DRAFT ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

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

"B1" CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND

CLUSTER EXTENT = 8.79.6 hectares

ROUGHSTONE AND GRAVEL QUARRY

at

K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu State

ToR File No.10798

ToR Identification No. TO24B0108TN5203883N, dated.31/05/2024

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Production in m^3
M/s. Shree Thevar Blue Metals S.F. No's: 295/1, 295/1A, 295/2 & 295/3, Kothapulli Village, Reddiarchatram, Dindigul District – 624622.	2.43.0ha & 244/1A, 244/2A1, 244/2A2	Rough stone – 419186 Gravel – 38404

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

No: 1/213-B, Ground Floor, Natesan Complex
Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.
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NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: 31.12.2026

ENVIRONMENTAL LAB

EKDANT ENVIRO SERVICES (P) LTD

No R7/1, AVK Tower, North Main Road,
Anna Nagar West Extn., Chennai-101, Tamil Nadu
NABL Certificate Number: TC-11742, Valid Until : 31.05.2025

Baseline Study Period

November 2021 through January 2022

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.10798

ToR Identification No. TO24B0108TN5203883N, dated.31/05/2024

Shree Thevar Blue Metals, Rough Stone and Gravel Quarry

Specific Terms of Reference for (Mining of Minerals)

1. SEIAA Specific Conditions:

S.No	Terms of Reference		
1.1	1	The detailed studies on the Loss of Vegetation, Loss of Biodiversity shall be carried out and the action plan to prevent the same shall be included in the EIA report.	A study on the loss of vegetation and biodiversity in the project area and surrounding areas is discussed in the Section 3.5 under Chapter III in the EIA report page 63-81.
	2	The detailed studies on the Impact on water bodies and human health shall be carried out and the action plan to prevent the same shall be included in the EIA report.	A detailed study of water bodies is discussed in the Section 3.2 under Chapter III in the EIA report page 40-49 and human health has been carried out, is discussed in the Section 3.6 under Chapter III in the EIA report page 81-85.
	3	The PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry by involving any one of the reputed Research and Academic Institution. A copy of such scientific study report shall be included in the EIA report.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III in the EIA report page 40-49.
	4	The PP shall carry out the scientific studies with prior permission from the DMS/Chennai Region, to design the controlled blast parameters for reducing the blast-induced ground/air - vibrations and	This is a fresh lease quarry, so there is no require the vibration study.

		eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution. A copy of such scientific study report shall be included in the EIA report.	
	5	The PP shall carry out the scientific studies to assess the slope stability of the working benches and existing quarry wall by involving any one of the reputed Research and Academic Institutions. A copy of such scientific study report shall be included in the EIA report.	This is a fresh lease quarry, so there is no require the Slope stability study.

2. SEAC Conditions - Site Specific

S.No	Terms of Reference		
2.1	1	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs of adequate fencing, green belt along the periphery of the project area and the photographs showing nearby water bodies will be included in final EIA report.
	2	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	The drone video will be submitted during final EIA presentation.
	3	The PP shall propose the mitigation measures for the protection of structures exists within 500 m	All types of mine mitigation measures like, blast-induced ground & air vibrations, air & water pollution, haul

		distance radially from the mine lease against the blast-induced ground & air vibrations, air & water pollution, haul road maintenance, ground water management.	road maintenance, ground water managements is discussed under the Chapter IV in the EIA report page 91-109.

3. SEAC Standard Conditions

S.No	Terms of Reference			
3.1	1	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:		
		(i)	Original pit dimension	It is a fresh quarry lease area and so the condition is not applicable.
		(ii)	Quantity achieved Vs EC Approved Quantity	
		(iii)	Balance Quantity as per Mineable Reserve calculated.	
		(iv)	Mined our Depth as on date Vs EC permitted depth	
		(v)	Details of illegal/illicit mining	
		(vi)	Violation in the quarry during the past working.	
		(vii)	Quantity of material mined out outside the mine lease area	
		(viii)	Condition of Safety zone/benches	
		(ix)	Revised/Modified Mining plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	

	2	Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.	The VAO certificate is attached in Annexure IV.
	3	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m, (iv) 300 m, (v) 500 m with details such as dwelling houses with number of occupants, whether it belongs to the owner or not, places of worship, industries, factories, sheds, etc with indicating the owner of the building nature of construction, age of the building, number of residents, their profession and income, etc.	There are no structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 500m from the proposed project area. The map showing the area of 50m, 100m, 200m, 300m, 500m will be submitted in the final EIA report.
	4	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the water bodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III in the EIA report page 40-49.
	5	The proponent shall carry out Bio diversity study through reputed institution and the same shall be included in EIA Report.	The details of Bio diversity from the reputed institution will be submitted in the final EIA report.
	6	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas,	The DFO letter will be attached in the final EIA report.

		Sanctuaries, Tiger reserve etc, up to a radius of 25 km from the proposed site.	
	7	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions – CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg. Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	It is a fresh quarry lease area and so the condition is not applicable.
	8	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed	It is a fresh quarry lease area and so the condition is not applicable.

		quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	
	9	The PP Shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR l96l such as blaster. mining mate, mine foreman. II/I Class mines manager appointed by the proponent.	The affidavit for blasting has been enclosed in the approved mining plan report in Annexure III.
	10	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	A conceptual design of blasting has been given in Section 2.6 under Chapter II, in the EIA report page 20-27.
	11	The EIA coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	There is no quarry lease granted in my name independently or combined so far in Tamil Nādu.

	12	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016. then the proponent shall furnish the following details from AD/DD, mines,	
	13	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	It is a fresh quarry lease area and so the condition is not applicable.
	14	Quantity of minerals mined out.	
		• Highest production achieved in any one year	
		• Detail of approved depth of mining.	
		• Actual depth of the mining achieved earlier.	
		• Name of the person already mined in that lease area.	
		• If EC and CTO already obtained, the copy of the same shall be submitted.	
		• Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
	15	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3, under Chapter II, in the EIA report page 12.

		and other ecological features of the study area (core and buffer zone).	
	16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	The drone video will be submitted during final EIA presentation.
	17	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs of adequate fencing, green belt of the project will be included in final EIA report.
	18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, The anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for The same.	The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. The plate used for reserve estimation has been presented in Figure 2.5 results of geological resources and reserves have been shown in Table 2.3. under Chapter II. In the EIA report page 13-16.
	19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure	Details of manpower required for this project have been given in Table 2.14 under Chapter II in the EIA report page 27.

		safety and to protect the environment.	
	20	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of 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.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III in the EIA report page 40-49.
	21	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III in the EIA report page 28-90.
	22	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.120-123.

		terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	
	23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.
	24	Land use of the study area delineating forest area, agricultural land, gazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III in the EIA report page 29-39. The details of surrounding sensitive ecological features have been provided in Table 3.44 under Chapter III in the EIA report page 88. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II in the EIA report page 23.

	25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&R issues. If any, should be provided.	This condition is not applicable to this project because no dumps have been proposed outside the lease area.
	26	Proximity to Areas declared as 'Critically Polluted, (or) the project areas which attracts the court restrictions for mining operations. Should also be indicated and where so required. Clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
	27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.
	28	Impact on local transport infrastructure due to the project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III in the EIA report page 86-87.
	29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc,) both within the mining lease applied area & 300m	A detailed tree survey was caried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III in the EIA report page 63-81.

		buffer zone and its management during mining activity.	
	30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II in the EIA report page 23.
	31	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.
	32	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University 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.	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 102-106.

	33	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/Horticulture with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.
	34	A Disaster management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII in the EIA report page 119-120.
	35	A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII in the EIA report page 116-118.
	36	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV in the EIA report page 106-107.

		mitigation measures with required facilities proposed in the mining area may be detailed.	
	37	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII in the EIA report page 125 - 126.
	38	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 20 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 124.
	39	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
	40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII in the EIA report page 124-126.

	41	If any quarrying operation were carried out in the proposed quarrying sile for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	It is a fresh lease quarry and so the condition is not available.
	42	The PP Shall prepare the EMP for the entire life/lease period of mine and also Furnish the sworn affidavit starting to Abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X in the EIA report page 128-134. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final EIA presentation.
	43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act' 1986.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.

4. SEIAA Standard Conditions:

4.1	1	Impacts on Energy requirement.	The energy is not used in this project, so the condition is not applicable.
	2	Impacts on living System (air, water, soil & microorganism).	The impact measurements of living streams (air, water, soil & microorganism) are presented in EIA report under Chapter IV page 91-109.
	3	Impacts on terrestrial & aquatic within and surrounding areas.	
	4	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 furnish the detailed EMP mentioning all the CER activities as committed with the action plan.	The applicant Indents to involve in corporate environment responsibilities (CER) activities such as renovation of existing toilet, plantation within the school premises, donating environment related books to the nearby school library, etc. The details are shown in Table 8.1 under Chapter VIII in the EIA report 126.
	5	All the construction of Buildings shall be energy efficient and confirm to the green building norms.	There are no any sensitive structures, building around the mine lease area. The VAO letter is attached in the Annexure IV.
	6	The proponent shall provide adequate parking facility for vehicles of all the workers & visitors.	The details are given in the Section 2.6 under Chapter II in the EIA report page 20-27.
	7	The proponent shall ensure that no treated or untreated trade effluent/sewage discharged outside the premises under any circumstances.	There is no treated or untreated trade effluent/sewage discharged outside the premises under any circumstances

	8	The disaster management and disaster mitigation standards to be seriously adhered to avoid of calamities.	The disaster management is discussed in the Section 7.3 under Chapter VII in the EIA report page 119-120.
	9	The proponent shall provide the action taken for reduction of greenhouse gas emissions to support the climatic action to make it sustainable buildings.	The action taken for the reduction of greenhouse gases is discussed in the Section 4.6 under Chapter IV in the EIA report page 102-106.
	10	The project proponent shall furnish the action taken to provide adequate parking space for visitors of all inmates including clean traffic plan.	There is no parking in the mine lease area.
	11	The project proponent shall furnish the action taken to improve water usage efficiency in the building.	The PP will be constructed rain water harvesting structure downstream area around 500m radius from the mine lease area.
	12	The project proponent shall conduct detailed study of biodiversity flora & fauna including invasives /endemic vulnerable species.	The detailed study of biodiversity flora & fauna including invasives /endemic vulnerable species is discussed in the Section 3.5 under Chapter III in the EIA report page 63-81.
	13	The project proponent shall furnish NOC obtained from competent authority that there is no encroachment of water bodies (including canals).	The NOC will be submitted in the final EIA report.
	14	The project proponent shall furnish impact of Green House Gases emissions and climate change likely due to activities.	The PP is adviced to use V6 engine vehicles and advance technology to control the greenhouse gases.

	15	The project proponent shall conduct detailed soil investigation including microflora /fauna.	The detailed biological studies were conducted for soil investigation and microflora/fauna is discussed under Chapter III in the EIA report page 63-81.
	16	The project proponent shall study impact on livelihoods of locals.	The socio-economic studies were conducted within 5 km radius from the lease area, the detail study id discussed in the Section 3.7 under Chapter III in the EIA report page 86-87.
	17	The project proponent shall furnish List of trees available in the area.	The list of trees available in the project is discussed in the Section 3.5 under Chapter III in the EIA report page 63-81.
	18	The project proponent shall study impact of activities on water bodies/wetlands.	The impact on water bodies is studied in the Section 4.3 under Chapter IV in the EIA report page 92-93.
	19	The project proponent shall conduct studies on invasive and alien species	The study on bio diversity and alien species is discussed in the Section 3.5 under Chapter III in the EIA report page 63-81.

1. Standard Terms of Reference for (Mining of minerals)

S.No	Terms of Reference	
1.1	An EIA-EMP Report shall be prepared for peak capacity (...MTPA) operation in an ML/project area of.... ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Yes, it is based on the generic structure specified in Appendix III of the EIA Notification, 2006. i.e., the peak capacity of the proposed quarry is 181280 MTPA and operation in an ML/project area of 2.43.0ha.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment	The baseline environment quality represents the background environmental scenario of various environmental

	management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for.... MTPA of mineral production based on approved project/Mining Plan for.... MTPA. Baseline data collection can be for any season (three months) except monsoon.	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 November 2021 - January 2022 with CPCB guidelines. The detailed baseline environmental monitoring studies were carried out and the results are discussed in the Chapter III and the approved mining plan is attached in the Annexure III.
1.3	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided	The KML file with proper pin drop and coordinate of the mine will be uploaded during the online submission.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1:50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where	The details of environmentally sensitive ecological features in the study area are given in the Table 3.44 under Chapter III in the EIA report page 88.

	endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also	
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	The map showing the lease area with cluster details is shown in the Figure 1.1 under Chapter I in the EIA report page 4. The details are given in the Table 3.44 under Chapter III in the EIA report page 88.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	The contour map showing showing the area drainage of the core zone will be submitted in the final EIA report.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ river let system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted.	The Catchment area with its drainage map of 25 km area within and outside the mine will be submitted in the final EIA report.
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working	The reserve details are discussed in the Section 2.5 under Chapter II in the EIA report page 13-19.

	scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.	
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.	The details of mining method, technology, equipment, etc is discussed in the Section 2.6 under Chapter II in the EIA report page 20-27.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	There is no any drainage within or around the lease area. The drainage map showing the details will be submitted in the final EIA report.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within	Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II in the EIA report page 23.

	and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.	There is no any drainage within or around the lease area. The drainage map is shown in Figure 3.1 under Chapter III in the EIA report page 30. The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through NH-83 road connecting Palani Village Road and MDR-966 road connecting K.Pudukottai and the details are shown in Section 3.7 under Chapter III in the EIA report page 86-87.

1.12 Original land use (agricultural land/forestland/grazing land / wasteland / water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights.

S.No	ML/Project Land use	Area under Surface Area Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	
1	Agricultural land	---	---	---	
2	Forest Land	---	---	---	
3	Grazing Land	---	---	---	
4	Settlements	---	---	---	
5	Others (specify)	2.43.0	2.43.0	2.43.0	

S.No	Details	Area (ha)
1	Buildings	---
2	Infrastructure	---
3	Roads	---
4	Others (area under quarry)	2.43.0
Total		**2.43.0**

1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.	The details on flora and fauna have been provided in Section 3.5 under Chapter III in the EIA report page 63-81.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/	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 **November 2021 - January 2022** with CPCB guidelines. Environmental baseline data

	MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.	were collected by an NABL accredited and MoEF notified ***Ekdant Enviro Services (P) Ltd*** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.
1.15	Map (1:50,000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.	The detailed study is discussed in the Chapter III in the EIA report page 28-90.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and	10km baseline study can be conducted only when total cluster area extent of the projects is above 25ha. Here, the proposed cluster

	accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided.	area of the projects is less than 25ha, (i.e,8.79.6ha) and so baseline monitoring study is done for 5 km only. The baseline study of the air quality is discussed in the Section 3.3, in Chapter III in the EIA report page 49-59.
1.17	A detailed traffic study along with presence of habitation in 100m distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.	There is no need of road widening, the details of traffic study are discussed in the Section 3.7 under Chapter III in the EIA report page 86-87. The carbon emission details are discussed in the Section 4.6 under Chapter IV in the EIA report page 102-106.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study also include the status of infrastructural	The socio-economic study is discussed in the Section 3.6 under Chapter III in the EIA report page 81-85.

	facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.	
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	There is no forest within 10km. The Ecology and biodiversity study is discussed in the Section 3.5 under Chapter III in the EIA report page 63-81. To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 29131 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.	The occupational health and safety of the personnel and manpower for the mine is submitted in the Section 4.8 under Chapter IV in the EIA report page 106-107.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	Hydrological studies as per GEC 2015 guidelines will be prepared and submitted in the final EIA report.

<table>
<tr><td>1.22</td><td>Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.</td><td>Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program. The detailed rain water harvesting will be submitted in the final EIA report.</td></tr>
<tr><td>1.23</td><td>Study on land subsidence including modelling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.</td><td>It is a fresh lease quarry and so the condition is not applicable.</td></tr>
<tr><td>1.24</td><td>Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.</td><td>
<table>
<tr><th>Purpose</th><th>Quantity</th><th>Source</th></tr>
<tr><td>Dust Suppression</td><td>1.3 KLD</td><td rowspan="4">The water requirement is purchased from the authorized water vendor.</td></tr>
<tr><td>Green Belt development</td><td>1.5 KLD</td></tr>
<tr><td>Drinking & Domestic</td><td>1.2 KLD</td></tr>
<tr><td>Total</td><td>4.0 KLD</td></tr>
</table>
</td></tr>
<tr><td>1.25</td><td>PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-</td><td>Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.</td></tr>
</table>

	vis reduction in concentration of emission for each APCEs	
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored	The PP is adviced to use LNG/CNG trucks in mining operation because these trucks can control air pollution and noise pollution.
1.27	PP to evaluate the greenhouse emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.	There is no greenhouse emission in the project lease area.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	The details are discussed in the Section 7.2 & 7.3 under Chapter VII in the EIA report page 116-120.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.	The impact on the air quality is discussed in the Section 4.4 under Chapter IV in the EIA report page 93-97.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for	The details regarding is discussed in the Section 4.5.2 under Chapter IV in the EIA report page 99-100.

	maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.	
1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.	The details are given in the Section 2.6 under Chapter II in the EIA report page 20-27.
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.	Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.	The ultimate mining is proposed to an average depth 45m bgl. the mined-out area will be fenced on top of working bench with SI fencing to arrest the entry of cattle's and public in to the quarry site. The details of mine closure budget is discussed in the Section 2.6.4 under Chapter II in the EIA report page 23.

1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be		The details are given in the Section 4.6 under Chapter IV in the EIA report page 102-106.
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.		The detailed EMP is given in the Chapter X in the EIA report page 128-134.
1.36	Details of R&R. Detailed project specific R&R plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with schedule of the implementation of the R&R plan should be given.		Not Applicable. The proposed lease area belongs to the lessee and there is no any habitation in the lease area.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.		The CSR plan is discussed in the Section 8.6 under Chapter VIII in the EIA report page 125.
1.38	Corporate Environment Responsibility:		
1.39	a)	The Company must have a well laid down Environment Policy approved by the Board of Directors.	The CER plan is discussed in the Section 8.7 under Chapter VIII in the EIA report page 126.

1.40	b)	The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	
1.41	c)	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	
1.42	d)	To have proper checks and balances, the company should have a well laid down 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.	
1.43	e)	Environment Management Cell and its responsibilities to be clearly spleel out in EIA/ EMP report	
1.44	f)	In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	

1.45	Status of any litigations/ court cases filed/pending on the project should be provided.			No litigation is pending in any court against this project.		
1.46	PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.			The DFO letter will be submitted in the final EIA report.		
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.			The clearance copy of approved mining plan letter is attached in the Annexure III.		
1.48	Details on the Forest Clearance should be given as per the format given:					
	Total ML Project Area	Total Forest land (ha) If more than one provides details of each FC	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of apply for diversion of forest land
	NA	NA	NA	NA	NA	NA
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report			Approved Mining plan of the expansion proposal is attached in the Annexure III and the mine closure plan is discussed in the Section 2.6.4 under Chapter II in the EIA report page 23.		
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form.			The public hearing comments will be submitted during final EIA report.		

	If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.	
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes	The drone video survey will be submitted in the final EIA report.
1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/Land acquired to its No. of renewals, CTO/CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	The required documents for the proposed quarry are provided in the chronology order in Annexure III.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL/MoEF & CC certification)	The first page of the EIA report mentions the peak capacity production, area, project proponent details, Consultant and NABET details and authorized Laboratory (NABL / MoEF & CC certification) details.
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter's section.	ToR Compliance is cited with respective chapter section and page no in tabular form.

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CHAPTER I
INTRODUCTION

1.0 PREAMBLE

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

In compliance with ToR obtained vide ToR File No.10798 and ToR Identification No. TO24B0108TN5203883N, dated.31/05/2024, this EIA report has been prepared for the project proponent, M/s.Shree Thevar Blue Metals applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.244/1A, 244/2A1 and 244/2A2 over an extent of 2.43.0ha in K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu. This EIA report takes into account the rough stone and gravel quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains one proposed project known as P1 and four existing projects known as E1, E2, E3 and E4. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016. The total extent of all the quarries is 11.67.1ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

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

Proposed Quarries					
Code	**Name of the Owner**	**S.F. No**	**Village**	**Extent (ha)**	**Status**
P1	M/s.Shree Thevar Blue Metals	244/1A, 244/2A1, 244/2A2	K.Pudukottai	2.43.0	Proposed Area
Existing Quarry					
E1	Premium Granite	249/1, 8B, 9, 10A…etc	K. Pudukottai	1.70.50	28.04.2023 to 27.04.2028
E2	Umarani	252/2, 4, 252/5	K.Pudukottai	1.01.00	07.10.2023 to 06.10.2028
E3	R S Palanisamy	304/1, 304/2,..etc	Kothapulli	2.53.05	19.05.2023 To 18.05.2028
E4	M.Balu	302/2	Kothapulli	1.12.05	02.09.2017 to 01.09.2022 Vide RC.No.3522/ mm6/23/.dt 18-05-2023 Extended 03.06.2023 to 02.12.2024
Total Cluster Extent				**8.79.6**	---

Source:

AD Letter - Rc.No.115/2023(Mines) Dated:11.03.2024.

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

1.1 PURPOSE OF THE REPORT

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **November 2021 - January 2022** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015, to analyse impacts and provide mitigation measures.

1.2 ENVIRONMENTAL CLEARANCE

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

Screening

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/ MIN/ 467014/2024, dated, 26/03/2024) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 04.04.2024

Scoping

The proposal was placed in the 464th meeting of SEAC on 03.05.2024. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Public Consultation

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

Appraisal

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

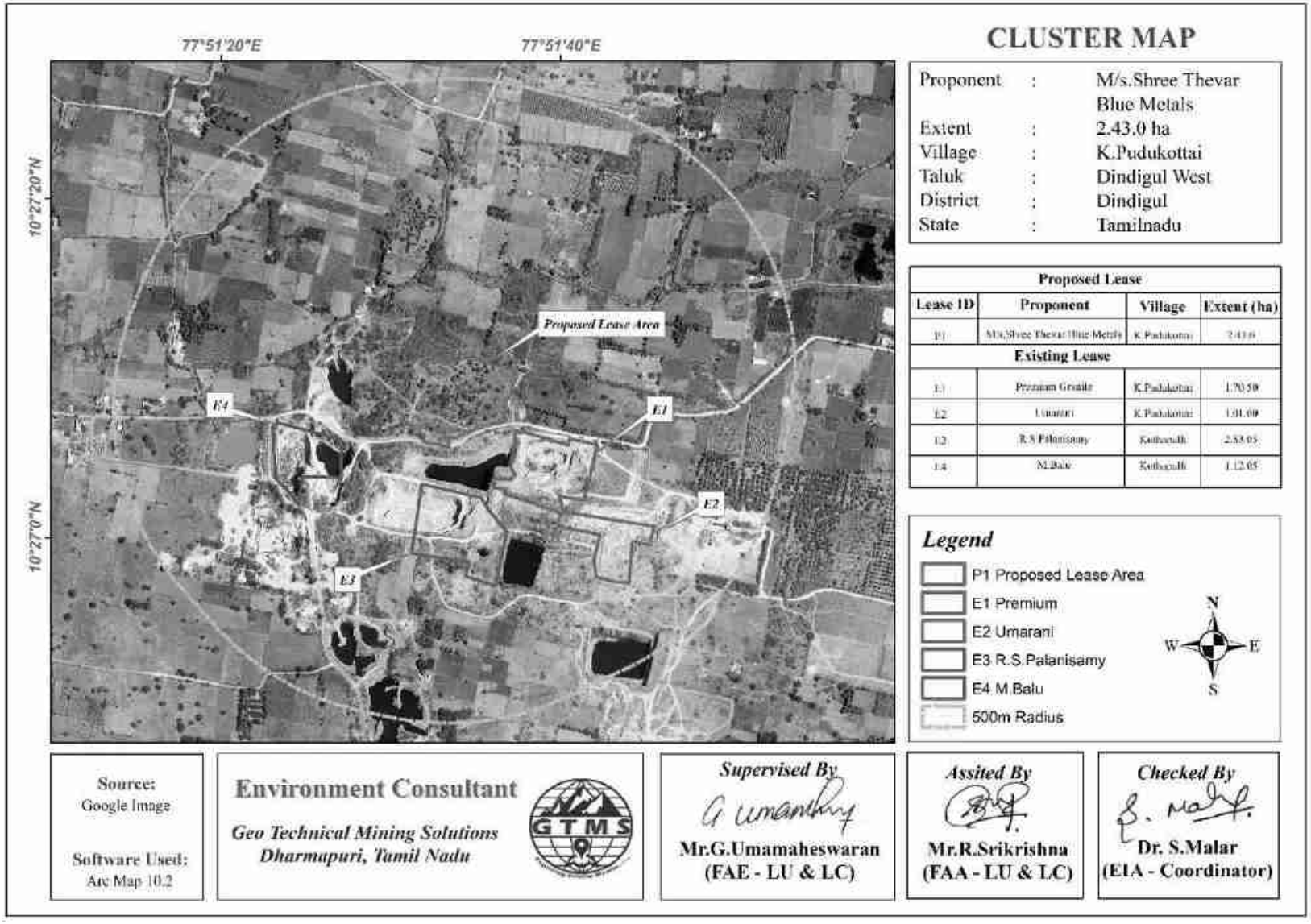


Figure 1.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

1.3 TERMS OF REFERENCE (ToR)

The SEAC framed a comprehensive Terms of Reference (TOR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued TOR to the proponent vide ToR File No. 10978 and ToR Identification No. TO24B0108TN5203883N, dated.13/03/2024.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

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

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

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written "no objection" by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period (EIA Guidance Manual for Mining of Minerals, 20).

1.6 IDENTIFICATION OF THE PROJECT PROPONENT

The profile of the project proponent who has involved in this quarrying project has been given in Table 1.2.

Table 1.2 Details of Project Proponent

Name of the Project Proponent	**M/s. Shree Thevar Blue Metals,**
Address	S.F.No's: 295/1, 295/1A, 295/2 & 295/3, Kothapulli Village, Reddiarchatram, Dindigul District – 624622.
Status	Proprietor

1.7 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone and gravel quarry which is primarily used in construction projects. The method adopted for rough stone and gravel quarry excavation is Open Cast Semi Mechanized mining method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in K. Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamilnadu State. Some of the important features of the proposed project have been provided in Table 1.3.

Table 1.3 Salient Features of the Proposed Project

Name of the Quarry	M/s. Shree Thevar Blue Metals Rough Stone and gravel quarry		
Type of Land	Patta Land		
Extent	2.43.0 Ha		
S.F. No	244/1A, 244/2A1 & 244/2A2		
Toposheet No	58-F/15		
Location of Project Site	10° 27'5.37"N to 10° 27'10.78"N 77°51'30.12"E to 77°5'37.37"E		
Highest Elevation	280 m AMSL		
Ultimate Pit Dimensions	Length (m)	Width (m)	Depth (m)
	96	116	45
Ultimate depth of Mining	45 m BGL		
Geological Resources	Rough Stone in m^3	Gravel in m^3	
	1045072	48608	
Mineable Reserves	Rough Stone in m^3	Gravel in m^3	
	419186	38404	
Proposed reserves for ten years	Rough Stone in m^3	Gravel in m^3	
	419186	38404	
Method of Mining	Open-Cast Semi Mechanized mining		
Topography	Flat Topography		
Machinery proposed	Jack Hammer	3	
	Compressor	1	
	Tipper	8	
	Excavator	1	
Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.		
Proposed Manpower Development	20 Nos		
Project Cost	Rs.81,10,500 /-		
CER Cost	Rs. 5,00,000/-		
Proposed Water Requirement	4.0 KLD		

1.8 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **November 2021-January 2022** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in Chapter III.

1.9 Legislation Applicable to Mining of Mineral Sector

A few important legislations are given below:

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

Note: *As per the OM vide F.No.J-11013/41/2006-IA-II(I)(Part), the baseline monitoring data were collected during the period of* **November 2021 - January 2022** *and utilized for preparation of this EIA report.*

CHAPTER II

PROJECT DESCRIPTION

2.0 GENERAL INTRODUCTION

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

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

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

2.1 DECSCRIPTION OF THE PROJECT

The proponent, **M/s.Shree Thevar Blue Metals** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone. Therefore, the proponent had applied for quarry lease on 22.12.2023 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Dindigul vide Rc.No.115/2023(Mines) Dated:27.02.2024. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Assistant Director Department of Geology and Mining, Dindigul Rc.No.115/2023 (Mines) dated:11.03.2024. The overall view of the project site is shown in Figure 2.1.

Figure 2.1 Overall View of Proposed Project Site

2.2 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in K.Pudukottai Village, Dindigul West Taluk, Dindigul District, as shown in Figure 2.2 & 2.3. The area lies between Latitudes from 10°27'5.37"N to 10°27'10.78"N and Longitudes from 77°51'30.12"E to 77°51'37.37"E. The maximum altitude of the project area is 280 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

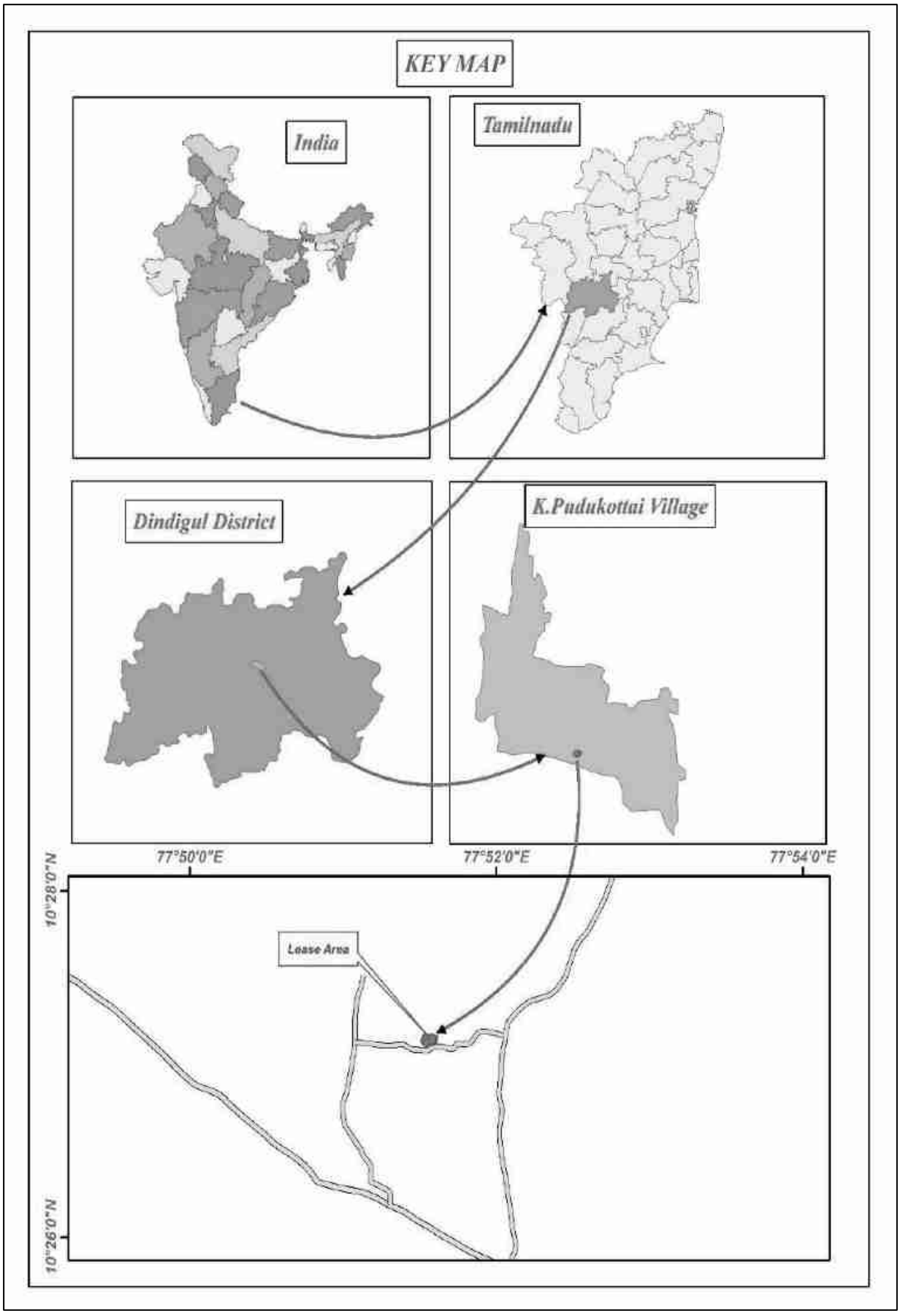


Figure 2.2 Key Map Showing Location of the Project Site

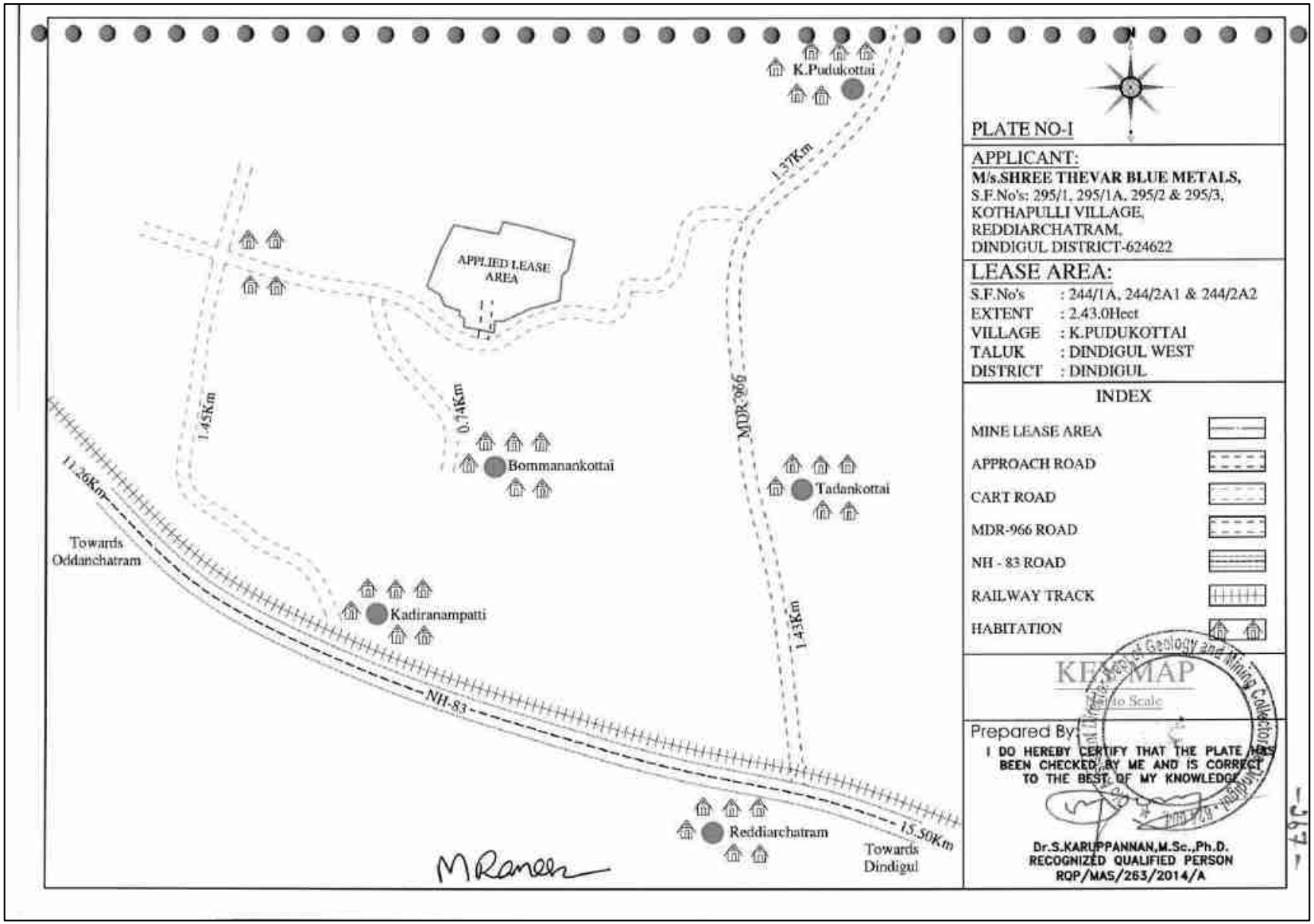


Figure 2.3 Site Connectivity to the Project Area

Table 2.1 Site Connectivity to the Project Area

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Reddiarchatram	2.4Km	South
b.	Nearest police station	Reddiarchatram	2.0km	South
c.	Nearest fire station	Oddanchatram	12.8km	West
d.	Nearest medical facility	Puduchatram	7.5Km	West
e.	Nearest school	S.Vadipatti	3.7Km	Southeast
f.	Nearest railway station	Akkaraipatti	8.9km	Southeast
g.	Nearest port facility	Tuticorin	189.0km	South
h.	Nearest airport	Tiruchirappalli	99.0km	Northeast
i.	Nearest villages	K.Pudukottai	0.9km	Northeast
		Tadankottai	1.2km	Southwest
		Bommanankottai	0.7km	Southwest
		Peddinayakkanpatti	0.8km	Northwest

2.3 LEASEHOLD AREA

- The extent of the proposed project site is 2.43.0 ha.
- The proposed project is site specific.
- There is no mineral beneficiation or processing proposed inside the project area.
- There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

2.3.1 Corner Coordinates

The boundary corner geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.4 & 2.5.

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	10°27'9.84"N	77°51'37.37"E	13	10°27'6.21"N	77°51'31.70"E
2	10°27'8.42"N	77°51'37.03"E	14	10°27'6.44"N	77°51'31.73"E
3	10°27'8.14"N	77°51'36.75"E	15	10°27'6.71"N	77°51'30.97"E
4	10°27'6.91"N	77°51'36.62"E	16	10°27'7.24"N	77°51'30.76"E
5	10°27'6.69"N	77°51'35.85"E	17	10°27'7.64"N	77°51'30.12"E
6	10°27'6.54"N	77°51'35.24"E	18	10°27'9.31"N	77°51'30.76"E
7	10°27'6.46"N	77°51'35.02"E	19	10°27'10.65"N	77°51'31.47"E
8	10°27'5.91"N	77°51'33.85"E	20	10°27'10.19"N	77°51'33.66"E
9	10°27'5.93"N	77°51'33.44"E	21	10°27'10.78"N	77°51'33.89"E
10	10°27'5.37"N	77°51'33.40"E	22	10°27'10.45"N	77°51'35.30"E
11	10°27'5.67"N	77°51'31.91"E	23	10°27'10.35"N	77°51'35.64"E
12	10°27'6.05"N	77°51'31.95"E	24	10°27'10.11"N	77°51'36.47"E

2.4 GEOLOGY

The lease area geologically occurs Hornblende–Biotite Gneiss. The Charnockite, commercially called as Roughstone occurs within the migmatite rock. Also, the lease area geomorphologically occurs pediment pediplain complex.

2.5 QUANTITY OF RESERVES

The Resources and Reserves of rough Stone and gravel were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5m and 10m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 45m considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.6 and 2.7 results of geological resources and reserves have been shown in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone in m^3	Gravel in m^3
Geological Resource in m^3	1045072	48608
Mineable Reserves in m^3	419186	38404
Proposed production for 10 years m^3	419186	38404

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.8 and Figure 2.9.

Table 2.4 Year-Wise Production Details

Year	Rough Stone in (m^3)	Gravel in (m^3) / 3 year
I	62170	13080
II	64743	11172
III	64118	14152
IV	63425	--
V	60940	--
VI	21055	--
VII	21030	--
VIII	20895	--
IX	20970	--
X	19840	--
Total	**419186**	**38404**

Source: Approved Mining Plan & ToR

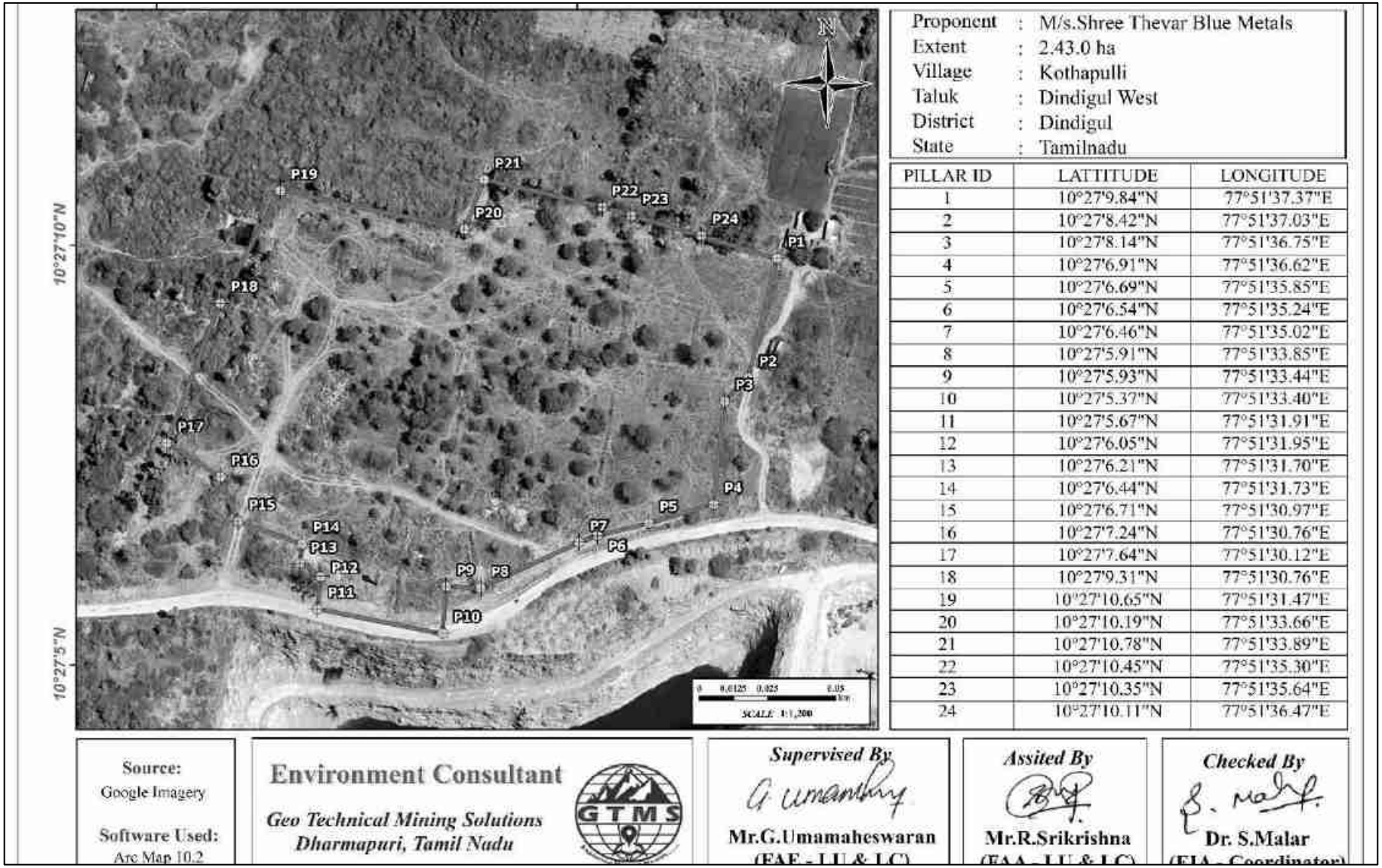


Figure 2.4 Google Earth Image Showing Lease Area with Pillars

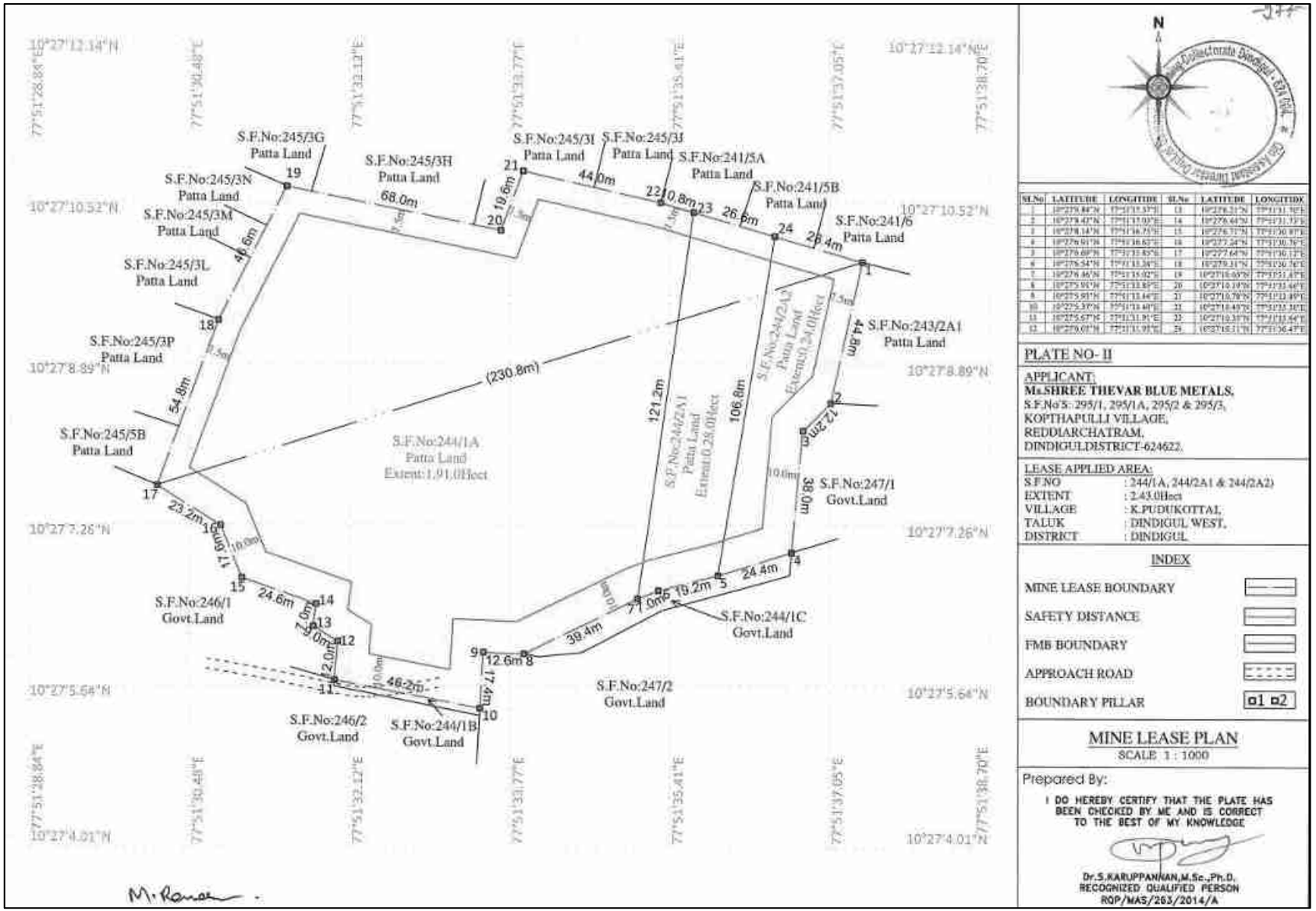


Figure 2.5 Mine Lease Plan

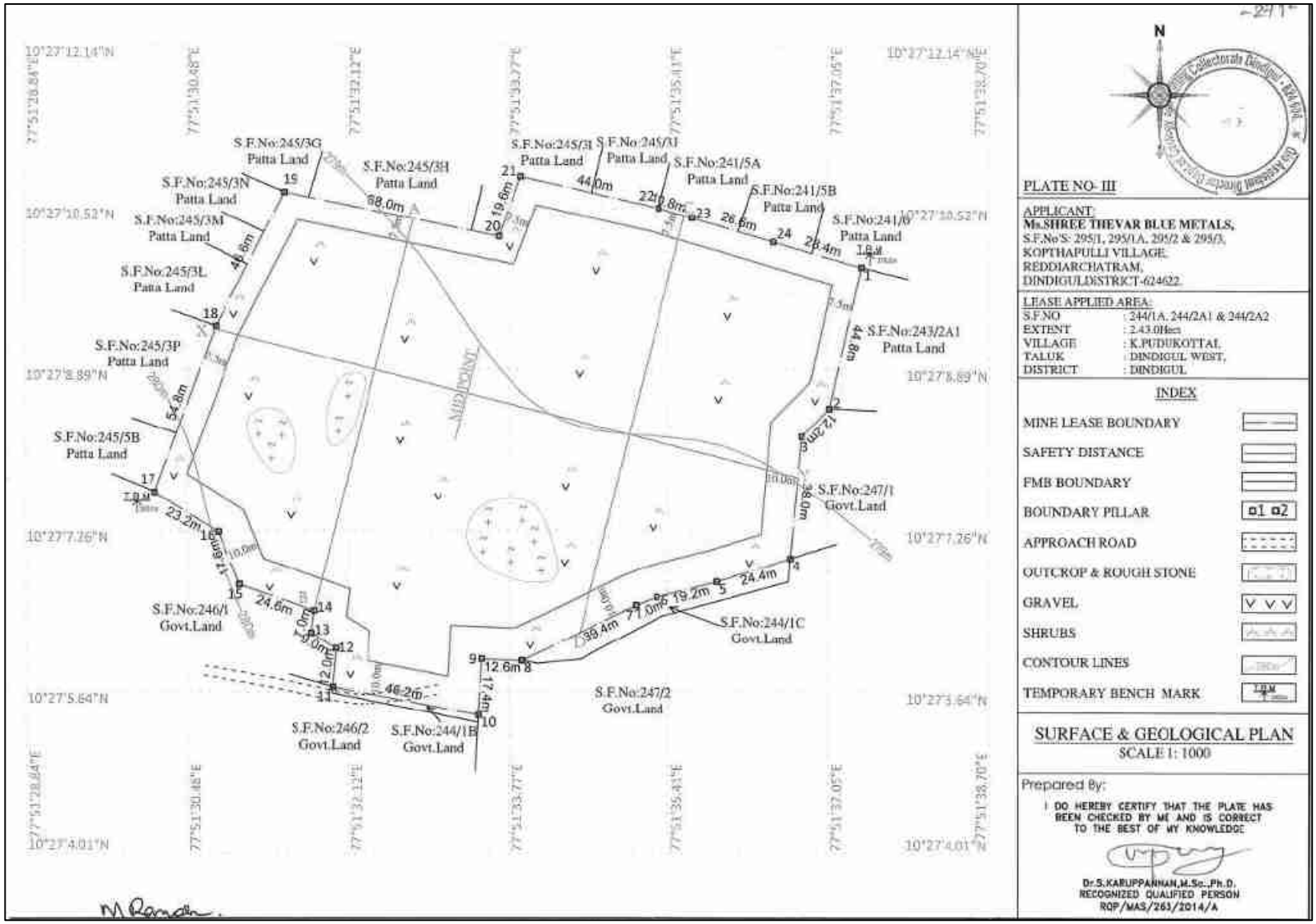
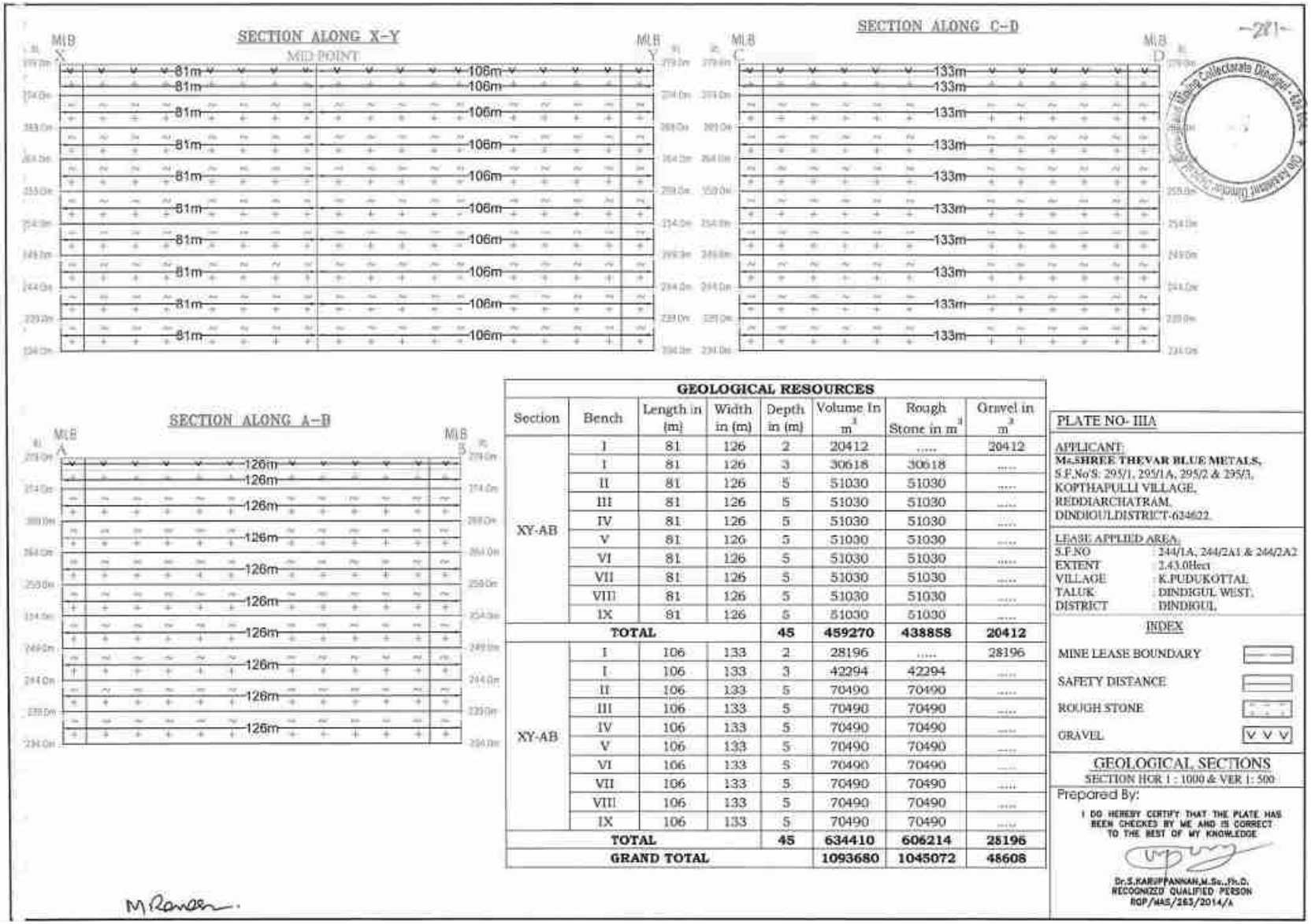


Figure 2.6 Surface & Geological Plan



Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m^3	Rough Stone in m^3	Gravel in m^3
XY-AB	I	81	126	2	20412	.....	20412
	I	81	126	3	30618	30618	.....
	II	81	126	5	51030	51030	.....
	III	81	126	5	51030	51030	.....
	IV	81	126	5	51030	51030	.....
	V	81	126	5	51030	51030	.....
	VI	81	126	5	51030	51030	.....
	VII	81	126	5	51030	51030	.....
	VIII	81	126	5	51030	51030	.....
	IX	81	126	5	51030	51030	.....
TOTAL				**45**	**459270**	**438858**	**20412**
XY-AB	I	106	133	2	28196	.....	28196
	I	106	133	3	42294	42294	.....
	II	106	133	5	70490	70490	.....
	III	106	133	5	70490	70490	.....
	IV	106	133	5	70490	70490	.....
	V	106	133	5	70490	70490	.....
	VI	106	133	5	70490	70490	.....
	VII	106	133	5	70490	70490	.....
	VIII	106	133	5	70490	70490	.....
	IX	106	133	5	70490	70490	.....
TOTAL				**45**	**634410**	**606214**	**28196**
GRAND TOTAL					**1093680**	**1045072**	**48608**

Figure 2.7 Surface & Geological Plan and Sections

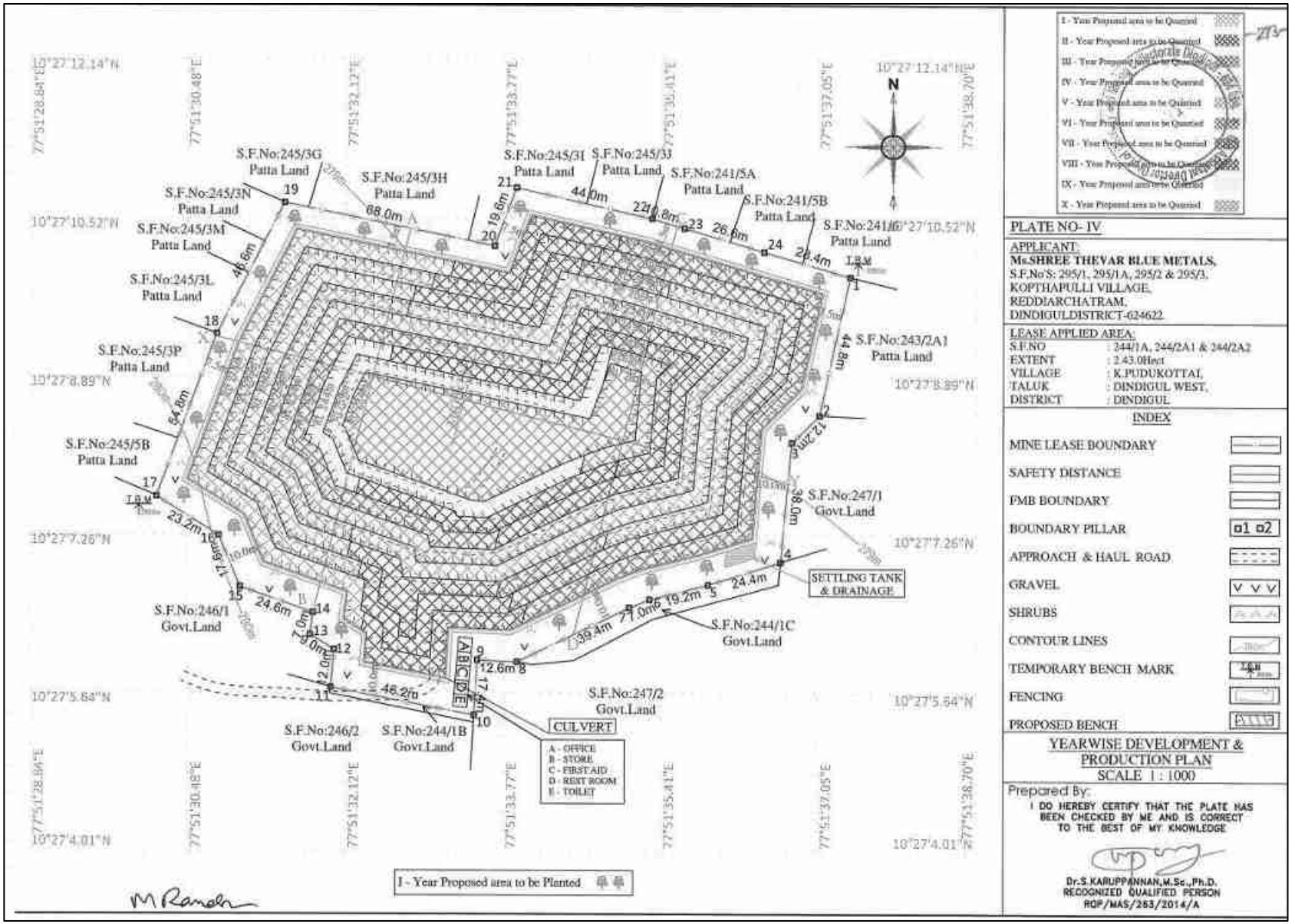
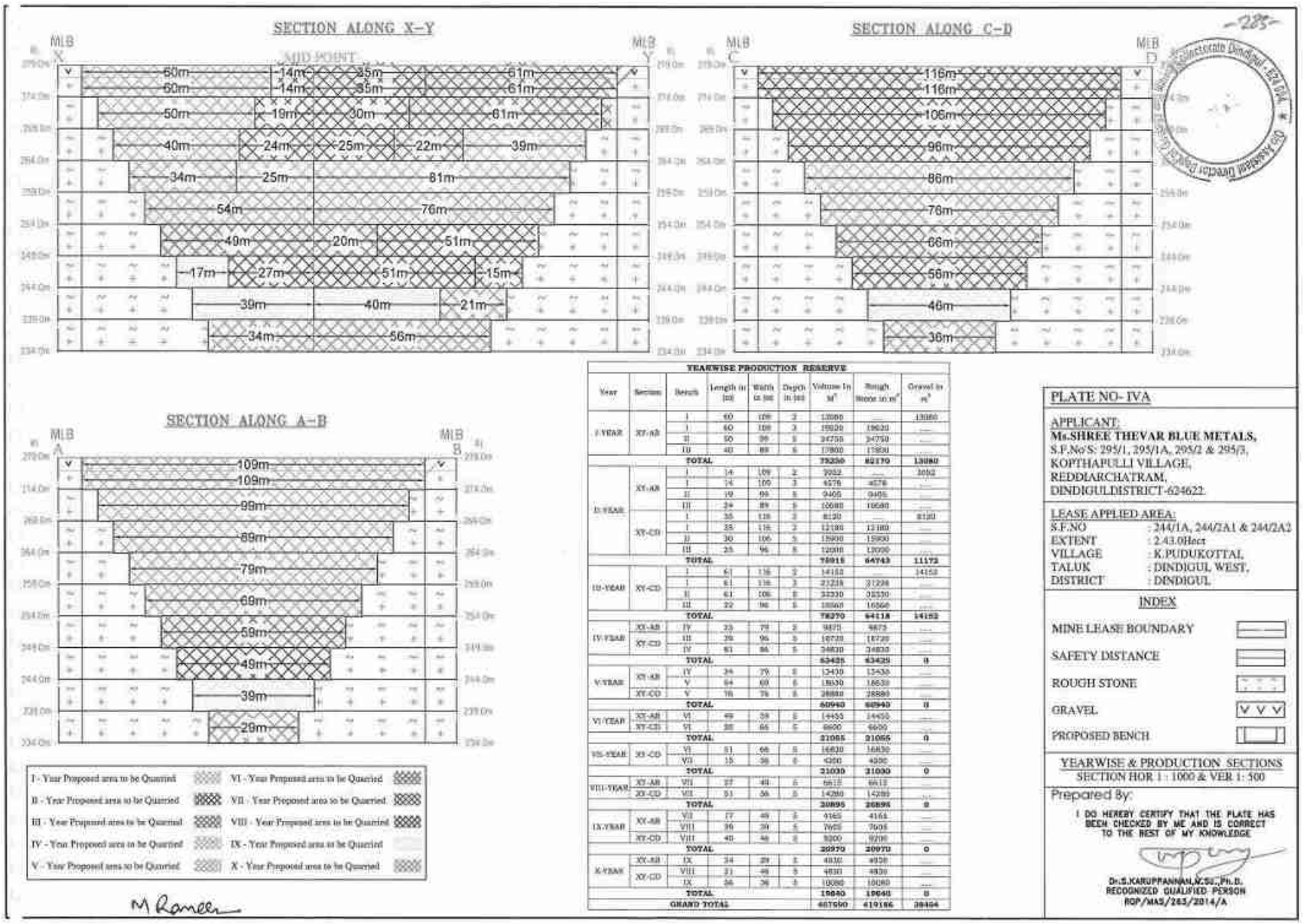


Figure 2.8 Year wise Production Plan



YEARWISE PRODUCTION RESERVE

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m³	Rough Stone in m³	Gravel in m³
I-YEAR	XY-AB	I	60	109	2	13080	----	13080
		I	60	109	3	19620	19620	----
		II	90	99	3	24750	24750	----
		III	40	89	5	17800	17800	----
		TOTAL				75250	62170	13080
II-YEAR	XY-AB	I	14	109	2	3052	----	3052
		I	14	109	3	4578	4578	----
		II	19	99	5	9405	9405	----
		III	24	89	5	10680	10680	----
	XY-CD	I	35	138	2	8120	----	8120
		I	35	138	3	12180	12180	----
		II	30	106	5	15900	15900	----
		III	25	96	5	12000	12000	----
		TOTAL				75915	64743	11172
III-YEAR	XY-CD	I	61	138	2	14152	----	14152
		I	61	138	3	21228	21228	----
		II	61	106	5	32330	32330	----
		III	22	96	5	10560	10560	----
		TOTAL				78270	64118	14152
IV-YEAR	XY-AB	IV	33	79	2	5214	5214	----
	XY-CD	III	29	96	3	16704	16704	----
		IV	61	86	5	26230	26230	----
		TOTAL				63425	63425	0
V-YEAR	XY-AB	IV	24	79	2	3792	3792	----
		V	64	69	5	17730	17730	----
	XY-CD	V	78	76	5	29880	29880	----
		TOTAL				60940	60940	0
VI-YEAR	XY-AB	VI	49	59	5	14455	14455	----
	XY-CD	VI	30	66	5	9900	9900	----
		TOTAL				21055	21055	0
VII-YEAR	XY-CD	VII	51	66	5	16830	16830	----
		VII	15	36	5	4200	4200	----
		TOTAL				21030	21030	0
VIII-YEAR	XY-AB	VII	27	49	5	6615	6615	----
	XY-CD	VII	51	56	5	14280	14280	----
		TOTAL				20895	20895	0
IX-YEAR	XY-AB	VII	17	49	5	4165	4165	----
		VIII	39	39	5	7605	7605	----
	XY-CD	VIII	40	48	5	9200	9200	----
		TOTAL				20970	20970	0
X-YEAR	XY-AB	IX	34	29	5	4930	4930	----
	XY-CD	VIII	21	48	5	4830	4830	----
		IX	56	36	5	10080	10080	----
		TOTAL				19840	19840	0
GRAND TOTAL						401590	419186	39404

PLATE NO- IVA

APPLICANT:
Mr.SHREE THEVAR BLUE METALS,
S.F.No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

MINE LEASE BOUNDARY
SAFETY DISTANCE
ROUGH STONE
GRAVEL
PROPOSED BENCH

YEARWISE & PRODUCTION SECTIONS
SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

Figure 2.9 Year wise Production Sections

2.6 MINING METHOD

The Quarrying operation is proposed to be carried out by open cast semi-mechanized mining method with the bench height and width of 5 m each. The open cast semi-mechanized method involving drilling and blasting is proposed to extract rough stone. The extracted rough stone will be loaded manually to the trucks for dispatch to the customers. In this project, NONEL blasting will be adopted to extract rough stone.

Conceptual Blasting Design

In this project, NONEL blasting will be employed to win rough stone. This method will involve closed spaced perimeter holes to reduce the overbreak/backbreak on a blast. The objective of the blasting design is to prevent fly rocks from damaging the nearby structures.

Rules of Thumb for Blast Design

Based on practical experience and technical information, a set of rules for blasting have been provided as below (Chapter8 (nps.gov)). These rules will be applied to blast rocks in the proposed project.

Rule 1: **The detonation velocity (VOD) of the explosive should be close to the same value of the sonic velocity (VSO) of the rock to be blasted.**

The sonic velocity of a rock is considered to be a reliable indicator of its structural integrity and resistance to fragmentation. As the VOD of the explosive approaches close to the VSO of the rock, the blasting would result in relatively smaller size of fragmentation with uniformity. There is no value in using an explosive that has a VOD greatly in excess of the VSO of the rock, since there is little or no improvement in fragmentation above the VSO. When selecting an explosive to match up the VSO of a rock mass, variance of <10% in the velocities is acceptable.

Rule 2: Generally, select the densest explosive possible.

When the density of explosives is higher, the potential energy of the explosives can be greater and the more of it can be placed within a borehole of a given size.

Rule 3: Select explosives according to the characteristics of the rock formation to be blasted.

When planes of separation in the rock are smaller than the degree of fragmentation required, the rock can often be blasted by using lower density and lower detonation velocity explosives.

Rule 4: When using slurry or water gel explosives, always determine the critical temperature below which the explosive will fail to reliably detonate.

Almost all slurry explosives have a critical temperature below which they may not detonate, or may not sustain detonation in elongated columns. The explosives should not be used when the temperature of the explosive at time of loading is below that critical temperature.

Rule 5: The distance between holes (spacing) should not be greater than one-half the depth of the borehole.

When the distance between holes in a row is greater than one-half the depth of the hole, the angles of breakage intersect above the bottom of the holes. This causes both a great deal of vertical throw and a very uneven bottom.

Rule 6: Stemming should be equal to the burden.

Stemming is useful to confine and maximize efficient use of the explosive's energy. It also reduces noise as much as possible. If the stemming is greater than the burden, the rock at the top of the borehole will have less cracking from reflection and refraction of compressive and tensile waves. Therefore, stemming should be equal to burden. Drill fines can be used for loading the borehole.

Rule 7: Subdrill (if necessary) should be between 0.3 and 0.5 of spacing/burden.

Subdrill should be equal to 0.3 of burden. It will work when there is row-for-row delay. In blasts where the delay system is both row-for-row and hole-for-hole, the subdrill should be determined by the largest dimension, which can be the spacing or the burden. An average subdrill of 0.4 of spacing is best to use for planning purposes. Based on the above-mentioned rules, blasting design has been conceptualized and has been provided in Table 2.5.

Table 2.5 Conceptual Blasting Design

Blasthole Diameter (D) in mm	32
Burden (B) in m	1.5
Spacing (S) in m	1.30
Subdrill in m	0.45
Charge length (C) in m	0.64
Stemming	1.5
Hole Length (L) in m	2.6
Bench Height (BH) in m	2.1
Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.43
Blast volume/hole in m^3	4.16

Production of rough stone/day in m^3	155
Number of blastholes/day	37
Blasthole pattern	Staggered / Rectangular
Mass of explosive /day in kg	14.94
Powder factor in kg/m^3	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	19

2.6.1 Magnitude of Operation

Based on the results of estimated production for the 10 years, details about the size of operation have been provided in Table 2.6.

Table 2.6 Operational Details for Proposed Project

	Rough Stone in m^3 10 years	**Gravel in m^3 3 year**
Proposed production for 10 years	419186	38404
Number of Working Days /Annum	270	270
Production of /Day (m^3)	155	47
No. of Lorry Loads	26	8

2.6.2 Extent of Mechanization

List of machineries proposed for the quarrying operation is given in Table 2.7.

Table 2.7 Machinery Details

S. No.	Type	No of Unit	Size /Capacity	Make	Motive Power
1	Jack Hammers	3	Hand held	--	Diesel Drive
2	Compressor	1	Air	--	Diesel Drive
3	Hydraulic Excavator	1	2.9-4.3 m^3	--	Diesel Drive
4	Tipper	8	--	--	Diesel Drive

2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows past, present, and future land use statistics. According to the land use results, as shown in Table 2.8 At Present about 2.43.0 ha of land is unutilized, Whereas, at the end of the mine life, about 0.01.35 ha of land is unutilized; about 0.44.69 ha of land is used for green belt and 0.03.00 will be used for roads and 0.01.0 is used for infrastructure.

Table 2.8 Land use data at present, during scheme of mining, and at the end of mine life

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	Nil	1.90.96
Infrastructure	Nil	0.01.0
Roads	Nil	0.03.0
Green Belt	Nil	0.44.69
Drainage & Settling Tank	Nil	0.02.0
Unutilized area	2.43.0	0.01.35
Total	**2.43.0**	**2.43.0**

2.6.4 Progressive Quarry Closure Budget

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, mine closure plan is not proposed for now. Based on the progressive mine closure plan for the scheme period, the mine closure cost is given in Table 2.9.

Table 2.9 Mine Closure Budget

Activity	Capital Cost
486 plants inside the lease area	97200
729 plants outside the lease area	218700
Wire Fencing	486000
Renovation of Garland Drain	24300
Total	**826200**

Source: Environment Management Plan

2.6.5 Conceptual Mining Plan

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

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth (m)
I	96	116	45

Source: Approved Mining Plan & ToR

2.6.6 Infrastructures

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

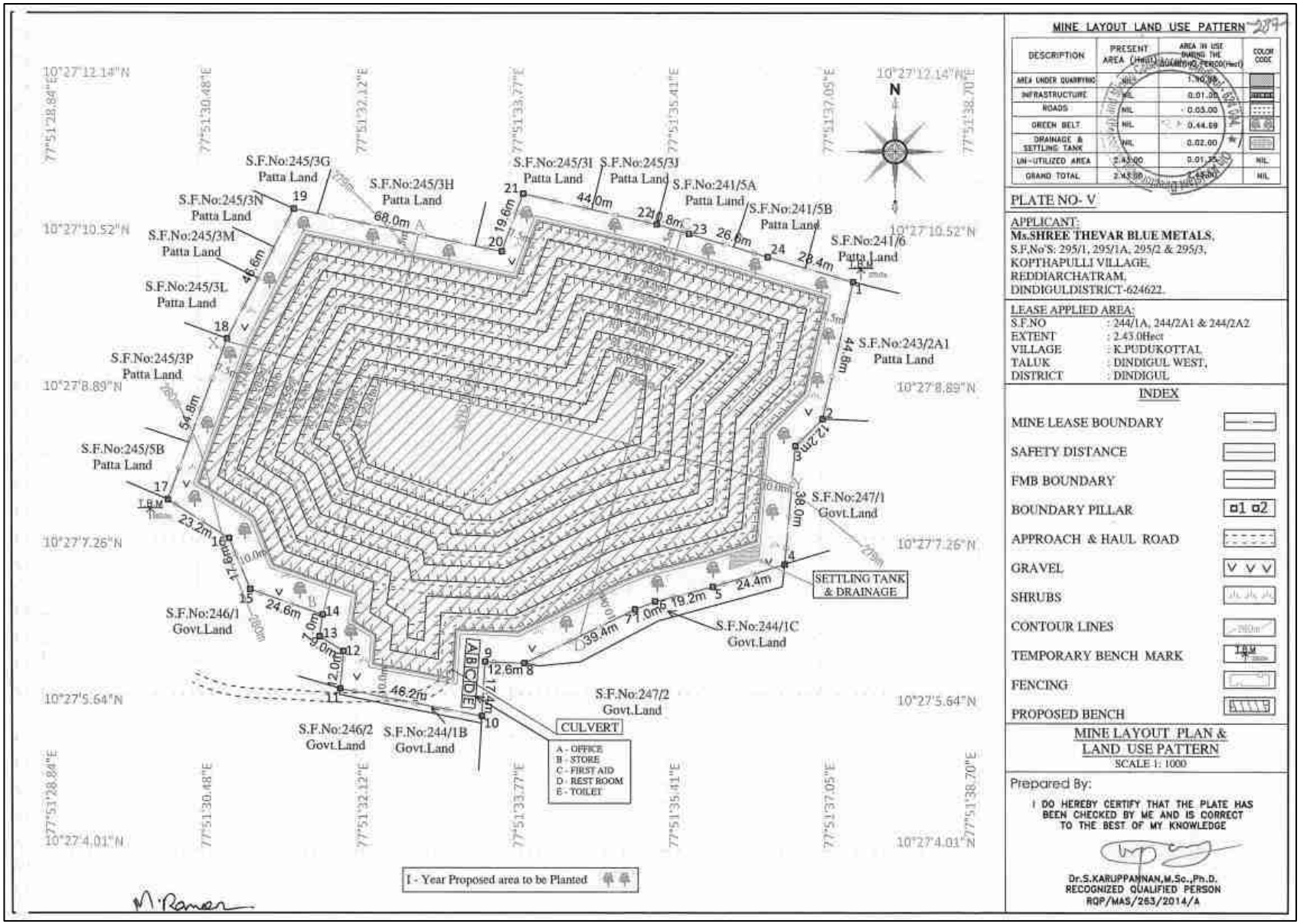
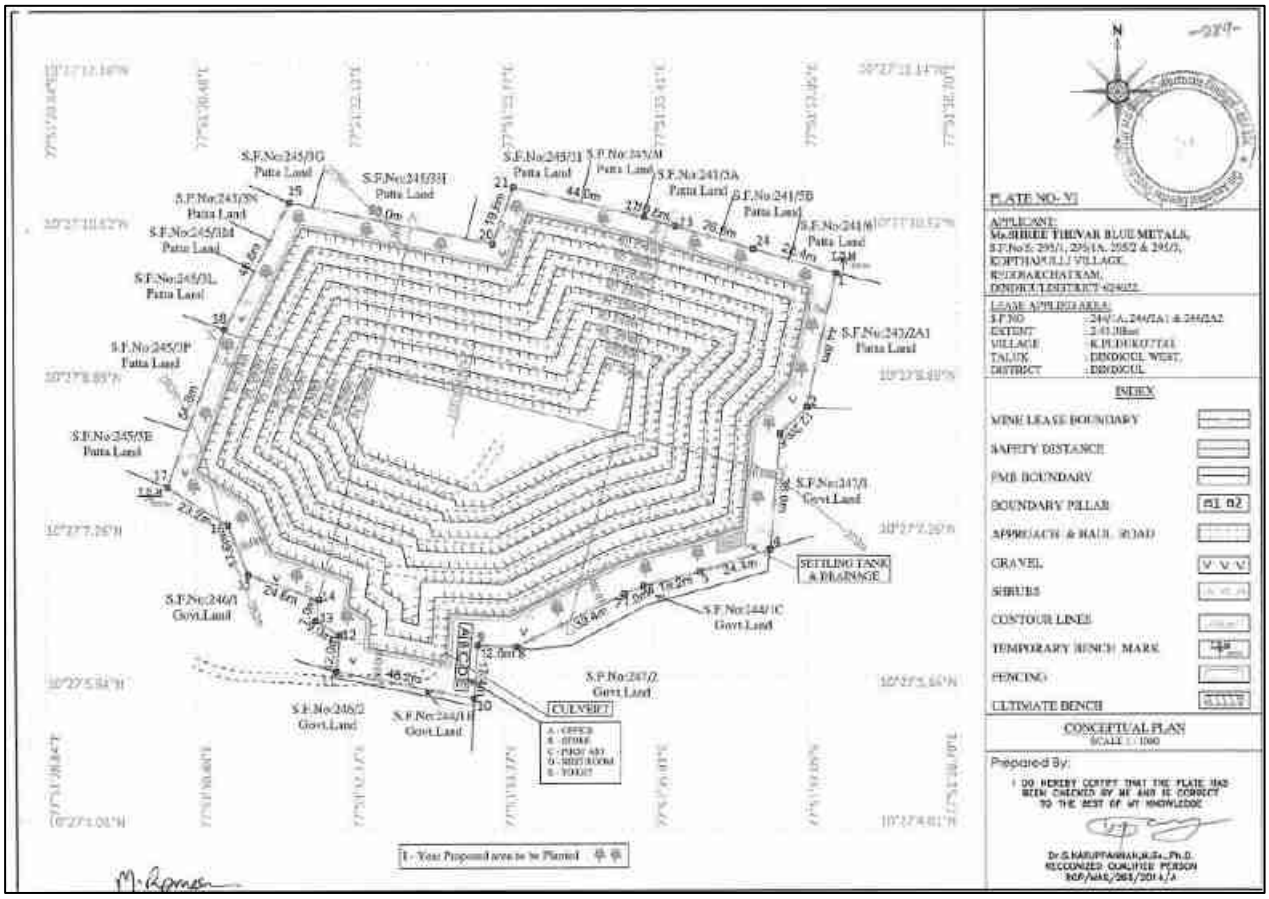
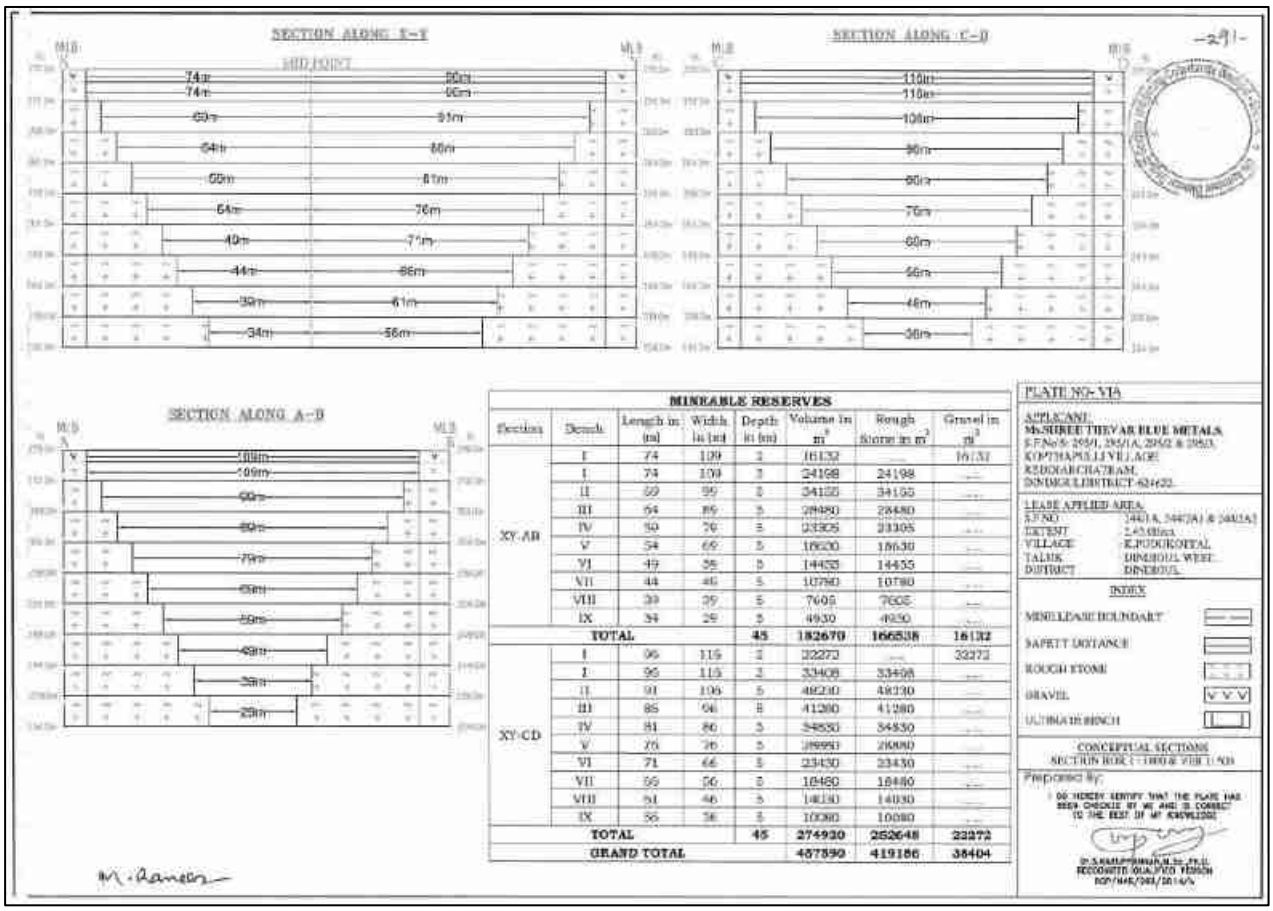


Figure 2.10 Mine Layout Plan and Land Use Pattern





Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Rough Stone in m^3	Gravel in m^3
XY-AB	I	74	109	3	16132	---	16132
	I	74	109	3	24198	24198	---
	II	69	99	3	34155	34155	---
	III	64	89	3	28480	28480	---
	IV	59	79	3	23305	23305	---
	V	54	69	3	18630	18630	---
	VI	49	59	3	14455	14455	---
	VII	44	49	3	10780	10780	---
	VIII	39	39	3	7605	7605	---
	IX	34	29	3	4930	4930	---
TOTAL				45	182670	166538	16132
XY-CD	I	96	115	3	33272	---	33272
	I	96	115	3	33408	33408	---
	II	91	105	5	48230	48230	---
	III	85	96	5	41280	41280	---
	IV	81	86	5	34830	34830	---
	V	76	76	5	28880	28880	---
	VI	71	66	5	23430	23430	---
	VII	66	56	5	18480	18480	---
	VIII	61	46	5	14030	14030	---
	IX	56	36	5	10080	10080	---
TOTAL				45	274930	252648	22272
GRAND TOTAL					457590	419186	38404

Figure 2.11 Conceptual Plan & Sections

2.6.6.1 Other Infrastructure Requirement

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

2.6.7 Water Requirement

Detail of water requirement in KLD is given in Table 2.11.

Table 2.11 Water Requirement for the Project

Purpose	Quantity	Source
Dust Suppression	1.3 KLD	Existing bore wells nearby the lease area
Green Belt development	1.5 KLD	Existing bore wells nearby the lease area
Drinking & Utilized	1.2 KLD	Existing bore wells and approved water vendors
Total	**4.0 KLD**	

Source: Prefeasibility Report

2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around **1915310** litres of HSD will be used for rough stone extraction during this 10 years plan period. The diesel will be brought to the site from nearby diesel pumps.

Table 2.12 Fuel Requirement Details

Fuel Requirement for Excavator			
Details	**Rough Stone (419186 m^3)**	**Gravel (38404 m^3)**	**Total Diesel (litre)**
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m^3/hr)	20	60	---
Time Required (hours)	20959	640	---
Total Diesel Consumption for 10 years (litre)	335349	6401	**341750**
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	**---**	**---**
Number of Drillholes/day	37	**---**	**---**
Total Diesel Consumption for 10 years (litre)	39960	**---**	**39960**
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m^3	6	6	---
Number of Trips / days	26	8	---
Number of Trips /10 years	70200	6480	---
Total Diesel Consumption for 10 years (litre)	1404000	129600	**1533600**
Total Diesel Consumption by Excavator, Compressor and Tipper			**1915310**

2.6.9 Capital Requirement

The project proponent will invest **Rs. 81,10,500/-** to the project. The breakup summary of the investment has been given in Table 2.13.

Table 2.13 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	13,61,000/-
2	Machinery cost	30,00,000/-
3	EMP Cost	31,40,000/-
Total Project Cost		**81,10,500/-**

Source: Approved Mining Plan

2.7 MANPOWER REQUIREMENT

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community. Number of employees required for this project have been provided in Table 2.14.

Table 2.14 Employment Potential for the proposed project

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

Source: Prefeasibility Report

2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the Tamil Nadu State Pollution Control Board. The conditions imposed during the environmental clearance will be compiled before the start of mining operation. Expected time schedule for the quarrying operation is given Table 2.15.

Table 2.15 Expected Time Schedule

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

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

CHAPTER III
DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **November 2021 - January 2022** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified ***Ekdant Enviro Services (P) Ltd*** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

Study Area

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

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 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico-Chemical characteristics	Once during the study period	8 (1 in near core & 7 in buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi

*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	8 (1 surface water & 7 ground water)	IS 10500& CPCB Standards
Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/automatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM_{10} $PM_{2.5}$ SO_2 NO_X	6	7 (1 core & 9 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.

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

3.1 LAND ENVIRONMENT

3.1.1 Geology and Geomorphology

Study area is mainly composed of hornblende-biotite genesis as shown in Figure 3.1. The lease area occurs in migmatite terrain.

Among the geomorphology map as shown in Figure 3.2. The lease area occurs in pediment pediplain complex.

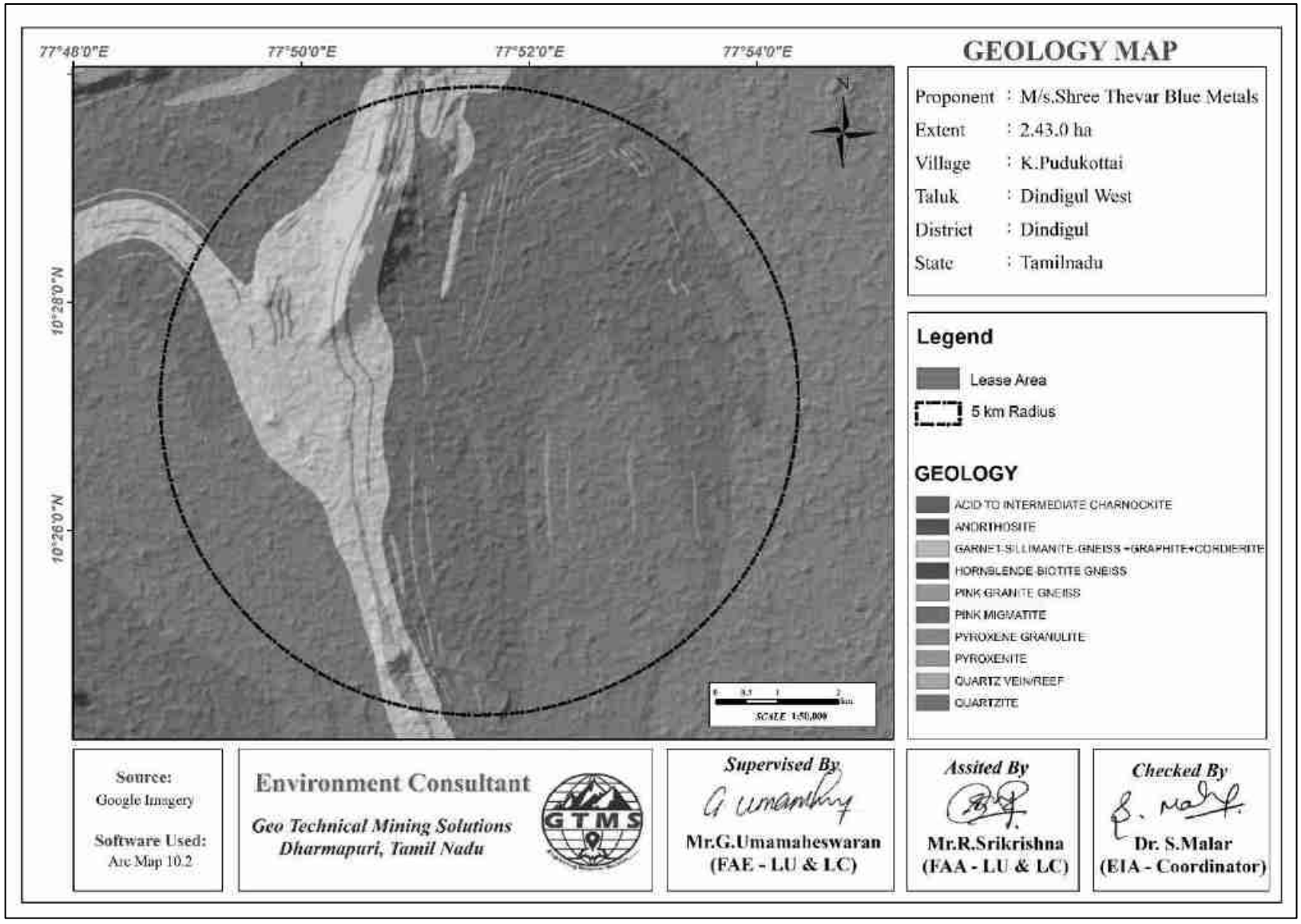


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

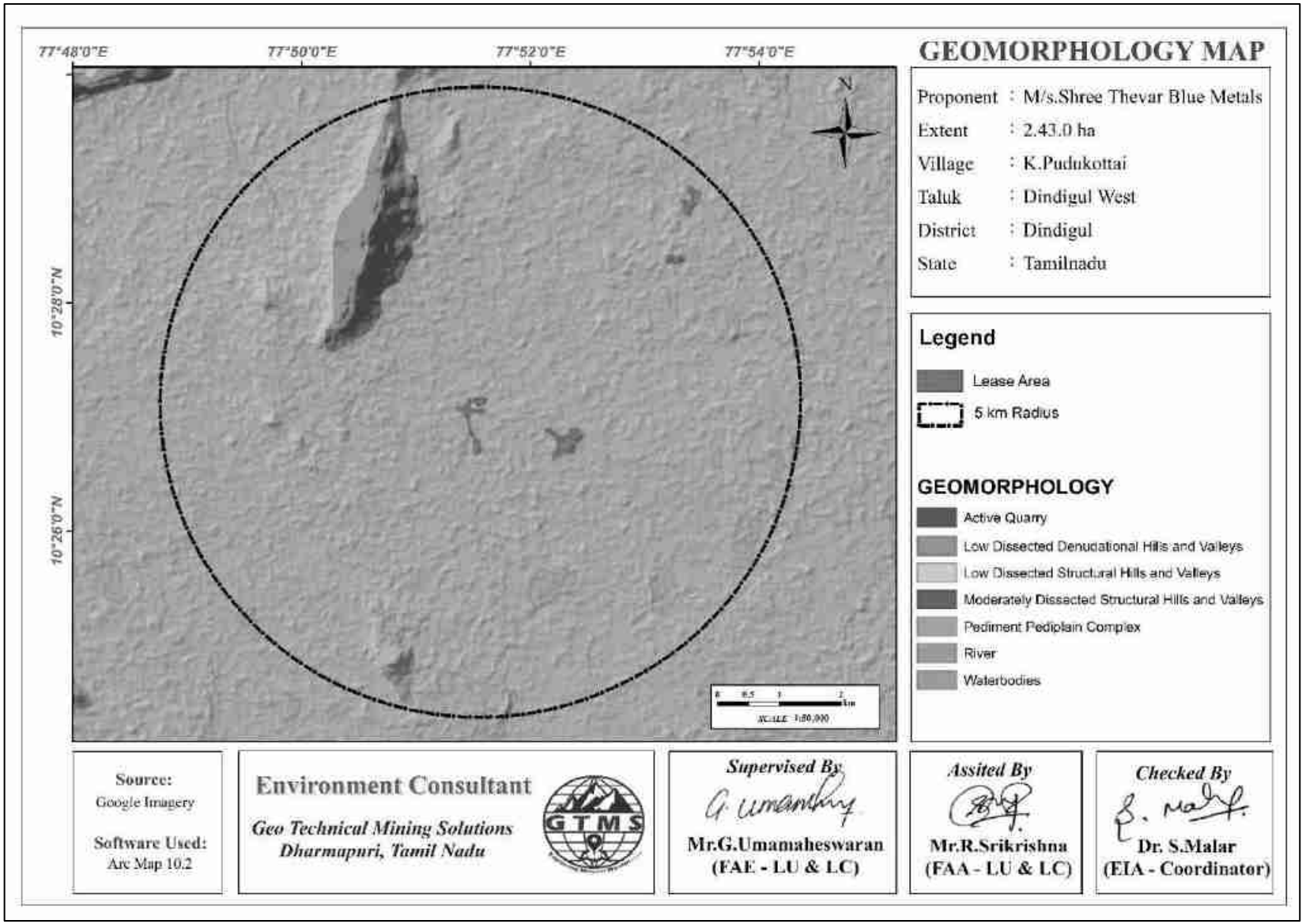


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site

3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally,6 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 21.08 ha accounting for 0.27%, of which lease area of 2.43.0 ha contributes only about 0.03 %. This small percentage of mining activities shall not have any significant impact on the land environment.

Table 3.2 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Crop land	4711.74	61.17
2	Fallow land	1567.97	20.35
3	Land with or without scrub	1374.36	17.84
4	Mining / Industrial wastelands	21.08	0.27
5	Plantations	19.46	0.25
6	Settlement	8.59	0.11
Total		**7822.86**	**100.0**

Source: Sentinel II Satellite Imagery

3.1.3 Topography

The proposed lease area is located in a flat terrain with an altitude range of 280 m AMSL.

3.1.4 Drainage Pattern

Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin over time that reveals characteristics of the kind of rocks and geological structures in a landscape. The proposed area shows dendritic drainage pattern indicating uniform lithology beneath the surface, as shown in Figure 3.4.

3.1.5 Seismic Sensitivity

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

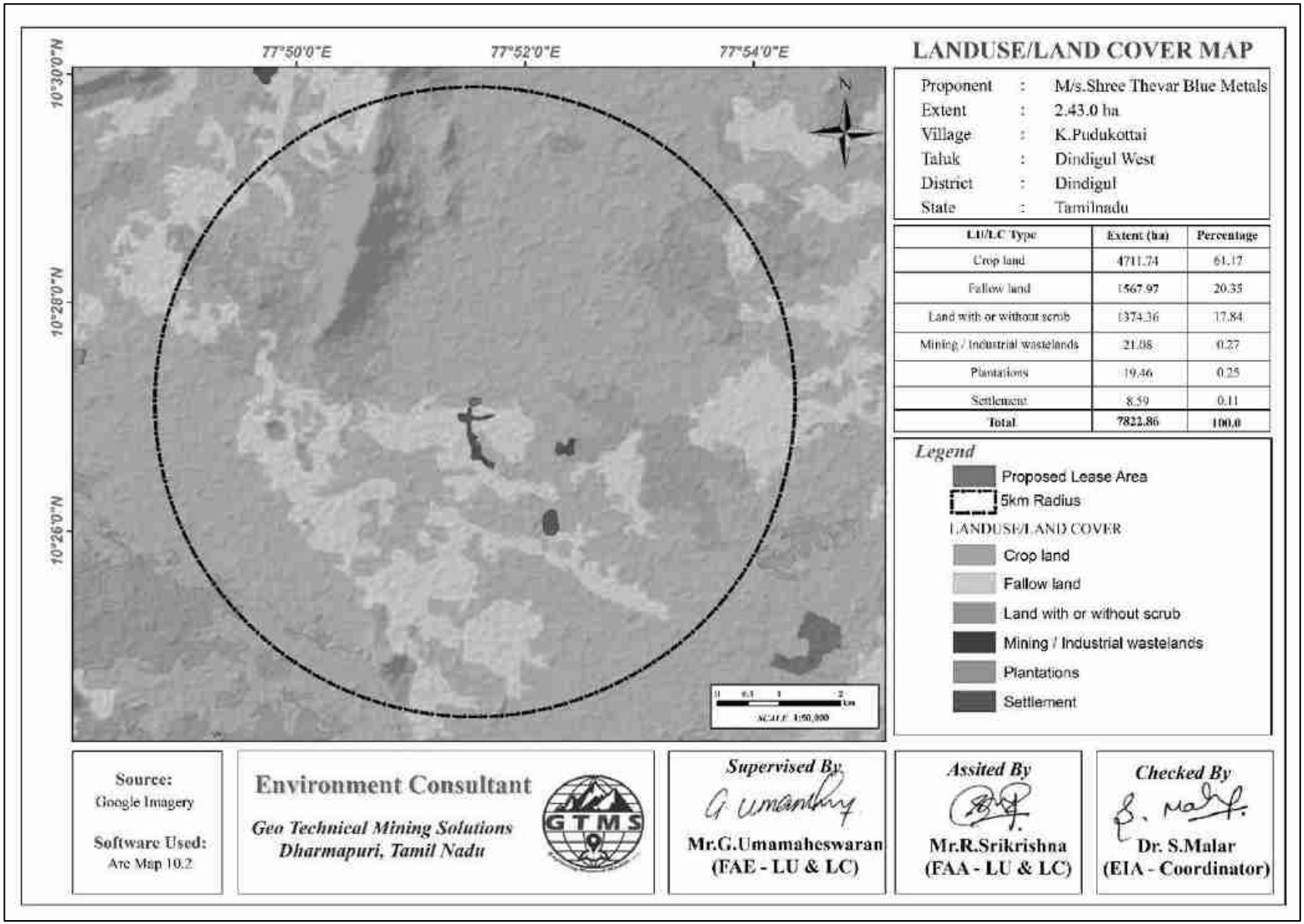


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site

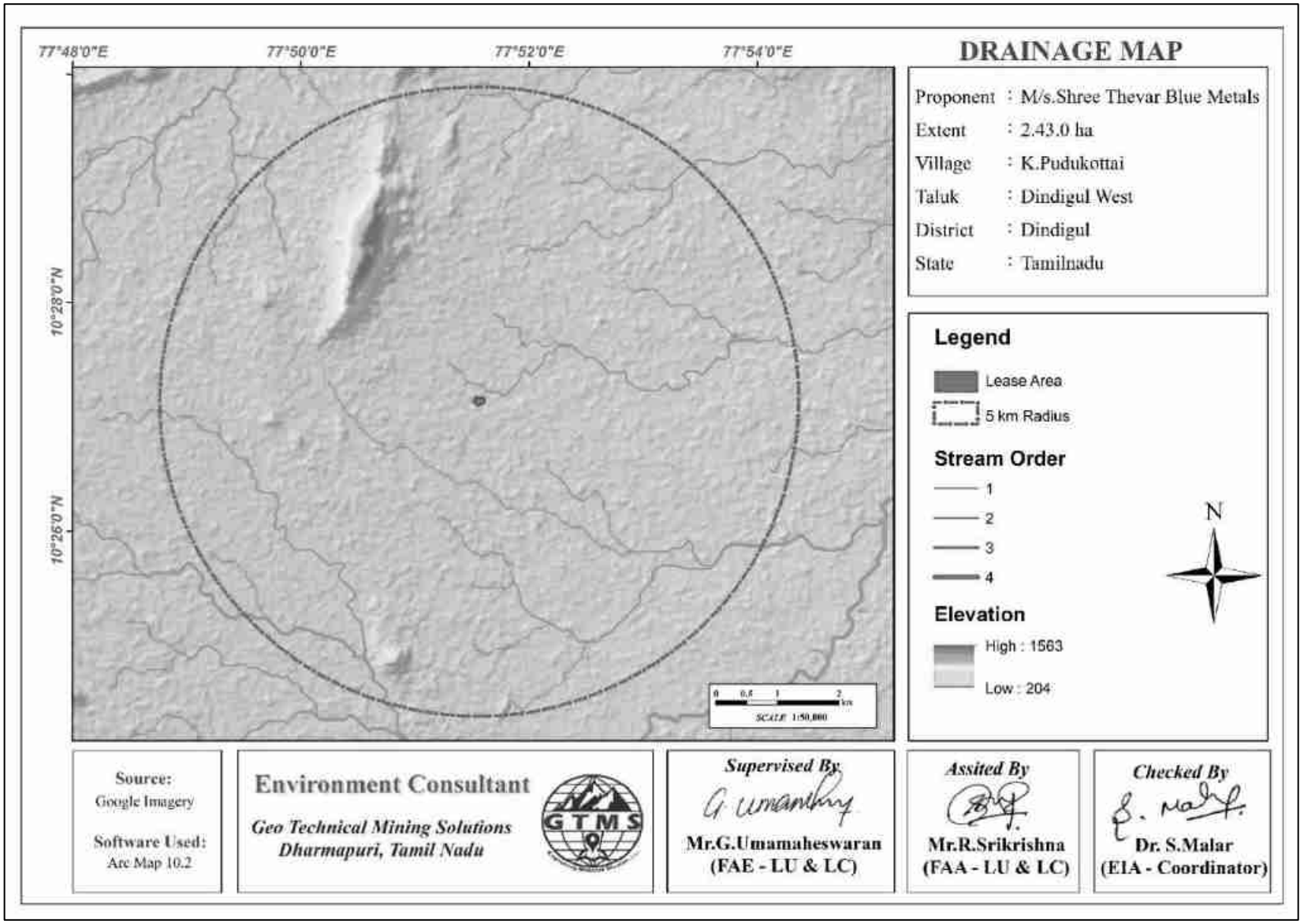


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site

3.1.6 Soil

Composite soil samples were collected from 8 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.5.

Table 3.3 Soil Sampling Locations

S. No	Location Code	Sampling Location	Direction	Distance	Latitude and Longitude
1	S1	Near Core Zone	NE	0.65 Km	10°27'14.29"N, 77°51'58.49"E
2	S2	Kothapulli	SW	0.99 Km	10°26'39.41"N, 77°51'14.69"E
3	S3	Silvarpatty	NE	2.77 Km	10°28'9.32"N, 77°52'46.04"E
4	S4	Semmadaippatty	SW	2.95 Km	10°25'39.00"N, 77°50'50.02"E
5	S5	Sennampatty	NE	3.66 Km	10°27'44.11"N, 77°53'32.79"E
6	S6	Kethampatty	SE	2.72 Km	10°25'37.44"N, 77°51'45.67"E
7	S7	Puduppatty	SW	4.32 Km	10°25'42.59"N, 77°49'36.28"E
8	S8	Near Thevar RF	NW	2.10 Km	10°28'3.55"N, 77°50'47.53"E

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

Physical Characteristics

The physical properties of the soil samples were examined for texture, bulk density, and water holding capacity. The soil texture found in the study area is clay loam. The bulk density of soils in the study area varies between 1.15 and 2.85 g/cc. The water holding capacity varies from 40.36 to 46.50.

Chemical Characteristics

The nature of soil is slightly alkaline to strongly alkaline with pH ranging from 7.21 to 7.91, Chloride ranges between 14.0 and 38.0 mg/kg, Sodium ranges between 9.0 and 24.0 mg/kg,

Potassium ranges between 0.98 and 2.0 mg/kg, Calcium ranges between 10.0 and 19.0 mg/kg, Magnesium ranges between 5.0 and 11.0 mg/kg.

Soil Quality Assessment

Soil quality is the foundation of sustainable crop production. Soil quality assessment helps to understand soil conditions and adopt suitable production practices. It can be done using physical, chemical, and biological properties of soil. For this assessment, four soil quality parameters including pH, EC, OM, and BD were taken into account. The soil quality score for each sample has been provided in Table 3.4.

Table 3.4 Assigning Scores to Soil Quality Indicators

Soil Quality Score						
S. No.	OM	BD	PH	EC	**Total Score**	**Recommendation**
S01	33	2	13	11	60	The Soil Requires Major and Immediate Treatment
S02	44	2	13	11	71	
S03	33	2	13	11	60	
S04	33	13	13	11	71	
S05	33	2	13	11	60	
S06	33	13	20	11	78	
S07	33	2	20	11	67	
S08	33	2	13	11	60	

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

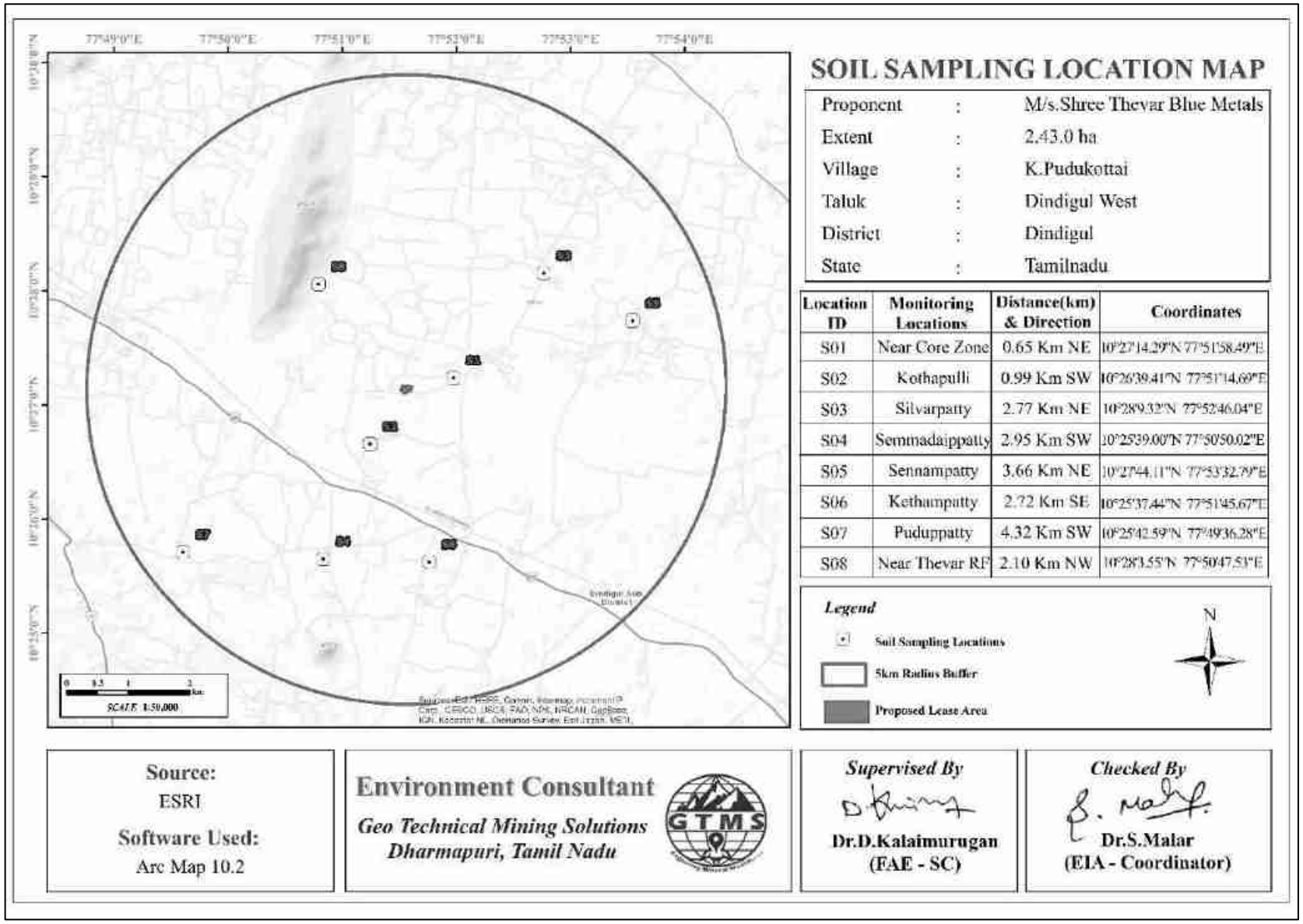


Figure 3.5 Map Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

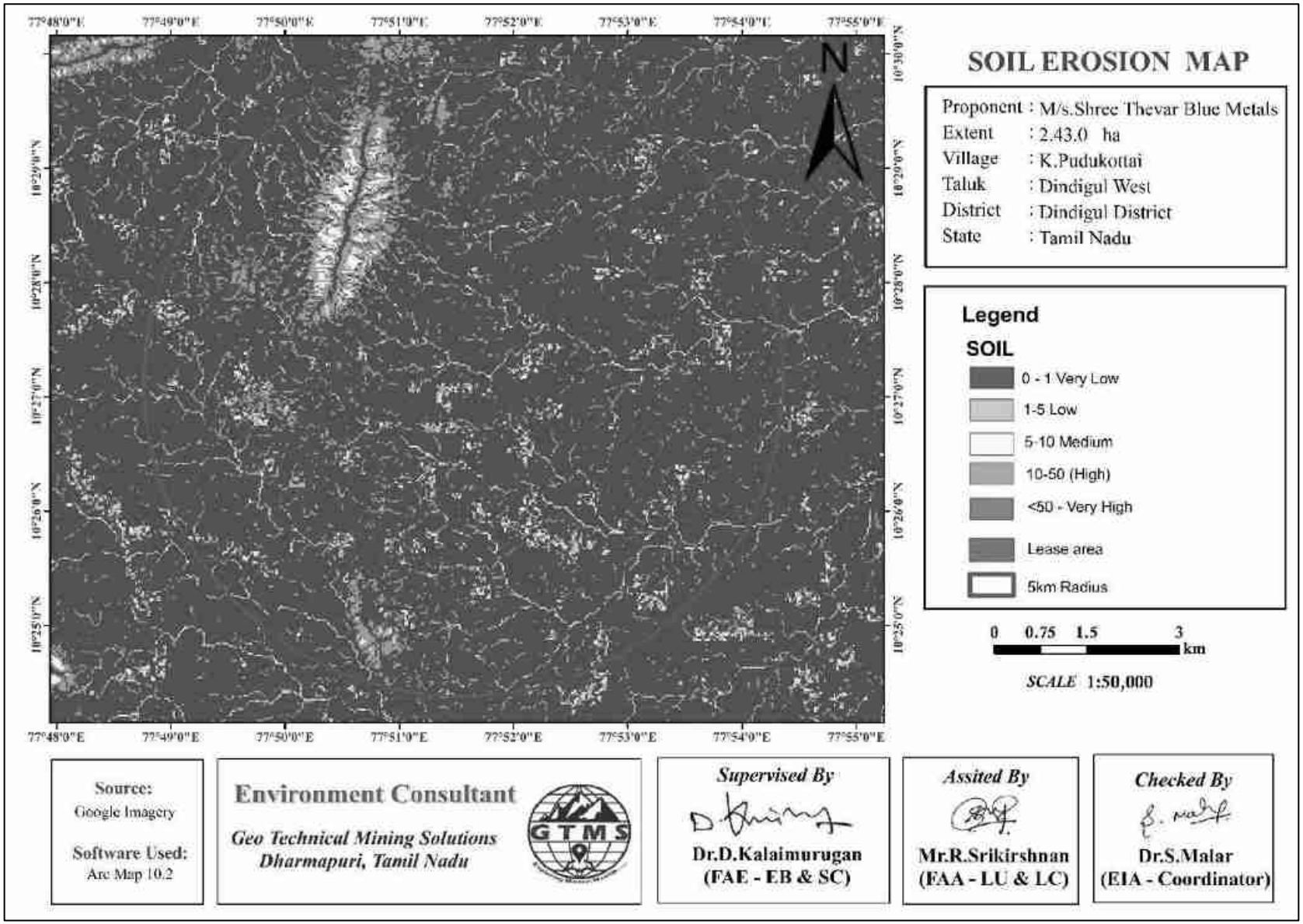


Figure 3.6 Soil Erosion map within 5 km Radius around the Proposed Project Site

Table 3.5 Soil Quality of the Study Area

Parameters		Unit	S1	S2	S3	S4	S5	S6	S7	S8
Physical Parameters										
1	pH (10% Solution)	-	7.65	7.91	7.90	7.60	7.55	7.29	7.21	7.30
2	Electrical Conductivity at (10% solution)	µs/cm	138	131	142	150	153	160	182	195
3	Texture	%	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
4	Sand	%	41.88	44.18	42.20	38.87	41.82	39.20	43.90	41.73
5	Slit	%	25.38	24.46	22.70	24.20	22.40	26.10	22.90	24.10
6	Clay	%	32.74	31.36	35.10	36.93	35.78	34.70	33.20	34.17
7	Water content	%	0.98	0.98	1.05	1.18	1.10	1.22	1.02	1.15
8	Water Holding Capacity	%	41.39	44.20	46.50	40.36	43.50	42.60	43.66	44.10
9	Bulk Density	g/cc	2.73	2.85	2.76	1.15	1.83	1.50	2.50	1.95
10	Organic Matter	%	1.93	2.52	2.36	1.66	1.83	1.42	1.95	2.04
	Chemical Parameters									
11	Alkalinity	mg/kg	18	15	22	18	24	20	36	40
12	Calcium (Ca)	mg/kg	13	10	13	16	15	19	14	15
13	Magnesium (Mg)	mg/kg	8	5	6	9	9	11	8	7
14	Sodium (Na)	mg/kg	12	9	12	14	13	16	20	24
15	Potassium(K)	mg/kg	1.21	0.98	1	1.45	1.56	1.63	2	1.85
16	Chlorides	mg/kg	19	14	18	22	22	25	32	38
17	Copper (Cu)	mg/kg	BLQ(LOQ =0.05)	BLQ(LOQ= 0.05)	BLQ(LOQ= 0.05)	BLQ(LOQ= 0.05))	BLQ(LOQ= 0.05)	BLQ(LOQ =0.05)	BLQ(LOQ= 0.05)	BLQ(LOQ= 0.05)
18	Iron	mg/kg	0.98	1.21	1.10	2.12	1.95	1.46	1.55	1.62
BLQ= Below Limit of Quantification; LOQ= Limit of Quantification										

Source: Sampling Results by Ekdant Enviro Services (P) Ltd in association with GTMS.

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 baseline quality of surface and ground water.

Table 3.6 Water Sampling Locations

S.No	Location	Distance & Direction	Coordinates
SW01	K.Pudukottai	0.60 Km NE	10°27'16.24"N, 77°51'56.01"E
BW01	Bommankottai	0.72 Km SW	10°26'43.78"N, 77°51'23.71"E
BW02	Kothapulli	0.44 Km SE	10°26'60.00"N, 77°51'49.34"E
BW03	Silvarpatty	5.48 Km SE	10°24'57.41"N, 77°53'40.61"E
BW04	Kamatchipuram	3.23 Km SW	10°26'29.22"N, 77°49'51.32"E
BW05	Gurunathanaickanur	4.79 Km NE	10°29'14.24"N,77°53'11.97"E
OW01	Sakkalanaicken Patty	0.50 Km W	10°27'14.64"N,77°51'15.56"E
OW02	Gurunathanaickanur	2.55 Km NW	10°28'30.47"N, 77°51'8.54"E

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

3.2.1 Surface Water Resources and Quality

K.Pudukottai Lakes are the one prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. Three surface water samples, known as SW1 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the three samples. Results for surface water samples in the Table 3.7 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

3.2.2 Ground Water Resources and Quality

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. seven groundwater samples, known as OW01, OW02, BW01, BW02, BW03, BW04 and BW05, were collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.7. Table 3.7 summarizes ground water quality data of the seven samples. Results for ground water samples in the Table 3.8 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

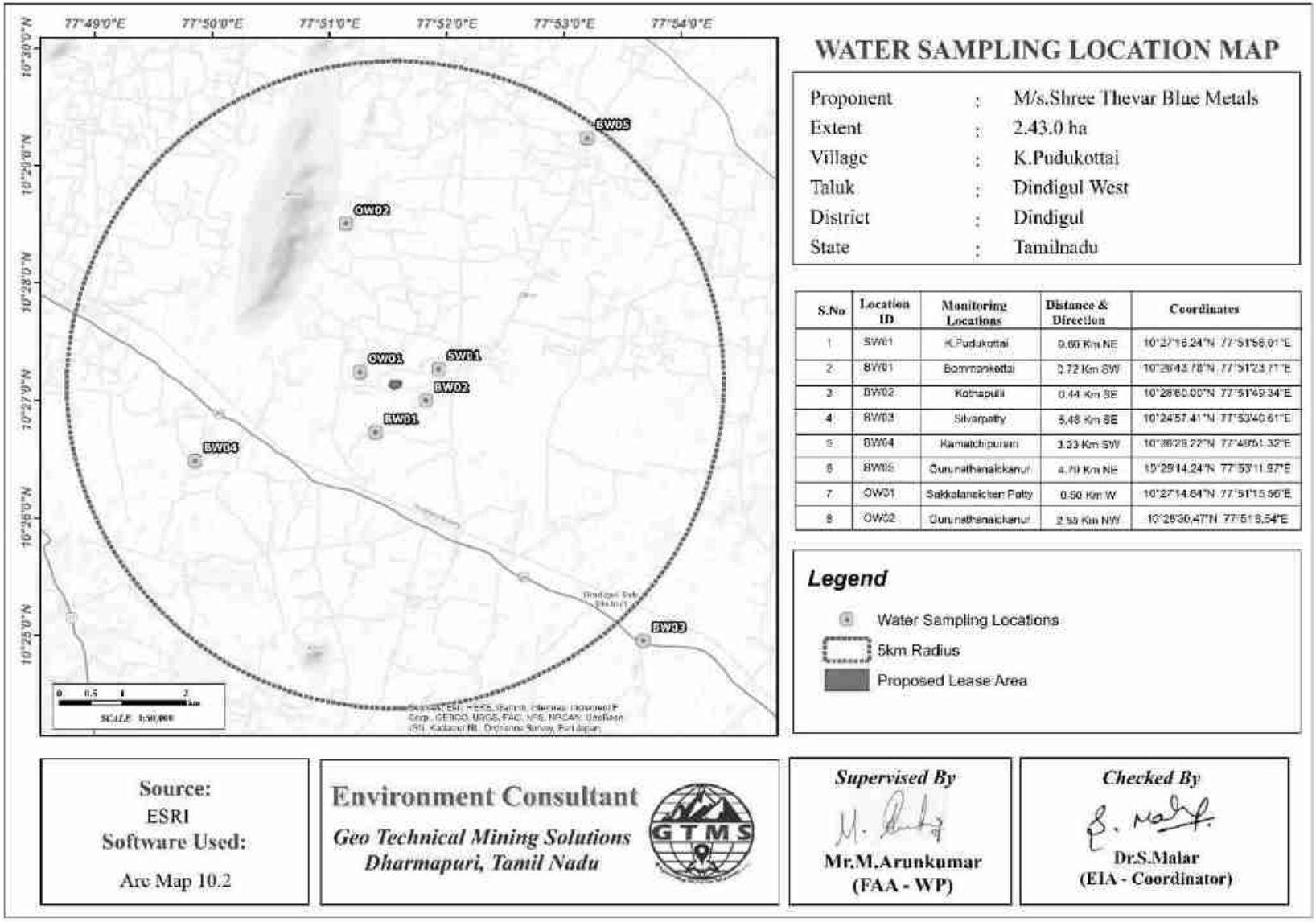


Figure 3.7 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.7 Ground Water Quality Result

S. No.	Parameters	Units	Results							Standards as Per IS 10500: 2012	
			BW1	BW2	BW3	BW4	BW5	OW1	OW2	Acceptable Limit	Permissible Limit
1	pH@ 25°C	-	7.36	7.51	7.27	7.31	7.91	7.63	7.80	6.5-8.5	6.5-8.5
2	Electrical Conductivity @ 25°C	µs/cm	1451	1746	1361	1135	943	831	1041	Not specified	Not specified
3	Turbidity	NTU	0.20	0.10	0.10	0.10	0.10	0.10	0.10	1	5
4	Total Suspended Solids	mg/l	BLQ (LOQ=1.0)	BLQ (LOQ=1.0)	BLQ (LOQ=1.0)	BLQ (LOQ=1.0)	BLQ (LOQ=1.0)	BLQ (LOQ=1.0)	BLQ (LOQ=1.0)	Not specified	Not specified
5	Total Dissolved Solids	mg /l	870	1014	792	684	538	472	590	500	2000
6	Total Hardness as $CaCo_3$	mg/l	581	792	426	418	381	293	457	200	600
7	Chloride as Cl-	mg/l	93	98	90	103	99	118	83	250	1000
8	Sulphate as SO4-	mg/l	29	46	35	63	40	42	36	200	400
9	Silica (Reactive) as SiO_2	mg/l	43	41	50	27	29	31	39	-	-
10	Total Iron as Fe	mg/l	0.08	0.11	0.09	0.04	0.03	0.03	0.04	0.3	0.3
11	Total Coliforms	MPN/100ml	80	60	40	50	70	60	50	Shall not be detectable in any 100ml	
12	E. coli	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Shall not be detectable in any 100ml	

*Source: Sampling Results by **Ekdant Enviro Services (P) Ltd,** in association with GTMS*

Table 3.8 Surface Water Quality Result

S. No.	Parameter	Unit	Result	Standards as Per IS 10500: 2012	
			SW1	Acceptable Limit	Permissible Limit
1	pH@ 25ºC	-	7.48	6.5-8.5	6.5 – 8.5
2	Electrical Conductivity @ 25°C	µs/cm	810	-	-
3	Turbidity	NTU	4.60	1	5
4	Total Suspended Solids	mg/l	16	-	-
5	Total Dissolved Solids	mg /l	490	500	2000
6	Total Hardness as $CaCO_3$	mg/l	190	200	600
7	Chloride as Cl^-	mg/l	85	250	1000
8	Sulphate as SO_4^-	mg/l	38	200	400
9	Total Iron as Fe	mg/l	0.13	0.3	0.3
10	Silica Reactive as SiO_2	mg/l	29	-	-
Microbiological Examination					
11	Total Coliforms	MPN/100ml	70	Shall not be detectable in any 100ml	
12	E. coli	MPN/100ml	Absent	Shall not be detectable in any 100ml	
	MPN- Most Probable Number				

*Source: Sampling Results by **Ekdant Enviro Services (P) Ltd,** in association with GTMS*

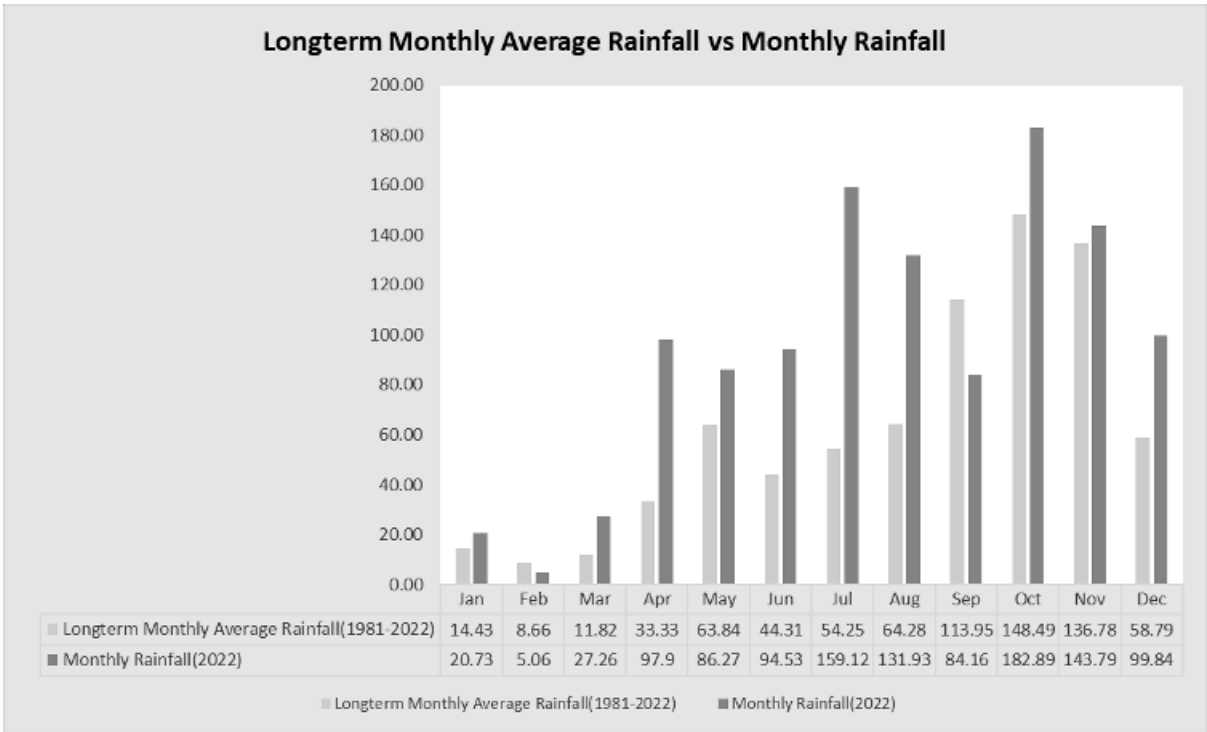
3.2.3 Hydrogeological Studies

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

Rainfall

Rainfall data for the study area were collected for the period of 1981-2022 (POWER Data Access Viewer (nasa.gov)**)**. Long term monthly average rainfall was estimated from the data of 1981-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.8. The

Figure 3.7 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in June, July, August, November and December of 2022 is higher than the previous years.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Longterm Monthly Average Rainfall(1981-2022)	14.43	8.66	11.82	33.33	63.84	44.31	54.25	64.28	113.95	148.49	136.78	58.79
Monthly Rainfall(2022)	20.73	5.06	27.26	97.9	86.27	94.53	159.12	131.93	84.16	182.89	143.79	99.84

Figure 3.8 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.2.3.1 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project area.

The open well water level data thus collected onsite are provided in Tables 3.9 According to the data, average depths to the static water table in open wells range from 20.6 to 23.6 m in monsoon. The bore well data thus collected onsite are provided in Tables 3.10. The average depths to static potentiometric surface in bore wells for during the study period vary from 62.3 to 66.2 m. Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

From the maps of open well groundwater flow direction shown in Figures 3.9, it is understood that most of the open well and groundwater for the study period flows towards the open well number 4 located in east direction of the proposed project site. The groundwater flow

maps in Figures 3.10 show that most of the bore well groundwater for the study period flow towards the bore well number 8 and 6. It is located in east direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

Table 3.9 Water Level of Open Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Nov 2021	Dec 2021	Jan 2022	Average		
OW01	21.5	22.7	23.0	22.4	10°27'10.37"N	77°51'31.02"E
OW02	22.0	23.5	24.6	23.4	10°27'19.93"N	77°51'33.95"E
OW03	21.0	22.5	23.5	22.3	10°26'38.71"N	77°51'17.53"E
OW04	20.5	21.0	22.5	21.3	10°26'53.01"N	77°51'36.40"E
OW05	22.5	23.7	24.5	23.6	10°27'23.95"N	77°51'7.70"E
OW06	20.5	21.7	22.5	21.6	10°27'5.83"N	77°52'3.14"E
OW07	22.0	23.5	24.7	23.4	10°27'33.33"N	77°52'28.98"E
OW08	19.5	20.5	21.8	20.6	10°27'38.64"N	77°52'3.27"E
OW09	21.5	22.7	23.5	22.6	10°27'42.05"N	77°51'46.70"E

Source: Onsite monitoring data

Table 3.10 Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Nov 2021	Dec 2021	Jan 2022	Average		
BW01	64.5	63.5	62.0	63.3	10°26'43.81"N	77°51'23.68"E
BW02	63.5	62.5	61.0	62.3	10°26'29.77"N	77°52'3.72"E
BW03	65.5	64.0	63.0	64.2	10°27'22.02"N	77°52'13.51"E
BW04	68.0	66.0	64.5	66.2	10°27'1.55"N	77°51'22.43"E
BW05	66.5	64.5	64.0	65.0	10°26'23.15"N	77°51'13.53"E
BW06	66.0	64.5	63.0	64.5	10°26'57.22"N	77°52'22.88"E
BW07	63.5	62.5	61.0	62.3	10°27'33.21"N	77°51'19.57"E
BW08	66.0	63.5	62.0	63.8	10°27'1.06"N	77°51'49.57"E
BW09	65.5	64.0	62.5	64.0	10°27'7.08"N	77°51'3.82"E

Source: Onsite monitoring data

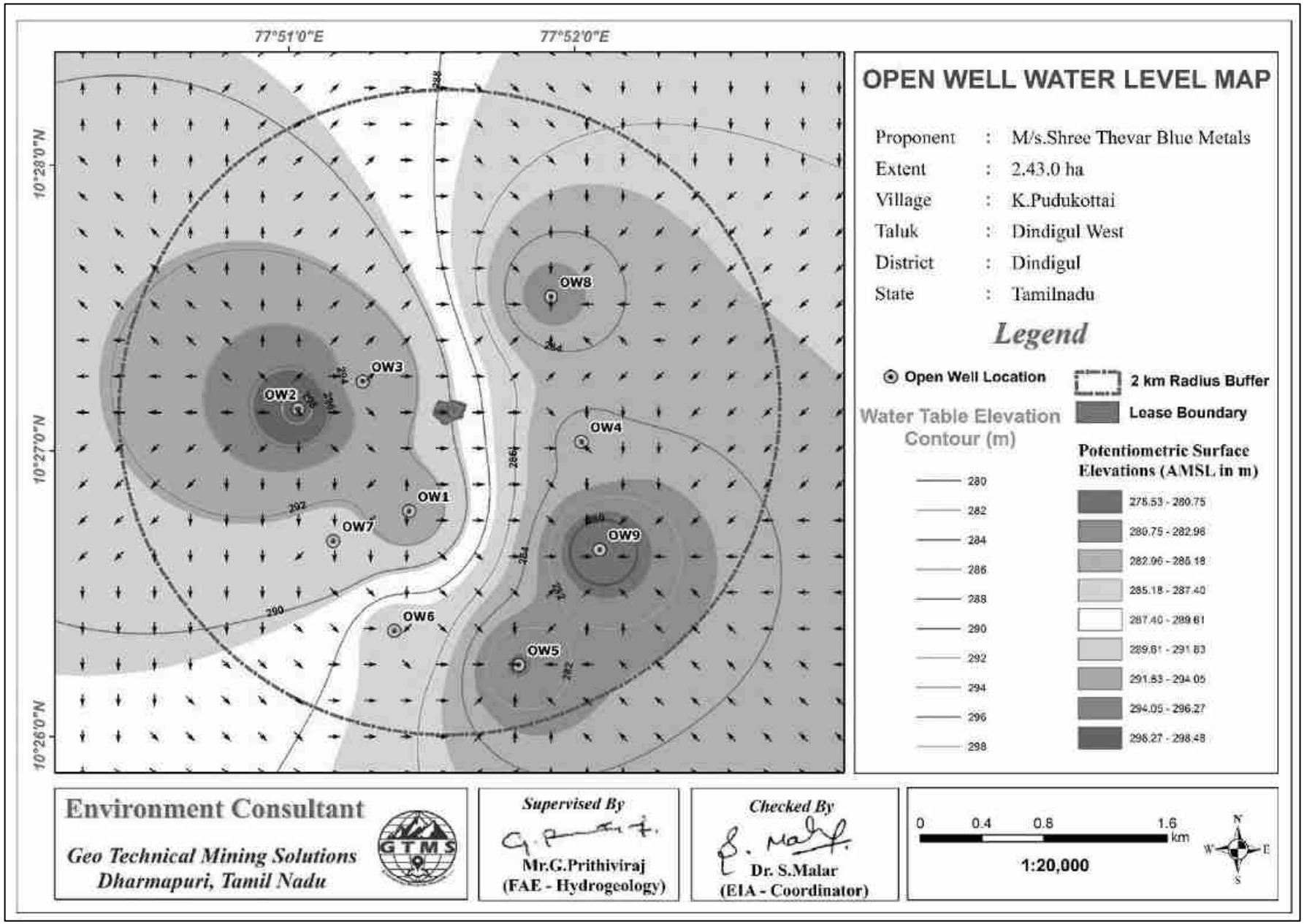


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow

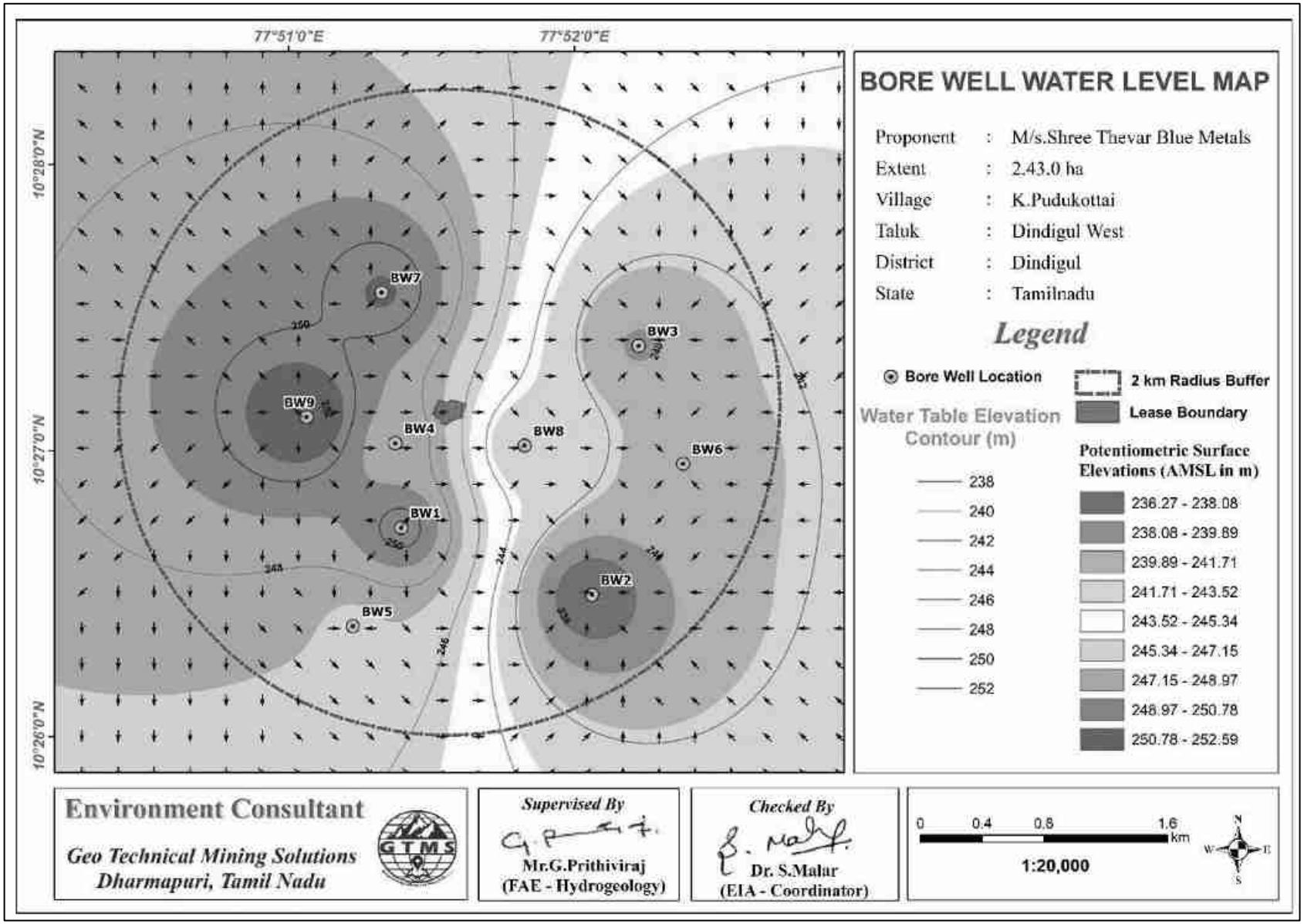


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow

3.2.3.2 Electrical Resistivity Investigation

Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses four electrodes set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference.

Result

The Geophysical VES data obtained from the project site have been shown in Table 3.11. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.11.

Table 3.11 Vertical Electrical Sounding Data

Location Coordinates - 10°27'8.09"N 77°51'31.55"E					
S. No.	**AB/2 (m)**	**MN/2 (m)**	**Geometrical Factor (G)**	**Resistance in Ω**	**Apparent Resistivity in Ωm**
1	2	2	11.78	13.248	156.061
2	4	2	49.46	6.127	303.041
3	6	5	112.26	3.937	441.968
4	8	5	200.18	2.798	560.104
5	10	5	75.36	8.997	678.014
6	15	10	173.49	5.188	900.066
7	20	10	310.86	3.558	1106.04
8	25	10	487.49	2.603	1268.94
9	30	10	274.75	5.001	1374.02
10	35	10	376.8	3.883	1463.11
11	40	10	494.55	3.160	1562.78
12	45	10	628	2.683	1684.92
13	50	10	777.15	1.943	1710.13
14	60	20	453.6	2.213	1922.1
15	70	20	989.1	2.651	1003.82
16	80	20	1256	2.196	2758.18
17	90	20	1554.3	1.846	2869.24
18	100	20	1653.6	2.213	3659.42

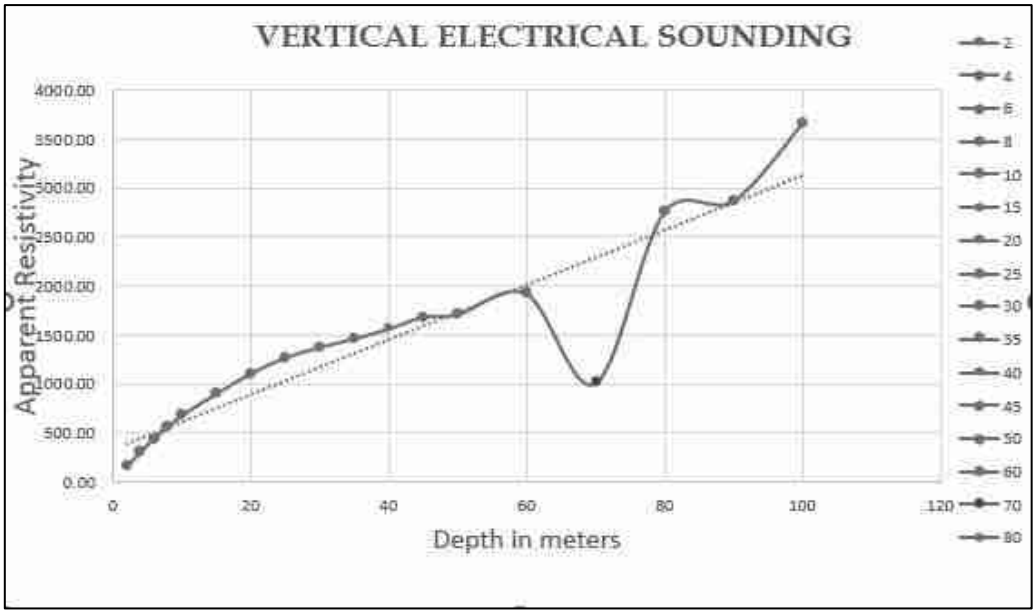


Figure 3.11 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 70 m Below Ground Level in Proposed Project

The rock formation of low resistivity values indicates occurrence of water at the depth of about 70 m below ground level. The maximum depth proposed for the proposed project is 45m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

3.3 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities.

3.3.1 Meteorology

3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.12.

According to the onsite data, the temperature in November,2021 varied from 20.33 to 30.68^{0}C with the average of 24.58^{0}C; in December, 2021 from 14.32 to 30.30^{0}C with the average of 23.16^{0}C; and in January ,2022 from 16.54 to 32.19^{0}C with the average of 23.94^{0}C. In November,2021, relative humidity ranged from 62.25 to 99.44 % with the average of 89.49%; in December, 2021, from 58.00 to 100 % with the average of 86.54%; and in

January,2022, from 46.19 to 100% with the average of 82.64%. The wind speed in November,2021 varied from 0.17 to 6.72 m/s with the average of 2.55 m/s; in December, 2021 from 0.48 to 6.58 m/s with the average of 2.78m/s; and in January,2022 from 0.12 to 6.80 m/s with the average of 2.79 m/s. In November,2021, wind direction varied from 0.15 to 359.82^0 with the average of 183.55^0; in December, 2021, from 0.64 to 359.75^0 with the average of 87.78^0; and in January,2022, 1.16 to 359.01^0 with the average of 88.33^0. In November,2021, surface pressure varied 97.37 to 98.64 kPa with the average of 98.18 kPa; in December, 2021, from 98.10 to 99.04 kPa with the average of 98.58 kPa; and in January,2022, from 97.94 to 99.00 kPa with the average of 98.51 kPa

Table 3.12 Onsite Meteorological Data

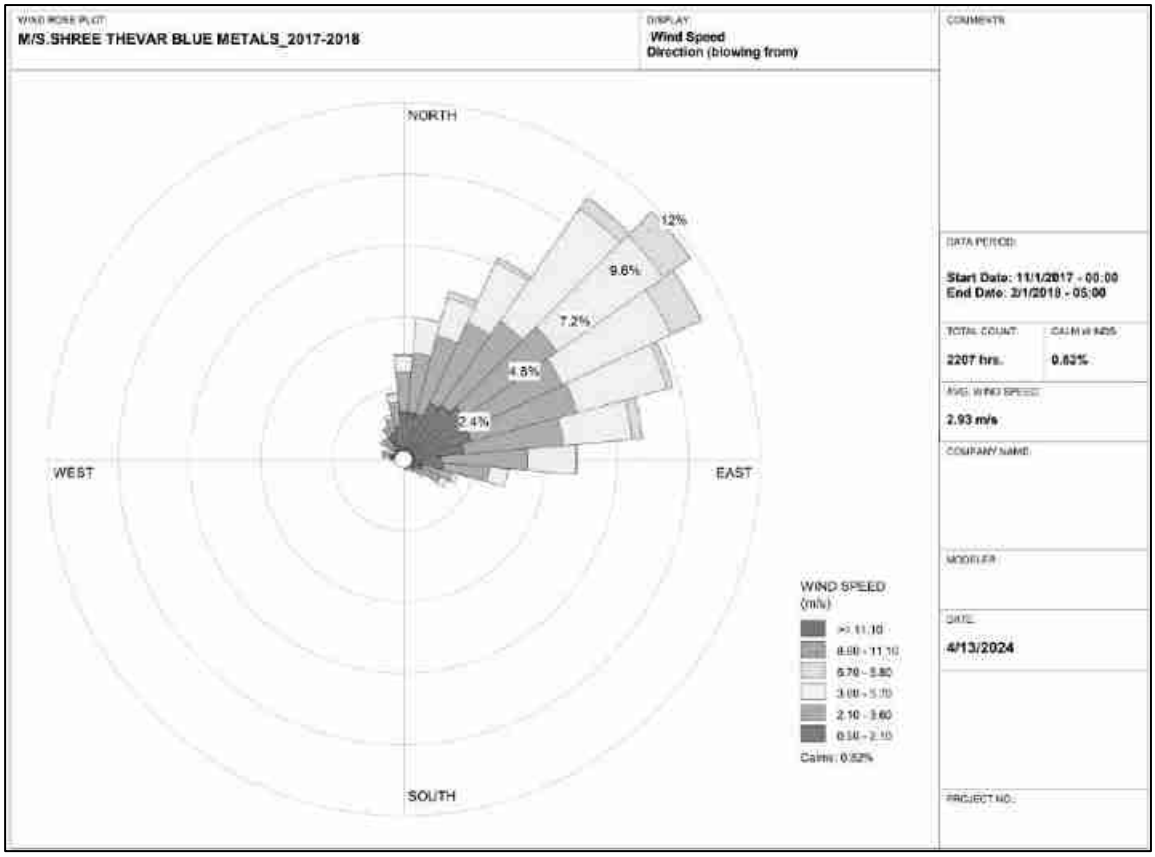
S. No.	Parameters		November,2021	December,2021	January,2022
1	Temperature (^{0}C)	Min	20.33	14.32	16.54
		Max	30.68	30.30	32.19
		Avg	24.58	23.16	23.94
2	Relative Humidity (%)	Min	62.25	58.00	46.19
		Max	99.44	100.00	100.00
		Avg	89.49	86.54	82.64
3	Wind Speed (m/s)	Min	0.17	0.48	0.12
		Max	6.72	6.58	6.80
		Avg	2.55	2.78	2.79
4	Wind Direction (degree)	Min	0.15	0.64	1.16
		Max	359.82	359.75	359.01
		Avg	183.55	87.78	88.33
5	Surface Pressure(kPa)	Min	97.37	98.10	97.94
		Max	98.64	99.04	99.00
		Avg	98.18	98.58	98.51

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

3.3.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of November through January of the years from 2017 to 2021 and the seasonal wind rose for the study period of November 2021 through January 2022. The wind rose diagrams thus produced are shown in Figures 3.12-3.13. Figure 3.14 reveals that:

- The measured average wind velocity during the study period is 2.71 m/s.
- Predominant wind was dominant in the directions ranging from Northeast to Southwest.



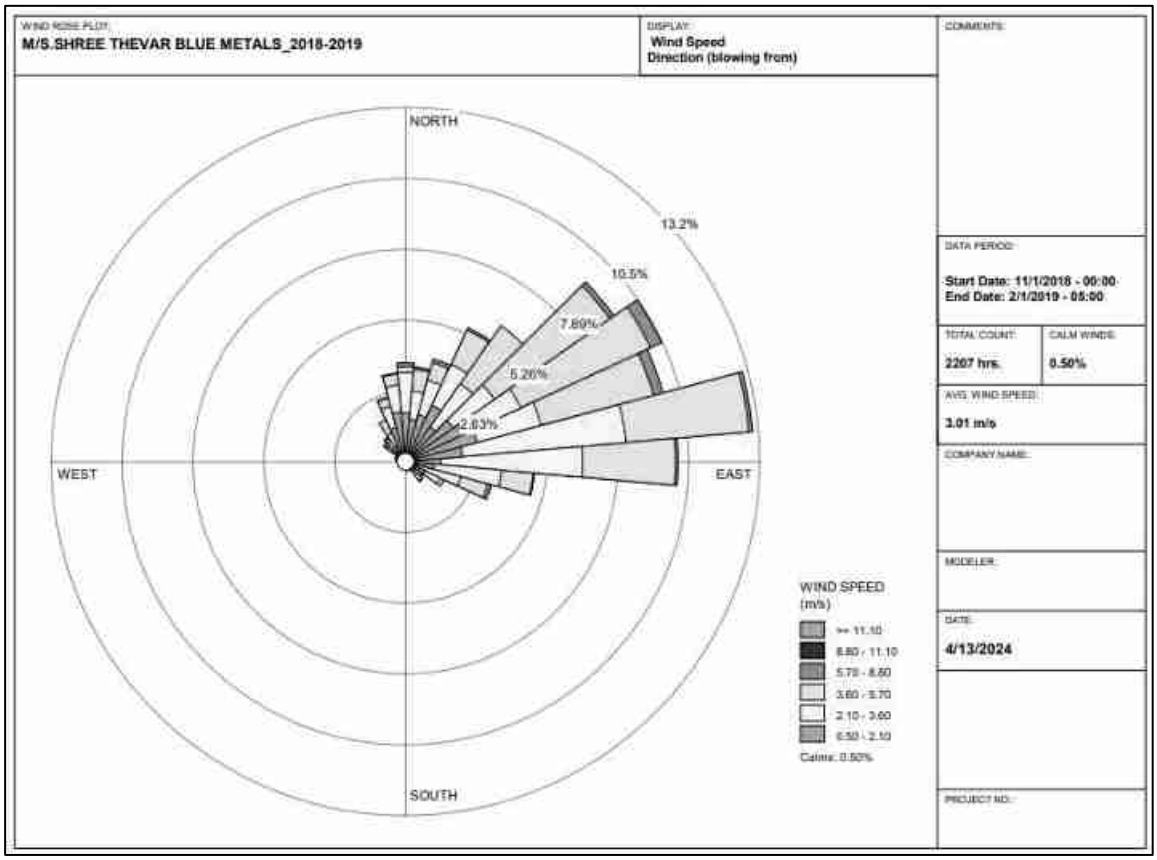
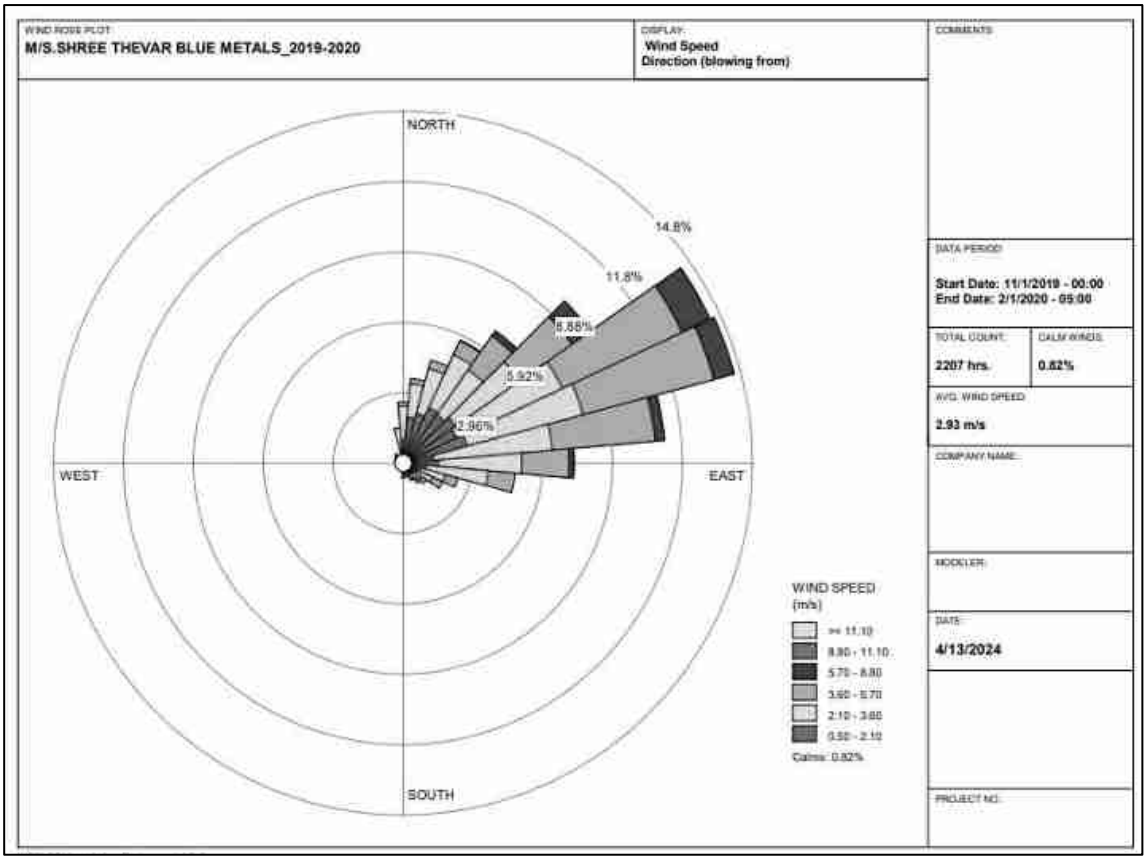


Figure 3.12 Windrose Diagram for 2017-2018 and 2018-2019 (November to January)



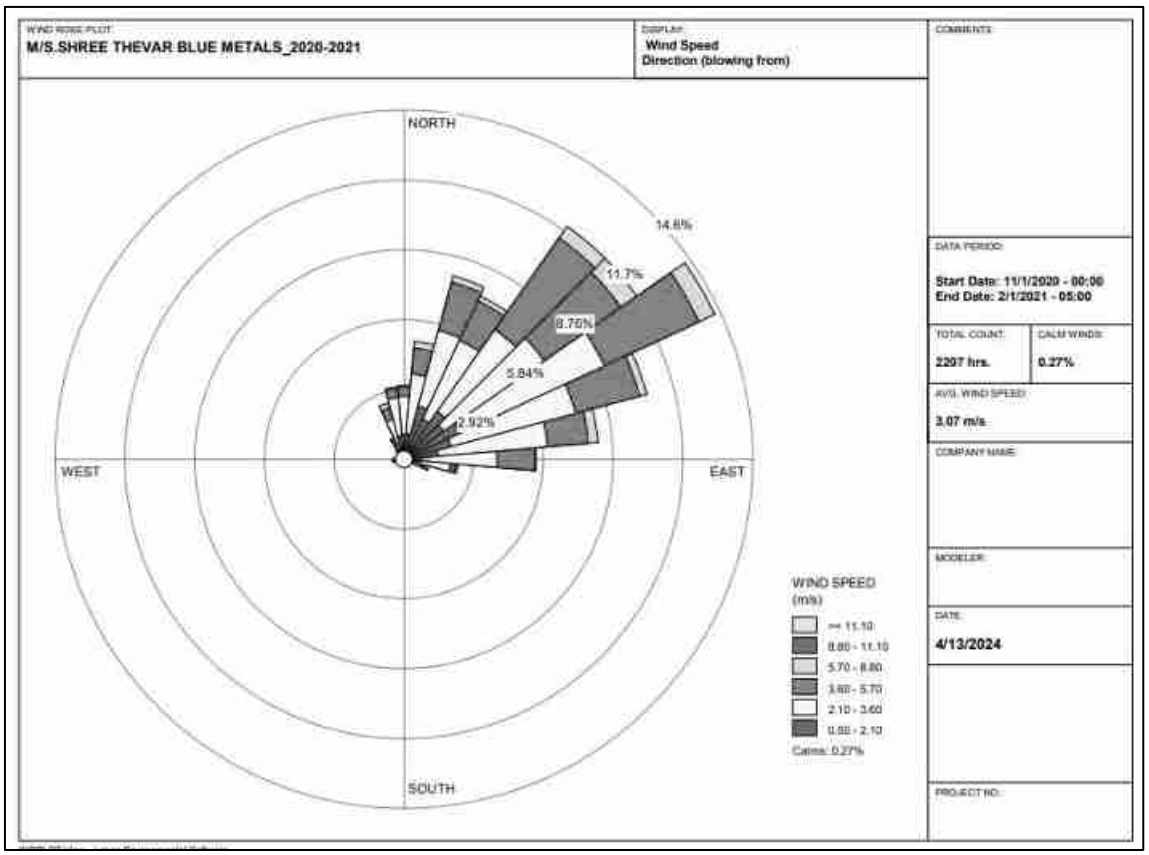


Figure 3.13 Windrose Diagram for 2019-2020 and 2020-2021 (November to January)

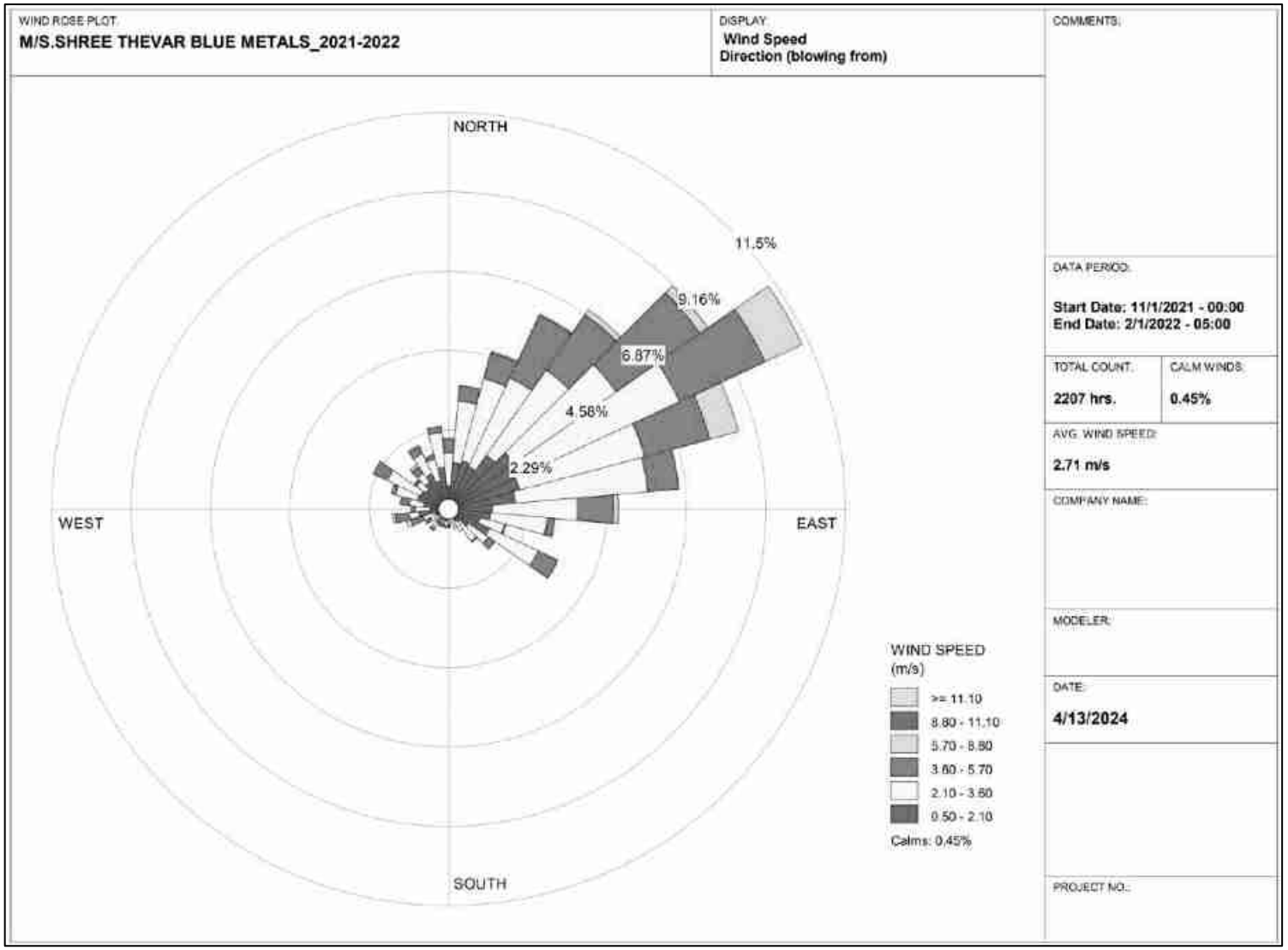


Figure 3.14 Onsite Wind Rose Diagram

3.3.2 Ambient Air Quality Study

The baseline ambient air quality is studied through a scientifically designed ambient air quality monitoring network considering the followings

- ❖ Meteorological condition on synoptic scale
- ❖ Topography of the study area
- ❖ Representatives of regional background air quality for obtaining baseline status
- ❖ Location of residential areas representing different activities
- ❖ Accessibility and power availability

Table 3.13 Methodology and Instrument Used for AAQ Analysis

Parameter	Method	Instrument
$PM_{2.5}$	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM_{10}	Gravimetric method Beta attenuation method	Respirable Dust Sampler
SO_2	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NOx	IS-5182 Part II (Jacob & Hoch heiser modified method)	Respirable Dust Sampler with gaseous attachment
Free Silica	NIOSH – 7601	Visible Spectrophotometry

*Source: Sampling Methodology based **Ekdant Enviro Services (P) Ltd** & CPCB* Notification

Table 3.14 National Ambient Air Quality Standards

S. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO_2 ($\mu g/m^3$)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO_x ($\mu g/m^3$)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM_{10} ($\mu g/m^3$)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	$PM_{2.5}$ ($\mu g/m3$)	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

Methodology

Ambient air quality monitoring was 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 **November 2021 to January**, 2022 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least 3 ± 0.5m above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The baseline data of ambient air were generated for $PM_{2.5}$, PM_{10}, sulphur dioxide (SO_2) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.15 and average concentrations of air pollutants are summarized in Tables 3.15 and are shown in Figures 3.16-3.20.

Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates
1	AAQ-1	Nearby Core zone	0.36	SSE	10°26'56.12"N,77°51'40.58"E
2	AAQ-2	Bommankottai	0.73	SSW	10°26'43.45"N,77°51'23.90"E
3	AAQ-3	Tadankottai	1.27	SE	10°26'34.69"N, 77°52'1.39"E
4	AAQ-4	K.Pudukkottai	1.13	NE	10°27'22.30"N,77°52'12.39"E
5	AAQ-5	Kannadampatty	2.73	NNE	10°28'33.29"N, 77°52'7.01"E
6	AAQ-6	Silvarpatty	3.97	SE	10°26'21.65"N,77°53'38.70"E
7	AAQ-7	Kamatchipuram	4.45	SW	10°25'42.04"N,77°49'32.46"E

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

Results

As per the monitoring data, $PM_{2.5}$ ranges from 19.20 µg/m^3 to 22.30 µg/m^3; PM_{10} from 37.30 µg/m^3 to 41.30 µg/m^3; SO_2 from 5.5 µg/m^3 to 7.9µg/m^3; NO_x from 17.30µg/m^3 to 21.20g/m^3. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 40 causing minimal impact to human health.

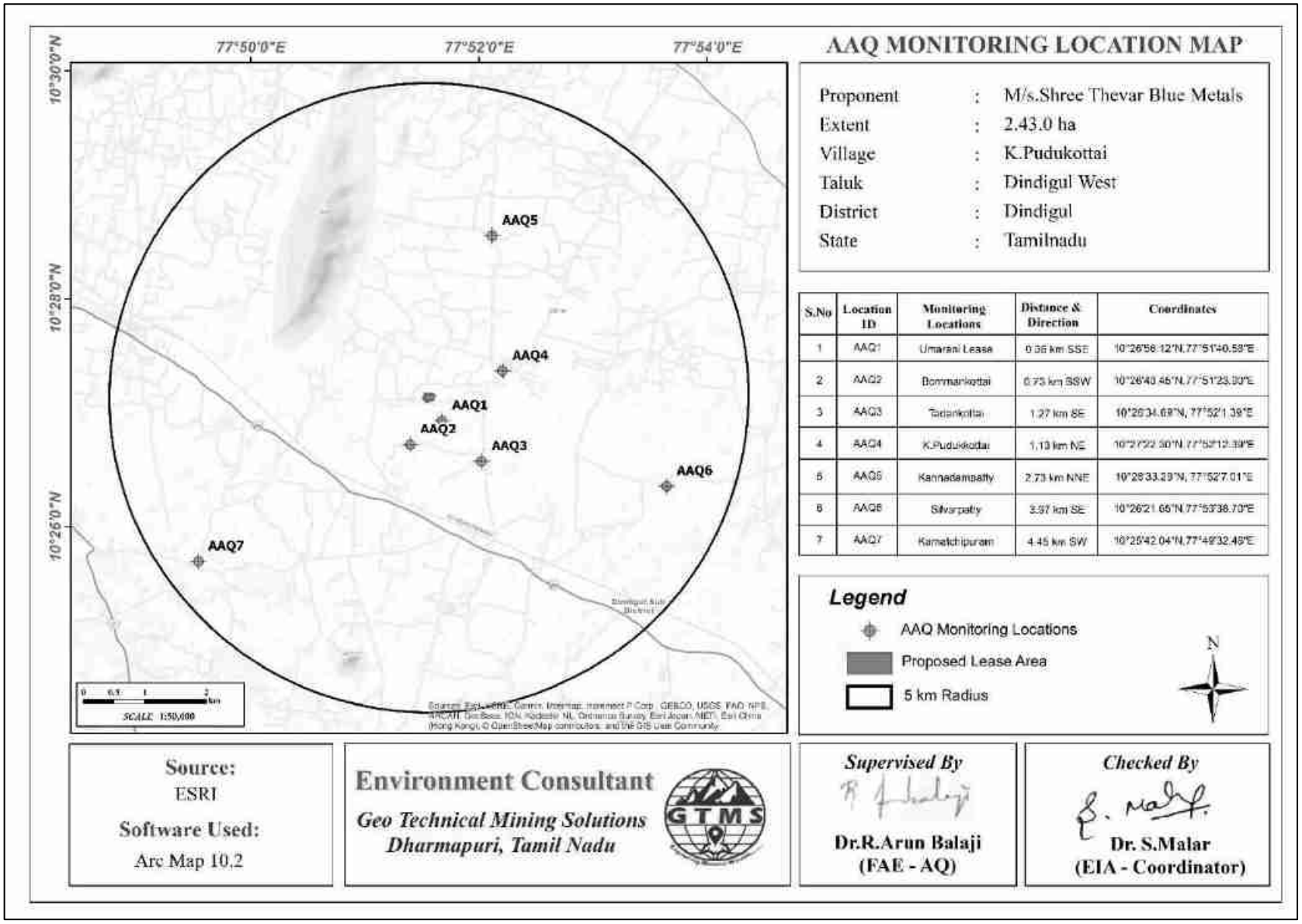


Figure 3.15 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

Table 3.16 Summary of AAQ Result

	$PM_{2.5}$				PM_{10}			
Station ID	**Max**	**Min**	**Mean**	**98th Percentile**	**Max**	**Min**	**Mean**	**98th Percentile**
AAQ1	21.6	17.2	19.69	21.46	36.8	32.1	35.24	36.8
AAQ2	24.9	21.5	23.42	24.85	41.6	37.1	39.55	41.46
AAQ3	23.4	18.2	20.80	21.74	43.8	38.6	40.94	43.29
AAQ4	22.7	19.9	21.06	22.51	38.7	35.7	37.11	38.65
AAQ5	19.7	17.1	18.04	19.60	38.9	35.6	37.52	38.80
AAQ6	23.6	22.1	21.57	23.37	43.9	40.1	42.20	43.71
AAQ7	20.2	18.3	19.37	20.06	45.6	42.2	43.80	45.55
	SO_2				NO_x			
AAQ1	6.9	4.1	5.35	6.9	18.4	14.1	16.13	18.17
AAQ2	8.2	5.1	6.54	8.06	26.2	20.3	23.51	26.20
AAQ3	9.6	7.1	8.49	9.44	17.9	15.8	16.73	17.72
AAQ4	6.2	4.2	5.00	6.06	26.7	22.2	25.10	26.52
AAQ5	7.9	5.2	6.50	7.76	18.9	14.2	16.23	18.76
AAQ6	8.8	7.1	7.74	8.70	21.2	18.1	19.20	21.02
AAQ7	7.6	6	6.62	7.55	19.1	16.3	18.05	18.72

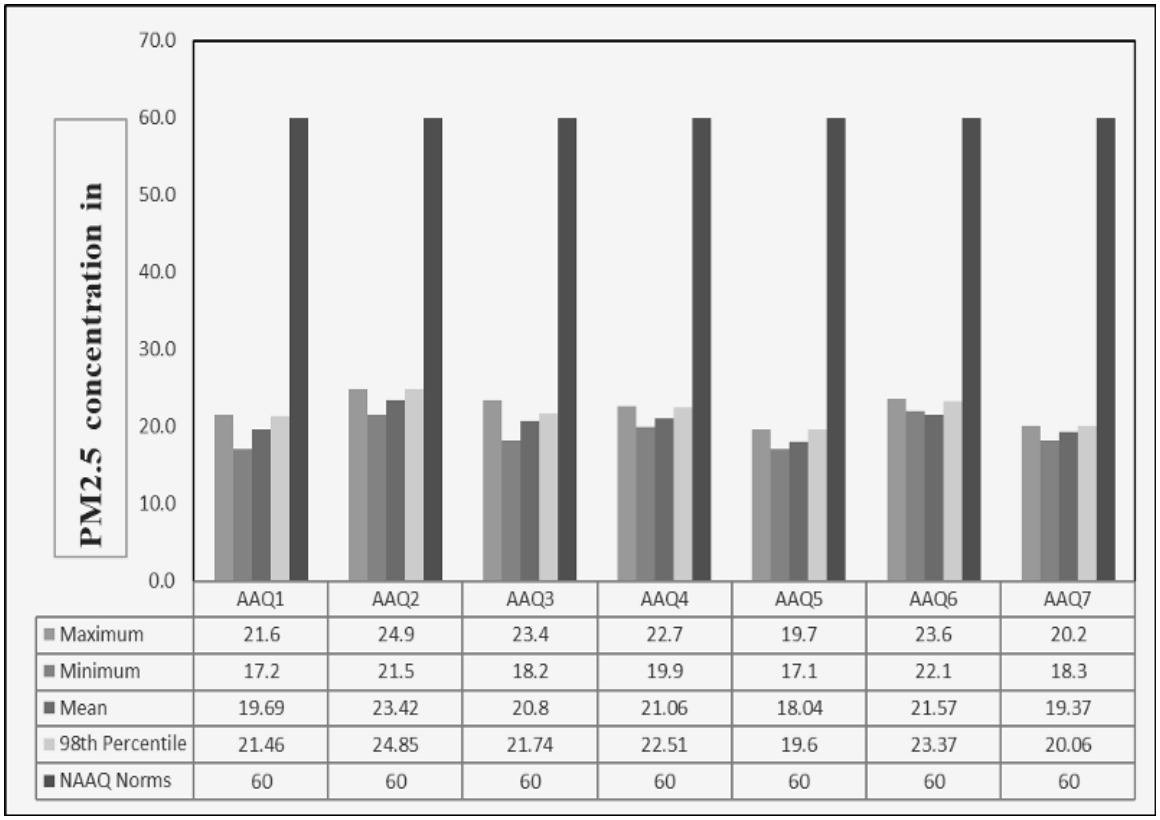
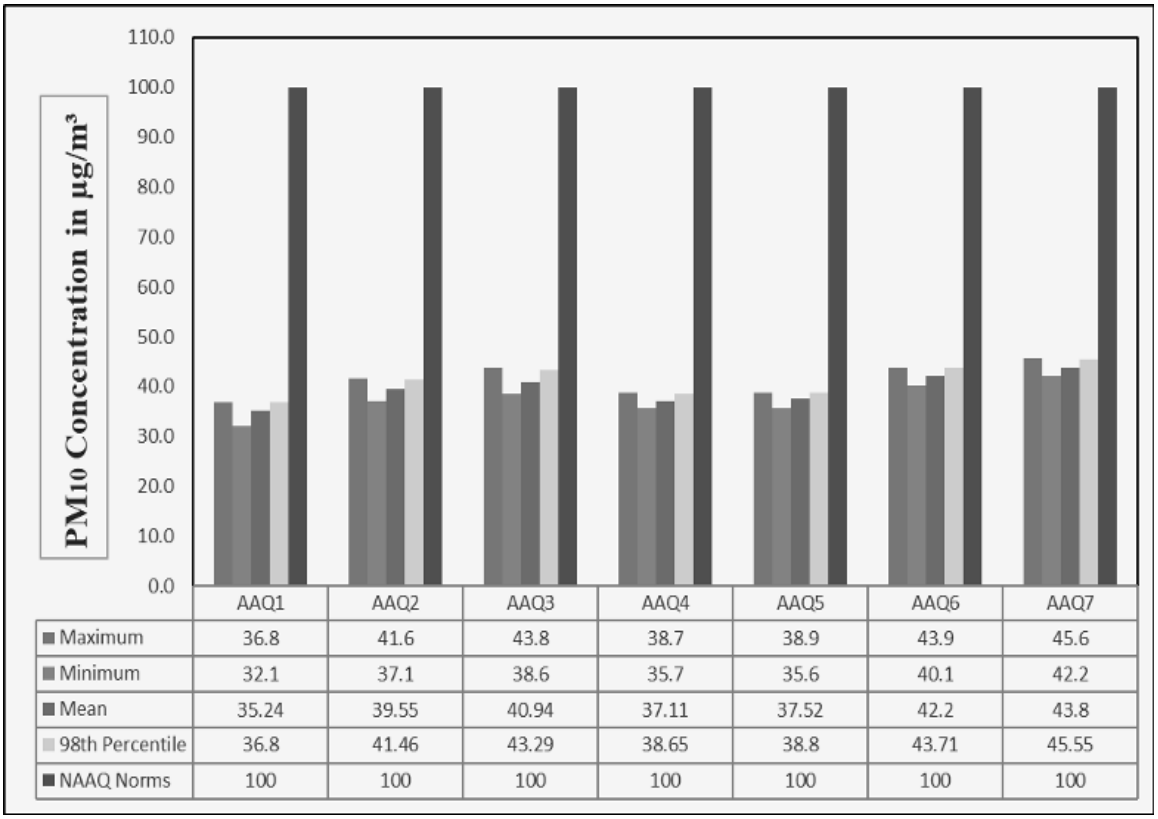
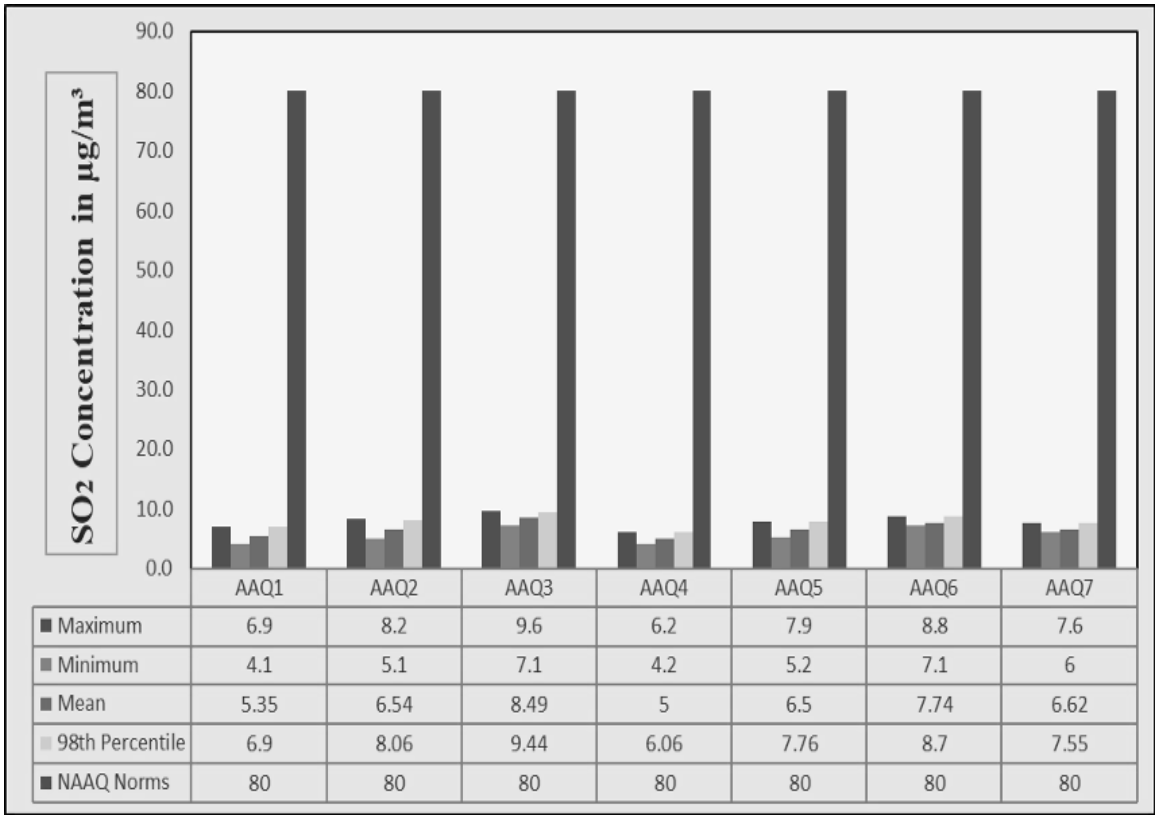


Figure 3.16 Bar Chart Showing Maximum, Minimum, and Average Concentrations of $PM_{2.5}$ Measured from 7 Air Quality Monitoring Stations within 5 km Radius



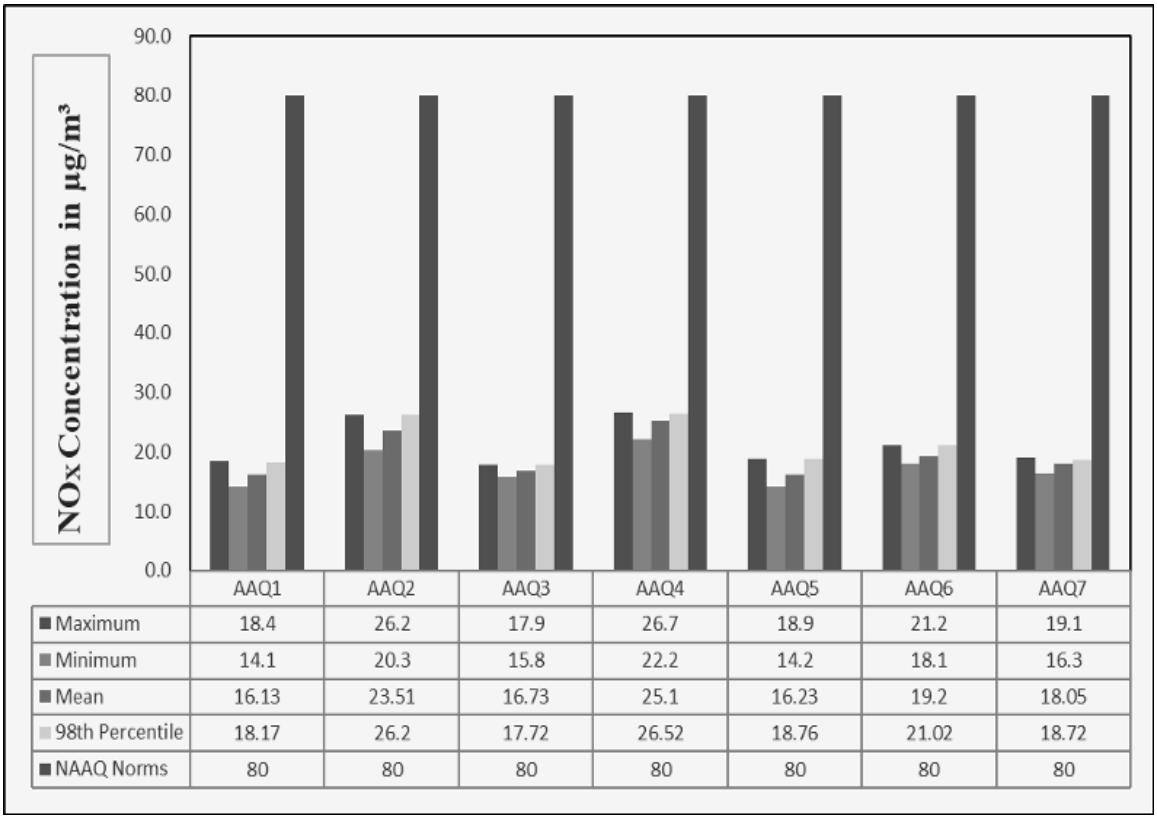
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Maximum	36.8	41.6	43.8	38.7	38.9	43.9	45.6
Minimum	32.1	37.1	38.6	35.7	35.6	40.1	42.2
Mean	35.24	39.55	40.94	37.11	37.52	42.2	43.8
98th Percentile	36.8	41.46	43.29	38.65	38.8	43.71	45.55
NAAQ Norms	100	100	100	100	100	100	100

Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{10} Measured from 7 Air Quality Monitoring Stations within 5 km Radius



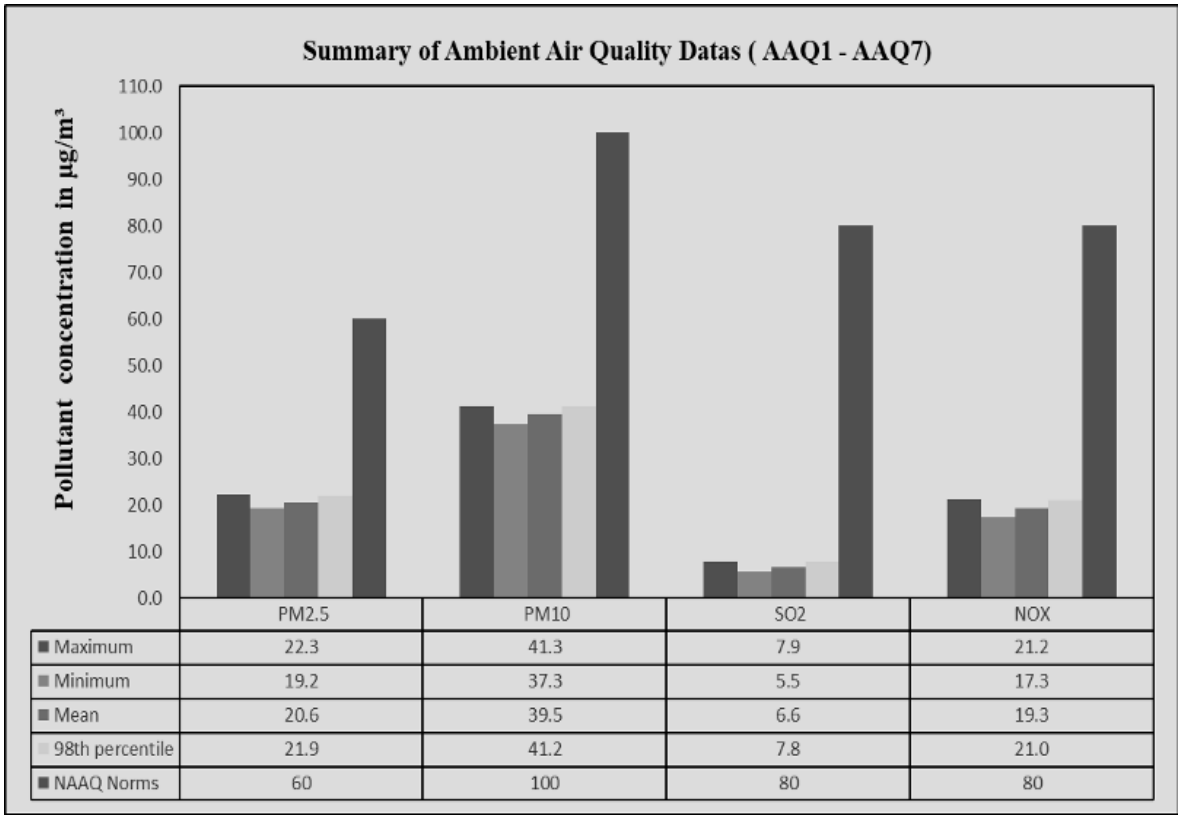
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Maximum	6.9	8.2	9.6	6.2	7.9	8.8	7.6
Minimum	4.1	5.1	7.1	4.2	5.2	7.1	6
Mean	5.35	6.54	8.49	5	6.5	7.74	6.62
98th Percentile	6.9	8.06	9.44	6.06	7.76	8.7	7.55
NAAQ Norms	80	80	80	80	80	80	80

Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO_2 Measured from 7 Air Quality Monitoring Stations within 5 km Radius



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Maximum	18.4	26.2	17.9	26.7	18.9	21.2	19.1
Minimum	14.1	20.3	15.8	22.2	14.2	18.1	16.3
Mean	16.13	23.51	16.73	25.1	16.23	19.2	18.05
98th Percentile	18.17	26.2	17.72	26.52	18.76	21.02	18.72
NAAQ Norms	80	80	80	80	80	80	80

Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO_x Measured from 7Air Quality Monitoring Stations within 5km Radius



	PM2.5	PM10	SO2	NOX
Maximum	22.3	41.3	7.9	21.2
Minimum	19.2	37.3	5.5	17.3
Mean	20.6	39.5	6.6	19.3
98th percentile	21.9	41.2	7.8	21.0
NAAQ Norms	60	100	80	80

Figure 3.20 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius

3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Seven (7) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.23.

Table 3.17 Noise Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates
1	N1	Nearby Core zone	0.16	E	10°27'5.43"N,77°51'41.62"E
2	N2	Bommankottai	0.67	S	10°26'44.25"N,77°51'27.92"E
3	N3	Tandankottai	1.21	SE	10°26'38.31"N,77°52'2.27"E
4	N4	K. Pudukottai	0.97	NE	10°27'17.78"N,77°52'8.03"E
5	N5	Sakkalanaicken Patty	0.55	W	10°27'7.26"N,77°51'12.00"E
6	N6	Semmadaipatty	4.72	NW	10°27'41.14"N,77°48'58.69"E
7	N7	Silvarpatty	5.41	E	10°26'29.00"N,77°54'30.53"E

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

Table 3.18 Ambient Noise Quality Result

Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (L_{eq} in dB (A))	
N1	Nearby Core zone	Industrial Area	46.0	39.1	75	70
N2	Bommankottai	Residential Area	40.04	31.27	55	45
N3	Tandankottai		39.02	30.94		
N4	K. Pudukottai		38.20	31.10		
N5	Sakkalanaicken Patty		39.21	31.51		
N6	Semmadaipatty		47.2	39.3		
N7	Silvarpatty		40.1	38.6		

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

The Table 3.18 shows that noise level in core zone was 45.8 dB (A) Leq during day time and 34.2 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.9 to 45.6dB (A) Leq and during night time from 28.0 to 39.0dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.21 and 3.22.

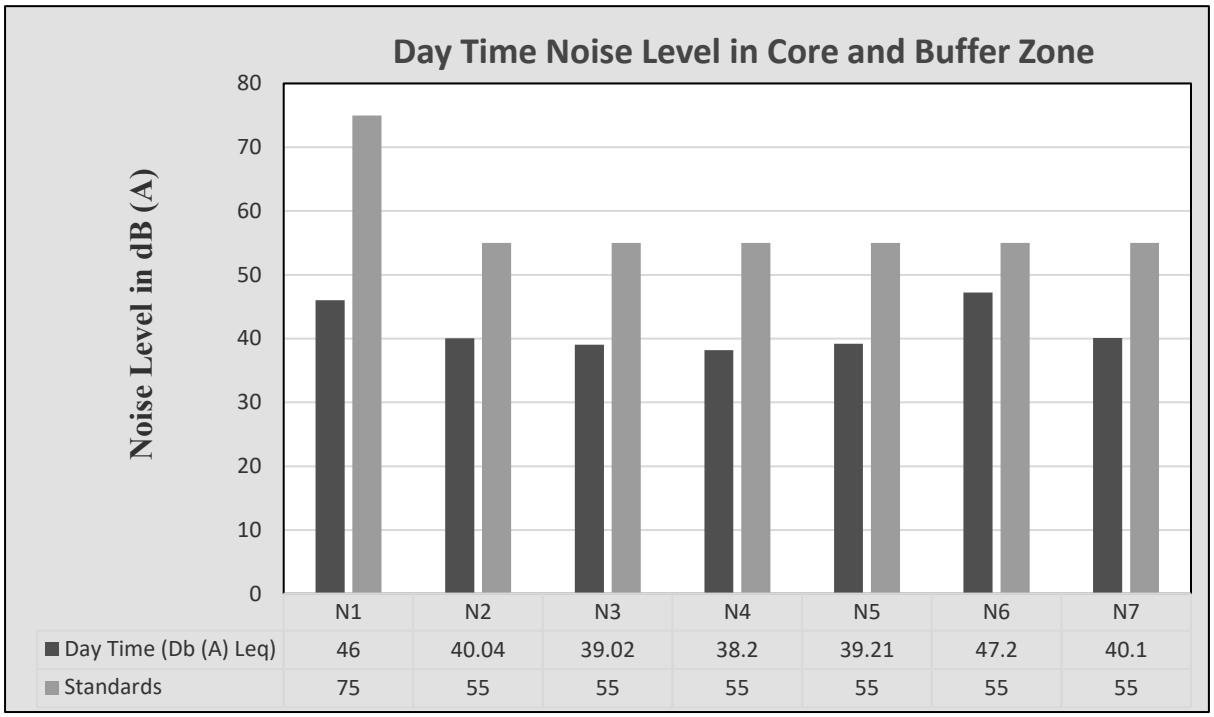


Figure 3.21 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

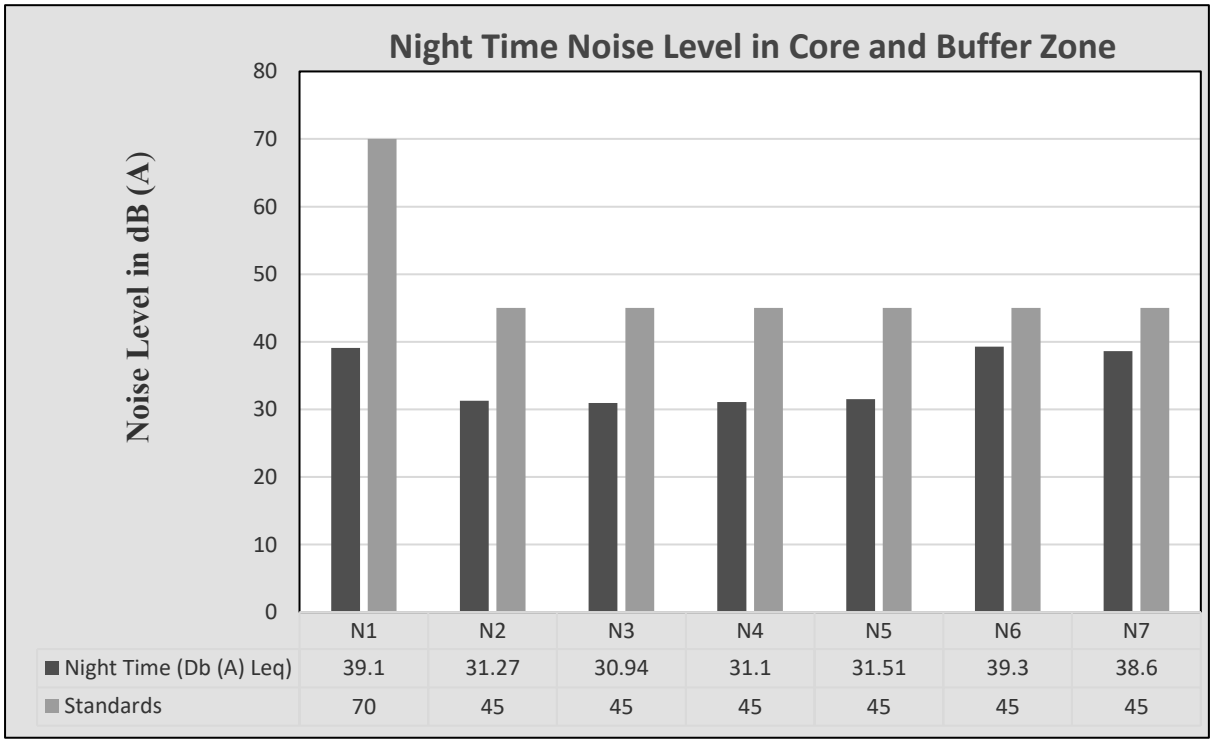


Figure 3.22 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

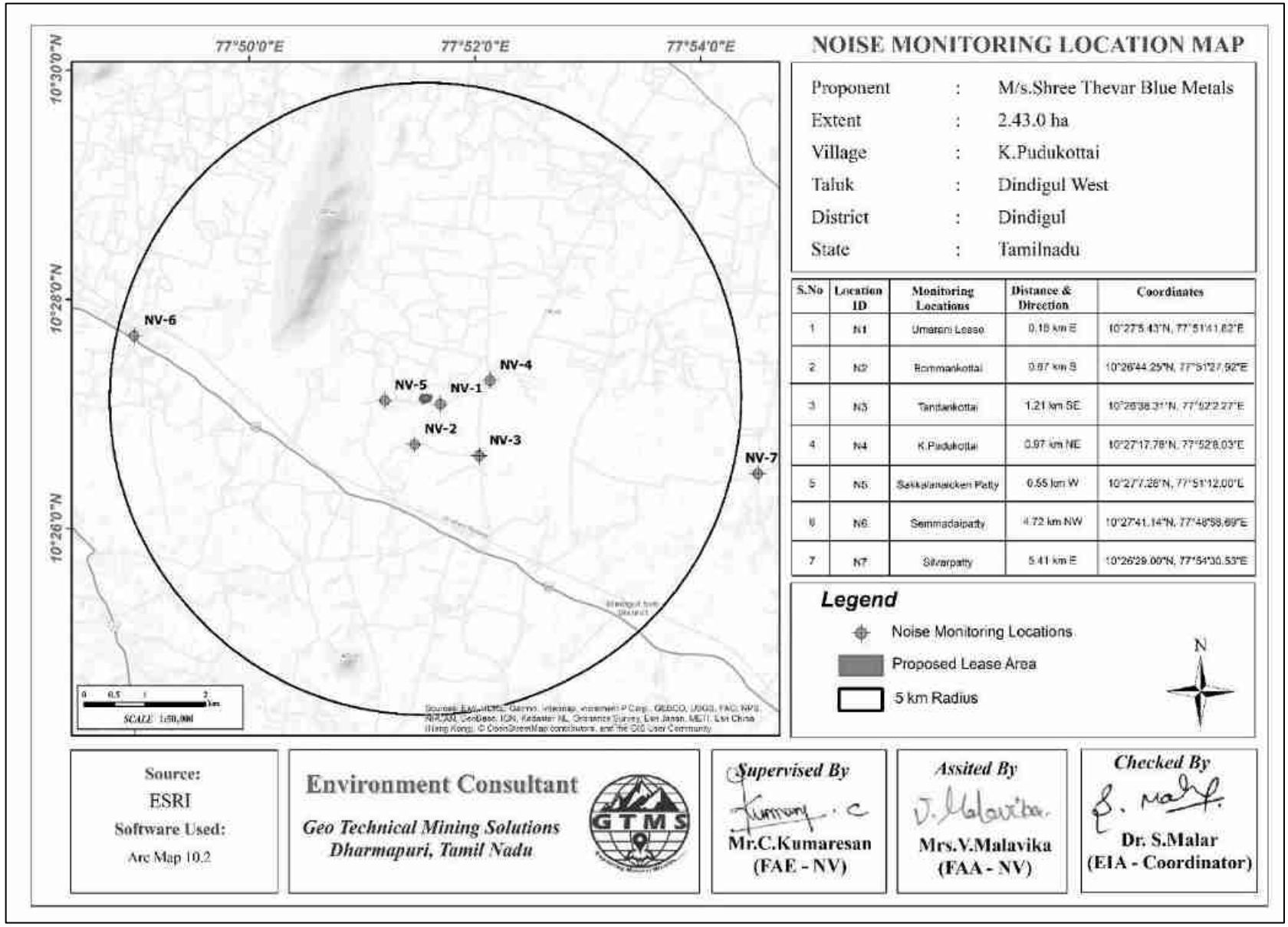


Figure 3.23 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site

3.5 BIOLOGICAL ENVIRONMENT

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

Methodology

Sampling locations were selected with reference to topography, land use, vegetation pattern, etc. In this study**,** quadrats of 25 m × 25 m were laid down to assess trees and quadrats of 10 m × 10 m were laid down for shrubs, as shown in Figure 3.24.

Figure 3.24 Quadrates Sampling Methods of Flora

Phyto-Sociological Studies

Phyto sociological parameters, such as ***Density, Frequency, Abundance and Importance Value Index*** of individual species were determined in randomly placed quadrat of different sizes in the study area, as shown in Table 3.19. Relative frequency, and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, *Density, Frequency, Relative Density & Relative Frequency were found*. Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 10 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

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

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

Shannon – Wiener Index, Evenness and Richness

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

Table 3.20 18 Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness

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

3.5.1 Flora

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections. Photographs showing various species are provided in Figure 3.25.

Flora in mine lease area (core zone)

Taxonomically a total of 28 species belonging to 21 families have been recorded from the core mining lease area. The lease applied area is flat terrain. Based on habitat classification of the enumerated plants the majority of species were Herbs & Climbers& Grass (14) followed by trees (5) Shrub (9) The result of core zone of flora studies shows that Fabaceae and Lamiaceae are the main dominating species in the study area it mentioned in Table 3.21. Species Richness (margalef Index) in the study area it mentioned in Table 3.21 to 3.23

The Flora in lease area and 300 m radius (buffer zone)

There is no agricultural land nearby lease area. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 5 Shrubs (17%) and Herbs and Climbers, Creeper, Grass & Cactus 20 (64%) were identified. Details of flora with the scientific name details and of diversity species Richness index were mentioned in Table 3.24-26. There is no threatened species in 300 m radius.

Flora in 10 km radius buffer zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because nearby agriculture land but presently there are no cultivation. It contains a total of 74 species belonging to 35 families have been recorded from the buffer zone. The floral (74) varieties among them Trees (28), shrubs (14) and thirty herbs, Climbers Creepers and Grasses, (32) were identified. The result of buffer zone of flora studies shows that Fabaceae and Poaceae, Cucurbitaceae are the main dominating species in the study area it mentioned in Table 3.19

Table 3.21 Flora in Core Zone

S.No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
TREE													
1	Karuvelam maram	Vachellia nilotica	Fabaceae	3	1	5	0.6	20	3.0	25.00	14.29	39.29	Not Listed
2	Vembu	Azadirachta indica	Meliaceae	2	2	5	0.4	40	1.0	16.67	28.57	45.24	Not Listed
3	Mullumaram	*Acacia tortilis*	Fabaceae	2	1	5	0.4	20	2.0	16.67	14.29	30.95	Not Listed
4	Velikathan	Prosopis juliflora	Fabaceae	4	2	5	0.8	40	2.0	33.33	28.57	61.90	Not Listed
5	Arappu maram	*Albizia Amara*	Fabaceae	1	1	5	0.2	20	1.0	8.33	14.29	22.62	Not Listed
SHRUBS													
1	Erukku	*Calotropis gigantea*	Apocynaceae	7	6	10	0.7	60	1.2	11.86	12.00	23.86	Not Listed
2	Unichedi	*Lantana camara*	Verbenaceae	6	5	10	0.6	50	1.2	10.17	10.00	20.17	Not Listed
3	Aavarai	*Senna auriculata*	Babesiae	6	5	10	0.6	50	1.2	10.17	10.00	20.17	Not Listed
4	Mullukkarai	*Catunaregam spinosa*	Rubiaceae	7	6	10	0.7	60	1.2	11.86	12.00	23.86	Not Listed
5	Sitraamutti.	*Hibiscus micranthus*	Malvaceae	5	4	10	0.5	40	1.3	8.47	8.00	16.47	Not Listed
6	thuthi	*Abutilon indicum*	Malvaceae	8	6	10	0.8	60	1.3	13.56	12.00	25.56	Not Listed
7	Milk multiplier	*Euphorbia cooperi*	Euphorbiaceae	7	7	10	0.7	70	1.0	11.86	14.00	25.86	Not Listed

8	Kattamanaku	*Jatropha gossypiifolia*	Euphorbiaceae	6	5	10	0.6	50	1.2	10.17	10.00	20.17	Not Listed
9	Canthium	*Canthium coromandelicum*	Rubiaceae	7	6	10	0.7	60	1.2	11.86	12.00	23.86	Not Listed
HERBS & Climbers													
1	Thumbai	Leucas aspera	Lamiaceae	8	7	15	0.5	46.7	1.1	8.33	8.24	16.57	Not Listed
2	Nerunji	Tribulus terrestris	Zygophyllales	6	5	15	0.4	33.3	1.2	6.25	5.88	12.13	Not Listed
3	Korai	Cyperus rotundus	Cyperaceae	4	3	15	0.3	20.0	1.3	4.17	3.53	7.70	Not Listed
4	Poolai poondu	Aerva lanata	Amaranthaceae	7	6	15	0.5	40.0	1.2	7.29	7.06	14.35	Not Listed
5	Arugampul	Cynodon dactylon	Poaceae	9	8	15	0.6	53.3	1.1	9.38	9.41	18.79	Not Listed
6	tulasi	Ocimum tenuiflorum	Lamiaceae	10	9	15	0.7	60.0	1.1	10.42	10.59	21.00	Not Listed
7	Kolunje	Tephrosia Purporea	Fabaceae	7	6	15	0.5	40.0	1.2	7.29	7.06	14.35	
8	Thumbai	Leucas Aspera	Lamiaceae	9	8	15	0.6	53.3	1.1	9.38	9.41	18.79	Not Listed
9	Vishnukrandi	Evolvulus alsinoides	Convolvulaceae	6	5	15	0.4	33.3	1.2	6.25	5.88	12.13	Not Listed
10	Parthineyam	Parthenium hysterophorus	Asteraceae	8	7	15	0.5	46.7	1.1	8.33	8.24	16.57	Not Listed
11	Perandai	Cissus quadrangularis L.	Vitaceae	7	6	15	0.5	40.0	1.2	7.29	7.06	14.35	Not Listed
12	Spiky Mother	Sansevieria pearsonii	Cactaceae	7	7	15	0.5	46.7	1.0	7.29	8.24	15.53	Not Listed
13	Kovakkai	Coccinia grandis	Cucurbitaceae	6	6	15	0.4	40.0	1.0	6.25	7.06	13.31	Not Listed
14	Vaelipparuthi	Pergularia daemia	Asclepiadaceae	2	2	15	0.1	13.3	1.0	2.08	2.35	4.44	Least concern

Table 3.22 Calculation of Species Diversity in Core Zone

S.No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x In (Pi)
Tree						
1	Karuvelam maram	Vachellia nilotica	3	0.25	-1.39	-0.35
2	Vembu	Azadirachta indica	2	0.17	-1.79	-0.30
3	Mullumaram	*Acacia tortilis*	2	0.17	-1.79	-0.30
4	Velikathan	Prosopis juliflora	4	0.33	-1.10	-0.37
5	Arappu maram	*Albizia Amara*	1	0.08	-2.48	-0.21
H (Shannon Diversity Index) =1.52						
Shrubs						
1	Erukku	*Calotropis gigantea*	7	0.15	-1.88	-0.29
2	Unichedi	*Lantana camara*	6	0.13	-2.04	-0.27
3	Aavarai	*Senna auriculata*	6	0.13	-2.04	-0.27
4	Mullukkarai	*Catunaregam spinosa*	7	0.15	-1.88	-0.29
5	Sitraamutti.	*Hibiscus micranthus*	5	0.11	-2.22	-0.24
6	thuthi	*Abutilon indicum*	8	0.17	-1.75	-0.30
7	Milk multiplier	*Euphorbia cooperi*	7	0.15	-1.88	-0.29
H (Shannon Diversity Index) =1.94						
herbs						
1	Thumbai	Leucas aspera	8	0.08	-2.48	-0.21
2	Nerunji	Tribulus terrestris	6	0.06	-2.77	-0.17
3	Korai	Cyperus rotundus	4	0.04	-3.18	-0.13
4	Poolai poondu	Aerva lanata	7	0.07	-2.62	-0.19
5	Arugampul	Cynodon dactylon	9	0.09	-2.37	-0.22
6	tulasi	Ocimum tenuiflorum	10	0.10	-2.26	-0.24
7	Kolunje	Tephrosia Purporea	7	0.07	-2.62	-0.19
8	Thumbai	Leucas Aspera	9	0.09	-2.37	-0.22
9	Vishnukrandi	Evolvulus alsinoides	6	0.06	-2.77	-0.17
10	Parthineyam	Parthenium hysterophorus	8	0.08	-2.48	-0.21
11	Perandai	Cissus quadrangularis L.	7	0.07	-2.62	-0.19
12	Spiky Mother	Sansevieria pearsonii	7	0.07	-2.62	-0.19
13	Kovakkai	Coccinia grandis	6	0.06	-2.77	-0.17
14	Vaelipparuthi	Pergularia daemia	2	0.02	-3.87	-0.08
H (Shannon Diversity Index) =3.00						

Table 3.23 Species Richness in Core Zone

Details	H	H max	Evenness	Species Richness (margalef Index)
Tree	1.52	1.61	0.94	1.61
Shrubs	1.94	1.95	1.00	1.57
Herbs	2.59	2.64	0.98	2.85

Table 3.24 Flora in 300 m Radius

S.No.	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Trees													
1	Karuvealan	*Prosopis juliflora*	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
2	Palm tree	*Borassus flabellifer*	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
3	Vembu	*Azadirachta indica*	Meliaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
4	Vealli vealan	*Vachellia leucophloea*	Babesiae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	least concern
5	Unjai maram	*Albizia amara*	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
6	Vetpalai	*Wrightia tinctoria*	Apocynaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
Shrubs													
1	Erukku	*Calotropis gigantea*	Apocynaceae	8	7	10	0.8	70.0	1.1	21.6	21.9	43.5	Not Listed
2	Uumaththai	*Datura metel*	Solanaceae	6	5	10	0.6	50.0	1.2	16.2	15.6	31.8	Not Listed
3	Thuthi	*Abutilon indicum*	Meliaceae	7	6	10	0.7	60.0	1.2	18.9	18.8	37.7	Not Listed
4	Avarai	*Senna auriculata*	Fabaceae	9	8	10	0.9	80.0	1.1	24.3	25.0	49.3	Not Listed
5	Unichadi	*Lantana camara*	Verbenaceae	7	6	10	0.7	60.0	1.2	18.9	18.8	37.7	Not Listed
Herbs													
1	Nayuruv	*Achyranthes aspera*	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed

2	Nearunji mull	*Tribulus zeyheri* Sond	Zygophyllaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
3	Pill	*Cenchrus ciliaris*	Poaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
4	Pulapoo	*Aerva lanata*	Amaranthaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
5	Kapok bush	*Aerva javani*	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
6	Rail poondu	*Croton bonplandianus*	Euphorbiaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
7	Yanai neariji	*pedalium murex*	Pedaliaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
8	Perandai	*Cissus quadrangularis*	Vitaceae	10	9	15	0.7	60.0	1.1	6.6	6.8	13.4	Not Listed
9	Thumbai chadi	*Leucas aspera*	Lamiaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
10	Umathai	*Datura metel*	Solanaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
11	Sethamutti	*Sida cordata*	Malvaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
12	Kolunji	*Tephrosia purpurea*	Fabaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
13	Ishappukol Vitai	*Plantago coronopus*	Plantaginaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
14	Vealiparuthi	*Pergularia daemia*	Apocynaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
15	Seppu nerinji	*Indigofera linnaei Ali*	Fabaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
16	Sapathikalli	*Opuntia ficus-indica*	Cactaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
17	Pal kodi	*Cynanchum viminale*	Apocynaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
18	Ilia perandai	*Cissus rotundifolia*	Vitaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
19	Katralai	*Aloe vera*	Asphodelaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
20	Seammulli	*Barleria prionitis*	Acanthaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed

Table 3.25 Calculation of Species Diversity in 300 m Radius

S.No.	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Trees						
1	Karuvealan	*Prosopis juliflora*	4	0.17	-1.79	-0.30
2	Palm tree	*Borassus flabellifer*	3	0.13	-2.08	-0.26
3	Vembu	*Azadirachta indica*	5	0.21	-1.57	-0.33
4	Vealli vealan	*Vachellia leucophloea*	4	0.17	-1.79	-0.30
5	Unjai maram	*Albizia amara*	3	0.13	-2.08	-0.26
6	Vetpalai	*Wrightia tinctoria*	5	0.21	-1.57	-0.33
H (Shannon Diversity Index) =1.77						
Shrubs						
1	Erukku	*Calotropis gigantea*	8	0.22	-1.53	-0.33
2	Uumaththai	*Datura metel*	6	0.16	-1.82	-0.29
3	Thuthi	*Abutilon indicum*	7	0.19	-1.67	-0.32
4	Avarai	*Senna auriculata*	9	0.24	-1.41	-0.34
5	Unichadi	*Lantana camara*	7	0.19	-1.67	-0.32
H (Shannon Diversity Index) =1.60						
Herbs						
1	Nayuruv	*Achyranthes aspera*	6	0.04	-3.23	-0.13
2	Nearunji mull	*Tribulus zeyheri Sond*	7	0.05	-3.08	-0.14
3	Pill	*Cenchrus ciliaris*	9	0.06	-2.83	-0.17
4	pulapoo	*Aerva lanata*	8	0.05	-2.94	-0.15
5	kapok bush	*Aerva javani*	6	0.04	-3.23	-0.13
6	Rail poondu	*Croton bonplandianus*	8	0.05	-2.94	-0.15
7	Mookuthi poondu	*pedalium murex*	7	0.05	-3.08	-0.14
8	Perandai	*Cissus quadrangularis*	10	0.07	-2.72	-0.18
9	Thumbai chadi	*Leucas aspera*	6	0.04	-3.23	-0.13
10	Umathai	*Datura metel*	7	0.05	-3.08	-0.14
11	Sethamutti	*Sida cordata*	8	0.05	-2.94	-0.15
12	Kolunji	*Tephrosia purpurea*	9	0.06	-2.83	-0.17
13	Ishappukol Vitai	*Plantago coronopus*	6	0.04	-3.23	-0.13
14	Vealiparuthi	*Pergularia daemia*	7	0.05	-3.08	-0.14
15	Seppu nerinji	*Indigofera linnaei Ali*	8	0.05	-2.94	-0.15
16	Sapathikalli	*Opuntia ficus-indica*	9	0.06	-2.83	-0.17
17	Pal kodi	*Cynanchum viminale*	6	0.04	-3.23	-0.13

18	Ilia perandai	*Cissus rotundifolia*	8	0.05	-2.94	-0.15
19	Katralai	*Aloe vera*	9	0.06	-2.83	-0.17
20	Seammulli	*Barleria prionitis*	8	0.05	-2.94	-0.15
H (Shannon Diversity Index) =2.98						

Table 3.26 Species Richness (Index) in 300 m radius

Details	H	H max	Evenness	Species Richness
Trees	1.77	1.79	0.99	1.57
Shrubs	1.60	1.61	0.99	1.11
Herbs	2.98	3.00	1.00	3.78

Table 3.27 Flora in Buffer Zone

S.No	Local Name	Scientific name	Family name
TREE			
1	Vembu	Azadirachta indica	Meliaceae
2	Karuvelam maram	Vachellia nilotica	Fabaceae
3	Arai nelli	Phyllanthus acidus	Phyllanthaceae
4	Nuna maram	Morinda citrifolia	Rubiaceae
5	Puliyamaram	Tamarindus indica	Fabaceae
6	Nochi	Vitex negundo	Lamiaceae
7	Moonghil	Bambusa bambo	Poaceae
8	Thailam maram	Eucalyptus tereticornis	Myrtaceae
9	Manga	Mangifera indica	Anacardiaceae
10	Athi	Ficus recemosa	Moraceae
11	Thekku	Tectona grandis	Lamiaceae
12	Kadukkai	Terminalia chebula	Combretaceae
13	Navalmaram	Sygygium cumini	Myrtaceae
14	Pappali maram	Carica papaya L	Caricaceae
15	pongam	Millettia pinnata	Fabaceae
16	Alamaram	Ficus benghalensis	Moraceae
17	Koyya	Psidium guajava	Myrtaceae
18	Ezhumuchaipalam	Citrus lemon	Rutaceae
19	Murunga maram	Moringa oleifera	Moringaceae
20	Marudaani	Lawsonia inermis	Lythraceae
21	Kattu Nelli	Phyllanthus emblica	Phyllanthaceae
22	Nettilinkam	Polylathia longifolia	Annonaceae

23	Vaagai	Albizia lebbeck	Fabaceae
24	Panai maram	Borassus flabellifer	Arecaceae
25	seethapazham	Annona reticulata	Annonaceae
26	Arasanmaram	Ficus religiosa	Moraceae
27	Kaṟivēppilai maram	Murraya koenigii	Rutaceae
28	Vazhaimaram	Musa acuminata	Musaceae
SHRUBS			
1	Avarai	Senna auriculata	Fabaceae
2	Erukku	Calotropis gigantea	Apocynaceae
3	Kattamanakku	Jatropha curcas	Euphorbiaceae
4	Thuthi	Abutilon indicum	Meliaceae
5	Sundaika	Solanum torvum	Solanaceae
6	Chaturakalli	Euphorbia antiquorum	Euphorbiaceae
7	Neermulli	Hydrophila auriculata	Acanthaceae
8	Thottalchinungi	Mimosa pudica	Fabaceae
9	Kundumani	Abrus precatorius	Fabaceae
10	Nithyakalyani	Cathranthus roseus	Apocynaceae
11	Chemparuthi	Hibiscu rosa-sinensis	Malvaceae
12	Arali	Nerium indicum	Apocynaceae
13	Virali	Dodonaea viscosa	Sapindaceae
14	Nocchi	Vitex negundo	Lamiaceae
HERBS&CLIMBER &CREEPER &GRASSES			
1	Parttiniyam	*Parthenium hysterophorus*	Asteraceae
2	Kuppaimeni	*Acalypha indica*	Euphorbiaceae
3	Arugampul	*Cynodon dactylon*	Poaceae
4	Thulasi	*Ocimum tenuiflorum*	Lamiaceae
5	Korai	*Cyperus rotundus*	Cyperaceae
6	Thumbai	*Leucas aspera*	Lamiaceae
7	Kunnakora	*Cyperus compressus*	Cyperaceae
8	Keelaneeli	*Phyllanthus niruri*	Phyllanthaceae
9	Kanamvazha	*Commelina benghalensis*	Commelinaceae
10	Mukurattai	*Boerhavia diffusa*	Nyctaginaceae

11	Veetukaayapoondu	*Tridax procumbens*	Asteraceae
12	Nai kadugu	*Celome viscosa*	Cleomaceae
13	Manathakkali	*Solanumnigrum*	Solanaceae
14	Kovai	*Coccinia grandis*	Cucurbitaceae
15	Kovakkai	*Trichosanthes dioica*	Cucurbitaceae
16	Karkakartum	*Clitoria ternatea*	Fabaceae
17	Perandai	*Cissus quadrangularis*	Vitaceae
18	Nannari	*Hemidesmus indicus*	Apocynaceae
19	Pavarkai	*Momordica charantia*	Cucurbitaceae
20	Sirupunaikkali	*Passiflora foetida*	Passifloraceae
21	Korai	*Cyperus rotandus*	Cyperaceae
22	Vallikeerai	*Ipomoea aquatica*	Convolvulaceae
23	Siru puladi	*Desmodium triflorum*	Fabaceae
24	Elikkathilai	*Merremia gangetica*	Convolvulaceae
25	Pullu	*Eragrostis ferruginea*	Poaceae
26	Arugampul	*Cynodon dactylon*	Poaceae
27	Chevvarakupul	*Chloris barbata*	Poaceae
28	milkvetch	*Astragalus balearicus*	Fabaceae
29	basora prieta	*Waltheria indica*	Malvaceae
30	Sulli Flower	*Barleria prionitis L*	Acanthaceae
31	Cappattukkalli	*Opuntia dillenii*	Cactaceae
32	Carrion Flower	*Stapelia gettliffei*	Apocynaceae.

Aquatic Vegetation

The Field Survey for Assessing the Aquatic Vegetation Was Also Undertaken During the Study Period. The List of Aquatic Plants Observed in The Study Area Is Given in Table 3.28

Table 3.28 Aquatic Vegetation

S. No.	Scientific Name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	*Eichornia Crassipe*	Water Hyacinth	Agayatamarai	NA
2	*Aponogetonnatans*	Floating Lace Plant	Kottikizhangu	NA
3	*Nymphaea Nouchali*	Blue Water Lily	Nellambal	LC
4	*Carex Cruciata*	Cross Grass	Koraipullu	NA
5	*Cynodon Dactylon*	Scutch Grass	Arugampullu	LC
6	*Cyperus Exaltatus*	Tall Flat Sedge	Koraikizhangu	LC

*Lc- Least Concern, Na-Not Yet Assessed

Food chain

The food chain in aquatic ecosystems often begins with the algae or phytoplankton producers, and then the zooplankton that feed on them. This type of food chain is found in Noyal River by phytoplankton, zooplankton, fish and Human.

Ex: Phytoplankton→Zooplankton→Small fish→Large fish

Forest Vegetation

The Thovar R.F located in 1.98km south west and palani R.F 9.17km south west frome the lease area. The biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs v), and migratory routes of fauna. There are no 10km radius. The area under study (Mine lease area and the 10 km buffer zone) is not ecologically sensitive.

Endangered and endemic species as per the IUCN Red List

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

3.5.2 Fauna

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

Table 3.29 Methodology applied during survey of fauna

S. No.	Taxa	Method of Sampling	References
1	Insects	Random walk, Opportunistic observations	Pollard (1977); Kunte (2000)
2	Reptiles	Visual encounter survey (Direct Search)	Daniel J.C (2002)
3	Amphibians	Visual encounter survey (Direct Search)	
4	Mammals	Tracks and Signs	Menon V (2014)
5	Avian	Random walk, Opportunistic observations.	Grimmett R (2011); Ali S (1941)

Fauna in Core Zone

A total of 34 varieties of species observed in the Core zone of K. Pudukottai Village, Rough stone quarry (Table 3.29) among them numbers of Insects 14(31%), Reptiles 7 (15%), Mammals 3 (6%) Avian 10 (31%). A total of 27 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 four species are under schedule IV according to Indian wild life Act 1972. A total nine 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. 3.30.

Fauna in Buffer Zone

Taxonomically a total of 48 species belonging to 34 families have been recorded from the buffer mining lease area. Based on habitat classification the majority of species were Birds 13(35%) followed by Insects 7 (20%), Reptiles 9 (19%), Mammals 3 (6%) and, Amphibians 3 (6%). Aves16(33%) There are four Schedule II species and twenty-six are under schedule IV according to Indian wild life Act 1972. A total 16 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. 3.30.

Table 3.30 Fauna in Core Zone

S. No	Common name/English Name	Scientific Name	Family Name	Schedule list wildlife Protection act 1972	IUCN Red List data
INSECTS					
1	Indian honey bee	*Apis cerana*	Apidae	Schedule IV	LC
2	Grasshopper	*Hieroglyphus sp*	Acrididae	NL	LC
3	Blue tiger	*Tirumala limniace*	Nymphalidae	Schedule IV	LC
4	Striped tiger	*Danaus plexippus*	Nymphalidae	Schedule IV	LC
5	Jewel beetle	*Eurythyrea austriaca*	Buprestidae	Schedule IV	NA
6	Dragonfly	*Ceratogomphus pictus*	Gomphidae	Schedule IV	LC
7	Red-veined darter	*Sympetrum fonscolombii*	Libellulidae	NL	LC
8	Ant	*Camponotus Vicinus*	Formicidae	NL	NL
9	Tawny coster	*Danaus chrysippus*	Nymphalidae	Schedule IV	LC
10	Common Indian crow	*Euploea core*	Nymphalidae	Schedule IV	LC
11	Milkweed butterfly	*Danainae*	Nymphalidae	NL	LC
12	Praying mantis	*Mantis religiosa*	Mantidae	NL	NL
13	Common Tiger	*Danaus genutia*	Nymphalidae	Schedule IV	LC
14	Lesser grass blue	*Zizina Otis indica*	Lycaenidae	Schedule IV	LC
REPTILES					

1	Common house gecko	*Hemidactylus frenatus*	Gekkonidae	NL	LC
2	Fan-Throated Lizard	*Sitanaponticeriana*	Agamidae	NL	LC
3	Brahminy skink	*Eutropis carinata*	Scincidae	NL	LC
4	Olive keel back water snake	*Atretium schistosum*	Natricidae	Sch II (Part II)	LC
5	Garden lizard	*Calotes versicolor*	Agamidae	NL	LC
6	Rat snake	*Ptyas mucosa*	Colubridae	Sch II (Part II)	LC
7	Common skink	*Mabuya carinatus*	Scincidae	NL	LC
MAMMALS					
1	Indian palm squirrel	*Funambulus palmarum*	Sciuridae	Schedule IV	LC
2	Asian Small Mongoose	*Herpestes javanicus*	Herpestidae	Schedule II	LC
3	Indian Field Mouse	*Mus booduga*	Muridae	Schedule IV	LC
AVES					
1	Cattle egret	*Accipiter badius*	Ardeidae	NL	LC
2	Shikra	*Dicrurus macroceRCus*	Accipitridae	NL	LC
3	Black drongo	*Francolinus pondicerianus*	Dicruridae	Schedule IV	LC
4	Grey Francolin	*Eudynamys*	Phasianidae	Schedule IV	LC
5	Koel	*Meropsorientalis*	Cucalidae	Schedule IV	LC
6	Asian green bee-eater	*Acridotheres tristis*	Meropidae	NL	LC
7	Common myna	*Coturnix coturnix*	Sturnidae	NL	LC
8	Common Quail	*Psittacula krameri*	Phasianidae	Schedule IV	LC
9	Rose-ringed parkeet	*Corvussplendens*	Psittaculidae	NL	LC
10	House crow	*Amaurornis phoenicurus*	Corvidae	NL	LC
AMPHIBIANS					
1	Indian Burrowing frog	*Sphaerotheca breviceps*	Dicroglossidae	Schedule IV	LC
2	Green Pond Frog	*Rana hexadactyla*	Ranidae	Schedule IV	LC
3	Tiger Frog	*Hoplobatrachus tigerinus (Rana tigerina)*	Chordata	Schedule IV	LC

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

Table 3.31 Fauna in Buffer Zone

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
INSECTS					
1	Tawny coster	Nymphalidae	*Danaus chrysippus*	ScheduleIV	LC
2	Milkweed butterfly	Nymphalidae	*Danainae*	NL	LC
3	Blue tiger	Nymphalidae	*Tirumala limniace*	ScheduleIV	LC
4	Common Indian crow	Nymphalidae	*Euploea core*	ScheduleIV	LC
5	Green marsh hawk	Libellulidae	*Orthetrum sabina*	NL	LC
6	Mottled emigrant	Peridae	*Catopsilia pyranthe*	NL	LC
7	Striped tiger	Nymphalidae	*Danaus plexippus*	ScheduleIV	LC
8	Ant	Formicidae	*Camponotus Vicinus*	NL	NL
9	Red-veined darter	Libellulidae	*Sympetrum fonscolombii*	NL	LC
10	Lesser grass blue	Lycaenidae	*Zizina Otis indica*	ScheduleIV	LC
11	Praying mantis	Mantidae	*mantis religiosa*	NL	NL
12	Grasshopper	Acrididae	*Hieroglyphus sp*	NL	LC
13	Common Tiger	Nymphalidae	*Danaus genutia*	Schedule IV	LC
REPTILES					
1	Chameleon	Chamaeleonidae	*Chameleon zeylanicus*	Sch II (PartII)	LC
2	Garden lizard	Agamidae	*Calotes versicolor*	NL	LC
3	Green Vine snake	Colubridae	*Ahaetulla nasuta*	ScheduleIV	LC
4	Common house gecko	Gekkonidae	*Hemidactylus frenatus*	NL	LC
5	Rat snake	Colubridae	*Ptyas mucosa*	Sch II (Part II)	LC
6	Fan-Throated Lizard	Agamidae	*Sitanaponticeriana*	NL	LC

7	Indian cobra	Elapidae	*Naja naja*	ScheduleIV	LC
MAMMALS					
1	Indian palm squirrel	Sciuridae	*Funambuluspalmarum*	ScheduleIV	LC
2	Indian Field Mouse	Muridae	*Mus booduga*	ScheduleIV	LC
3	Home mouse	Muridae	*Mus musculus tytleri*	NL	LC
AVES					
1	House crow	Corvidae	*Corvussplendens*	NL	LC
2	Cattle egret	Ardeidae	*Bubulcus ibis*	NL	LC
3	Black drongo	Dicruridae	*Dicrurus macrocercus*	ScheduleIV	LC
4	Red-vented Bulbul	Pycnonotidae	*Pycnonotuscafer*	ScheduleIV	LC
5	Indian pond heron	Ardeidae	*Ardeola grayii*	ScheduleIV	LC
6	Asian green bee-eater	Meropidae	*Meropsorientalis*	NL	LC
7	Small Sunbird	Nectariniidae	*Nectarinia asiatica*	ScheduleIV	LC
8	Common myna	Sturnidae	*Acridotheres tristis*	NL	LC
9	Blue Rock Pigeon	Columbidae	*Columba livia*	ScheduleIV	LC
10	Common Coot	Rallidae	*Fulica atra*	ScheduleIV	LC
11	Common quail	Phasianidae	*Coturnix coturnix*	ScheduleIV	LC
12	Small blue Kingfisher	Alcedinidae	*Alcedo atthis*	ScheduleIV	LC
13	Rose-ringed parkeet	Psittaculidae	*Psittacula krameri*	NL	LC
14	Grey Francolin	Phasianidae	*Francolinus pondicerianus*	Schedule IV	LC
15	Two-tailed Sparrow	Dicruridae	*Dicrurus macrocercus*	ScheduleIV	LC
16	White breasted waterhen	Rallidae	*Amaurornis phoenicurus*	NL	LC
AMPHIBIANS					

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

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

3.5.3 Agriculture & Horticulture in dindigul district

In Dindigul district three different climatic conditions prevail. Tropical climate prevails in plains, sub-tropical in lower Palani Hills and Sirumali and temperate climate prevails in Palani Hills. Due to these favourable climates, all kinds of horticultural crops are cultivated in this district. In both plains and hill the minimum temperature prevailing is 9°C and maximum temperature is 36°C. Loamy soil, clayey soil and Alluvial soil, Sandy loam and Sandy clay soil are the soil types found in the district. Major horticulture crops cultivated are, fruits crops like banana, sapota, guava and acid lime, vegetables like tomato, brinjal, bhendi, chillies, beans and cabbage, flowers like jasmine, pitchi, crossandra, nerium, chrysanthemum, tagetus, gomphrena and medicinal plants like Gloriosa.

Major Agricultural Crops 1km radius

Major horticulture crops cultivated in 1km radius are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.32

Table 3.32 Major Crops in 1km radius

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

Major Horticulture Crops 1km radius

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

Horticulture 1km radius

Major horticulture crops cultivated in 1km radius are fruit crops like mango, banana, and vegetables like tomato, brinjal, Veandai, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.33.

Table 3.33 Major Field Crops & Horticulture cultivation in 1km radius.

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

Results

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

3.6 SOCIO ECONOMICS ENVIRONMENT

3.6.0 Introduction

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the

project. Socio-economic study of an area provides a good opportunity to assess the socio - economic condition and possibly makes a change in living and social standards of the particular area benefitted due to the project.

3.6.1Objectives of the Study

The main objectives of the study are as follows:

- ❖ To know the current socio-economic condition in the region to cover the sub sectors education, health, sanitation, and water & food security.
- ❖ To recommend practical strategic interventions in the sector.
- ❖ To help in providing better living standards.
- ❖ To understand skill sets and plan for employment opportunities which shall be created.

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 Socio-Economic Status of Study area

K. Pudukottai is a large village located in Dindigul Taluka of Dindigul district, Tamil Nadu with total 621 families residing. The K. Pudukottai village has population of 2275 of which 1136 are males while 1139 are females as per Population Census 2011.In K. Pudukottai village population of children with age 0-6 is 234 which makes up 10.29 % of total population of village. Average Sex Ratio of K. Pudukottai village is 1003 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the K. Pudukottai as per census is 887, K. Pudukottai village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of K. Pudukottai village was 68.99 % compared to 80.09 % of Tamil Nadu. In K. Pudukottai Male literacy stands at 79.25 % while female literacy rate was 58.89 %. As per constitution of India and Panchyati Raaj Act, K.Pudukottai village is administrated by Sarpanch (Head of Village) who is elected representative of village. Our website, don't have information about schools and hospital in K. Pudukottai village.

Table 3.34 K. Pudukottai Village Population Facts

S. No	Particulars	Total	Male	Female
1	**Total geographical Area**	**12.62 Sq. Km**		
2	Total No. of Houses	621	-	-
3	Population	2,275	1,136	1,139
4	Child (0-6)	234	124	110

5	Schedule Caste	393	200	193
6	Schedule Tribe	0	0	0
7	Literacy	68.99 %	79.25 %	58.89
8	Total Workers	1,420	734	686
9	Main Worker	1,331	-	-
10	Marginal Worker	89	24	65

Source: Secondary Data, District Statistical Hand book – 2019-2020.

K. Pudukottai village has total administration over 621 houses to which it supplies basic amenities such as water and sewerage. It is also authorized to build roads within village Panchayat limits and impose taxes on properties coming under its jurisdiction.

Table 3.35 Population of K. Pudukottai village

Total Population	Male Population	Female Population
2,275	1,136	1,139

3.6.4 Sex Ratio

K. Pudukottai village population of children with age 0-6 is 234 which makes up 10.29 % of total population of village. Average Sex Ratio of K. Pudukottai village is 1003 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the K. Pudukottai as per census is 887, lower than Tamil Nadu average of 943.

3.6.5 Literacy Rate of K. Pudukottai village

K. Pudukottai village population of children with age 0-6 is 234 which makes up 10.29 % of total population of village. Average Sex Ratio of K. Pudukottai village is 1003 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the K. Pudukottai as per census is 887, lower than Tamil Nadu average of 943.

Table 3.36 Literacy Rate of K. Pudukottai

S. No	Particulars	Literacy Rate	Illiteracy Rate
1	Male	71	29
2	Female	54	46
	Total	**61**	**39**

Source: Village Census Record Book – 2011

Table 3.37 Population and Literacy Data of Study Area

S. No.	Village Name	No of House Holds	Total Population	Male	Female	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate
1	K. Pudukottai	621	2275	1136	1139	1032	454	578	1243	563	680
2	Kothapulli	1267	4816	2344	2472	2352	1453	899	2464	1356	1108
3	Silvarpatti	1842	7280	3656	3624	3642	1914	1728	3638	1793	1845
4	Alagupatti	753	2848	1387	1461	874	470	404	1974	842	1132
5	Ammapatti	546	2034	1035	999	960	550	410	1074	473	601
6	Kamachipuram	1433	5010	2503	2507	2473	1954	519	2537	1163	1374
7	Tettupatti	2279	8205	4180	4025	3970	1745	2225	4235	2053	2182
8	Kuthathupatti	2380	9270	4651	4619	5113	3520	1593	4157	1954	2203
9	Sullerumbu	1394	5255	2600	2655	2576	1765	811	2679	1094	1585
10	Neelamalaikottai	746	2712	1367	1345	1243	679	564	1469	589	880

Table 3.38 Workers Profile of Study Area

S. No.	Village Name	Total Workers Population	Male Workers	Female Workers	Total Main Workers	Main Workers Male	Main Workers Female	Main Cultivation Workers	Main Agriculture Workers	Main Other Workers	Non-Worker Population
1	K. Pudukottai	1420	734	686	1331	710	621	276	640	395	855
2	Kothapulli	2890	1530	1360	2692	1455	1237	640	1444	549	1926
3	Silvarpatti	4203	2300	1903	2871	1599	1272	999	1117	701	3077
4	Alagupatti	1636	874	762	1110	643	467	199	543	320	1212
5	Ammapatti	1239	658	581	163	129	34	163	693	312	795
6	Kamachipuram	3052	1601	1451	2997	1576	1421	436	1928	614	1958
7	Tettupatti	4737	2596	2114	4603	2529	2074	652	2903	1010	3468
8	Kuthathupatti	5047	2845	2202	2959	1848	1111	483	1575	811	4223
9	Sullerumbu	3027	1687	1340	2521	1478	1043	852	1009	649	2228
10	Neelamalaikottai	1808	952	856	1590	846	744	470	732	357	904

Table 3.39 Educational Facilities in the Study Area

S. No	Village Name	PPS	PS	MS	SS	SSS	DC	EC	MC	MI	PT	VTS	SSD
1	K. Pudukottai	2	2	1	1	1	-	1	-	-	1	-	-
2	Kothapulli	1	2	1	1	-	-	-	-	-	-	-	-
3	Silvarpatti	2	2	1	1	-	-	-	-	-	-	-	-
4	Alagupatti	2	3	1	1	-	-	-	-	-	-	-	-
5	Ammapatti	2	2	1	1	1	-	-	-	-	-	-	-
6	Kamachipuram	2	4	1	1	1	-	1	-	-	1	-	-
7	Tettupatti	2	3	1	1	1	-	-	-	-	-	-	-
8	Kuthathupatti	4	4	2	2	1	-	-	-	-	-	-	-
9	Sullerumbu	2	2	2	1	1	-	-	-	-	-	-	-
10	Neelamalaikottai	2	2	2	1	1	-	-	-	-	1	-	-

3.6.6 Recommendation and Suggestion

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

3.6.7 Summary & Conclusion

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

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Dindigul – Ottanchathiam (NH-209) as shown in Table 3.40 and in Figure 3.25. Traffic density measurements were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station. During each shift one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

Table 3.40 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road		Village Road
TS2	Dindigul – Ottanchathiam (NH-209)		Dindigul – Ottanchathiam (NH-209)

Source: On-site monitoring by GTMS FAE & TM

Table 3.41 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	45	135	54	54	89	45	234
TS2	104	285	60	60	96	48	393

Source: On-site monitoring by GTMS FAE & TM

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

Table 3.42 Rough Stone Transportation Requirement

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	8	24

Source: Approved Mining Plan

Table 3.43 Summary of Traffic Volume

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960guidelines
Village Road	234	24	258	1200
Dindigul – Ottanchathiam (NH-209)	393	24	417	1200

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

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

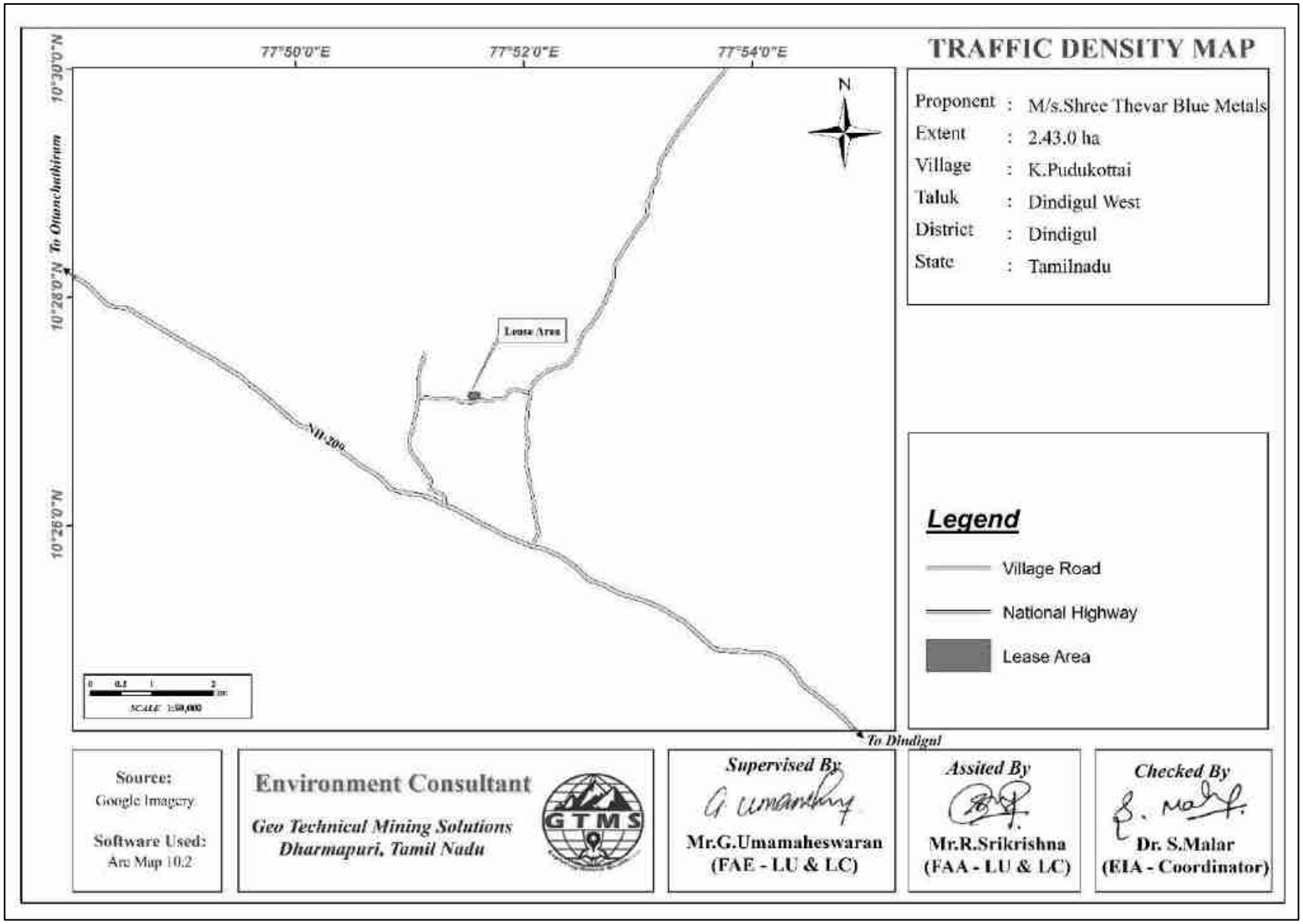


Figure 3.25 Traffic Density Map

3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries and National Park within 10 km radius. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitive areas around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.44.

Table 3.44 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
		None	Nil within 10 km radius
2	Reserve Forest	Devar Malai R.F	1.89km NW
		Kannivadi Block III Bit R.F	7.90km NW
		Kannivadi Block I R.F	10.78km SW
		PH Northern Slope R.F	10.85km NW
		IdayakottaI R.F	11.23km NE
		Karumalai R.F	13.69km NE
		Siruvattukkadu R.F	15.35km SW
		Kokkuparai R.F	18.95km SW
		Chatrapatti R.F	19.95km SW
		Vandamalai R.F	20.16km SW
		Vennilai R.F	20.57km SW
		Rengamalai R.F	21.36km NE
		Chatrapatti R.F	21.39km SE
		Vellodu R.F	21.90km SE
		Umaiyar R.F	22.30km SW
		Jambuthuraikottai R.F	22.67km SW
		Sirumalai Northwest R.F	23.02km SE
		Sirumalai R.F	23.34km SE
		Senkattanpatti R.F	23.50km South
		Pambukallar R.F	23.73km SW
		Kaniyankadu R.F	24.14km SW
		Attamalai R.F	24.62km NW
		Kadavumalai R.F	25.00km SW
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Mangarai River R.F	5.42km SW
		Periandavar Oodai R.F	2.32km SE
		Rive bank R. F	9.93km East
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Densely Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Centrally Protected Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet

Figure 3.26 Field Study Photographs

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

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. This chapter discusses the anticipated impacts on soil, land, water, air, noise, biological, and socioeconomic environments.

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

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

4.1.2 Mitigation Measures from Proposed Project

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

- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

4.2.1 Anticipated Impact on Soil Environment

Following impacts are anticipated due to mining operations:

- Removal of protective vegetation cover
- Exposure of subsurface materials which are unsuitable for vegetation establishment

4.2.2 Mitigation Measures from proposed project

- Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

4.3.1 Anticipated Impact

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

4.3.2 Mitigation Measures for the Proposed Project

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits

- ❖ Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- ❖ The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- ❖ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

4.4 AIR ENVIRONMENT

4.4.1 Anticipated Impact from proposed project

- ❖ During mining at various stages of activities such as excavation, drilling 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

4.4.2 Emission Estimation

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

Table 4.1 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	E= [u0.4a0.2{9.7+ 0.01p+b/(4+0.3b)}]	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm^3/yr); a = Lease area(km^2); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that PM_{10} emission rate is derived from the SPM estimation in the background that PM_{10} constitutes 52% of SPM emission. The $PM_{2.5}$ and PM_{10} emission results have been given in Table 4.2.

Table 4.2 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m^2	Calculated Value ($g/s/m^2$)
Overall Mine	$PM_{2.5}$	1.191783511	24300	4.90446E-05
Overall Mine	PM_{10}	0.178767527	24300	7.35669E-06

4.4.2.1 Modelling of Incremental Concentration

Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500 m around the project area is predicted by open pit source modelling using AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants, as shown in Tables 4.3-4.4.

4.4.2.2 Model Results

The post project resultant concentrations of PM_{10}, $PM_{2.5}$ is given in Tables 4.3-4.4.

Table 4.3 Incremental & Resultant GLC of $PM_{2.5}$

Station ID	Distance to core	Direction	PM 2.5 concentrations(µg/m³)			Comparison against air quality standard	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.36	SSE	19.69	3	22.69	Below standard	15.2	Not significant
AAQ2	0.73	SSW	23.42	1	24.42		4.3	
AAQ3	1.27	SE	20.80	1	21.8		4.8	
AAQ4	1.13	NE	21.06	0.3	21.36		1.4	
AAQ5	2.73	NNE	18.04	0.3	18.34		1.7	
AAQ6	3.97	SE	21.57	0.5	22.07		2.3	
AAQ7	4.45	SW	19.37	0	19.37		0.0	

Table 4.4 Incremental & Resultant GLC of PM_{10}

Station ID	Distance to core	Direction	PM_{10} concentrations(µg/m³)			Comparison against air quality standard (100 µg/m³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.36	SSE	35.24	3.7	38.94	Below standard	10.5	Not significant
AAQ2	0.73	SSW	39.55	2.5	42.05		6.3	
AAQ3	1.27	SE	40.94	2.5	43.44		6.1	

AAQ4	1.13	NE	37.11	1.3	38.41		3.5	
AAQ5	2.73	NNE	37.52	1.3	38.82		3.5	
AAQ6	3.97	SE	42.20	1.3	43.5		3.1	
AAQ7	4.45	SW	43.80	1.3	45.1		3.0	

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

Mitigation Measures

- The blasting operations in the cluster quarries will use shallow holes and delay detonators to reduce the ground vibrations
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during 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
- During blasting, other activities in the immediate vicinity will be temporarily stopped
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

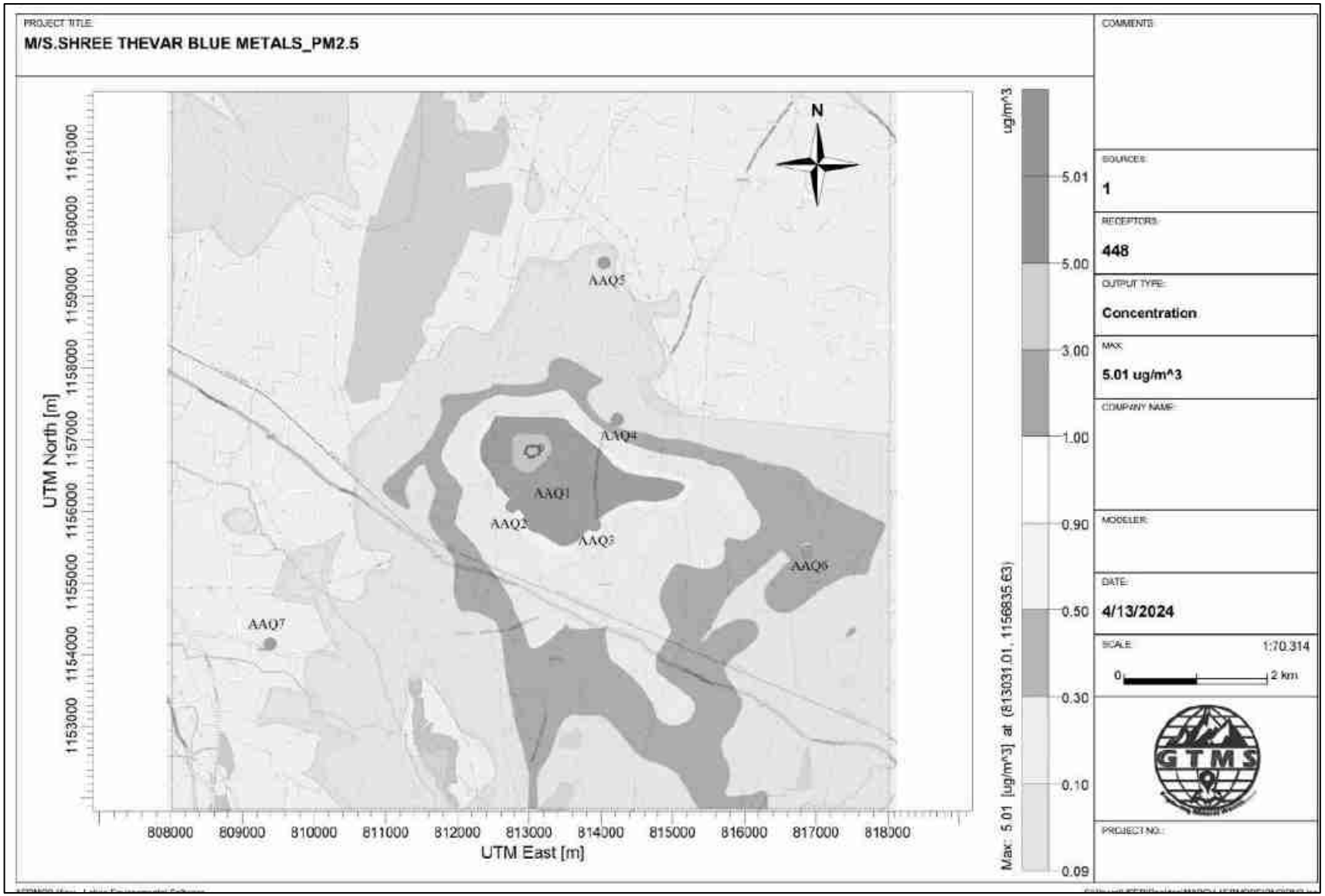


Figure 4.1 Predicted Incremental Concentration of $PM_{2.5}$

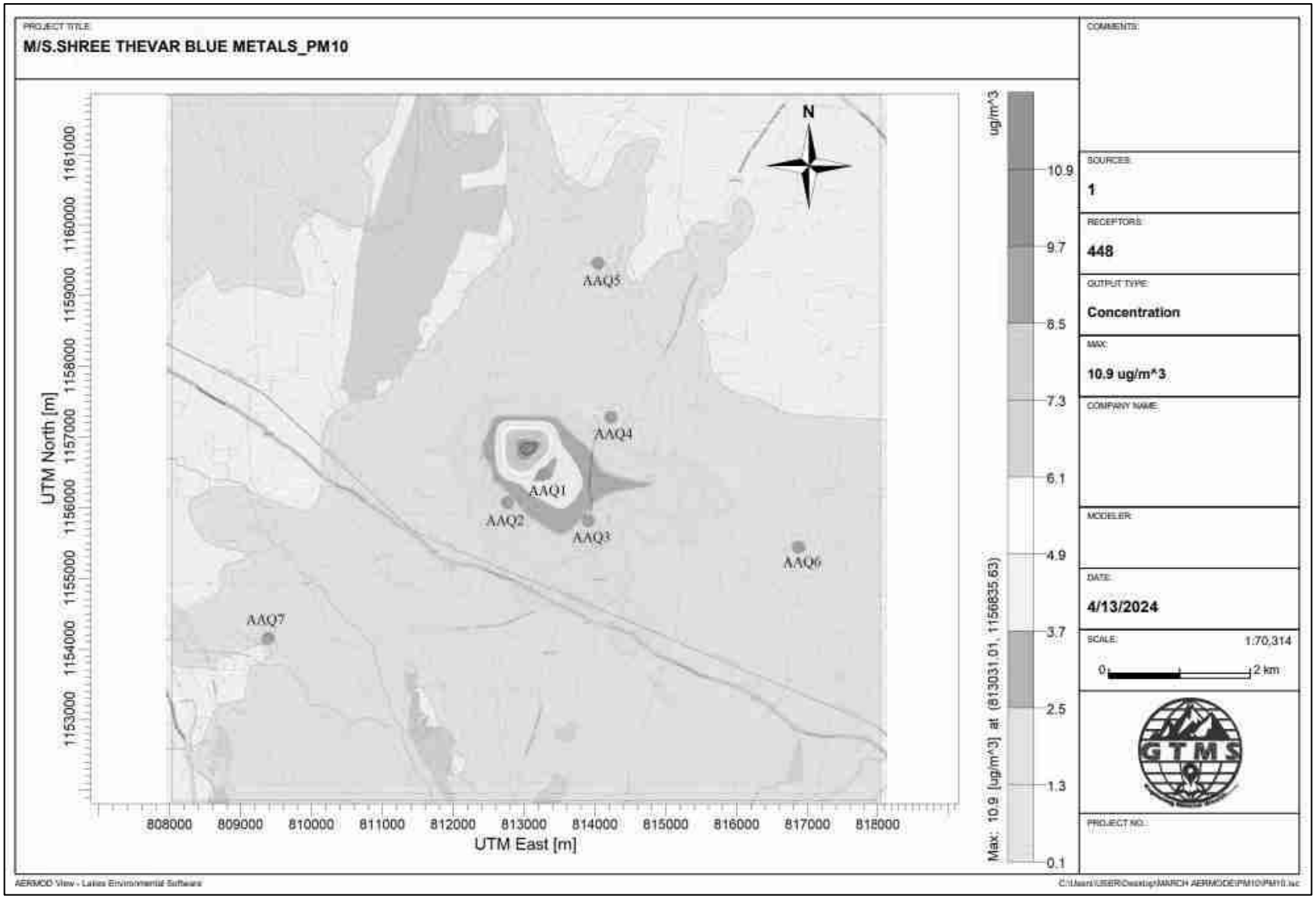


Figure 4.2 Predicted Incremental Concentration of PM_{10}

4.5 NOISE ENVIRONMENT

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

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

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

Where,

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

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

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

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

4.5.1 Anticipated Impact

The attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. 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, and 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 4.5.

Table 4.5 Activity and Noise Level Produced by Machinery

S. No.	Machinery / activity	Impact on environment?	Noise produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
Total			**95.8**

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). Generally, most mining operations produce noise between 95.8 dB (A).

Table 4.6 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level (dBA)	Total (dBA)
Nearby Core zone	160	46.0	39.88	46.95
Bommankottai	670	40.04	27.44	40.27
Tandankottai	1210	39.02	22.30	39.11
K. Pudukottai	970	38.20	24.22	38.37
Sakkalanaicken Patty	550	39.21	29.15	39.62
Semmadaipatty	4720	47.2	10.48	47.20
Silvarpatty	5410	40.1	9.30	40.10
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

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. Therefore, no impact is anticipated on the noise environment due to the project

4.5.2 Common Mitigation Measures

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

- Usage of sharp drill bits while drilling which will help in reducing noise
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise
- Silencers / mufflers will be installed in all machineries

- ❖ Greenbelt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured though training and awareness
- ❖ Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects

4.5.3 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 kutcha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

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

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

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

Where,

V = peak particle velocity (mm/s)

K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

Table 4.7 Predicted PPV Values due to Blasting

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	14.95	550	0.18	19	0.04	127

Table 4.8 Predicted PPV Values due to Blasting at 100-500 m radius

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	14.95	100	2.74	19	0.34	145
		200	0.90		0.15	137
		300	0.47		0.09	133
		400	0.30		0.06	130
		500	0.20		0.05	128

4.5.3.1 Common Mitigation Measures

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

- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- None of the plants will be cut during operational phase of the mine
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- Carbon released from quarrying machineries and tippers during quarrying would be 3746 kg per day, 1011448 kg per year and 5057239 kg over five years, as provided in Table 4.9.

Table 4.9 Carbon Released During Ten Years of Rough Stone and Gravel Production

	Per day	Per year	Per five years
Fuel consumption of excavator	253	68350	341749
Fuel consumption of compressor	14.8	3996	19980
Fuel consumption of tipper	1130	305060	1525300
Total fuel consumption in liters	1398	377406	1887029
Co_2 emission in kg	3746	1011448	5057239

4.6.2 Mitigation Measures on Flora

- During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- None of the plants in the lease area will be cut during operational phase of the mine. we recommend uprooting and planting of the 10 trees along the 7.5 m safety zone to prevent environmental pollution during quarrying. As the survival rate due to uprooting was

only 30%, 100 seedlings will be procured at the rate of 10 seedlings per tree and planted in 7.5 m safety zone

- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Carbon Sequestration

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 53688 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 1215 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 4911585 kg of the total carbon, as provided in Table 4.10.

Table 4.10 CO_2 Sequestration

CO_2 sequestration in kg	108	29131	145654
Remaining CO_2 not sequestered in kg	3638	982317	4911585
Trees required for environmental compensation	40930		
Area required for environmental compensation in hectares	82		

Table 4.11 Recommended Species for Greenbelt Development Plan

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

Table 4.12 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m^2)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	486	389	4374
	Number of plants outside the mine lease area		
	729	583	6561
Total	**1212**	**972**	**10935**

Table 4.13 Budget for Greenbelt Development Plan

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recuring Cost-per annum
Plantation inside the mine lease area (in safety margins)	486	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))"	97200	14580
Plantation outside the area	729	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	218700	21870
Total			**315900**	**167677**

Source: EMP budget

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

4.6.3. Anticipated Impact on Fauna

- ❖ Direct impact is anticipated on fauna of core zone
- ❖ Insignificant impact is anticipated on fauna in the buffer area due to air emissions, noise, vibration, transportation, waste water discharges, and changes in land use

4.6.4 Mitigation Measures on Fauna

- ❖ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ❖ The workers shall be trained not to harm any wildlife near the project site

4.6.5 Impact on agriculture and horticulture crops in 1km Radius

- ❖ Problems to agricultural and horticulture land due to dust caused by movement of heavy vehicles.
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season.
- ❖ The fugitive dust released from the mining operations may cause effect on the agricultural and horticulture land who are directly exposed to the fugitive dust.
- ❖ Dust from the quarries is likely to affect reproductive systems in nearby agricultural and horticulture lands.
- ❖ Dust from quarries can affect plant growth and reduce vegetable yields.

4.6.6 Mitigation Measures on agriculture and horticulture crops.

- ❖ The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- ❖ It is a granite quarry, no explosives are used, there is no possibility of vibration and dust, thus there is no possibility of damage to the adjacent agricultural land.
- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ❖ A green belt will be created in 7.5 safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust.

Aquatic Biodiversity

Mining activities will not disturb the existing aquatic ecology as there is no effluent discharge proposed from the rough stone and gravel quarry. There is no natural perennial surface water body within the mine lease area. Hence, aquatic biodiversity is not observed in the mine lease area.

4.7 SOCIO ECONOMIC ENVIRONMENT

4.7.1 Anticipated Impact from Proposed and Existing Projects

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

4.7.2 Common Mitigation Measures for Proposed Project

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

4.8 OCCUPATIONAL HEALTH AND SAFETY

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

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

4.8.1 Respiratory Hazards

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

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

4.8.2 Noise

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

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

4.8.3 Physical Hazards

The following measures are proposed for control of physical hazards

- Specific personnel training on work-site safety management will be taken up;
- Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level;
- Maintenance of yards, roads and footpaths, providing sufficient water drainage and preventing slippery surfaces with an all-weather surface, such as coarse gravel will be taken up.

4.8.4 Occupational Health Survey

All the persons will undergo pre-employment and periodic medical examination. Employees will be monitored for occupational diseases by conducting the following tests

- General physical tests
- Audiometric tests
- Full chest, X-ray, Lung function tests, Spirometric tests
- Periodic medical examination – yearly
- Lung function test – yearly, those who are exposed to dust
- Eye test

Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost. The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

4.9 MINE WASTE MANAGEMENT

No waste is anticipated from any of the proposed quarries.

4.10 MINE CLOSURE

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project. Therefore, progressive mine closure plan should be specifically dealt with in the mining plan and is to be reviewed along with mining plan. As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

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

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

4.10.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.10.1.1 Physical Stability

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

4.10.1.2 Chemical Stability

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

4.10.1.3 Biological Stability

The stability of the surrounding environment is primarily dependent upon the physical and chemical characteristics of the site, whereas the biological stability of the mine site itself is closely related to rehabilitation and final land use. Nevertheless, biological stability can significantly influence physical or chemical stability by stabilizing soil cover, prevention of erosion/wash off, leaching, etc., A vegetation cover over the disturbed site is usually one of the main objectives of the rehabilitation programme, as vegetation cover is the best long-term method of stabilizing the site. When the major earthwork components of the rehabilitation programme have been completed, the process of establishing a stable vegetation community begins. For re-vegetation, management of soil nutrient levels is an important consideration. Additions of nutrients are useful under three situations.

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

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

CHAPTER V
ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

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

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

The proposed project is site specific and has the following advantages:

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

5.2 ANALYSIS OF ALTERNATIVE SITE

No alternatives are suggested as the mine site is mineral specific.

5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY

Manual open cast mining method with secondary blasting will be applied to extract rough stone and gravel in the area. The proposed mining lease areas have following advantages:

- As the mineral deposition is homogeneous and batholith formation, opencast method of working is preferred over underground method.
- The material will be loaded with the help of excavators into tractors/tippers and transported to the need by customers.
- Semi-skilled labours fit for quarrying operations are easily available around the nearby villages.

5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY

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

CHAPTER VI
ENVIRONMENTAL MONITORING PROGRAMME

6.0 GENERAL

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections. The main objective of environmental monitoring is to ensure that the obtained results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results, this forms as base data to identify the cause and suggest remedial measures. Environmental monitoring is mandatory to meet compliance of statutory provisions under the Environment (Protection) Act, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA-TN as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTE/CTO.

6.1 METHODOLOGY OF MONITORING MECHANISM

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

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in the proposed quarry. The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment

❖ Seeking expert's advice when needed.

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies as compliance status reports.

The sampling and analysis report of the monitored environmental attributes will be submitted to the Tamil Nadu Pollution Control Board (TNPCB) at a frequency of half-yearly and yearly by the proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA-TN as well.

The sampling and analysis of the environmental attributes will be as per the guidelines of Central Pollution Control Board (CPCB)/Ministry of Environment, Forest and Climate Change (MoEF & CC). The Environmental Monitoring Cell will be formed for the proposed project. The structure of the cell will be as shown in Figure 6.1.

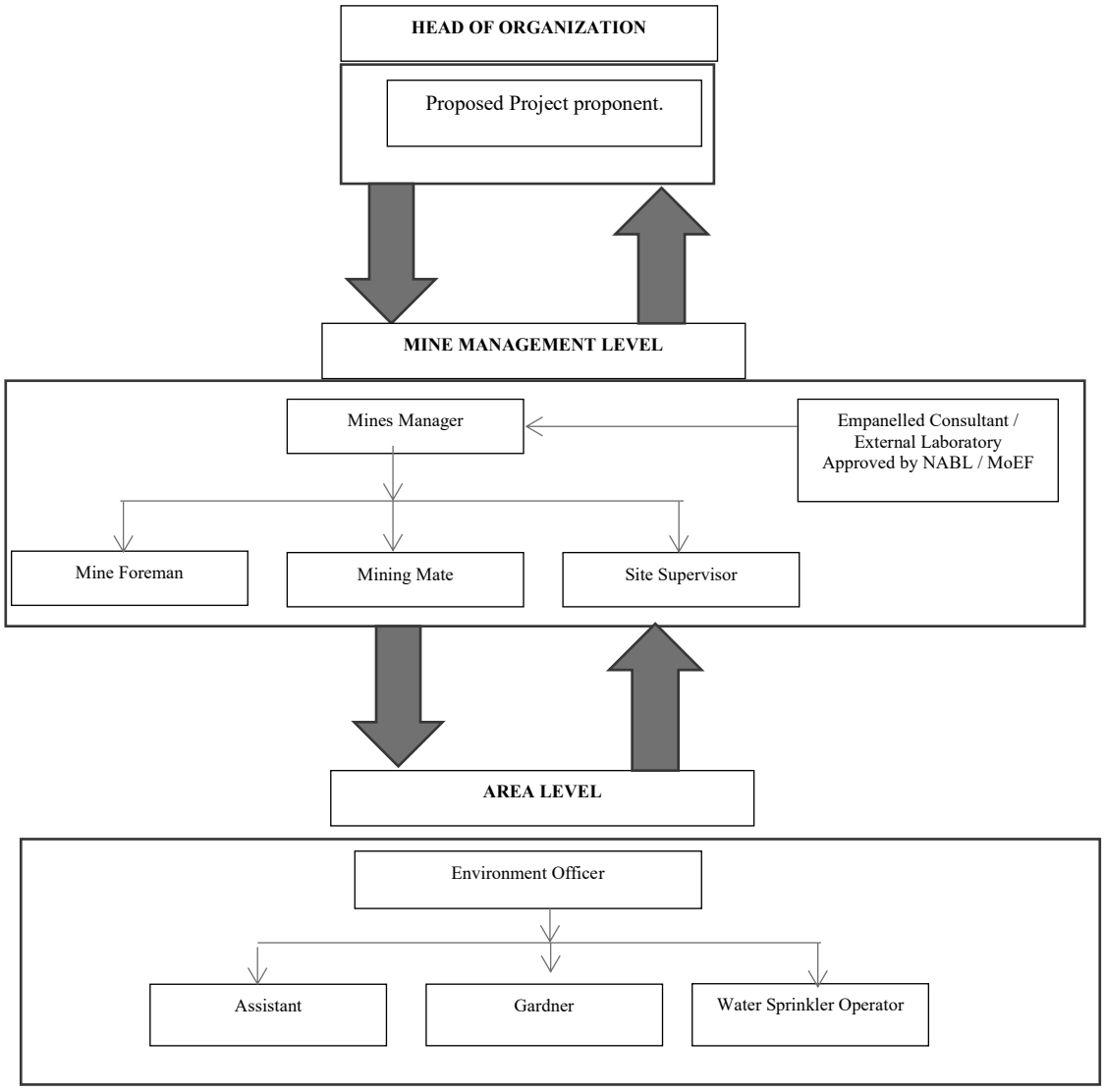


Figure 6.1 Proposed environmental monitoring chart

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in chapter IV will be implemented so as to reduce the impact on the environment due to the operations of the proposed project. Implementation schedule of mitigation measures is given in Table 6.1.

Table 6.1 Implementation Schedule for Proposed Project

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

6.3 MONITORING SCHEDULE AND FREQUENCY

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against statutory standards. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

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

- ❖ Air quality
- ❖ Water and wastewater quality
- ❖ Noise levels

- ❖ Soil quality and
- ❖ Greenbelt development

The details of proposed monitoring schedule have been provided in Table 6.2.

Table 6.2 Proposed Monitoring Schedule Post EC for the Proposed Quarry

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

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

6.4 BUDGETARY PROVISION FOR ENVIRONMENT MONITORING PROGRAM

The cost in respect of monitoring of environmental attributes, parameter to be monitored, sampling/monitoring locations with frequency and cost provision against each proposal is shown in Table 6.3. Monitoring work will be outsourced to external laboratory approved by NABL / MoEF. The proposed recurring cost for Environmental Monitoring Programme is Rs **2,95,000** /- per annum for the proposed project site.

Table 6.3 Environment Monitoring Budget

S. No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	-	Rs 60,000/-
2	Meteorology	-	Rs 15,000/-
3	Water Quality	-	Rs 20,000/-
4	Water Level Monitoring		Rs 10,000/-
5	Soil Quality	-	Rs 20,000/-
6	Noise Quality	-	Rs 10,000/-
7	Vibration Study	-	Rs 1,50,000/-
8	Greenbelt	-	Rs 10,000/-
Total		**-**	**Rs 2,95,000 /-**

Source: Field Data

6.5 REPORTING SCHEDULES OF MONITORED DATA

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

Periodical reports to be submitted to:

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

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

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

CHAPTER VII
ADDITIONAL STUDIES

7.0 GENERAL

Additional studies deal with:

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

7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

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

7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

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

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

Table 7.1 Risk Assessment & Control Measures for Proposed Project

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and 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.
3	Transportation	Potential hazards and unsafe workings contributing to accident and injuries Overloading of material While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition. ✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. ✓ Concave mirrors should be kept at all corners ✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point ✓ Loading according to the vehicle capacity ✓ Periodical maintenance of vehicles as per operator manual
4	Natural calamities	Unexpected happenings	✓ Escape Routes will be provided to prevent inundation of storm water ✓ Fire Extinguishers & Sand buckets
5	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.

Source: Analysed and proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone II. The area is far away from the sea. Hence, the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

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

In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency situations. Structure of the team has been shown in Figure 7.1.

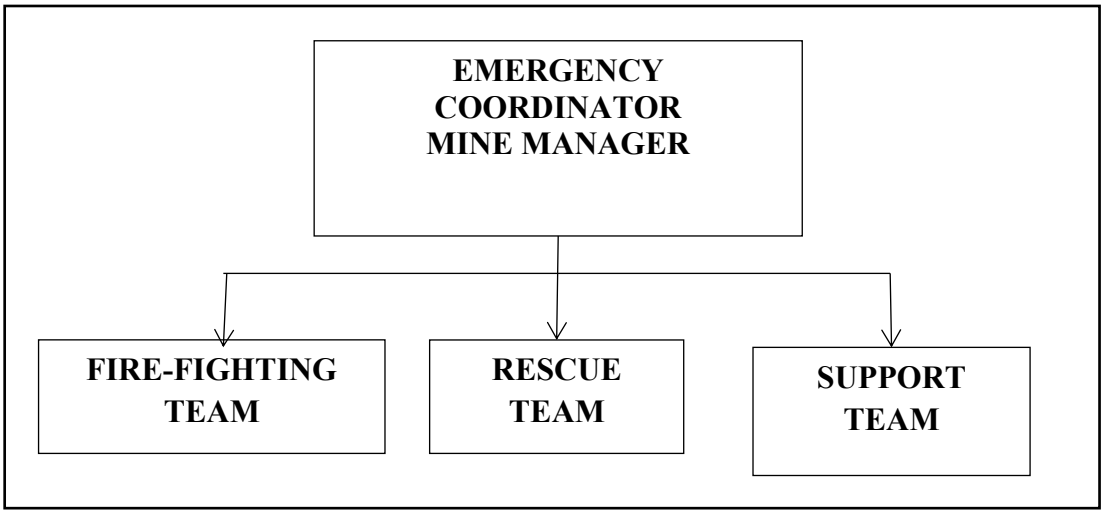


Figure 7.1 Disaster management team layout for proposed project

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

7.3.1 Emergency Control Procedure

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

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

7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, one proposed project, known as P1, are taken into consideration. The details of P1 have been given in Table 1.3.

7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from one proposed project have been given in Tables 7.2 and 7.3.

Table 7.2 Cumulative Production Load of Rough Stone

Proposed Production Details				
Quarry	**10 Years in m^3**	**Per Year in m^3**	**Per Day in m^3**	**Number of Lorry Load Per Day**
P1	419186	41919	155	26
Grand Total	**419186**	**41919**	**155**	**26**

Table 7.7 Cumulative Production Load of Gravel

Quarry	Production for 3 Years (m^3)	Yearly Production(m^3)	Daily Production(m^3)	Number of Lorry Loads Per Day
P1	38404	12801	47	8
Grand Total	**38404**	**12801**	**47**	**8**

The cumulative study shows that the overall production of rough stone from the quarry is 155 m^3 per day with a capacity of 26 trips of rough stone per day and that production of gravel from proposed quarry is 47 m^3 per day accounting for 8 trips/day.

7.4.1.1 Cumulative Impact of Air Pollutants

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

Table 7.8 Cumulative Impact Results from the proposed project

Pollutants	Baseline Data ($\mu g/m^3$)	Incremental Values ($\mu g/m^3$)	Cumulative Value ($\mu g/m^3$)
		P1	
$PM_{2.5}$	20.6	5.01	**25.61**
PM_{10}	39.5	10.9	**50.4**

7.4.2 Noise Environment

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

Table.7.9 Cumulative Impact of Noise from the Proposed project

Location ID	Distance (m)	Direction	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	550	W	39.21	29.15	39.62	**55**
Cumulative Noise (dB (A))					39.62	

Source: Lab Monitoring Data

The cumulative analysis of noise due to one proposed project shows that habitation will receive about 39.62dB (A) respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the one proposed project have been shown in Table 7.10.

Table 7.10 Cumulative Effect of Ground Vibrations Resulting from one proposed project

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	14.95	550	0.18
Total			**0.18**

Results from the above tables 7.11 indicate that the cumulative PPV value of each habitation is well below the peak particle velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

7.4.3 Socio Economic Environment

Socio Economic benefits of the one proposed project were calculated and the results have been shown in Table 7.11 the one quarry will contribute Rs. 5,00,000/-towards CER fund.

Table 7.11 Socio Economic Benefits from Proposed Quarry

Location ID	Project Cost	CER Cost
P1	Rs.81,10,500	Rs. 5,00,000
Grand Total	**Rs.81,10,500**	**Rs. 5,00,000**

Table 7.12 Employment Benefits from Proposed Quarry

Location ID	Employment
P1	20
Grand Total	**20**

A total of 20 people will get employment due to one proposed Quarry in cluster

7.4.4 Ecological Environment

Table 7.13 Greenbelt Development Benefits from One Quarry

Code	Number of Trees proposed	Area to be covered (m^2)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1215	10935	972	*Azadirachta indica, Albizia lebbeck, Delonix regia, Techtona grandis,* etc.,
Total	**1215**	**10935**	**972**	

Cumulative studies show that the proposed Quarry will plant about 1215 native tree species like *Azadirachta indica*, *Albizia lebbeck*, *Delonix regia*, *Techtona grandis,* etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 972 trees will survive in this green belt development program.

7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

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

7.5.1 Objective

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

A detailed action plan to manage plastic waste has been provided in Table 7.14.

Table 7.14 Action Plan to Manage Plastic Waste

S. No.	Activity	Responsibility
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance.	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste.	Mines Manager
3	Collection of plastic waste.	Mines Foreman
4	Setting up of Material Recovery Facilities.	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities.	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers.	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction.	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility.	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance.	Mine Owner

Source: Proposed by FAEs and EC.

CHAPTER VIII
PROJECT BENEFITS

8.0 GENERAL

The proposed project at K.Pudukottai Village aims to produce **419186m^3** of rough stone and Gravel is **38404m^3**over a period of 10 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 20 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED

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

8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

The proposed quarry project is located in K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu. The area has already well-established communications roads and other facilities. The following physical infrastructure facilities will further improve due to proposed project.

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

8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

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

8.5 OTHER TANGIBLE BENEFITS

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

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

8.6 CORPORATE SOCIAL RESPONSIBILITY

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

Under this programme, the project proponents will take-up following programmes for social and economic development of villages within 5 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- Health Services
- Social Development
- Infrastructure Development
- Education & Sports
- Self-Employment
- CSR Cost Estimation

- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the K.Pudukottai Village. CSR budget is allocated.

8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

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

Table 8.1 CER Action Plan

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

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about Rs. **4,83,52,836** to the state government through various ways, as provided in Table 8.2.

Table 8.2 Project Benefits to the State Government

Particulars	Budget for Rough Stone (Rs.)	Budget for Gravel (Rs.)
CER	5,00,000	---
Seigniorage @ Rs.90 /m^3 of rough stone and Gravel @ Rs.56 /m^3	3,77,26,740	21,50,624
District Mineral Foundation Tax @ 10% of Seigniorage	37,72,674	2,15,062
Green Tax @ 10% of Seigniorage	37,72,674	2,15,062
Total	**4,57,72,088**	**25,80,748**

CHAPTER IX
ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER X

ENVIRONMENTAL MANAGEMENT PLAN

10.0 GENERAL

Environment Management Plan (EMP) aims at the preservation of ecological system by considering in-built pollution abatement facilities at the proposed site. Good practices of environmental management plan will ensure to keep all the environmental parameters of the project in respect of ambient air quality, water quality, socio economic improvement standards. Mitigation measures at the source level and an overall environment management plan at the study area are elicited so as to improve the supportive capacity of the receiving bodies. The EMP presented in this chapter discusses the administrative aspects ensuring that mitigative measures are implemented and their effectiveness monitored after approval of the EIA.

10.1 ENVIRONMENTAL POLICY

The project proponent is committed to conduct all its operations and activities in an environmentally responsible manner and to continually improve environmental performance. The Proponent **M/s.Shree Thevar Blue Metals** will:

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

10.1.1 Description of the Administration and Technical Setup

The environment monitoring cell discussed under chapter VI will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through mine management level of each proposed quarry. The said team will be responsible for:

- Monitoring of the water/ waste water quality, air quality and solid waste generated.
- Analysis of the water and air samples collected through external laboratory.

- ❖ Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- ❖ Co-ordination of the environment related activities within the project as well as with outside agencies.
- ❖ Collection of health statistics of the workers and population of the surrounding villages.
- ❖ Green belt development.
- ❖ Monitoring the progress of implementation of the environmental monitoring program.
- ❖ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.1 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

Table 10.1 EMP Budget for Proposed Project

Attribute	Mitigation measures	Provision for Implementation	Capital Cost	Recurring Cost/annum
			(Rs.)	(Rs.)
Air Environment	Compaction, gradation and drainage on both sides	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare	24300	24300
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000

	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	75000	7500
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	40000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	10000
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare	0	48600
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			**989300**	**230400**
Noise Environment	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0

	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	1173721
Total Noise Environment			**50000**	**1175721**
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	24300	12150
Total Water Environment			**24300**	**12150**
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring	25000	20000

		cost for collection /disposal).		
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Total Waste Management			**30000**	**22000**
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	10000	1000
Total Implementation of EC, Mining Plan			**10000**	**1000**
Occupational Health and Safety	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	56000	14000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	14000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	9720
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	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	486000	24300
	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	121500	24300

	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
Total Occupational Health and Safety			**703500**	**873320**
Development of Green Belt	Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	97200	14580
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	218700	21870
Total Development of Green Belt			**315900**	**36450**
Mine Closure	Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs)		0	82620

	G.O.(Ms)No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for rough stone = Rs.90)	3987736	0
TOTAL			**6110736**	**2351041 (Exclude. Mine Closure)**

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

For First Five years				
Ist Year	**IInd Year**	**IIIrd Year**	**IVth Year**	**Vth Year**
2351041	2468593	2592022	2721624	2857705

For Next Five Years						
VIth Year	**VIIth Year**	**VIIIth Year**	**IXth Year**	**Xth Year (including Mine Closure Cost)**	**Total Recurring Cost**	**Total EMP Cost**
3000590	3150620	3308151	3473558	3729856	**29653759**	**35764495**

In order to implement the environmental protection measures, an amount of **Rs. 6110736** as capital cost and recurring cost as **Rs. 2351041** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs. 35764495** as shown in Table 10.2.

10.3 CONCLUSION

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

CHAPTER XI

SUMMARY AND CONCLUSION

11.1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 11.67.1ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No.244/1A, 244/2A1 and 244/2A2 over the extent of 2.43.0ha is situated in the cluster falling in K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu. The cluster contains one proposed project known as P1 and four existing projects known as E1, E2, E3 and E4.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 10° 27'5.37"N to 10° 27'10.78"N Longitudes from 77°51'30.12"E to 77°5'37.37"E in K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu. According to the approved mining plan, about 419186m^3 of rough stone and 38404 m^3 of Gravel will be mined up to the depth of 45 m BGL in the ten years. The quarrying operation is proposed to be carried out by open cast manual mining method involving drilling and formation of benches of the prescribed dimensions.

11.3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during **November 2021 - January 2022** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified ***Ekdant Enviro Services (P) Ltd*** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

11.3.1 Land Environment

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 11.1.

Table.11.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Crop Land	4684.39	59.69
2	Dense Forest	12.27	0.16
3	Fallow Land	784.45	10.00
4	Mining/Industrial lands	82.95	1.06
5	Land with or without scrub	8.98	0.11
6	Plantations	2006.32	25.56
7	Settlements	48.98	0.62
8	Water Bodies	219.74	2.80
Total		**7848.07**	**100.0**

Source: Sentinel II Satellite Imagery

11.3.2 Soil Environment

The physical properties of the soil samples were examined for texture, bulk density, and water holding capacity. The soil texture found in the study area is clay loam. The bulk density of soils in the study area varies between 1.15 and 2.85 g/cc. The water holding capacity varies from 40.36 to 46.50. The nature of soil is slightly alkaline to strongly alkaline with pH ranging from 7.21 to 7.91, Chloride ranges between 14.0 and 38.0 mg/kg, Sodium ranges between 9.0 and 24.0 mg/kg, Potassium ranges between 0.98 and 2.0 mg/kg, Calcium ranges between 10.0 and 19.0 mg/kg, Magnesium ranges between 5.0 and 11.0 mg/kg.

11.3.3 Water Environment

Surface Water

K.Pudukottai Lakes are the one prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. Three surface water samples, known as SW1 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the three samples. Results for surface water samples in the Table 3.7 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

Ground Water

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. seven groundwater samples, known as OW01, OW02, BW01, BW02, BW03, BW04 and BW05, were collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.7. Table 3.7 summarizes ground water quality data of the seven samples. Results for ground water samples in the Table 3.8 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2022, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 20.6 to 23.6 m BGL in pre monsoon and 11.6 to 16.3 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December (Post-Monsoon Season) vary from 62.3 to 66.2 m and from 63.8 to 67.7 m for the period of March through May, (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

11.3.4 Air Environment

As per the monitoring data, $PM_{2.5}$ ranges from 19.20 µg/m^3 to 22.30 µg/m^3; PM_{10} from 37.30 µg/m^3 to 41.30 µg/m^3; SO_2 from 5.5 µg/m^3 to 7.9µg/m^3; NO_x from 17.30µg/m^3 to 21.20g/m^3. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 40 causing minimal impact to human health.

11.3.5 Noise Environment

Noise level in core zone was 45.8 dB (A) Leq during day time and 34.2 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.9 to 45.6dB (A) Leq and during night time from 28.0 to 39.0dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.3.6 Biological Environment

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

Flora in core zone

Taxonomically a total of 26 species belonging to 21 families have been recorded from the core mining lease area. The lease applied area is flat terrain. Based on habitat classification of the enumerated plants the majority of species were Herbs, Climbers 19 followed by Trees 3 Shrub 4 The result of core zone of flora studies shows that Fabaceae and Lamiaceae are the main dominating species in the study area it mentioned in Table 3.21. Species Richness (margalef Index) in the study area it mentioned in Table 3.21 to 3.23

Flora in 300 m radius zone

There is no agricultural land nearby lease area. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 5 Shrubs (17%) and Herbs and Climbers, Creeper, Grass & Cactus 20 (64%) were identified. Details of flora with the scientific name details and of diversity species Richness index were mentioned in Table 3.24-26. There is no threatened species in 300 m radius.

Fauna in Core Zone

A total of 34 varieties of species observed in the Core zone of K. Pudukottai Village, Rough stone quarry (Table 3.29) among them numbers of Insects 14(31%), Reptiles 7 (15%), Mammals 3 (6%) Avian 10 (31%). A total of 27 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 four species are under schedule IV according to Indian wild life Act 1972. A total nine 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. 3.30.

Fauna in Buffer Zone

Taxonomically a total of 48 species belonging to 34 families have been recorded from the buffer mining lease area. Based on habitat classification the majority of species were Birds 13(35%) followed by Insects 7 (20%), Reptiles 9 (19%), Mammals 3 (6%) and, Amphibians 3 (6%). Aves16(33%) There are four Schedule II species and twenty-six are

under schedule IV according to Indian wild life Act 1972. A total 16 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. 3.31.

11.3.7 Socio Economic Environment

The proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of people's standard of living.

11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

11.4.1 Land Environment

Anticipated Impact

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

Mitigation Measures

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.

- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimize dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

11.4.2 Water Environment

Anticipated Impact

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

Mitigation Measures

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program

11.4.3 AIR ENVIRONMENT

Anticipated Impact

- During mining at various stages of activities such as excavation, drilling 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

Mitigation Measures

- 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
- Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone
- Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours
- 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
- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- The un-metaled haul roads will be compacted weekly before being put into use
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Haul roads and service roads will be graded to clear accumulation of loose materials
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

11.4.4 Noise Environment

Anticipated Impact

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. The peak particle velocity produced by the charge of 42.55 kg is well below that of 0.3 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

Mitigation Measures

- The blasting operations in the cluster quarries will use shallow holes and delay detonators to reduce the ground vibrations
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during 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
- During blasting, other activities in the immediate vicinity will be temporarily stopped
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

11.4.5 Biological Environment

Anticipated Impact

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 3746 kg per day, 1011448 kg per year and 5057239 kg over five years, as provided in Table 4.9.

Mitigation Measures

- During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 53688 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.12), about 1215 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 4911585 kg of the total carbon, as provided in Table 4.10.

11.4.6 Socio Economic Environment

Anticipated Impact

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

Mitigation Measures

- Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems

- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines
- Air pollution control measure will be taken to minimize the environmental impact within the core zone
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc.., from this project directly and indirectly

11.4.7 Occupational Health

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spiro metric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and Eye test
- Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost.
- The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

11.5 Environment Monitoring Program

Table 11.2 Environment Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms

4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Peak particle velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

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

11.6 ADDITIONAL STUDIES

11.6.1 Risk Assessment

The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

11.6.2 Disaster Management Plan

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

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

11.6.3 Cumulative Impact Study

The results on the cumulative impact of the proposed project on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.

- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time
- PPV resulting from proposed project is well below the permissible limit of Peak Particle Velocity of 8 mm/s
- The proposed project will allocate Rs.5,00,000/- towards CER as recommended by SEAC
- The proposed project will directly provide jobs to 20 local people, in addition to indirect jobs
- The proposed project will plant 1215 about trees in and around the lease area
- The proposed project will add 102 PCU per day to the nearby roads.

11.7 Project Benefits

Various benefits are envisaged due to the three proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- Direct employment to 20 local people.
- Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- Strengthening of existing community facilities through the Community Development Program.
- Skill development & capacity building like vocational training.
- Rs. 5,00,000 will be allocated for CER

11.8 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs. 6110736** as capital cost and recurring cost as **Rs. 2351041** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs. 35764495** as shown in Table 10.2.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, M/s.Shree Thevar Blue Metals has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

Address of the consultancy:

No: 1/213B Natesan Complex,
Oddapatti, Dharmapuri – 636705,
Tamil Nadu, India.
Email:info.gtmsdpi@gmail.com
Web: www.gtmsind.com
Phone: 04342 232777.

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

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

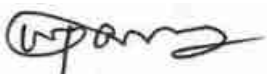
15	P. Dhatchayini	FAA	1(a)(i)	AQ	B
16	V. Malavika	FAA	1(a)(i)	NV, SHW	B

Abbreviations

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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

Signature : 

Date :

Name : **Dr. S. Karuppannan**

Designation : EIA Coordinator

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date

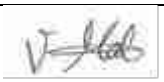
We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for M/s.Shree Thevar Blue Metals rough stone and gravel quarry project with the extent of 2.43.0 ha situated in the cluster with the extent of 8.79.60 ha in K.Pudukottai Village, Dindigul West Taluk, Dindigul District of Tamil Nadu is true and correct to the best of our knowledge.

Functional Area Experts Engaged in this Project

S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity ○ Prediction of air pollution and propose mitigation measures / control measures	J.N. Manikandan	
			P.Venkatesh	
2	WP	○ Suggesting water treatment systems, drainage facilities ○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	Dr.S. Malar	
3	HG	○ Interpretation of ground water table and predict impact and propose mitigation measures. ○ Analysis and description of aquifer Characteristics	Dr.M. Vijay Prabhu	
4	GEO	○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	G.Gopala Krishnan	
5	SE	○ Revision in secondary data as per Census of India, 2011. ○ Impact Assessment & Preventive Management Plan ○ Corporate Environment Responsibility.	Dr. G. Prabhakaran	
6	EB	○ Collection of Baseline data of Flora and Fauna. ○ Identification of species labelled as	Dr.J. Rajarajeshwari	

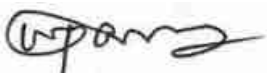
		Rare, Endangered and threatened as per IUCN list. o Impact of the project on flora and fauna. o Suggesting species for greenbelt development.		
7	RH	o Identification of hazards and hazardous substances o Risks and consequences analysis o Vulnerability assessment o Preparation of Emergency Preparedness Plan o Management plan for safety.	J.N. Manikandan	
8	LU	o Construction of Land use Map o Impact of project on surrounding land use o Suggesting post closure sustainable land use and mitigative measures.	G.Uma Maheswaran	
9	NV	o Identify impacts due to noise and vibrations o Suggesting appropriate mitigation measures for EMP.	Dr.R. Arun Balaji	
10	AQ	o Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. o Recommending mitigations measures for EMP	Dr.R. Arun Balaji	
11	SC	o Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. D.Kalaimurugan	
12	SHW	o Identify source of generation of non-hazardous solid waste and hazardous waste. o Suggesting measures for minimization of generation of waste and how it can be reused or recycled.	J.N. Manikandan	

List of Functional Area Associate Engaged in this Project

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithiviraj	LU, HG	○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG	
2	C. Kumaresan	NV	○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling	
3	P. Vellaiyan	HG & GEO	○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection	
5	P. Dhatchayini	AQ	○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data	
6	V. Malavika	NV, SHW	○ Site visit along with FAE ○ Assistance in report preparation	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, **Dr. S. KARUPPANNAN,** Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for M/s.Shree Thevar Blue Metals rough stone and gravel quarry project with the extent of 2.43.0 ha situated in the cluster with the extent of 8.79.60 ha in K.Pudukottai Village, Dindigul West Taluk, Dindigul District of Tamil Nadu is true and correct to the best of my knowledge.

Signature	:	
Date	:	
Name	:	**Dr. S. Karuppannan**
Designation	:	Managing Partner
Name of the EIA Consultant Organization	:	Geo Technical Mining Solutions
NABET Certificate No & Issue Date	:	NABET/EIA/23-26/RA 0319
Validity	:	Till 31.12.2026

File No: 10798
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **31/05/2024**

To,

M Ramesh
SHREE THEVAR BLUE METALS
M/s.SHREE THEVAR BLUE METALS, S.F.No's: 295/1,295/1A,295/2 295/3, Kothapulli Village, Reddiarchatram, Dindigul District - 624622., K Pudukottai, DINDIGUL, TAMIL NADU, 624622
msshreethevarbluemetals@gmail.com

Subject: Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of the Proposed Rough Stone and Gravel Quarry over an extent of 2.43.0Ha at S.F.No's: 244/1A, 244/2A1 & 244/2A2 K. Pudukottai village, Dindigul West Taluk, Dindigul District by M/S. Shree Thevar Blue Metals submitted to Ministry vide proposal number SIA/TN/MIN/467014/2024 dated 26/03/2024.

Ref: 1. Online proposal No. SIA/TN/MIN/ 467014/2024, dt: 26/03/2024
2. Your application submitted for Terms of Reference dated: 04.04.2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5203883N
(ii) File No.	10798
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	K.Pudukottai Village Rough Stone Gravel mining Lease
(viii) Name of Company/Organization	SHREE THEVAR BLUE METALS
(ix) Location of Project (District, State)	DINDIGUL, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the State Environment Impact Assessment Authority(SEIAA) under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by State Environment Impact Assessment Authority(SEIAA) in the meeting held on 24/05/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

5. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).

6. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to grant Terms of Reference for instant proposal of M/s. M Ramesh under the provisions of EIA Notification, 2006 and as amended thereof.

7. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.

8. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

9. This issues with the approval of the Competent Authority.

10. 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 OM No.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

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, Dindigul District.
7.Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Specific Conditions:

S. No	Terms of Reference
1.1	1. The detailed studies on the Loss of Vegetation, Loss of Biodiversity shall be carried out and the

S. No	Terms of Reference
	action plan to prevent the same shall be included in the EIA report. 2. The detailed studies on the Impact on water bodies and human health shall be carried out and the action plan to prevent the same shall be included in the EIA report. 3. The PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry by involving any one of the reputed Research and Academic Institution. A copy of such scientific study report shall be included in the EIA report. 4. The PP shall carry out the scientific studies with prior permission from the DMS/Chennai Region, to design the controlled blast parameters for reducing the blast-induced ground/air-vibrations and eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution. A copy of such scientific study report shall be included in the EIA report. 5. The PP shall carry out the scientific studies to assess the slope stability of the working benches and existing quarry wall by involving any one of the reputed Research and Academic Institutions. A copy of such scientific study report shall be included in the EIA report.

2. Seac Conditions - Site Specific

S. No	Terms of Reference
2.1	1. 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. 2. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc., 3. The PP shall propose the mitigation measures for the protection of structures exists within 500 m distance radially from the mine lease against the blast-induced ground & air vibrations, air & water pollution, haul road maintenance, ground water management.

3. Seac Standard Conditions

S. No	Terms of Reference
3.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.

S. No	Terms of Reference
	4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. ● Highest production achieved in any one year ● Detail of approved depth of mining. ● Actual depth of the mining achieved earlier. ● Name of the person already mined in that leases area. ● If EC and CTO already obtained, the copy of the same shall be submitted. ● Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for

S. No	Terms of Reference
	the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.

S. No	Terms of Reference
	33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

4. Seiaa Standard Conditions:

S. No	Terms of Reference
4.1	1. Impacts on Energy requirement. 2. Impacts on living System (air ,water ,soil & micro organism). 3. Impacts on terrestrial & aquatic within and surrounding areas. 4. 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 furnish the detailed EMP mentioning all the CER activities as committed with the action plan. 5. All the construction of Buildings shall be energy efficient and confirm to the green building norms. 6. The proponent shall provide adequate parking facility for vehicles of all the workers & visitors. 7. The proponent shall ensure that no treated or untreated trade effluent/sewage discharged outside the premises under any circumstances. 8. The disaster management and disaster mitigation standards to be seriously adhered to avoid of calamities.

S. No	Terms of Reference
	9. The proponent shall provide the action taken for reduction of green house gas emissions to support the climatic action to make it sustainable buildings. 10. The project proponent shall furnish the action taken to provide adequate parking space for visitors of all inmates including clean traffic plan. 11. The project proponent shall furnish the action taken to improve water usage efficiency in the building. 12. The project proponent shall conduct detailed study of biodiversity flora & fauna including invasives /endemic vulnerable species. 13. The project proponent shall furnish NOC obtained from competent authority that there is no encroachment of water bodies (including canals). 14. The project proponent shall furnish impact of Green House Gases emissions and climate change likely due to activities. 15. The project proponent shall conduct detailed soil investigation including microflora /fauna. 16. The project proponent shall study impact on livelihoods of locals. 17. The project proponent shall furnish List of trees available in the area. 18. The project proponent shall study impact of activities on water bodies/wetlands. 19. The project proponent shall conduct studies on invasive and alien species

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the

S. No	Terms of Reference
	water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights S.N ML/Project Land use Area under Surface Rights(ha) Area Under Mining Rights(ha) (ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements 5 Others (specify) S.N. Details Area (ha) 1 Buildings

S. No	Terms of Reference
	2 Infrastructure 3 Roads 4 Others (specify) Total
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with

S. No	Terms of Reference
	the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored
1.27	PP to evaluate the green house emission gases from the mine operation and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and

S. No	Terms of Reference
	effluents/pollution load emanating from these activities should also be provided.
1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
1.38	Corporate Environment Responsibility:
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
1.42	d) To have proper checks and balances, the company should have a well laid down 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.
1.43	e) Environment Managament Cell and its responsibilities to be clearly spleel out in EIA/ EMP report

S. No	Terms of Reference
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.
1.48	Details on the Forest Clearance should be given as per the format given: Total ML Project Area (ha) / Total Forest land (ha) If more than one provide details of each FC / Date of FC / Extent of Forest Land / Balance area for which FC is yet to be obtained / Status of appl For diversion of forest land
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes
1.52	Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.

From

Thiru.K.Vijayaragavan, M.Sc.,
Assistant Director,
Geology and Mining,
Dindigul

To

M/s. Shree Thevar Blue Metals,
SF.Nos: 295/1, 295/1A, 295/2, 295/3
Kothapulli Village,
Reddiarchatram,
Dindigul District

Rc.No.115/2023(Mines) dated: 11 .03.2024

Sir,

Sub: Mines and Quarries – Minor Minerals – Dindigul District - Dindigul West Taluk - K.Pudukottai Village in SF.Nos.244/1A, 244/2A1, 244/2A2 - over an extent of 2.43.0 Hects., of patta lands - Rough stone & Gravel quarry lease – 500mts radius details – requested - Regarding.

Ref: 1.Application of M/s. Shree Thevar Blue Metals, Kothapullu, Dindigul dt.22.12.2023
2.Precise area communication in Rc.No.115/2023(Mines) dated: 27.02.2023
3.Letter from M/s. Shree Thevar Blue Metals, Kothapullu, Dindigul letter dt.06.03.2024

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With reference to your letter in the reference 3rd cited, the details of existing and lease expired quarries located within 500m radius from the proposed Rough stone & gravel quarry, over an extent of 2.43.0 Hects in patta S.F.Nos. 244/1A, 244/2A1, 244/2A2 of K.Pudukottai Village, Dindigul West Taluk, Dindigul District are as follows:

1. Proposed Area

S. No	Name of the applicant	Village &Taluk	S.F.No	Extent (in hec)
1	M/s. Shree Thevar Blue Metals, SF.Nos: 295/1, 295/1A, 295/2, 295/3 Kothapulli Village, Reddiarchatram, Dindigul District	Dindigul West Taluk, K.Pudukottai Village	244/1A, 244/2A1, 244/2A2	2.43.0

M. Ramesh.

4) **Existing Other Quarries:**

S. No	Name of the Lessee / Permit Holder	Village & Taluk	S.F.No	Extent (in hec)	Lease period
1.	Premium Granite Kothapulli Village Thathankottai Road Reddiyarchathiram, Dindigul West	Dindigul West Taluk, K.Pudukottai Village	249/1, 8B, 9, 10A,..etc	1.70.50	28.04.2023 to 27.04.2028
2.	Umarani W/o Chelladurai No 11-4-29 Royal Theature Annanagar back side Keelakottai Sinnalapatti Dindigul 624301	Dindigul West Taluk, K.Pudukottai Village	252/2,4, 252/5	1.01.00	07.10.2023 to 06.10.2028
3.	R S Palanisamy, Rengappanaickanpatti, Reddiyarchatram, Kothapulli village Dindigul Dist.	Dindigul West Taluk, Kothapulli Village	304/1,30 4/2..etc	2.53.05	19.05.2023 to 18.05.2028
4.	M.Balu, S/o. Muthu 1/141, West Street, Pillayarnatham Dindigul	Dindigul West Taluk, Kothapulli Village	302/2	1.12.05	02.09.2017 to 01.09.2022 Vide RC No.3522/mm6 /23/dt 18-05-2023 Extended 03-06-2023 to 02-12-2024

M. Ramesh.

3) Lease Expired

S. No	Name of the Lessee / Permit Holder	Village & Taluk	S.F.No	Extent (in hec)	Lease period
1.	P.Bharathcibi, S/o.R.Pandiyarajan, B28, Vivekananda Nagar, Near Roatry Meeting Hall, Dindigul	Dindigul West Taluk, K.Pudukottai Village	248/1B, 248/2, 248/3A, 248/4, 248/5, 248/7	1.27.0	20.11.2017 to 19.11.2022
2.	P.Anbarasu, S/o R.S.Palanisamy, Rengappanaickenpatty, K.Pudukottai (Po), Reddiyarchatram (Via), Dindigul	Dindigul West Taluk, Kothapulli Village	315/8, 315/9 , 315/10 315/11, 315/12 315/13	1.60.5	07.07.2015 to 06.07.2020

Assistant Director,
Geology and Mining,
Dindigul

From

Thiru.K.Vijayaragavan, M.Sc.,
Assistant Director,
Geology and Mining,
Dindigul

To

M/s.Shree Thevar Blue Metals,
SF.Nos: 295/1, 295/1A, 295/2, 295/3
Kothapulli Village,
REddiarchatram,
Dindigul District

Rc.No.115/2023(Mines) dated: 11.03.2024

Sir,

Sub: Mines and Quarries – Minor Minerals – Dindigul District - Dindigul West Taluk - K.Pudukottai Village in SF.Nos.244/1A, 244/2A1, 244/2A2 - over an extent of 2.43.0 Hects., of patta lands - Rough stone & Gravel quarry lease – draft mining plan submitted by M/s.Shree Thevar Blue Metals - Approval of mining plan - Regarding.

Ref: 1.Application of M/s. Shree Thevar Blue Metals, Kothapulli, Dindigul dt.22.12.2023
2.Precise area communication in Rc.No.115/2023(Mines) dated: 27.02.2023
3.Letter from M/s. Shree Thevar Blue Metals, Kothapullu, Dindigul letter dt.06.03.2024

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In the reference 1st cited, M/s. Shree Thevar Blue Metals, Kothapullu, Dindigul has applied for the grant of lease to quarry rough stone & Gravel, over an extent of 2.43.0 hects in patta lands in SF.Nos.244/1A, 244/2A1, 244/2A2 of K.Pudukottai Village, Dindigul West Taluk, Dindigul District under Rule 19(1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

2) The precise area has been communicated to the applicant under reference 2nd cited above, based on the recommendations of the Revenue Divisional Officer, Dindigul and the Assistant Director of Geology and Mining, Dindigul.

3) In exercise of powers delegated under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the mining plan submitted by M/s. Shree Thevar Blue Metals for grant of lease to quarry rough stone & gravel, over an extent of 2.43.0 hects in patta lands in

M. Ramesh

SF.Nos.244/1A, 244/2A1, 244/2A2 of K.Pudukottai Village, Dindigul West Taluk, Dindigul District for a period of Ten years and the proposed mineable reserves of rough stone and gravel after leaving safety distance is arrived as **419186 M³** and **38404 M³** to the proposed depth of 45m. This approval is 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). The scheme of mining shall be submitted to the Assistant Director of Geology and Mining atleast 180 days before the expiry of the five years period forwhich it was approved on the last occation.

Assistant Director,
Geology and Mining,
Dindigul

Encl: 2 copies of Approved Mining Plan.

Copy submitted to:

1. The Chairman,
   State Level Environment Impact Assessment Authority, Chennai
2. The Commissioner of Geology and Mining, Industrial Estate, Guindy, Chennai- 32

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MINING PLAN

FOR

K.PUDUKOTTAI VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/Opencast Semi-Mechanized mining/ Non- Forest/Non - Captive Use – "B2' Category

Lease period 10 Years from the date of lease execution

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

LOCATION OF THE LEASE AREA

STATE	:	**TAMILNADU**
DISTRICT	:	**DINDIGUL**
TALUK	:	**DINDIGUL WEST**
VILLAGE	:	**K.PUDUKOTTAI**
S.F. No's	:	**244/1A, 244/2A1 & 244/2A2**
EXTENT	:	**2.43.0 Hectares**

ADDRESS OF THE APPLICANT

M/s.Shree Thevar Blue Metals,

S.F.No's: 295/1, 295/1A, 295/2 & 295/3,

Kothapulli Village,

Reddiarchatram,

Dindigul District – 624622

PREPARED BY

Dr.S.KARUPPANNAN.M.Sc., Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
No: 1/213 -B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.
Mob. : +91 9443937841, +917010076633,
E-mail: info.gtmsdpi@gmail.com ,
Website: www.gtmsind.com

M. Ramesh.

CONTENTS

M. Ramesh.

ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of **FMB** (Field Measurement book)	II
3.	Copy of combined sketch	III
4.	Copy of "A" registered	IV
5.	Copy of Chitta & adangal	V
6.	Copy of Consent Documents	VI
7.	Copy of GST Certificate	VII
8.	Photocopy of the proposed lease area	VIII
9.	Copy of ID Proof of the authorized signature	IX
10.	Copy of RQP certificate	X

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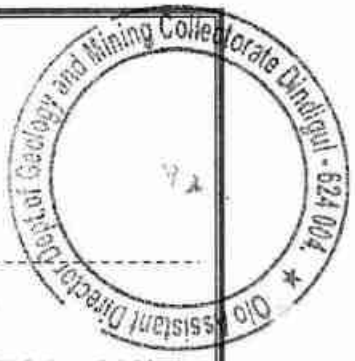
LIST OF PLATES

O/o Assistant Director, Dept. of Geology and Mining Collectorate Dindigul - 624 004

M Ramesh

M/s.Shree Thevar Blue Metals,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
Kothapulli Village,
Reddiarchatram,
Dindigul District – 624622



CONSENT LETTER FROM THE APPLICANT

The Mining Plan for rough stone and gravel quarry lease in S.F.No's: 244/1A, 244/2A1 & 244/2A2, over an extent of 2.43.0hectares, K.Pudukottai Village, Dindigul West Taluk, Dindigul District, TamilNadu State has been prepared by

Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Regn. No. RQP/MAS/263/2014/A)

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

Dr. S. KARUPPANNAN. M.Sc., Ph.D.
(Regn. No. RQP/MAS/263/2014/A)
GEO TECHNICAL MINING SOLUTIONS
(A NABET accredited & ISO certified Company)
No: 1/213-B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post office, Dharmapuri-636705
Ph: +91 9443937841, +91 7010076633
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com

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

Place: Dindigul, TN

Date:

M. Ramesh.

Signature of the applicant
(M/s.Shree Thevar Blue Metals)

M. Ramesh

M/s.Shree Thevar Blue Metals,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
Kothapulli Village,
Reddiarchatram,
Dindigul District – 624622

DECLARATION

The Mining Plan of rough stone and gravel quarry lease in S.F.No's: 244/1A, 244/2A1 & 244/2A2, over an extent of 2.43.0hectares, K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Dindigul, TN

Date:

M. Ramesh.

Signature of the applicant
(M/s.Shree Thevar Blue Metals)

M. Ramesh.

Dr. S. KARUPPANNAN. M.Sc., Ph.D.
(Regn. No. RQP/MAS/263/2014/A)
GEO TECHNICAL MINING SOLUTIONS
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Oddapatti, Collectorate Post office, Dharmapuri-636705
Ph: +91 9443937841, +91 7010076633
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com

CERTIFICATE

This is to certify that the provisions given in rule 19 & 20 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the rough stone and gravel quarry lease mining plan in S.F.No's: 244/1A, 244/2A1 & 244/2A2 over an extent of 2.43.0Hectares in K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu State applied in the name of **M/s.Shree Thevar Blue Metals**, Dindigul District, Tamil Nadu.

Wherever specific permission / exemptions / relaxations or approvals are required the applicant will approach the concerned authorities of State and Central governments for granting such permissions etc.

Place: Dharmapuri, TN
Date: 04/03/24

Signature of the Recognized Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
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Dharmapuri-636705, TamilNadu, India

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

Office of Assistant Director Dept.of Geology and Mining Collectorate Dindigul - 624 004

CERTIFICATE

I certify that the preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 244/1A, 244/2A1 & 244/2A2 over an extent of 2.43.0hectares, K.Pudukottai Village, Dindigul West Taluk, Dindigul District, Tamil Nadu prepared to **M/s.Shree Thevar Blue Metals**, Dindigul District, Tamil Nadu covers all the provisions of Mines Act, Rules and Regulations etc. made therein and if any specific permission is required the applicant will approach **"The Director General of Mines Safety"**, Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

Place: Dharmapuri, TN
Date: 04/03/24

Signature of the Recognized Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
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Collectorate Post Office, Oddapatti,
Dharmapuri-636705, TamilNadu, India

M. Ramesh.

MINING PLAN

FOR

K.PUDUKOTTAI VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/Opencast Semi-Mechanized mining/ Non- Forest/Non - Captive Use

"B2' Category

Lease period 10 Years from the date of lease execution

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

INTRODUCTORY NOTES:

1) **Introduction:** The applicant M/s.Shree Thevar Blue Metals, office at S.F.No's: 295/1, 295/1A, 295/2 & 295/3, Kothapulli Village, Reddiarchatram, Dindigul District, Tamil Nadu State, filed an application for new proposal had submitted to the Assistant Director, Department of Geology and Mining, Dindigul dated 22.12.2023 to grant the quarry lease for rough stone and gravel in S.F.No's: 244/1A, 244/2A1 & 244/2A2, over an extent of 2.43.0hectares of K.Pudukottai Village, Dindigul West Taluk, Dindigul District, TamilNadu State further the period of 10 years.

2) **Precise area communication letter particulars:** The Assistant Director, Department of Geology and Mining, Dindigul has directed to the applicant **M/s.Shree Thevar Blue Metals**, through his precise area communication letter **Rc.No.115/2023(Mines) Dated: 27.02.2024**, before execution of lease deed should submit the mining plan for approval and obtain environmental clearance from the competent authority of State Level Environment Impact Assessment Authority-TamilNadu (SEIAA) per EIA notification S.O.1533(E) dated 14th September 2006 and its subsequent amendments S.O.3977(E), dated 14th August 2018, MoEF & CC office memorandum letter F.No.22-1/2019 -IA.III [E116917] dated 15th December, 2021 for quarrying lease rough stone and gravel at Tamil Nadu State, Dindigul District, Dindigul West Taluk, K.Pudukottai Village in S.F.Nos: 244/1A, 244/2A1 & 244/2A2 over an extent of 2.43.0hectares has recommended as following conditions for a period of ten years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959

i. A safety distance of 7.5m should be left out for Patta lands nearby the applied area while quarrying activities.

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ii. A safety distance of 10m should be left out for Government Poramboke lands nearby the applied area while quarrying activities.

iii. Wire fencing should be setup around the quarry before the start of quarrying.

3) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, for mining lease as per conditions mentioned in the precise area communication letter **Rc.No.115/2023(Mines) Dated: 27.02.2024.**

4) **Geological resources and Mineable reserves:** Geological resource was estimated as **1093680m³** without considering the safety benches in which, rough stone is estimated about **1045072m³** and gravel is about **48608m³**(Refer Plate No. III). The total mineable reserve is estimated as **457590m³** by deducting the reserves in safety area and benches. The calculated rough stone is about **419186m³** and gravel is about **38404m³** up to a depth of 45m below ground level (R.L.279-234m) for 10 years. (Refer Plate No.VIA).

5) **Proposed production schedule:** Total proposed production is **457590m³** in which the rough stone is **419186m³** and gravel is **38404m³** up to a depth of 45m below the ground level (R.L.279m-234m) for ten years. Average production is **41918m³** of rough stone and gravel is **12801m³** per year for three years. (Refer Plate No. IVA)

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

i. **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.

ii. **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.

iii. **Indian Forest Act, 1980:** There is no forest land involved in the proposed Project. It will not attract the act. The nearest Reserved Forest is Devarmalai R.F – 1.80km – Northwest Side.

iv. **CRZ Notification, 1991:** There is no sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 1991.

1.0 GENERAL:

a.	Name of the Applicant	:	**M/s.Shree Thevar Blue Metals**
	Applicant address	:	S.F.No's: 295/1, 295/1A, 295/2 & 295/3, Kothapulli Village, Reddiarchatram,

M. Ramesh.

	District	:	Dindigul
	State	:	TamilNadu
	Pin code	:	624622
	Phone	:	
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	
b.	Status of the Applicant		
	Private individual	:	---
	Cooperative Association	:	---
	Private company	:	Private company
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	:	Rough stone and gravel quarry lease
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of ten (10) years.
e.	Name of the NABET accredited company preparing the Mining Plan	:	**Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,**
	Address	:	**Geo Technical Mining Solutions** (A NABET Accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
	Fax	:	Nil
	e-mail	:	info.gtmsdpi@gmail.com
	Telex	:	Nil
	Certificate Number	:	RQP/MAS/263/2014/A
	Date of grant/renewal	:	16.12.2014
	Valid upto	:	15.12.2024
f.	Name of the prospecting agency	:	**Geo Technical Mining Solutions** GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.
	Address	:	No: 1/213-B, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633

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g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter issued by the Assistant Director, Department of Geology and Mining, Dindigul was received vide **Rc.No.115/2023(Mines) Dated: 27.02.2024**

2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: IA & IB
	District & State	:	Dindigul, Tamil Nadu
	Taluk	:	Dindigul West Taluk
	Village	:	K.Pudukottai
	Khasra No./ Plot No./ Block Range/ Felling Series etc.		

Survey No.	Sub division	Total Extent in Hect	Patta No.	Village and Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area out of total area in hect.
244	1A	1.91.0	1332	1.Mr.Ramesh S/o.Murugesanthevar 2.Mr.Balaji S/o. Murugesanthevar	244/1A	1.91.0
244	2A1	0.28.0			244/2A1	0.28.0
244	2A2	0.24.0			244/2A2	0.24.0
Total Extent		**2.43.0**		**Applied lease area extent**		**2.43.0**

Lease area (hectares)	:	2.43.0 Hectare
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	No, forest is involved. This is recorded patta Land.
Ownership / Occupancy	:	This is a patta land S.F.No's. 244/1A, 244/2A1 & 244/2A2 is registered in the name of 1.Mr.Ramesh & 2. Mr.Balaji S/o Murugesanthevar vide Patta No.1332. (Ref. Annex. No:VI).

Existence of Public Road / Railway line if any nearby and approximate distance:

- ✓ Excavated materials will be transported through the approach road on the south side of the lease applied area.
- ✓ There is an NH-83 road are situated about 1.7km away from the south side which is connecting Palani Road.
- ✓ There is a MDR-966 road are situated about 0.8km away from the east side which is connecting K.Pudukottai road.
- ✓ There is no SH road situated around 5km radius from the proposed lease area.
- ✓ There is a railway line situated about 1.6km radius away on south side of the lease area.

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	Toposheet No. with latitude and longitude	:	SOI Toposheet No. **58 F/15** Latitude : From 10°27'5.37"N to 10°27'10.78"N Longitude : From 77°51'30.12"E to 77°51'37.37"E

Geo-Coordinates of the lease boundary:

Sl.No	LATITUDE	LONGITIDE	Sl.No	LATITUDE	LONGITIDE
1	10°27'9.84"N	77°51'37.37"E	13	10°27'6.21"N	77°51'31.70"E
2	10°27'8.42"N	77°51'37.03"E	14	10°27'6.44"N	77°51'31.73"E
3	10°27'8.14"N	77°51'36.75"E	15	10°27'6.71"N	77°51'30.97"E
4	10°27'6.91"N	77°51'36.62"E	16	10°27'7.24"N	77°51'30.76"E
5	10°27'6.69"N	77°51'35.85"E	17	10°27'7.64"N	77°51'30.12"E
6	10°27'6.54"N	77°51'35.24"E	18	10°27'9.31"N	77°51'30.76"E
7	10°27'6.46"N	77°51'35.02"E	19	10°27'10.65"N	77°51'31.47"E
8	10°27'5.91"N	77°51'33.85"E	20	10°27'10.19"N	77°51'33.66"E
9	10°27'5.93"N	77°51'33.44"E	21	10°27'10.78"N	77°51'33.89"E
10	10°27'5.37"N	77°51'33.40"E	22	10°27'10.45"N	77°51'35.30"E
11	10°27'5.67"N	77°51'31.91"E	23	10°27'10.35"N	77°51'35.64"E
12	10°27'6.05"N	77°51'31.95"E	24	10°27'10.11"N	77°51'36.47"E

	Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	:	It is an barren and virgin land
b)	*Attach a general location and vicinity map showing area boundaries and existing and proposed access routes. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000*: **Refer plate no-IA & IB**		

i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Reddiarchatram	2.4Km	South
b.	Nearest police station	Reddiarchatram	2.0km	South
c.	Nearest fire station	Oddanchatram	12.8km	West
d.	Nearest medical facility	Puduchatram	7.5Km	West
e.	Nearest school	S.Vadipatti	3.7Km	Southeast
f.	Nearest railway station	Akkaraipatti	8.9km	Southeast
g.	Nearest port facility	Tuticorin	189.0km	South
h.	Nearest airport	Tiruchirappalli	99.0km	Northeast
i.	Nearest DSP office	Vedasandur	13.4km	Northeast
j.	Nearest villages	K.Pudukottai	0.9km	Northeast
		Tadankottai	1.2km	Southeast
		Bommanankottai	0.7km	Southwest
		Peddinayakkanpatti	0.8km	Northwest

PART – A

3.0 GEOLOGY AND MINERAL RESERVES:

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

(i)	Topography	:	The proposed lease area exhibits flat topography. The maximum elevation (280m) was observed in Southwest side of the site. The slope is towards northern side and falls in Toposheet no. 58-F/15.
(ii)	**a) Geology of the District:** The district is essentially a high grade gneissic terrain characterized by highly deformed rocks, which can be classified under three groups as 1)Khondalite Group, 2) Charnockite Group and 3) Migmatite Group. The terrain also exposes basic/ultrabasic and younger acid intrusives. **Khondalite Group** comprises quartzite, calc granulite / crystalline limestone, garnetsillimanite gneiss, garnet-cordierite gneiss and garnet quartz-feldspar gneiss. Quartzite is an important member of the group. It is white or smoky grey and consists of interlocking grains of quartz with minerals like garnet, biotite, diopside, sillimanite and magnetite as accessories. Magnetite quartzite bands are of restricted thickness. Calcgneiss is grey or green and banded, which shows typical ribbed weathering. It consists of diopside, calcite, scapolite, wollastonite and sphene in various proportions with a small amount of quartz and garnet. With decrease in silicate minerals and increase in carbonates, it grades into crystalline limestone. Crystalline limestone is white, medium to coarse, with interlocking calcite, with a small amount of diopside, biotite and magnetite. Garnet-sillimanite gneiss is medium to coarse grained, it is mainly made of bands of quartz-k-feldspar rich layers alternating with layers rich in biotite, sillimanite and garnet. This rock also has thin interbands of garnet- ordierite gneiss and garnetquartz-feldspar gneiss. **The Charnockite Group** comprises pyroxene granulite and charnockite. The pyroxene granulite is dark grey, medium grained granulitic rock with typical salt and pepper texture, seen on the weathered surface. It consists of diopside, hypersthene, plagioclase, hornblende, biotite and quartz. Charnockite is the		

M. Rajesh

predominant rock. It is grey, medium to coarse grained, greasy looking with foliation seen prominently on the weathered surface. It is essentially made of smoky or grey quartz, pale grey microcline and hypersthene as major minerals with plagioclase, hornblende and biotite as accessories.

Intrusive igneous rocks are seen in the area are meta-gabbro and anorthosites as for example around Oddanchatram and east of Vedasandur. Meta gabbro is coarse grained, dark grey, mainly comprising pyroxene, amphibole and plagioclase. Anorthosite is pale pink to light brown, medium to coarse grained rock essentially made up of plagioclase with a small amount of pyroxene and amphibole. Quartz and pegmatite veins are of restricted areal extent. Minor bodies of younger granite are exposed in the area east of Vedasandur.

Foliation/ gneissosity, the prominent planar structure seen in the metamorphic rocks is ENE-WSW in the west and near N-S in the central part of the district. The eastern part of the district shows complicated folded structures due to interference of two phases of folding, forming a series of domes and basins. Faults and shear zones trend N-S in the central part, and NW-SE in the southern part.

Migmatite is a group of banded felsic rocks of varying mineralogical composition that are formed due to the influx of quartzo-feldspathic material into high grade metamorphic rocks. Two types of migmatite are seen in the Dindigul district, one is grey and the other is pink. Next to charnockite, migmatite gneiss is the second most extensive rock. The migmatite gneiss consists of quartz, kfeldspar, plagioclase, hornblende and biotite in varying proportions.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Quaternary	Recent to Pleistocene	Kankar
		Laterite
Proterozoic	Acid Intrusive	Quartz Vein Pegmatite Granite
Archaean – Proterozoic	Migmatite Group	Pink Migmatite Granitic gneiss Hornblende-biotite gneiss
	Basic/Ultrabasic Intrusive	Anorthosite Amphibolite / Norite / Gabbro Ultramafic
	Charnockite Group	Magnetite quartzite Pyroxene granulite

M. Ramesh.

				Charnockite
			Khondalite Group	Garnet quartz - feldspar gneiss. Garnet-Sillimanite gneiss ± cordierite. Calc-gneiss / Limestone Quartzite

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

a) Topography of the proposed lease area:

The proposed lease area exhibits flat topography. The proposed site shows the maximum elevation (280m) was observed in southwest side of the site. The applied lease area is fresh, covered with gravel and beneath the charnockite rocks found based on existing pit nearby the lease area. Surface plan preparing for contour lines, surface features and Geological mapped the applied lease area.

b) Mode of origin:

The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by recrystallization at high pressures and moderately high temperatures.

c) Physiography of the rocks:

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

d) Chemical composition of rocks:

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

Order of superposition of rocks in the proposed site:

Age	Group	Rock Formation
Recent to Sub recent	----	Gravel
Archaean	Charnockite Group	Charnockite.

(iv)	Drainage Pattern	There is no major river located within 500m radius. The drainage in the area is sub-dendritic in nature.

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

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	a. Present status		The RQP examined the surface features during survey. It is a fresh quarry lease covered with red loamy soil in this lease area. No exploration carried out.
	b. Surface Plan		Surface plan showing elevation contour, rock exposure, and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No.III.
(c)	Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000		Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No.IIIA

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

Year	No.of boreholes	Total meterage	No.of Pits and Dimensions	No.of Trenches and Dimensions
I-Xth Year	N.A	---	---	N.A
	N.A	---	---	N.A
	N.A	---	---	N.A
	N.A	---	---	N.A
	N.A	---	---	N.A

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

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

The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one sections (longitudinal and transverse) to calculate the volume of material up to the depth of 45m below ground level. The longitudinal and transverse cross sections were assigned (XY-AB) & (XY-CD) as respectively. Using the cross-sectional method, total reserve is estimated to be **1093680m^3** including the resources of safety zone, and gravel, etc. Of which, rough stone resources of about **1045072m^3** and gravel is **48608m^3**.

Gravel is obtained about 0-2m (R.L279 to 277m) and a rough stone starts from 2 to 45m (R.L.277 to 234m) from the below the ground level. (Refer plate no's. IIIA).

GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m^3	Rough Stone in m^3	Gravel in m^3
XY-AB	I	81	126	2	20412	.....	20412
	I	81	126	3	30618	30618	.....
	II	81	126	5	51030	51030	.....
	III	81	126	5	51030	51030	.....
	IV	81	126	5	51030	51030	.....
	V	81	126	5	51030	51030	.....
	VI	81	126	5	51030	51030	.....
	VII	81	126	5	51030	51030	.....
	VIII	81	126	5	51030	51030	.....
	IX	81	126	5	51030	51030	.....
TOTAL					**459270**	**438858**	**20412**
XY-CD	I	106	133	2	28196	.....	28196
	I	106	133	3	42294	42294	.....
	II	106	133	5	70490	70490	.....
	III	106	133	5	70490	70490	.....
	IV	106	133	5	70490	70490	.....
	V	106	133	5	70490	70490	.....
	VI	106	133	5	70490	70490	.....
	VII	106	133	5	70490	70490	.....
	VIII	106	133	5	70490	70490	.....
	IX	106	133	5	70490	70490	.....
TOTAL					**634410**	**606214**	**28196**
GRAND TOTAL					**1093680**	**1045072**	**48608**

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

The total mineable reserve is estimated to be **457590m^3** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 45m (R.L.279 to 234m) below ground level. Of which, rough stone is about **419186m^3** and gravel is **38404m^3**.The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no. VIA).

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m^3	Rough Stone in m^3	Gravel in m^3
XY-AB	I	74	109	2	16132	.....	16132
	I	74	109	3	24198	24198	.....
	II	69	99	5	34155	34155	.....
	III	64	89	5	28480	28480	.....
	IV	59	79	5	23305	23305	.....
	V	54	69	5	18630	18630	.....
	VI	49	59	5	14455	14455	.....
	VII	44	49	5	10780	10780	.....
	VIII	39	39	5	7605	7605	.....
	IX	34	29	5	4930	4930	.....
TOTAL					**182670**	**166538**	**16132**

	XY-CD	I	96	116	2	22272	.....	22272
		I	96	116	3	33408	33408	
		II	91	106	5	48230	48230	.....
		III	86	96	5	41280	41280	.....
		IV	81	86	5	34830	34830	.....
		V	76	76	5	28880	28880	.....
		VI	71	66	5	23430	23430	.....
		VII	66	56	5	18480	18480	.....
		VIII	61	46	5	14030	14030	.....
		IX	56	36	5	10080	10080	.....
	TOTAL					**274920**	**252648**	**22272**
	GRAND TOTAL					**457590**	**419186**	**38404**

4.0 MINING:

a.	Briefly describe the existing / proposed method for developing / working the deposit with all design parameters. (Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)	:	It is a fresh quarry lease. The mining operation is opencast, semi-mechanized method adopted on single shift only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 all the open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal

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

Total proposed production of **457590m³** of which, rough stone is about **419186m³** and gravel is **38404m³** up to a depth of 45m below the ground level (R.L.279 to 234m) from the below ground level for Ten years plan period. Average production is **41918m³** of rough stone per year and the gravel is **12801m³** for three year. (Refer Plate No's. IV & IVA).

Year	Pit No.(s)	Topsoil/Over burden (m^3)	ROM (m^3)	Saleable rough stone (m^3) @ 100%	Rough stone rejects(m^3)	Sub grade/ Weathered rock in (m^3)	Saleable Gravel (m^3)	Rough stone to topsoil ratio
I	I	---	75250	62170	...	....	13080	....
II	I	---	75915	64743	...	....	11172	....
III	I	---	78270	64118	...	....	14152	....
IV	I	---	63425	63425	...	....	....	....

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V	I	---	60940	60940	...	....	....	....
VI	I	---	21055	21055	...	....	....	....
VII	I	---	21030	21030	...	....	....	....
VIII	I	---	20895	20895	...	....	....	....
IX	I	---	20970	20970	...	....	....	....
X	I	---	19840	19840	...	....	....	....
Total	**---**	**---**	**457590**	**419186**	**...**	....	**38404**	**....**

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

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

YEARWISE PRODUCTION RESERVE								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in m^3	Gravel in m^3
I-YEAR	XY-AB	I	60	109	2	13080	.....	13080
		I	60	109	3	19620	19620	.....
		II	50	99	5	24750	24750	.....
		III	40	89	5	17800	17800	.....
TOTAL						**75250**	**62170**	**13080**
II-YEAR	XY-AB	I	14	109	2	3052	.....	3052
		I	14	109	3	4578	4578	.....
		II	19	99	5	9405	9405	.....
		III	24	89	5	10680	10680	.....
	XY-CD	I	35	116	2	8120	.....	8120
		I	35	116	3	12180	12180	.....
		II	30	106	5	15900	15900	.....
		III	25	96	5	12000	12000	.....
TOTAL						**75915**	**64743**	**11172**
III-YEAR	XY-CD	I	61	116	2	14152	.....	14152
		I	61	116	3	21228	21228	.....
		II	61	106	5	32330	32330	.....
		III	22	96	5	10560	10560	.....
TOTAL						**78270**	**64118**	**14152**
IV-YEAR	XY-AB	IV	25	79	5	9875	9875	.....
	XY-CD	III	39	96	5	18720	18720	.....
		IV	81	86	5	34830	34830	.....
TOTAL						**63425**	**63425**	**0**
V-YEAR	XY-AB	IV	34	79	5	13430	13430	.....
		V	54	69	5	18630	18630	.....
	XY-CD	V	76	76	5	28880	28880	.....
TOTAL						**60940**	**60940**	**0**
VI-YEAR	XY-AB	VI	49	59	5	14455	14455	.....
	XY-CD	VI	20	66	5	6600	6600	.....
TOTAL						**21055**	**21055**	**0**
VII-YEAR	XY-CD	VI	51	66	5	16830	16830	.....
		VII	15	56	5	4200	4200	.....
TOTAL						**21030**	**21030**	**0**
VIII-YEAR	XY-AB	VII	27	49	5	6615	6615	.....
	XY-CD	VII	51	56	5	14280	14280	.....
TOTAL						**20895**	**20895**	**0**

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IX-YEAR	XY-AB	VII	17	49	5	4165	4165	.....
		VIII	39	39	5	7605	7605	.....
	XY-CD	VIII	40	46	5	9200	9200	.....
TOTAL						**20970**	**20970**	**0**
X-YEAR	XY-AB	IX	34	29	5	4930	4930	.....
	XY-CD	VIII	21	46	5	4830	4830	.....
		IX	56	36	5	10080	10080	
TOTAL						**19840**	**19840**	**0**
GRAND TOTAL						**457590**	**419186**	**38404**

d.	Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.	:	Composite plan not prepared in this proposed lease area. It is "B_2" category of mine.

e. ***Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:***

At this rate of production, the expected life of quarry is calculated as given below: -

Rough stone:

Mineable reserves of rough stone = **419186m³**

Yearly production = **41918m³**

Monthly production of rough stone = **3493m³**

Gravel

Mineable reserves of gravel = **38404m³**

Monthly production of gravel = **1066m³**

The regular working of the quarry and its production depends upon the demand from the market. The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production. The year wise production, anticipated life of quarry etc., are only a tentative figure.

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

i)	Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:	:	Considering the indefinite depth persistence of the rough stone and gravel deposit is proved beyond the workable limits about up to a depth of 45m below ground level (R.L.279m-234m) from the petrogenetic character of the rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 10 years.

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

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

ULTIMATE PIT LIMIT-(XY-AB)						
Bench	**Bench R.L**	**Period**	**Overburden/ Mineral**	**L (m)**	**W (m)**	**D (m)**
I	R.L.279-277m	10 years plan period	Gravel	74	109	2
I	R.L.277-274m		Rough stone	74	109	3
II	R.L.274-269m		Rough stone	69	99	5
III	R.L.269-264m		Rough stone	64	89	5
IV	R.L.264-259m		Rough stone	59	79	5
V	R.L.259-254m		Rough stone	54	69	5
VI	R.L.254-249m		Rough stone	49	59	5
VII	R.L.249-244m		Rough stone	44	49	5
VIII	R.L.244-239m		Rough stone	39	39	5
IX	R.L.239-234m		Rough stone	34	29	5
					Total	**45m**

ULTIMATE PIT LIMIT-(XY-CD)						
Bench	**Bench R.L**	**Period**	**Overburden/ Mineral**	**L (m)**	**W (m)**	**D (m)**
I	R.L.279-277m	10 years plan period	Gravel	96	116	2
I	R.L.277-274m		Rough stone	96	116	3
II	R.L.274-269m		Rough stone	91	106	5
III	R.L.269-264m		Rough stone	86	96	5
IV	R.L.264-259m		Rough stone	81	86	5
V	R.L.259-254m		Rough stone	76	76	5
VI	R.L.254-249m		Rough stone	71	66	5
VII	R.L.249-244m		Rough stone	66	56	5
VIII	R.L.244-239m		Rough stone	61	46	5
IX	R.L.239-234m		Rough stone	56	36	5
					Total	**45m**

iii)	Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long-term use in the event of continuation of mining activity: -	:	The recovery of rough stone and gravel in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary.

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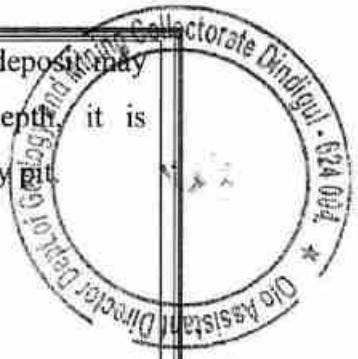

iv)	Whether back filling of pits after recovery of mineral up to techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -	:	As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.
v)	Whether post mining land use envisaged: -	:	At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.
g.	***Open cast Mines:***		
	i). Describe briefly giving salient features of the mode of working (Mechanized, Semi-mechanized, manual)	:	It is a fresh quarry lease. The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal. Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Excavators and tipper combination are adapted.
	ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden /waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	:	The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using drilling with the help of tractor mounted compressor attached with jack hammers, nonel blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers.

			Bench height = 5mts. Bench width = 5mts.
	a. Details of topsoil/ overburden	:	No separate of topsoil will be removed
	b. Rough stone waste and side burden waste:-	:	The recovery of rough stone in this quarry is 100%. Any other waste or side burden dumps are doesn't proposed.
h.	***Underground Mines:***	:	Not applicable

i. ***Extent of mechanization:***

Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.

(1) Drilling Machines:

Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.

Details of drilling equipment's are given below.

Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P
Jack Hammer	3	32 mm	Hand held	---	Diesel	--
Compressor	1	---	Air	--	Diesel	--

(2) Loading Equipment:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Hydraulic Excavator	1	2.9 - 4.3m^3	--	Diesel	--

(3) Haulage and Transport Equipment

(a) Haulage within the mining leasehold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	8	--	--	Diesel	--

Whether the dumpers are fitted with exhaust conditioner should be indicated:

The dumpers are not used in this quarry; hence it's a small B2 category quarry.

a) Transport from mine head to the destination	:	Tipper will be used for transport rough stone from the mine head to needy customer.
c. Describe briefly the transport system (please specify)	:	Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.

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	d. Ore transported by : own trucks / hired trucks	:	Hired trucks for initially production purposes.
	e. Main destination to which ore is transported (giving to and from distance)	:	Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size (i.e 1/4", 1/2", 1/3" and 1") The recovery of rough stone in this quarry is 100%.

f. Details of hauling / transport equipment:

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

(4). Miscellaneous:

Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.

(A) Operations	:	The mining operation is open-cost, semi-mechanized methods are adopted and on single shift basis only.
(B) Machineries deployed	:	Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted. (Refer Part-A-4(i))

5. BLASTING:

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

Blasting pattern:

The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.

Drilling and Blasting parameters are as follows,

Rough stone Production for 10 Years = 419186m^3

BLAST DESIGN	
Blasthole Diameter (D) in mm	32
Burden (B) in m	1.2

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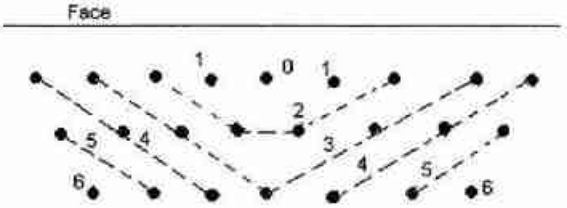
Spacing (S) in m	1.38
Subdrill in m	0.5
Charge length (C) in m	0.80
Stemming	1.2
Hole Length (L) in m	2.0
Bench Height (BH) in m	2.5
Mass of explosive/hole in g	500
Stemming material size in mm	3.2
Burden stiffness ratio	2.08
Blast volume/hole in m^3	4.14
Production of rough stone/day in m^3	150
Number of blast holes/day	36
Number of blast round/day	1
Blasthole pattern	Staggered
Mass of explosive /day in kg	**18.08**
Powder factor in kg/m^3	0.12
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL



Staggered blasting method

b) Type of explosives used / to be used:

Following explosives are recommended for efficient blasting with safe practice.

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

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

The control blasting measures is being adopted for minimizing ground vibration and fly rock. Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock.

Delay detonators:

Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:

- Reduction of ground vibration
- Reduction in air blast

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	❖ Reduction in over break ❖ Improved fragmentation ❖ Better control of fly rock Blasting program for the production per day No of holes : 36holes Yield : 150m³ Total explosive required : 18.08kg-Slurry explosives Charge per hole : 0.5kg Blasting at day time only : 12.0p.m-1.0p.m		
	d) Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.5kg per holes of explosives
	e) Whether secondary blasting is needed, if so describe it briefly	:	Irrespective of the method of primary blasting employed, it may be necessary to re-blast a proportion of the rock on the quarry floor so as to reduce it to a size suitable for handling by the excavators and rock breakers.
	f) Storage of explosives (like capacity and type of explosive magazine)	:	1. The applicant is advised to engage an authorized explosive agency to carry out blasting. 2. First Aid Box will be keeping ready at all the time. 3. Necessary precautionary announcement will be carried out before the blasting operation.
6.	***MINE DRAINAGE***		
	a) Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 65m in rainy season and 70m in summer from the below ground level in the adjacent bore wells of the area.
	b) Workings expected to be _____ m. above / reach below water table by the year ____.	:	Proposed depth of mining is 45m bgl. The present Mining lease will be proposed above the water table.
	c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage will

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	discharged		be less than 300 Lpm and it will be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.
7.	***STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:***		
(a)	Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years: No separate of topsoil will be removed and any other waste or side burden dumps are doesn't proposed.		
(b)	Land chosen for disposal of waste with proposed justification	:	There is no waste are proposed.
(c)	Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated year wise.	:	There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.
8.	***USE OF MINERAL:***		
(a)	Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc
(b)	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone and the same are used for building stone, sized stone materials only, so there are no chemical specifications are specified. Only physical specifications are involved.
(c)	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	:	Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.
9.	***OTHERS***		
(a)	**Describe briefly the following**	:	Infrastructure required for such mines

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	Site services		like office, stores, canteen, first aid station, shelter latrine and booth rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.

(b) Employment potential :

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

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

1.	Highly Skilled	Mines Manager	1No.
		Mine Engineer	1No.
		Mine Geologist	1No
		Blaster	1No
2.	Unskilled	Musdoor / Labours	16 No's
		Total =	**20 No's**

10	**MINERAL PROCESSING/BENEFICIATIONS:**		
(a)	If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.	:	Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose. The recovery of rough stone in this quarry is 100%.
(b)	Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect	:	No water will be used for quarrying or any other processing except drinking water to be drawn from public sources. Some stagnation of rain water in the pit will be used for drilling and spraying

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	of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).		haul roads. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the SPM in a pit before passing the water in to natural system.
(c)	A flow sheet or schematic diagram of the processing procedure should be attached.	:	Not applicable.
(d)	Specify quantity and type of chemicals to be used in the processing plant.	:	Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	:	Not applicable
(f)	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	:	Drinking is 0.2KLD, utilized water is 1.0KLD, Dust suppression is 1.3KLD and Green Belt is 1.5KLD. Minimum quantity of water 4.0KLD per day. It is proposed to make an own bore well for providing uninterrupted supply of RO drinking water, dust suppression and green belt development. The sewage water to a tune of 0.8KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.

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PART – B

11.0 ENVIRONMENTAL MANAGEMENT PLAN :

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

11.1 Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below.

Sl. No.	Land Use	Present area (Hect.)
1.	Area under mining	Nil
2	Infrastructure	Nil
3	Road	Nil
4	Green belt	Nil
5	Drainage & Settling Tank	Nil
6	Un-utilized area	2.43.0
	Grand total	**2.43.0**

11.2	Water Regime	:	Water table in this area is noticed at a depth of 70m in summer and 65m in rainy season from the general ground level and presently the quarrying of rough stone is proposed depth of 45m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.
11.3	Flora and Fauna	:	There is no major flora observed in this area and except acacia bushes, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.
11.4	Quality of air, ambient noise level and water	:	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc.., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.

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11.5	Climatic conditions: **Climate:** The district receives the rain under the influence of both Southwest and Northeast monsoons. The Northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The Southwest monsoon rainfall is highly erratic and summer rains are negligible. The average annual rainfall over the district varies from about 620 mm to 745 mm. **Rainfall:** The annual rainfall normal (1970-2000) of Dindigul district is 742 mm.4 Projections of rainfall over Dindigul for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively.
11.6	Human Settlement: The nearest villages are found in the buffer zone with population as per 2011 census.

S.No	Village	Direction	Distance in Kms	Population
1	K.Pudukottai	Northeast	0.9km	2275
2	Tadankottai	Southeast	1.2km	1103
3	Bommanankottai	Southwest	0.7km	625
4	Peddinayakkanpatti	Northwest	0.8km	569

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

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11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	:	The proposed area not fall under notified area under water (Prevention & Control of Pollution), Act, 1974

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

i) ***Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:***

Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:

Sl. No.	Land Use	Area in use during the quarrying period (Hect)
1.	Area under mining	1.90.96
2	Infrastructure	0.01.0
3	Road	0.03.0
4	Green belt	0.44.69
5	Drainage & Settling Tank	0.02.0
6	Un-utilized area	0.01.35
	Grand total	**2.43.0**

ii).	Air Quality		Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc.., will be suppressed by periodical wetting of land by water spraying.
iii).	Water quality		A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.
iv).	Noise levels		Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.
v).	Vibration levels (due to blasting)		No deep hole blasting envisaged. Small dia

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			shot holes are used for breaking boulders. The maximum peak particles velocity will be recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime		No major water bodies like rivers, pond, lake etc., located within a radius of 500m.
vii).	Socio-economics		1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.		There are no historical monuments, etc found around 10km radius.

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

i).	Temporary storage and utilization of topsoil	:	No separate of topsoil will be removed.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during ten years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	:	The present mining is proposed to an average depth of 45m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.

iii) ***Programme of afforestation, Yearwise for the initial five years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.***

Green Belt Development:

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

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	4469	500	80%	@100 Rs Per sapling	50000/-
Second	Approach road and Nearby Village Road	--	300	80%		30000/-
Third	Schools	--	300	80%		30000/-
					Total	**1,10,000/-**

iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the ten years (and up to conceptual plan period for 'A' category mines).	:	No waste or rejects removed in this lease area.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this quarry area.
vi).	Treatment and disposal of water from mine.	:	It will not be harmful and it does not require any treatment before discharging into the natural courses.
vii).	Measures for minimizing adverse effects on water regime.	:	There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry. The worked-out pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit. The open pit will be used as rain water storage structure to augment groundwater levels which improve the mine environment.

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viii).	Protective measures for ground vibrations / air blast caused by blasting,	:	It is a small B2 category opencast, semi mechanized/ manual method of mining is adopted and no heavy machinery will be used. The only smooth blasting is proposed, therefore no change for ground vibration or noise from the quarry.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	:	No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	:	The nearest villages are will get employment benefits.

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

Not applicable. It is B2 category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	The proposed mining is up to a depth of 45m bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. Green belt development at the rate of 500 trees will be proposed in quarry lease area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	The quarry lease is a fresh mining lease. No mitigation measures adopted.
12.4	Mine closure activity	:	The present mining plan is proposed to depth of 45m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1

			fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	:	If the benches are made with proposed height and width no risk will be there. First aid facilities will avail and the standby vehicle in the lease area to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities.
12.7	Care and maintenance during temporary discontinuance	:	A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	:	During the ten years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 20 labors will be improved.
12.9	Reclamation and Rehabilitation	:	No removal of structures proposed.

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

A	**Fixed Asset Cost**:		
	1. Land Cost (Consent Land)	:	Rs. 5,00,000/-
	2. Labour Shed		Rs. 1,50,000/-
	3. Sanitary Facility	:	Rs. 1,50,000/-
	4. Fencing	:	Rs. 2,61,000/-
	5. Other expenses (Security guard, dust bin, etc)	:	Rs. 3,00,000/-
	Total	:	**Rs. 13,61,000/-**

B	**B. Machinery cost**	:	**Rs. 30,00,000/-** (Hire Basis)
C	**Total Expenditure of EMP cost** (for ten years)		
	1. Drinking Water Facility	:	Rs. 1,00,000/-
	2. Sanitary facility & Maintenance	:	Rs. 75,000/-
	3. Permanent water sprinkler	:	Rs. 1,00,000/-
	4. Afforestation and its maintenance	:	Rs. 1,10,000/-
	5. Safety Kits	:	Rs. 75,000/-
	6. Provision of tyre washing facility	:	Rs. 1,00,000/-
	7. Surface runoff management structures like garland drain, settling pond & Bund (0.02.0Hect or 200Sq.m X 400)	:	Rs. 80,000/-
	8. Blasting materials with blast mat cost	:	Rs. 20,00,000/-
	9. Environment monitoring	:	Rs. 5,00,000/-
	Total	:	**Rs. 31,40,000/-**
D	**Total Project Cost (A+B+C)**	:	**Rs. 81,10,500/-**

13.0 FINANCIAL ASSURANCE:

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

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT:

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

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

(iii)The mining plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Assistant Director of Geology and Mining, Dindigul vide letter **Rc.No.115/2023(Mines) Dated: 27.02.2024.**

(iv)Total proposed production of **457590m^3**. Of which, rough stone is about **419186m^3** and gravel is about **38404m^3** up to a depth of 45m below the ground level (R.L.279m-234m) for ten years plan period. Average production is **41918m^3** of rough stone and gravel is **12801m^3** per year.

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17.0 CSR Expenditure:

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

Place: Dharmapuri, TN
Date: 09/03/24

Signature of the Recognized Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri-636705, TamilNadu, India

RoC. No. 115 / 2023 Date :
This Mining Plan is approved based on Instruction guidelines given by the Commissioner of Geology and Mining, Chennai wide Lette[r] No : 3868/LC/2012, Dated 19-11-2012 a[nd] condition laid by The District Collector, Dindigul in Precise, Area Communication letter Roc. No .Roc.00..115./23..(Mines), dated 27.2.24....

ASSISTANT DIRECTOR
GEOLOGY AND MINING
DINDIGUL.

ANNEXURE - 1

அனுப்புநர்

திரு.கி.விஜயராகவன், எம்.எஸ்ஸி,
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திண்டுக்கல்

பெறுநர்

தி/ள்.ஸ்ரீ தேவர் புளு மெட்டல்ஸ்,
புல எண்.295/1, 295/1ஏ, 295/2, 295/3,
கொத்தபுள்ளி கிராமம்,
ரெட்டியார்சத்திரம்,
திண்டுக்கல்

ந.க.எண்.115/2023 (கனிமம்) நாள்: 27.02.2024

அய்யா,

பொருள் : கனிமங்கள் மற்றும் சுரங்கங்கள் - திண்டுக்கல் மாவட்டம் - திண்டுக்கல் மேற்கு வட்டம், கே.புதுக்கோட்டை கிராமம், பட்டா புல எண்கள். 244/1ஏ (1.91.0 ஹெக்டேர்), 244/2ஏ1 (0.28.0 ஹெக்டேர்) மற்றும் 244/2ஏ2 (0.24.0 ஹெக்டேர் ஆகியவற்றின் மொத்தப்பரப்பு 2.43.0 ஹெக்டேரில் கல் மற்றும் மேல்மண் குவாரி குத்தகை உரிமம் கோரி தி/ள்.ஸ்ரீ தேவர் புளு மெட்டல்ஸ் நிறுவனத்தினர் விண்ணப்பம் செய்தது - வரைவு சுரங்கத்திட்டம் சமர்ப்பிக்க அறிவுறுத்துதல் - தொடர்பாக.

பார்வை :
1. தி/ள்.ஸ்ரீ தேவர் புளு மெட்டல்ஸ், கொத்தபுள்ளி, திண்டுக்கல் என்பவரின் விண்ணப்பம் நாள்: 22.12.2023
2. வருவாய் கோட்டாட்சியர், திண்டுக்கல் அவர்களின் கடிதம் ந.க.4935/2023/அ1, நாள்: 23.01.2024.
3. உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, திண்டுக்கல் அவர்களின் அறிக்கை நாள்: 20.02.2024
4. மற்றும் தொடர்புடைய ஆவணங்கள்.

.....

திண்டுக்கல் மாவட்டம், திண்டுக்கல் மேற்கு வட்டம், கே.புதுக்கோட்டை கிராமம், பட்டா புல எண்கள். 244/1ஏ (1.91.0 ஹெக்டேர்), 244/2ஏ1 (0.28.0 ஹெக்டேர்) மற்றும் 244/2ஏ2 (0.24.0 ஹெக்டேர் ஆகியவற்றின் மொத்தப்பரப்பு 2.43.0 ஹெக்டேரில் கல் மற்றும் மேல்மண் குவாரி குத்தகை உரிமம் கோரி தி/ள்.ஸ்ரீ தேவர் புளு மெட்டல்ஸ் நிறுவனத்தினர் அனுமதி கோரி விண்ணப்பம் செய்துள்ளார்.

பார்வை 2 மற்றும் 3ல் கண்டுள்ளவாறு வருவாய் கோட்டாட்சியர், திண்டுக்கல் மற்றும் உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, திண்டுக்கல் ஆகியோர் புலத்தணிக்கை மேற்கொண் திண்டுக்கல் மேற்கு வட்டம், கே.புதுக்கோட்டை கிராமம், பட்டா புல எண்கள். 244/1ஏ (1.91.0 ஹெக்டேர்), 244/2ஏ1 (0.28.0 ஹெக்டேர்) மற்றும் 244/2ஏ2 (0.24.0 ஹெக்டேர் ஆகியவற்றின் மொத்தப்பரப்பு 2.43.0 ஹெக்டேரில் கல் மற்றும் மேல்மண் குத்தகை உரிமம் வழங்க அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

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எனவே, தி/ள்.ஸ்ரீ தேவர் புளு மெட்டல்ஸ் நிறுவனத்தினருக்கு திண்டுக்கல் மாவட்டம், கே.புதுக்கோட்டை கிராமம், பட்டா புல எண்கள். 244/1ஏ (1.91.0 ஹெக்டேர்) 244/2ஏ1 (0.28.0 ஹெக்டேர்) மற்றும் 244/2ஏ2 (0.24.0 ஹெக்டேர் ஆகியவற்றின் மொத்தப்பரப்பு 2.43.0 ஹெக்டேர் பரப்பினை 1959-ம் வருடாந்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.19 & 20-ன் கீழ் 10 வருட காலங்களுக்கு கல் மற்றும் மேல்மண் குவாரி குத்தகை உரிமம் அனுமதி வழங்க உகந்த புலமாக கருதி அறிவிப்பு செய்யப்படுகிறது.

மேலும், தி/ள்.ஸ்ரீ தேவர் புளு மெட்டல்ஸ் நிறுவனத்தினர் மூன்று மாத காலத்திற்குள் வரைவு சுரங்கத்திட்ட அறிக்கை (Draft Mining Plan) கீழ்கண்ட பிந்தனைகளுக்குட்பட்டு தயார் செய்து திண்டுக்கல் மாவட்ட புவியியல் மற்றும் சுரங்கத்துறை, உதவி இயக்குநரிடம் ஒப்புதல் பெற்றும், தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 41 & 42-ன் படி ஏற்பளிக்கப்பட்ட சுரங்கத்திட்ட அறிக்கை மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவாணைச் சான்று பெற்றும் சமர்ப்பிக்குமாறு அறிவுறுத்தப்படுகிறது.

1. விண்ணப்ப புலங்களின் அருகில் உள்ள பட்டா 7.5 மீட்டர் பாதுகாப்பு இடைவெளி விடவேண்டும்.
2. விண்ணப்ப புலங்களை சுற்றியுள்ள அரசுப் புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட வேண்டும்.
3. குவாரிப்பணி தொடங்குவதற்கு முன்பாக குவாரியினை சுற்றி முள்கம்பிவேலி (Wire Fencing) அமைத்து குவாரிப்பிணை தொடங்கவேண்டும்.

23/1/14

உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திண்டுக்கல்

M Ramesh.

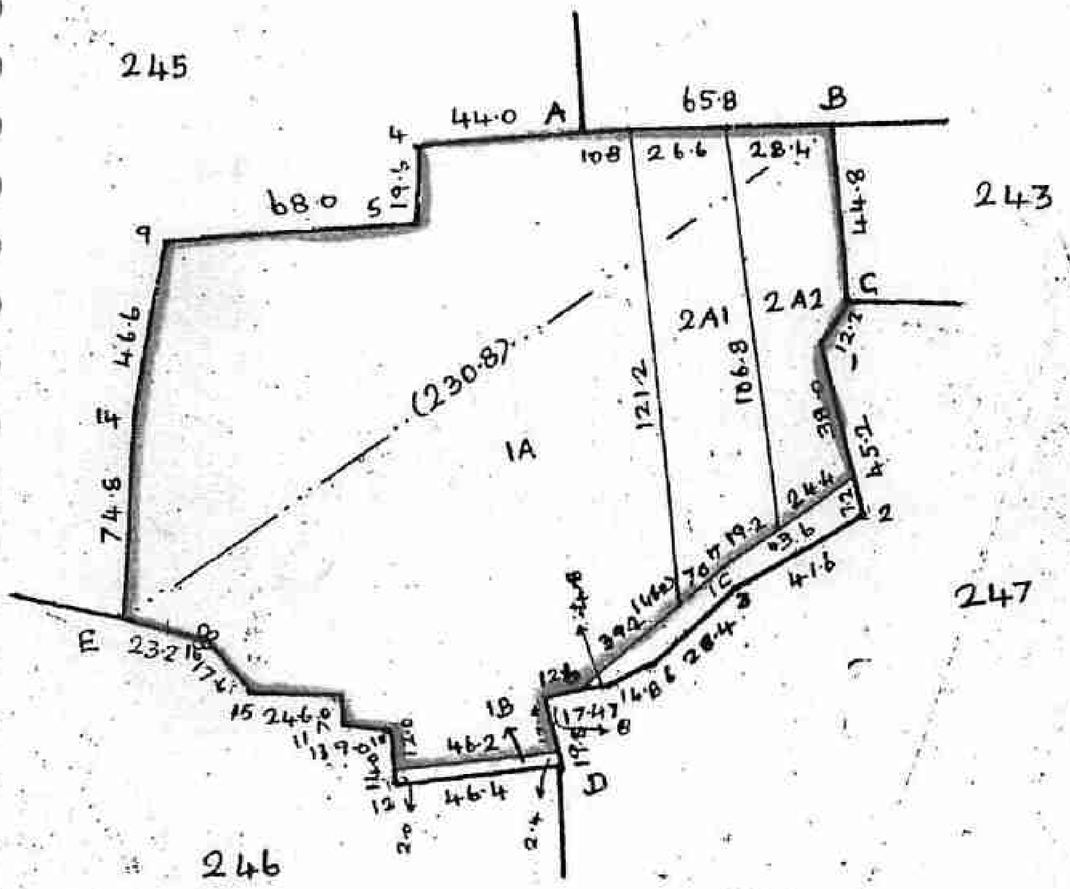
அளவைபடிவ எண் 23 ANNEXURE

வட்டம். மதுரை

மாவட்டம் திண்டுக்கல்

கிராமம் { எண் 2 / பெயர் புதுக்கோட்டை

புல எண். 244 பரப்பு: ஹெக்டேர் 2 ஏர். 47.5



	X 164.6	77.0	9
[illegible].6	154.2		
[illegible]3.0	147.6		
[illegible].8	133.0		
89.2	118.0		
	106.2	41.8	5
	94.4	57.4	4
[illegible].6	90.4		
	55.4	36.0	A
[illegible]2	49.4		
[illegible]6	33.8		
38.8	23.0		
	B		

		E		
17	78.2	238.8		
		90.8		
16	16.2	214.2		
15	33.6	212.2		
		196.8	43.2	14
13	55.2	195.6		
12	74.4	195.0		
11	48.6	193.0		
10	61.6	189.2		
		X		

உண்மைநகல்

27-2-2023

கிராம நிர்வாக அலுவலர்
எண்.22, க. புதுக்கோட்டை. கிராமம்
திண்டுக்கல் மேற்கு வட்டம்.

M Ramesh

வரைவு செய்தல்: அளவு 1:2000

LEASE APPLIED AREA

ANNEXURE - III

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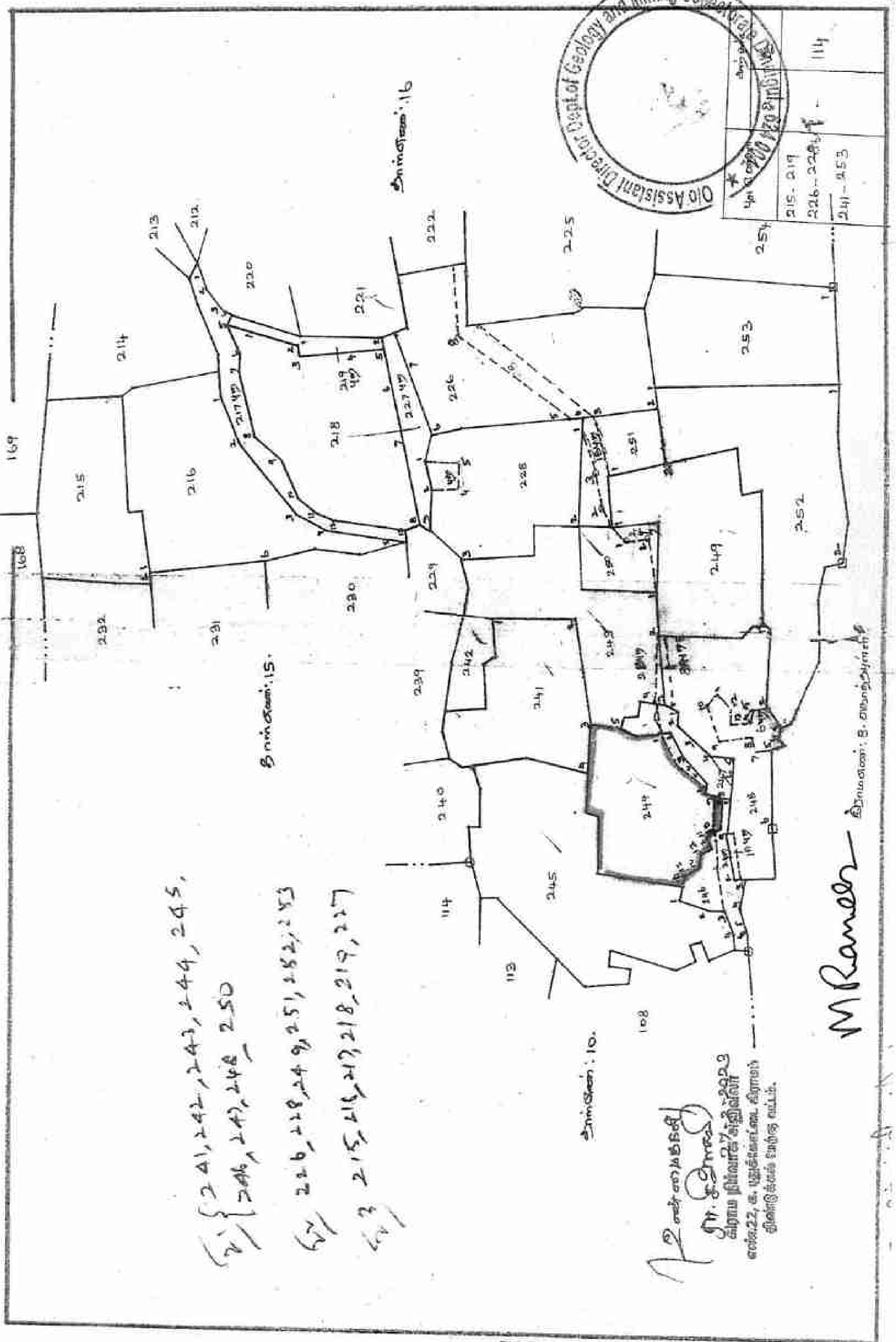

LEASE APPLIED AREA

அ-பதிவேடு விவரங்கள்

ANNEXURE - IV

மாவட்டம் : திண்டுக்கல்

வட்டம் : திண்டுக்கல் (மேற்கு)

கிராமம் : கெ.புதுக்கோட்டை

1. புல எண்	**244**	9. மண் வயனமும் ரகமும்	**7 - 2**
2. உட்பிரிவு எண்	**1A**	10. மண் தரம்	**4**
3. பழைய புல உட்பிரிவு எண்	**244-1A**	11. தீர்வை (ரூ - ஹெ)	**2.77**
4. பகுதி	**-**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**1 - 91.00**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**5.25**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**1332**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**0**	16. பெயர்	**1.ரமேஷ் 2.பாலாஜி**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் 150249 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

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அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : திண்டுக்கல் (மேற்கு)

கிராமம் : கெ.புதுக்கோட்டை

1. புல எண்	**244**	9. மண் வயனமும் ரகமும்	**7 - 2**
2. உட்பிரிவு எண்	**2A1**	10. மண் தரம்	**4**
3. பழைய புல உட்பிரிவு எண்	**244-2A1**	11. தீர்வை (ரூ - ஹெ)	**2.77**
4. பகுதி	**-**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**0 - 28.00**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**0.78**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**1332**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**0**	16. பெயர்	**1.ரமேஷ் 2.பாலாஜி**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் 150249 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

M Ramesh.

அ-பதிவேடு விவரங்கள்

மாவட்டம் : திண்டுக்கல்

வட்டம் : திண்டுக்கல் (மேற்கு)

கிராமம் : கெ.புதுக்கோட்டை

1. புல எண்	**244**	9. மண் வயனமும் ரகமும்	**7 - 2**
2. உட்பிரிவு எண்	**2A2**	10. மண் தரம்	**4**
3. பழைய புல உட்பிரிவு எண்	**244-2A2**	11. தீர்வை (ரூ - ஹெ)	**2.77**
4. பகுதி	**-**	12. பரப்பு (ஹெக்டேர் - ஏர்)	**0 - 24.00**
5. அரசு / ரயத்துவாரி	**ரயத்துவாரி**	13. மொத்த தீர்வை (ரூ - பை)	**0.66**
6. நிலத்தின் வகை	**புஞ்சை**	14. பட்டா எண்	**1332**
7. பாசன ஆதாரம்	**-**	15. குறிப்பு	**-**
8. இரு போகமா	**0**	16. பெயர்	**1.ரமேஷ் 2.பாலாஜி**

குறிப்பு 1:

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **http://eservices.tn.gov.in** என்ற இணைய தளத்தில் 150249 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

M Ramesh

ANNEXURE -V

தமிழ்நாடு அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : திண்டுக்கல் வட்டம் : திண்டுக்கல் (மேற்கு)

வருவாய் கிராமம் : கெ.புதுக்கோட்டை பட்டா எண் : 1332

உரிமையாளர்கள் பெயர்

1. முருகேசத்தேவர் மகன் ரமேஷ்

2. முருகேசத்தேவர் மகன் பாலாஜி

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	
107	3	0 - 7.00	0.19	--	--	--	--	2022/0103/13/205728-- -------- 14-07-2022
107	4	0 - 22.50	0.62	--	--	--	--	2022/0103/13/205728-- -------- 14-07-2022
226	1	0 - 19.00	0.53	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
228	10	0 - 32.50	0.90	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
228	2	0 - 15.50	0.43	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
228	4	0 - 18.00	0.49	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
228	8	0 - 18.00	0.50	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	15A	0 - 2.50	0.07	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	16	0 - 4.50	0.13	--	--	--	--	2022/0103/13/184931-- -------- 06-02-2022
241	17B	0 - 4.50	0.12	--	--	--	--	2022/0103/13/184931-- -------- 06-02-2022
241	18	0 - 9.00	0.35	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	1A	0 - 3.00	0.08	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	1B	0 - 11.50	0.32	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	1C	0 - 12.00	0.34	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	4A	0 - 12.50	0.34	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	4B	0 - 10.00	0.28	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	5A	0 - 15.50	0.44	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021
241	8	0 - 7.50	0.21	--	--	--	--	2021/0103/13/173625-- -------- 31-12-2021

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241	9A	0 - 4.50	0.12	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
241	9B	0 - 5.00	0.14	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
243	2A1	0 - 45.50	1.25	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
243	2A2	0 - 2.50	0.07	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
243	2A3	0 - 37.00	1.03	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
243	3	0 - 69.00	1.90	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
244	1A	1 - 91.00	5.25	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
244	2A1	0 - 28.00	0.78	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
244	2A2	0 - 24.00	0.66	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	1	0 - 48.00	1.32	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	2B	0 - 11.00	0.30	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	2C	0 - 9.00	0.25	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	3F	0 - 34.50	0.95	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	3G	0 - 39.00	1.08	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	3H	0 - 40.00	1.12	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	3I	0 - 16.50	0.45	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	3J	0 - 11.50	0.31	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	3K	0 - 26.50	0.72	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	3L	0 - 16.50	0.45	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	3N	0 - 1.50	0.06	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	3O	0 - 5.00	0.14	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	3P	0 - 6.00	0.17	--	--	--	--	2022/0103/13/184931- -- -------- 06-02-2022
245	4A	0 - 6.50	0.18	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	4B	0 - 7.50	0.20	--	--	--	--	2021/0103/13/173625- -- -------- 31-12-2021
245	5A	0 - 15.00	0.42	--	--	--	--	2022/0103/13/205728- -- -------- 14-07-2022
245	5B	0 - 8.50	0.23	--	--	--	--	2022/0103/13/205728- -- -------- 14-07-2022
245	5C	0 - 8.50	0.23	--	--	--	--	2022/0103/13/205728- -- -------- 14-07-2022
245	5D	0 - 6.50	0.18	--	--	--	--	2022/0103/13/205728- -- -------- 14-07-2022
245	6	0 - 19.00	0.53	--	--	--	--	2022/0103/13/205728- -- -------- 14-07-2022

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250	1	0 - 73.50	2.04	--	--	--	--	2021/0103/13/173625-- ---- 31-12-2021
251	1A	0 - 19.50	0.54	--	--	--	--	2021/0103/13/173625-- ---- 31-12-2021
		10 - 61.00	29.41					

Geology and Mining Collectorate Dindigul - 624 004.
O/o Assistant Director

குறிப்பு :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **13/32/022/01332/140249** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 04-03-2024 அன்று 11:01:00 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைபேசி கேமராவின்2D barcode பயப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

M Kamalam.

140 - ஆ... திண்டுக்கல் மாவட்டம் திண்டுக்கல் மேற்கு வட்டம் 22 K. புதுக்கோட்டை கிராமக் கணக்கு

எண் 2

கிராமத்தில் வருடவாரி புலவாரி கைப்பற்று சாகுபடி அடங்கல் கணக்கு

நில வரித் திட்டத்தின்படி புலன்களின் விபரம். நில அளவை எண். (1)	உட்பிரிவு எண். (2)	பரப்பு. (3)	தீர்வை. (4)	ஒரு போகம் அல்லது இரு போகம். (5)	கைப்பற்று தாரருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாரருடைய பெயர். (6)	சாகுபடியாளரின் பெயர். நிலத்தின் எந்த பகுதி யாரது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளது. (7)	முதல் போகம். எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது. (8)	பயிரின் பெயர். (9)	பயிரான / அறுவடையான பரப்பு. (10)	உண்மையான பாய்ச்சல் ஆதாரம். (11)	விளைச்சல் அளவு விழுக்காடு. (12)
244	1A	1.91.6	5.95	1332	ரமேஷ்	(ஒ)	–	–	–		
244	2A1	0.28.5	0.78	1332	do		–	–	–		
244	2A2	0.24.0	0.66	1332	do		–		–		...

இரண்டாம் போகம். எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது. (13)	பயிரின் பெயர். (14)	பயிரான / அறுவடையான பரப்பு. (15)	உண்மையான பாய்ச்சல் ஆதாரம். (16)	விளைச்சல் அளவு விழுக்காடு. (17)	கிராம அலுவலரின் குறிப்புரை :- (1) புலன்களின் பகுதிகளில் மட்டும் பயிரிடப்பட்ட நிலங்களில் விபரங்கள் அளவில். (2) கைப்பற்றில் இல்லாத நிலம்–தனிச் சாகுபடியின் பரப்பு (3) முந்தைய மாதத்தில் பாய்ச்சல் உதவியின்றி பயிரிடப்பட்டவை என்று பதிவிடப்பட்ட நிலங்களின் தொடர்ந்த விபரங்கள். (18)	கீழ்க்கண்ட வகையில் பயிரிடப்படாது உள்ள நிலத்தின் தன்மை மற்றும் பரப்பின் விவரங்கள் ஒவ்வொரு நில அளவை எண் அல்லது அதன் பகுதியில். (அ) வனம், (ஆ) பயனற்ற பயிர் செய்ய இயலாத நிலம், (இ) விவசாயம் மற்றும் இதர காரியங்களுக்கு பயன் படுத்தப் படும் நிலம், (ஈ) பயிரிடத்தக்க தரிசு (உ) நிலையான புல் தரைகளும் மற்றும் இதர மேய்ச்சல் நிலங்களும், (ஊ) விதைக்கப்பட்ட நிகர பரப்பில் சேர்க்கப்படாத மரவகைப் பயிர்களும் தோப்புகளும், (எ) நடப்புத் தரிசுகள் (ஏ) இதர தரிசு நிலங்கள். (18அ)	பயிர் பராமரிப்பு அலுவலர் குறிப்புரை. (19)

இணைப்புகள்
ரா. சி. இராமு
27-2-2023
கிராம நிர்வாக அலுவலர்
எண்.22, க. புதுக்கோட்டை கிராமம்
திண்டுக்கல் மேற்கு வட்டம்.

O/o Assistant Director, Dept. of Geology and Mining Collectorate Dindigul - 624 004.

M Ramesh

380/25-R.F. III-A-10-50,00,000 Cps.-GBP.-Mdu.-7,-2017.

3361/2023 TP/149025606/2023 ANNEXURE - VI

भारतीय गैर न्यायिक INDIA NON JUDICIAL

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தமிழ்நாடு तमिलनाडु TAMILNADU 25.04.2023

ஸ்ரீ தேவர் புளூ மெட்டல்ஸ்
கொத்தப்புள்ளி

BC 763146

V. வெங்கடகுமார்
முத்திரைத்தாள் விற்பனையாளர்
உரிமம் எண் : 35/2010/B1
கலெக்ட்ரேட் அஞ்சல்,
திண்டுக்கல் - 624 004.

குத்தகைப்பத்திரம் ஆவணம்

அதாவது சுபகிருது தமிழ் வருடம் சித்திரை மாதம் 12ஆம் தேதி

2023ம் வருடம் ஏப்ரல் மாதம் 25ம் தேதி

திண்டுக்கல் மாவட்டம், திண்டுக்கல் வட்டம், **SF.No.295/1** கொத்தப்புள்ளி என்ற முகவரியில் அமைந்து அதே முகவரியில் இயங்கி வரும் **ஸ்ரீ தேவர் புளூ மெட்டல்ஸ்** நிறுவனத்திற்காக, அதன் நிறுவன பிரதிநிதியான, திண்டுக்கல் மாவட்டம், திண்டுக்கல் டவுன், நேருஜி நகர், **LIC**.காலனி விஸ்தரிப்பு, ராஜன் அவென்யூ, பிளாட் நம்பர்.1ல் வசித்து வரும் திரு.முருகேசத் தேவர் அவர்கள் குமாரர் **திரு.ரமேஷ்** (ஆதார் அடையாள அட்டை எண். **6708 1014 7729**) ஆகிய தங்களுக்கு,

எழுதிக்கொடுப்பவர்கள் எழுதிவாங்குபவர்

1. M. Ramesh

2. M. [signature]

1 புத்தகம் 2023 வருடத்திய 3361 ம் ஆவணம்
20 தாள்களைக்கொண்டது.
1 தாள்
பதிவு அலுவலர்

For SHREE THEVAR BLUE METALS
M. Ramesh
Partners

M Ramesh

-937-

भारतीय गैर न्यायिक INDIA NON JUDICIAL

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தமிழ்நாடு तमिलनाडु TAMILNADU 25.04.2023

BC 763147

ஸ்ரீ தேவர் புளு மெட்டல்ஸ்
கொத்தப்புள்ளி

V. .... குமார்
முத்திரைத்தாள் விற்பனையாளர்
உரிமம் எண் : 35/2010/B1
கலெக்ட்ரேட் அஞ்சல்,
திண்டுக்கல் - 624 004.

-2-

திண்டுக்கல் மாவட்டம், திண்டுக்கல் டவுன், நேருஜி நகர், LIC.காலனி விஸ்தரிப்பு, ராஜன் அவென்யூ, பிளாட் நம்பர்.1ல் வசித்து வரும் மேற்படி ஸ்ரீ தேவர் புளு மெட்டல்ஸ் நிறுவனத்தின் பங்குதாரரும் திரு.முருகேசத்தேவர் அவர்கள் குமாரர் **திரு.ரமேஷ்** (ஆதார் அடையாள அட்டை எண்.**6708 1014 7729**) (செல்நம்பர்.**94435 98248**)..2,

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh

2. M. ....

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M. Ramesh

Partners

I புத்தகம் 2023 ம் வருடத்திய 3361 ம் ஆவணம்
20 தாள்களைக்கொண்டது.
21 தாள்

பதிவு அலுவலர்

M Ramesh

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தமிழ்நாடு தமிழ்நாடு TAMILNADU 25.04.2023

BC 763148

ஸ்ரீ தேவர் புளூ மெடல்ஸ்
கெளரவ்

V. வெங்கட குமார்
முத்திரைத்தாள் விற்பனையாளர்
உரிமம் எண் : 35/2010/B1
கலெக்ட்ரேட் அஞ்சல்,
திண்டுக்கல் - 624 004.

-3-

திண்டுக்கல் மாவட்டம், திண்டுக்கல் டவுன், நேருஜி நகர், LIC.காலனி விஸ்தரிப்பு, ராஜன் அவென்யூ, பிளாட் நம்பர்.1ல் வசித்து வரும் மேற்படி ஸ்ரீ தேவர் புளூ மேட்டல்ஸ் நிறுவனத்தின் பங்குதாரரும் திரு.முருகேசத்தேவர் அவர்கள் குமாரரும் ஷை 1வது நபரின் உடன்பிறந்த சகோதரரும் **திரு.M.பாலாஜி** (ஆதார் அடையாள அட்டை எண்.3235 2079 0350) (செல் நம்பர்.77088 19977)..2, ஆகிய நாங்கள் இரண்டு பேர்களும் சேர்ந்து எழுதிக் கொடுத்த பூமி வகையறாச் சொத்தின் குத்தகைப் பத்திர ஆவணம் என்னவென்றால்,

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh.

2. M. Balaji

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M. Ramesh

Partners

1 புத்தகம் 2023 ம் வருடத்தின் 3361 ம் ஆவணம்
20 தாள்களைக்கொண்டது.
3 தாள்
பதிவு அலுவலர்

M Ramesh

-941-

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தமிழ்நாடு तमिलनाडु TAMILNADU 25-04-2023

BC 763149

ஸ்ரீ தேவர் புளூமெட்டல்ஸ் கொத்தப்புள்ளி

V. [illegible]
முத்திரைத்தாள் விற்பனையாளர்
உரிமம் எண் : 35/2010/21
கலெக்ட்ரேட் அஞ்சல்,
திண்டுக்கல் - 624 004.

- 4 -

இதன்கீழ் சொத்து விவரத்தில் காண்பிக்கப்பட்டுள்ள சொத்தானது திண்டுக்கல் ஜாயிண்ட் 2ம் நம்பர் சார்பதிவகத்தில் 1ம் புத்தகம் **7477/2021**ம் எண்ணாக கடந்த **26.10.2021**ம் தேதியில் பதிவான கிரயப்பத்திரப்படி பாத்தியப்பட்டு எனது அனுபோக சுவாதீனத்தில் இருந்து வருகிறது

எழுதிக்கொடுப்பவர்கள்

1. M. Rameen.

2. M. Balaji

எழுதிவாங்குபவர்
For SHREE THEVAR BLUE METALS
M. Rameen.
Partners

1 புத்தகம் 2023 ம் வருடத்திய 2281 ம் ஆவணம்
20 தாள்களைக்கொண்டது.
4 தாள்
பதிவு அலுவலர்

M Rameen.

-243-

भारतीय गैर न्यायिक INDIA NON JUDICIAL

भारत

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INDIA

தமிழ்நாடு तमिलनाडु TAMILNADU 25.04.2023

BC 763150

ஸ்ரீ தேவர் புளூ மெட்டல்ஸ் கொத்தப்புள்ளி

ப. வெங்கட குமார்
முத்திரைத்தாள் விற்பனையாளர்
உரிமம் எண் : 35/2010/B1
கலெக்ட்ரேட் அஞ்சல்,
திண்டுக்கல் - 624 004.

- 5 -

இவ்வாறான நிலையில் மேற்படி ஸ்ரீ தேவர் புளூ மெட்டல்ஸ் என்ற கூட்டு நிறுவனம் திண்டுக்கல் மாவட்ட கூட்டு நிறுவன பதிவேட்டில் பதிவு எண்.33/2018 தேதி.27.03,2018ல் பதிவு செய்யப்பட்டு நடப்பில் இருந்து வரும் நிலையில் மேற்படி அந்த நிறுவனத்தின் பேரில் மேற்சொல்லப்பட்டு இதன்கீழ் விவரிக்கப்பட்டுள்ள சொத்தின் நிலப்பரப்பினுள் திண்டுக்கல் மாவட்ட ஆட்சியர் அவர்களிடம் சாதாரண கற்கள் மற்றும் கிராவல் மண் எடுக்கும் காரியத்திற்காக

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh.

2. M. [signature]

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M. Ramesh.

Partners

1 புத்தகம் 2023ம் வருடத்திய 8361ம் ஆவணம்
20 தாள்களைக்கொண்டது.
5 தாள்
பதிவு அலுவலர்

M Ramesh.

-245-

भारतीय गैर न्यायिक INDIA NON JUDICIAL

एक हजार रुपये ONE THOUSAND RUPEES

रु.1000 Rs.1000

सत्यमेव जयते INDIA

தமிழ்நாடு तमिलनाडु TAMILNADU 25.04.2023

BC 763151

ஸ்ரீ தேவர் புளூ மெட்டல்ஸ் கொத்தப்புள்ளி

-6-

மேற்படி நிறுவனத்தின் பேரில் விண்ணப்பிக்கப்பட்டுள்ளதில் அரசாங்கத்திடமிருந்து வரப்பெறும் குவாரி குத்தகை உரிமம் நிறைவேற்றும் தேதியிலிருந்து **10(பத்து) வருடங்கள் கால** கெடுவிற்கு வருடம் ஒன்றுக்கு ரூபாய்.**50,000/-** (ரூபாய்.ஐம்பதாயிரம் மட்டும்) வீதம் குத்தகைக்கு கொடுக்க ஒப்புக்கொண்டு அதற்கு முன் தொகையாக ரூபாய்.**1,00,000/-** (ரூபாய்.ஒரு இலட்சம் மட்டும்) இன்றைய தேதியில் நாங்கள் பெற்றுக்கொண்டு கீழ்க்கண்ட நிபந்தனைகளுக்கு உட்பட்டு எழுதிக்கொடுத்த குத்தகை பத்திரம் இதுவே ஆகும்.

எழுதிக்கொடுப்பவர்கள்

1. M. Rangan

2. M. Balaji

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M. Rangan

Partners

1 புத்தகம் 2023ம் வருடத்திய 3860ம் ஆவணம்
20 தாள்களைக்கொண்டது
6 தாள்

பதிவு அலுவலர்

M Rangan

நிபந்தனைகள் பின்வருமாறு

1. குவாரி குத்தகை உரிமம் நிறைவேற்றும் தேதியிலிருந்து குத்தகை காலம் 10 (பத்து) வருடங்கள் ஆகும்
2. கீழ்காணும் பூமியை உங்களுக்கு இந்த ஆவணம் மூலம் வழங்கியுள்ளதைத் தவிர வேறு எவருக்கும் உள்குத்தகைக்கு கொடுக்க வில்லை மேலும் வேறு எவருக்கும் உள்குத்தகைக்கு கொடுக்க மாட்டேன் என்ற உறுதியளிக்கிறேன்.
3. மேற்படி கெடு காலம் வரையில் நான் கீழ்காணும் பூமியைப்பொறுத்து எந்த இடையூறுகளையும் செய்ய மாட்டேன் என்ற உறுதியளிக்கிறேன்.
4. கீழ்காணும் பூமியில் மராமத்து செய்யும் அனைத்து செலவினங்களும் உங்களையே சார்ந்தது என்றும் அந்த செலவு என்னை எவ்விதத்திலும் கட்டுப்படுத்தாது.
5. கீழ்காணும் பூமிக்கு உண்டான நில வரியை நீங்களே உரியவகையில் செலுத்திக்கொள்ள வேண்டியது.
6. குத்தகை காலம் முடியும் வரை நீங்கள் அடியில் கண்ட சொத்தை எவ்வித வில்லங்க பாராதீனங்களுக்கும் உட்படுத்தக்கூடாது
7. குத்தகை இடத்தில் நீவிர் நிறுவனம் சாதாரன கற்கள் மற்றும் கிராவல் மண் எடுக்கும் காரியத்திற்காக மட்டும் நான் சம்மதிக்கிறேன்.

இந்தப்படிக்கு நாங்கள் எழுதிக்கொடுத்த குத்தகைப்பத்திரம் ஆவணம் சரியே.

சொத்து விபரம்

1. திண்டுக்கல் பதிவு மாவட்டம், திண்டுக்கல் ஜாயிண்டு 2ம் நம்பர் சார்பதிவகம், திண்டுக்கல் மேற்கு தாலுகா, **K.புதுக்கோட்டை கிராமபுலத்தில்**

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh.
2. [signature]

எழுதிவாங்குபவர்
For SHREE THEVAR BLUE METALS
M. Ramesh
Partners

1 புத்தகம் 2023ம் வருடத்திய 3361ம் ஆவணம்
20 தாள்களைக்கொண்டது
7 தாள்
பதிவு அலுவலர்

M Ramesh.

பழைய சர்வே.244/2A நம்பர் புஞ்சை ஏக்கர் 1 செண்டு 29ல் மேற்குப்பக்கம் சப்டிவிஷன் செய்துள்ளபடி பட்டா எண்.1332ல் கண்ட புது சர்வே.244/2A1 நம்பர் புஞ்சை ஹெக்டேர்.0.28.5க்கு செண்டு 70 உள்ள நிலத்திற்கு நான்குமால் விபரம்

கிழமேல் ரோட்டிற்கும்.....வடக்கு

முன்பு திரு.காளியப்பன் வகையறாவிற்கு பாத்தியப்பட்டும்

தற்போது தங்கள் கைவசம் உள்ள நிலத்திற்கும்.....தெற்கு

முன்பு திரு.T.கனகராஜ் அவர்கள் நிலம் தற்போது தங்கள்

கைவசம் உள்ள நிலத்திற்கும்.....கிழக்கு

முன்பு லெட்சுமணன் அவர்களுக்கு பாத்தியப்பட்டும்

தற்போது தங்கள் கைவசம் உள்ள சொத்திற்கும்.....மேற்கு

இதற்குள் கட்டுப்பட்ட ஷை புஞ்சை செண்டு 70 உள்ள ஷை நிலமும்,

2. திண்டுக்கல் பதிவு மாவட்டம், திண்டுக்கல் ஜாயிண்டு 2ம் நம்பர் சார்பதிவகம், திண்டுக்கல் மேற்கு தாலுகா, **K.புதுக்கோட்டை கிராமபுலத்தில்**

பழைய சர்வே.244/2A நம்பர் புஞ்சை ஏக்கர் 1 செண்டு 29ல் கீழ்புறம் கட்டுப்பட்ட புஞ்சை ஹெக்டேர்.0.26.0க்கு செண்டு 64½ உள்ள நிலத்திற்கு நான்குமால் விபரம்

கிழமேல் ரோட்டிற்கும்.....வடக்கு

முன்பு திரு.காளியப்பன் வகையறாவிற்கு பாத்தியப்பட்டும்

தற்போது தங்கள் கைவசம் உள்ள நிலத்திற்கும்.....தெற்கு

முன்பு திரு.T.கனகராஜ் அவர்கள் நிலம்

தற்போது தங்கள் கைவசம் உள்ள நிலத்திற்கும்.....கிழக்கு

முன்பு லெட்சுமணன் அவர்களுக்கு பாத்தியப்பட்டும் தற்போது

தங்கள் கைவசம் உள்ள சொத்திற்கும்.....மேற்கு

இதற்குள் கட்டுப்பட்ட ஷை புஞ்சை செண்டு 64½ உள்ள ஷை நிலமும்,

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh

2. M. Thangaraj

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M. Ramesh

Partners

1 புத்தகம் 2023 ம் வருடத்தில் 2961 ம் ஆவணம்
30 தாள்களைக்கொண்டது.
8 ஆம் பக்கம்
பதிவு அலுவலர்

M Ramesh

மேற்படி சொத்து தற்கால சப்டிவிஷன் செய்துள்ளபடி பட்டா எண்.1332ல் கண்ட சர்வே.244/2A2 நம்பருக்கு கட்டுப்பட்டது.

3. திண்டுக்கல் பதிவு மாவட்டம், திண்டுக்கல் ஜாயிண்டு 2ம் நம்பர் சார்பதிவகம், திண்டுக்கல் மேற்கு தாலுகா, **K.புதுக்கோட்டை கிராமபுலத்தில்**

பட்டா எண்.1332ல் கண்ட

அயன் சர்வே.244/1A நம்பர் புஞ்சை ஹெக்டேர்.1.91.0க்கு ஏக்கர் 4 செண்டு 71 உள்ள நிலத்திற்கு நான்குமால் விபரம்

பாதைக்கும், பாறைக்கும், கல்குவாரிக்கும்.....வடக்கு

முன்பு நாகப்பகவுடர், காவேரியம்மாள் புஞ்சைக்கும்,

சுப்பாயம்மாள் புஞ்சை தற்போது தங்கள் கைவசம்

உள்ள நிலத்திற்கும்.....தெற்கு

முன்பு நாகப்பகவுடர், காவேரியம்மாள் இவர்கள் புஞ்சை

தற்போது தங்கள் கைவசம் உள்ள நிலத்திற்கும்.....கிழக்கு

முன்பு முத்தையகவுடர் புஞ்சை தற்போது தங்கள் கைவசம்

உள்ள நிலத்திற்கும்.....மேற்கு

இதற்குள் கட்டுப்பட்ட ஸை புஞ்சை ஏக்கர் 4 செண்டு 71 உள்ள ஸை நிலமும்,

ஆக 1,2,3லக்க சொத்துக்கள் ஹெக்.2.45.5க்கு ஏக்கர் 6 செண்டு 5.1/2 உள்ள நிலங்களும்

மேற்படி சொத்துக்குத் தடப்பாத்தியம்

இந்த குத்தகைச் சொத்திற்கு மேற்படி மூல ஆவணத்தில் சொல்லப்பட்டப்படியும் அதன் முன் மூல ஆவணங்களில் கண்டுள்ளபடியும் ஆட்கள் கால் நடைகள், வண்டி வாகனங்கள், நவீன கனரக புவி ஊர்திகள் முதலான அனைத்தும் ஒட்டிக்கொண்டு போக வர தடப் பாத்தியம் உண்டு மற்றும் சகல ஈஸ்ட்மெண்ட் பாத்தியங்களும் பாத்தியம் உண்டு.

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh

2. M. Thangaraj

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M. Ramesh

Partners

1 புத்த 2023 ம் வருடத்திய 2361 ம் ஆவணம்
20 தாள்களைக்கொண்டது.
9
பதிவு அலுவலர்

M Ramesh.

-953-

மேலும் மேற்படி புஞ்சை நிலத்தில் தற்போது திறந்தவெளிக்கிணறுகளோ ஆழ்துளை கிணறுகளோ & அரசு மற்றும் தனியார் நீர்நிலைகளோ எதுவும் இல்லை.

Office Assistant Director Geology and Mining Collectorate Dindigul - 624 004

எழுதிக்கொடுப்பவர்கள்

1. M. Ramesh

2. M. Thilagi

எழுதிவாங்குபவர்

For SHREE THEVAR BLUE METALS

M Ramesh

Partner

சாட்சிகள்

1. A. விக்னேஷ் த/பெ.அழகர்சாமி, 22/10, பிள்ளையார்பாளையம், திண்டுக்கல்-624001

(ஆதார் அடையாள அட்டை எண்.7803 4419 3176)

2. M. முத்துமாரி த/பெ.முருகன், 3, வேதாத்திரி நகர், அறிவுத்திருக்கோவில் எதிரில், செட்டிநாயக்கன்பட்டி, திண்டுக்கல் - 624004

(ஆதார் அடையாள அட்டை எண்.8540 0962 9671)

புத்தக 2023ம் வருடத்திய 2364ம் ஆவணம்
20 தாள்களைக்கொண்டது.
10 தாள்
பதிவு அலுவலர்

ஆவணம் அமைத்தவர்:- P.Thangappandi

(பா.தங்கப்பாண்டியன்),த/பெ.O.M.பாண்டியன், 26A, R.K.G.பூங்கா, கருப்பணசாமி கோவில் தெரு, தாடிக்கொம்பு ரோடு, திண்டுக்கல். உரிமம் எண். A460/DGL/1993, புதுப்பித்தல் தேதி: 31.12.2023. Cell Nos. 99421 52555, 93679 15221. ompt555@gmail.com

M Ramesh.

ANNEXURE - VII

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सत्यमेव जयते

Government of India

Form GST REG-06

[See Rule 10(1)]

The Assistant Director of Geology and Mining Collectorate Dindigul - 624 004.

Registration Certificate

Registration Number : 33ADPFS9502H1ZT

1.	**Legal Name**	SHREE THEVAR BLUE METALS			
2.	**Trade Name, if any**	SHREE THEVAR BLUE METALS			
3.	**Constitution of Business**	Partnership			
4.	**Address of Principal Place of Business**	0, 295/1, KOTHAPULLI VILLAGE, DINDIGUL, Dindigul, Tamil Nadu, 624622			
5.	**Date of Liability**				
6.	**Period of Validity**	From	19/04/2018	To	NA
7.	**Type of Registration**	Regular			
8.	**Particulars of Approving Authority**				

Signature

Signature Not Verified
Digitally signed by DS GOODS AND SERVICES TAX NETWORK 1
Date: 2018.04.23 23:44:13 IST

Name	
Designation	
Jurisdictional Office	
9. Date of issue of Certificate	23/04/2018

Note: The registration certificate is required to be prominently displayed at all places of business in the State.

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of application on 19/04/2018 .

M Ranee

सत्यमेव जयते

Annexure A

GSTIN	33ADPFS9502H1ZT
Legal Name	SHREE THEVAR BLUE METALS
Trade Name, if any	SHREE THEVAR BLUE METALS

Details of Additional Places of Business

Total Number of Additional Places of Business in the State	0

M. Ramesh

सत्यमेव जयते

Annexure B

GSTIN	33ADPFS9502H1ZT
Legal Name	SHREE THEVAR BLUE METALS
Trade Name, if any	SHREE THEVAR BLUE METALS

Details of Managing / Authorized Partners

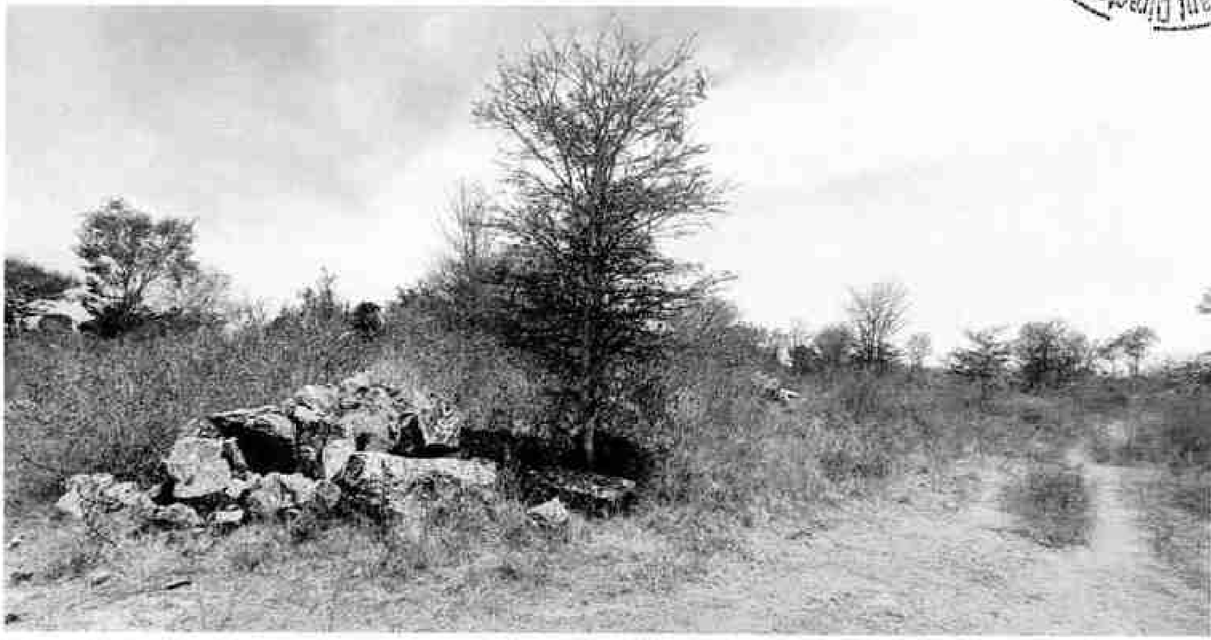
1		Name	RAMESH
		Designation/Status	partnership
		Resident of State	Tamil Nadu
2		Name	BALAJI
		Designation/Status	partnership
		Resident of State	Tamil Nadu

M Ramesh.

PHOTOCOPY OF THE APPLIED LEASE AREA

Site photos in respect of rough stone and gravel quarry lease in S.F.No. 244/1A, 244/2A1 & 244/2A2 - Patta land - over an extent of 2.43.00hectares – K.Pudukottai Village – Dindugul West Taluk, Dindigul District, Tamil Nadu State in belongs to M/s.Shree Thevar Blue Metals.

O/o Assistant Director, Department of Geology and Mining Collectorate Dindigul - 624 004.



M Ramesh.

-963- **ANNEXURE - IX**

O/o Assistant Director of Geology and Mining Collectorate Dindigul - 624 004.


आयकर विभाग
INCOME TAX DEPARTMENT
भारत सरकार
GOVT. OF INDIA
स्थायी लेखा संख्या कार्ड
Permanent Account Number Card
ADPFS9502H
नाम / Name
SHREE THEVAR BLUE METALS
निगमन/गठन की तारीख
Date of Incorporation/Formation
12/02/2018
04042018


भारत सरकार
Government of India
Issue Date: 23/03/2017
பாலாஜி
Balaji
பிறந்த நாள் / DOB: 24/04/1985
ஆண் / MALE
3235 2079 0350
मेरा आधार, मेरी पहचान


भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India
Print Date: 10/03/2021
Address: S/O. Murugesan Thevar, FLAT NO-1, RAJAN AVENUE, L I C COLONY EXTENSION, NEHRUJI NAGAR, Dindigul, Dindigul, Tamil Nadu, 624001
3235 2079 0350
1947 help@uidai.gov.in www.uidai.gov.in


भारत सरकार
Government of India
Ramesh
பிறந்த நாள் / DOB: 29/06/1976
ஆண் / MALE
6708 1014 7729
मेरा आधार, मेरी पहचान


भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India
Print Date: 10/03/2021
Address: S/O: Murugesan Thevar, FLAT NO-1, RAJAN AVENUE, L I C COLONY EXTENSION, NEHRUJI NAGAR, Dindigul, Dindigul, Tamil Nadu, 624001
6708 1014 7729
1947 help@uidai.gov.in www.uidai.gov.in

M Ramesh

ANNEXURE - X

भारत सरकार / GOVERNMENT OF INDIA
खान मंत्रालय / MINISTRY OF MINES
भारतीय खान ब्यूरो / INDIAN BUREAU OF MINES

अर्हता प्राप्त व्यक्ति के रुप मेंमान्यता प्रमाण पत्र
(खनिज रियायत नियमावली, 1960 के नियम 22सी के तहत)

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON
(Under Rule 22C of Mineral Concession Rules, 1960)

श्री एस. करुपण्णण, मॉग्गनीकाडू, मुत्तमंपटटी पोस्ट, बोम्मीडी वयॉ , ओमलूर तालुक, सेलम डीस्टीक्ट, तमिलनाडू – 635 301, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोष जनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है ।

Shri S. Karuppannan, Manganikadu, Muthampatty (Post), Bommidi (Via), Omalur Taluk, Salem District, Tamilnadu – 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है
His registration number is **RQP /MAS/263/2014/A**

यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 15.12.2024 को समाप्त होगी।
This recognition is valid for a period of 10 years ending on 15.12.2024.

उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की स्थिती में यह प्रमाण पत्र वापस लिया जाएगा / निरस्त किया जाएगा।
This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai
दिनांक/ Date : 16.12.2014.

क्षेत्रीय खाननियंत्रक / Regional Controller of Mines
भारतीय खानब्यूरो/ Indian Bureau of Mines
चेन्नई क्षेत्र / Chennai Region

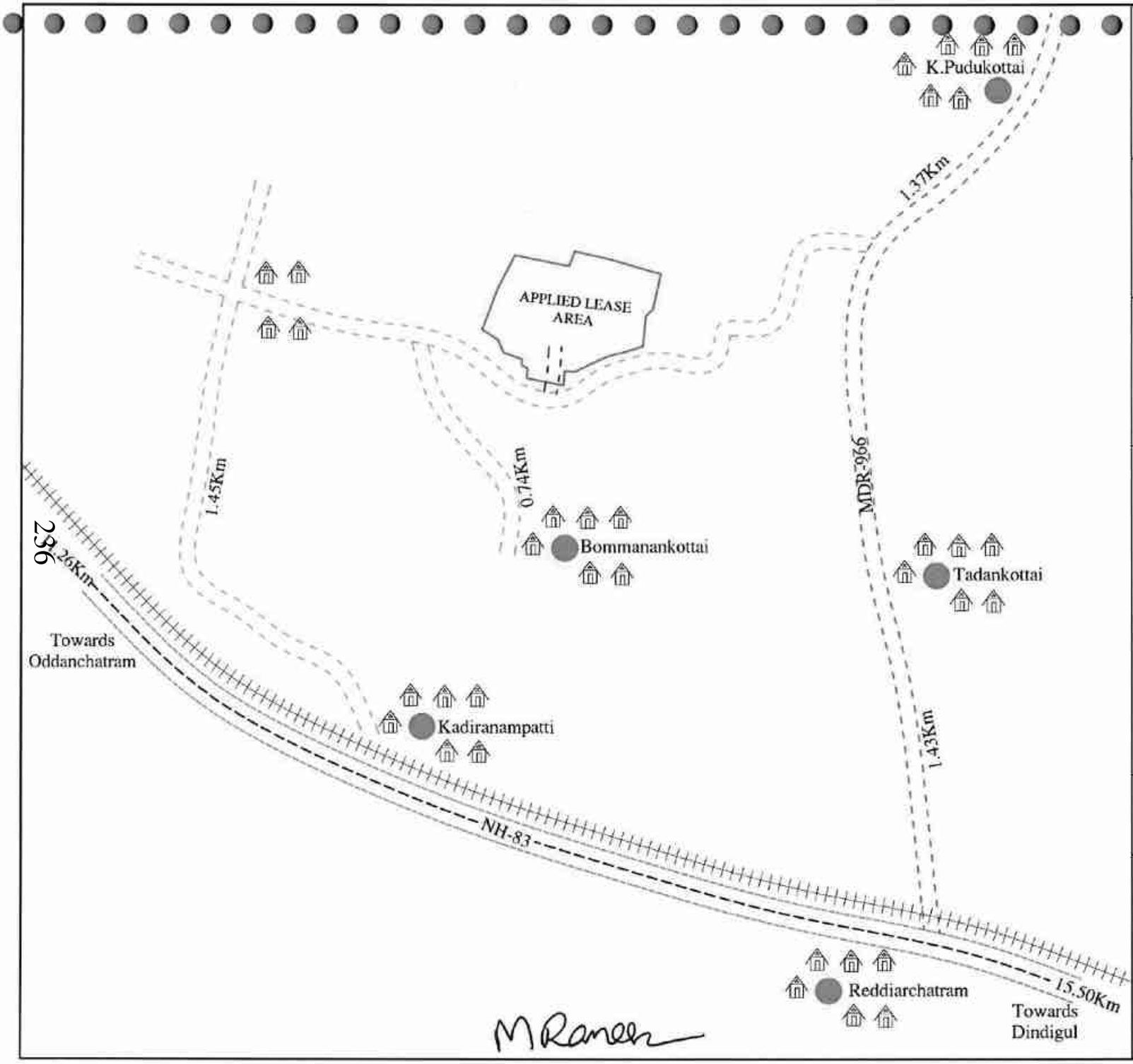


PLATE NO-I

APPLICANT:

M/s.SHREE THEVAR BLUE METALS,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
KOTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGUL DISTRICT-624622

LEASE AREA:

S.F.No's	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI
TALUK	: DINDIGUL WEST
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE AREA
- APPROACH ROAD
- CART ROAD
- MDR-966 ROAD
- NH - 83 ROAD
- RAILWAY TRACK
- HABITATION

KEY MAP

Not to Scale

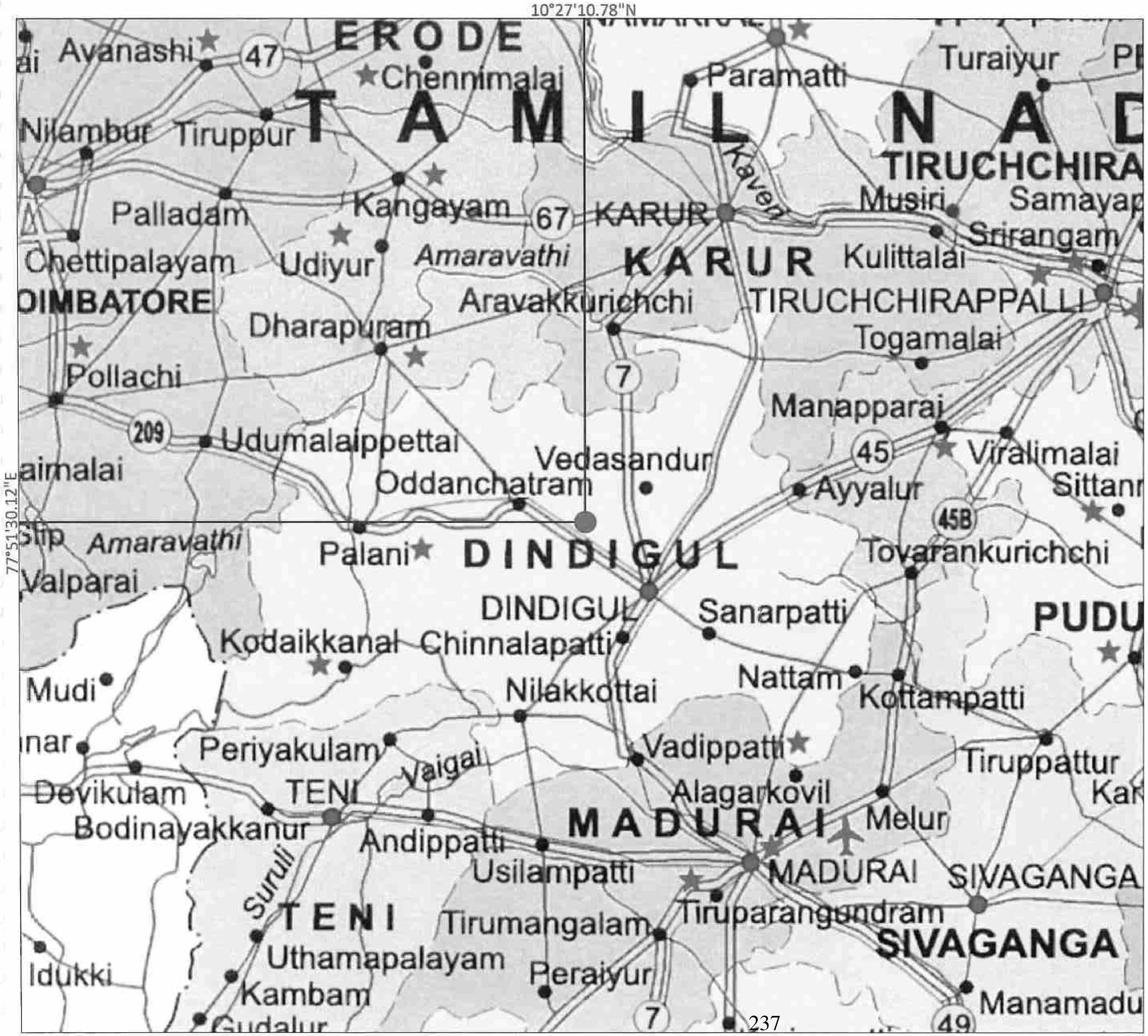
Prepared By:

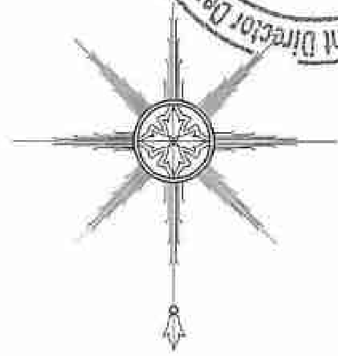
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

-367-

-269-





M Ramesh

Geology and Mining Collectorate Dindigul - 624 004. O/o Assistant Director of

PLATE NO-IA

APPLICANT:
M/s.SHREE THEVAR BLUE METALS,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
KOTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGUL DISTRICT-624622

LEASE AREA:

S.F.No's	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI
TALUK	: DINDIGUL WEST
DISTRICT	: DINDIGUL

INDEX

MINE LEASE AREA :

TOPO SHEET NO : 58-F/15

LATITUDE : 10°27'5.37"N to 10°27'10.78"N

LONGITUDE : 77°51'30.12"E to 77°51'37.37"E

LOCATION PLAN
NOT TO SCALE

Prepared By:
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

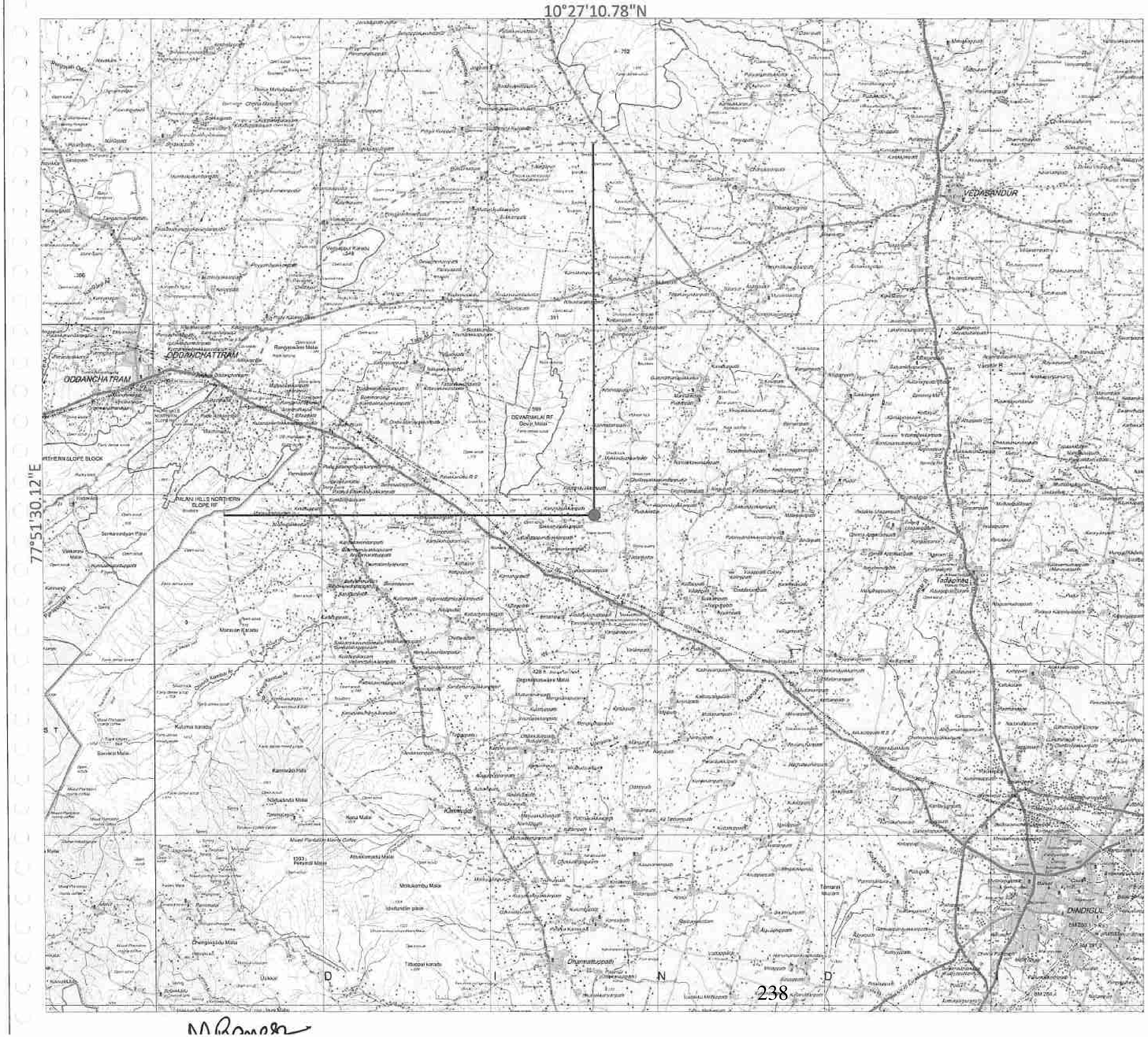


PLATE NO-IB

APPLICANT:
M/s.SHREE THEVAR BLUE METALS,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
KOTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGUL DISTRICT-624622

LEASE AREA:

S.F.No's	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI
TALUK	: DINDIGUL WEST
DISTRICT	: DINDIGUL

TOPO SHEET NO : 58-F/15

LATITUDE : 10°27'5.37"N to 10°27'10.78"N

LONGITUDE : 77°51'30.12"E to 77°51'37.37"E

MINE LEASE AREA

10KM RADIUS

CONVENTIONAL SYMBOLS

TOPOSHEET MAP
SCALE – 1:1,00,000

Prepared By:
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON

Collectorate Dindigul - 624 004. O/o Assistant Director of Geology and Mining

-973-

Dy. Director of Geology and Mining Collectorate Dindigul - 624 004 (stamp)

PLATE NO-IC

APPLICANT:
M/s.SHREE THEVAR BLUE METALS,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
KOTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGUL DISTRICT-624622

LEASE AREA:

S.F.No's	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI
TALUK	: DINDIGUL WEST
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE AREA
- APPROACH ROAD
- CART ROAD
- 100M RADIUS
- 200M RADIUS
- 300M RADIUS
- 400M RADIUS
- 500M RADIUS
- EXISTING PIT

TOPO SHEET NO :58-F/15

LATITUDE : 10°27'5.37"N to 10°27'10.78"N

LONGITUDE : 77°51'30.12"E to 77°51'37.37"E

SATELITE IMAGERY MAP

SCALE- 1:5000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

M Ramesh

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OCTOBER TO DECEMBER

10°27'10.78"N

77°51'30.12"E
Towards
Kothapulli

Towards
K.Pudukottai

Towards
Bommanankottai

JULY TO SEPTEMBER

N

Dio Assistant Director Geology & Mining Collectorate Dindigul - 624 004

PLATE NO-ID

APPLICANT:

M/s.SHREE THEVAR BLUE METALS,
S.F.No's: 295/1, 295/1A, 295/2 & 295/3,
KOTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGUL DISTRICT-624622

LEASE AREA:

S.F.No's	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI
TALUK	: DINDIGUL WEST
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE AREA
- APPROACH ROAD
- CART ROAD
- 100M RADIUS
- 200M RADIUS
- 300M RADIUS
- 400M RADIUS
- 500M RADIUS
- EXISTING PIT
- SHRUBS & TREES

TOPO SHEET NO :58-F/15

LATITUDE : 10°27'5.37"N to 10°27'10.78"N

LONGITUDE : 77°51'30.12"E to 77°51'37.37"E

ENVIRONMENTAL PLAN

SCALE– 1:5000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

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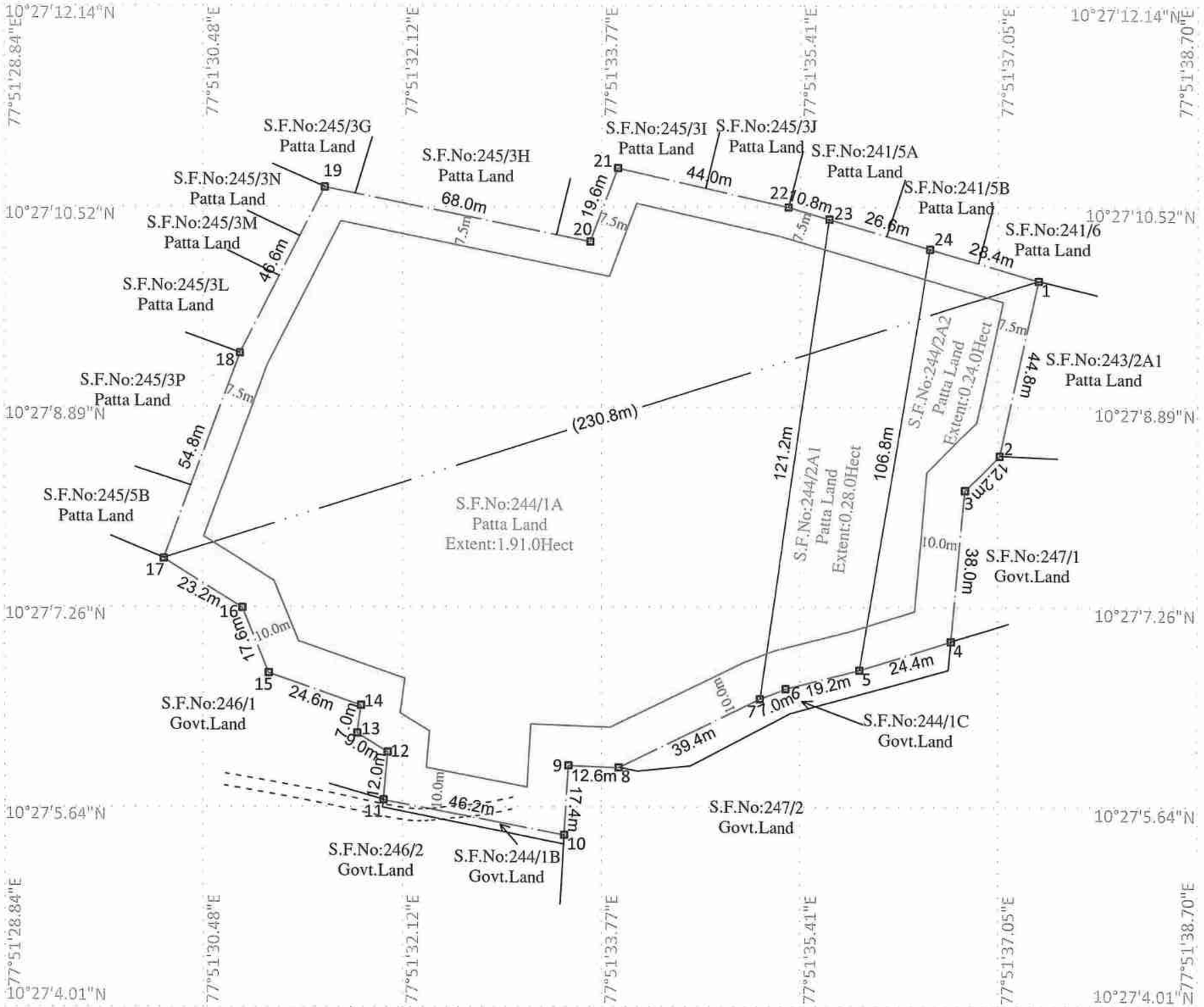

Sl.No	LATITUDE	LONGITIDE	Sl.No	LATITUDE	LONGITIDE
1	10°27'9.84"N	77°51'37.37"E	13	10°27'6.21"N	77°51'31.70"E
2	10°27'8.42"N	77°51'37.03"E	14	10°27'6.44"N	77°51'31.73"E
3	10°27'8.14"N	77°51'36.75"E	15	10°27'6.71"N	77°51'30.97"E
4	10°27'6.91"N	77°51'36.62"E	16	10°27'7.24"N	77°51'30.76"E
5	10°27'6.69"N	77°51'35.85"E	17	10°27'7.64"N	77°51'30.12"E
6	10°27'6.54"N	77°51'35.24"E	18	10°27'9.31"N	77°51'30.76"E
7	10°27'6.46"N	77°51'35.02"E	19	10°27'10.65"N	77°51'31.47"E
8	10°27'5.91"N	77°51'33.85"E	20	10°27'10.19"N	77°51'33.66"E
9	10°27'5.93"N	77°51'33.44"E	21	10°27'10.78"N	77°51'33.89"E
10	10°27'5.37"N	77°51'33.40"E	22	10°27'10.45"N	77°51'35.30"E
11	10°27'5.67"N	77°51'31.91"E	23	10°27'10.35"N	77°51'35.64"E
12	10°27'6.05"N	77°51'31.95"E	24	10°27'10.11"N	77°51'36.47"E

PLATE NO- II

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F,No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2)
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- FMB BOUNDARY
- APPROACH ROAD
- BOUNDARY PILLAR □1 □2

MINE LEASE PLAN

SCALE 1 : 1000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

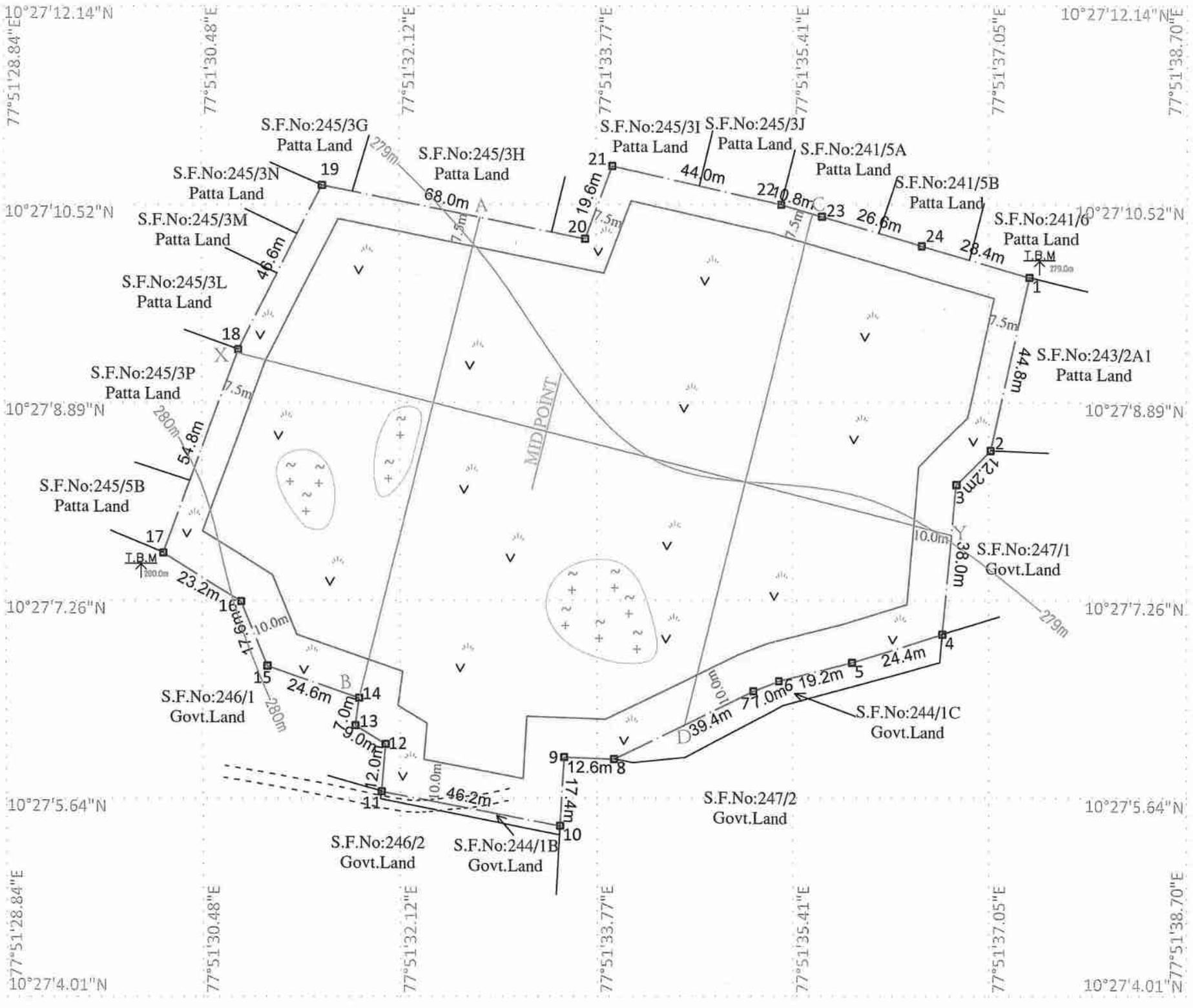

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PLATE NO- III

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F,No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- FMB BOUNDARY
- BOUNDARY PILLAR □1 □2
- APPROACH ROAD
- OUTCROP & ROUGH STONE
- GRAVEL
- SHRUBS
- CONTOUR LINES 280m
- TEMPORARY BENCH MARK T.B.M

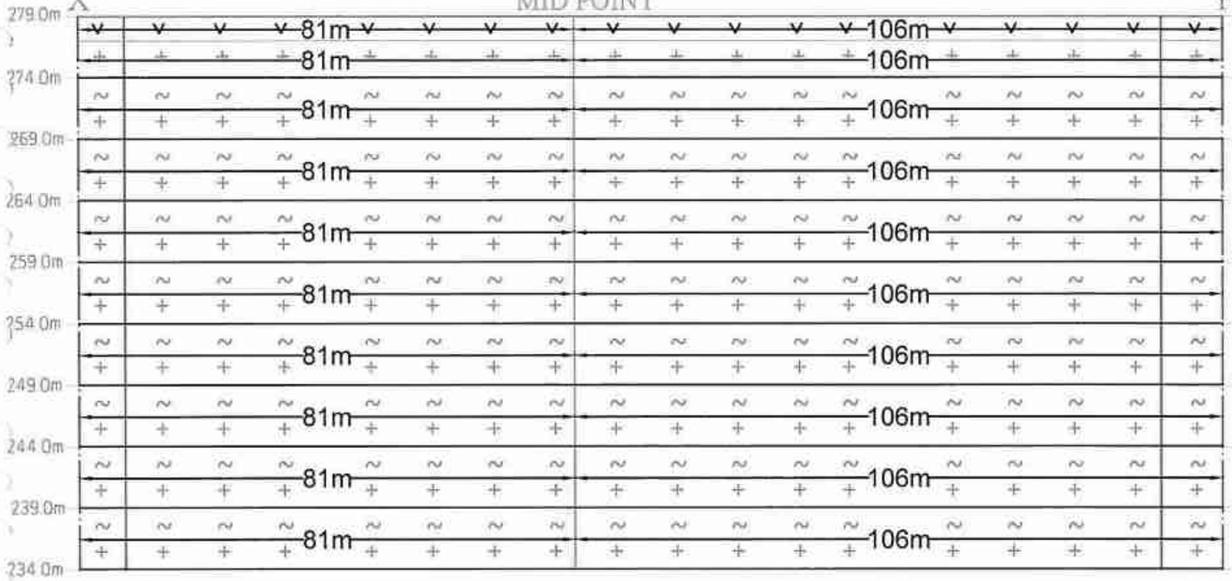
SURFACE & GEOLOGICAL PLAN
SCALE 1: 1000

Prepared By:

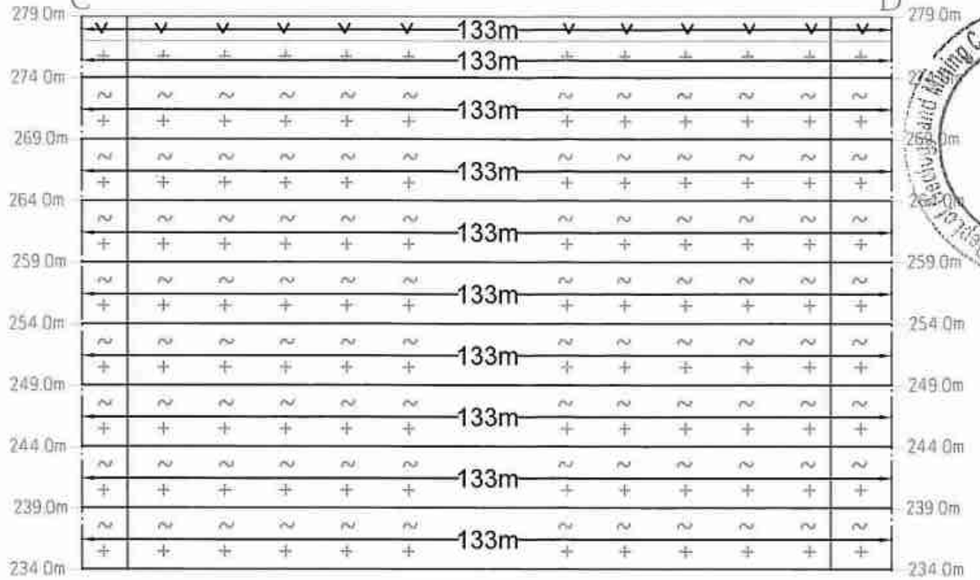
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

SECTION ALONG X–Y



SECTION ALONG C–D



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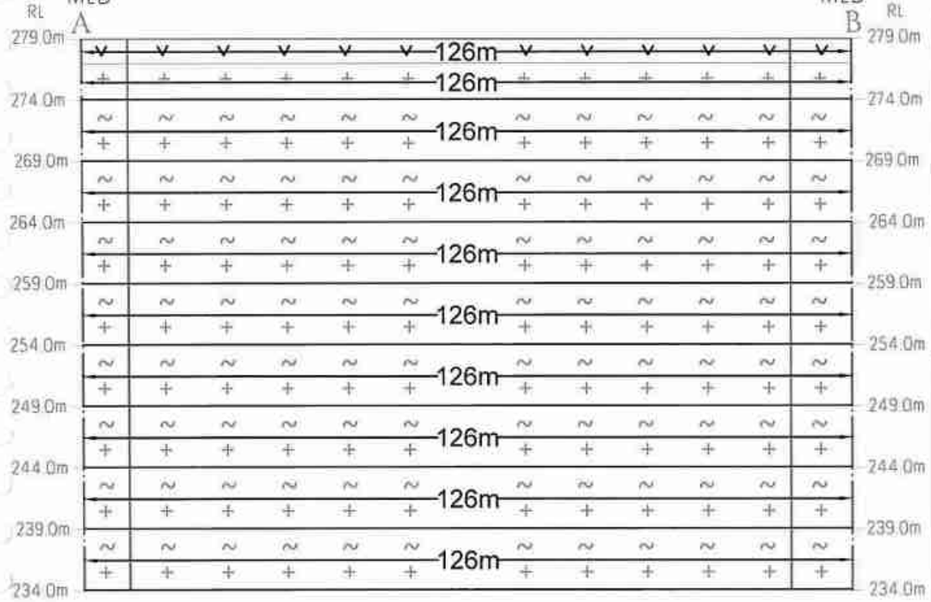


GEOLOGICAL RESOURCES

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m^3	Rough Stone in m^3	Gravel in m^3
XY-AB	I	81	126	2	20412	.....	20412
	I	81	126	3	30618	30618	.....
	II	81	126	5	51030	51030	.....
	III	81	126	5	51030	51030	.....
	IV	81	126	5	51030	51030	.....
	V	81	126	5	51030	51030	.....
	VI	81	126	5	51030	51030	.....
	VII	81	126	5	51030	51030	.....
	VIII	81	126	5	51030	51030	.....
	IX	81	126	5	51030	51030	.....
TOTAL				**45**	**459270**	**438858**	**20412**
XY-AB	I	106	133	2	28196	.....	28196
	I	106	133	3	42294	42294	.....
	II	106	133	5	70490	70490	.....
	III	106	133	5	70490	70490	.....
	IV	106	133	5	70490	70490	.....
	V	106	133	5	70490	70490	.....
	VI	106	133	5	70490	70490	.....
	VII	106	133	5	70490	70490	.....
	VIII	106	133	5	70490	70490	.....
	IX	106	133	5	70490	70490	.....
TOTAL				**45**	**634410**	**606214**	**28196**
GRAND TOTAL					**1093680**	**1045072**	**48608**

PLATE NO- IIIA

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F,No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

MINE LEASE BOUNDARY

SAFETY DISTANCE

ROUGH STONE

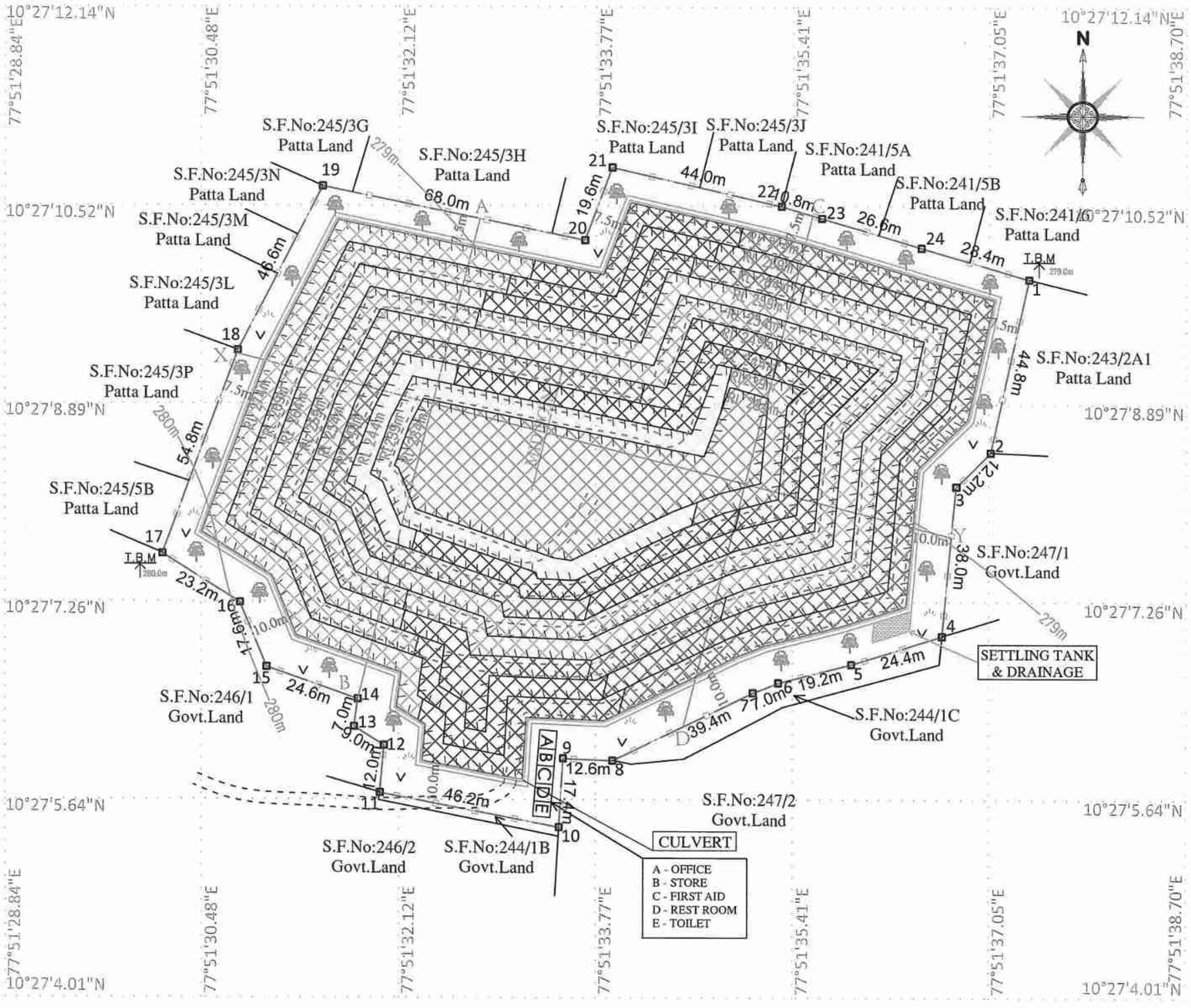
GRAVEL

GEOLOGICAL SECTIONS
SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A



I - Year Proposed area to be Planted 244

I - Year Proposed area to be Quarried
II - Year Proposed area to be Quarried
III - Year Proposed area to be Quarried
IV - Year Proposed area to be Quarried
V - Year Proposed area to be Quarried
VI - Year Proposed area to be Quarried
VII - Year Proposed area to be Quarried
VIII - Year Proposed area to be Quarried
IX - Year Proposed area to be Quarried
X - Year Proposed area to be Quarried

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Assistant Director (Mining) Collectorate Dindigul - 624 004

PLATE NO- IV

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F.No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- FMB BOUNDARY
- BOUNDARY PILLAR □1 □2
- APPROACH & HAUL ROAD
- GRAVEL
- SHRUBS
- CONTOUR LINES 280m
- TEMPORARY BENCH MARK T.B.M
- FENCING
- PROPOSED BENCH

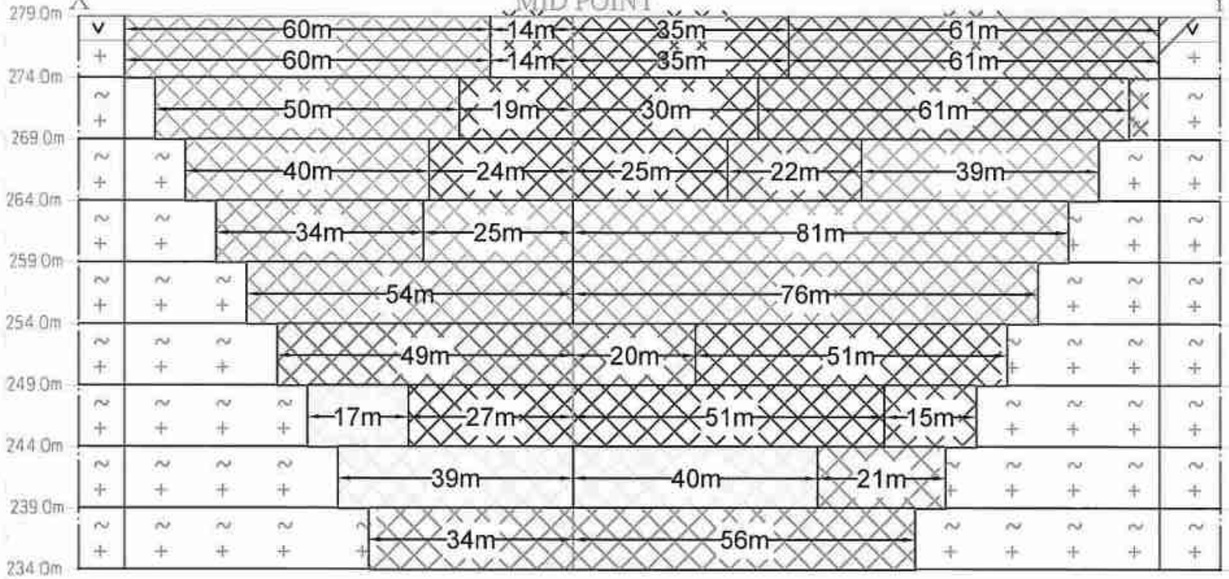
YEARWISE DEVELOPMENT & PRODUCTION PLAN
SCALE 1 : 1000

Prepared By:

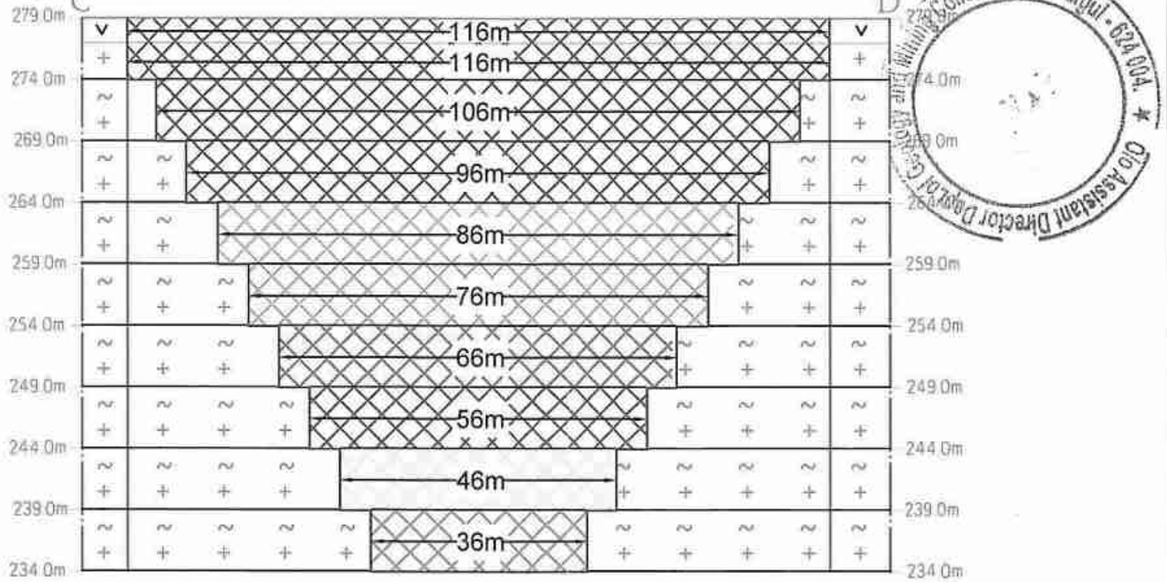
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

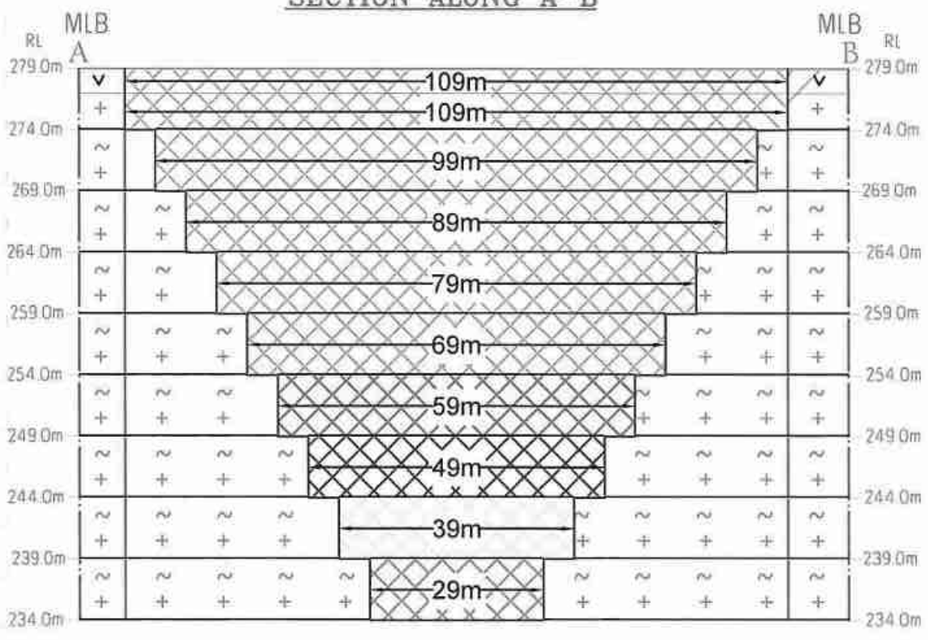
SECTION ALONG X–Y



SECTION ALONG C–D



SECTION ALONG A–B



I - Year Proposed area to be Quarried		VI - Year Proposed area to be Quarried		
II - Year Proposed area to be Quarried		VII - Year Proposed area to be Quarried		
III - Year Proposed area to be Quarried		VIII - Year Proposed area to be Quarried		
IV - Year Proposed area to be Quarried		IX - Year Proposed area to be Quarried		
V - Year Proposed area to be Quarried		X - Year Proposed area to be Quarried		

M Ramesh

YEARWISE PRODUCTION RESERVE

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M^3	Rough Stone in m^3	Gravel in m^3
I-YEAR	XY-AB	I	60	109	2	13080	.....	13080
		I	60	109	3	19620	19620	.....
		II	50	99	5	24750	24750	.....
		III	40	89	5	17800	17800	.....
TOTAL						75250	62170	13080
II-YEAR	XY-AB	I	14	109	2	3052	.....	3052
		I	14	109	3	4578	4578	.....
		II	19	99	5	9405	9405	.....
		III	24	89	5	10680	10680	.....
	XY-CD	I	35	116	2	8120	.....	8120
		I	35	116	3	12180	12180	.....
		II	30	106	5	15900	15900	.....
		III	25	96	5	12000	12000	.....
TOTAL						75915	64743	11172
III-YEAR	XY-CD	I	61	116	2	14152	.....	14152
		I	61	116	3	21228	21228	.....
		II	61	106	5	32330	32330	.....
		III	22	96	5	10560	10560	.....
TOTAL						78270	64118	14152
IV-YEAR	XY-AB	IV	25	79	5	9875	9875	.....
	XY-CD	III	39	96	5	18720	18720	.....
		IV	81	86	5	34830	34830	.....
TOTAL						63425	63425	0
V-YEAR	XY-AB	IV	34	79	5	13430	13430	.....
		V	54	69	5	18630	18630	.....
	XY-CD	V	76	76	5	28880	28880	.....
TOTAL						60940	60940	0
VI-YEAR	XY-AB	VI	49	59	5	14455	14455	.....
	XY-CD	VI	20	66	5	6600	6600	.....
TOTAL						21055	21055	0
VII-YEAR	XY-CD	VI	51	66	5	16830	16830	.....
		VII	15	56	5	4200	4200	.....
TOTAL						21030	21030	0
VIII-YEAR	XY-AB	VII	27	49	5	6615	6615	.....
	XY-CD	VII	51	56	5	14280	14280	.....
TOTAL						20895	20895	0
IX-YEAR	XY-AB	VII	17	49	5	4165	4165	.....
		VIII	39	39	5	7605	7605	.....
	XY-CD	VIII	40	46	5	9200	9200	.....
TOTAL						20970	20970	0
X-YEAR	XY-AB	IX	34	29	5	4930	4930	.....
	XY-CD	VIII	21	46	5	4830	4830	.....
		IX	56	36	5	10080	10080	.....
TOTAL						19840	19840	0
GRAND TOTAL						457590	419186	38404

PLATE NO- IVA

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F,No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

MINE LEASE BOUNDARY

SAFETY DISTANCE

ROUGH STONE

GRAVEL

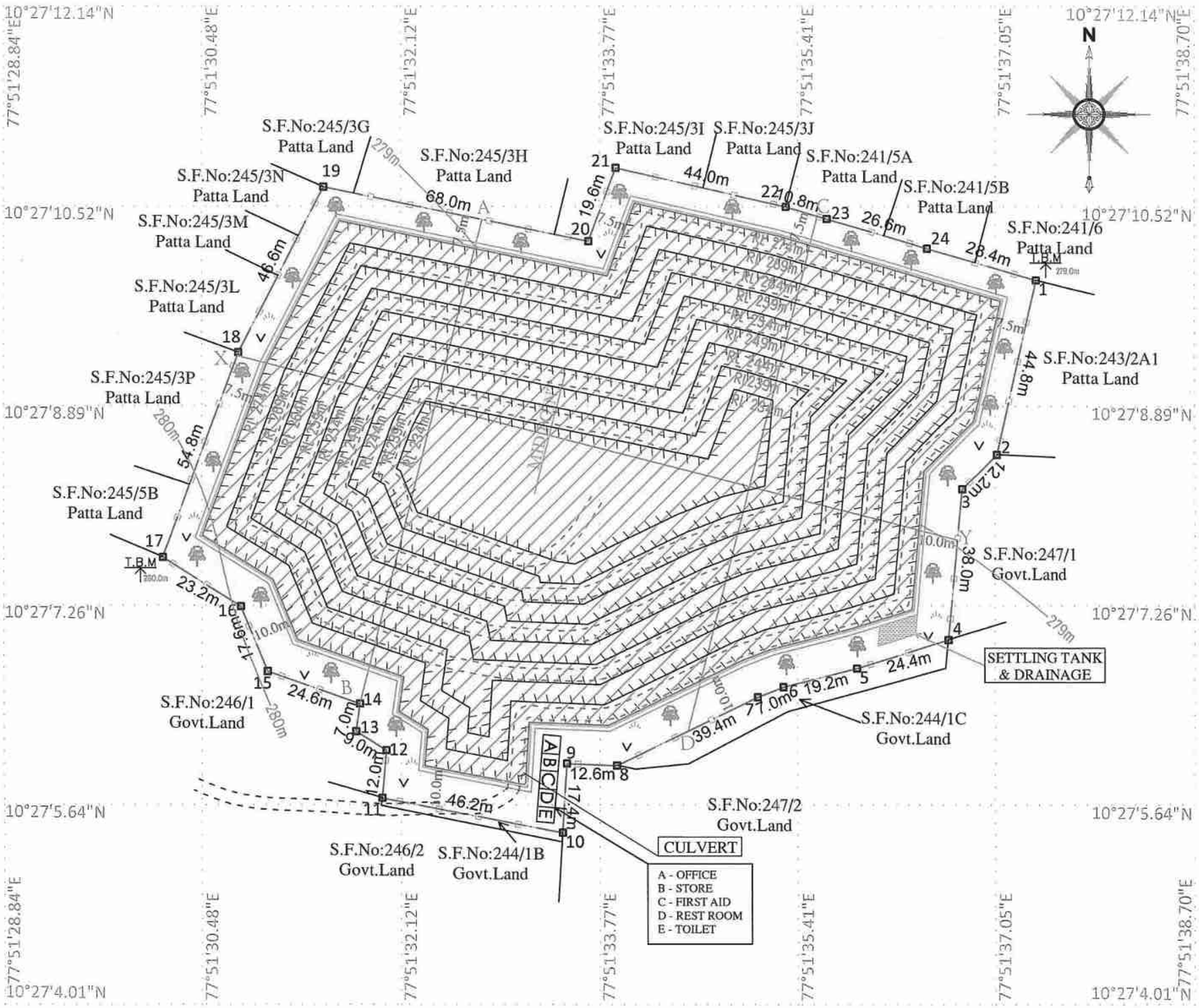
PROPOSED BENCH

YEARWISE & PRODUCTION SECTIONS
SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A



MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	1.90.96	
INFRASTRUCTURE	NIL	0.01.00	
ROADS	NIL	0.03.00	
GREEN BELT	NIL	0.44.69	
DRAINAGE & SETTLING TANK	NIL	0.02.00	
UN-UTILIZED AREA	2.43.00	0.01.35	NIL
GRAND TOTAL	2.43.00	2.43.00	NIL

PLATE NO- V

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F.No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- FMB BOUNDARY
- BOUNDARY PILLAR □1 □2
- APPROACH & HAUL ROAD
- GRAVEL
- SHRUBS
- CONTOUR LINES 280m
- TEMPORARY BENCH MARK T.B.M
- FENCING
- PROPOSED BENCH

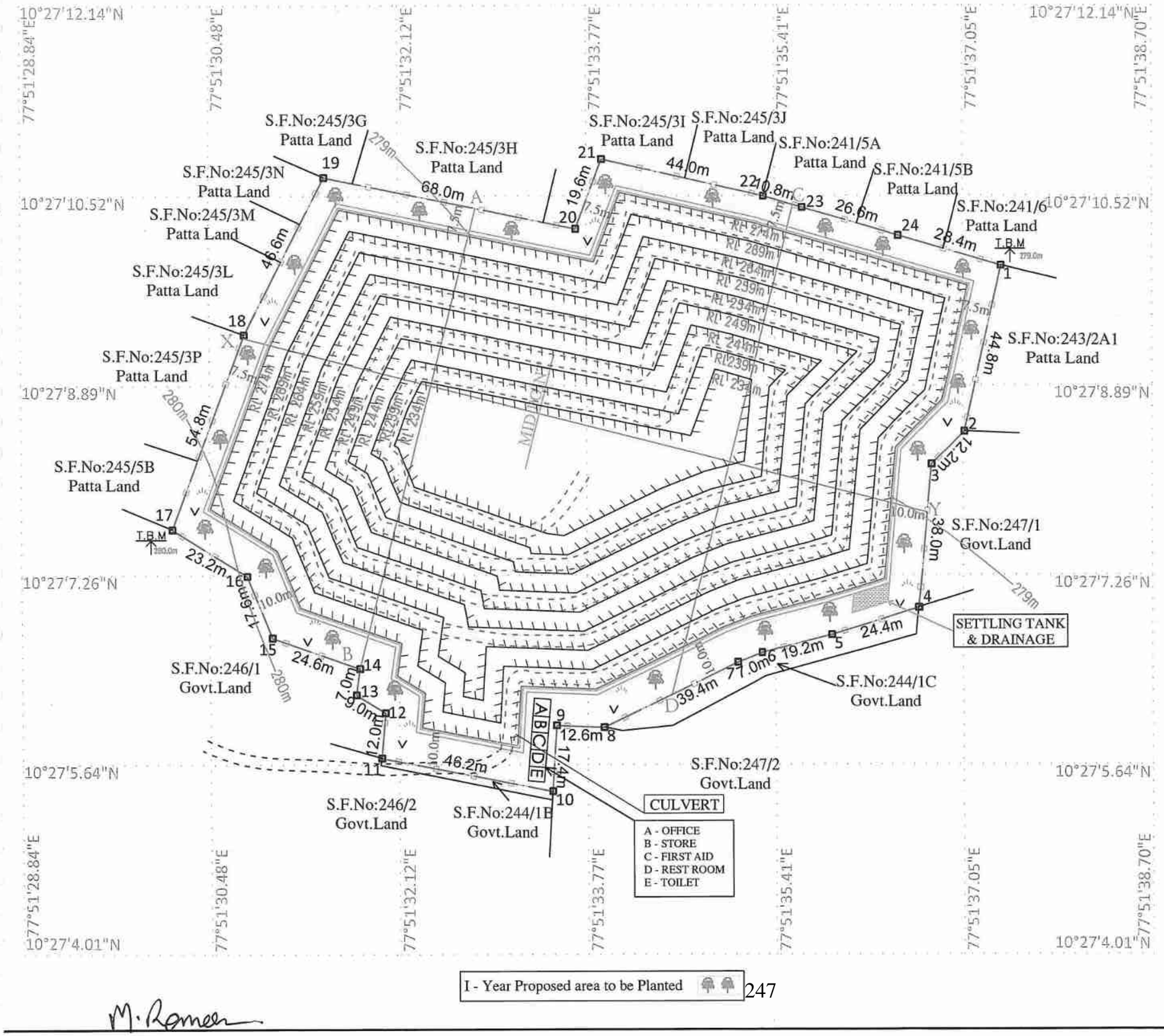
MINE LAYOUT PLAN & LAND USE PATTERN
SCALE 1: 1000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

246



I - Year Proposed area to be Planted

A - OFFICE
B - STORE
C - FIRST AID
D - REST ROOM
E - TOILET

247

M. Ramesh

N

Office of the Assistant Director Geology and Mining Collectorate Dindigul - 624 004

PLATE NO- VI

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F,No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- FMB BOUNDARY
- BOUNDARY PILLAR □1 □2
- APPROACH & HAUL ROAD
- GRAVEL
- SHRUBS
- CONTOUR LINES 280m
- TEMPORARY BENCH MARK T.B.M 280.0m
- FENCING
- ULTIMATE BENCH

CONCEPTUAL PLAN
SCALE 1 : 1000

Prepared By:

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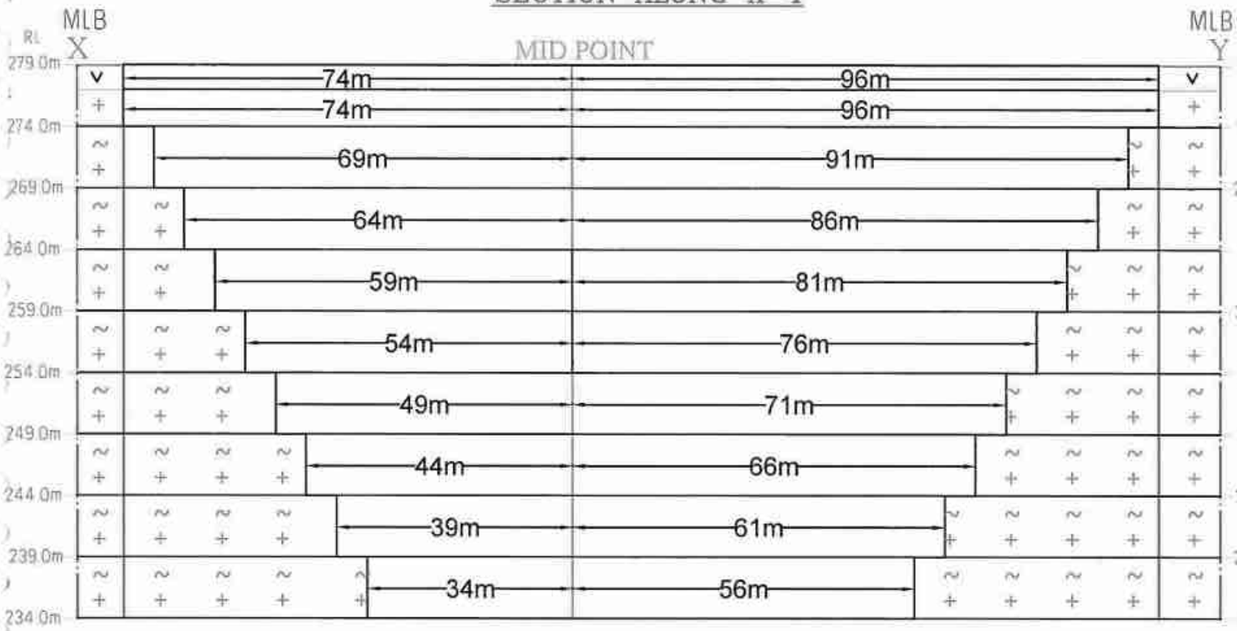
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

SECTION ALONG X-Y



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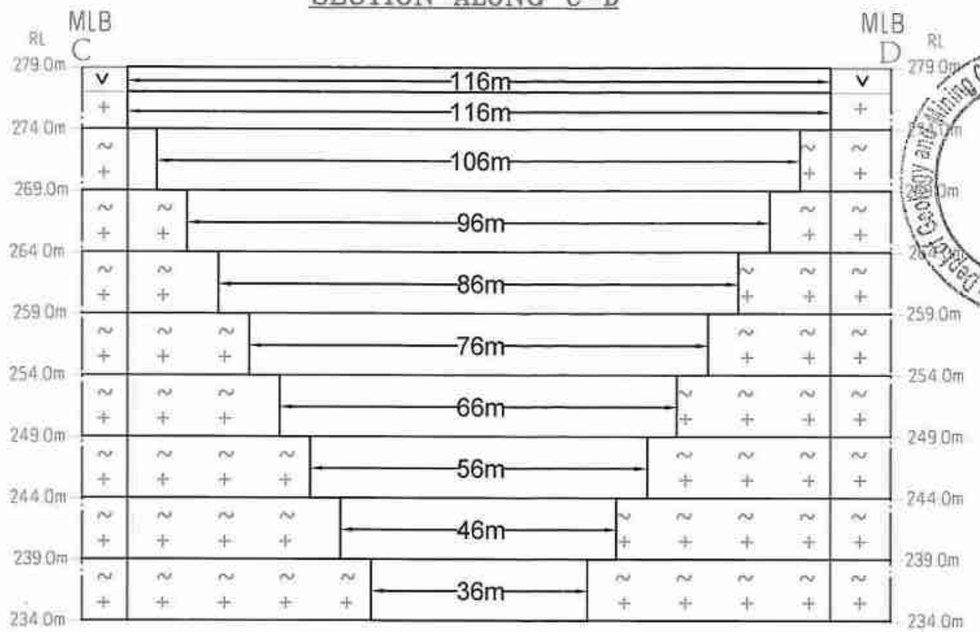
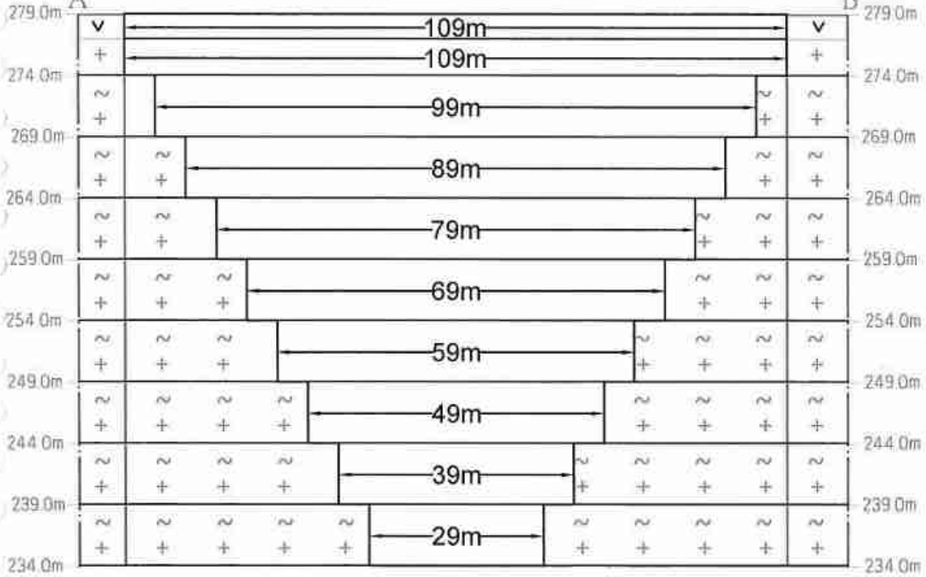


SECTION ALONG A-B



MINEABLE RESERVES

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m^3	Rough Stone in m^3	Gravel in m^3
XY-AB	I	74	109	2	16132	.....	16132
	I	74	109	3	24198	24198	.....
	II	69	99	5	34155	34155	.....
	III	64	89	5	28480	28480	.....
	IV	59	79	5	23305	23305	.....
	V	54	69	5	18630	18630	.....
	VI	49	59	5	14455	14455	.....
	VII	44	49	5	10780	10780	.....
	VIII	39	39	5	7605	7605	.....
	IX	34	29	5	4930	4930	.....
TOTAL				**45**	**182670**	**166538**	**16132**
XY-CD	I	96	116	2	22272	.....	22272
	I	96	116	3	33408	33408	.....
	II	91	106	5	48230	48230	.....
	III	86	96	5	41280	41280	.....
	IV	81	86	5	34830	34830	.....
	V	76	76	5	28880	28880	.....
	VI	71	66	5	23430	23430	.....
	VII	66	56	5	18480	18480	.....
	VIII	61	46	5	14030	14030	.....
	IX	56	36	5	10080	10080	.....
TOTAL				**45**	**274920**	**252648**	**22272**
GRAND TOTAL					**457590**	**419186**	**38404**

PLATE NO- VIA

APPLICANT:
Ms.SHREE THEVAR BLUE METALS,
S.F,No'S: 295/1, 295/1A, 295/2 & 295/3,
KOPTHAPULLI VILLAGE,
REDDIARCHATRAM,
DINDIGULDISTRICT-624622.

LEASE APPLIED AREA:

S.F.NO	: 244/1A, 244/2A1 & 244/2A2
EXTENT	: 2.43.0Hect
VILLAGE	: K.PUDUKOTTAI,
TALUK	: DINDIGUL WEST,
DISTRICT	: DINDIGUL

INDEX

MINE LEASE BOUNDARY

SAFETY DISTANCE

ROUGH STONE

GRAVEL

ULTIMATE BENCH

CONCEPTUAL SECTIONS
SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

திண்டுக்கல் மேற்கு வட்டாட்சியர் அவர்களுக்கு
பணிந்து சமர்ப்பிக்கப்படுவது.

திண்டுக்கல் மேற்கு வட்டம், [illegible] உள்வட்டம், [illegible] கிராமம் புல எண் 244/1A பரப்பு 1.91.0 ஏக், புல எண் 244/2A1 பரப்பு 0.28.0 ஏக், புல எண் 244/2A2 0.24.0 ஏக், மொத்தப்பரப்பு 2.43.0 ஏக் [illegible], 1959-ம் [illegible] 19(1)-ன் [illegible]

[illegible] 2.43.00 [illegible] 1332 [illegible]

[illegible] 244/1A, 244/2A1, 244/2A2 [illegible] 11 [illegible] (3 [illegible]), [illegible] 6, [illegible] 31, [illegible] 2 [illegible] LT line, [illegible] 300 [illegible]

[illegible] Detail [illegible]

[illegible]

மேற்படி புல எண்ணுக்கு அரசு பதிவேடு மற்றும்
தொடர்பு பதிவேடு ஏதுமில்லை. மேற்படி அரசு [illegible]
புறம்போக்கு 300 அடி நீளமுள்ள கிராமச் சாலை
அமைக்கப்பட்டு பயன்பாட்டில் உள்ளது.

இந்நிலையில் மேற்படி புறம்போக்கு நிலம் எவ்வித
[illegible] [illegible], [illegible]
[illegible] [illegible] [illegible]
புல எண் 244/1A, 244/2A1, 244/2A2
[illegible] நான்கெல்லை விபரம்:

வடக்கு புல எண் 241 மற்றும் புல எண் 245
மேற்கு புல எண் 245 மற்றும் புல எண் 246
தெற்கு புல எண் 246 மற்றும் புல எண் 247
கிழக்கு புல எண் 243 மற்றும் புல எண் 247

எனவே மேற்படி [illegible] [illegible]
கோ புதுக்கோட்டை கிராமம் புல எண் 244/1A பரப்பு
1.91.0 ஏர், புல எண் 244/2A1 பரப்பு 0.28.0 ஏர்,
புல எண் 244/2A2 - 0.24.0 ஏர் ஆகமொத்தப் பரப்பு
2.43.0 ஏர் [illegible] நிலம் ([illegible]) [illegible]
[illegible] [illegible] [illegible] மற்றும் [illegible]
உட்பட அரசு [illegible] [illegible]
[illegible]

இணைப்பு: கிராமக் கணக்கு நகல்

[signature] 21/03/2024
கிராம நிர்வாக அலுவலர்
எண்.22, க. புதுக்கோட்டை கிராமம்
திண்டுக்கல் மேற்கு வட்டம்.

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL® OF INDIA
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NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Technical Mining Solutions, Dharmapuri

5/1485-3, Salem Main Road, Elakkiyampatty, Dharmapuri, Tamil Nadu

*The organization is accredited as **Category-A** under the QCI-NABET **Scheme for Accreditation of EIA Consultant Organization, Version 3**: for preparing EIA/EMP reports in the following Sectors.*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals - including opencast and underground mining	1	1 (a) (i)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated January 24, 2024, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3142 dated Feb 19, 2024. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

Issue Date
Feb 19, 2024

Valid up to
Dec 31, 2026

Mr. Ajay Kumar Jha
Sr. Director, NABET

Certificate No.
NABET/EIA/23-26/RA 0319

Prof (Dr) Varinder S Kanwar
(CEO NABET)

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