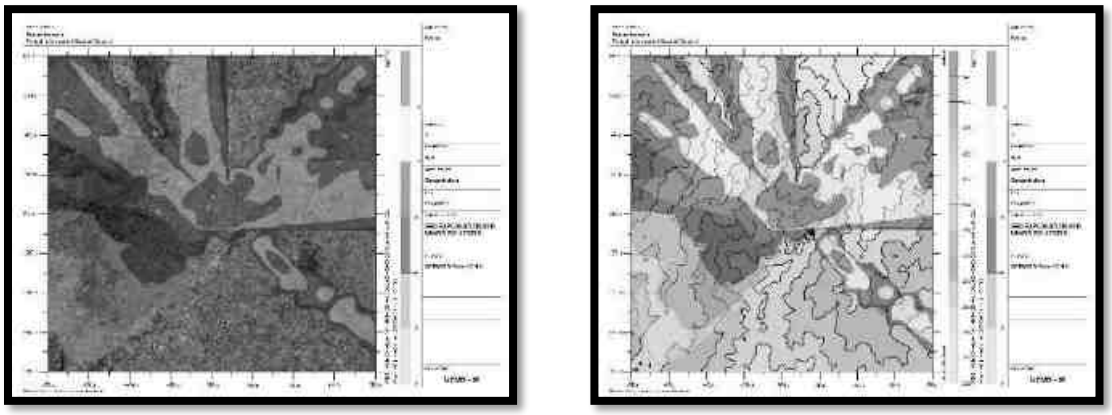


FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM_{25}

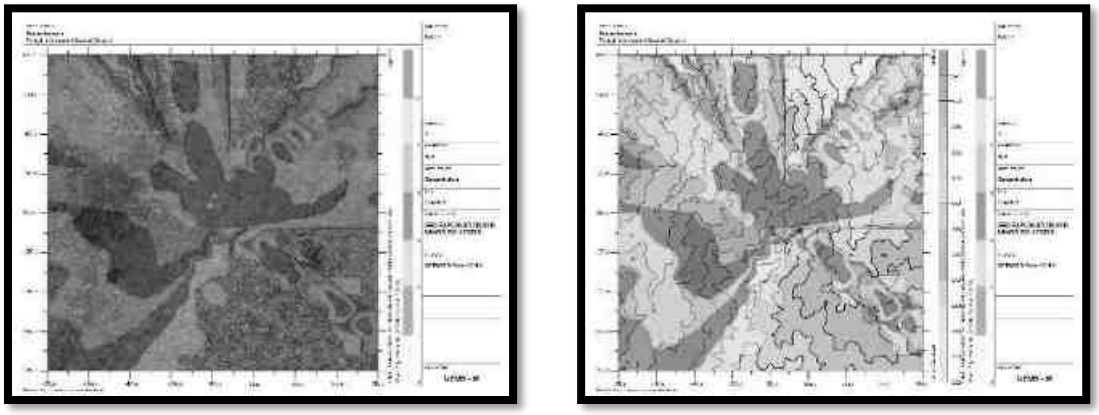


FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO_X

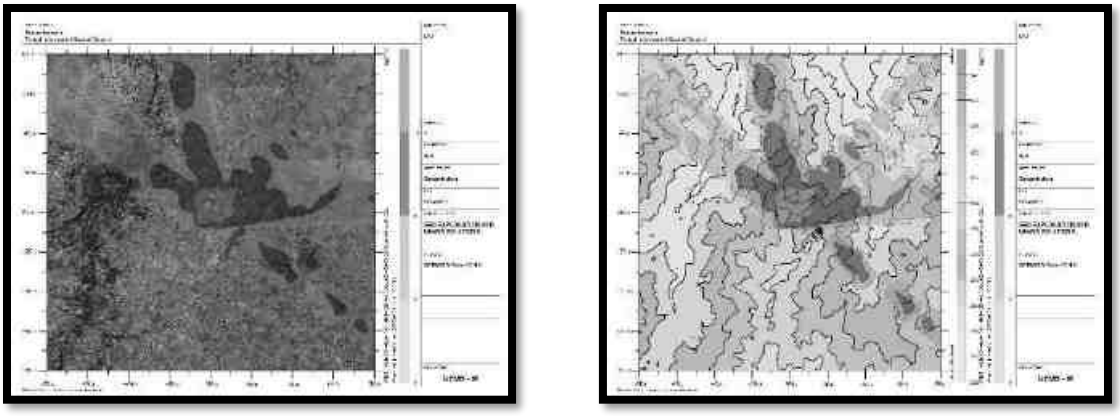


FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF So2

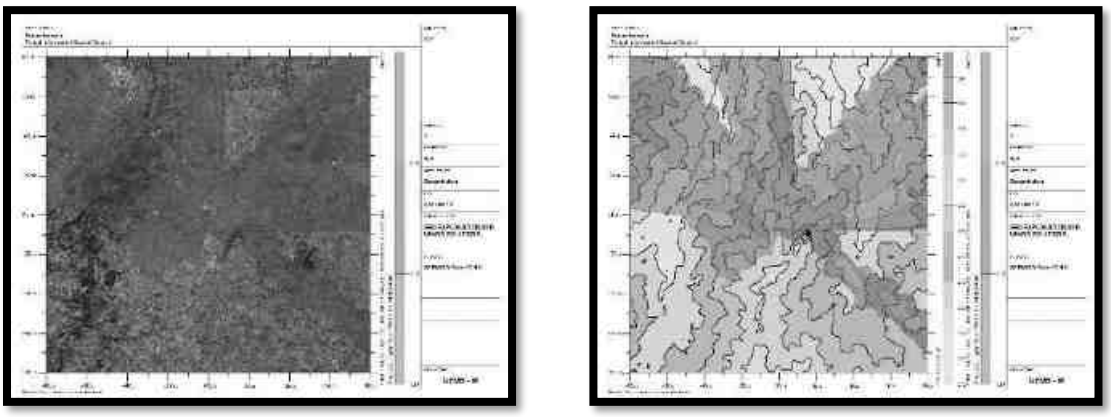
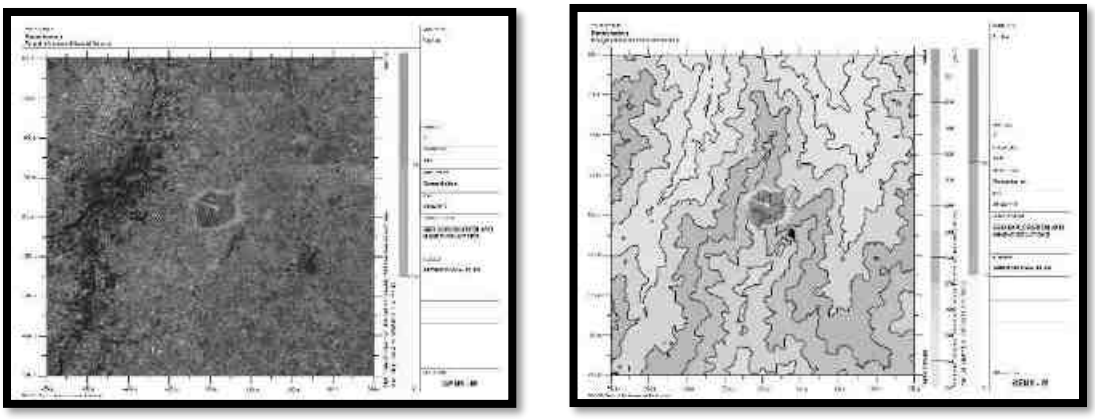


FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST



4.3.2.1 Model Results

The post project Resultant Concentrations of PM_{10}, $PM_{2.5}$, SO_2 & NO_X (GLC) is given in Table below:

TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM_{10}

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM_{10} ($\mu g/m^3$)	Incremental value of PM_{10} due to mining ($\mu g/m^3$)	Total PM_{10} ($\mu g/m^3$)
AAQ1	10°40'31.92"N 77°33'41.38"E	-110	-11	46.3	15.85	62.15
AAQ2	10°40'49.72"N 77°33'48.53"E	106	537	42.8	15.24	58.04
AAQ3	10°40'24.16"N 77°32'21.32"E	-2563	-252	43.2	8.91	52.11
AAQ4	10°37'24.58"N 77°34'2.30"E	530	-5818	43.1	0	43.1
AAQ5	10°41'45.27"N 77°37'8.56"E	6236	2264	43.4	10	53.4
AAQ6	10°42'31.68"N 77°32'34.42"E	-2704	3736	42.8	11.21	54.01
AAQ7	10°39'25.90"N 77°35'57.97"E	4143	-2561	43.3	0	43.3

TABLE 4.3: INCREMENTAL & RESULTANT GLC OF PM2.5

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline $PM_{2.5}$ ($\mu g/m^3$)	Incremental value of $PM_{2.5}$ due to mining ($\mu g/m^3$)	Total $PM_{2.5}$ ($\mu g/m^3$)
AAQ1	10°40'31.92"N 77°33'41.38"E	-110	-11	20.8	7.91	28.71
AAQ2	10°40'49.72"N 77°33'48.53"E	106	537	19.9	7.36	27.26
AAQ3	10°40'24.16"N 77°32'21.32"E	-2563	-252	20.5	4.42	24.92
AAQ4	10°37'24.58"N 77°34'2.30"E	530	-5818	20.4	0	20.4
AAQ5	10°41'45.27"N 77°37'8.56"E	6236	2264	23.6	4.94	28.54
AAQ6	10°42'31.68"N 77°32'34.42"E	-2704	3736	21.1	6.19	27.29
AAQ7	10°39'25.90"N 77°35'57.97"E	4143	-2561	20.9	3.33	24.23

TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO2

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO_2 ($\mu g/m^3$)	Incremental value due to mining ($\mu g/m^3$)	Total SO_2 ($\mu g/m^3$)
AAQ1	10°40'31.92"N 77°33'41.38"E	-110	-11	7.4	2.28	9.68
AAQ2	10°40'49.72"N 77°33'48.53"E	106	537	6.9	2.20	9.1
AAQ3	10°40'24.16"N 77°32'21.32"E	-2563	-252	6.5	0.57	7.07
AAQ4	10°37'24.58"N 77°34'2.30"E	530	-5818	7.0	0	7
AAQ5	10°41'45.27"N 77°37'8.56"E	6236	2264	6.5	1.80	8.3
AAQ6	10°42'31.68"N 77°32'34.42"E	-2704	3736	6.4	1.00	7.4
AAQ7	10°39'25.90"N 77°35'57.97"E	4143	-2561	6.6	0	6.6

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NO_X

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NOx ($\mu g/m^3$)	Incremental value due to mining ($\mu g/m^3$)	Total NOx ($\mu g/m^3$)
AAQ1	10°40'31.92"N 77°33'41.38"E	-110	-11	23.7	10.23	33.93
AAQ2	10°40'49.72"N 77°33'48.53"E	106	537	22.4	9.51	31.91
AAQ3	10°40'24.16"N 77°32'21.32"E	-2563	-252	23.4	0	23.4
AAQ4	10°37'24.58"N 77°34'2.30"E	530	-5818	22.7	0	22.7
AAQ5	10°41'45.27"N 77°37'8.56"E	6236	2264	22.5	0	22.5
AAQ6	10°42'31.68"N 77°32'34.42"E	-2704	3736	23.8	2.00	25.8
AAQ7	10°39'25.90"N 77°35'57.97"E	4143	-2561	23.0	0	23.0

TABLE 4.6: INCREMENTAL & RESULTANT GLC OF FUGITIVE DUST

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline Fugitive ($\mu g/m^3$)	Incremental value due to mining ($\mu g/m^3$)	Total Fugitive Dust ($\mu g/m^3$)
AAQ1	10°40'31.92"N 77°33'41.38"E	-110	-11	65.46	28.00	93.46
AAQ2	10°40'49.72"N 77°33'48.53"E	106	537	67.04	7.00	74.04
AAQ3	10°40'24.16"N 77°32'21.32"E	-2563	-252	65.15	0	65.15
AAQ4	10°37'24.58"N 77°34'2.30"E	530	-5818	63.89	0	63.89
AAQ5	10°41'45.27"N 77°37'8.56"E	6236	2264	63.86	0	63.86
AAQ6	10°42'31.68"N 77°32'34.42"E	-2704	3736	63.74	0	63.74
AAQ7	10°39'25.90"N 77°35'57.97"E	4143	-2561	61.3	0	61.3

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

4.3.4. Mitigation Measures

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

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 taurpaulin
- 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-metaled 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 –

- 1500Nos of trees will be planted through this project in the lease area and village roads (Approach Road) to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored
- Annual medical checkups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed

4.4 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling & blasting and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement within 300m radius from the project site. Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities.

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

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

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

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

Where:

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

$Ae_{1,2}$ is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

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 taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4-8.

TABLE 4.7: 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

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

The total noise to be produced by mining machineries 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 nose prediction modelling.

TABLE 4.8: PREDICTED NOISE INCREMENTAL VALUES

Location ID	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**
Maximum Monitored Value (Day) dB(A)	49.7	46.2	46.8	45.9	49.8	48.1	47.9
Incremental Value dB(A)	56.6	52.1	43.8	33.9	24.2	25.7	25.3
Total Predicted Noise level dB(A)	54.5	53.1	48.6	46.2	49.8	48.1	47.9

The incremental noise level is found within the range of 56.6 dB (A) in Core Zone and 24.2 to 52.1 dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations are within permissible limits of Industrial area (core zone) & Residential area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.).

4.4.2 Mitigation Measures

The following noise mitigation measures are proposed for control of Noise

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;

- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured though training and awareness.
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects

4.4.3 Ground Vibrations

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

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

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

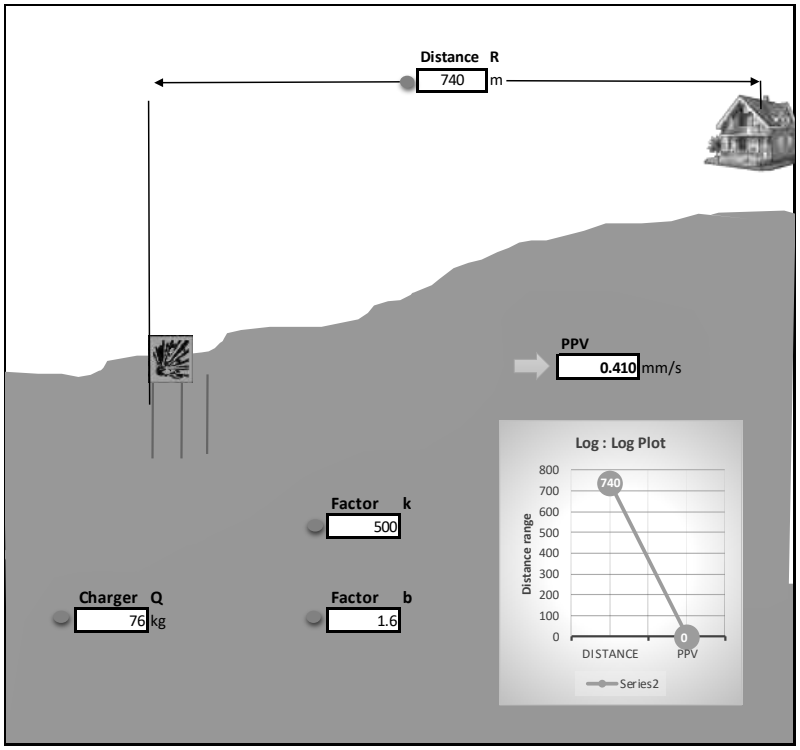
$$V = K\,[R/Q^{0.5}]^{-B}$$

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 4.9: PREDICTED PPV VALUES DUE TO BLASTING

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	76	740-SE	0.410

FIGURE 4.6: GROUND VIBRATION PREDICTION



From the above graph, the charge per blast of 76kg (charge per blast is 20kg i.e., four times per day) is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997. But the all the project proponents ensure that the charge per blast shall be less than 50 kg and carry out blasting twice or thrice a day based on the onsite conditions under the supervision of competent person employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

4.4.3.1 Mitigation Measures

- It is proposed to carry out blasting operation 20kg per round so that the vibration will be minimal
- The mining operation will be carried out without deep hole drilling, 25mm small dia cartridge will be utilized for the blasting
- The blasting operations in the project site without deep hole drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting will be maintained as per DGMS guidelines;
- Blasting shelter will be provided as per DGMS guidelines;
- Blasting operations will be carried out only during day time;
- The charge per delay will be minimized and preferably a greater number of delays will be used per blasts;
- During blasting, other activities in the immediate vicinity will be temporarily stopped;

- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed.
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public.
- 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 mm/s.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

4.5 IMPACT ON THE BIOLOGICAL ENVIRONMENT

4.5. Impact on the Biological Environment

4.5.1. Anticipated Impact on agricultural land associated with flora

1. Dust particle settle on neighbouring agriculture land it is located about 100m on the South & West side. Mostly dust emission from nearby crusher unit and during operation and minerals are transported in approach roads.
2. Dust deposition on leaf observed on nearby lease boundary local plant species which may result in decline the rate of photosynthesis and retards the plant growth.

4.5.2 Mitigation Measures

4.5.2.1. General Guidelines for Green Belt Development

Drone survey was covered the green belt and fencing as per the terms of references. The green belt and plantation purposes in and around the proposed mine lease area native species, fruit-bearing trees, medicinal plants, and dense canopy trees should be selected. These species should be tolerant to pollution levels as per Bio- Geography zones of India.

After the operation of mining production capacity, green belt and Plantation species should be in accordance with the Terms and Conditions of the Environmental Clearance Green belt is created not only for the purpose of protecting sensitive areas or maintaining the ecological balance but because they also act as efficient biological filters or sinks for particulate and gaseous emissions, generated by vehicular movements and various industrial and mining activities. Optimally designed green belts can be effective in reducing the impact of fugitive emissions and pollutants accidentally or otherwise released at ground levels.

4.5.2.2. 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. 5 m wide greenbelt will be developed along the plant premises, as per land available.

4.5.2.3. Development of Green Belt

The plantation matrix adopted for the green belt development includes pit of 0.3 m x 0.3 m in size with a spacing of 2 m x 2 m. In addition, earth filling and manure may also be required for the proper nutritional balance and nourishment of the sapling. It is also recommended that the plantation has to be taken up randomly and the landscaping

aspects could be taken into consideration. Multi-layered plantations comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt.

4.5.3.4. Selection of Plant Species for Green Belt Development

It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration. Multi-layered plantations comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt. Green belt is plantation of trees for reducing the air pollution as they absorb both gaseous and particulate pollutant, thus removing them from atmosphere. Green plants form a surface capable of absorbing air pollutants and forming sinks for pollutants. It improves the aesthetic value of local environment. Under present project, green belts have been planned with emphasis on creating biodiversity; enhance natural surroundings and mitigating pollution. Regional tree saplings in eco-friendly bags like Pterocarpus marsupium, Pongamia pinnata, Limonia acidissima, and Cassia roxburghii will be planted along the Lease boundary and avenues as well as over non-active dumps with intervals 3m in between with the GPS Coordinates. The greenbelt development plan aims to overall improvement in the environmental conditions of the region Native plant species will be preferred.

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

Table No 4.1. 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
10	Madhuca longifolia	Illupai maram

(*Source: Term of Reference-ToR)

Table No 4.2. 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
9	Delonix regia	Neruppu Kondrai
10	Cassia Fistula	Sara Kondrai

(*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 for absorb fugitive emissions and noise levels which are generated during mining activities. All the open spaces, where tree plantation may not be possible, should be covered with shrubs and grass to prevent erosion of topsoil.

4.5.4. Anticipated Impact on Fauna

- Noise generation due to vehicle may affect avifauna.
- The lease area is not inhabited by any wild life, as there is no forest cover, hence there will not be any effect on migration or extinction of wildlife.
- There is no National Park, Biosphere Reserve, Wildlife corridors, and Tiger/Elephant Reserve found within 10 km radius of the project site.

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 to the flora and fauna in consultation with 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.

4.5.3. Impact on Aquatic Biodiversity

- The major lake along the project sites doesn't have a rich biodiversity and almost all the species of both fauna and flora listed are either least concerned or not evaluated.
- There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.

Table No. 4.3. Overall Ecological impact assessments of Manakkadavu Village, Rough stone and gravel quarry, Dharapuram Taluk, Tiruppur District, Tamil Nadu.

S. No	Attributes	Assessment
	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	The Thalavaipattinam Reserve Forest is located about 9km on the West side.
4	The proposed project restricts access to waterholes for wildlife	'No '
5	Proposed mining project impact surface water quality that also provides water to wildlife	'No 'scheduled or threatened wildlife animals are sighted regularly core in the core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity areas.	Surface runoff management such as drains is constructed properly so there will be no siltation effect in the 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 the chances of water becoming polluted is low.
9	Mining projects affect the forest-based livelihood/ any specific forest product on which local livelihood depended.	'No'
10	The project likely to affect migration routes.	'No 'migration route was observed during the monitoring period.
11	The project is likely to affect the 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 is likely to affect wetlands, Fish breeding grounds, and marine ecology.	'No'. Wetland was not present in the near core Mining lease area. No breeding and nesting ground is present in the core mining area.

(*Source: EIA Guidance Manual-Mining and Minerals, 2010)

TABLE 4.13: RECOMMENDED SPECIES FOR GREENBELT DEVELOPMENT PLAN

SI.No	Name of the plant (Botanical)	Family Name	Common Name	Habit
1	*Azadirachta indica*	Meliaceae	Neem, Vembu	Tree
2	*Albiziafalcatoria*	Fabaceae	Tamarind, Puliyamaram	Tree
3	*Polyalthialongifolia*	Annonaceae	Kattumaram	Tree
4	*Borassus Flabellifer*	Arecaceae	Palmyra Palm	Tree

The 7.5m Safety distance along the boundary has been identified to be utilized for subsequent Afforestation. However, the afforestation should always be carried out in a systematic and scientific manner. Regional trees like Neem, Pongamia, Pinnata will be planted along the Lease boundary and avenue plantation will be carried out in the project site.

TABLE 4.14: GREENBELT DEVELOPMENT PLAN

No. of tress proposed to be planted	Area to be covered in m^2	Name of the species
1500	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development.	Neem, Pongamia Pinnata,Ashoka etc.,

4.6 SOCIO ECONOMIC

4.6.1 Construction Phase

Anticipated Impacts:

♣ No. of people will get employment during the construction stage resulting in the ancillary development and growth. Nearby Local people will be given preference for employment on the basis of their skill and experience.

♣ Further due to proposed project, influx of working community will also generate an indirect employment through development of nearby market/ shops, trade centres, activities, transportation etc.

♣ Population influx during the construction phase can introduce various water and vector borne diseases which can lead to various unhygienic health problems in the area by disturbing the existing sanitation infrastructure.

♣ Rapid diverse population influx at the project site can create unusual behavioural activity such as worker-community conflicts, increase violence such as theft/ stabbing, and increased consumption of drugs/alcohol within the area.

♣ Impacts on the health of nearby villagers can be envisaged due to the transportation activities leading to short term exposure of fugitive dust, resulting in various acute diseases such as increased eye irritation, nausea, headache etc.

4.6.2 Mitigation measures:

♣ Deploying of mobile toilets or the construction of temporary toilets will be done near to the construction site with the adequate water supply.

♣ Awareness programme will be conducted before the monsoon season regarding the spread of water borne/ vector diseases.

♣ Mosquito repellents will be provided in the nearby villages and at construction site to avoid the spread of diseases.

♣ To overcome behavioural impact, proper site in charge with timely supervision will be done. In advance, facilities with equipped medical and safety services will be provided to take a control over the incident/violence if any caused.

♣ To overcome behavioural impact, supervision will be done by site in charge. In advance, emergency cell will be formed with fully equipped communication system, medical and safety services to take control over the incident/violence caused.

4.6.3 Operation Phase:

Anticipated Impacts:

♣ Long term exposure to the pollutants such as PM, SO2 and NO2 Cement dust have a potential to create health impacts such as risk of cardiovascular and respiratory disease, eye irritation, bronchitis, lung damage, increased heart ailments, etc.

♣ Other impacts, associated with the Proposed Rough stone and gravel quarry Project will create a positive impact as it will result in the overall development of the area in respect to the infrastructure development, educational growth, health facilities etc. as a part of the CSR activity.

Mitigation Measures:

♣ In order to mitigate the long-term health impacts, efficient Air Pollution Control Equipment (APCE) like Bag House / Bag Filter / ESP will be installed at all major stacks to keep the emissions within the permissible limits. To reduce the gaseous emission, Pyro-process itself acts as a long SO2 scrubber and De - NOx system will be installed for fuel burning along with calciner for low NOx formation. To reduce fugitive emission from vehicles and machineries will be regularly monitored and maintained.

♣ For emergency, proposed to develop an occupational health centre for its employees and nearby villagers.

4.6.4 Impact Evaluation:

Table 4.15 Impact Evaluation

Impact Evaluation Element	Impact on socio economics due to the Proposed project Thiru. V.Maheshwari Rough Stone and Gravel quarry 3.00.0 Ha, Manakadavu Village, Dharapuram Taluk, Tiruppur District.
Potential Effect/ Concern	Proposed project will provide direct & indirect employment opportunities to the local residents, which will help to increase their earning and better living standard as well as further up-liftmen of socio-economic status of the area.

Characteristics of Impacts				
Nature	Positive		Nagative	Netural
	✓			
Type	Direct	Indirect	Cumulative	
Extent	Project area	Local	Zonal	Regional
	✓			
Duration	Short time		Long term	
			✓	
Intensity	Low		Medium	High
			✓	
Frequency	Remote (R)	Occasional (O)	Periodic (P)	Continuous (C)
				✓
Significance of Impact				
Significance	Insignificant	Minor	Moderate	Major
			✓	

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, the entire mined out material will be sold to needy crushers and customers.

4.9 MINE CLOSURE

The ultimate depth of the mine is 47m bgl and the life of the mine is 10years, after completion of mining operation the following action will be taken in the project site as a part of Mine closure plan

- The total Mined out land would be around 2.39.5Ha this land will be converted into temporary water reservoir which will facilitate to collect the rain water
- The stagnant water will be supplied to the nearby agriculture land during drought seasons
- Fencing will be re constructed around the pit after closure, the warning/ danger display board will be placed on all the sides of the project site
- The un utilized area and haul roads will be converted as plantation area, fruit bearing trees will be planted to retain the eco system of the area
- Final Mine closure plan will be prepared and submitted to the concerned authority

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project.

As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

- To create a productive and sustainable after-use for the site, acceptable to mine owners, regulatory agencies, and the public
- To protect public health and safety of the surrounding habitation
- To minimize environmental damage
- To conserve valuable attributes and aesthetics

- To overcome adverse socio-economic impacts.

4.9.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.9.1.1 Physical Stability

All anthropogenic structures, which include mine workings, buildings, rest shelters etc., remaining after mine decommissioning should be physically stable. They should present no hazard to public health and safety as a result of failure or physical deterioration and they should continue to perform the functions for which they were designed. The design periods and factors of safety proposed should take full account of extreme events such as floods, hurricane, winds or earthquakes, etc. and other natural perpetual forces like erosion, etc.,

4.9.1.2 Chemical Stability

The solid wastes on the mine site should be chemically stable. This means that the consequences of chemical changes or conditions leading to leaching of metals, salts or organic compounds should not endanger public health and safety nor result in the deterioration of environmental attributes. If the pollutant discharge likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

4.9.1.3 Biological Stability

The stability of the surrounding environment is primarily dependent upon the physical and chemical characteristics of the site, whereas the biological stability of the mine site itself is closely related to rehabilitation and final land use. Nevertheless, biological stability can significantly influence physical or chemical stability by stabilizing soil cover, prevention of erosion/wash off, leaching, etc.,

A vegetation cover over the disturbed site is usually one of the main objectives of the rehabilitation programme, as vegetation cover is the best long-term method of stabilizing the site. When the major earthwork components of the rehabilitation programme have been completed, the process of establishing a stable vegetation community begins. For re-vegetation, management of soil nutrient levels is an important consideration. Additions of nutrients are useful under three situations.

- Where the nutrient level of spread topsoil is lower than material in-situ e.g., for development of social forestry
- Where it is intended to grow plants with a higher nutrient requirement than those occurring naturally e.g., planning for agriculture
- Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor e.g., development of green barriers

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

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost-effective options.

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

The surrounding areas already undergone quarrying operation, there are 2-3 Crushers within the radius of 1km. Most of the quarries in the regions are Existing quarries. Hence this quarry will feed the rough stone material to the crushing units.

The Rough Stone and Gravel Quarry Project for excavation of Rough Stone, which is site specific. The proposed mining lease areas have following advantages: -

- The mineral deposit occurs in a non-forest area.
- There is no habitation within the project area; hence no R & R issues exist.
- There is no river, stream, nallah and water bodies in the applied mine lease areas.
- Availability of skilled, semi-skilled and unskilled workers in this region.
- All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are well connected and accessible.
- The mining operations will not intersect the ground water level. Hence, no impact on ground water environment.
- Study area falls in seismic zone – II, there is no major history of landslides, earthquake, subsidence etc., recorded in the past history.

5.2 ANALYSIS OF ALTERNATIVE SITE

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

5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY

The existing quarries in the area operated by Opencast Mechanised Mining operation with drilling and blasting method will be used to extract Rough Stone in the area. All the applied mining lease areas have following advantages –

- As the mineral deposition is homogeneous and batholith formation, therefore opencast method of working is preferred over underground method
- The material will be loaded with the help of excavators into dumpers / trippers and transported to the needy customers.
- Blasting and availability of drills along with controlled blasting technology gives desired fragmentation so that the mineral is handled safely and used without secondary blasting.
- Semi-skilled labours fit for quarrying operations are easily available around the nearby villages.

5.4 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.

6. ENVIRONMENTAL MONITORING PROGRAMME

6.0 GENERAL

The main objective of environmental monitoring is to ensure that the obtained results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results, this forms as base data to identify the cause and suggest remedial measures. Environmental monitoring is mandatory to meet compliance of statutory provisions under the Environment (Protection) Act, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTO.

6.1 METHODOLOGY OF MONITORING MECHANISM

Implementation of EMP and periodic monitoring will be carried out by the project proponent. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to this project; Environmental protection measures like dust suppression, control of noise and blast vibrations, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of Environmental Management Plan and environmental clearance conditions will be monitored by Mine Management. On the other hand, implementation of area level protection measures like green belt development, environmental quality monitoring etc., are taken up by a senior executive who reports to their Mine Management.

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

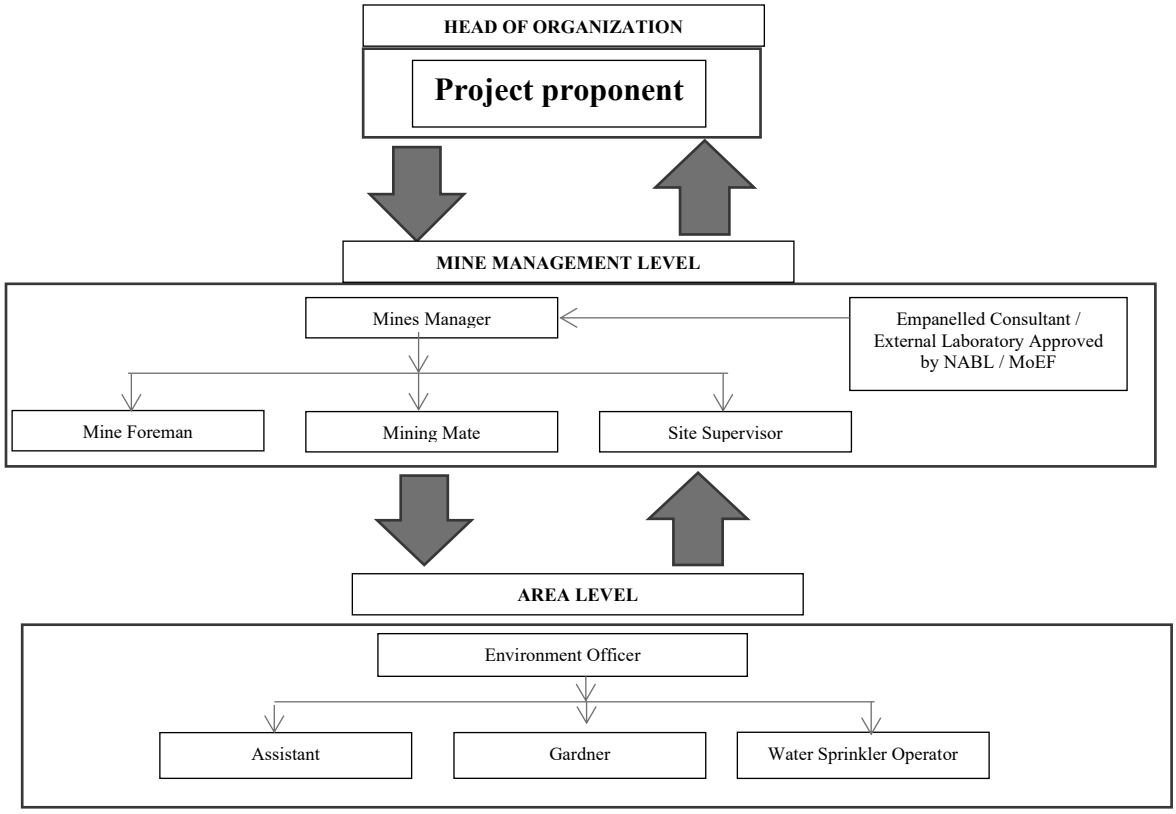
The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed.

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies as compliance status reports. The sampling and analysis report of the monitored environmental attributes will be submitted to the Tamil Nadu Pollution Control Board (TNPCB) at a frequency of half-yearly and yearly by each proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA as well.

The sampling and analysis of the environmental attributes will be as per the guidelines of Central Pollution Control Board (CPCB)/Ministry of Environment, Forest and Climate Change (MoEF & CC).

FIGURE 6.1: PROPOSED ENVIRONMENTAL MONITORING CELL



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

SI No.	Recommendations	Time Period	Schedule
1	Land Environment Control Measures	Before commissioning of the project	Immediately after the commencement of project
2	Soil Quality Control Measures	Before commissioning of the project	Immediately after the commencement of project
3	Water Pollution Control Measures	Before commissioning of the project and along with mining operation	Immediately and as project progress
4	Air Pollution Control Measures	Before commissioning of the project and along with mining operation	Immediately and as project progress
5	Noise Pollution Control Measures	Before commissioning of the project and along with mining operation	Immediately and as project progress
6	Ecological Environment	Phase wise implementation every year along with mine operations	Immediately and as project progress

6.3 MONITORING SCHEDULE AND FREQUENCY

The environmental monitoring will be conducted in the mine operations as follows:

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil Quality; and
- Greenbelt Development

The details of monitoring are detailed in Table 6.2

TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC FOR P1

S.No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1 SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	L eq, L max, L min, L eq Day & L eq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

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

6.4 BUDGETARY PROVISION FOR EMP

The cost in respect of monitoring of environmental attributes, parameter to be monitored, sampling/monitoring locations with frequency and cost provision against each proposal is shown in Table 6.3. Monitoring work will be outsourced to external laboratory approved by NABL / MoEF.

The proposed capital cost for Environmental Monitoring Programme is Rs 76,000/- and the recurring cost is Rs 3,80,000/- per annum for each Proposed Project.

TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET

PROPOSAL – P1			
Sl.No.	**Parameter**	**Capital Cost**	**Recurring Cost per annum**
1	Air Quality	Rs. 76,000/-	Rs. 3,80,000/-
2	Meteorology		
3	Water Quality		

4	Hydrology		
5	Soil Quality		
6	Noise Quality		
7	Vibration Study		
Total		**Rs 76,000/-**	**Rs. 3,80,000/-**

Source: Approved Mining Plan

6.5 REPORTING SCHEDULES OF MONITORED DATA

The monitored data on air quality, water quality, noise levels and other environmental attributes will be periodically examined by the Cluster Mine Management Coordinator and Respective Head of Organization for taking necessary corrective measures. The monitoring data will be submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO Conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

Periodical reports to be submitted to: -

- MoEF & CC – Half yearly status report
- TNPCB - Half yearly status report
- Department of Geology and Mining: quarterly, half yearly annual reports

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

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

7. ADDITIONAL STUDIES

7.0 GENERAL

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

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

7.1. PUBLIC CONSULTATION

Application to The Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

7.2 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for all proposed projects. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

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

TABLE 7.1 RISK ASSESSMENT& CONTROL MEASURES

S. No	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries	Improper handling and unsafe working practice	All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations; Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited; Fire-fighting and first-aid provisions in the mine office complex and mining area; Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use

			Working of quarry, as per approved plans and regularly updating the mine plans; Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut; Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager; Maintenance and testing of all mining equipment as per manufacturer 's guidelines.
2	Drilling	Improper and unsafe practices Due to high pressure of compressed air, hoses may burst Drill Rod may break	Safe operating procedure established for drilling (SOP) will be strictly followed. Only trained operators will be deployed. No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, Drilling shall not be carried on simultaneously on the benches at places directly one above the other. Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual. All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition. Operator shall regularly use all the personal protective equipment.
4	Blasting	Fly rock, ground vibration, Noise and dust. Improper charging, stemming & Blasting/ fining of blast holes Vibration due to movement of vehicles	Restrict maximum charge per delay as per regulations and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blasting can be conducted safely. SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation shots are fired during daytime only. All holes charged on any one day shall be fired on the same day. The danger zone will be distinctly demarcated (by means of red flags)
5	Transportation	Potential hazards and unsafe workings contributing to accident and injuries Overloading of material While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	Before commencing work, drivers personally check the 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 corners All vehicles should be fitted with reverse horn with one spotter at every tipping point. Loading according to the vehicle capacity Periodical maintenance of vehicles as per operator manual
6	Natural calamities	Unexpected happenings	Escape Routes will be provided to prevent inundation of storm water Fire Extinguishers & Sand Buckets

7	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height.

Source: Analysed and Proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN

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

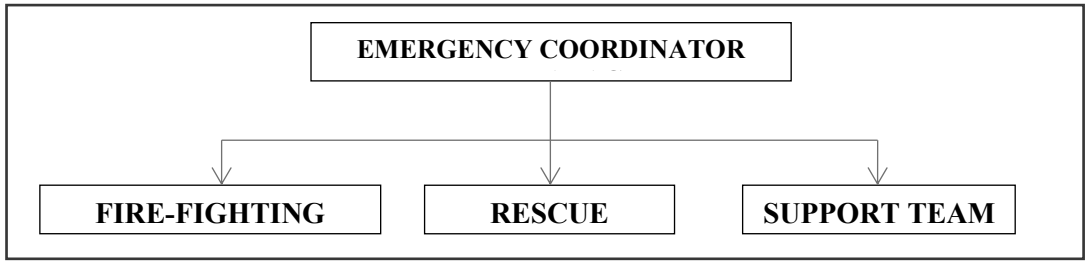
The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- Rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency situations and the coordination among key personnel and their team has been shown in Fig 7.1.

FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT



The emergency organization shall be headed by emergency coordinator who will be qualified competent mine manager. In his absence senior most people available at the mine shall be emergency coordinator till arrival of mine manager. There would be three teams for taking care of emergency situations – Fire-Fighting Team, Rescue Team and Support Team. The proposed composition of the teams is given in Table 7.2.

TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION

DESIGNATION	QUALIFICATION
FIRE-FIGHTING TEAM	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member	Mines Foreman
Team Member	Mining Mate

RESCUE TEAM	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member/ Incident Controller (IC)	Environment Officer
Team Member	Mining Foreman
SUPPORT TEAM	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Assistant Team Leader	Environment Officer
Team Member	Mining Mate
Security Team Leader/ Emergency Security Controller	Mines Foreman

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

Roles and responsibilities of emergency team –

(a) Emergency coordinator (EC)

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

(b) Incident controller (IC)

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

(c) Communication and advisory team

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

(d) Roll call coordinator

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

(e) Search and rescue team

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

(f) Emergency security controller

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

Emergency control procedure –

The onset of emergency, will in all probability, commence with a major fire or explosion or collapse of wall along excavation and shall be detected by various safety devices and also by members of operational staff on duty. If located by a staff member on duty, he (as per site emergency procedure of which he is adequately briefed) will go to nearest alarm call point, break glass and trigger off the alarms. He will also try his best to inform about location and nature of accident to the emergency control room. In accordance with work emergency procedure the following key activities will immediately take place to interpret and take control of emergency.

- On site fire crew led by a fireman will arrive at the site of incident with fire foam tenders and necessary equipment.
- Emergency security controller will commence his role from main gate office
- Incident controller shall rush to the site of emergency and with the help of rescue team and will start handling the emergency.
- Site main controller will arrive at MECR with members of his advisory and communication team and will assume absolute control of the site.
- He will receive information continuously from incident controller and give decisions and directions to:
    - Incident controller
    - Mine control rooms
    - Emergency security controller

Proposed fire extinguishers at different locations –

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

TABLE 7.3: PROPOSED FIRE EXTINGUISHERS AT DIFFERENT LOCATIONS

LOCATION	TYPE OF FIRE EXTINGUISHERS
Electrical Equipment's	CO_2 type, foam type, dry chemical powder type
Fuel Storage Area	CO_2 type, foam type, dry chemical powder type, Sand bucket
Office Area	Dry chemical type, foam type

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.

7.4 CUMULATIVE IMPACT STUDY

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

TABLE 7.4: LIST OF QUARRIES WITHIN 500 METER RADIUS

PROPOSED QUARRY					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
P1	Tmt.V.Maheshwari	Manakadavu	**863(P)**	**3.00.0**	ToR obtained vide Lr.No. SEIAA-TN/F.No. 8785/ SEAC /TOR-1329/2023 Dated: 09.02.2023
	TOTAL EXTENT			**3.00.0**	
EXISTING QUARRIES					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
E-1	Thiru.C.K.Chellamuthu	Manakadavu	872/2 NP	2.64.0	Lease Period; 24.04.2018 to 23.04.2023
E-2	Thiru. N. Rama lingam	Manakadavu	872/2 SP	1.96.5	Lease Period; 07.06.2021 to 06.06.2026
	TOTAL EXTENT			**4.60.5**	
	TOTAL CLUSTER EXTENT			**7.60.50**	

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

TABLE 7.5: SALIENT FEATURES OF PROPOSAL "P1"

Name of the Project	Tmt.V. Maheswari Rough Stone and Gravel Quarry	
S.F. No.	863(P)	
Extent	3.00.0 ha	
Village Taluk and District	Manakkadavu Village, Dharapuram Taluk, Tiruppur District.	
Land Type	Patta land	
Land Ownership	It is a Patta lands. Jointly Registered in the name of the applicant (Tmt.V. Maheshwari) & Thiru.R.Vasudevan, vide Patta Nos. 1411. The applicant has obtained consent from the other pattadhars	
Toposheet No	58 - F/10	
Latitude between	**10° 46' 28.65"N to 10° 40' 35.70"N**	
Longitude between	**77° 33' 40.78"E to 77° 33' 49.94"E**	
Elevation of the area	290m(Max) AMSL	
Lease period	10 Years	
Mining Plan period	10 years	
Proposed Depth of Mining	47m Bgl	
	Rough Stone in m^3	Gravel m^3
Geological Resources	13,18,275	58,590
Mineable Reserves	5,28,150	45,968
Year wise Production (Ten Years)	5,28,150	45,968
Peak Production	62,150	19,584

Ultimate Pit Dimension	171m(L) x 138m(W) x 47m(D) (BGL)	
Water Level in the region	73-68 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is exhibits plain topography. The area has gentle sloping towards North Eastern side. The altitude of the area is 290m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation. Massive Charnockite is found after 2m Gravel which is clearly inferred from the existing quarry pits.	
Machinery proposed	Jack Hammer	6 Nos
	Compressor	2 Nos
	Excavator with Bucket and Rock Breaker	2 No
	Tippers	4 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	35 Nos	
Project Cost	Rs.57,30,000/-	
EMP Cost	Rs. 7,60,000/-	
Project Cost	Rs.64,90,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Amaravathi River	4.7km – NW
	Nallathangal Odai	4.4 km - SE
	Paruthiyur Velar Lake	5.0km - SE
	Nallathangal Odai Reservoir	5.5 km - NE
Greenbelt Development Plan	Proposed to plant 1500Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	3.0 KLD	
Nearest Habitation	740m – South East	
Nearest Reserve Forest	Dalavaipattinam RF – 9.29 km - NW	
Nearest Wild Life Sanctuary	Kodaikanal Wildlife Sanctuary – 32.0 km - South	

Source: Approved Mining Plan

TABLE 7.6: SALIENT FEATURES OF PROPOSAL "E1"

Name of the Project	Thiru.C.K.Chellamuthu Rough stone and Gravel quarry
S.F. No.	872/2 NP
Extent	2.64.0 ha
Village Taluk and District	Manakkadavu Village, Dharapuram Taluk, Tiruppur District
Land Ownership	Government Land
Toposheet No	58 - F/10
Latitude between	10°40'25.83"N to 10°40'33.34"N
Longitude between	77°33'48.00"E to 77°33'55.63"E
Elevation of the area	292m AMSL
Lease period	5 Years
Mining Plan period	5 years
Depth of Mining	46m(11m agl + 35m bgl)
Production Quantity	2,83,865m^3 of Roughstone and 3571m^3 of Topsoil
Ultimate Pit Dimension	Pit I : 147m(L) x 162m(B) x 46m(11m agl + 35m bgl) (D)

Water Level in the region	57-60 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Machinery proposed	Jack Hammer	2Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1No
	Tippers	1 No
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	14Nos	
Project Cost	Rs.61,60,000/-	
EMP Cost	Rs. 7,10,000/-	
Total Project cost	Rs.68,70,000/-	
CER Cost	Rs. 1,72,000/-	
Greenbelt Development Plan	Proposed to plant 1300 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	

Source: Approved Mining Plan

TABLE 7.7: SALIENT FEATURES OF PROPOSAL "E2"

Name of the Project	Thiru.N.Ramalingam Rough stone and Gravel quarry	
EC granted	Lr.No.SEIAA-TN/F.No.7932/1(a)/EC.No: 4560/2020 dated: 24.02.2021	
S.F. No.	872/2 SP	
Extent	1.96.5 ha	
Village Taluk and District	Manakkadavu Village, Dharapuram Taluk, Tiruppur District.	
Toposheet No	58 - F/10	
Latitude between	10°40'23.32"N to 10°40'29.97"N	
Longitude between	77°33'46.11"E to 77°33'52.13"E	
Lease period	5 Years	
Scheme of Mining period	5 years	
Depth of Mining	56m(8m agl+48m bgl)	
	Rough Stone in m^3	Top soil m^3
Approved Quantity	1,90,754m^3	2,083m^3
Water Level in the region	57-60 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	23 Nos	
Project Cost	Rs. 54,94,00	
EMP Cost	Rs. 3,80,000/-	
Total Project cost	Rs. 58,74,000	
CER Cost	Rs. 1,20,000/-	
Greenbelt Development Plan	Proposed to plant 1000 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	

Source: Approved Mining Plan

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.

Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.8 & 7.11.

TABLE 7.8: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	Production for Year wise	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1 (Ten-year)	5,28,150	52,815	176	15
Total	**5,28,150**	**52,815**	**176**	**15**
E1 (Five)	2,83,865	56,773	190	16
E2 (Five)	1,90,754	38,150	127	11
Total	**4,74,619**	**94,923**	**317**	**27**
Grand Total	**10,02,769**	**1,47,738**	**493**	**42**

TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL/TOPSOIL

Quarry	Production for one / three-year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	45,968	15,323	51	4
Total	**45,968**	**15,323**	**51**	**4**
E1	3571	1190	4	1
E2	2083	694	2	1
Total	**5,654**	**1884**	**6**	**2**
Grand Total	**51,622**	**17,207**	**57**	**6**

On a cumulative basis considering the proposed quarry, it can be seen that the overall production of Rough Stone is 493m^3 per day and overall production of Gravel is 57 m^3 per day with a capacity of 42 trips of Rough Stone per day and 6 Trips per day of Gravel from the cluster.

Note: Per day production of Rough Stone is calculated for 5 or10 Years Lease Period and for Gravel production is calculate for 3 years. And the load of existing quarries is covered under existing environment of the cluster.

Based on the above production quantities the emissions due to various activities in all mines includes various activities like ground preparation, excavation, handling and transport of ore. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 7.14.

TABLE 7.10: EMISSION ESTIMATION FROM CLUSTER QUARRIES WITHIN 500 METER RADIUS

EMISSION ESTIMATION FOR QUARRY "P1"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.099990480	g/s
	Blasting	Point Source	0.001395877	g/s
	Mineral Loading	Point Source	0.054187724	g/s
	Haul Road	Line Source	0.002784553	g/s/m
	Overall Mine	Area Source	0.201071071	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.001696641	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000210327	g/s

EMISSION ESTIMATION FOR QUARRY "E1"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.097312553	g/s
	Blasting	Point Source	0.001218704	g/s
	Mineral Loading	Point Source	0.052357117	g/s
	Haul Road	Line Source	0.002780436	g/s/m
	Overall Mine	Area Source	0.174327769	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.001227785	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000112540	g/s
EMISSION ESTIMATION FOR QUARRY "E2"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.086373018	g/s
	Blasting	Point Source	0.000671343	g/s
	Mineral Loading	Point Source	0.050303030	g/s
	Haul Road	Line Source	0.002777124	g/s/m
	Overall Mine	Area Source	0.153129418	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000805357	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000056167	g/s

Source: Emission Calculation

TABLE 7.11: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER

PM_{10} in µg/m^3	
Background	46.3
Incremental	15.85
Resultant	62.15
NAAQ Norms	**100 µg/m^3**
$PM_{2.5}$ in µg/m^3	
Background	20.8
Incremental	7.91
Resultant	28.71
NAAQ Norms	**60 µg/ m^3**
So2 in µg/m^3	
Background	7.4
Incremental	2.28
Resultant	9.68
NAAQ Norms	**80 µg/ m^3**
No2 in µg/m^3	
Background	23.7
Incremental	10.23
Resultant	33.93
NAAQ Norms	**80 µg/ 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.

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

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

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

TABLE 7.12: PREDICTED NOISE INCREMENTAL VALUES FROM QUARRY

Location ID	N1	N2	N3	N4	N5	N6	N7
Maximum Monitored Value (Day) dB(A)	49.7	46.2	46.8	45.9	49.8	48.1	47.9
Incremental Value dB(A)	56.6	52.1	43.8	33.9	24.2	25.7	25.3
Total Predicted Noise level dB(A)	54.5	53.1	48.6	46.2	49.8	48.1	47.9

Source: Lab Monitoring Data

The incremental noise level is found within the range of 24.2 to 52.1 (Buffer zone) – 56.6 dB (A) in Core 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 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 nearby the mining areas and may cause injury to persons or damage to the structures. Nearest Habitations from 3 mines respectively are as in below Table 7.17.

TABLE 7.13: NEAREST HABITATION FROM CLUSTER QUARRIES

Location ID	Distance & Direction
Habitation Near P1	740m-SE
Habitation Near E1	635m-SE
Habitation Near E2	630m-SE

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

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

Where –

V = peak particle velocity (mm/s)
K = site and rock factor constant
Q = maximum instantaneous charge (kg)
B = constant related to the rock and site (usually 1.6)
R = distance from charge (m)

TABLE 7.14: GROUND VIBRATIONS AT CLUSTER QUARRIES

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	76	740m-SE	0.410
E1	82	635m-SE	0.557
E2	55	630m-SE	0.410

Source: Blasting Calculations

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

Socio Economic Environment –

The 3 mines shall contribute towards CER and the community shall develop.

TABLE 7.15: SOCIO ECONOMIC BENEFITS FROM CLUSTER QUARRIES

Location ID	Project Cost	CER
P1	Rs.64,90,000/-	Rs.5,00,000
E1	Rs.68,70,000/-	Rs.1,72,000
E2	Rs. 58,74,000/-	Rs.1,20,000
Total	**Rs. 1,92,34,000/-**	**Rs. 7,92,000**

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

- Proposed Projects shall fund towards **CER – Rs 5,00,000/-**
- Existing Projects shall fund towards **CER- Rs. 2,92,000/-**

TABLE 7.16: EMPLOYMENT BENEFITS FROM CLUSTER QUARRIES

Description	Employment
P1	35
Total	**35**
E1	14
E2	23
Total	**37**
Grand Total	**72**

A total of 35 people will get employment due to one proposed mines in cluster and 37 people are already employed at existing mines.

TABLE 7.17: GREENBELT DEVELOPMENT BENEFITS FROM CLUSTER QUARRIES

CODE	No of Trees proposed to be planted	Area Covered Sq.m	Name of the Species
P1 (Ten Years)	1,500	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development	Neem, Causarina Pongamia,Ashoka etc.,
Total	**1,500**		
E1 (5 Years)	1,300		
E2	1,000		

(5 Years)			
Total	**2,300**		
G. Total	**3,800**		

Based on the Proposed Mining Plans it's anticipated that there shall growth of native species of Neem, Causarina etc., in the Cluster at a rate of 3,800 Trees Planted over a period of Five or Ten Years.

7.5 PLASTIC WASTE MANAGEMENT PLAN

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

Objective –

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

TABLE 7.18: ACTION PLAN TO MANAGE PLASTIC WASTE

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

8. PROJECT BENEFITS

8.0 GENERAL

The Proposed Project for Quarrying Rough Stone and gravel at Manakkadavu Village aims to produce about 5,28,150 m^3 Rough Stone over a period of 10 Years and Gravel of 45,968 m^3 for period of Three years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits.

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 35 persons for carrying out mining operations and give preference to the local people in providing employment in the one proposed quarry in the cluster. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED

The impact of mining activity in the area will be more positive on the socio-economic environment in the immediate project impact area. The employment opportunities both direct and indirect will contribute to enhanced money incomes to job seekers with minimal skill sets especially among the local communities.

8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

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

- Road Transport facilities
- Communications
- Medical, Educational and social benefits will be made available to the nearby civilian population in addition to the workmen employed in the mine.

8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

8.5 OTHER TANGIBLE BENEFITS

The proposed mine is likely to have other tangible benefits as given below.

- Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation, sanitation, for supply of goods and services to the mine and other community services.
- Additional housing demand for rental accommodation will increase
- Cultural, recreation and aesthetic facilities will also improve
- Improvement in communication, transport, education, community development and medical facilities and overall change in employment and income opportunity
- The State Government will also benefit directly from the proposed mine, through increased revenue from royalties, cess, DMF, GST etc.,

CORPORATE SOCIAL RESPONSIBILITY

The Project Proponent will take responsibility to develop awareness among all levels of their staff about CSR activities and the integration of social processes with business processes. Those involved with the undertaking of CSR activities will be provided with adequate training and re-orientation.

CSR Cost Estimation

- CSR activities will be taken up in the Manakkadavu village mainly contributing to education, health, training of women self-help groups and contribution to infrastructure etc., CSR budget is allocated as 2.5% of the profit.

CORPORATE ENVIRONMENT RESPONSIBILITY

For the existing quarries 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.

Proponent intends to spent Rs 5,00,000/- towards CER for the Government School near the project site the details are given below:

TABLE 8.1 CER – ACTION PLAN

Activity	CER
• Renovation/ Construction of Existing Toilet • Providing Environmental Related books to the school Library • Carrying out plantation and maintenance in the school Ground • Any other requirements in consultation with the school Head master	Rs 5,00,000/-

9. ENVIRONMENTAL COST BENEFIT ANALYSIS

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

10. ENVIRONMENTAL MANAGEMENT PLAN – Tmt.V.Maheshwari

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 Tmt.V.Maheshwari will –

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

Description of the Administration and Technical Setup –

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

The said team will be responsible for:

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

- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2. LAND ENVIRONMENT MANAGEMENT –

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (un utilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. There is no major vegetation in the project area during the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development programme.

TABLE 10.1. PROPOSED CONTROLS FOR LAND ENVIRONMENT

CONTROL	RESPONSIBILITY
Design vehicle wash-down areas so that all runoff water is captured and passed through oil water separators and sediment catchment devices.	Mines Manager
Refuelling to be undertaken in a safe location, away from vehicle movement pathways&100 m away of any watercourse Refuelling activity to be under visual observation at all times. Drainage of refuelling areas to sumps with oil/water separation	Mine Foreman & Mining Mate
Soil and groundwater testing as required following up a particular incident of contamination.	Mines Manager
At conceptual stage, the mining pits will be converted into Rain Water Harvesting. Remaining area will be converted into greenbelt area	Mines Manager
No external dumping i.e., outside the project area	Mine Foreman
Garland drains with catch pits / settlement traps to be provided all around the project area to prevent run off affecting the surrounding lands.	Mines Manager
The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier.	Mines Manager

Source: Proposed by FAE's & EIA Coordinator

10.3. SOIL MANAGEMENT

There overburden in the form of Gravel which will directly loaded into tippers for the filling and levelling of low-lying areas.

TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT

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

Source: Proposed by FAE's & EIA Coordinator

10.4. WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash is anticipated and domestic sewage from mines office. The quarrying operation is proposed up to

a depth of 47m BGL, the water table in the area is 68m – 73m below ground level, hence the proposed projects will not intersect the Ground water table during entire quarry period.

TABLE 10.3. PROPOSED CONTROLS FOR WATER ENVIRONMENT

CONTROL	RESPONSIBILITY
To maximize the reuse of pit water for water supply	Mines Foreman
Temporary and permanent garland drain will be constructed to contain the catchments of the mining area and to divert runoff from undisturbed areas through the mining areas	Mines Manager
Natural drains/nallahs/brooklets outside the project area should not be disturbed at any point of mining operations	Mines Manager
Ensure there is no process effluent generation or discharge from the project area into water bodies	Mines Foreman
Domestic sewage generated from the project area will be disposed in septic tank and soak pit system	Mines Foreman
Monthly or after rainfall, inspection for performance of water management structures and systems	Mines Manager
Conduct ground water and surface water monitoring for parameters specified by CPCB	Manager Mines

Source: Proposed by FAE's & EIA Coordinator

10.5. AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations due to fugitive dust. Daily water sprinkling on the haul roads, approach roads in the vicinity would be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements.

TABLE 10.4. PROPOSED CONTROLS FOR AIR ENVIRONMENT

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

Source: Proposed by FAE's & EIA Coordinator

10.6. NOISE POLLUTION CONTROL

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time.

TABLE 10.5.: PROPOSED CONTROLS FOR NOISE ENVIRONMENT

CONTROL	RESPONSIBILITY
Development of thick greenbelt all along the Buffer Zone (7.5 Meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Foreman
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Mines Manager
Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Mining Mate
Provision of effective silencers for mining machinery and transport vehicles	Mines Manager
Provision of sound proof AC operator cabins to HEMM	Mines Manager
Sharp drill bits are used to minimize noise from drilling	Mines Foreman
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is 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

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

TABLE 10.6.: PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK – P1

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 1500nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area. 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

Year	No. of tress proposed to be planted	Area to be covered in m^2	Name of the species
I	1500	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development.	Neem, Pongamia Pinnata,Ashoka etc.,

Source: Approved Mining plan

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 FOR THE PLANTSAITON

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

Source: Proposed by FAE's & EIA Coordinator

10.9. OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

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

10.9.1. Medical Surveillance and Examinations –

The health status of workers in the mine will be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detailed 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	1st Year	2nd Year	3rd Year	4th Year	5th 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)					

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.
- 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.
- 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 as per Metalliferous Mines Regulation, 1961.

10.9.4.: Budgetary Provision for Environmental Management –

Adequate budgetary provision has been made by the Company for execution of Environmental Management Plan. The Table 10.10 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 10.10: EMP BUDGET FOR PROPOSED PROJECT

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 yearly maintenance @ Rs. 10,000/- per hectare	30000	30000
	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 Governers @ Rs. 5000/- per Tipper/Dumper deployed - 4 Units	20000	1000
	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	60000
	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	686595
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 management	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	30000	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	600000	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1500 Trees - (670 Inside Lease Area & 830 Outside Lease Area)	Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	134000	20100
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	249000	24900

	4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	#71850	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	#4753350	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) - 35 Employees	140000	35000
	Health check-up for workers will be provisioned	IME & PME Health check-up @ Rs. 1000/- per employee	0	35000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	6000
	Slope stability action plan	Slope stability action plan in the end of fourth year plan period	200000	0
	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	150000	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 (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	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			**3163000**	**1895595**

- Not include the Capital Cost

*Marked cost is already discussed in the mining plan hence that is not included in the total Environmental Management plan cost Total Cost for the Ten years. The EMP has been prepared for the entire **lease period of 10 years** for the peak production capacity of **62,150m^3 of Rough stone**.

Year	Total Cost	Year	Total Cost
1st	**₹ 50,58,595/-**	**6th**	**₹ 40,00,813/-**
2nd	₹ 19,90,375/-	**7th**	₹ 26,19,354/-
3rd	₹ 20,89,893/-	**8th**	₹ 27,50,321/-
4th	₹ 21,94,388/-	**9th**	₹ 28,87,837/-
5th	₹ 23,04,108/-	**10th**	₹ 31,04,079/-

Total = 290 lakhs

Cost inflation 5% per annum

Note: This Environmental Management plan cost will vary according to the public consultation comments

10.10.: CONCLUSION –

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

11. SUMMARY AND CONCLUSION

This EIA & EMP report prepared for the proposed Rough stone and Gravel quarry project located in S.F. No 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District belongs to Tmt. V. Maheshwari the Project falls in the Cluster category consist of 1 Proposed, 2 Existing Quarries 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.

The proposed project is 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".

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 Oct to Dec - 2023 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed. Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Rough Stone as per market demand. Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 35 people directly in the proposed projects and indirectly around 50 people.

As discussed, it is safe to say that the proposed quarries are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the Tmt.V. Maheswari Rough stone and Gravel quarry (Extent – 3.00.0ha).

12. DISCLOSURE OF CONSULTANT

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 for the proposed project.

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS
No 17, Advaitha 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	EB	Ecology and bio-diversity
AEC	Associate EIA Coordinator	NV	Noise and vibration
FAE	Functional Area Expert	SE	Socio economics
FAA	Functional Area Associates	HG	Hydrology, ground water and water conservation
TM	Team Member	SC	Soil conservation
GEO	Geology	RH	Risk assessment and hazard management
WP	Water pollution monitoring, prevention and control	SHW	Solid and hazardous wastes
AP	Air pollution monitoring, prevention and control	MSW	Municipal Solid Wastes
LU	Land Use	ISW	Industrial Solid Wastes
AQ	Meteorology, air quality modeling, and prediction	HW	Hazardous Wastes

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

This EIA/EMP for Tmt.V. Maheswari Rough stone and Gravel quarry over an Extent of 3.00.0 ha in Manakkadavu Village, Dharapuram Taluk, Tiruppur District of Tamil Nadu is prepared as per the Generic Structure of EIA Guidelines manual. 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.

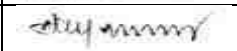
Name**:** **Dr. M. Ifthikhar Ahmed**

Designation**:** **EIA Coordinator**

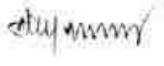
Date & Signature:

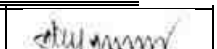
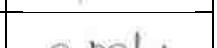
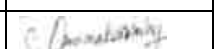
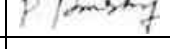
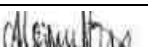
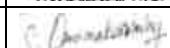
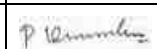
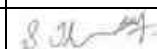
Period of Involvement: **August 2023 to till date**

EIA COORDINATORS IN THE ORGANIZATION

Sno	Name	Sector	Cate A/B	Signature
1	Dr. M. Ifthikhar Ahmed	1, 38	A	
2	Dr. P. Thangaraju	1	A	
3	Mr.Vikram Krishna JR	1, 38	A	
4	Mr. S.Nagamani	1	B	
5	Mr.N.Senthilkumar	28,38 & 31	B	

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

Sl. No.	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	▪ Identification of different sources of air pollution due to the proposed mine activity ▪ Prediction of air pollution and propose mitigation measures / control measures	Mr. A. Jagannathan	
2	WP	▪ Suggesting water treatment systems, drainage facilities ▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	Dr. M. Ifthikhar Ahmed	
			Mr. N. Senthilkumar	
			Mr.P. Govindasamy	
3	HG	▪ Interpretation of ground water table and predict impact and propose mitigation measures. ▪ Analysis and description of aquifer Characteristics	Dr. P. Thangaraju	
4	GEO	▪ Field Survey for assessing the regional and local geology of the area.	Dr. M. Ifthikhar Ahmed	

		▪ Preparation of mineral and geological maps. ▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	Dr. P. Thangaraju	
			Mr. S. Nagamani	
			Mr.V.Balasubramanian	
			Mr.A. Natarajan	
			Mr. M. Abdul Nissar	
			Mr.S. Umamaheswaran	
			Mr.M.Santhoshkumar	
5	SE	▪ Revision in secondary data as per Census of India, 2011. ▪ Impact Assessment & Preventive Management Plan ▪ Corporate Environment Responsibility.	Mrs. K. Anitha	
			Mrs.T.Sasikala	
			Mr.A.Allimuthu	
6	EB	▪ Collection of Baseline data of Flora and Fauna. ▪ Identification of species labelled as Rare, Endangered and threatened as per IUCN list. ▪ Impact of the project on flora and fauna. ▪ Suggesting species for greenbelt development.	Mr..D.Devanathan	
			Mr.P. Panneer Selvam	
			Mr. Alagappa Moses	
7	RH	▪ 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	▪ Construction of Land use Map ▪ Impact of project on surrounding land use ▪ Suggesting post closure sustainable land use and mitigative measures.	Mr. A. Allimuthu	
			Mr.S. Umamaheswaran	
			Mr.P. Viwanathan	
			Mr.S.Ilavarasan	
9	NV	▪ Identify impacts due to noise and vibrations ▪ Suggesting appropriate mitigation measures for EMP.	Mr. A. Jagannathan	
10	AQ	▪ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ▪ Recommending mitigations measures for EMP	Mr. N. Senthilkumar	
11	SC	▪ Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. M. Ifthikhar Ahmed	
12	SHW	▪ Identify source of generation of non-hazardous solid waste and hazardous waste. ▪ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.	Mr. A. Jagannathan	
			Mr. J. R. Vikram Krishna	

LIST OF TEAM MEMBERS AS FUNCTIONAL AREA EXPERT

Sl.No.	Name	Functional Area Proposed	FAE /Mentor	Involvement	Signature
1	Mrs.Nathiya T	EB	Mr. A.Alagappa Moses	▪ Site Visit with FAE ▪ Assist FAE with collection of baseline data ▪ Provide inputs and assist with labelling of Flora and Fauna	
2	Mr. R. Sakthivel	LU	Mr.A. Allimuthu	▪ Site Visit with FAE ▪ Assisting FAE in preparation of land use maps ▪ identifying impacts Assisting FAE in preparation of land use maps	
3	Mr. M Abdul Niyaas.	GEO	Mr. S.Umamahesvaran	▪ Site Visit with FAE ▪ Provide inputs on Geological Aspects ▪ Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan	

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 Cluster EIA/EMP for Tmt.V. Maheswari Rough stone and Gravel quarry over an Extent of 3.00.0 ha in Manakkadavu Village, Dharapuram Taluk, Tiruppur 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/RA 0276 Dated: 20-2-2023**
Validity:	**Valid till 06.08.2025**

ANNEXURE

TMT. V. MAHESWARI

ROUGH STONE AND GRAVEL QUARRY

S.F. No. 863(P),

Manakkadavu Village, Dharapuram Taluk, Tiruppur District

EXTENT = 3.00.0ha

ToR Obtained vide

Lr.No. SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023

Project Proponent

Tmt. V. Maheswari,

W/o. Vasudevan,
No. 220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram, Tiruppur District – 638 657.

LIST OF ANNEXURES

ANNEXURES	DESCRIPTION	PAGE NOS
P1- TMT.V. MAHESWARI	COPY OF TERMS OF REFERENCE	1A – 23A
	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	24A - 25A
	COPY OF MINING PLAN APPROVED LETTER	26A – 28A
	COPY OF APPROVED MINING PLAN WITH PLATES	29A – 97A
	COPY OF HYDROGEOLOGICAL REPORT	98A – 107A
	COPY OF INSPECTION LETTER (TEHSILDAR, RI, A1)	108A – 116A
	COPY OF BDO	117A
	COPY OF CER	118A
	COPY OF PRECISE AREA COMMUNICATION LETTER	119A – 121A
	COPY OF 300m & VAO ATTESTATION LETTER	122A – 123A
	COPY OF EXPLOSIVE LETTER	124A – 126A
	GREENBELT AND FENCING PHOTOS	127A – 133A
E1 THIRU. C. K. CHELLAMUTHU	COPY OF MINING PLAN APPROVED LETTER	134A – 136A
E2 THIRU. N. RAMALINGAM	COPY OF MINING PLAN APPROVED LETTER	137A – 139A
	COPY OF BASE LINE MONITORING DATA	140A – 181A
	COPY OF CONSULTANT ACCREDITATION CERTIFICATE	182A

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

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

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.8785/SEAC/ToR-1329/2023 Dated: 09.02.2023

To

Tmt. V. Maheswari,
W/o. Vasudevan,
No.220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram Taluk,
Tiruppur District - 638 657.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for the Proposed Rough Stone and Gravel quarry lease over an extent of 3.00.0 Ha at S.F.No. 863 (P) of Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu by Tmt. V. Maheswari - 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/67510/2021, dated 11.09.2021.
2. Your application submitted for Terms of Reference dated: 14.09.2021.
3. Minutes of the 345th SEAC meeting held on 10.01.2023.
4. Minutes of the 390th SEIAA meeting held on 09.02.2023.

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

MEMBER SECRETARY
SEIAA-TN

1 A

The proponent, Tmt. V. Maheswari has submitted application for Terms of Reference (ToR) on 14.09.2021, in Form-I, Pre- Feasibility report for the Proposed Rough Stone and Gravel quarry lease over an extent of 3.00.0 Ha at S.F.No. 863 (P) of Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Rough Stone quarry lease over an extent 3.00.0 Ha at S.F.No.863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu by Tmt. V. Maheswari - For Terms of Reference.

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, Tmt. V. Maheswari has applied for Terms of Reference for the proposed Rough Stone quarry lease over an extent 3.00.0 Ha at S.F.No.863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur 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. The PP has requested to revoke the withdrawal request made.
4. As per the mining plan, the lease period is for 10 years. The mining plan is for 10 years. The production for 10 years not to exceed 528150cu.m of rough stone and 45968 cu.m of gravel with an ultimate depth of 47m below ground level.

Based on the presentation and details furnished by the project proponent, SEAC decided to grant Terms of Reference (TOR) with Public Hearing subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report.

1. The PP shall furnish a letter from DFO on the proximity details of nearest RF with respect to the proposed project site.
2. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m shall be enumerated with details such as dwelling houses with number of occupants, places of worship, industries, factories, sheds, etc.
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

MEMBER SECRETARY
SEIAA-TN

2 A

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.
    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 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).

MEMBER SECRETARY
SEIAA-TN

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 proposed 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 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.

MEMBER SECRETARY
SEIAA-TN

4 A

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 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.

MEMBER SECRETARY
SEIAA-TN

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, 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.
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.

MEMBER-SECRETARY
SEIAA-TN

6 A

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.

Appendix

List of Native Trees Suggested for Planting

1. ***Aegle marmelos*** – Vilvam
2. ***Adenanthera pavonina*** - Manjadi
3. ***Albizia lebbeck*** – Vaagai
4. ***Albizia amara*** - Usil
5. ***Bauhinia purpurea*** - Manthirai
6. ***Bauhinia racemosa*** - Aathi
7. ***Bauhinia tomentosa*** – Iruvathi
8. ***Buchanania axillaris*** - Kattuma
9. ***Borassus flabellifer*** - Panai
10. ***Butea monosperma*** - Murukka maram
11. ***Bobax ceiba*** – Ilavu, Sevvilavu
12. ***Calophyllum inophyllum*** - Punnai
13. ***Cassia fistula*** - Sarakondrai
14. ***Cassia roxburghii***- Sengondrai
15. ***Chloroxylon swietenia*** - Purasa maram
16. ***Cochlospermum religiosum*** – Kongu, Manjal Ilavu
17. ***Cordia dichotoma*** – Mookuchali maram
18. ***Crateva adansonii*** – Mavalingam
19. ***Dillenia indica*** – Uva, Uzha

MEMBER SECRETARY
SEIAA-TN

20. ***Dillenia pentagyna*** – Siru Uva, Sittuzha
21. ***Diospyros ebenum*** - Karungali
22. ***Diospyros chloroxylon*** – Vaganai
23. ***Ficus amplissima*** – Kal Itchi
24. ***Hibiscus tiliaceus*** – Aatru poovarasu
25. ***Hardwickia binata*** – Aacha
26. ***Holoptelia integrifolia*** - Aayili
27. ***Lannea coromandelica*** - Odhiam
28. ***Lagerstroemia speciosa*** - Poo Maruthu
29. ***Lepisanthus tetraphylla*** - Neikottai maram
30. ***Limonia acidissima*** - Vila maram
31. ***Litsea glutinosa*** –Pisin pattai
32. ***Madhuca longifolia*** - Illuppai
33. ***Manilkara hexandra*** – Ulakkai Paalai
34. ***Mimusops elengi*** - Magizha maram
35. ***Mitragyna parvifolia*** - Kadambu
36. ***Morinda pubescens*** – Nuna
37. ***Morinda citrifolia*** – Vellai Nuna
38. ***Phoenix sylvestre*** - Eachai
39. **Pongamia pinnata** – Pungam
40. **Premna mollissima** – Munnai
41. **Premna serratifolia** – Narumunnai
42. **Premna tomentosa** - Purangai Naari, Pudanga Naari
43. **Prosopis cinerea** - Vanni maram
44. **Pterocarpus marsupium** - Vengai
45. **Pterospermum canescens** – Vennangu, Tada
46. **Pterospermum xylocarpum** - Polavu
47. **Puthranjiva roxburghii** – Puthranjivi
48. **Salvadora persica** – Ugaa Maram
49. **Sapindus emarginatus** - Manipungan, Soapu kai
50. **Saraca asoca** - Asoca
51. **Streblus asper** - Pirayamaram

MEMBER SECRETARY
SEIAA-TN

8 A

52. **Strychnos nuxvomica** – Yetti
53. **Strychnos potatorum** - Therthang Kottai
54. **Syzygium cumini** - Naval
55. **Terminalia bellerica** - Thandri
56. **Terminalia arjuna** - Ven marudhu
57. **Toona ciliate** – Sandhana vembu
58. **Thespesia populnea** - Puvarasu
59. **Walsuratrifoliata** – valsura
60. **Wrightia tinctoria** – Veppalai
61. **Pithecellobium dulce** – Kodukkapuli

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 590th Authority meeting held on 09.02.2023. The Authority noted that the subject was appraised in 345th SEAC meeting held on 10.01.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in '**Annexure B**' of this minute.

1. The project proponent shall prepare mine closure plan considering mineable quantity of Topsoil, Weathered rock & mineral reject/waste, if any.
2. Copy of valid mining lease approval obtained from the competent Authority.
3. Copy of approved review of scheme of mining plan by the competent authority (Dept. of Geology and Mining / IBM).
4. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.
5. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.

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.

MEMBER SECRETARY
SEIAA-TN

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

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following

    a) Soil health & soil biological, physical land chemical features.
    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.

MEMBER SECRETARY
SEIAA-TN

10 A

f) Hydrothermal/Geothermal effect due to destruction in the Environment.

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

h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.

14. Impact on soil flora & vegetation around the project site.

15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.

16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.

17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.

18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.

20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.

21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.

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

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

MEMBER SECRETARY
SEIAA-TN

working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

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

Climate Change

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

MEMBER SECRETARY
SEIAA-TN

12 A

36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

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

Disaster Management Plan

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

Others

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

MEMBER SECRETARY
SEIAA-TN

management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land

MEMBER SECRETARY
SEIAA-TN

14 A

area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

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

MEMBER SECRETARY
SEIAA-TN

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 appeoval of the concerned Coastal Zone Management Authority).

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

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

MEMBER SECRETARY
SEIAA-TN

16 A

modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

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

MEMBER SECRETARY
SEIAA-TN

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

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

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

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

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

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

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

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

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

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards

MEMBER SECRETARY
SEIAA-TN

implementation of EMP should be clearly spelt out.

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

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

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

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

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

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

MEMBER SECRETARY
SEIAA-TN

features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical, chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this

MEMBER SECRETARY
SEIAA-TN

20 A

information may not be necessary)

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

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.

MEMBER SECRETARY
SEIAA-TN

c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment, Climate Change and 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 - 110 032.
3. The Chairman, 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 - 110 003.
6. The District Collector, Tiruppur District.
7. Stock File.

Protects if She is Protected

From

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

To

Tmt. V. Maheswari,
W/o. Vasudevan,
220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram Taluk,
Tiruppur District – 638 657.

R.c. No. 1512/2020/Mines Dated : 03 .08.2021.

Sub: Mines and Minerals – Minor Mineral – Rough Stone and Gravel – Tiruppur District – Dharapuram Taluk – Manakkadavu Village – Patta land in S.F.No. 863 (Part) over an extent of 3..00.0 Hectares – Quarry lease application preferred by Tmt. V. Maheswari, W/o. Vasudevan - Precise area communicated - Draft mining plan submitted – Approved – Other quarries situated in 500m radius details - Requested - Regarding.

Ref:
1. Tmt. V. Maheswari, W/o. Vasudevan, 220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram Taluk, Tiruppur District – 638 657 quarry lease application dated: 26.11.2020 and 22.07.2021.
2. The Deputy Director, Geology and Mining, Tiruppur letter R.C. No. 1512/2020/Mines dated 23.07.2021.
3. Mining Plan submitted by Tmt. V. Maheswari, W/o. Vasudevan in letter dated 02.08.2021.

****

1. Tmt. V. Maheswari, W/o. Vasudevan has preferred application for the grant of Rough Stone and Gravel quarry lease in Patta land in S.F.No. 863 over an extent of 5.00.0 Hectares of Manakkadavu Village of Dharapuram Taluk of Tiruppur District for a period of 10 years under Tamil Nadu Minor Mineral Concession Rules, 1959. Subsequently, the applicant has requested to grant a quarry lease only an extent of 3.00.0 Hect. in S.F. No. 863 (Part) of Manakkadavu village vide letter dated 22.07.2021.

2. Based on reports and records available, precise area has been communicated to the applicant with a direction to submit mining plan and also to submit environmental clearance as stipulated in rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 vide memo dated 23.07.2021.

3. Accordingly Tmt. V. Maheswari, W/o. Vasudevan has submitted the draft mining plan and the same has been approved by the Deputy Director (Geology & Mining) on .08.2021 and also requested to furnish the details of Quarry Lease / Mining Lease situated within 500 mts radius and pit dimension details from the subject quarry for obtaining Environment Clearance from the State level Environment Impact Assessment Authority.

4. In this connection the details of existing / abandoned quarries located within 500m radius from the proposed area are as follows.

a. **Existing quarries**

S. No	Name of the lessee	Village	S.F. No	Extent Hect.	Collector's proceedings No. & Date	Lease period
1	C.K. Chella muthu	Mana kadavu	872/2 NP	2.64.0	176 / Mines / 2017 dated 24.4.2018	24.04.2018 - 23.4.2023
2	N. Rama lingam	Mana kadavu	872/2 SP	1.96.5	266/2020/Mines dated 07.06.2021	07.06.2021 - 06.06.2026

b. Abandoned / expired quarries

S. No	Name of the lessee	Village	S.F. No	Extent Hect.	Collector's proceedings No. & Date	Lease period expired on
---- Nil ---						

c. Present proposed quarries

S. No	Name of the lessee	Village	S.F. No	Extent Hect.	Collector's proceedings No. & Date	Lease periomd
1.	V. Maheswari	Manakadavu	863 (P)	3.00.0	--	Proposed quarry

03.08.21

Deputy Director,
Geology and Mining,
Tiruppur.

Copy to

The Chairman, State Level Environment Impact,
Assessment Authority, Tamil Nadu,
3rd Floor, PanagalMaaligai, No.1 Jeenis Road, Saidapet, Chennai-15.

03.08.21

From

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

To

Tmt. V. Maheswari,
W/o. Vasudevan,
220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram Taluk,
Tiruppur District – 638 657.

R.c. No. 1512/2020/Mines Dated : 03.08.2021.

Sub: Mines and Minerals – Minor Mineral – Rough Stone and Gravel – Tiruppur District – Dharapuram Taluk – Manakkadavu Village – Patta land in S.F.No. 863 (Part) over an extent of 3.00.0 Hectares – Quarry lease application preferred by Tmt. V. Maheswari, W/o. Vasudevan - Precise area communicated - Draft mining plan submitted – Approved – Regarding.

Ref:
1. Tmt. V. Maheswari, W/o. Vasudevan, 220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram Taluk, Tiruppur District – 638 657 quarry lease application dated: 26.11.2020 and 22.07.2021.
2. The Deputy Director, Geology and Mining, Tiruppur letter R.C. No. 1512/2020/Mines dated 23.07.2021.
3. Mining Plan submitted by Tmt. V. Maheswari, W/o. Vasudevan in letter dated 02.08.2021.

****

1. Tmt. V. Maheswari, W/o. Vasudevan has preferred application for the grant of Rough Stone and Gravel quarry lease in Patta land in S.F.No. 863 over an extent of 5.00.0 Hectares of Manakkadavu Village of Dharapuram Taluk of Tiruppur District for a period of 10 years under Tamil Nadu Minor Mineral Concession Rules, 1959. Subsequently, the applicant has requested to grant a quarry lease only an extent of 3.00.0 Hect. in S.F. No. 863 (Part) of Manakkadavu village vide letter dated 22.07.2021.

2. Based on reports and records available, precise area has been communicated to the applicant with a direction to submit mining plan and also to submit environmental clearance as stipulated in rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 vide memo dated 23.07.2021.

3. Accordingly, Tmt. V. Maheswari, W/o. Vasudevan has submitted the Draft Mining Plan and the same has been examined in detail and it is found correct. Therefore, in exercise of the powers delegated under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, and as per the guidelines / instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Roc.No.3868/LC/2012 dated 19.11.2012, the mining plan submitted by Tmt. V. Maheswari, W/o. Vasudevan in respect of the subject area is hereby 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). Safety distances mentioned in the precise area has to be maintained for the entire duration of the lease period.

(vii). Waste material should be dumped within the lease granted area as earmarked in the Mining Plan.

(viii). Necessary Environmental Clearance has to be obtained by the applicant from the competent authority before the grant of quarry lease as per the rules.

(ix). Quarrying operations and production shall be carried out as per the approved Mining Plan and the applicant shall 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.

(x). If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules shall attract.

(xi). The applicant should strictly adhere to the statutory and safety requirements.

Encl: Approved Mining Plan.

03.08.21

Deputy Director,
Geology and Mining,
Tiruppur.

Copy to

03.08.21

1. The Director,
   Department of Geology and Mining,
   Guindy, Chennai - 600 032.

2. The Chairman ,
   State Level Environment Impact Assessment Authority,
   Panagal park Building, Saidapet, Chennai -600 015.

3. Dr. P. Thangaraju, RQP,
   Reg.off.No.17, Advaitha Ashram Road,
   Alagapuram, Salem-636 004.

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

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

Patta Land / Lease Period = Ten Years

IN

LOCATION OF THE QUARRY LEASE APPLIED AREA

EXTENT : 3.00.0ha

S.F.NO : 863 (P)

VILLAGE : MANAKKADAVU

TALUK : DHARAPURAM

DISTRICT : TIRUPPUR

STATE : TAMIL NADU

FOR

APPLICANT

Tmt.V.Maheswari,

W/o. Vasudevan,

No.220/02, Kurinjinagar,

Ellis Nagar, Udumalai Road,

Dharapuram, Tiruppur District – 638 657,

Tamil Nadu State.

PREPARED BY

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

Qualified Person

Regd. Off. No.17, Advaitha Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539.

E-mail: infogeoexploration@gmail.com

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

V.Maheswari,
W/o. Vasudevan,
No.220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram, Tiruppur District – 638 657,
Tamil Nadu State.

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

CONSENT LETTER FROM APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Manakkadavu Rough stone & Gravel Quarry in S.F.No.863 (P) over an extent of 3.00.0ha of Patta land in Manakkadavu Village, Dharapuram Taluk, Tiruppur 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, Tiruppur 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

V.Maheswari

Place: Tiruppur
Date: 24.07.2021

V.Maheswari,
W/o. Vasudevan,
No.220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram, Tiruppur District – 638 657,
Tamil Nadu State.

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

DECLARATION OF THE APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Manakkadavu Rough stone & Gravel Quarry in S.F.No.863 (P) over an extent of 3.00.0ha of Patta land in Manakkadavu Village, Dharapuram Taluk, Tiruppur 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

V.Maheswari

Place: Tiruppur
Date: 24.07.2021

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

CERTIFICATE

Certified that I am, **Dr. P. THANGARAJU, M.Sc., Ph.D.,** having an office at Regd. Off. No. 17, Advaitha Ashram Road, Alagapuram, Salem – 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 Manakkadavu Rough stone & Gravel Quarry in S.F.No.863 (P) over an extent of 3.00.0ha of Patta land in Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu State for **Tmt.V.Maheswari,** W/o. Vasudevan, No.220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram, Tiruppur District – 638 657, Tamil Nadu State. Since the Mining Plan is prepared as per the provisions contained in Rule 15(I)(a) and (I)(b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Signature of the Qualified Person

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

Place: Salem

Date: 27.07.2021

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.

DEPUTY DIRECTOR - GEOLOGY - TIRUPPUR

CERTIFICATE FROM THE RECOGNIZED 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 Manakkadavu Rough stone & Gravel Quarry in S.F.No.863 (P) over an extent of 3.00.0ha of Patta land in Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu State has been prepared for

Tmt.V.Maheswari,
W/o. Vasudevan,
No.220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram, Tiruppur District – 638 657,
Tamil Nadu State.

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of the Deputy Director, Department of Geology and Mining, Tiruppur 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: 27.07.2021

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.

DEPUTY DIRECTOR • GEOLOGY & MINING • TIRUPPUR

CERTIFICATE FROM THE RECOGNIZED 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 Manakkadavu Rough stone & Gravel Quarry in S.F.No.863 (P) over an extent of 3.00.0ha of Patta land in Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu State has been prepared for

Tmt.V.Maheswari,
W/o. Vasudevan,
No.220/02, Kurinjinagar,
Ellis Nagar, Udumalai Road,
Dharapuram, Tiruppur District – 638 657,
Tamil Nadu State.

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: 27.07.2021

LIST OF CONTENTS

S. No.	Description	Page No.
1.0	Introduction and Executive Summary	1
2.0	General Information	5
3.0	Location	6
	PART-A	
4.0	Geology and Mineral Reserves	8
5.0	Mining	11
6.0	Blasting	16
7.0	Mine Drainage	18
8.0	Other Permanent Structures	19
9.0	Employment Potential & Welfare Measures	21
	PART-B	
10.0	Environment Management Plan	23
11.0	Progressive Quarry Closure Plan	31
12.0	Any Other Details Intend to Furnish by the Applicant	38

LIST OF ANNEXURES

S. No.	Description	Annex. No.
1.	Copy of Precise Area Communication	I
2.	Copy of FMB	II
3.	Copy of Village Map	III
4.	Copy of Patta	IV
5.	Copy of Adangal	V
6.	Copy of A-Register	VI
7.	Copy of Consent Letter from the Pattadar	VII
8.	Copy of ID Proof	VIII
9.	Copy of Educational Certificate of Qualified Person	IX
10.	Copy of Experience Certificate of Qualified Person	X

LIST OF PLATES

S. No.	Description	Plate No.
1.	Location Plan	I
2.	Topo sketch of Quarry Lease Applied Area for 10km Radius	I-A
3.	Environmental & Land use Plan	I-B
4.	Route Map	I-C
5.	Quarry Lease Plan & Surface Plan	II
6.	Topography, Geological Plan, First Five Yearwise Development & Production Plan & Sections	III-A
7.	Topography, Geological Plan, Next Five Yearwise Development & Production Plan & Sections	III-B
8.	Progressive Quarry Closure Plan & Sections	IV
9.	Conceptual Plan & Sections	V

MINING PLAN AND PROGRESSIVE QUARRY CLOSURE PLAN FOR MANAKKADAVU ROUGH STONE AND GRAVEL QUARRY OVER AN EXTENT OF 3.00.0ha IN MANAKKADAVU VILLAGE, DHARAPURAM TALUK, TIRUPPUR DISTRICT, TAMIL NADU STATE.

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

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This Mining Plan and Environment Management Plan are prepared for **Tmt.V.Maheswari,** W/o.Vasudevan, residing at No.220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram, Tiruppur District – 638 657, Tamil Nadu State.

The applicant applied for Rough stone and Gravel quarry over an extent of 3.00.0ha of Patta land in S.F.No.863 (P) of Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu State.

The application was processed by the Deputy Director, Department of Geology and Mining, Tiruppur District and passed a Precise Area Communication letter vide **Rc.No.1512/Mines/2020, Dated:23.07.2021** to submit Mining Plan for the approval in Department of Geology and Mining, Tiruppur District and obtain Environmental Clearance from the Competent Authority, Tamil Nadu State, 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. The applicant should leave a safety distance of 7.5m to the adjacent Patta land.
3. The applicant should leave a safety distance of 10m to the Government land in S.F.No.872/2 on the Eastern side and Earthen Road in S.F.No.864/2, 865/2 of patta lands on the Northern side of the applied area.
4. E.B. line passing on the eastern side of the applied area has to be shifted 50 meters away from the applied area before execution of lease deed.
5. The quarry operation should be carried out with slurry explosives by an authorized explosive agency and no hindrance shall be caused to the adjacent Patta land and Government lands.
6. The applicant shall submit the approved mining plan within the time stipulated in the precise area communication letter.

This Mining Plan is approved as per the Powers conferred under rule 41(2) of Tamil Nadu Minor Mineral Concession Rules, 1959

This Mining Plan is approved subject to the Conditions Indicated in the Mining Plan approved Letter No. B.Dir.Geo 1512/2020/2020 Dated: 03.08.21

03.08.21

DEPUTY DIRECTOR
Geology and Mining
Tiruppur

7. Prior Environment clearance should be obtained from the competent authority in respect of the area applied for quarry lease before grant of quarry lease.

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

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

Short Notes of Mining Plan:

a. Village Panchayat - Manakkadavu

b. Panchayat Union - Dharapuram

c. The Geological Resources are **13,18,275m^3** of Rough stone and **58,590m^3** of Gravel formation in the entire area.

d. The Total Mineable Reserves are **5,28,150m^3** of Rough stone and **45,968m^3** of Gravel in the entire area.

e. The proposed quantity of reserves/ (level of production) to be mined are **5,28,150m^3** of Rough stone (2,76,400m^3 for first five years and 2,51,750m^3 for remaining five years period) for ten years and **45,968m^3** of Gravel for three years in the entire area.

f. Total extent of the lease applied area = 3.00.0ha

g. Topography of the area = The area exhibits plain terrain

h. Proposed Depth of mining = 47m (10 Years) & 17m (1st five years) below ground level

i. Lease Period = Ten years

j. It is a fresh lease application.

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 is given below:

Excavators attached with rock breaker (Rental Basis).

Jack-Hammer, Compressor (Diesel drive) (4 Jack-Hammer capacity) (Rental Basis).

m. No trees will be uprooted due to this quarrying operation.

n. The approach road from the main road to quarry road will be constructed and maintained in a good condition for the haulage of Rough stone and Gravel.

o. There is No Export of this Rough stone and Gravel.

p. Topo sketch covering 10km and 1km radius around the proposed area with markings of habitations, water bodies including streams, rivers, roads, major structure like bridges, wells, archaeological importance, places of worships is marked and enclosed as Plate Nos. IA & IB.

q. The lease applied area is about 3.00.0ha bounded by eight corners; the corners are designated as 1-8 Clockwise from the Western corner the Co – ordinates for the all the corners are clearly marked in the Quarry Lease and Surface Plan enclosed as 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 as Plate Nos. III-A, III-B and IV.

s. General conditions will not be applicable for the proposed area. The area applied for lease is 10Km away from the,

i) Interstate Boundary,

ii) Protected area under wild life protection ACT, 1972,

iii) Critically polluted areas as identified by CPCB,

iv) Notified Eco sensitive areas.

t. There is no waste anticipated during this quarry operation, hence waste dump is not proposed in the lease applied area.

u. Around 35 employees are deploying in the quarrying operation.

v. Total Cost of the project is about **Rs.66,20,000/-.**

w. Infrastructures around the lease applied area given below in the table:

TABLE-1

Particulars	Location	Approximate aerial distance and direction from lease applied area
Nearest Post Office	Therupatti	2km – Northeast
Nearest School	Pachapalayam	1km – Southeast
Nearest Dispensary	Dharapuram	8km – Northwest
Nearest Town	Dharapuram	8km – Northwest
Nearest Police Station	Dharapuram	8km – Northwest
Nearest Hospital	Dharapuram	8km – Northwest
Nearest D.S.P. Office	Dharapuram	8km – Northwest
Nearest Railway Station	Palani	26km – Southwest
Nearest Airport	Coimbatore	77km – Northwest
Nearest Seaport	Kochi	164km – Southwest
District Head quarters	Tiruppur	54km – Northwest

2.0 GENERAL INFORMATION

2.1 a) Name of the Applicant : **Tmt.V.Maheswari,**
W/o. Vasudevan,

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

Address	:	No.220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram, Tiruppur District.
Pin Code	:	638 657
Mobile No	:	+91 94432 41410
Aadhaar No	:	2024 7044 4234
Email ID	:	vasudevan4252@gmail.com

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

The applicant is an Individual.

2.2 a) Mineral which the Applicant intends to mine:

The Applicant intends to quarry Rough stone and Gravel only.

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

The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, Tiruppur District vide **Rc.No.1512/Mines/2020, Dated: 23.07.2021** to submit approved mining plan and to obtain Environmental Clearance from the Competent Authority, Tamil Nadu State.

c) Period of permission / lease to be granted:

Ten Years.

d) Name and address of the Qualified Person who preparing the Mining Plan:

Name	:	**Dr. P. Thangaraju, M.Sc., Ph.D.,** Qualified Person
Address	:	Reg. No.17, Advaitha Ashram Road, Alagapuram, Salem District – 636 004.
Telephone	:	0427- 2431989 (Office)
Cell No	:	+91 94422 78601 & 94433 56539
Email	:	infogeoexploration@gmail.com

(Refer Annexure Nos. IX & X).

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

3.0 LOCATION

a) Details of the area with location map:

The lease applied area is about 54km Southeastern side of Tiruppur town and 8km Southeastern side of Dharapuram town, the lease applied area located along Manakkadavu Village at a distance of 2km Eastern side.

	47km		6km		2km	
Tiruppur	→	Dharapuram	→	Manakkadavu	→	Lease Applied area
	Southeast		Southeast		East	

Location Map of the Lease Applied Area

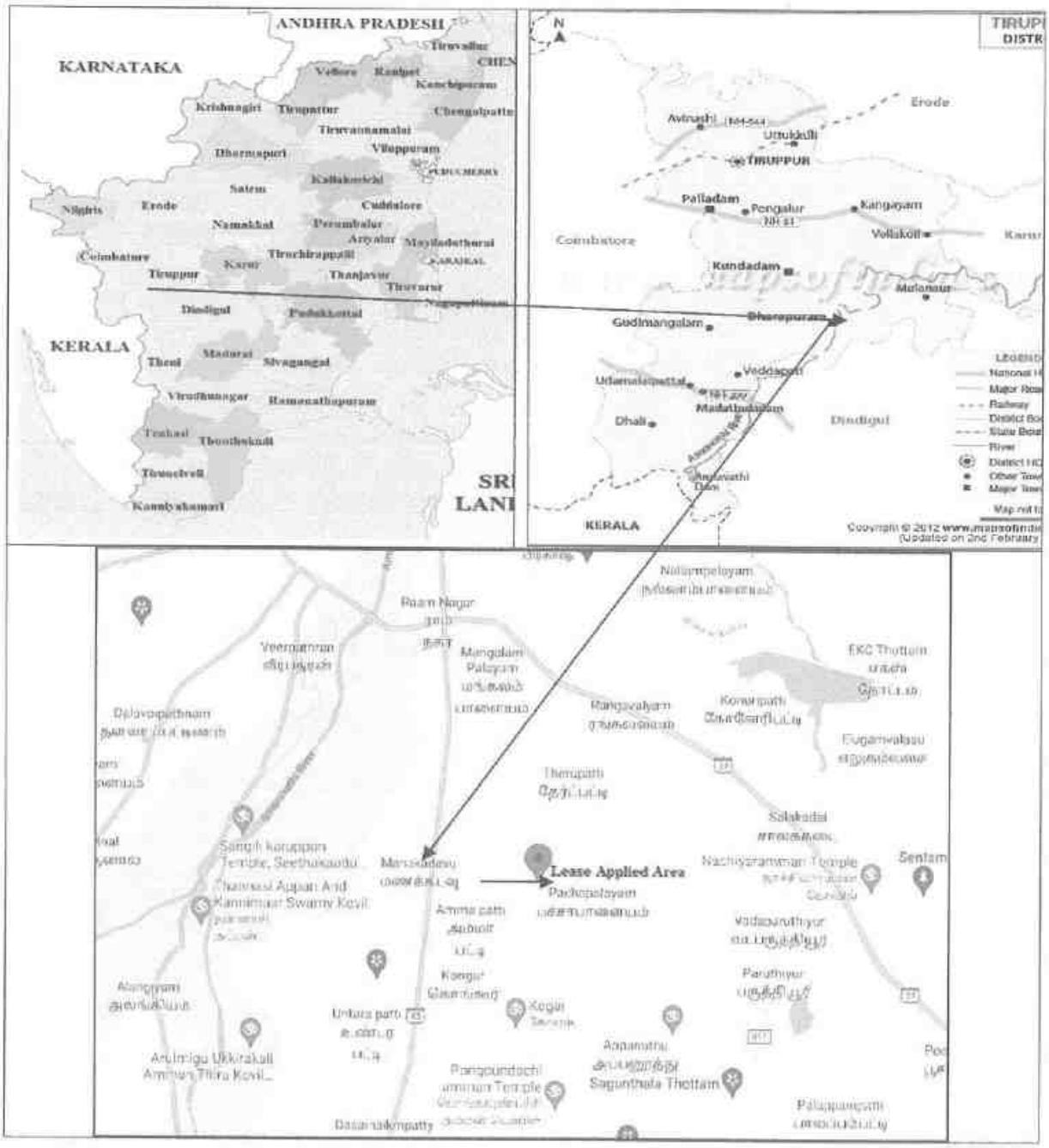


TABLE-2

District	Taluk	Village	S.F. No.	Lease Applied Area in ha.
Tiruppur	Dharapuram	Manakkadavu	863 (P)	3.00.0
Total Extent				**3.00.0ha**

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

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

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

It is a Patta land. Jointly Registered in the name of the applicant (Tmt.V.Maheswari) and Thiru.R.Vasudevan, vide Patta No.1411. The applicant has obtained consent from the other pattadar. Refer Annexure Nos. IV & VII.

d) Topo sheet No. with latitude and longitude:

The lease applied area falls in the Topo sheet No: **58 - F/10** Latitude between: **10°40'28.65"N** to **10°40'35.70"N** and Longitude between: **77°33'40.78"E** to **77°33'49.94"E** on WGS datum-1984. Please refer the Plate Nos. I to II.

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

The approach (metal) road is situated on the Northern side which connects the Cart Track at a distance of 10m of the applied area.

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

The approach road from the quarry is constructed and 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 Pollachi – Dindigul which is about 23km on the Southwestern side of the lease applied area.

DEPUTY DIRECTOR GEOLOGY AND MINING PALAKKAD

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 is exhibits plain topography. The area has gentle sloping towards Northeastern side. The altitude of the area is 290m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel formation. Massive Charnockite is found after 2m (Gravel) which is clearly inferred from the nearby existing quarry pits.

The Water table is found at a depth of 73m in summer and at 68m in rainy seasons. Average annual rainfall is about 618mm.

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 regional scale of the Charnockite body is N40°E – S40°W with dipping towards SE70°.

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

AGE		FORMATION
Recent	-	Quaternary
		Formation (Gravel)
----------Unconformity----------		
Archaean	-	Charnockite
		Peninsular Gneiss complex

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 Tiruppur 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 nearby existing quarry pits.

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 two sections have been drawn, one section is drawn as Length wise as (X-Y) and other one section is drawn as Width wise as (A-B) to cover the maximum area considered for lease.

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 Nos. III-A & III-B). As the sale of Rough stone is in terms of cubic meters (Volume) only and not in terms of tonnage.

Geological Resources (Plate Nos. III-A & III-B):

The Geological Resources of Rough stone and Gravel are calculated up to a maximum depth of 47m (2m Gravel + 45m Rough stone) below ground level. **The total Geological resources are calculated by sectional method**. The total geological resources are given below:

TABLE-3

GEOLOGICAL RESOURCES						
Section	**Bench**	**Length in (m)**	**Width in (m)**	**Depth in (m)**	**Geological Resources in Rough stone (m^3)**	**Gravel Formation (m^3)**
XY-AB	I	189	155	2	-	58590
	II	189	155	5	146475	-
	III	189	155	5	146475	-
	IV	189	155	5	146475	-
	V	189	155	5	146475	-
	VI	189	155	5	146475	-
	VII	189	155	5	146475	-
	VIII	189	155	5	146475	-
	IX	189	155	5	146475	-
	X	189	155	5	146475	-
Total					**1318275**	**58590**

Total Geological Resources of Gravel Formation : **58,590m^3**

Total Geological Resources of Rough stone : **13,18,275m^3**

Mineable Reserves:

The Mineable Reserves are calculated after leaving the safety distance and bench loss to a maximum depth of 47m below ground level.

TABLE-4

MINEABLE RESERVES						
Section	**Bench**	**Length in (m)**	**Width in (m)**	**Depth in (m)**	**Mineable Reserves in Rough stone (m^3)**	**Gravel (m^3)**
XY-AB	I	169	136	2	-	45968
	II	163	130	5	105950	-
	III	153	120	5	91800	-
	IV	143	110	5	78650	-
	V	133	100	5	66500	-
	VI	123	90	5	55350	-
	VII	113	80	5	45200	-
	VIII	103	70	5	36050	-
	IX	93	60	5	27900	-
	X	83	50	5	20750	-
Total					**528150**	**45968**

The mineable reserves have been computed as **5,28,150m^3** of Rough stone and **45,968m^3** of Gravel at the rate of 100% recovery upto a maximum depth of 47m below ground level for a period of ten years.

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

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 Gravel, the Gravel will be directly loaded into Tippers for the filling and levelling of low lying areas, this will be done only after obtaining permission and paying necessary seigniorage fees to the Government. The excavated Rough stone will be directly loaded into Tippers to the needy customers. The Composite year wise Development and production plan and sections indicating the Pit lay out, Green belt development are shown in Plate Nos. III-A & III-B.

Yearwise development and Production

TABLE-5

FIRST FIVE YEARWISE PRODUCTION DETAILS							
Years	**Section**	**Bench**	**Length in (m)**	**Width in (m)**	**Depth in (m)**	**Recoverable Reserves in Rough stone (m^3)**	**Gravel (m^3)**
I	XY-AB	I	54	136	2	-	14688
		II	48	130	5	31200	-
		III	38	120	5	22800	-
		Total				**54000**	**14688**
II		I	43	136	2	-	11696
		II	43	130	5	27950	-
		III	43	120	5	25800	-
		Total				**53750**	**11696**
III		I	72	136	2	-	19584
		II	72	130	5	46800	-
		III	10	120	5	6000	-
		Total				**52800**	**19584**
IV		III	62	120	5	37200	-
		IV	30	110	5	16500	-
		Total				**53700**	-
V		IV	113	110	5	62150	-
		Total				**62150**	-
Grand Total						**276400**	**45968**

The Recoverable reserves have been computed as **2,76,400m^3** of Rough stone and **45,968m^3** of Gravel at 100% recovery upto depth of 17m below ground level (R.L.290m to R.L.273m) for first five years.

TABLE-5A

SECOND FIVE YEARWISE PRODUCTION DETAILS						
Years	**Section**	**Bench**	**Length in (m)**	**Width in (m)**	**Depth in (m)**	**Recoverable Reserves in Rough stone (m^3)**
VI	XY-AB	V	105	100	5	52500
		Total				**52500**
VII		V	28	100	5	14000
		VI	85	90	5	38250
		Total				**52250**
VIII		VI	38	90	5	17100
		VII	88	80	5	35200
		Total				**52300**
IX		VII	25	80	5	10000
		VIII	103	70	5	36050
		Total				**46050**
X		IX	93	60	5	27900
		X	83	50	5	20750
		Total				**48650**
Grand Total						**251750**

The Recoverable reserves have been computed as **2,51,750m^3** of Rough stone at 100% recovery upto depth of 30m below ground level] (R.L.273m to R.L.243m) for remaining five years.

The Recoverable reserves have been computed as **5,28,150m^3** of Rough stone and **45,968m^3** of Gravel at 100% recovery upto depth of 47m below ground level (R.L.290m to R.L.243m) for ten years.

The applicant ensures the total quantity proposed in the benches will not exceed during the quarrying operation. Besides the Rough stone locked up in benches will be exploited after obtaining necessary permission from the office of **Director General of Mine Safety, Chennai** region by submitting relevant documents, appropriate safety plans and its Mitigation measures.

One lorry load	=	$6m^3$ (approx.)
Total No of Working days	=	300 Days per year
Total quantity to be removed in these ten years plan period	=	$5,28,150m^3$
Hence total lorry loads per day	=	$5,28,150m^3/6m^3$
	=	88025 lorry loads
	=	88025/10 years
	=	8803/300 Days
Rough stone	=	**29** lorry loads per day
Total quantity to be removed in these three years plan period	=	$45,968m^3$
Hence total lorry loads per day	=	$45,968m^3/6m^3$
	=	7661 lorry loads
	=	7661/3 Years
	=	2554/300 Days
Gravel	=	**8-9** lorry load per day

Working hours = 8.30 am to 5.30 pm (with 12.30-1.30 pm lunch break)

5.5 Machineries to be used:

For Mining:

The following machineries are utilized on rental basis for the development and production work at this quarry.

TABLE-6

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	2	300	Diesel Drive

III. HAULAGE WITHIN THE MINE & TRANSPORT EQUIPMENT:

S. No.	Type	Nos	Capacity	Motive Power
1	Tippers	4	20 tonnes	Diesel Drive

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

5.6 Disposal of Overburden/Waste:

The overburden in the form of Gravel. The Gravel will be directly loaded into Tippers for the filling and levelling of low lying areas. The excavated Rough stone (100%) will be directly loaded into Tippers to the needy customers. There is no Waste anticipated during this plan period hence, disposal of waste does not arise.

5.7 Brief note on conceptual mining plan for the entire lease period base on the geological, mining and Environment considerations:

Conceptual mining plan is prepared with an object of long term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, selection of sites for construction of infrastructure, etc.,

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

As the applicant has applied quarry lease for ten years, the ultimate pit limit (dimension) at the end of this mining plan period is given below:

TABLE-7

First Five years Proposed Pit Dimension	**Length in m (Max)**	**Width in m (Max)**	**Depth in m (Max)**
	171	138	17m below ground level
Ultimate Pit Dimension	**Length in m (Max)**	**Width in m (Max)**	**Depth in m (Max)**
	171	138	47m below ground level

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

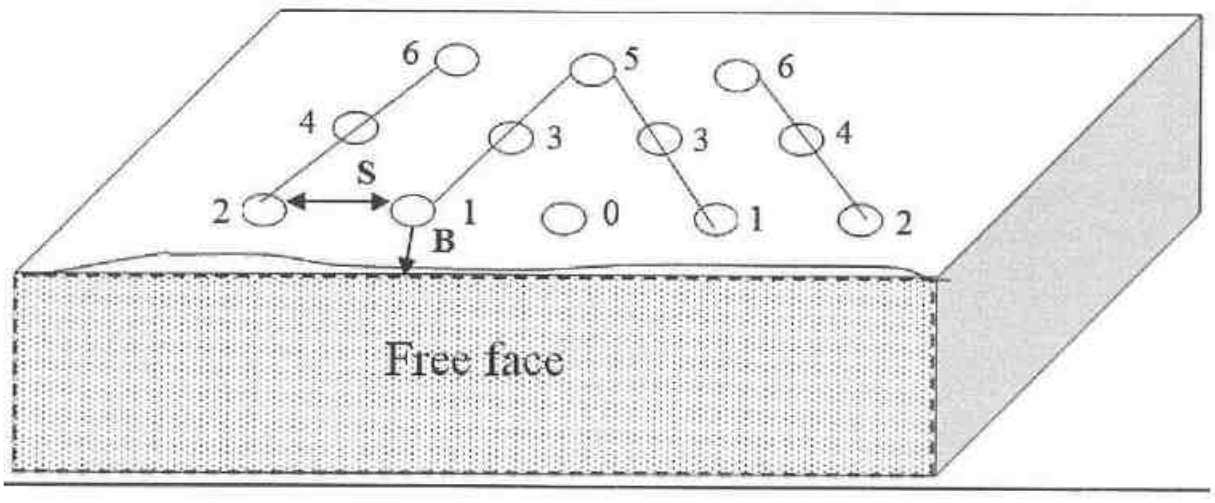
6.1 Blasting pattern:

The quarrying operation is proposed to carried out by Mechanized Opencast Method in conjunction with conventional method of mining using Jack-Hammer drilling and slurry blasting of shattering effect for loosen 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=		**152 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.

6.3 Measures proposed to minimize ground vibration due to blasting:

The quarry is situated more than 300m from the nearby villages, Controlled blasting measures is being adopt for minimizing ground vibration and fly rock.

Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in Rough stone for easy excavation and to control fly rock.

Delay detonators:

Delay blasting (millisecond delays) permits to divide the shot in to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:

- Reduction of ground vibration.
- Reduction in air blast.
- Reduction in over break.
- Improved fragmentation.
- Better control of fly-rock.

Blasting program for the production per day:

No of Holes	= 152 Holes
Yield	= 458 Tons
Powder factor	= 6 Tons/Kg of explosives
Total explosive required	= 76 Kg-Slurry explosives
Charge/ hole	= 0.5 Kg
Blasting at day time only	= 12.00 – 12.30p.m (whenever required)

6.4 Storage and safety measures to be taken while blasting:

The applicant will engage authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/Permit Mines Manager. The explosives agencies should be have the valid Blaster certificate. He will blast holes in the quarry site. After the completion of Blasting the Explosives Agencies will take it out back the remaining quantity of Explosives. The magazine is available at the quarry site to temporarily store the explosives.

7.0 MINE DRAINAGE

7.1 Depth of water table (based on nearby wells and water bodies):

The Water Table in the area is 73m in summer season and 68m 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-8

Type	Distance & Direction	Location
Bore Well	800m Southeastern side	10°40'09.65"N 77°34'06.39"E

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

Quarry operations are confined well above the water table during the entire lease period. If water is encountered at due to rain water and seepage, the same will be pumped out by 5HP water pumps to the Greenbelt development areas. Besides, the water will also be used for dust suppression on haul roads during Haulage of machineries.

8.0 OTHER PERMANENT STRUCTURES (also shown in the map)

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

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 an E.B. line passing on the Eastern side, the applicant should be shifted the line about 50m away from the applied area before execution of lease deed. There is no Housing area, EB line (HT & LT Line) within the radius of 50m from the lease applied area.

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

There is no other River, Pond, Lake, Odai, Canal located within 50m radius of the lease applied area.

8.4 Archaeological / historical monuments:

There is no Archaeological / historical monuments within 300m radius from the lease applied area.

8.5 Road (NH, SH, others):

The Nearest National Highway (NH-209) Coimbatore – Dindigul is situated about 22km on the Southwestern side of the lease applied area.

The State Highway (SH-83) Erode – Palani is situated about 2km on the Western side of the lease applied area.

The Major District (MD-911) Puliyampatty – Salakadai Road is situated about 4km on the Eastern 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 / forest / social forest / wild life sanctuary etc., within radius of 500m of the lease applied area.

SALIENT FEATURES

S. No.	Salient Features Present around site	Prescribed safety distance	If any present within Prescribed distance it's actual distance and direction from the area
1.	Railways, Highways, Reservoirs or Canal	50m	None of the above situated within 50m radius.
2.	Village Road	10m	Earthen Road is passing on the Northern side within 10m radius on the lease applied area.
3.	Habitation / Village	300m	There is no approved habitation within 300m radius from the lease applied area (Refer Plate No I-B).
4.	Adjacent Patta lands / Govt. Land	7.5m/10m	<table><tr><th>Direction</th><th>Classification</th><th>Safety Distance</th></tr><tr><td>North</td><td>Patta land / Earthen Road</td><td>10m</td></tr><tr><td>East</td><td>Patta land</td><td>7.5m</td></tr><tr><td>South</td><td>Patta land</td><td>7.5m</td></tr><tr><td>West</td><td>Patta land</td><td>7.5m</td></tr></table> (Refer Plate No. II).
5.	Housing area, EB line (HT & LT Line)	50m	There is an E.B. line passing on the Eastern side, the applicant should be shifted the line about 50m away from the applied area before execution of lease deed. There is no Housing area, EB line (HT & LT Line) within the radius of 50m from the lease applied area.
6.	Boundaries of the permitted area	7.5m/10m	The boundaries of the permitted areas are as follows: North - S.F.Nos.865 & 864 East - S.F.No.872/2 South - S.F.No.863 (P) West - S.F.No.862 (Refer Plate No. II).
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).

9.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES

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

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

a.	Skilled labour:		
	Mine Foreman	:	1
	Blaster/mate	:	1
	Excavator – Operator & Drivers	:	6
	Jack-Hammer operator	:	12
b.	Semi-skilled:		
	Security	:	1
c.	Unskilled:		
	Labour & Helper	:	6
	Co-operator and Cleaner	:	8
	Total	**:**	**35**

The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that the labour will not be employed less than 18 years, **No child labour** will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.

9.2 Welfare Measures:

a. Drinking Water:

Packaged drinking water is available from the nearby approved water vendors in Manakkadavu which is about 2km on the Western side of the lease applied area.

b. Sanitary Facilities:

Hygienic modern Sanitary Facilities will be constructed as semi permanent structure and it will be maintained periodically as hygienic.

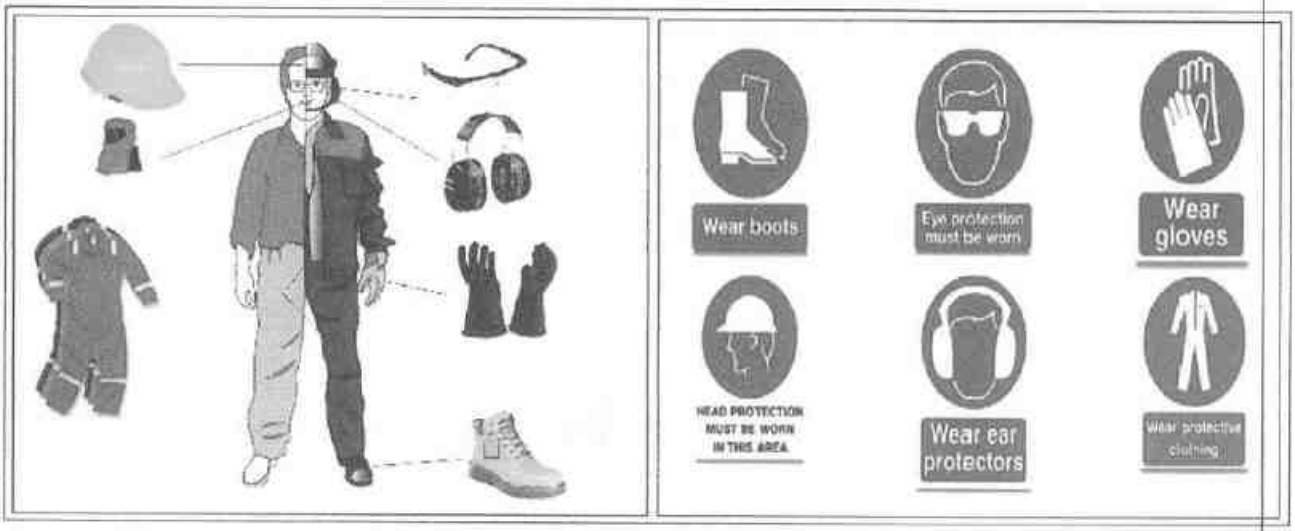
c. First aid facility:

First aid kits are kept in Mines office room, in case of such eventuality is the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager/mate will be in charge of first aid and injured person will be taken to the hospital by the applicant vehicle. Hospital is available in Dharapuram located at a distance of 8km on the Northwestern side.

d. Labour Health:

Periodically medical check-up related to occupational health safety will be conducted to all the workers in applicant own cost.

e. Precautionary safety measures to the labourers:



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

All personnel protective devices will be provided as per the specification approved by Director of mines safety. Periodically medical check-up will be conducted for all workers for any mine health related problems. Proper training and vocational education will be given by qualified and experienced safety officer to all the employees about the safety and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically, to carry out the quarrying operations scientifically and to safe guard the men and machinery and to create awareness about conventional opencast quarrying operations.

PART – B

10.0 ENVIRONMENT MANAGEMENT PLAN

10.1 Existing Land use pattern:

The quarry lease applied area is exhibits plain terrain. The area is a dry barren land devoid of Agriculture and Habitations. The lease applied area has utilized only for quarry operation in earlier.

LAND USE TABLE-9

Description	Present area in (ha)	Area at the end of this quarrying period (ha)
Quarrying Pit	Nil	2.39.5
Infrastructure	Nil	0.01.0
Roads	Nil	0.02.0
Green Belt	Nil	0.25.0
Unutilized Area	3.00.0	0.32.5
Grand Total	**3.00.0**	**3.00.0**

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.

10.3 Flora and Fauna:

TABLE–10

S.No.	Name of the plant (Scientific)	Family Name	Common Name	Habit	Picture
1.	*Thespesia populnea*	*Indian Tulip Tree*	Poovarasu	Tree	
2.	*Tamarindus indica*	*Caesalpiniaceae*	Puli	Tree	
3.	*Pongamia pinnata*	*Fabaceae*	Pungai	Tree	
4.	*Cassia auriculata*	*Fabaceae*	Aavarampoo	Shurb	
5.	*Ziziphus oenoplia.*	*Rhamnaceae*	Suraimullu, Surai ilantai	Shurb	

List of Fauna			
S.No.	**Scientific Name**	**Common Name**	**Picture**
1.	*Capra hircus*	Goat	
2.	*Boigaspp*	Cat snake	
3.	*Athene brama*	Spotted owlet	
4.	*Passer domesticus*	House sparrow	
5.	*Precis hierta*	Yellow pansy	
6.	*Funambuluspalmarum*	Indian palm squirrel	

10.4 Climatic Conditions:

The area receives rainfall of about 618mm/annum and the rainy season is mainly from Oct - Dec 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 in this area within 5km radius; the approximate distance and population are given below:

TABLE–11

S. No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Therupatti	2km – Northeast	1200
2.	Pachapalayam	1km – Southeast	700
3.	Manakkadavu	2km – West	5,100

Basic human welfare Amenities such as Health Centre, Schools, Communication Facilities, and Commercial Centres etc., are available at Dharapuram located at a distance of 8km on the Northwestern 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 Mitigative measures carried out to prevent dust and Air propagation in to air. The estimated budget for dust suppression would be around **Rs.52,000**/year.

10.7 Plan for Noise level control:

The noise level increased due to the Drilling, Blasting, Excavation and Transportation.

Engineering Noise control:

Noise will be created due to the usage of Machineries and Vehicles. The Noise will be controlled in the following manner.

- Selection of new low – noise equipment's is proposed to be deployed for the Rough stone quarry operation.
- Modifications of older equipments.
- Implementation of effective preventive maintenance which reduces noise more than 50%.
- Developing Green belts which act as Acoustic barrier, pollution absorbent and noise controller.
- The drivers will be strictly instructed to move the vehicle during the transportation not exceed 40km per hour.
- Sentries with flags & whistle will posted in village road junction and populated area to control and regulate traffic.

Shallow holes of 32mm diameter and maximum depth of 1.5m will be drilled and conventional low power explosives such as 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 ten years:

In the mining plan proposed for a production of Rough stone does not involve deep hole drilling and blasting. Such limited mining activity is not likely to cause any impact adversely on the environment. As far as pollution of air, water and noise concerned, the Environment impact studies will be conducted as per EIA notification issued by MoEF&CC. It is B2 Category mine. The estimated budget would be around **Rs.7,60,000/-.**

10.9 Proposal for waste management:

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

10.10 Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.):

In the mining plan proposed only to a maximum depth of 47m below ground level has been envisaged as workable depth for safe & economic mining during entire lease applied area. There is no waste generated hence, backfilling is not possible. Hence, the quarry area will be fenced with Barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle. The barbed wire fencing cost would be around **Rs.2,10,000/-.**

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

The safety zone all along the 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–12

Years	No. of tress proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	30	80	250	Neem, Pongamia Pinnata, Casuarina, etc.,	24
II	30	80	250		24
III	30	80	250		24
IV	30	80	250		24
V	30	80	250		24
VI	30	80	250		24
VII	30	80	250		24
VIII	30	80	250		24
IX	30	80	250		24
X	30	80	250		24

Nearly 2,500sq.m area is proposed to use under Greenbelt by planting 30 Number of tree saplings during every year with an anticipated survival rate of 80% (Please refer Plate No. III). The estimated budget for plantation and maintenance of Greenbelt development would be around **Rs.30,000/-** for the period of ten years.

The Greenbelt Development will be formed in around the quarried out top benches and approach road. The cost would be around **Rs.50,000/-.**

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

Budget Provision for the entire quarrying period:

TABLE-13

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.7,60,000/-** for the period of ten years.

A.	**Project / investment / Operational cost**	
i) Land cost	The Land value as per the Government Guideline land cost is about, Rs.5,38,000/ha, hence the total land cost is calculated about 3.00.0ha X Rs.5,38,000/- = Rs.16,15,500/- i.e., Rs.16,16,000/- (source: https://tnreginet.gov.in/portal/)	= Rs.16,16,000/-
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.25,00,000/-
iii) Refilling/ Fencing	Fencing will be constructed around the quarry pit to prevent the inadvertent entry of public and cattles cost would be around	= Rs.2,10,000/-
iv) Labourers shed	Labour sheds will be constructed as semi permanent structure. The cost would be around	= Rs.1,65,000/-
v) Sanitary facility	Adequate latrine and urinal accommodation shall be provided at conveniently accessible places the cost would be around	= Rs.1,00,000/-
vi) Others items	First aid room & accessories	= Rs.90,000/-

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.3,00,000/-
viii) Sanitary arrangement	The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around	= Rs.80,000/-
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.1,00,000/-
x) Water sprinkling	Water will be sprinkled in the haul roads by water sprinklers the cost would be around	= Rs.3,00,000/-
xi) Garland drains Construction	Construction of garland drains to divert surface run-off from virgin area away from mining area	= Rs.1,89,000/-
xii) Greenbelt etc.	Greenbelt program will be carried out in the boundary barriers the cost would be around	= Rs.30,000/-
	Greenbelt program will be carried out in the quarried out top benches and approach road	= Rs.50,000/-
	Total Operational Cost	**= Rs.57,30,000/-**

B. EMP Cost:- (Per year)	
Air Quality monitoring	Rs.52,000/-
Water Quality Sampling	Rs.16,000/-
Noise Monitoring	Rs. 2,000/-
Ground Vibration test	Rs. 4,000/-
Total Cost	**Rs.76,000/-**
Total EMP Cost for the ten years period is **Rs.7,60,000/-**	

Description	Amount (Rs.)
A. Operational Cost	**57,30,000**
B. EMP Cost	**7,60,000**
Total Project Cost (A+ B)	**64,90,000**
The applicant indents to involve corporate environment responsibilities (CER) activity like Solar Lamps, Water purifier and Medicine storage rack facilities to the nearby Dispensary at 2.0% from the total project cost. The Cost would be around **Rs.1,30,000/-**.	**1,30,000**
Total Cost	**66,20,000**
The Total cost would be around sixty six lakhs and twenty thousands only.	

11.0 PROGRESSIVE QUARRY CLOSURE PLAN

11.1 Introduction:

The Progressive Quarry Closure Plan for Rough stone and Gravel quarry over an extent of 3.00.0ha of Patta land in S.F.No.863 (P) of Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu State has been prepared for **Tmt.V.Maheswari,** W/o.Vasudevan, residing at No.220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram, Tiruppur District – 638 657, Tamil Nadu State.

11.2 Present Land use pattern:

LAND USE TABLE-14

Description	Present area in (ha)
Quarrying Pit	Nil
Infrastructure	Nil
Roads	Nil
Green Belt	Nil
Unutilized Area	3.00.0
Grand Total	**3.00.0**

11.3 Method of Mining:

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

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

11.4 Mineral Processing Operations:

The quarried out Rough stone will be transported by the 20tons capacity Tipper to the needy crushers. Splitting of rock mass of considerable volume from the parent rock mass by Jack-Hammer drilling and blasting, hydraulic excavators are used for loading the Rough stone from pithead to the needy crushers.

11.5 Reasons for closure:

As the mineral is not going to be exhausted during the proposed plan period no immediate closure is planned and sufficient reserves are available to carry on the activities. The reason for closure will be discussed in the ensuing mining plan.

11.6 Statutory obligations:

The applicant ensures to comply all the conditions were imposed while granting the precise area communication letter before the execution of lease deed and during the course of quarry operations.

11.7 Progressive quarry closure plan preparation:

Name and address of the Qualified Person who prepared the progressive closure plan and name and address of the executing agency who is involved in the preparation of progressive quarry closure plan.

Name	:	**Dr. P. Thangaraju, M.Sc., Ph.D.,** Qualified Person
Address	:	Reg. No.17, Advaitha Ashram Road, Alagapuram, Salem District – 636 004.
Telephone	:	0427- 2431989 (Office)
Cell No	:	+91 94422 78601 & 94433 56539

Applicant will himself implement the closure plan; no outside agency will be involved.

11.8 Review of Implementation of Mining Plan including Progressive Closure Plan upto the Final Closure Plan:

Mining Plan and Progressive quarry closure plan are being submitted for the first time. It will be reviewed after ten years and review of implementation will be given with next review of mining plan.

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

11.9 Closure Plan:

(i) Mined Out Land:

At the end of mining plan period, about 2.39.5ha of area will be mined out. Land use at various stages is given in the table below.

LAND USE TABLE-15

Description	Present area in (ha)	Area at the end of this quarrying period (ha)
Quarrying Pit	Nil	2.39.5
Infrastructure	Nil	0.01.0
Roads	Nil	0.02.0
Green Belt	Nil	0.25.0
Unutilized Area	3.00.0	0.32.5
Grand Total	**3.00.0**	**3.00.0**

The Greenbelt Development will be formed in around the quarried out top benches and approach road of the lease applied area.

(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 land.
- Domestic sewage from site office & urinals/latrines provided in QL is discharged in septic tank followed by soak pits.

(iii) Air Quality Management:

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face-mask, earplug/ muffs.

For air pollution management at the progressive quarry closure plan, greenbelt will be developed to prevent and control air pollution.

(iv) Top Soil and Waste Management:

There is no topsoil or waste generated during the proposed plan period. The entire quarried out Rough stone and Gravel is utilized (100%). Hence, waste management does not arise.

(v) Disposal of mining machinery:

All the machineries will be engage on rental basis. Hence, disposal or decommissioning of mining machinery does not arise.

(vi) Safety & Security:

Safety measures will be implemented to prevent access in the excavation area an un-authorized persons as per Mine Act 1952, MMR 1961.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, and Mines Rules 1955.
- Provisions of MMR 1961 shall be strictly followed and all roads shall be wider than the height of the bench or equal to the height of the bench and have a gradient of not more than 1 in 16.
- The bench height will be 5.0m.
- Width of working bench will be kept about 5.0m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations and proper signal by siren alarm will be provide before blasting time to prevent any 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 quarrying operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, TNMMCR 1959 and other laws applicable to mine will be strictly complied with.
- During heavy rainfall the mining activities will be suspended.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.
- The Greenbelt Development will be formed in around the quarried out top benches and approach road 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.

(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-16

ACTIVITY		YEARS										RATE	COST (Rs.)
		I	II	III	IV	V	VI	VII	VIII	IX	X		
Plantation under safety zone	Nos	30	30	30	30	30	30	30	30	30	30	@100 Rs Per sapling	30,000/-
	Cost	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000		
Plantation in quarried out benches and approach road	Nos	50	50	50	50	50	50	50	50	50	50		50,000/-
	Cost	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000		
Wire Fencing (In Mtrs) 700 Mtrs		210000	-	-	-	-	-	-	-	-	-	@300 Rs Per Meter	2,10,000/-
Garland drain (In Mtrs) 630 Mtrs		189000	-	-	-	-	-	-	-	-	-	@300 Rs Per Meter	1,89,000/-
TOTAL													**4,79,000/-**

12.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

This Mining Plan for Rough stone (Charnockite) and Gravel is under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959. The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied within the quarrying 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: Salem

Date: 27.07.2021

DONATE RED
SPREAD GREEN
SAVE BLUE

This Mining Plan is approved subject to the Conditions Indicated in the Mining Plan approved Letter No. ந.க.எண் 1512/கனிம/2021 Dated 03.08.21

This Mining Plan is approved as per the Powers conferred under rule 41(2) of Tamil Nadu Minor Mineral Concession Rules, 1959

03.08.21
DEPUTY DIRECTOR
Geology and Mining
Tiruppur
03.08.21

ANNEXURE 1

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

ந.க.எண். 1512/கனிமம்/ 2020

புவியியல் மற்றும் சுரங்கத்துறை
மாவட்ட ஆட்சியர் அலுவலகம்,
திருப்பூர்.

நாள்: 23.07.2021.

குறிப்பாணை

பொருள் : கனிமங்களும் சுரங்கங்களும் - சிறு கனிமம் - திருப்பூர் மாவட்டம் - தாராபுரம் வட்டம் - மணக்கடவு கிராமம் - பட்டா புல எண். 863 (பகுதி)-ல் 3.00.0 ஹெக்டர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் மண் குவாரி குத்தகை உரிமம் கோரி திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவர் விண்ணப்பம் அளித்தது - புலத்தணிக்கை அறிக்கை சமர்பிக்கப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவிணை பெற்று சமர்பிக்கக் கோருதல் - தொடர்பாக.

பார்வை :

1. திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன், 220/02, குறிஞ்சிநகர், எல்லீஸ் நகர், உடுமலை ரோடு, தாராபுரம், திருப்பூர் மாவட்டம் என்பவரின் விண்ணப்பம் நாள்: 26.11.2020.
2. இவ்வலுவலக ந.க.எண். 1512/2020/கனிமம் நாள்: 01.12.2020.
3. திரு. ராமதுரை என்பவரின் புகார் மனு நாள்: 04.01.2021.
4. இவ்வலுவலக ந.க.எண். 1512/2020/கனிமம் நாள்: 11.01.2021
5. வட்டார வளர்ச்சி அலுவலர், தாராபுரம் கடிதம்ந.க. 1515/2014/அ2 நாள்: 17.12.2020 (இவ்வலுவலகத்தில் பெறப்பட்ட நாள்: 24.12.2020).
6. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை ந.க. 1870/எம்.எம்.1/2020 நாள்: 10.08.2020 கடிதத்துடன் அரசாணை (பல்வகை) எண். 169, தொழில் (எம்எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).
7. அரசாணை (பல்வகை) எண். 208, தொழில் (எம்.எம்.சி-1) துறை நாள்: 21.09.2020.
8. வட்டாட்சியர், தாராபுரம் கடிதம் ந.க. 469/2021/அ2 நாள்: 15.02.2021.
9. சார் ஆட்சியர் (பொ), தாராபுரம் மற்றும் உதவி ஆணையர் (கலால்), திருப்பூர் கடிதம் ந.க. 3835/2020/இ நாள்: 23.06.2021.
10. திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் கடிதம் நாள்: 22.07.2021.
11. உதவிப் புவியியலாளர் (கனிமம்), திருப்பூர் புலத்தணிக்கை அறிக்கை நாள்: 22.07.2021.
12. மற்றும் உரிய ஆவணங்கள்

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், பட்டா புல எண். 863-ல் 5.00.0 ஹெக்டர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரிக் குத்தகை உரிமம்

வழங்க கோரி திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவர் பார்வை 1-ல் கண்டுள்ளபடி உரிய ஆவணங்களுடன் விண்ணப்பம் அளித்துள்ளார். மேலும், மனுதாரர் தனது 22.07.2021 நாளிட்ட கடிதத்தில், தனது குடும்ப சூழ்நிலை காரணமாக முழுப்பரப்பிற்கும் குவாரிப்பணி செய்ய இயலவில்லை எனவும், புல எண். 863-ல் 3.00.0 ஹெக்டர் பரப்பில் மட்டும் குவாரி உரிமம் வழங்குமாறு கோரியுள்ளார்.

2. மேற்படி விண்ணப்பங்கள் தொடர்பாக, வட்டார வளர்ச்சி அலுவலர், தாராபுரம், வட்டாட்சியர், தாராபுரம், சார் ஆட்சியர் (பொ), தாராபுரம் மற்றும் உதவிப் புவியியலாளர் (கனிமம்), திருப்பூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், பட்டா புல எண். 863 (பகுதி)-ல் 3.00.0 ஹெக்டர் பரப்பில் திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவருக்கு சாதாரண கற்கள் மற்றும் கிராவல் மண் குவாரி உரிமம் வழங்க கீழ்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

நிபந்தனைகள்:

a. 1959ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை II-ல் கண்டுள்ளபடி குவாரி செய்யப்படும் கனிமங்களுக்குரிய சீனியரேஜ் தொகை அவ்வப்போது செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.

b. அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப் பணி மேற்கொள்ள வேண்டும்.

c. விண்ணப்பப் புலத்திற்கு கிழக்கே உள்ள அரசு புறம்போக்கு புல எண். 872/2-ற்கும் வடக்கே பட்டா புலத்தில் புல எண். 864/2, 865/2-ல் உள்ள நிலவியல் பாதைக்கும் 10 மீட்டர் பாதுகாப்பு இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.

d. விண்ணப்பப் புலத்தின் கிழக்கே அமைந்துள்ள மின்கம்பி பாதையை குத்தகை ஒப்பந்தப் பத்திரம் நிறைவேற்றும் முன்னர் 50 மீட்டர் தொலைவிற்கு அப்பால் மாற்றி அமைக்கப்பட வேண்டும்.

e. அனுபவம் வாய்ந்த வெடிபொருள் பயன்படுத்துவோர் மூலம் குறைந்த அளவு சக்தி கொண்ட வெடிபொருட்களை பயன்படுத்தி அருகிலுள்ள பட்டாதாரர்களுக்கு எவ்வித இடையூறுமின்றி / அருகிலுள்ள பட்டா மற்றும் அரசு புலங்களில் எவ்வித ஆக்கிரமிப்பும் இன்றி குவாரிப்பணி மேற்கொள்ள வேண்டும்.

f. விதிகளின் படி ஏற்பளிக்கப்பட்ட கரங்கத்திட்டத்தினை உரிய காலத்திற்குள் சமர்பிக்க வேண்டும்.

g. குவாரி உரிமம் வழங்க உள்ள பகுதிக்கு சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் முன் அனுமதி பெற்று சமர்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும்.

3. எனவே, வட்டார வளர்ச்சி அலுவலர், தாராபுரம், வட்டாட்சியர், தாராபுரம், சார் ஆட்சியர் (பொ), தாராபுரம் மற்றும் உதவிப் புவியியலாளர் (கனிமம்), திருப்பூர் ஆகியோரின் பரிந்துரை மற்றும் நிபந்தனைகளின் அடிப்படையில், திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், பட்டா புல எண். 863 (பகுதி)-ல் 3.00.0 ஹெக்டர் பரப்பில் மட்டும் 1959ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19-ன் படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு விண்ணப்பப் புலம் ஏற்கனவே குவாரி செய்யப்படாத பகுதி என்பதால் 10 (பத்து) வருட காலத்திற்கு திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவருக்கு சாதாரண கற்கள் மற்றும் கிராவல் மண் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

4. மேலும், தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு மனுதாரரைக் கேட்டுக்கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-ன் படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

23.7.21

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திருப்பூர்.

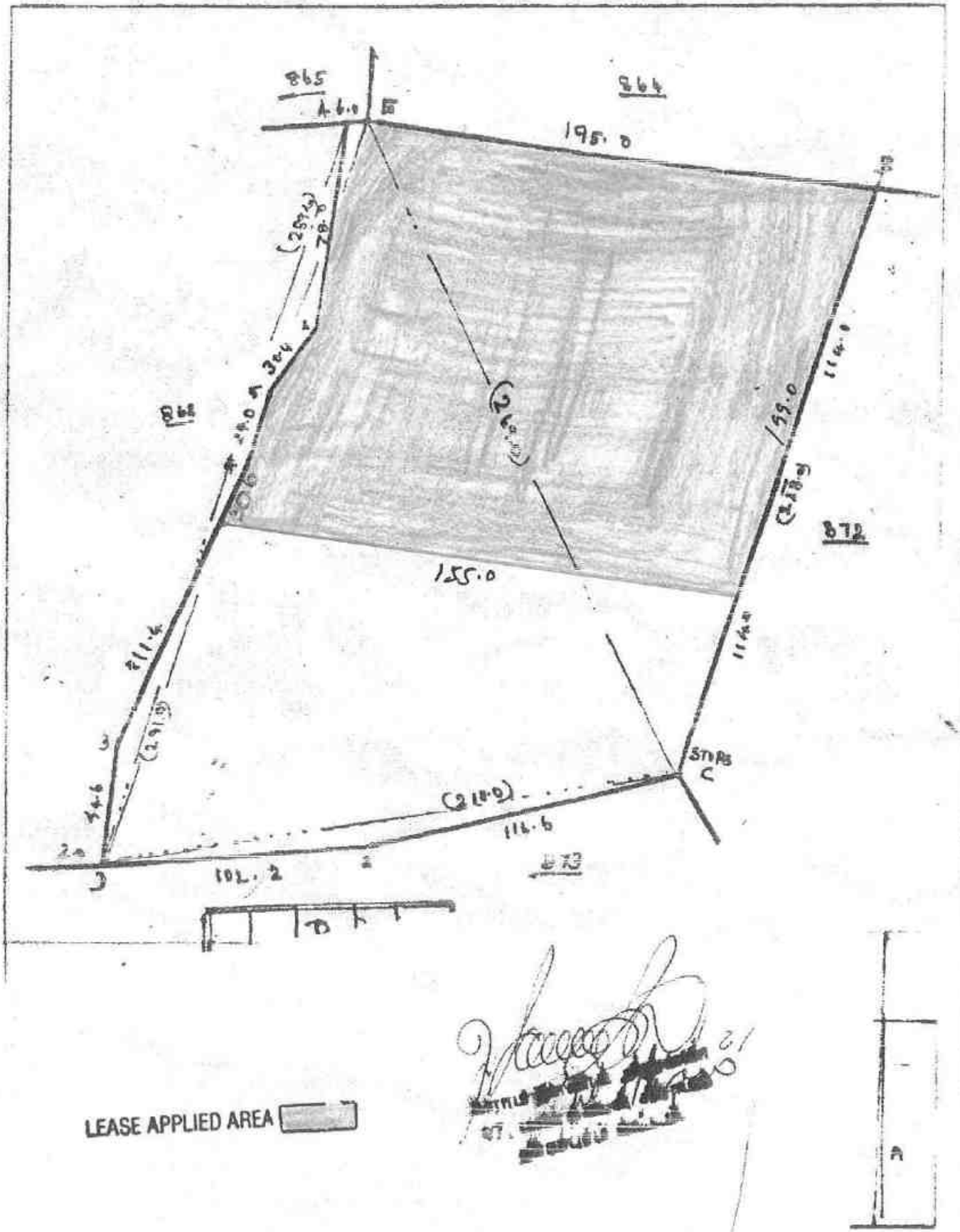
பெறுநர்:

திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன்,
220/02, குறிஞ்சிநகர், எல்லீஸ் நகர்,
உடுமலை ரோடு, தாராபுரம்,
திருப்பூர் மாவட்டம்

23/7/21

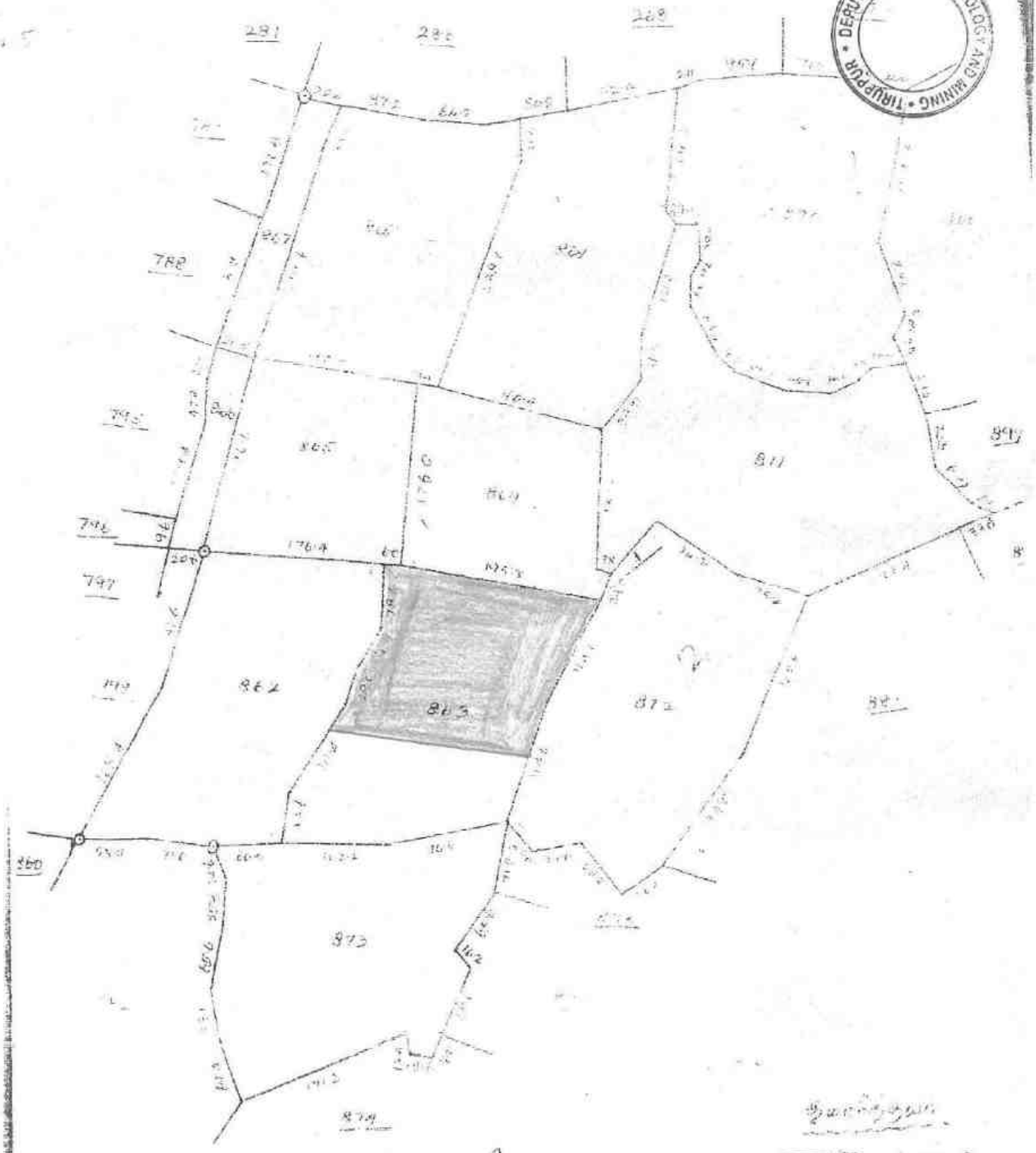
ANNEXURE II

DEPUTY DIRECTOR GEOLOGY AND MINING MADURAI



ANNEXURE III

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR



ANNEXURE IV

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : திருப்பூர் வட்டம் : தாராபுரம்

வருவாய் கிராமம் : மேலக்கடவு பட்டா எண் : 1411

உரிமையாளர்கள் பெயர்

1. ராமசாமி மகன் வாசுதேவன்

2. வாசுதேவன் மனைவி மகேஸ்வரி

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
862	3	1 - 60.00	2.20	--	--	--	--	2020/0103/32/276269---06-11-2020
863	-	5 - 12.00	7.05	--	--	--	--	2020/0103/32/276269---06-11-2020
		6 - 72.00	9.25					

குறிப்பு2 :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் 33/04/067/01411/10757 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 07-11-2020 அன்று 09:47:41 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

கிராமம் எண்/பெயர்

17, 29 - ம் பகுதியில் திருப்பூர் மாவட்டம் தாராபுரம் வட்டம் மொடக்குறி

நில அளவை எண். (1)	உட்பிரிவு எண். (2)	ஏர் (3)	சென்ட் (4)	ஒரு போகம் அல்லது இரு போகம் (5)	சாகுபடி செய்த பயிர் வகை (6)	முதல் போகம் நிலத்தை வரைமுறை செய்தல் (7)	முதல் போகம் எந்த பயிர் சாகுபடி செய்யப்பட்டுள்ளது (8)	முதல் போகம் பாசனம் (9)	முதல் போகம் பாசன மூலம் (10)	முதல் போகம் உள்ளாட்சி நிர்வாகம் (11)	முதல் போகம் விளைச்சல் அளவு விபரங்கள் (12)
362/3		1	30.0	ஒரு போகம்	1411 மக்காச்சோளம் (மலை)	இல்லை					
363		1	5.0	ஒரு போகம்	1411 மக்காச்சோளம்	>					

எந்த மாதத்தில் பயிர் செய்யப்பட்டது அல்லது செய்யப்பட்டது (13)	பயிர்களின் பெயர் (14)	பயிரிடப்பட்ட பரப்பு (15)	உள்ளடங்கிய பாய்ச்சல் ஆகாதவை (16)	விளைச்சல் அளவு (17)	பிரிவு அலுவலரின் பதிவேடுகளில் பதிவு செய்யப்பட்ட விளைச்சல் விபரங்கள் (1) பயிர்களின் பதிவேடுகளில் பதிவு செய்யப்பட்ட விளைச்சல் விபரங்கள் (2) வருவாய்த்துறை பதிவேடுகளில் பதிவு செய்யப்பட்ட விளைச்சல் விபரங்கள் (3) தோட்டக்கலைத்துறை பதிவேடுகளில் பதிவு செய்யப்பட்ட விளைச்சல் விபரங்கள் (18)	கிழக்கண்டவாறு பயிரிடப்பட்டது உண்மை நிலைதான் என்பதை மற்றும் பயிரின் விளைச்சல் ஒப்பொழு நில அளவை என்ன தன்மை அதன் பகுதியில். (அ) வளம், (ஆ) பயன்தரும் பயிர் வகை (இவைதவிர நிலம், (இ) விளைச்சல் மற்றும் இதர காரியங்களுக்கு பயன் படுத்தும் நிலம், (ஈ) பயிரிடத்தக்க தரிசு (உ) நிலையான பல தரைகளும் மற்றும் இதர மேய்ச்சல் நிலங்களும், (ஊ) விதைகளைப்பட்ட நிகர பரப்பும் சேர்க்கப்படாத வகைகளை பயிர்களும் தோற்றமும். (ஈ) நடப்புத் தரிசுகள் (ஈ) இதர முரண் நிலங்கள். (18அ)	பயிர் பாதுகாப்பு சான்றிதழ் (19)

கிராம நிர்வாக அலுவலரு
உதவி வேளாண்மை அலுவலர்
சாகுபடி வட்டம்

380 (3)-R.F. III-A-10-40,00,000 Cps.-GBP.-Mau.-7.-

81 A

எண் 2

கிராமத்தில் வருடவாரி பயிர் சாகுபடி அடங்கல் கணக்கு

ANNEXURE V

TIRUPPUR - DEPUTY DIRECTOR - GEOLOGY AND MINING

ANNEXURE VI

அ-பதிவேடு விவரங்கள்

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

மாவட்டம் : திருப்பூர்

வட்டம் : தாராபுரம்

கிராமம் : மணக்கடவு

1. புல எண்	863	9. மண் வயனமும் ரகமும்	8 - 4
2. உட்பிரிவு எண்	-	10. மண் தரம்	6
3. பழைய புல உட்பிரிவு எண்	361	11. தீர்வை (ரூ - ஹெ)	1.38
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	5 - 12.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ -பை)	7.05
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	1411
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.வாகுதேவன் 2.மகேஸ்வரி

குறிப்பு 1:

1.மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் **60757** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

ANNEXURE VII

2-1-

76AB 842423

S. தேவராஜ்,
உ.எண் : 161/1997, சார்பதிவக
முத்திரைத்தாள் விற்பனையாளர்,
தாராபுரம், தமிழ்நாடு.

R.வாசுதேவன்
தாராபுரம்

23.11.2020

ஆட்சேபணையின்மைக் கடிதம்

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், எல்லீஸ் நகர், குறிஞ்சி நகர், 220/02 என்ற முகவரியில் வசிக்கும் ராமசாமி மகன் ஆர்.வாசுதேவன் (1) ஆகிய நான்,

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், எல்லீஸ் நகர், குறிஞ்சி நகர், 220/02 என்ற முகவரியில் வசிக்கும் ஆர்.வாசுதேவன் மனைவி மகேஸ்வரி (2) ஆகிய உங்களுக்கு எழுதிக் கொடுக்கும் சம்மதக் கடிதம் என்னவென்றால்,

1)

2)

N. RANGASAMY, B.Sc., B.L.,
ADVOCATE & NOTARY
R.No : 893/89
79, West Cutchery Street,
Tiruppur

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், புல எண்.862/3, 863ல் ஹெக்டேர் பரப்பு பட்டா பூமியானது பட்டா எண்.1411ன் படி நம்மில் 1 மற்றும் 2 இலக்கமிட்டவர்கள் பெயரில் கூட்டுபட்டாவாக தாக்கலாகியுள்ளது.

மேற்படி புல எண்ணில் நம்மில் 2 இலக்கமிட்ட திருமதி.மகேஸ்வரி என்பவர் பெயரில் சாதாரண கற்கள்/கிராவல் மண் வெட்டியெடுக்க குவாரி குத்தகை உரிமம் வழங்கக் கோரி திருப்பூர் மாவட்ட ஆட்சியரிடம் மனு செய்துள்ளார். மேற்படி விண்ணப்பத்தின் பேரில் மாவட்ட ஆட்சியர் அனுமதி வழங்கும் நாளிலிருந்து 10 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் பெற்று சாதாரணை கற்கள்/கிராவல் குவாரி நடத்த நம்மில் 1 இலக்கமிட்டவரான எனக்க எவ்விதமான ஆட்சேபணையும் இல்லை. பின்னிட்டு எவ்வித பிரச்சனையும் செய்யமாட்டேன் முழுமனதுடன் சம்மதம் அளிக்கிறேன் என உறுதி கூறுகிறேன்.

1)

2) V. Mahesh

NOTARIAL

84 A

ANNEXURE VIII

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

भारत सरकार
GOVERNMENT OF INDIA

மகேஸ்வரி
Maheswari
பிறந்த நாள் / DOB : 01/04/1975
பெண் / FEMALE

2024 7044 4234

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

भारतीय विशिष्ट पहचान प्राधिकरण
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:
வாசுதேவன், 220/02, குருஞ்சி நகர், எல்லிஸ் நகர், உடுமைப்பேட்டை ரோடு, தாராபுரம், திருப்பூர், தமிழ் நாடு, 638657

Address:
W/O,Vasudevan, 220/02, Kurunji Nagar, Ellis Nagar, Udumalpet Road, Dharapuram, Tiruppur, Tamil Nadu, 638657

1947
help@uidai.gov.in
www.uidai.gov.in
P.O. Box No.1547, Bengaluru-560 001

ANNEXURE IX

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

212/1010

சென்னைப் பல்கலைக் கழகம்

University of Madras

அறிவியல் புலம்

FACULTY OF SCIENCE

சென்னைப் பல்கலைக் கழகப் பேரவை 1994 ஆம் ஆண்டு ஏப்ரல் மாதம் நடத்திய கனிமவியல் தேர்வில் P. தங்கராசு என்பவர் முதல் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க தேர்வாளர்கள் சான்றளித்தபடி அறிவியல் நிறைஞர் என்னும் பட்டத்தை அவருக்குப் பல்கலைக் கழக இலச்சினையின் வழங்குகிறது.

The Senate of the UNIVERSITY OF MADRAS hereby makes known that P. Thangaraju 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

சேப்பாக்கம், Chepauk
சென்னை, Madras
நாள்: Dated: 25-01-1999

86 A

பதிவாளர்
Registrar

P.T. [illegible]
துணை வேந்தர்
Vice-Chancellor

ANNEXURE X

DEPUTY DIRECTOR • GEOLOGY & MINES • TIRUPPUR

GOVERNMENT OF INDIA
MINISTRY OF LABOUR AND REHABILITATION
OFFICE OF THE DIRECTOR GENERAL OF MINES SAFETY

Certificate of Practical experience granted by the Manager to a candidate for a Manager's / Surveyor's / Foremen'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 T.VENKATARAJAGOPALAN being the Mines Agent of M/S.LIMENAPH CHEMICALS, RAJAPALAYAM OF LIMESTONE PRODUCTS (Thenmali 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.

THENMALAI LIME STONE MINES

10/6/96

Agent (Mines)

(Signature with date and official Seal)
[T.VENKATARAJAGOPALAN]

Mines Agent:

P.O. : ARUKANGULAM

District : TIRUNELVELI

State : TAMIL NADU

(Signature of Candidate)

(State name of Mineral) : LIMESTONE

S.No	Particulars of practical Expereince (a)	Place of Experience (b)	Period of practical experience(c)		Total Experience (c)		
			From	To	Yr.	Month	Day
01.	As a Trainee in Drilling Operation.	Semi Mechanised Opencast 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	20.07.1999	01	00	24
06.	Supervision in HEMM 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 Nil	35	35

for THENGALAI LIME STONE MINES

Signature of Candidate

Signature of Manager with Date & Seal
[T.VENKATARAJAGOPALAN]

Name of the Mine :

Instructions :-

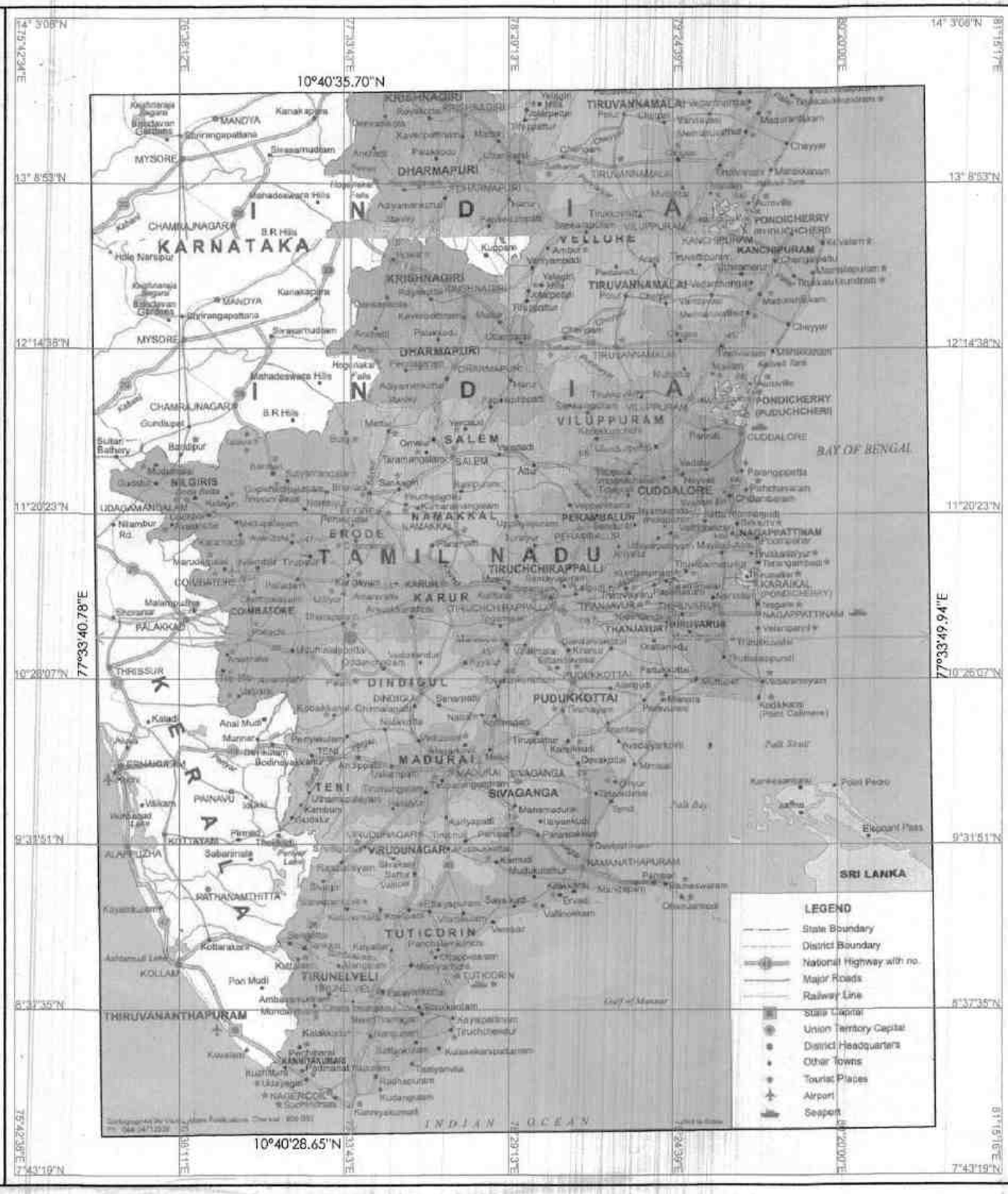
01. State clearly the nature of duties

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



DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

INDEX

Q.L.APPLIED AREA :

TOPO SHEET NO. : 58 F/10

LATITUDE : 10°40'28.65"N to 10°40'35.70"N
LONGITUDE : 77°33'40.78"E to 77°33'49.94"E

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P),
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU,
TALUK : DHARAPURAM,
DISTRICT : TIRUPPUR.
STATE : TAMILNADU.

PLATE NO - I

DATE OF SURVEY : 07.06.2021

LOCATION PLAN

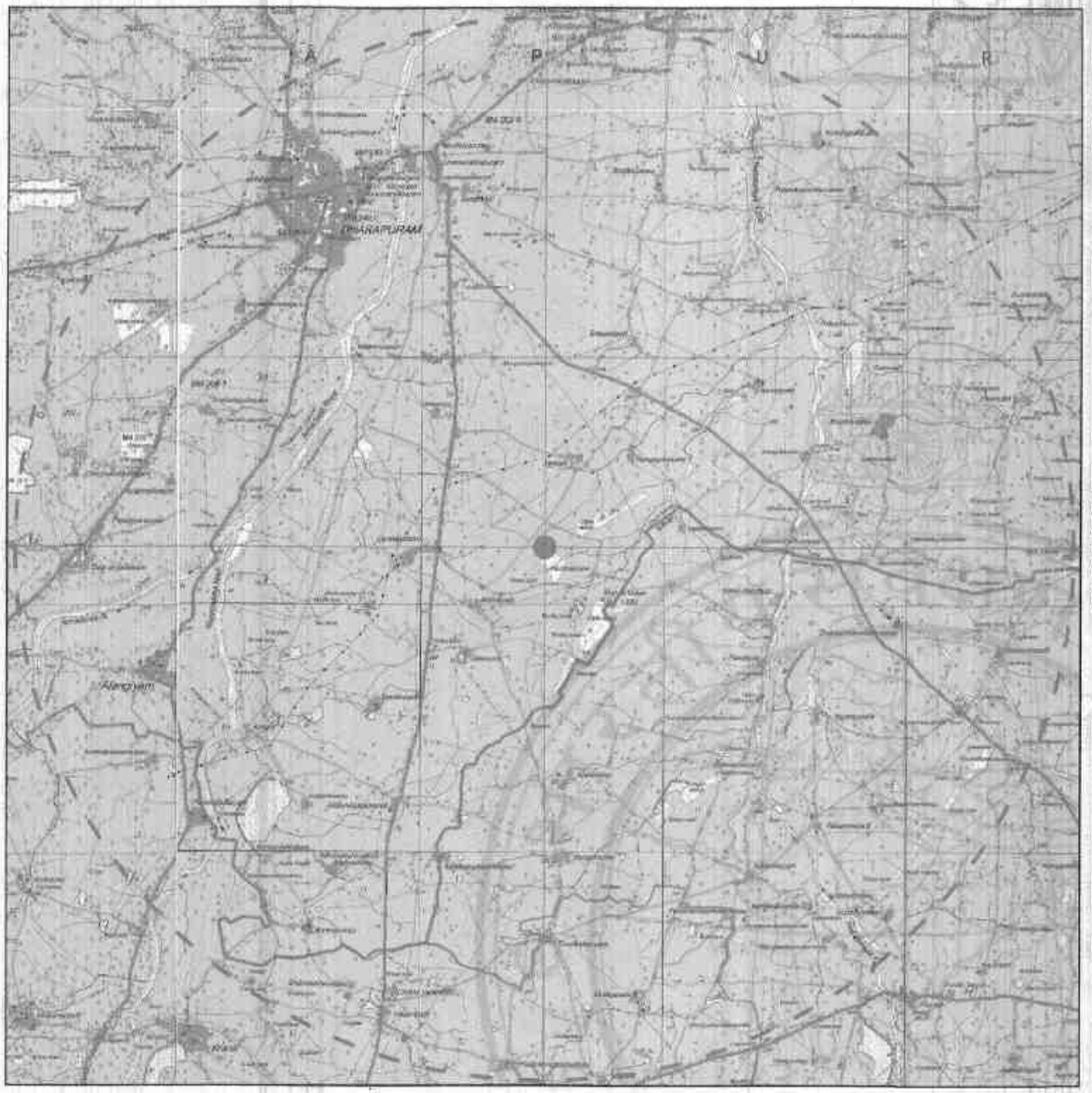
SCALE. 1:24,00,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

T.MUNIYARAJU, M.Sc., Ph.D.,
QUALIFIED PERSON

10° 46' 00.96"N



77° 28' 11.92"E

77° 39' 18.78"E

10° 35' 03.39"N

TOPO SHEET NO. : 58 F/10

LATITUDE : 10°40'28.65"N to 10°40'35.70"N
LONGITUDE : 77°33'40.78"E to 77°33'49.94"E

10km RADIUS :

Q.L. APPLIED AREA 90 A:

INDEX

Express highway: with toll; with bridge; with distance stone.....
Roads metalled: according to importance.....
Roads, double carriageway; according to importance.....
Unmetalled road. Cart-track. Pack-track with pass. Foot-path.....
Streams: with track in bed; undefined. Canal.....
Dams: masonry or rock-filled; earthwork. Weir.....
River; dry with water channel; with island & rocks. Tidal river.....
Submerged rocks. Shoal. Swamp. Reeds.....
Wells: lined; unlined. Tubewell. Spring. Tanks:perennial; dry.....
Embankments: road or rail; tank. Broken ground.....
Railways, broad gauge: double; single with station; under constrn.
Railways, other gauges: double; single with distance stone; do.....
Mineral line or tramway. Kiln. Cutting with tunnel.....
Contours with sub-features. Rocky slopes. Cliffs.....
Sand features: (1)flat. (2)sand-hills(permanent). (3)dunes(shifting).
Towns or Villages: inhabited; deserted. Fort.....
Huts: permanent; temporary. Tower. Antiquities.....
Temple. Chhatri. Church. Mosque. Idgah. Tomb. Graves.....
Lighthouse. Lightship. Buoys: lighted; unlighted. Anchorage.....
Mine. Vine on trellis. Grass. Scrub.....
Palms: palmyra; other. Plantain. Conifer. Bamboo. Other trees.....
Areas: cultivated; Wooded. Surveyed trees.....
Boundary, international.....
Boundary, state: demarcated; undemarcated.....
Boundary, district; subdivision; tahsil or taluk; forest.....
Boundary pillers: surveyed; unlocated.....
Heights. triangulated: station: point; approximate.....
Bench-mark: geodetic; tertiary; canal.....
Post office. Telegraph office. Overhead tank.....
Rest house or inspection bungalow. Circuit house. Police station....
Camping Ground. Forest: reserved; protected.....
Spaces names: administrative; locality or tribal.....
Hospital. Dispensary. Veterinary: Hospital/Dispensary.....
Aerodrome. Helipad. Tourist site.....
Powerline: with pylons surveyed; with poles unsurveyed.....

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM, TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P),
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU,
TALUK : DHARAPURAM,
DISTRICT : TIRUPPUR,
STATE : TAMILNADU.

PLATE NO - I-A

DATE OF SURVEY : 26.07.2021

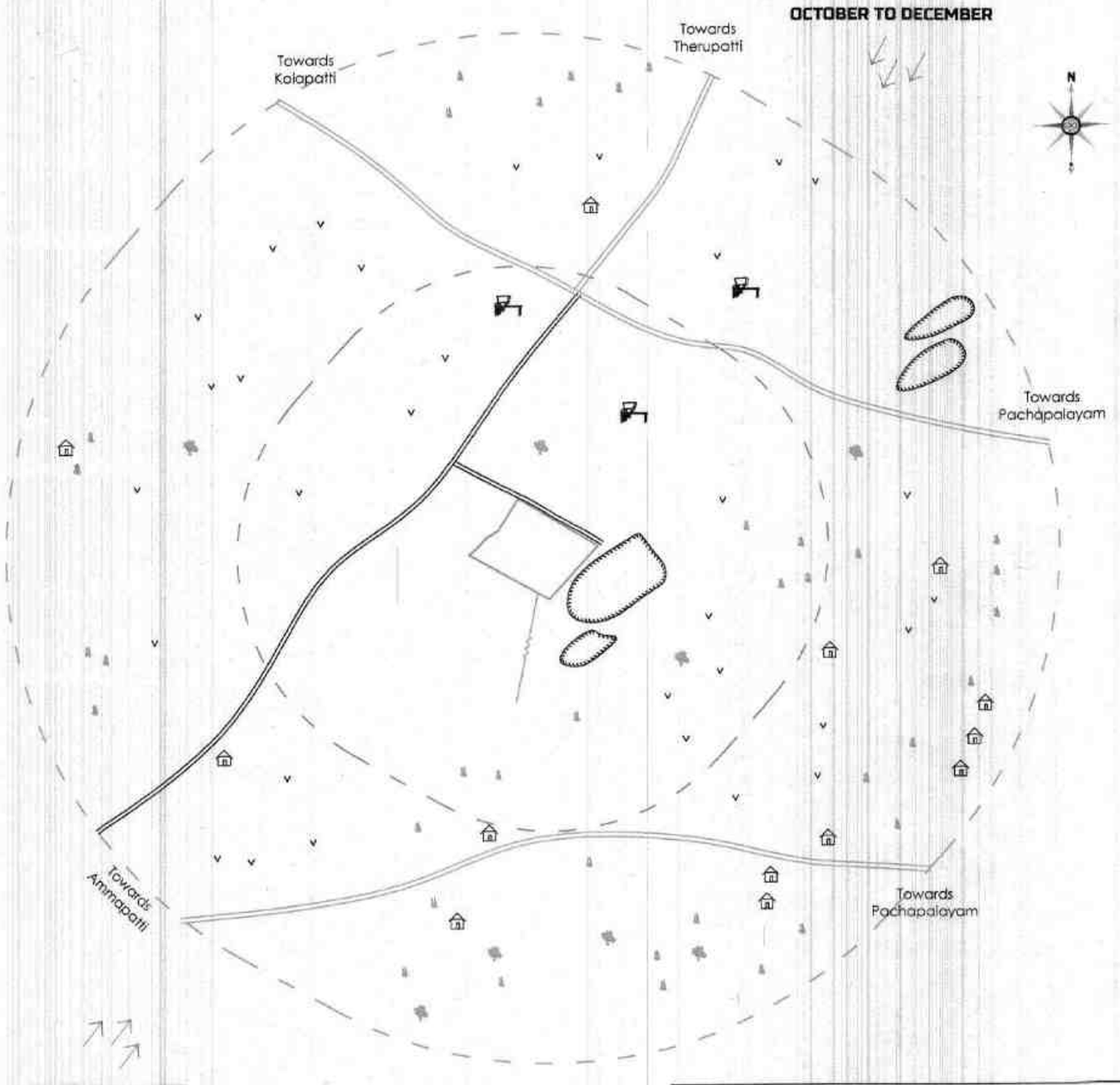
TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10Km RADIUS

SCALE. 1:1,00,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

Dr.P.THANGARAJU, M.Sc.,.Ph.D.,
QUALIFIED PERSON



INDEX

- Q.L. APPLIED AREA
- 1 Km RADIUS
- 500m RADIUS
- SEASONAL AGRICULTURE LAND
- TREES
- HABITATION
- WIND DIRECTION
- PANCHAYAT ROAD
- EARTHEN ROAD
- QUARRY PIT & CRUSHER
- E.B. LINE
- BARREN LAND

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P),
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU,
TALUK : DHARAPURAM,
DISTRICT : TIRUPPUR,
STATE : TAMILNADU.

PLATE NO - I-B

DATE OF SURVEY : 25.09.2020

ENVIRONMENTAL & LAND USE PLAN

SCALE. 1:10,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

P. THANGARAJU, M.Sc., Ph.D.,
QUALIFIED PERSON

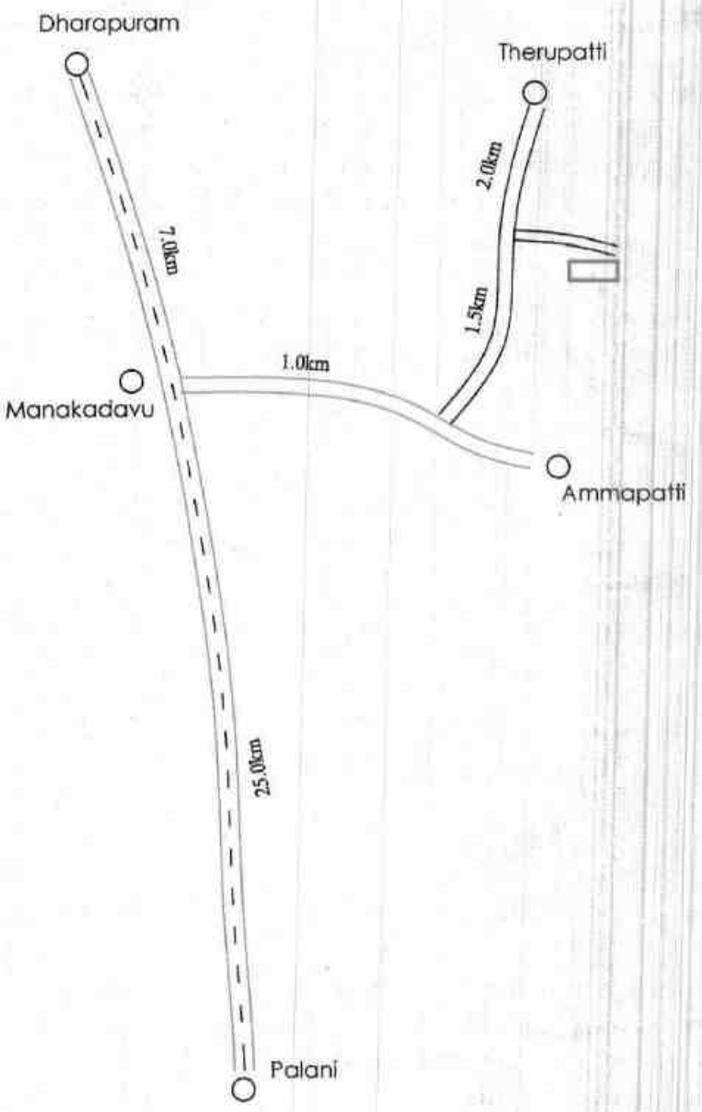
TOPO SHEET NO. : 58 F/10
LATITUDE : 10°40'28.65"N to 10°40'35.70"N
LONGITUDE : 77°33'40.78"E to 77°33'49.94"E

LAND USE PATTERN

DESCRIPTION	PERCENTAGE	INDEX
QUARRY PIT & CRUSHER	(08%)	
TREES	(04%)	
ROADS	(07%)	
HABITATION	(05%)	
AGRICULTURE LAND	(27%)	
BARREN LAND	(49%)	
TOTAL	100%	

PLATE NO : I-C

ROUTE MAP



DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

INDEX

LEASE APPLIED AREA

STATE HIGHWAY

VILLAGE ROAD

EARTHEN ROAD

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR,
ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. A. AREA:

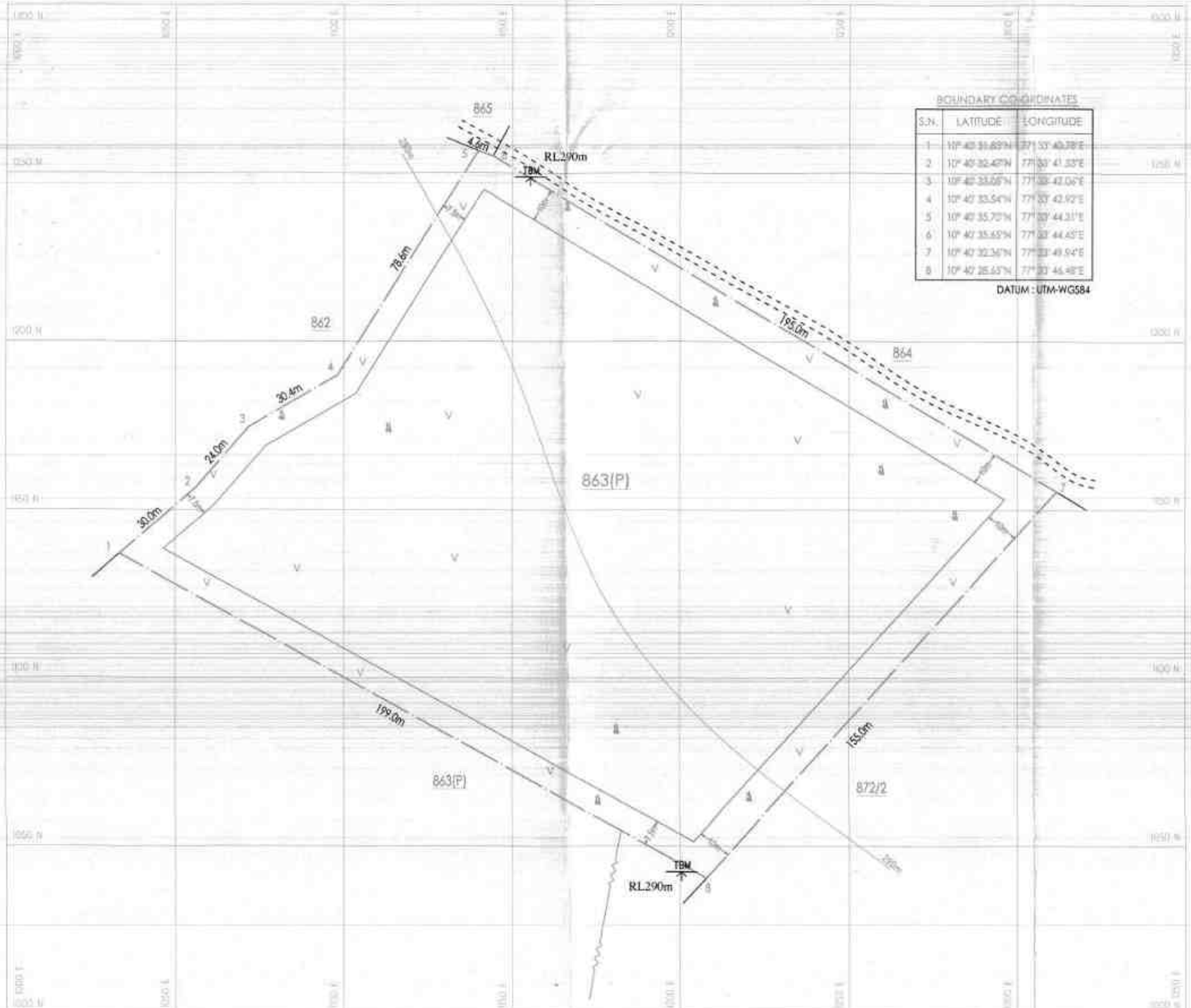
S.F.No : 863 (P),
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU,
TALUK : DHARAPURAM,
DISTRICT : TIRUPPUR,
STATE : TAMILNADU.

SCALE : NOT TO SCALE

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

Dr.P.THANGARAJU,M.Sc.,Ph.D.,
QUALIFIED PERSON



BOUNDARY COORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 40' 31.69"N	77° 33' 40.78"E
2	10° 40' 32.49"N	77° 33' 41.35"E
3	10° 40' 33.08"N	77° 33' 42.06"E
4	10° 40' 33.54"N	77° 33' 42.92"E
5	10° 40' 35.70"N	77° 33' 44.31"E
6	10° 40' 35.65"N	77° 33' 44.45"E
7	10° 40' 32.36"N	77° 33' 49.94"E
8	10° 40' 28.63"N	77° 33' 46.48"E

DATUM : UTM-WGS84

N

INDEX

- Q.L. APPLIED AREA BOUNDARY
- 10m&7.5m SAFETY DISTANCE
- TBM TEMPORARY BENCH MARK
- GRAVEL
- CONTOUR
- SHRUBS
- EARTHEN ROAD
- E.B. LINE (To be shifted)

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P).
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU.
TALUK : DHARAPURAM.
DISTRICT : TIRUPPUR.
STATE : TAMILNADU.

PLATE NO - II

DATE OF SURVEY : 26.07.2021

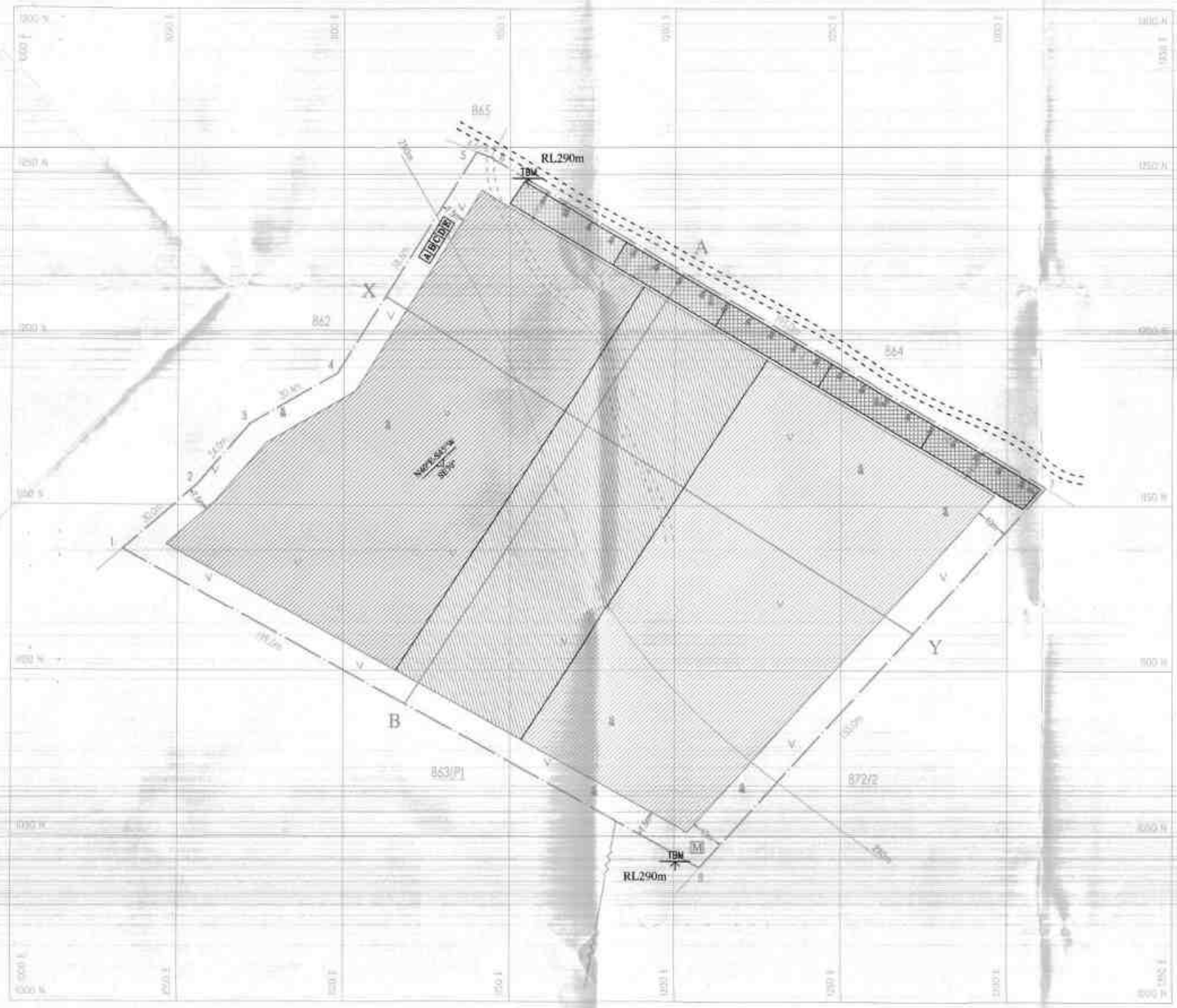
QUARRY LEASE PLAN & SURFACE PLAN

SCALE. 1:1000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

[illegible] M.Sc., Ph.D.,
QUALIFIED PERSON



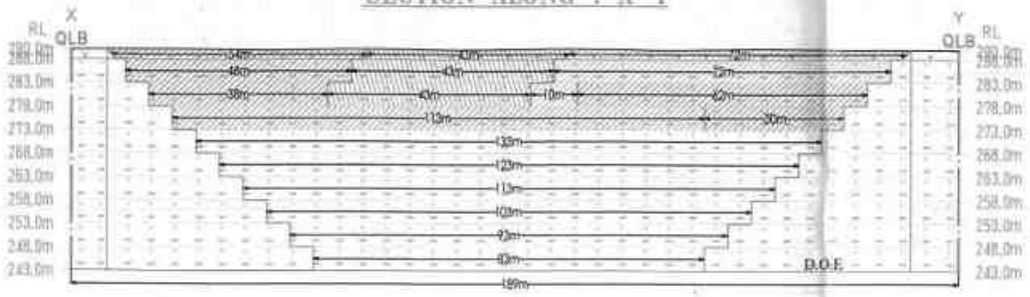
DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

BOUNDARY CO-ORDINATES

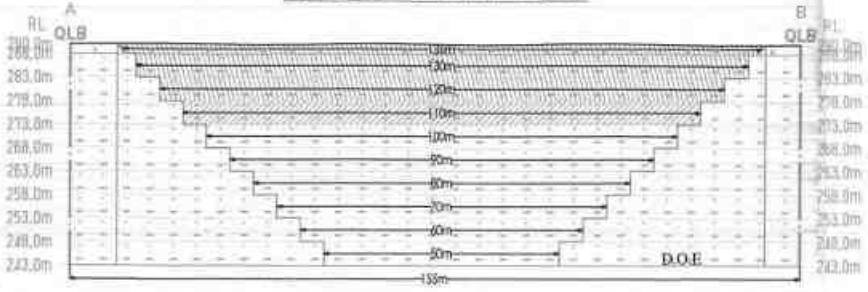
S.N.	LATITUDE	LONGITUDE
1	10° 40' 31.83"N	77° 33' 40.78"E
2	10° 40' 32.47"N	77° 33' 41.33"E
3	10° 40' 33.09"N	77° 33' 42.06"E
4	10° 40' 33.54"N	77° 33' 42.92"E
5	10° 40' 33.70"N	77° 33' 44.01"E
6	10° 40' 35.65"N	77° 33' 44.45"E
7	10° 40' 32.36"N	77° 33' 49.94"E
8	10° 40' 28.63"N	77° 33' 46.48"E

DATUM : UTM-WGS84

SECTION ALONG : X–Y



SECTION ALONG : A–B



I - yr Proposed area to be Quarried

II - yr Proposed area to be Quarried

III - yr Proposed area to be Quarried

IV - yr Proposed area to be Quarried

V - yr Proposed area to be Quarried

I - yr Proposed area to be Planted

II - yr Proposed area to be Planted

III - yr Proposed area to be Planted

IV - yr Proposed area to be Planted

V - yr Proposed area to be Planted

SITE SERVICES
(Proposed)

A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET
M - MAGAZINE

INDEX

- Q.L. APPLIED AREA BOUNDARY
- 10m & 7.5m SAFETY DISTANCE
- TBM — TEMPORARY BENCH MARK
- GRAVEL
- ROUGHSTONE
- STRIKE & DIP
- CONTOUR
- SHRUBS
- QUARRY HAUL ROAD
- EARTHEN ROAD
- E.B. LINE (To be shifted)
- D.O.E — DEPTH OF ESTIMATION

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P).
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU.
TALUK : DHARAPURAM.
DISTRICT : TIRUPPUR.
STATE : TAMILNADU.

PLATE NO - III-A

DATE OF SURVEY : 26.07.2021

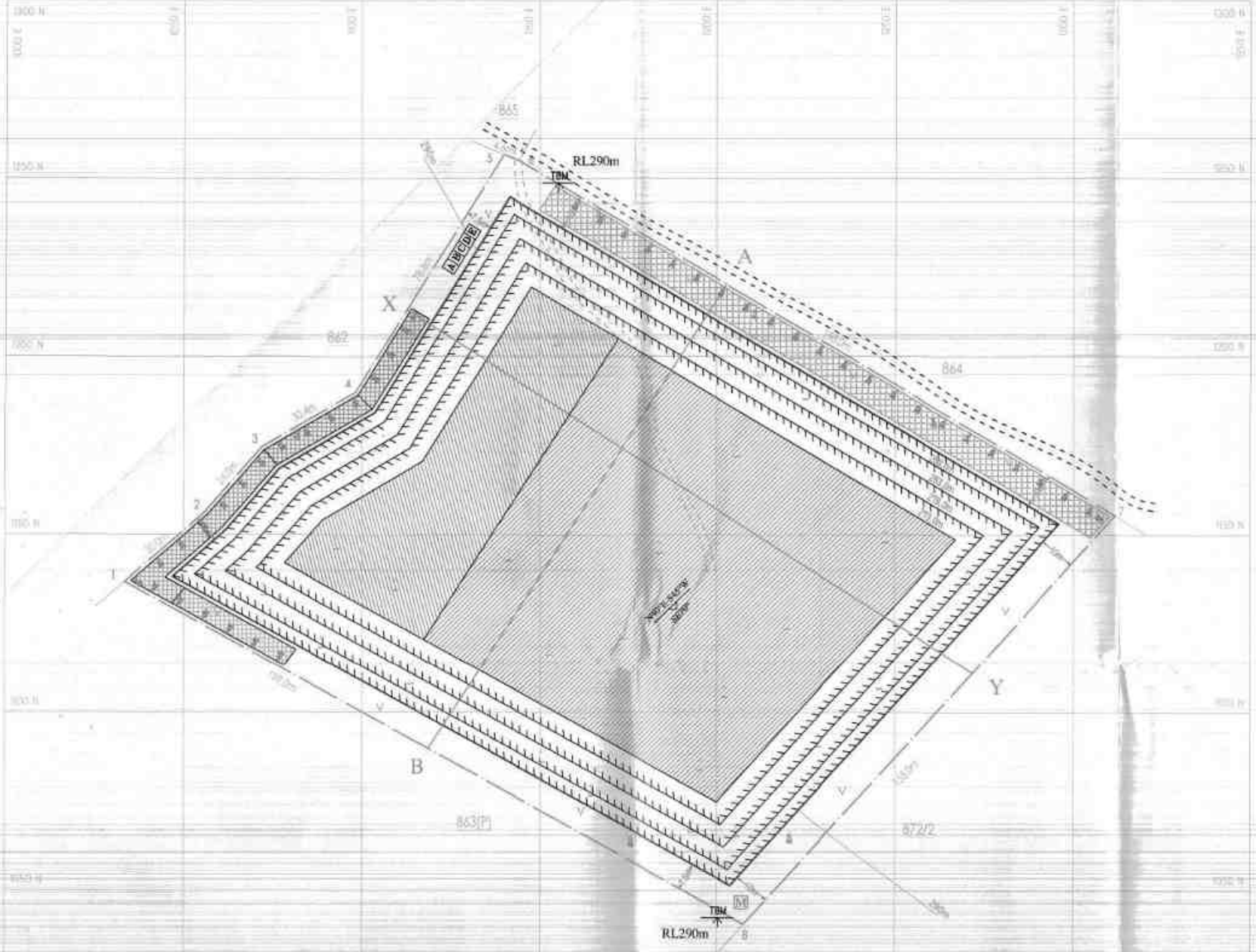
TOPOGRAPHY, GEOLOGICAL PLAN, FIRST FIVE YEARWISE DEVELOPMENT &PRODUCTION PLAN & SECTIONS

SCALE. 1:1000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

Dr. [illegible] M.Sc., Ph.D.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATES

S.N.	LATITUDE	LONGITUDE
1	10° 40' 31.85"N	77° 33' 40.78"E
2	10° 40' 32.47"N	77° 33' 41.93"E
3	10° 40' 33.05"N	77° 33' 42.06"E
4	10° 40' 33.54"N	77° 33' 42.92"E
5	10° 40' 35.70"N	77° 33' 44.31"E
6	10° 40' 35.65"N	77° 33' 44.45"E
7	10° 40' 32.36"N	77° 33' 49.14"E
8	10° 40' 28.65"N	77° 33' 46.46"E

DATUM : UTM-WGS84

INDEX

- Q.L. APPLIED AREA BOUNDARY
- 10m & 7.5m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- GRAVEL
- ROUGHSTONE
- STRIKE & DIP
- QUARRY PIT
- CONTOUR
- SHRUBS
- QUARRY HAUL ROAD
- EARTHEN ROAD
- I-V Yr PLANTATION

APPLICANT :

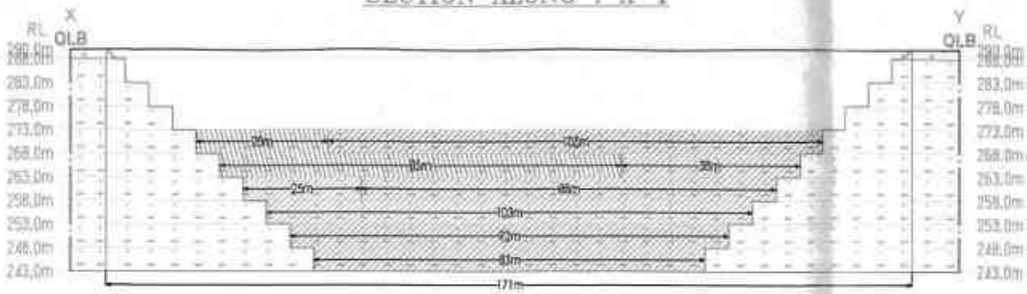
Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

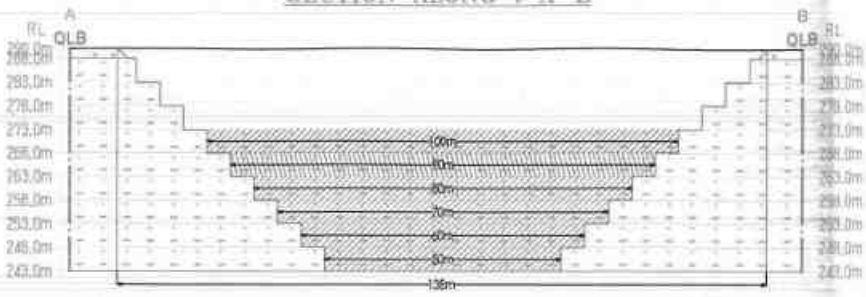
S.F.No : 863 (P).
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU
TALUK : DHARAPURAM.
DISTRICT : TIRUPPUR.
STATE : TAMILNADU.

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

SECTION ALONG : X-Y



SECTION ALONG : A-B



VI - yr Proposed area to be Quarried	
VII - yr Proposed area to be Quarried	
VIII - yr Proposed area to be Quarried	
IX - yr Proposed area to be Quarried	
X - yr Proposed area to be Quarried	

VI - yr Proposed area to be Planted	
VII - yr Proposed area to be Planted	
VIII - yr Proposed area to be Planted	
IX - yr Proposed area to be Planted	
X - yr Proposed area to be Planted	

Proposed Pit Dimension (max)
=171mX138mX17m(d)
(For First Five Years)

SITE SERVICES
A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET
M - MAGAZINE

PLATE NO - III-B

DATE OF SURVEY : 26.07.2021

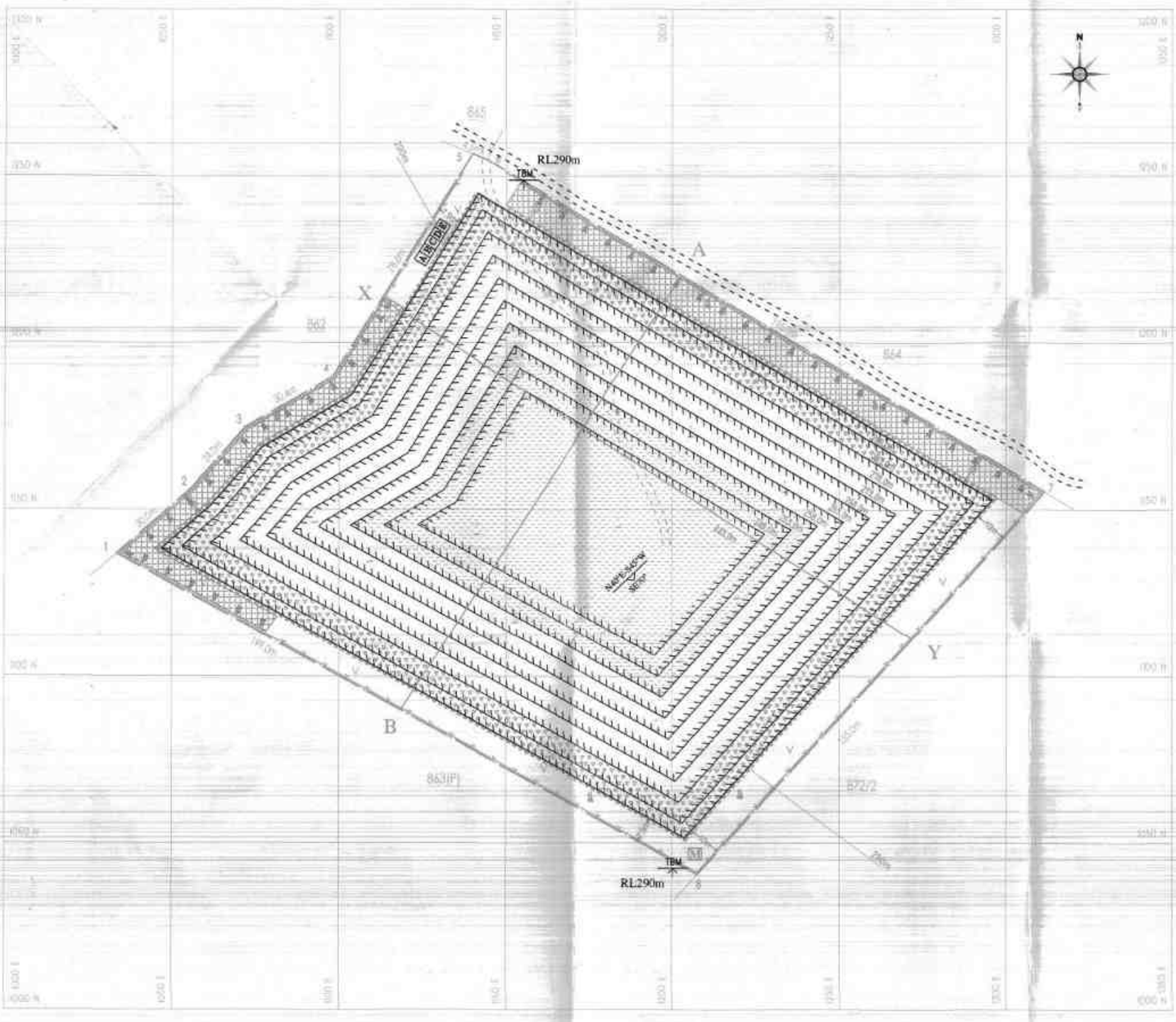
TOPOGRAPHY, GEOLOGICAL PLAN, NEXT FIVE YEARWISE DEVELOPMENT &PRODUCTION PLAN & SECTIONS

SCALE. 1:1000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

S. THANGARAJ, M.Sc., Ph.D.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATES

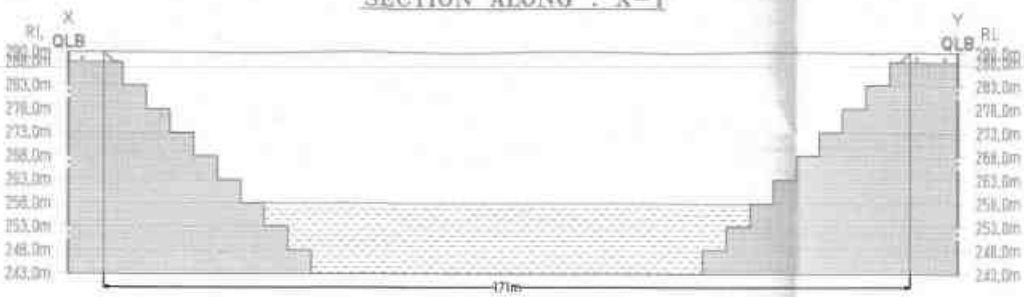
S.N.	LATITUDE	LONGITUDE
1	10° 40' 31.83"N	77° 33' 40.70"E
2	10° 40' 32.47"N	77° 33' 41.53"E
3	10° 40' 33.05"N	77° 33' 42.04"E
4	10° 40' 33.54"N	77° 33' 42.92"E
5	10° 40' 35.70"N	77° 33' 44.31"E
6	10° 40' 35.65"N	77° 33' 44.45"E
7	10° 40' 32.56"N	77° 33' 49.94"E
8	10° 40' 28.60"N	77° 33' 46.48"E

DATUM : UTM-WGS84

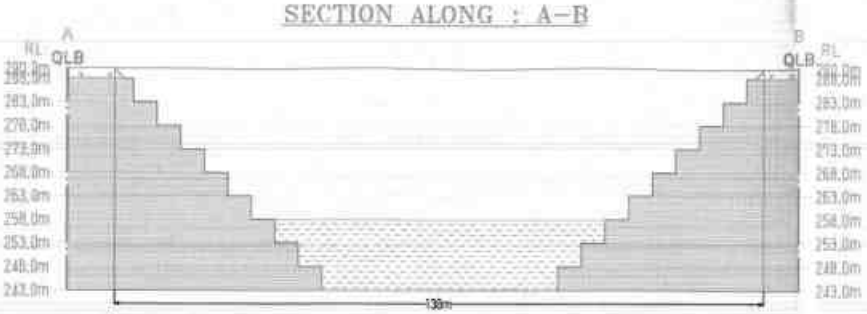
INDEX

- Q.L. APPLIED AREA BOUNDARY
- 10m & 7.5m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- GRAVEL
- ROUGHSTONE
- STRIKE & DIP
- QUARRY PIT
- CONTOUR
- SHRUBS
- QUARRY HAUL ROAD
- EARTHEN ROAD
- I-V Yr PLANTATION
- VI-X Yr PLANTATION
- BARBED WIRE FENCING
- EXISTING LAND FORM
- SOIL LAYER
- REHABILITATED LAND FORM
- PROPOSED GARLAND DRAIN
- OLD SURFACE LEVEL
- FINISHED SURFACE LEVEL
- RAIN WATER STORAGE

SECTION ALONG : X–Y



SECTION ALONG : A–B



LAND USE PATTERN

DESCRIPTION	PRESENT AREA IN (Ha)	AREA AT THE END OF THIS QUARRYING PERIOD (Ha)
QUARRYING PIT	Nil	2.39.5
INFRASTRUCTURE	Nil	0.01.0
ROADS	Nil	0.02.0
GREEN BELT	Nil	0.25.0
UN-UTILIZED AREA	3.00.0	0.32.5
TOTAL	3.00.0	3.00.0

Proposed Pit Dimension (max)
= 171mX138mX47m(d)

SITE SERVICES

A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET
M - MAGAZINE

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P),
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU,
TALUK : DHARAPURAM,
DISTRICT : TIRUPPUR,
STATE : TAMILNADU.

PLATE NO - IV

DATE OF SURVEY : 26.07.2021

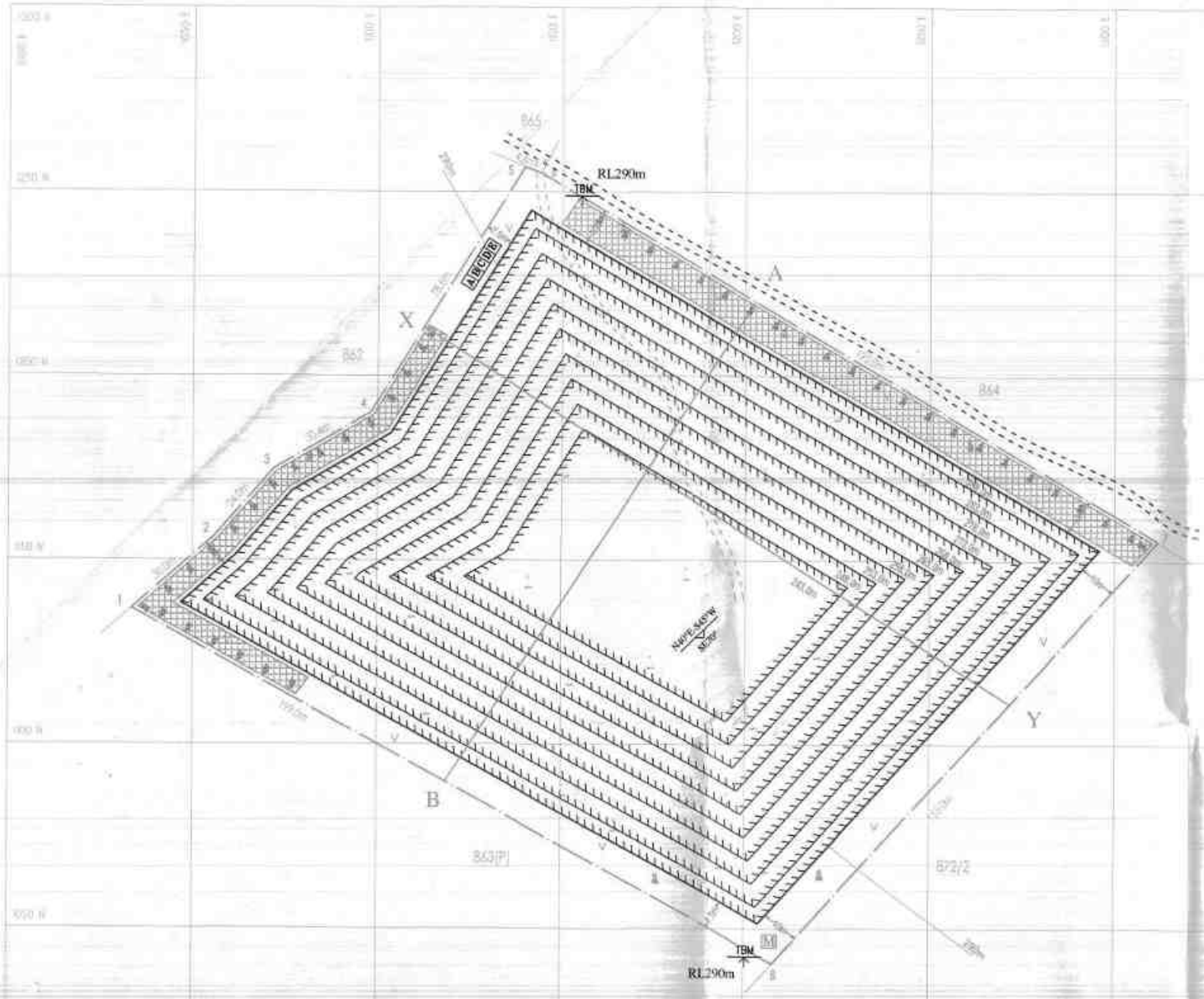
PROGRESSIVE QUARRY CLOSURE PLAN & SECTIONS

SCALE. 1:1000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT.

M.Sc., Ph.D.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATES

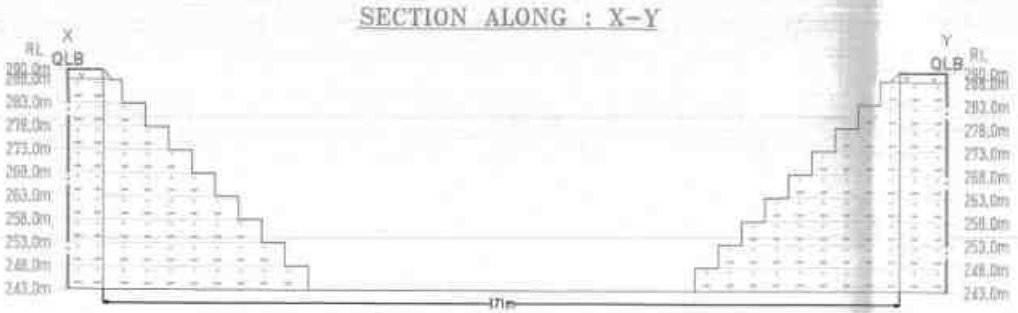
S.N.	LATITUDE	LONGITUDE
1	10° 40' 31.83"N	77° 33' 40.78"E
2	10° 40' 32.47"N	77° 33' 41.53"E
3	10° 40' 33.05"N	77° 33' 43.04"E
4	10° 40' 33.54"N	77° 33' 42.92"E
5	10° 40' 33.70"N	77° 33' 44.21"E
6	10° 40' 33.65"N	77° 33' 44.45"E
7	10° 40' 33.36"N	77° 33' 49.94"E
8	10° 40' 28.65"N	77° 33' 46.48"E

DATUM : UTM-WGS84

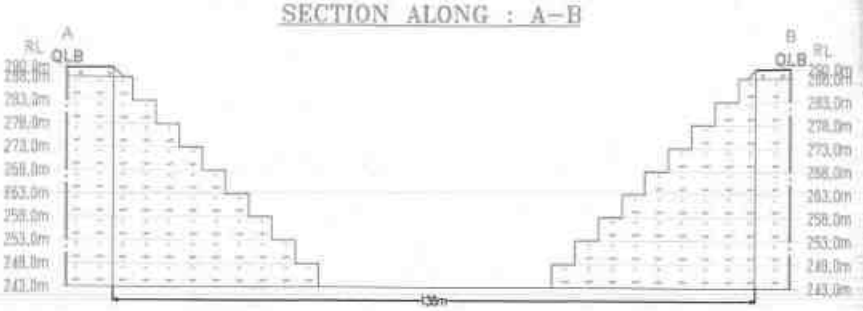
INDEX

- Q.L. APPLIED AREA BOUNDARY
- 10m & 7.5m SAFETY DISTANCE
- TBM TEMPORARY BENCH MARK
- GRAVEL
- ROUGHSTONE
- STRIKE & DIP
- QUARRY PIT
- CONTOUR
- SHRUBS
- QUARRY HAUL ROAD
- EARTHEN ROAD
- I-V Yr PLANTATION
- VI-X Yr PLANTATION

SECTION ALONG : X–Y



SECTION ALONG : A–B



Ultimate Pit Dimension (max)
= 171mX138mX47m(d)

SITE SERVICES
A - OFFICE
B - STORE ROOM
C - FIRST AID ROOM
D - REST SHELTER
E - TOILET
M - MAGAZINE

APPLICANT :

Tmt. V. MAHESWARI,
W/o. VASUDEVAN,
No.220/ 02, KURINJI NAGAR, ELLIS NAGAR,
UDUMALAI ROAD,
DHARAPURAM,
TIRUPPUR DISTRICT - 638 657.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 863 (P),
EXTENT : 3.00.0 Ha.
VILLAGE : MANAKKADAVU,
TALUK : DHARAPURAM,
DISTRICT : TIRUPPUR,
STATE : TAMILNADU.

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

PLATE NO - V

DATE OF SURVEY : 26.07.2021

CONCEPTUAL PLAN & SECTIONS

SCALE. 1:1000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

[illegible], M.Sc., Ph.D.,
QUALIFIED PERSON

HYDRO GEOLOGICAL REPORT FOR

Rough Stone and Gravel Quarry Over an

extent of 3.00.0Ha in S.F.No. 863 (P),

Manakkadavu Village, Dharapuram Taluk,

Tiruppur District, Tamil Nadu.

HYDRO GEOLOGICAL REPORT FOR MANAKKADAVU ROUGH STONE AND GRAVEL QUARRY

The Client requires detailed information on Ground Water Occurrences at Proposed Project Site of Rough Stone and gravel 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.

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.

1. INTRODUCTION

NAME OF THE APPLICANT WITH ADDRESS-

Name of the applicant	**:**	**Tmt.V.Maheswari**
Address	**:**	W/o. Vasudevan, No. 220/02, Kurinjinagar, Ellis Nagar, Udumalai Road, Dharapuram Taluk, Tiruppur - 638 657
State	**:**	Tamilnadu

DETAILS OF THE AREA-

Land Classification	**:**	Patta Land
Survey Nos	**:**	863 (P)
Extent	**:**	3.00.0Ha
Village	**:**	Manakkadavu
Taluk	**:**	Dharapuram
District	**:**	Tiruppur

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 - F/10** Latitude between **10°40'28.65"N to 10°40'35.70"N** and Longitude between **77°33'40.78"E to 77°33'49.94"E** on WGS datum-1984.

4. GEOMORPHOLOGY

Geomorphology and Land Use

The geomorphologic characteristics of Tirupur are broadly classified into Pedi plain, Habitation mask and Water body mask. The land use categories are classified as Built up, Agriculture, Water bodies and Waste land. Soil types in Tirupur block can be divided into Fine, Fine loamy, Loamy skeletal, and Clayey loamy.

Climate

The climate in the plains of Noyyal river basin is "semiarid subtropical monsoonic".The hot months are March, April and May with a maximum temperatures ranging from 35.5°C to 36.8°C and the cool months are November, December and January with minimum temperatures ranging from 23.9°C to 24.1 °C. The mean annual temperature is 29.4°C.

Rainfall

Rainfall in the basin is highly variable due to the orographic effects of the Western Ghats. The western and upper reaches usually receive more than 3000 mm annually during the southwest monsoon whereas the eastern part of the basin receives an annual rainfall of 600 mm, which mostly occurs during the northeast monsoon and most of it is received during the months of April and May.

Soil

The type of soil that occur in Noyyal basin are many and varied, ranging from shallow red non-calcareous soils to very deep grey calcareous ones. A standard reconnaissance soils survey of Coimbatore district reveals the occurrence of 14 different soil series and their associations. These 14 series can be broadly classified in to five categories: red soil, grey soil, alluvial soil, colluvial soil and forest soil

5. GEOLOGY

Regional Geology of Tiruppur District-

Tiruppur 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 i) Charnockite Group represented by Charnockite, Pyroxene Granulite and Magnetite Quartzite, ii) Peninsular Gneissic Complex (II) comprising hornblende-biotite gneiss, iii) Basic intrusive include Pyroxinite/Dunite iv) Younger intrusive comprising, Nepheline-Syenite, Pink Granite, Pegmatite and Quartz veins and v) Quaternary sediments of Kankar and soil.

Stratigraphy of the Area

Tiruppur District is predominantly occupied by hornblende Biotite gneisses of PGC (II) with enclaves of Magnetite Quartzite, Pyroxene Granulite and Charnockite. The area exposes several bands of Pyroxene Granulite which is medium grained, medium to dark grey in color and stand out prominently in the gneissic country generally parallel to regional foliation. Charnockite is coarse grained, massive, many places it is foliated, grey colored and greasy and exposed as boulder outcrops and small knolls. It is well exposed in Central, Western and Southern parts of the Tiruppur District. The general strike of foliation varies from ENE-WSW, E-W with dipping towards NW and N respectively.

Hornblende-Biotite gneiss is well foliated, medium to coarse grained, pale grey and exposed as sheets and small knolls. Pink Granite gneiss occurs as thin bands and lensoidal bodies. It is a medium grained rock composed of alternating bands of mafic (mainly of biotite

and hornblende) and felsic (Feldspar and Quartz) minerals. It is well recognized in Avinashi area.

Stratigraphy succession of Tiruppur District

Age	Group	Lithology
Holocene		Block Cotton Soil/Clay±Gypsum
Cenozoic		Kankar/calc-tufa
Neoproterozoic	Acid intrusive	Quartz veins Pegmatite Pink Granite
	Sivamalai syenite Complex	Nepheline-syenite
	Chalk Hills (Basic Intrusive)	Pyroxenite/Dunite
Archaean-Palaeo proterozoic	Peninsular Gneissic Complex (II) PGC (II)	Pink Granite Gneiss Hornblende Biotite gneiss
Archaean	Charnockite Group	Charnockite (Unclassified) Pyroxene Granulite Banded Magnetite Quartzite

Basic intrusive such as pyroxinite/dunite occurs as bouldery outcrop and lensoidal bodies in the country rock and mostly concordant to the regional foliation. Many basic intrusive are reported in south and south-east of Tiruppur town. The trend of these bodies is east-west.

Nepheline syenite is a leucocratic, coarse-grained rock and composed mainly of Feldspar with Nepheline and shows pitted appearance due to removal of Nepleline. This alkaline rock is available in and around Sivanmalai area only.

Acid intrusive are overlain by sediments of Quaternary age, represented by Kankar and black cotton soil with Gypsum. Most of the area is covered by brown and red brown soil. Some part of the area covered with black cotton soil contains Gypsum as lumps. Black cotton soil covers south-western part of the district.

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.

The resistance R of a certain material is directly proportional to its length L and cross-sectional area A, expressed as:

$$R = Rs * L/A \text{ (in Ohm)}$$

Where Rs is known as the specific resistivity (characteristic of the material and independent of its shape or size)

With Ohm's Law,

$$R = dV/I \text{ (Ohm)}$$

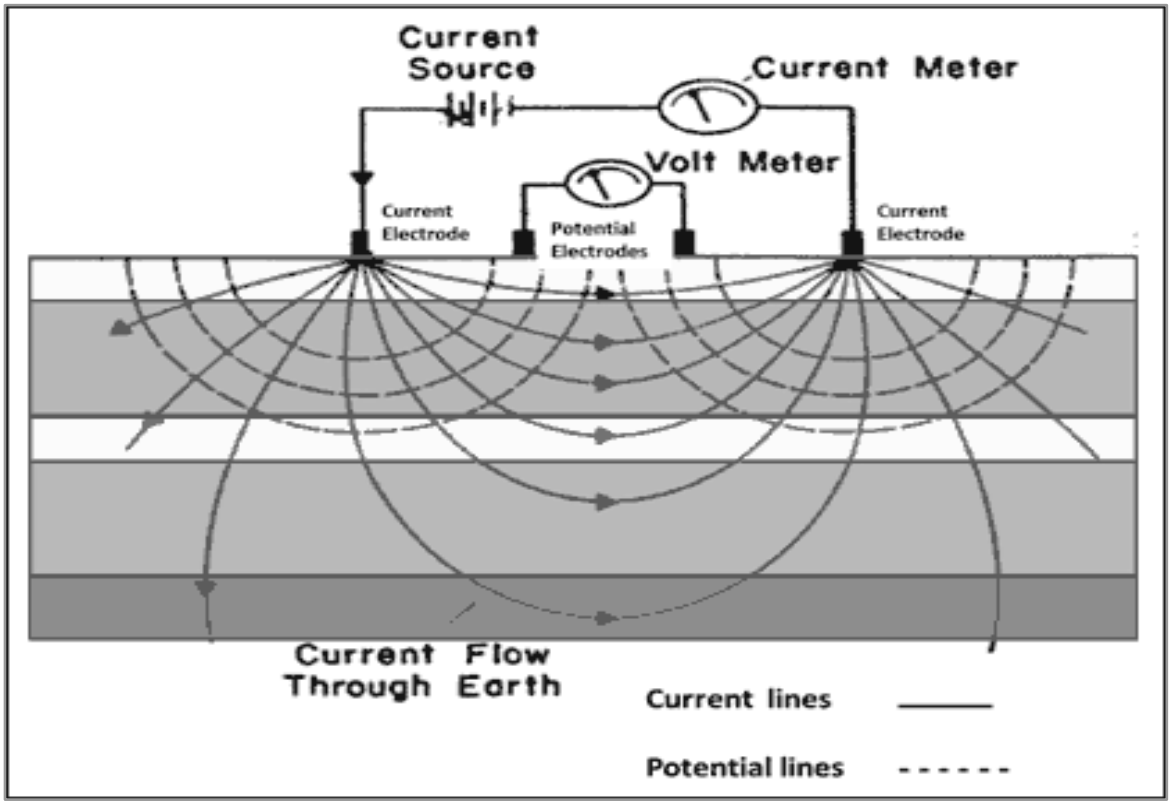
Where dV is the potential difference across the resistor and I is the electric current through the resistor. The specific resistivity may be determined by:

$$Rs = (A/L) * (dV/I) \text{ (in Ohm m)}$$

Vertical Electrical Sounding (VES)

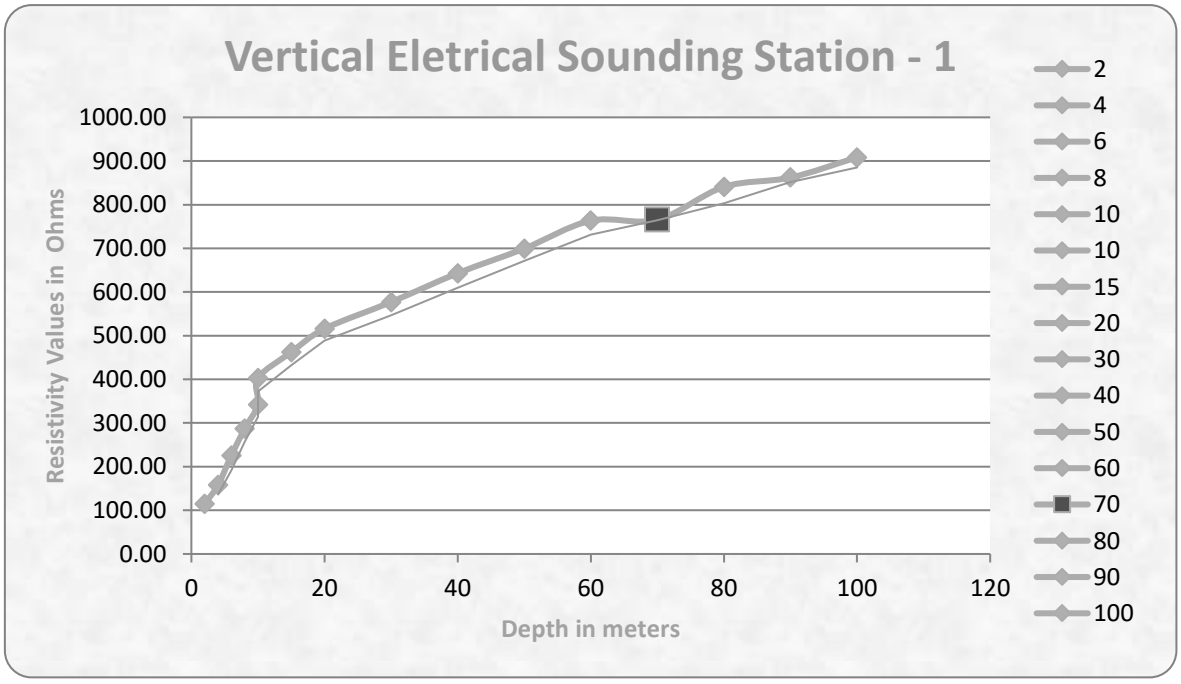
When carrying out a resistivity sounding, current is led into the ground by means of two electrodes. With two other electrodes, situated near the center of the array, the potential field generated by the current is measured. From the observations of the current strength and the potential difference, 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



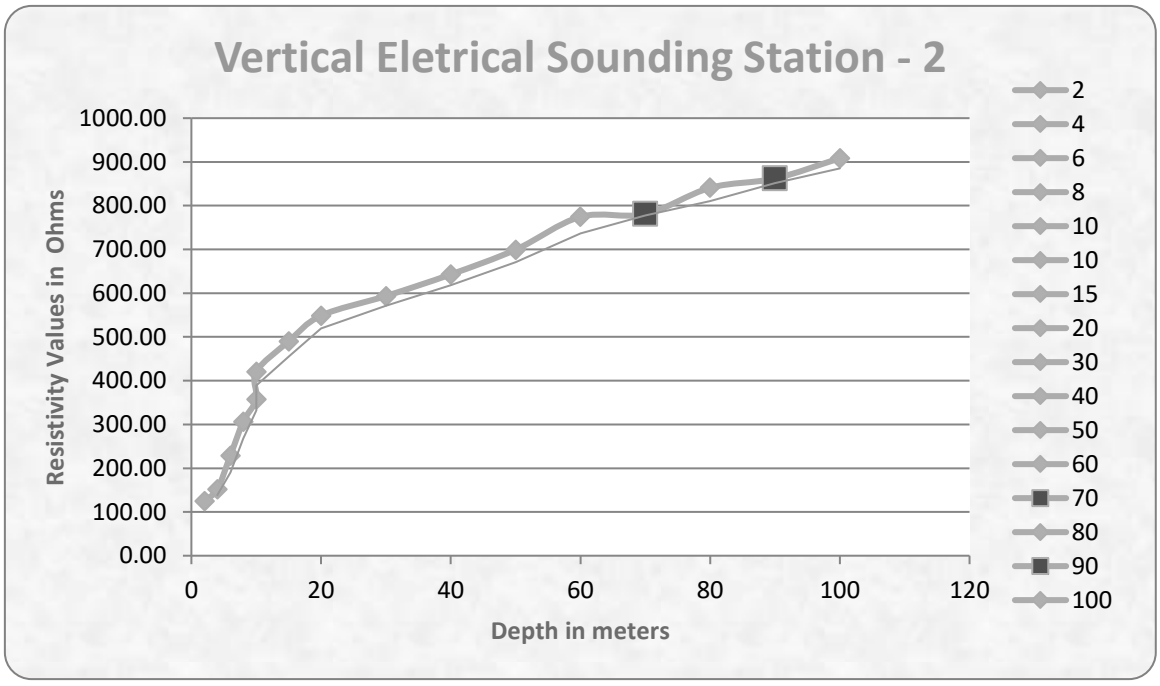
Geophysical Data's and Graphs Fracture Zone Levels

Vertical Electrical Sounding Station - 1					
GPS Coordinates - 10°40'32.95"N 77°33'43.37"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	24.36	114.74
2	4	1	23.55	6.68	157.79
3	6	1	54.95	4.08	225.30
4	8	1	98.91	2.92	286.84
5	10	1	155.45	2.22	341.99
6	10	5	23.55	17.12	402.71
7	15	5	62.80	7.38	462.21
8	20	5	117.75	4.35	515.75
9	30	5	274.75	2.10	576.98
10	40	5	494.55	1.29	642.92
11	50	5	777.15	0.92	699.44
12	60	5	1122.55	0.69	763.33
13	70	5	1530.75	0.48	765.38
14	80	5	2001.75	0.41	840.74
15	90	5	2535.55	0.32	862.09
16	100	5	3132.15	0.27	908.32



Based on the vertical electrical sounding graphs purple color is fracture zone.

Vertical Electrical Sounding Station - 2					
GPS Coordinates - 10°40'30.69"N 77°33'47.14"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	26.51	124.96
2	4	1	23.55	6.45	152.13
3	6	1	54.95	4.18	228.59
4	8	1	98.91	3.08	306.62
5	10	1	155.45	2.32	357.54
6	10	5	23.55	17.87	420.60
7	15	5	62.80	7.82	489.84
8	20	5	117.75	4.67	548.72
9	30	5	274.75	2.18	593.46
10	40	5	494.55	1.29	642.92
11	50	5	777.15	0.89	699.44
12	60	5	1122.55	0.70	774.56
13	70	5	1530.75	0.50	780.68
14	80	5	2001.75	0.41	840.74
15	90	5	2535.55	0.33	862.09
16	100	5	3132.15	0.28	908.32



This vertical electrical sounding graphs purple color is fracture zone.

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 85m to 90m where minor fractures are observed and shallow aquifers are expected above 65m to 70m BGL. The ultimate pit limit as per the approved mining plan depth is 47m (10 Years) & 17m (1st five years) 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, Advaitha Ashram Road,
Alagapuram, Salem – 636 004, Tamil Nadu
Mobile: +91 - 94433 56539
E-Mail: infogeoexploration@gmail.com

760
15/2/20

அனுப்புநர்:
ரா ரெங்கராஜன், எம்.காம்.,
சார் ஆட்சியர் (பொறுப்பு)
தாராபுரம்,
மற்றும் உதவி ஆணையர் (கலால்)
திருப்பூர்.

பெறுநர்:
துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
மாவட்ட ஆட்சியர் அலுவலகம்,
திருப்பூர்.

ந.க.3835/2020/இ நாள்: 23.06.2021

அய்யா,

பொருள் : கனிமங்களும் குவாரிகளும் - திருப்பூர் மாவட்டம் - தாராபுரம் வட்டம் மணக்கடவு கிராமம் - புல எண்.863-ல் 5.12.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குத்தகை உரிமம் கோரி திருமதி.மகேஸ்வரி க/பெ.வாசுதேவன் என்பவர் மனு அளித்தது - முன்மொழிவுகள் அனுப்புதல் - தொடர்பாக

பார்வை :

1. திருப்பூர்,துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அலுவலக கடித ந.க.1512/2020/கனிமம், நாள்:01.12.2020.
2. இவ்வலுவலக கடித ந.க.3835/2020/இ, நாள்:07.12.2020.
3. திரு.மு.ராமதுரை என்பவரது மனு நாள்:29.12.2020.
4. இவ்வலுவலக கடித ந.க.3835/2020/இ, நாள்:31.12.2020,மற்றும் 08.02.2021.
5. திருப்பூர்,துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அலுவலக கடித ந.க.1512/2020/கனிமம், நாள்:11.01.2021.
6. தாராபுரம் வட்டாட்சியர் அலுவலக ந.க.469/2021/அ2, நாள்:15.02.2021.
7. தாராபுரம் சார் ஆட்சியர்(பொ) மற்றும் உதவி ஆணையர் (கலால்),திருப்பூர் புலத்தணிக்கை நாள்:14.06.2021.

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், புல எண்.863-ல் 5.12.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குத்தகை உரிமம் கோரி திருமதி.மகேஸ்வரி க/பெ.வாசுதேவன் என்பவர் அளித்துள்ள விண்ணப்பம் தொடர்பாக பார்வை 1-ல் காணும் கடிதம் வரப்பெற்றது. இது தொடர்பாக விசாரணை மற்றும் புலத்தணிக்கை மேற்கொண்டு பார்வை 6-ல் காணும் தாராபுரம் வட்டாட்சியரின் அறிக்கை வரப்பெற்றது. எனவே,அதன் பேரில் புலத்தணிக்கை மற்றும் விசாரணை மேற்கொண்டு எனது அறிக்கையினை கீழ்க்கண்டவாறு சமர்ப்பித்துக்கொள்கிறேன்.

மனுதாரர் திருமதி.மகேஸ்வரி திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், சித்தராவுத்தன் பாளையம் கிராமம், பஜார் குறிஞ்சி நகர், கதவு எண்.220/2 என்ற முகவரியில் வசித்து வருகிறார். மனுதாரருக்கு தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீ.ச.863-ல் 2.56.0 பு.ஹெக் பூமியானது தாராபுரம் சார்பதிவக கிரையப்பத்திர எண்.7620/2020, நாள்:21.10.2020-ன்படியும், மனுதாரரின் கணவர் திரு.வாசுதேவன் என்பவருக்கு ரீ.ச.863-ல் 2.56.0 பு.ஹெக் பூமியானது தாராபுரம் சார்பதிவக

கிரையப்பத்திர எண்.7621/2020, நாள்:21.12.2020-ன்படியும், ஆக மொத்தம் 5.12.0 பு.ஹெக் பூமியானது திருமதி.மகேஸ்வரி மற்றும் அவரது கணவர் திரு.வாசுதேவன் என்பவருக்கு கூட்டாக பாத்தியப்பட்டது ஆகும. மேற்படி பூமியானது கிராம ஆவணங்களில் பட்டா எண்.1411-ல் மனுதாரர் மற்றும் அவரது கணவர் பெயரில் கூட்டுப் பட்டாவாக தாக்கலாகியுள்ளது. மேற்படி புலத்தில் மனுதாரருக்கு பாத்தியப்பட்ட பூமியில் குவாரி குத்தகை உரிமம் பெற மனுதாரரின் கணவர் திரு.வாசுதேவன் என்பவருக்கு ஆட்சேபணை ஏதும் இல்லை என உறுதியளித்துள்ளார். எனவே மொத்தம் உள்ள 5.12.0 பு.ஹெக் பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டி எடுக்க 10 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் கோரியுள்ளார். மனுதாரர் குவாரி உரிமம் கோரும் 5.12.0 ஹெக் பரப்பு புலவரைபடத்தில் தனியே குறித்து காட்டப்பட்டுள்ளது.

குத்தகை உரிமம் வழங்கக் கோரும் புலமானது நிலமெடுப்பு, நில ஆர்ஜிதம், பூமிதானம் மற்றும் நில உச்சவரம்பு போன்ற நடவடிக்கைகளுக்கு உட்படுத்தப்படவில்லை. குத்தகை உரிமம் கோரும் புலத்திற்கு 300 மீட்டர் சுற்றளவிற்குள் அங்கீகரிக்கப்பட்ட மனையிடங்கள், குடியிருப்புகள் மற்றும் கிராம நத்தம் ஏதுமில்லை என தாராபுரம் வட்டார அலுவலர் (கி.ஊ) அவர்களின் ந.க.1515/2014/ஆ2, நாள்:17.12.2020-ன்படி கடிதம் பெற்று இத்துடன் இணைக்கப்பட்டுள்ளது. மேலும், குத்தகை உரிமம் கோரும் புலத்திற்கு அருகில் கட்டுமானங்கள், பள்ளிக்கூடம், கோயில்கள், மசூதி மற்றும் தேவாலயங்கள் ஏதுவுமில்லை. மேலும், உயர்வழுத்த தாழ்வழுத்த மின்கம்பிகள் மற்றும் மின் கோபுரங்கள் ஏதுவுமில்லை. மேற்படி குத்தகை உரிமம் பெற மனுதாரர் ரூ.1500/-ஐ சலான் எண்.101, நாள்:26.11.2020-ன்படி திருப்பூர் பாரதி வங்கியில் சீனியரேஜ் கட்டணம் செலுத்தியுள்ளார். குத்தகை உரிமம் கோரும் புலத்தின் எல்லைகள் வரையறுக்கப்பட்டு எல்லை கற்கள் நடப்பட்டுள்ளது. மேற்படி பூமிக்கு நிலவரி, வருமான வரி மற்றும் கனிமவரி போன்ற வரி இனங்கள் எதுவும் நிலுவையில் இல்லை என மனுதாரர் உறுதிமொழி பத்திரம் கொடுத்துள்ளார். சிறு கனிம சட்டம் 1959-ன்படி விதிகளுக்குட்பட்டு நடப்பதாக மனுதாரர் வாக்குமூலம் அளித்துள்ளார். மேலும் குத்தகை உரிமம் வழங்குவது தொடர்பாக பொதுமக்களிடம் ஆட்சேபனை இல்லை என வாக்குமூலம் பெறப்பட்டு இத்துடன் இணைக்கப்பட்டுள்ளது.

இந்நிலையில் குவாரி குத்தகை உரிமம் வழங்குவதற்கு மேற்படி கிராமத்தில் 15.12.2020 அன்று "அ1" விளம்பரம் செய்யப்பட்ட நிலையில் குவாரி குத்தகை உரிமம் வழங்க ஆட்சேபனை செய்து திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், தேர்ப்பட்டி செடியங்காட்டுத்தோட்டம் என்ற முகவரியைச் சேர்ந்த திரு.ராமதுரை த/பெ.முத்துசாமிகவுண்டர் என்பவர் மட்டும் பார்வை 3-ல் காணும் விண்ணப்பம் அளித்துள்ள நிலையில் இது தொடர்பாக அறிக்கை அளிக்க தெரிவித்து பார்வை 5-ல் காணும் கடிதம் வரப்பெற்றது எனவே இது தொடர்பாக விசாரணை மேற்கொண்டு அறிக்கை அளிக்க தாராபுரம் வட்டாட்சியருக்கு பார்வை 4-ல் காணும் கடிதம் அனுப்பப்பட்டது. அதன் படி தாராபுரம் வட்டாட்சியர் விசாரணை மேற்கொண்டதில் மேற்படி குவாரி குத்தகை உரிமம் வழங்க ஆட்சேபனை செய்து திரு.ராமதுரை என்பவர் மட்டும் மனு அளித்துள்ள நிலையில் அங்கு வசிக்கும் பொது மக்கள் யாரும் ஆட்சேபனை இல்லை என வாக்குமூலம் அளித்துள்ளனர் என்பதால் அரசின் சட்ட விதிகளுக்கு உட்பட்டு குவாரி குத்தகை உரிமம் வழங்கலாம் என தாராபுரம் வட்டாட்சியர் அறிக்கை அளித்துள்ளார்.

எனவே, திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீச.863-ல் 5.12.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு திருமதி.மகேஸ்வரி என்பவருக்கு திரு.ராமதுரை என்பவர் ஆட்சேபணை தெரிவித்துள்ள நிலையிலும் அரசு விதிகளுக்குட்பட்டு குவாரி குத்தகை உரிமம் வழங்கலாம் என்பதைப் பணிவுடன் தெரிவித்துக்கொள்கிறேன்.

இணைப்பு: மேற்கண்டவாறு

ஒம்/-ரெ.ரெங்கராஜன்
சார் ஆட்சியர் (பொறுப்பு)
தாராபுரம் மற்றும்
உதவி ஆணையர் (கலால்)
திருப்பூர்.

/உண்மை நகல்/உத்திரப்படி/

நேர்முக உதவியாளர்

23/6/2021

வே.இராமலிங்கம்,பி.எஸ்.சி.,பி.எல்.,
ஆட்சியர்,
தாராபுரம்.

001328
383/2020.

பெறுநர்
சார் ஆட்சியர்,
தாராபுரம்,

ந.க. 469/2021/அ2 நாள்: .02.2021 .

அய்யா,

பொருள் :- கனிமங்களும் குவாரிகளும் - திருப்பூர் மாவட்டம் - தாராபுரம் வட்டம் - மணக்கடவு கிராமம் - புல எண்.863 - ல் - 5.12.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்குளுக்கு குத்தகை உரிமம் கோரி திருமதி.மகேஸ்வரி க/பெ.வாசுதேவன் என்பவர் மனு அளித்தது - அறிக்கை சமர்ப்பித்தல் - தொடர்பாக .

பார்வை :- 1. அலங்கியம் உள்வட்ட நிலவருவாய் ஆய்வாளர் அறிக்கை நாள்:20.01.2021

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், புல எண்.863 ல் 5.12.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டியெடுக்க 10 வருடங்களுக்கு குத்தகை உரிமம் கோரி திருமதி.மகேஸ்வரி க/பெ.வாசுதேவன் என்பவர் மனு செய்தது தொடர்பாக புலத்தணிக்கை மற்றும் விசாரணை மேற்கொண்டு எனதறிக்கையினை கீழ்க்கண்டவாறு சமர்ப்பிக்கிறேன்.

மனுதாரர் திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், சித்தராவுத்தன்பாளையம் கிராமம், பஜார் குறிஞ்சி நகர், கதவு எண்:220/2 என்ற முகவரியில் வசித்து வருகிறார். மனுதாரருக்கு தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீ.ச.863 - ல் 2.56.0 பு.ஹெக் பூமியானது தாராபுரம் சார்பதிவக கிரையப்பத்திர எண்.7620/2020, நாள்:21.10.2020 - ன் படியும், மனுதாரரின் கணவர் திரு.வாசுதேவன் என்பவருக்கு ரீ.ச.863- ல் 2.56.0 பு.ஹெக் பூமியானது தாராபுரம் சார்பதிவக கிரையப்பத்திர எண்.7621/2020, நாள்:21.12.2020 ன் படியும், ஆக மொத்தம் 5.12.0 பு.ஹெக் பூமியானது திருமதி.மகேஸ்வரி என்பவருக்கு கூட்டாக பாத்தியப்பட்டது. மேற்படி பூமியானது கிராம ஆவணங்களில் பட்டா எண்.1411 - ல் மனுதாரர் மற்றும் அவரது கணவர் பெயரில் கூட்டுப் பட்டாவாக தாக்கலாகியுள்ளது. மேற்படி புலத்தில் மனுதாரருக்கு பாத்தியப்பட்ட பூமியில் குவாரி குத்தகை உரிமம் பெற மனுதாரரின் கணவர் திரு.வாசுதேவன் என்பவருக்கு ஆட்சேபணை ஏதும் இல்லை என உறுதியளித்துள்ளார். எனவே மொத்தம் உள்ள 5.12.0 பு.ஹெக் பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டி எடுக்க 10 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் கோரியுள்ளார். மனுதாரர் குவாரி உரிமம் கோரும் 5.12.0 ஹெக் பரப்பு புலவரைபடத்தில் தனியே குறித்து காட்டப்பட்டுள்ளது.

குத்தகை உரிமம் வழங்கக் கோரும் புலமானது நிலமெடுப்பு, நில ஆர்ஜிதம், பூமிதானம் மற்றும் நில உச்சவரம்பு போன்ற நடவடிக்கைகளுக்கு உட்படுத்தப்படவில்லை.மேற்படி குத்தகை உரிமம் பெற மனுதாரர் ரூ.1500/- ஐ சலான் எண்.101, நாள்: 26.11.2020- ன் படி திருப்பூர் பாரதி வங்கியில் சீனியரேஜ் கட்டணம் செலுத்தியுள்ளார். குத்தகை உரிமம் கோரும் புலத்தின் எல்லைகள் வரையறுக்கப்பட்டு எல்லை கற்கள் நடப்பட்டுள்ளது. மனுதாரருக்கு குத்தகை உரிமம் வழங்குவது தொடர்பாக மேற்படி கிராமத்தில் 15.12.2020 அன்று "அ1" விளம்பரம்

செய்யப்பட்டது. ஆனால் மேற்படி புலத்தில் குத்தகை உரிமம் வழங்க ஆட்சேபணை திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், தே... செடியங்காட்டுத்தோட்டம் என்ற முகவரியைச் சேர்ந்த திரு.ராமதுரை த/பெ.முத்துசாமிகவுண்ட... என்பவர் மனு அளித்துள்ளார். குத்தகை உரிமம் கோரும் புலத்திற்கு 300 மீட்டர் சுற்றளவிற்குள் அங்கீகரிக்கப்பட்ட மனையிடங்கள், குடியிருப்புகள் மற்றும் கிராம நத்தம் எதுவுமில்லை என தாராபுரம் வட்டார வளர்ச்சி அலுவலர்(கி.ஊ) அவர்களின் ந.க.எண்.1515/2014/ஆ2 நாள்:17.12.2020 - ன் படி கடிதம் பெற்று இத்துடன் இணைக்கப்பட்டுள்ளது.

மேலும்.குத்தகை உரிமம் கோரும் புலத்திற்கு அருகில் கட்டுமானங்கள், பள்ளிக்கூடம், கோயில்கள் , மசூதி மற்றும் தேவாலயங்கள் எதுவுமில்லை. மேலும் உயர்வழுத்த, தாழ்வழுத்த மின்கம்பிகள் மற்றும் மின்கோபுரங்கள் எதுவுமில்லை. மேற்படி பூமிக்கு நிலவரி, வருமான வரி மற்றும் கனிம வரி போன்ற வரி இனங்கள் எதுவும் நிலுவையில் இல்லை என மனுதாரர் உறுதிமொழி பத்திரம் கொடுத்துள்ளார். சிறு கனிம சட்டம் 1959 -ன் படி விதிகளுக்குட்பட்டு நடப்பதாக மனுதாரர் வாக்குமூலம் அளித்துள்ளார். மேலும் குத்தகை உரிமம் வழங்குவது தொடர்பாக பொதுமக்களிடம் வாக்குமூலம் பெறப்பட்டு இத்துடன் இணைக்கப்பட்டுள்ளது. மேற்படி கிராமத்தை சேர்ந்த திரு.ராமதுரை த/பெ.முத்துசாமிகவுண்டர் என்பவர் மட்டும் ஆட்சேபணை தெரிவித்துள்ளார்.

எனவே திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீ.ச.863(முழு) -ல் 5.12.0 பு.ஹெக் பரப்பில் சாதாரண கற்கள்/ கிராவல் மண் வெட்டி எடுக்க 10 ஆண்டுகளுக்கு திருமதி.மகேஸ்வரி என்பவருக்கு திரு.ராமதுரை என்பவர் ஆட்சேபணை தெரிவித்துள்ள நிலையிலும் அரசு விதிகளுக்குட்பட்டு குவாரி குத்தகை உரிமம் வழங்கலாம் எனப் பரிந்தரை செய்து மேல்நடவடிக்கைக்காக நிலவருவாய் ஆய்வாளர் அறிக்கை, கிராம நிர்வாக அலுவலர் வாக்குமூலம் மற்றும் இதர கிராம ஆவணங்களை இத்துடன் இணைத்து அனுப்பி வைத்துள்ளேன் என்பதைப் பணிவுடன் தெரிவித்துக்கொள்கிறேன்.

இணைப்பு : மேற்குறிப்பிட்டவாறு

தங்கள் உண்மையுள்ள,

வட்டாட்சியர்,
தாராபுரம்.

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், கிராம நிர்வாக அலுவலர் வாக்குமூலம்:

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீ.ச.863(முழு)-ன் பு.ஹெக்.5.12.0 பரப்பில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் கோரி திருமதி.மகேஸ்வரி க/பெ. வாசுதேவன் என்பவர் அளித்த மனுவின் பேரில், விசாரணை என்பதை தெரிந்துகொண்டேன்.

மனுதாரர் திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், சித்தராவுத்தன் கிராமம், பஜார் குறிஞ்சி நகர்,220/2 என்ற முகவரியில் வசித்து வருகிறார். மனுதாரருக்கு மேற்படி கிராமத்தில் ரீ.ச.863-ல் பு.ஹெக்.2.56.0 பூமியானது தாராபுரம் சார்பதிவக கிரையப்பத்திர எண்.7620/2020, நாள்.21.10.2020-ன்படியும், மேலும் மனுதாரின் கணவர் திரு. வாசுதேவன் பெயரில் இதே காலையில் பு.ஹெக்.2.56.0 பூமியானது தாராபுரம் சார்பதிவக கிரையப்பத்திர எண்.7621/2020, நாள்.21.10.2020-ன்படியும், ஆக மொத்தம் பு.ஹெக்.5.12.0 பூமி பாத்தியப்பட்டுள்ளது. மேற்படி பூமியானது கிராம ஆவணங்களில் பட்டா எண்.1411-ல் மனுதாரர் மற்றும் அவரின் கணவர் பெயரில் கூட்டுப்பட்டாவாக தாக்கலாகியுள்ளது. மேற்படி புலத்தில் உள்ள பு.ஹெக்.5.12.0 முழு பரப்பிலும் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் புதுப்பிக்க கோரியுள்ளார். மேற்படி புலத்தில் மனுதாரின் கணவருக்கு பாத்தியப்பட்ட பூமியில் குவாரி குத்தகை உரிமம் பெற மேற்படி மனுதாரின் கணவர் திரு.வாசுதேவன் ஆட்சேபணை ஏதும் இல்லை என உறுதிமொழி சமர்பித்துள்ளார். மனுதாரர் குவாரி உரிமம் கோரும் பு.ஹெக்.5.12.0 பரப்பு புலவரைபடத்தில் தனியே குறித்து காட்டப்பட்டுள்ளது.

குத்தகை உரிமம் வழங்கக் கோரும் புலமானது நிலமெடுப்பு, நிலஆர்ஜிதம், பூமிதானம், நில உச்சவரம்பு போன்ற நடவடிக்கைகளுக்கு உட்டுத்தப்படவில்லை. மேற்படி குத்தகை உரிமம் பெறுவதற்கு மனுதாரர் சீனியரேஜ் கட்டணம் ரூ.1500/-ஐ சலான் எண்.101, நாள்.26.11.2020-ன்படி தாராபுரம் பாரத வங்கியில் செலுத்தியுள்ளார். குத்தகை உரிமம் கோரும் புலத்தின் எல்லைகள் வரையறுக்கப்பட்டு எல்லை கற்கள் நடப்பட்டுள்ளது. மனுதாரருக்கு குத்தகை உரிமம் வழங்குவது தொடர்பாக, மேற்படி கிராமத்தில் 15.12.2020 அன்று "அ1" விளம்பரம் செய்யப்பட்டது. மேற்படி புலத்தில் குத்தகை உரிமம் வழங்க ஆட்சேபணை தெரிவித்து திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், தேர்ப்பட்டி , செடியன்காட்டுத் தோட்டம் என்ற முகவரியை சேர்ந்த திரு.ராமதுரை த/பெ முத்துச்சாமிகுவுண்டர் என்பவர் மனு அளித்துள்ளார். குத்தகை உரிமம் கோரும் புலத்திற்கு 300

மீட்டர் சுற்றளவிற்குள் அங்கீகரிக்கப்பட்ட மனையிடங்கள், குடியிருப்புகள் மற்றும் கிராம நத்தம் எதுவுமில்லை என தாராபுரம் வட்டார வளர்ச்சி அலுவலர்(கி.ஊ) அவர்களின் ந.க.எண்: 1515/2014/ஆ2 நாள்: 17.12.2020 ன்படி கடிதம் பெற்று சமர்பித்துள்ளார்.

மேலும், குத்தகை உரிமம் கோரும் புலத்திற்கு அருகில் கட்டுமானங்கள் மற்றும் பள்ளிக்கூடம், கோயில்கள், மசூதி மற்றும் தேவாலயங்கள், உயர்வழுத்த மின்பாதை எதுவுமில்லை. மேலும். மேற்படி பூமிக்கு நிலவரி, வருமான வரி, கனிம வரி போன்றவை எதுவும் நிலுவை இல்லை என உறுதிமொழி பத்திரம் கொடுத்துள்ளார். சிறு கனிம சட்டம் 1959-ன்படி விதிகளுக்குட்பட்டு நடப்பதாக மனுதாரர் வாக்குமூலம் கொடுத்துள்ளார். மேலும் குத்தகை உரிமம் வழங்குவது தொடர்பாக பொதுமக்களிடம் வாக்குமூலம் பெற்று இணைக்கப்பட்டுள்ளது. மேற்படி கிராமத்தை சேர்ந்த திரு.ராமதுரை த/பெ முத்துச்சாமிகுவுண்டர் என்பவர் மட்டும் ஆட்சேபணை தெரிவித்துள்ளார்.

எனவே திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீ.ச.863(முழு)-ன் பு.ஹெக்.5.12.0 பரப்பில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 ஆண்டுகளுக்கு மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்குவது தொடர்பாக மேற்படி ஆட்சேபணைனை கருத்தில் கொண்டு அரசு விதிகளுக்குட்பட்டு நடவடிக்கை மேற்கொள்ளலாம் என்பதை பணிவுடன் கேட்டுக்கொள்கிறேன்.

// படித்துப்பார்த்தேன் சரி//

கிராம நிர்வாக அலுவலர்
மணக்கடவு

//என்னால்//

நில வருவாய் அலுவலர்
அவினாசி

அ1 விளம்பரம்

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், ரீ.ச.863(முழு) - பு.ஹெக்.5.12.0 பரப்பு நிலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டி எடுக்க 10 வருடங்களுக்கு அனுமதி கோரி திருமதி. வா.மகேஸ்வரி க/பெ ஆர்.வாசுதேவன் என்பவர் மனு அளித்தது தொடர்பாக, மேற்படியாருக்கு அனுமதி வழங்க நடவடிக்கை மேற்கொள்ளப்பட்டு வருகிறது. இது தொடர்பாக ஆட்சேபனை ஏதும் இருப்பின் தாராபுரம் வட்டாட்சியர் / அலங்கியம் நிலவருவாய் ஆய்வாளர் / மணக்கடவு கிராம நிர்வாக அலுவலருக்கு 15 தினங்களுக்குள் எழுத்து மூலமாக தெரிவிக்க வேண்டும். இல்லையெனில் கனிம சட்டத்தின் படி மேற்படியாருக்கு குவாரி உரிமம் வழங்க தக்க நடவடிக்கை எடுக்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

15/11/2018

நிலவருவாய் ஆய்வாளர்,
அலங்கியம் உள்வட்டம்.

மேற்படி விளம்பரத்தை மணக்கடவு கிராமத்தில் பொதுமக்கள் நன்கு அறியும் படி பிரசித்தம் செய்து திரும்ப சமர்ப்பிக்குமாறு மணக்கடவு கிராம நிர்வாக அலுவலர் கேட்டுக்கொள்ளப்படுகிறார்.

15/11/2018

நிலவருவாய் ஆய்வாளர்
அலங்கியம் உள்வட்டம்.

பெறுநர்:
கிராம நிர்வாக அலுவலர்,
மணக்கடவு கிராமம்.

1 R. முருகன் / தந்தையார் - R. முருகன்

2 P. முருகன் / தந்தையார் — [illegible]

3 K. செந்தில்குமார் / கணவனார் — K. செந்தில்குமார்

4 K. வெங்கடாசலம் / தந்தையார் — K. [illegible]

5 R Prakash / Therpathi — R Prakash

6 A. ஜெகன் / மணமகன் — A. ஜெகன்

7 [illegible] / தந்தையார் — [illegible]

8 A. சண்முகம் / தந்தை — A. சண்முகம்

9 [illegible] / தந்தையார் — [illegible]

10 K. Balamurugan / தோழி — K. Balam

1 to 10

மேற்படி 10 மனுக்களும் எனது முன்னிலையில் கையொப்பம்
இடப்பட்டன மேற்படி எனது முன்னிலையில் கையொப்பம்
மற்றும் அலுவலகத்தில் சீராது.

[signature]

[illegible]

அனுப்புநர் :

திருமதி.த.பானுப்பிரியா,
வட்டார வளர்ச்சி அலுவலர்
(கிராம ஊராட்சிகள்),
தாராபுரம்.

பெறுநர் :

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்க துறை,
திருப்பூர்.

ந.க.எண்.1515/2014/ஆ2 நாள் :17.12.2020

அய்யா

பொருள் : கனிமங்களும் சுரங்கங்களும் - சிறுகனிமம் சாதாரண கற்கள் திருப்பூர் மாவட்டம் - தாராபுரம் வட்டாரம் - மணக்கடவு கிராமம் - பட்டா புல எண்: 863-ல் 5.12.0 ஹெக்டேர் பட்டா நிலப்பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டி எடுக்க 05 வருடங்களுக்கு குவாரி குத்தகை உரிமம் திருமதி.வி.மகேஸ்வரி , க/பெ.வாசுதேவன் என்பவர் மனு செய்துள்ளது - விசாரணை அறிக்கை கோரப்பட்டது தொடர்பாக

பார்வை: 1 திருப்பூர் துணை இயக்குநர், புவியியல் மற்றும் சுரங்க துறை, அவர்களின் ந.க.எண்.1512/2020/கனிமம். நாள். 01.12.2020

ooooooo

பார்வையில் காணும் கடிதத்தின்படி தாராபுரம் வட்டாரம் மணக்கடவு கிராமம் பட்டா புல எண்: 863-ல் 5.12.0 ஹெக்டேர் பட்டா நிலப்பரப்பில் சாதாரண கற்கள்/கிராவல் மண் வெட்டி எடுக்க 05 வருடங்களுக்கு குவாரி குத்தகை உரிமம் கோரி திருமதி.வி.மகேஸ்வரி , க/பெ.வாசுதேவன் என்பவர் விண்ணப்பம் தொடர்பான கருத்துரு அனுப்பி வைக்க தெரிவிக்கப்பட்டுள்ளது.

மேற்படி பிரஸ்தபா புலங்களில் இருந்து 300மீ சுற்றளவிற்குள் அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள் (Layout) மற்றும் அங்கீகரிக்கப்பட்ட கட்டுமானங்கள் எதுவும் இல்லை என்ற விபரத்தினை இதன் மூலம் தெரிவித்துக்கொள்கிறேன்.

வட்டார வளர்ச்சி அலுவலர்
(கிராம ஊராட்சிகள்)
தாராபுரம் .

நகல்: திருமதி.வி.மகேஸ்வரி , க/பெ.வாசுதேவன்,மணக்கடவு,தாராபுரம்.

E:\Mines & Minerals\Mines Manakkadavu.docx

அனுப்புநர்

திரு.ப.இராஜாமணி,

தலைமையாசிரியர்,

அரசு உயர் நிலைப் பள்ளி,

தேர்ப்பட்டி -638673,

திருப்பூர் மாவட்டம்.

பெறுநர்

மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம்,

சென்னை.

ஐயா,

பொருள் : பள்ளிக் கல்வி - திருப்பூர் மாவட்டம் தேர்பட்டி அரசு உயர்நிலைப் பள்ளியில் மாணவர்களுக்குத் தேவையான வசதிகள் செய்தது - பணிகள் நிறைவு செய்த விவரம் தெரிவித்தல் - தொடர்பாக.

.....

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், தேர்ப்பட்டியில் உள்ள புல எண் : 863 ல் அமைந்துள்ள கல்குவாரியின் உரிமையாளர் திருமதி. வி. மகேஸ்வரி க/பெ வாசுதேவன் என்பவர் திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், தேர்பட்டி, அரசு உயர்நிலைப் பள்ளியில் மாணவர்களுக்குத் தேவையான கீழ்க்காண் பணிகளை பள்ளியின் சார்பாக கேட்டுக் கொண்டதன் பேரில் நிறைவாக செய்து முடித்துள்ளார்.

பணிகள் விவரம்

1. மாணவர்களின் கழிவறைக்குத் தண்ணீர் வசதி, கழிவறை தரைத்தளம் மற்றும் கழிவறைக்கு புதிய கதவுகள் மாற்றி அமைத்து தந்துள்ளார்.
2. ஏழு வகுப்பறைகளுக்கு உள் மற்றும் வெளிப்புறங்களுக்கு வெள்ளை அடித்தல் கதவு ஜன்னல் மற்றும் கரும்பலகைகளுக்கு வண்ணம் பூசி தந்துள்ளார்.
3. மூன்று ஏக்கர் பரப்பளவு உள்ள பள்ளி மைதானத்தில் புற்கள் மற்றும் செடிகளை அகற்றி சுத்தம் செய்து தந்துள்ளார்
4. மூன்று வகுப்பறை கட்டித்திற்கு மேல் தளம் பழுது நீக்கி ஓடுகள் பதித்து தந்துள்ளார்

மேலும் எதிர் வரும் காலத்தில் பள்ளிக்கு ஏதேனும் அடிப்படை வசதிகள் தேவைப்பட்டால் ரூ.5,00,000/- மதிப்பில் பணிகள் செய்து தருவதாக உறுதி அளித்துள்ளார் என்பதைத் தெரிவித்துக் கொள்கிறேன்.

26/09/2024

தலைமையாசிரியர்
அரசு உயர்நிலைப் பள்ளி,
தேர்பட்டி - 638 673.
திருப்பூர் மாவட்டம்

இடம் : தேர்ப்பட்டி

தேதி : 26.09.2024

ANNEXURE 1

DEPUTY DIRECTOR • GEOLOGY AND MINING • TIRUPPUR

ந.க.எண். 1512/கனிமம்/ 2020

புவியியல் மற்றும் சுரங்கத்துறை
மாவட்ட ஆட்சியர் அலுவலகம்
திருப்பூர்.

நாள்: 23.07.2021.

குறிப்பாணை

பொருள் : கனிமங்களும் சுரங்கங்களும் - சிறு கனிமம் - திருப்பூர் மாவட்டம் - தாராபுரம் வட்டம் - மணக்கடவு கிராமம் - பட்டா புல எண். 863 (பகுதி)-ல் 3.00.0 ஹெக்டர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் மண் குவாரி குத்தகை உரிமம் கோரி திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவர் விண்ணப்பம் அளித்தது - புலத்தணிக்கை அறிக்கை சமர்பிக்கப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவிணை பெற்று சமர்பிக்கக் கோருதல் - தொடர்பாக.

பார்வை :

1. திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன், 220/02, குறிஞ்சிநகர், எல்லீஸ் நகர், உடுமலை ரோடு, தாராபுரம், திருப்பூர் மாவட்டம் என்பவரின் விண்ணப்பம் நாள்: 26.11.2020.
2. இவ்வலுவலக ந.க.எண். 1512/2020/கனிமம் நாள்: 01.12.2020.
3. திரு. ராமதுரை என்பவரின் புகார் மனு நாள்: 04.01.2021.
4. இவ்வலுவலக ந.க.எண். 1512/2020/கனிமம் நாள்: 11.01.2021
5. வட்டார வளர்ச்சி அலுவலர், தாராபுரம் கடிதம்ந.க. 1515/2014/அ2 நாள்: 17.12.2020 (இவ்வலுவலகத்தில் பெறப்பட்ட நாள்: 24.12.2020).
6. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை ந.க. 1870/எம்.எம்.1/2020 நாள்: 10.08.2020 கடிதத்துடன் அரசாணை (பல்வகை) எண். 169, தொழில் (எம்எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).
7. அரசாணை (பல்வகை) எண். 208, தொழில் (எம்.எம்.சி-1) துறை நாள்: 21.09.2020.
8. வட்டாட்சியர், தாராபுரம் கடிதம் ந.க. 469/2021/அ2 நாள்: 15.02.2021.
9. சார் ஆட்சியர் (பொ), தாராபுரம் மற்றும் உதவி ஆணையர் (கலால்), திருப்பூர் கடிதம் ந.க. 3835/2020/இ நாள்: 23.06.2021.
10. திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் கடிதம் நாள்: 22.07.2021.
11. உதவிப் புவியியலாளர் (கனிமம்), திருப்பூர் புலத்தணிக்கை அறிக்கை நாள்: 22.07.2021.
12. மற்றும் உரிய ஆவணங்கள்

திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், பட்டா புல எண். 863-ல் 5.00.0 ஹெக்டர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரிக் குத்தகை உரிமம்

வழங்க கோரி திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவர் பார்வை 1-ல் கண்டுள்ளபடி உரிய ஆவணங்களுடன் விண்ணப்பம் அளித்துள்ளார். மேலும், மனுதாரர் தனது 22.07.2021 நாளிட்ட கடிதத்தில், தனது குடும்ப சூழ்நிலை காரணமாக முழுப்பரப்பிற்கும் குவாரிப்பணி செய்ய இயலவில்லை எனவும், புல எண். 863-ல் 3.00.0 ஹெக்டர் பரப்பில் மட்டும் குவாரி உரிமம் வழங்குமாறு கோரியுள்ளார்.

2. மேற்படி விண்ணப்பங்கள் தொடர்பாக, வட்டார வளர்ச்சி அலுவலர், தாராபுரம், வட்டாட்சியர், தாராபுரம், சார் ஆட்சியர் (பொ), தாராபுரம் மற்றும் உதவிப் புவியியலாளர் (கனிமம்), திருப்பூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், பட்டா புல எண். 863 (பகுதி)-ல் 3.00.0 ஹெக்டர் பரப்பில் திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவருக்கு சாதாரண கற்கள் மற்றும் கிராவல் மண் குவாரி உரிமம் வழங்க கீழ்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

நிபந்தனைகள்:

a. 1959ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை II-ல் கண்டுள்ளபடி குவாரி செய்யப்படும் கனிமங்களுக்குரிய சீனியரேஜ் தொகை அவ்வப்போது செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.

b. அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப் பணி மேற்கொள்ள வேண்டும்.

c. விண்ணப்பப் புலத்திற்கு கிழக்கே உள்ள அரசு புறம்போக்கு புல எண். 872/2-ற்கும் வடக்கே பட்டா புலத்தில் புல எண். 864/2, 865/2-ல் உள்ள நிலவியல் பாதைக்கும் 10 மீட்டர் பாதுகாப்பு இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.

d. விண்ணப்பப் புலத்தின் கிழக்கே அமைந்துள்ள மின்கம்பி பாதையை குத்தகை ஒப்பந்தப் பத்திரம் நிறைவேற்றும் முன்னர் 50 மீட்டர் தொலைவிற்கு அப்பால் மாற்றி அமைக்கப்பட வேண்டும்.

e. அனுபவம் வாய்ந்த வெடிபொருள் பயன்படுத்துவோர் மூலம் குறைந்த அளவு சக்தி கொண்ட வெடிபொருட்களை பயன்படுத்தி அருகிலுள்ள பட்டாதாரர்களுக்கு எவ்வித இடையூறுமின்றி / அருகிலுள்ள பட்டா மற்றும் அரசு புலங்களில் எவ்வித ஆக்கிரமிப்பும் இன்றி குவாரிப்பணி மேற்கொள்ள வேண்டும்.

f. விதிகளின் படி ஏற்பளிக்கப்பட்ட கரங்கத்திட்டத்தினை உரிய காலத்திற்குள் சமர்பிக்க வேண்டும்.

g. குவாரி உரிமம் வழங்க உள்ள பகுதிக்கு சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் முன் அனுமதி பெற்று சமர்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும்.

3. எனவே, வட்டார வளர்ச்சி அலுவலர், தாராபுரம், வட்டாட்சியர், தாராபுரம், சார் ஆட்சியர் (பொ), தாராபுரம் மற்றும் உதவிப் புவியியலாளர் (கனிமம்), திருப்பூர் ஆகியோரின் பரிந்துரை மற்றும் நிபந்தனைகளின் அடிப்படையில், திருப்பூர் மாவட்டம், தாராபுரம் வட்டம், மணக்கடவு கிராமம், பட்டா புல எண். 863 (பகுதி)-ல் 3.00.0 ஹெக்டர் பரப்பில் மட்டும் 1959ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19-ன் படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு விண்ணப்பப் புலம் ஏற்கனவே குவாரி செய்யப்படாத பகுதி என்பதால் 10 (பத்து) வருட காலத்திற்கு திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன் என்பவருக்கு சாதாரண கற்கள் மற்றும் கிராவல் மண் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

4. மேலும், தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு மனுதாரரைக் கேட்டுக்கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-ன் படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

23.7.21

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திருப்பூர்.

பெறுநர்:

திரு. வா. மகேஸ்வரி, க/பெ. வாசுதேவன்,
220/02, குறிஞ்சிநகர், எல்லீஸ் நகர்,
உடுமலை ரோடு, தாராபுரம்,
திருப்பூர் மாவட்டம்

23/7/21

நிறைவுச் சான்றிதழ்

உடல் வேலைக்கு நிறைவு சான்று

863 ன் படி 5.12.00 முதல்

நிலைக்கு சான்றுகள் வேண்டி விண்ணப்பித்தல் (1)

விண்ணப்பம் மீது மேற்கொண்ட — (2) பணிகள்

பார்த்து சான்று 863 — 5.12.00 வரை சார்ந்த

துறை அலுவலர் அவர்களால்

பரிந்துரை செய்யப்பட்டு மேற்படி

நிறைவுச் சான்று வழங்கப்படுகிறது.

கிராம நிர்வாக அலுவலர்
87.மணக்குடவு கிராமம்.
[illegible]

TOPOGRAPHICAL VIEW OF MANAKKADAVU ROUGH STONE AND GRAVEL QUARRY LEASE APPLIED AREA

Name of the Applicant	:	**V.Maheswari,**
		W/o. Vasudevan,
Address	:	No.220/02, Kurinjinagar,
		Ellis Nagar, Udumalai Road,
		Dharapuram, Tiruppur District – 638 657,
		Tamil Nadu State.

LOCATION DETAILS

Extent	:	3.00.0ha
S.F.No.	:	863 (P)
Village	:	Manakkadavu
Taluk	:	Dharapuram
District	:	Tiruppur
State	:	Tamil Nadu

Signature of the applicant

V. Maheswari

V.Maheswari

(Village Administrative Officer)

Attestation

M/S.HANUMAN EXPLOSIVES PVT.LTD.,

Survey No.898,Chinnamaruthur Village, DharapuramTaluk, TIRUPUR (Dt), Tamil Nadu
Licence No: E/SC/TN/22/714(E97779), E/SC/TN/22/737(E97783), E/SC/TN/22/734(E97787), E/SC/TN/22/733(E97791), E/SC/TN/22/736(E97794), E/SC/TN/22/735(E97797).

To

Smt.V.Mageshwari,
W/o.Vasudhevan,
No.220/2,Kurinji Nagar,
Ellish Nagar,Udumalai Road,
Dharapuram-638 657,
Tiruppur DT.

REF : your letter dated.

SUB : Regarding blasting work and using explosives in your proposed quarry.

Respected Sir,

We Have the licence for the use of explosives under form 22 licence No:E/SC/TN/22/735 (E97797) situated in survey SF NO.898,Chinnamaruthur, Pichaikalpatty village, Dharapuram(Tk), Tiruppur(Dt)), TamilNadu. Our office functions at address 322,Agaram X road, kamakkapalayam(PO), Attur, Thalaivasal, Salem(Dt), TamilNadu.

We operate 2 explosives vans for transporting detonators and class 2 mixture separately form our magazine to your work site. We also provide well experienced and licenced blasters and shot firer for safe blasting without untoward incident.

We are willing to undertake work on contract basis at your SF NO : 863, Area:3.00.0 Ha in Manakadavu Village, Dharapuram Taluk, Tiruppur District.

Thanking you

FOR HANUMAN EXPLOSIVES
For M/s HANUMAN EXPLOSIVES PVT. LTD.
AUTHORISED SIGNATORY

ENCLOSURE

1.LICENCE COPY

322, Agaram X Road, Kamakkapalayam PO, Attur, Thalaivasal, Salem(DT), Tamil Nadu. PIN: 636112

GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION(PESO)
(Formerly Department of Explosives)

A & D - Wing, Block 1-8, IInd Floor, Shastri Bhavan
26 Haddous Road, Nungambakkam Chennai 600006
Tele: 28281023 Fax: 28284848
Email: jtccechennai@explosives.gov.in

No.: E/SC/TN/22/736(E97794)

To,

Dated:11/03/2020

M/s.HANUMAN EXPLOSIVES PVT.LTD.,

322, Agaram X Road, Kamakkapalayam PO, Attur , Town/Village - Thalaivasal

District-SALEM, State-Tamil Nadu, Pincode - 636112

Subject: **Possession for Use of of Explosives from magazine situated at Survey No.:898 (Magazine-5), Chinnamaruthur, Dharapuram Taluk, Dist. TIRUPUR, Tamil Nadu - Licence No.: E/SC/TN/22/736(E97794) granted in Form LE-3 of Explosives Rules, 2008 -**
Amendment of Quantity of Explosives/Monthly Purchase Limit .

Sir(s),

Please refer to your letter No. x dated 18/12/2019 on the subject cited above.

The Licence No.: E/SC/TN/22/736(E97794) is forwarded herewith duly amended in respect of followings ;

Quantity of Explosives/Monthly Purchase Limit

The licence capacity at any one time shall not exceed the kinds and quantities mentioned below ;

No	Explosive(s)	Class	Div	Sub Div	Capacity	Unit
1	Nitrate Mixture	2	0	0	1000	Kg.
2	Detonating Fuse	6	2	0	3000	Mtrs
3	Safety Fuse	6	1	0	1500	Mtrs
4	Electric and/or Ordinary Detonators	6	3	0	6000	Nos.

Quantity of explosives to be purchased in a calendar month[applicable for licence under article 3(b) and (c)] : **15 times as above.**
This Licence shall remain valid till**31st day of March 2023.**

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,
(D.C.PANDEY)
Controller of Explosives
For Joint Chief Controller of Explosives
South Circle, Chennai

Copy Forwarded to:

1. **District Magistrate, TIRUPUR, Tamil Nadu with reference to his Noc No: R.DIS.NO.5846/2017/C2 Dated: 11/12/2017.**

2. **Superintendent of Police, TIRUPUR, 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]

Disclaimer : This page gives the latest action taken by this organization on your application. This page is made available for the information of concerned applicant/licensee only. For documentry purposes, only the original documents issued under the seal and signature of the respective offices of Petroleum & Explosives Safety Organization, shall be valid. All efforts have been made to secure this information. However, PESO will not be responsible for any misuse of the information by unauthorised persons including the hackers.

127 A

128 A

130 A

131 A

From

Thiru. L. Sattanathan Sankar, M.Sc.,
Deputy Director,
Geology and Mining,
Tiruppur

To

Thiru. C.K. Chellamuthu,
S/o. Kuppusamy Gounder,
118/8, Kuppana Complex,
Ellis Nagar, Byepass Road,
Dharapuram Taluk.

R.c. No. 176 / Mines / 2017 Dated : 03.07.2017.

Sir,

Sub: Mines and Minerals – Minor Mineral – Rough Stone permission in S.F. No. 872/2 (North Part) of Manakadavu Village – Dharapuram Taluk - total Extent 2.64.0 Hectares – **Thiru. C.K. Chellamuthu, S/o. Kuppusamy Gounder** - Precise area communicated - Submission of Mining Plan – submitted - Approved - regarding.

Ref:
1. Tiruppur District Gazette (Extra-ordinary) Issue No. 6 dated 20.10.2016.
2. Tiruppur District Gazette (Extra-ordinary) Issue No. 1 dated 3.2.2017.
3. G.O. Ms. No. 79 / Industries (MMC 1) Department dated 06.04.2015.
4. The District Collector's, Tiruppur letter R.C. No. 176 / Mines / 2017 dated 24.3.2017.
5. Mining Plan submitted by **Thiru. C.K. Chellamuthu, S/o. Kuppusamy Gounder** in letter dated 13.6.2017.

****

As directed in the reference 4th cited, the applicant **Thiru. C.K. Chellamuthu, S/o. Kuppusamy Gounder** has submitted three copies of Mining Plan prepared by RQP for approval in connection with the grant of Rough Stone Quarry permission in Poramboke land in **S.F. No. 872/2 (North Part) over an extent of 2.64.0 Hectare of Manakadavu Village** of **Dharapuram Taluk** in **Tiruppur District.**

The Mining Plan has been verified in detail and found that it has been prepared in accordance with the guidelines/ instructions issued by the Commissioner of Geology and Mining in letter RC. No. 3868 / LC / 2012 dated 19.11.2012.

Therefore in exercise of the powers conferred under Rule 41(2) of Tamil Nadu Minor Mineral Concession Rules, 1959, read with G.O. (Ms). No.79 / Industries (MMC 1) Department dated 06.04.2015, the mining plan is hereby approved, subject to the following conditions:

Part-I:-

(i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

(ii) This approval of the mining plan does not in any way convey the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

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

(iv) The validity of the mining plan is co-terminus with the lease period.

(v) Quarrying shall be done in accordance with the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from ti me to time whether such laws are made by the Central Government, State Government or any other authority.

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

Part-II

(a) There is only one minor mineral quarry situated within a radial distance of 500 meters from the applied fields.

S. No	Name of the lessee	S.F. No.	Extent	Status
1	A. Ramadurai	872/2 South Part	2.55.0	Expired.

Encl.: One copy of Approved Mining Plan.

Deputy Director,
Geology and Mining,
Tiruppur

Copy to

1. Thiru. C. Natarajan, M.SC., M.Phil,
   Recognized Qualified Person,
   93/36-E2, Subramaniyar Koil Street,
   Omalur Taluk, Salem District.

2. The Commissioner,
   Geology and Mining, Chennai -32.

From

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

To

Thiru. N. Ramalingam,
S/o. V.S. Nachimuthu Gounder,
No. 46, Velankattu Valasu,
Avalpoondurai village,
Erode District – 638 115.

R.c. No. 266/2020/Mines Dated : 07.09.2020.

Sub: Mines and Minerals – Minor Mineral – Rough Stone– Tiruppur District – Dharapuram Taluk – Manakadavu village – Poramboke land in S.F. No. 872/2 South Part over an extent of 1.96.5 Hect. – Tender application preferred by Thiru. N. Ramalingam, S/o. V.S. Nachimuthu Gounder – Declared as successful bidder – Revised Precise area communicated - Draft mining plan submitted – Approval - accorded –Regarding..

Ref:
1. Tiruppur District Gazette (Extra-ordinary) Issue No. 1 dated 25.02.2020.
2. Thiru. N. Ramalingam, S/o. V.S. Nachimuthu Gounder, No. 46, Velankattu Valasu, Avalpoondurai village, Erode District – 638 115 tender application dated 19.03.2020.
3. The District Collector's, Tiruppur precise area communication memo R.C. No. 266/2020/Mines dated 15.05.2020.
4. Thiru. N. Ramalingam, S/o. V.S. Nachimuthu Gounder letter dated 04.08.2020.
5. This office letter of even number dated:07.07.2020
6. The Deputy Director, Geology and Mining Tiruppur revised precise area communication memo R.C. No. 266/2020/Mines dated 14.08.2020.
7. Thiru. N. Ramalingam, S/o. V.S. Nachimuthu Gounder letter dated 01.09.2020.

****

1. Tender Cum Auction has been conducted for stone quarry situated in S.F. No. 872/2 (South Part) over an extent of 2.55.0 Hect. of Government land of Manakadavu village on 19.03.2020 and conducting Tender Cum Auction Thiru. N. Ramalingam has been declared as a successful bidder.

2. Since, he has remitted entire tender amount, precise area has been communicated to the applicant vide memo dated 15.05.2020 with a direction to submit mining plan and Environmental Clearance over an extent of 2.55.0 Hect. only in S.F. No.

872/2 (South Part) of Manakadavu village as stipulated in rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the mining plan was approved vide letter dated 07.07.2020. In the mean time, the applicant has requested to reduce an extent of 0.58.5 Hect for EB line from the total extent of 2.55.0 Hect. and to grant a quarry lease to an extent of 1.96.5 Hect. only in S.F. No. 872/2 South Part.

3. Based on reports and records available, revised precise area has been communicated to the applicant with a direction to submit mining plan and also to submit environmental clearance as stipulated in rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 vide memo dated 14.08.2020.

4. Accordingly, Thiru. N. Ramalingam, S/o. V.S. Nachimuthu Gounder has submitted the Draft Mining Plan over an etent of 1.96.5 hects and the same has been examined in detail and it is found correct. Therefore, in exercise of the powers delegated under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, and as per the guidelines / instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Roc.No.3868/LC/2012 dated 19.11.2012, the mining plan submitted by Thiru. N. Ramalingam, S/o. V.S. Nachimuthu Gounder in respect of the subject area is hereby 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). Safety distances mentioned in the precise area has to be maintained for the entire duration of the lease period.

(vii). Waste material should be dumped within the lease granted area as earmarked in the Mining Plan.

(viii). Necessary environmental Clearance has to be obtained by the applicant from the competent authority before the grant of quarry lease as per the rules.

(ix). Quarrying operations and production shall be carried out as per the approved Mining Plan and the applicant shall 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.

(x). If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules shall attract.

(xi). The applicant should strictly adhere to the statutory and safety requirements.

Encl: Approved Mining Plan.

07.9.2020

Deputy Director,
Geology and Mining,
Tiruppur.

Copy to

1. The Director,
   Department of Geology and Mining,
   Guindy, Chennai - 600 032.

2. The Chairman ,
   State Level Environment Impact Assessment Authority,
   Panagal park Building, Saidapet, Chennai -600 015.

3. Thiru. A. Jagannathan, RQP,
   Reg.off.No.17, Advaitha Ashram Road,
   Alagapuram, Salem-636 004.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/001	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/001
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ1 Core zone - Project Area 10°40'31.92"N 77°33'41.38"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	45.2	20.6	8.2	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	45.9	20.2	7.9	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	46.2	20.5	7.3	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	47.1	20.5	8.6	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	45.5	21.8	7.4	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	43.1	20.1	8.1	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	48.9	20.1	6.2	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	46.1	20.5	6.6	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	46.8	21.0	6.3	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	47.5	21.5	6.9	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	46.2	21.8	6.8	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	46.9	20.1	7.9	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	48.1	20.8	7.7	24.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	47.2	20.7	7.5	24.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	43.5	20.4	7.8	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	43.9	21.4	5.9	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	46.2	21.8	6.5	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	46.9	21.4	6.8	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	47.1	20.1	6.2	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	45.8	20.8	7.7	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	46.5	20.4	7.3	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	47.1	20.9	7.5	25.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	46.6	21.1	8.8	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	46.1	21.5	7.4	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	46.2	21.1	7.8	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	46.1	20.2	8.1	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<80	<80	<100	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit

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

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
140 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/001	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/001
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ1 Core zone - Project Area 10°40'31.92"N 77°33'41.38"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	66.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	66.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	67.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	64.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	64.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	66.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	64.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
141 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/002	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/002
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 2 – Core Zone - Near Crusher Area - 10°40'49.72"N 77°33'48.53"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	43.5	19.2	7.5	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	42.1	19.6	7.0	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	42.9	20.9	7.2	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	42.5	20.1	8.3	21.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	42.1	18.9	8.4	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	41.6	19.3	7.2	20.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	42.1	19.6	7.6	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	42.8	18.9	6.7	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	43.6	18.5	5.6	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	42.5	19.2	6.5	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	41.1	20.8	7.1	21.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	42.5	20.2	7.3	21.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	44.2	21.9	6.7	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	43.6	21.6	6.9	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	43.1	19.3	6.5	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	43.5	18.8	6.6	22.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	42.1	19.7	5.9	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	41.9	20.1	5.2	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	42.5	19.2	6.3	21.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	43.9	18.9	6.4	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	41.8	18.5	6.5	21.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	42.5	19.2	6.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	42.2	20.9	8.1	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	43.9	21.2	7.4	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	44.2	21.9	7.5	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	42.6	20.5	6.6	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<60	<80	<80	<100	<400

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
142 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/002	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/002
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 2 – Core Zone - Near Crusher Area - 10°40'49.72"N 77°33'48.53"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	67.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	68.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	67.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	68.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	68.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	67.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	67.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
143 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/003	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/003
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ3 – Manakadavu - 10°53'3.31"N 77°32'59.19"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	42.1	20.5	6.8	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	41.6	21.2	6.4	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	43.6	19.8	6.8	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	44.1	20.1	6.1	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	42.8	21.5	5.9	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	43.5	20.9	6.3	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	42.8	20.2	6.9	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	42.5	19.3	7.2	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	41.6	19.9	6.3	24.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	43.2	19.2	6.6	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	45.1	20.3	6.8	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	43.9	20.5	6.5	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	43.1	20.4	5.9	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	44.5	21.0	6.3	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	43.1	20.2	6.5	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	42.6	20.2	6.4	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	44.7	21.1	6.8	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	42.2	21.5	6.3	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	43.1	22.9	6.7	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	44.1	21.5	6.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	42.8	20.1	6.6	24.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	41.2	21.2	6.5	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	42.8	20.8	6.3	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	43.7	19.6	6.5	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	43.8	19.2	6.9	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	43.6	20.9	6.5	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<60	<80	<80	<100	<400

Note: BDL: Below Detection Limit ;DL: Detection Limit

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

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
144 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/003	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/003
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ3 – Manakadavu - 10°53'3.31"N 77°32'59.19"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	64.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	68.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	64.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	64.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	64.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	62.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	64.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	63.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	64.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	63.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	67.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
145 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/004	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/004
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ4 – Pungamuthur - 10°37'24.58"N 77°34'2.30"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	43.2	19.8	6.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	42.6	19.2	6.5	21.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	42.8	19.8	7.8	21.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	42.6	20.5	7.4	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	43.1	21.3	7.2	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	43.9	21.2	7.8	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	42.8	19.8	6.4	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	42.5	19.3	6.1	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	42.8	18.5	6.9	22.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	41.9	21.6	6.7	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	43.2	20.6	6.4	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	43.6	18.3	6.8	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	42.7	21.9	6.5	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	43.5	20.5	7.9	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	43.1	21.6	7.1	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	42.6	19.9	7.3	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	42.9	19.6	6.7	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	43.6	20.1	6.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	44.2	21.5	6.8	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	43.8	20.6	6.2	24.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	42.1	20.1	6.7	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	42.9	19.8	7.3	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	43.6	20.9	7.7	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	43.1	21.6	7.3	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	42.6	20.2	7.4	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	44.1	21.1	7.6	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<60	<80	<80	<100	<400

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
146 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/004	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/004
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ4 – Pungamuthur - 10°37'24.58"N 77°34'2.30"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	62.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	62.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	62.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	64.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	64.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	62.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	65.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	66.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	62.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	63.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	63.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
147 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/005	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/005
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ5 – Elugamvalasu - 10°41'45.27"N 77°37'8.56"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	42.9	25.4	6.3	24.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	45.4	21.3	5.9	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	43.3	23.8	5.4	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	43.7	24.1	7.8	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	42.4	23.6	5.9	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	42.6	22.1	5.8	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	45.1	21.3	5.1	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	43.4	23.8	7.3	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	43.8	23.9	6.3	20.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	41.9	22.4	5.8	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	43.6	20.7	7.9	20.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	42.4	22.5	6.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	42.5	21.4	8.5	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	44.7	23.6	5.9	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	43.4	23.8	6.4	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	42.5	21.7	7.7	21.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	41.9	24.4	5.3	20.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	42.4	23.7	6.9	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	43.6	22.3	5.8	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	45.4	25.4	6.3	25.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	46.6	23.6	5.9	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	43.7	26.4	7.4	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	42.8	25.9	6.2	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	41.9	26.3	5.6	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	42.6	25.7	7.2	21.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	42.7	24.3	6.9	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<60	<805	<80	<100	<400

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
148 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/005	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/005
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ5 – Elugamvalasu - 10°41'45.27"N 77°37'8.56"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	65.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	63.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	64.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	65.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	63.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	65.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	62.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	63.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	63.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	62.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	64.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	61.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	63.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	62.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory
Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
149 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/006	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/006
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 6 – Achiyur Pudur 10°42'31.68"N 77°32'34.42"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	43.7	20.3	6.8	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	41.9	20.1	6.3	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	42.6	20.6	6.1	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	43.8	21.2	5.8	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	42.7	21.5	5.2	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	43.5	21.8	5.8	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	41.6	20.7	7.3	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	43.6	20.8	7.0	22.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	42.5	20.1	7.8	25.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	44.9	20.2	7.6	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	41.9	21.1	7.1	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	43.6	21.5	5.8	24.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	42.7	21.5	6.6	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	43.6	21.5	6.5	25.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	41.9	21.9	6.4	24.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	42.5	21.5	5.5	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	43.4	20.1	5.6	25.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	41.9	20.1	5.1	25.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	42.4	20.6	5.6	23.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	41.8	21.5	5.7	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	43.4	22.5	6.2	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	42.7	20.8	6.3	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	43.6	22.6	7.5	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	41.9	22.5	7.1	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	41.9	21.2	7.8	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	42.5	20.8	6.4	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<60	<80	<80	<100	<400

Note: BDL: Below Detection Limit ; **DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
150 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/006	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/006
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 6 – Achiyur Pudur 10°42'31.68"N 77°32'34.42"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	64.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	63.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	63.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	64.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	64.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	64.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	63.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	62.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	63.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	63.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	61.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	63.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	64.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	63.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	64.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	63.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
151 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/007	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/007
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 7 Paruthiyur - 10°39'25.90"N 77°35'57.97"E**		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
02.10.2023	7:00-7:00	43.2	20.3	5.3	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.10.2023	7:15-7:15	43.5	20.9	5.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.10.2023	7:00-7:00	43.9	21.3	5.6	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.10.2023	7:15-7:15	43.7	21.4	5.4	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.10.2023	7:00-7:00	43.5	21.6	5.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.10.2023	7:15-7:15	44.6	21.7	6.5	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.10.2023	7:00-7:00	44.2	20.3	6.1	23.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.10.2023	7:15-7:15	44.3	20.1	6.5	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.10.2023	7:00-7:00	43.5	20.4	6.1	21.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
31.10.2023	7:15-7:15	44.3	19.3	6.4	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.11.2023	7:00-7:00	42.5	19.7	6.8	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
07.11.2023	7:15-7:15	42.6	18.3	6.3	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.11.2023	7:00-7:00	41.6	18.9	6.4	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
14.11.2023	7:15-7:15	42.7	19.4	6.9	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.11.2023	7:00-7:00	44.6	20.3	6.7	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
21.11.2023	7:15-7:15	42.3	21.3	6.8	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.11.2023	7:00-7:00	42.3	23.2	6.1	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
28.11.2023	7:15-7:15	43.8	22.5	6.4	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
04.12.2023	7:00-7:00	43.7	22.4	7.3	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.12.2023	7:15-7:15	43.6	23.5	7.5	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
11.12.2023	7:00-7:00	43.2	21.2	7.6	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.12.2023	7:15-7:15	42.3	21.3	7.1	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
18.12.2023	7:00-7:00	42.9	21.5	7.5	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.12.2023	7:15-7:15	42.7	20.3	7.6	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
25.12.2023	7:00-7:00	42.9	21.3	7.8	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.12.2023	7:15-7:15	42.5	21.5	7.9	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<100	<60	<80	<80	<400	<4

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
152 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/007	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 5182	**Sample Drawn by**	Laboratory
Sample Name	Air	**Sample Code**	EHS360/007
Sample Description	Ambient Air Quality Monitoring	**Sample Condition**	Good
Sampling Location	**AAQ 7 Paruthiyur - 10°39'25.90"N 77°35'57.97"E**		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
02.10.2023	7:00-7:00	62.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.10.2023	7:15-7:15	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.10.2023	7:00-7:00	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.10.2023	7:15-7:15	62.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.10.2023	7:00-7:00	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.10.2023	7:15-7:15	60.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.10.2023	7:00-7:00	60.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.10.2023	7:15-7:15	60.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.10.2023	7:00-7:00	61.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
31.10.2023	7:15-7:15	61.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.11.2023	7:00-7:00	61.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
07.11.2023	7:15-7:15	61.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.11.2023	7:00-7:00	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
14.11.2023	7:15-7:15	59.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.11.2023	7:00-7:00	59.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
21.11.2023	7:15-7:15	60.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.11.2023	7:00-7:00	60.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
28.11.2023	7:15-7:15	61.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
04.12.2023	7:00-7:00	61.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.12.2023	7:15-7:15	61.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
11.12.2023	7:00-7:00	61.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.12.2023	7:15-7:15	61.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
18.12.2023	7:00-7:00	61.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.12.2023	7:15-7:15	61.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
25.12.2023	7:00-7:00	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.12.2023	7:15-7:15	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<200	<100	<60	<80	<80

Note: BDL: Below Detection Limit ;**DL**: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
153 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 008	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 9989	**Sample Drawn by**	Laboratory
Sample Name	Noise Level Monitoring	**Sample Code**	EHS360/ 008
Sample Description	Ambient Noise	**Sample Collected Date**	25-12-2024

Location	**N1 – Core Zone - 10°40'29.72"N 77°33'45.46"E**			**N2 – Near Crusher Area - 10°40'50.39"N 77°33'48.69"E**		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	36.8	38.9	**38.0**	32.6	36.6	**35.0**
07:00-08:00	34.2	38.5	**36.9**	34.5	40.2	**38.2**
08:00-09:00	36.6	40.2	**38.8**	35.2	39.5	**37.9**
09:00-10:00	35.5	39.2	**37.7**	36.8	38.4	**37.7**
10:00-11:00	36.1	41.3	**39.4**	36.9	37.6	**37.3**
11:00-12:00	36.8	43.5	**41.3**	38.1	45.5	**43.2**
12:00-13:00	38.1	41.8	**40.3**	34.9	40.5	**38.5**
13:00-14:00	34.5	47.6	**44.8**	37.2	41.3	**39.7**
14:00-15:00	36.6	45.6	**43.1**	36.2	43.6	**41.3**
15:00-16:00	35.1	45.5	**42.9**	35.9	44.8	**42.3**
16:00-17:00	37.2	47.2	**44.6**	36.5	38.4	**37.6**
17:00-18:00	36.5	45.9	**43.4**	32.5	40.9	**38.5**
18:00-19:00	39.4	46.1	**43.9**	34.4	43.4	**40.9**
19:00-20:00	35.6	41.2	**39.2**	31.2	39.7	**37.3**
20:00-21:00	36.1	44.3	**41.9**	36.9	46.5	**43.9**
21:00-22:00	37.5	45.5	**43.1**	32.5	40.8	**38.4**
22:00-23:00	35.1	46.2	**43.5**	36.1	44.3	**41.9**
23:00-00:00	36.2	40.5	**38.9**	34.1	39.9	**37.9**
00:00-01:00	35.9	40.1	**38.5**	32.9	37.8	**36.0**
01:00-02:00	35.2	39.6	**37.9**	33.5	36.9	**35.5**
02:00-03:00	36.1	41.3	**39.4**	33.7	35.8	**34.9**
03:00-04:00	35.7	40.1	**38.4**	32.5	34.5	**33.6**
04:00-05:00	34.9	38.9	**37.3**	33.4	36.6	**35.3**
05:00-06:00	36.1	36.9	**36.5**	33.5	35.5	**34.6**
Result	Day Means		**41.3**	Day Means		**39.4**
	Night Means		**38.1**	Night Means		**35.4**

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**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
154 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 009	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 9989	**Sample Drawn by**	Laboratory
Sample Name	Noise Level Monitoring	**Sample Code**	EHS360/ 009
Sample Description	Ambient Noise	**Sample Collected Date**	25-12-2024

Location	**N3–Mudhallpalayam- 10°40'23.57"N 77°32'21.30"E**			N4 – Pungamuthur - 10°37'24.74"N 77°34'1.00"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	35.5	38.7	**37.4**	32.5	45.9	**43.1**
07:00-08:00	36.1	37.6	**36.9**	38.4	47.3	**44.8**
08:00-09:00	34.3	35.5	**34.9**	36.5	42.9	**40.8**
09:00-10:00	35.9	38.9	**37.7**	32.6	45.1	**42.3**
10:00-11:00	34.1	41.3	**39.0**	38.4	41.3	**40.1**
11:00-12:00	35.5	42.5	**40.3**	36.5	44.8	**42.4**
12:00-13:00	37.2	46.7	**44.2**	35.9	42.3	**40.2**
13:00-14:00	34.2	49.2	**46.3**	36.3	44.7	**42.3**
14:00-15:00	31.8	49.7	**46.8**	36.7	48.2	**45.5**
15:00-16:00	34.5	45.6	**42.9**	35.7	44.2	**41.8**
16:00-17:00	35.1	44.3	**41.8**	36.8	41.3	**39.6**
17:00-18:00	31.5	48.2	**45.3**	35.4	43.5	**41.1**
18:00-19:00	31.5	46.7	**43.8**	39.4	47.2	**44.9**
19:00-20:00	38.4	46.9	**44.5**	37.6	44.9	**42.6**
20:00-21:00	34.8	47.2	**44.4**	38.2	41.5	**40.2**
21:00-22:00	32.6	41.6	**39.1**	35.4	40.9	**39.0**
22:00-23:00	35.8	46.3	**43.7**	36.5	44.2	**41.9**
23:00-00:00	31.9	38.5	**36.3**	35.2	43.5	**41.1**
00:00-01:00	34.2	39.4	**37.5**	32.9	41.8	**39.3**
01:00-02:00	32.8	39.8	**37.6**	34.1	44.5	**41.9**
02:00-03:00	33.7	38.9	**37.0**	32.6	39.4	**37.2**
03:00-04:00	32.8	36.8	**35.2**	35.6	40.5	**38.7**
04:00-05:00	33.5	35.5	**34.6**	35.4	42.7	**40.4**
05:00-06:00	33.8	39.6	**37.6**	32.5	38.4	**36.4**
Result	Day Means		**41.7**	Day Means		**41.9**
	Night Means		**36.6**	Night Means		**39.3**

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
155 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 010	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 9989	**Sample Drawn by**	Laboratory
Sample Name	Noise Level Monitoring	**Sample Code**	EHS360/ 010
Sample Description	Ambient Noise	**Sample Collected Date**	25-12-2024

Location	N5– Elugamvalasu 10°41'45.22"N 77°37'7.41"E			N6 – Achiyur Pudur - 10°42'32.08"N 77°32'34.43"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	32.7	40.6	**38.2**	32.9	40.6	**38.3**
07:00-08:00	32.9	42.9	**40.3**	31.4	35.2	**33.7**
08:00-09:00	35.2	45.6	**43.0**	36.7	40.6	**39.1**
09:00-10:00	36.4	48.2	**45.5**	36.2	42.1	**40.1**
10:00-11:00	37.9	47.3	**44.8**	33.9	45.2	**42.5**
11:00-12:00	35.4	43.7	**41.3**	35.4	44.6	**42.1**
12:00-13:00	36.3	44.9	**42.5**	36.8	41.5	**39.8**
13:00-14:00	36.2	45.2	**42.7**	32.4	39.2	**37.0**
14:00-15:00	35.9	46.8	**44.1**	33.5	42.8	**40.3**
15:00-16:00	34.2	43.4	**40.9**	35.7	44.2	**41.8**
16:00-17:00	35.5	46.2	**43.5**	34.1	43.7	**41.1**
17:00-18:00	36.8	44.7	**42.3**	33.7	41.9	**39.5**
18:00-19:00	34.5	42.9	**40.5**	32.8	40.5	**38.2**
19:00-20:00	36.8	44.7	**42.3**	35.5	44.2	**41.7**
20:00-21:00	34.4	45.4	**42.7**	36.7	45.4	**42.9**
21:00-22:00	36.2	44.7	**42.3**	35.4	43.9	**41.5**
22:00-23:00	35.8	46.2	**43.6**	32.9	40.4	**38.1**
23:00-00:00	31.5	40.7	**38.2**	33.6	41.8	**39.4**
00:00-01:00	32.7	43.2	**40.6**	34.8	41.3	**39.2**
01:00-02:00	31.6	40.7	**38.2**	31.2	39.5	**37.1**
02:00-03:00	32.5	41.9	**39.4**	32.7	40.4	**38.1**
03:00-04:00	34.2	40.7	**38.6**	31.9	38.2	**36.1**
04:00-05:00	32.6	39.2	**37.1**	32.5	40.7	**38.3**
05:00-06:00	31.9	35.4	**34.0**	31.7	38.5	**36.3**
Result	Day Means		**42.4**	Day Means		**39.9**
	Night Means		**38.0**	Night Means		**37.8**

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
156 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 011	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	IS 9989	**Sample Drawn by**	Laboratory
Sample Name	Noise Level Monitoring	**Sample Code**	EHS360/ 011
Sample Description	Ambient Noise	**Sample Collected Date**	25-12-2024

Location	N7 - Paruthiyur - 10°39'25.64"N 77°35'58.22"E		
Parameter	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)
06:00-07:00	32.7	40.6	**38.2**
07:00-08:00	35.4	46.3	**43.6**
08:00-09:00	36.8	44.5	**42.2**
09:00-10:00	31.8	38.3	**36.2**
10:00-11:00	33.5	42.6	**40.1**
11:00-12:00	31.9	42.3	**39.7**
12:00-13:00	35.7	43.7	**41.3**
13:00-14:00	36.1	47.2	**44.5**
14:00-15:00	31.5	42.7	**40.0**
15:00-16:00	32.9	43.5	**40.9**
16:00-17:00	33.7	41.7	**39.3**
17:00-18:00	32.9	40.6	**38.3**
18:00-19:00	31.4	42.5	**39.8**
19:00-20:00	33.5	44.2	**41.5**
20:00-21:00	31.6	42.7	**40.0**
21:00-22:00	32.8	41.5	**39.0**
22:00-23:00	34.5	43.2	**40.7**
23:00-00:00	31.8	42.4	**39.8**
00:00-01:00	32.5	41.3	**38.8**
01:00-02:00	33.7	41.7	**39.3**
02:00-03:00	31.5	39.5	**37.1**
03:00-04:00	33.9	41.4	**39.1**
04:00-05:00	32.7	40.2	**37.9**
05:00-06:00	31.5	38.4	**36.2**
Result	Day Means		**40.3**
	Night Means		**38.3**

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
157 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 012	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 012
Sample Description	Soil 1	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	Core Zone		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.61
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	453 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	45.8 %
04	Bulk Density	By Cylindrical Method	1.06 g/cm^3
05	Porosity	By Gravimetric Method	46.5 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	41.2 mg/kg
07	Magnesium as Mg		28.4 mg/kg
08	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	38 mg/kg
09	Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0014 %
10	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	4.01 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	455.36 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.31 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	0.76 %

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
158 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 012	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 012
Sample Description	Soil 1	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	Core Zone		

S. No	Test Parameters	Protocols	Results
14	**Texture :**		
	Clay	Gravimetric Method	32.5 %
	Sand		30.9 %
	Silt		36.6 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	11.2 mg/kg
16	Zinc as Zn		2.66 mg/kg
17	Boron as B		2.5 mg/kg
18	Potassium as K		27.7 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		1.52
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.61 mg/kg
23	Iron as Fe		4.10 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	39.5 meq/100g of soil

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
159 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 013	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 013
Sample Description	Soil 2	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 2 - Manakadavu**		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.55
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	401 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	47.7 %
04	Bulk Density	By Cylindrical Method	1.05 g/cm^3
05	Porosity	By Gravimetric Method	44.6 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	70 mg/kg
07	Magnesium as Mg		60.5 mg/kg
08	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	17 mg/kg
09	Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0015 %
10	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	5.11 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	398 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	3.25 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.89 %

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
160 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 013	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 013
Sample Description	Soil 2	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 2 - Manakadavu**		

S. No	Test Parameters	Protocols	Results
14	**Texture :**		
	Clay	Gravimetric Method	30.9 %
	Sand		31.6 %
	Silt		37.5 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	20.5 mg/kg
16	Zinc as Zn		8 mg/kg
17	Boron as B		2.59 mg/kg
18	Potassium as K		38 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		1.95 mg/kg
23	Iron as Fe		1.44 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	35.5 meq/100g of soil

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
161 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 014	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 014
Sample Description	Soil 3	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 3 - Pungamuthur**		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.17
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	350 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	46.1 %
04	Bulk Density	By Cylindrical Method	1.01 g/cm^3
05	Porosity	By Gravimetric Method	47.3 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	25.1 mg/kg
07	Magnesium as Mg		29 mg/kg
08	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	21.5 mg/kg
09	Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0011 %
10	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	2.93 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	400.15 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.13 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.24 %

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
162 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TESTREPORT

Report No	EHS360/TR/2022-23/ 014	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 014
Sample Description	Soil 3	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 3 - Pungamuthur**		

S.No	Test Parameters	Protocols	Results
14	**Texture :**		
	Clay	Gravimetric Method	34.2 %
	Sand		31.5 %
	Silt		34.3 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	14.5 mg/kg
16	Zinc as Zn		4.2 mg/kg
17	Boron as B		3.33 mg/kg
18	Potassium as K		6.25 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		1.83
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		0.91 mg/kg
23	Iron as Fe		5.65 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	45.1 meq/100g of soil

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
163 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 015	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 015
Sample Description	Soil 4	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 4 – Elugamvalasu**		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.06
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	542 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	47.2. %
04	Bulk Density	By Cylindrical Method	1.05 g/cm^3
05	Porosity	By Gravimetric Method	46.6 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	81.2 mg/kg
07	Magnesium as Mg		63 mg/kg
08	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	35 mg/kg
09	Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0026 %
10	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	2.10 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	416.2 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.57 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	0.91 %

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
164 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 015	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 015
Sample Description	Soil 4	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 4 – Elugamvalasu**		

S. No	Test Parameters	Protocols	Results
14	**Texture :**		
	Clay	Gravimetric Method	33.2 %
	Sand		32.6 %
	Silt		34.2 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	17.2 mg/kg
16	Zinc as Zn		4.10 mg/kg
17	Boron as B		1.05 mg/kg
18	Potassium as K		29.1 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		3.44
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		1.52 mg/kg
23	Iron as Fe		2.16 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	33.2 meq/100g of soil

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
165 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 016	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 016
Sample Description	Soil 5	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 5 – Achiyur Pudur**		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.03
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	256 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	44.2 %
04	Bulk Density	By Cylindrical Method	1.10 g/cm^3
05	Porosity	By Gravimetric Method	42 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	42.6 mg/kg
07	Magnesium as Mg		27.5 mg/kg
08	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	21 mg/kg
09	Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0021 %
10	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	2.56 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	425.14 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.29 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.33 %

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
166 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 016	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 016
Sample Description	Soil 2	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 5 – Achiyur Pudur**		

S. No	Test Parameters	Protocols	Results
14	**Texture :**		
	Clay	Gravimetric Method	30.5 %
	Sand		32.9 %
	Silt		36.6 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	11.2 mg/kg
16	Zinc as Zn		1.23 mg/kg
17	Boron as B		3.35 mg/kg
18	Potassium as K		1.5 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		3.11
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		2.15 mg/kg
23	Iron as Fe		9.54 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	40.2 meq/100g of soil

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
167 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 017	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 017
Sample Description	Soil 6	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 6 - Paruthiyur**		

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.05
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	400 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	45.5 %
04	Bulk Density	By Cylindrical Method	1.05 g/cm^3
05	Porosity	By Gravimetric Method	46.1 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	41.5 mg/kg
07	Magnesium as Mg		25 mg/kg
08	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	34.2 mg/kg
09	Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0015 %
10	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	3.88 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	420 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.12 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.23 %

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
168 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 017	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Soil	**Sample Code**	EHS360/ 017
Sample Description	Soil 6	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 KG	**Sample Received On**	25-12-2024
Sample Condition	Good	**Test Commenced On**	27-12-2024
Sampling Location	**Soil – 6 - Paruthiyur**		

S. No	Test Parameters	Protocols	Results
14	**Texture :**		
	Clay	Gravimetric Method	31.7 %
	Sand		30.0 %
	Silt		38.3 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	22.7 mg/kg
16	Zinc as Zn		3.14 mg/kg
17	Boron as B		1.09 mg/kg
18	Potassium as K		17 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		5.0
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		2.66 mg/kg
23	Iron as Fe		3.43 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	40.1 meq/100g of soil

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
169 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 018	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/018
Sample Description	Surface Water (SW-1)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Amaravathi River**		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical		
1	Colour	IS 3025 Part 4:1983	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.55
4	Conductivity @ 25°C	IS 3025 Part 14:2013	895 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	6.3 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	529 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009	170.18 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	30.8 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	22.7 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986	169 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	97.2 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986	58 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.25 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	0.15 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988	12.2 mg/l

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
170 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/018	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/018
Sample Description	Surface Water (SW-1)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Amaravathi River**		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	9.2 mg/l
32	Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	50 mg/l
33	Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.5 mg/l
34	Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
35	Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	1.8 mg/l
36	Sulphide as H_2S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
37	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
38	Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
39	Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	20 mg/l
	Discipline: Biological	**Group:** Water	
40	Total Coliform	APHA 23rd Edn. 2017:9221B	490 MPN/100ml
41	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	100 MPN/100ml

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
171 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 019	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/019
Sample Description	Surface Water (SW-2)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Paruthiyur Lake**		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical		
1	Colour	IS 3025 Part 4:1983	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.27
4	Conductivity @ 25°C	IS 3025 Part 14:2013	864 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	5.1 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	510 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009	186.52 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	32.9 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	25.4 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986	164.2 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	95.7 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986	47.3 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.18 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	0.11 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988	7.86 mg/l

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
172 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/019	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/019
Sample Description	Surface Water (SW-2)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Paruthiyur Lake**		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	7.8 mg/l
32	Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	30 mg/l
33	Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.45 mg/l
34	Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
35	Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	1.09 mg/l
36	Sulphide as H_2S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
37	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
38	Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
39	Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	15.3 mg/l
	Discipline: Biological	**Group:** Water	
40	Total Coliform	APHA 23rd Edn. 2017:9221B	640 MPN/100ml
41	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	150 MPN/100ml

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
173 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/020	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/020
Sample Description	Ground Water (WW-1)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Near Project Area**		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical		
1	Colour	IS 3025 Part 4:1983	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	6.75
4	Conductivity @ 25°C	IS 3025 Part 14:2013	992 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	1.0 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	586 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009	209.69 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	37.9 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	28.0 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986	200 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	110 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986	75.1 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.19 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	0.24 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988	3.10 mg/l

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
174 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 020	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/020
Sample Description	Ground Water (WW-1)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Near Project Area**		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Sulphide as H_2S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
37	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
38	Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
39	Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	BDL (DL:0.0005 mg/l)
	Discipline: Biological	**Group:** Water	
40	Total Coliform	APHA 23rd Edn. 2017:9221B	175 MPN/100ml
41	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	< 1.8 MPN/100ml

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
175 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 021	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/021
Sample Description	Ground Water (WW-2)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Achiyur Pudur**		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical		
1	Colour	IS 3025 Part 4:1983	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.53
4	Conductivity @ 25°C	IS 3025 Part 14:2013	1059 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	1.0 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	625 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009	204.39 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	33.8 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	29.2 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986	205 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	137 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986	70.1 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.21 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	0.18 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988	5.11 mg/l

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
176 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 021	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/021
Sample Description	Ground Water (WW-2)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Achiyur Pudur**		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H_2S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	**Group:** Water	
37	Total Coliform	APHA 23rd Edn. 2017:9221B	105 MPN/100ml
38	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	< 1.8 MPN/100ml

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
177 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 022	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/022
Sample Description	Ground Water (BW-1)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Near Project Area**		

S.No	Parameters	Test Method	RESULTS
Discipline: Chemical			
1	Colour	IS 3025 Part 4:1983	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.22
4	Conductivity @ 25°C	IS 3025 Part 14:2013	835 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	1.0 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	493 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009	163.06 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	29.1 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	22.0 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986	160 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	84 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986	52 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.19 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	0.36 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988	5. mg/l

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
178 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 022	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/022
Sample Description	Ground Water (BW-1)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Near Project Area**		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H_2S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	**Group:** Water	
37	Total Coliform	APHA 23rd Edn. 2017:9221B	130 MPN/100ml
38	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	< 1.8 MPN/100ml

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
179 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

EHS 360 LABS PRIVATE LIMITED

TC-9583

TEST REPORT

Report No	EHS360/TR/2022-23/ 023	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/023
Sample Description	Ground Water (BW-2)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Pungamuthur**		

S.No.	Parameters	Test Method	RESULTS
	Discipline: Chemical		
1	Colour	IS 3025 Part 4:1983	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.01
4	Conductivity @ 25°C	IS 3025 Part 14:2013	986 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	1.0 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	582 mg/l
7	Total Hardness as $CaCO_3$	IS 3025 Part 21:2009	177.97 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	30.3 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	24.9 mg/l
10	Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986	188 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	125.4 mg/l
12	Sulphate as SO_4	IS 3025 Part 24:1986	70 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.13 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	0.16 mg/l
16	Nitrate as NO_3	IS 3025 Part 34:1988	4.48 mg/l

**********End of Report**********

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Verified by

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
180 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai - 600083.

EHS 360 LABS PRIVATE LIMITED

TEST REPORT

Report No	EHS360/TR/2022-23/ 023	**Report Date**	05-01-2024
Site Location	**TMT. V. MAHESHWARI ROUGH STONE AND GRAVEL QUARRY** S.F. Nos. 863(P), Manakkadavu Village, Dharapuram Taluk, Tiruppur District, Tamil Nadu,Extent: 3.00.0 Ha		
Sampling Method	SOP Method	**Sample Drawn by**	Laboratory
Sample Name	Water	**Sample Code**	EHS360/023
Sample Description	Ground Water (BW-2)	**Sample Collected Date**	25-12-2024
Qty. of Sample Received	2 Litres	**Sample Received On**	25-12-2024
Sample Condition	Fit for Analysis	**Test Commenced On**	27-12-2024
Sampling Location	**Pungamuthur**		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H_2S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	Discipline: Biological	**Group:** Water	
37	Total Coliform	APHA 23rd Edn. 2017:9221B	150 MPN/100ml
38	*Escherichia coli*	APHA 23rd Edn. 2017:9221F	< 1.8 MPN/100ml

**********End of Report**********

Verified by

EHS360 LABS PRIVATE LIMITED CHENNAI 600 083

Authorised Signatory

Name : Santhosh Kumar A

Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

E: info@ehs360labs.com
W: ehs360labs.com
181 A
10/2, Ground Floor, 50th Street, 7th Avenue
Ashok Nagar, Chennai – 600083.

QUALITY COUNCIL® OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Exploration & Mining Solutions, Salem

No. 17, Advaitha Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

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

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals opencast only	1	1 (a) (i)	A
2	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	B
3	Building and construction projects	38	8(a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 20, 2023

Certificate No.
NABET/EIA/2225/RA 0276

Valid up to
August 06, 2025

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