

**DRAFT OF 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 = 12.20.50 hectares

At

Kuppam Village, Pugalur Taluk,

Karur District, Tamil Nadu State

ToR letter No. Lr. No. SEIAA-TN/F.No.10158/ToR-1531/2023 Dated:07.08.2023

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
M/s.Shri Selva Vinaayaga Blue Survey No.162/1, Thalaiyuthuppatti, Kuppam Post, Pugalur Taluk, Karur District- 639 111	4.30.5 Ha & 171/1A (Part) & 171/1B (Part)	Rough Stone-1048968 m³ Gravel – 743320 m³

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



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NABET ACC. NO: NABET/EIA/2124/SA 0184
Valid till: Apr 2, 2024

ENVIRONMENTAL LAB

EXCELLENCE LABORATORY

**No.23/93, 5th Street Ram Nagar, S.S.Colony,
Madurai, Tamil Nadu**

**NABL Certificate Number: TC-6932, Valid Until : 19.03.2024
Baseline Study Period – October 2023 through December 2023**

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR issued vide Lr No. SEIAA-TN/F.No.10358//SEAC/ToR-1642/2023 Dated 02.01.2024

for

M/s.Shri Selva Vinaayaga Blue Metal Rough Stone & Gravel Quarry

1	The proponent shall furnish registered land deed/lease agreement for all the Survey nos of the proposed mining lease area.	The registered land deed/lease agreement will be included in the final EIA report.
2	The PP shall furnish the letter commenting the depth of 2m quarried earlier in the same survey numbers from the concerned AD (Mines) after having inspected the site.	The details regarding the AD Mines will be submitted in the final EIA report.
3	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, place of worship, industries, factories, sheds, 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 included in the final EIA report.
4	The Proponent shall provide a Controlled Blast design & Vibration Prediction for the structures located within 500 m from the lease boundary and any other sensitive structures.	A controlled design of blasting has been given in Section 2.6 under Chapter II, pp.16-22.
5	The project proponent shall furnish details of photographs of adequate barbed fencing, greenbelt and garland drain around the boundary of the proposed quarry.	The photographs of green belt, fencing is shown in the Figure 4.5 under Chapter IV, p.97.

6	The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	This details of Slope Stability of the proposed quarry will be included in the final EIA report.
7	The proponent shall furnish a revised EMP budget for entire life of proposed mining including progressive mine closure plan.	A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.123-128.
8	The PP shall mark the DGPS reference pillars painted with blue & white colour indicating the safety barrier of 7.5 m to be left under the Rule 13 (1) of MCDR, 1988 within the lease boundary and protective bunds.	The details of the DGPS reference pillars will be submitted in the final EIA report.
9	The PP shall develop green belt/plantation all along the mining lease boundary in a safety barrier.	The details of green belt/plantation along the mine lease area are discussed in the Section 4.6 under Chapter IV, pp.95-98.
10	The PP shall furnish the total manpower required for the proposed mining project including Statutory officials, Geologist, Supervisory staff, Skilled, Semi-skilled & Unskilled staff with showing the representation of the local people as per their eligibility and experience.	Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.22.
Annexure - I		
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
The details regarding the AD Mines letter will be submitted in the final EIA report.		

	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.	The VAO certificate has been submitted in the Annexure IV.
3		The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 100m, (ii) 100m, (iii) 200m and (iv) 300m (v) 500m shall be enumerated with the 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.	The details about the structure within the radius of 100m, 200m, 300m, 500m will be included in the final EIA report.
4		The PP shall submit a detailed hydrological report indicating the impact of proposed	Detailed hydrogeological study was carried out. The results have been

	quarrying operations on the waterbodies like lake, water tanks, etc are located within 1km of the proposed quarry.	discussed Section 3.2 under Chapter III, pp.34-46.
5	The proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	Details regarding Bio diversity is given in the Section 3.5 under Chapter III, pp.60-72.
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.	The document will be submitted along with the final EIA report.
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 prepare and submit an 'Slope Stability Action plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director and mining during the time of appraisal for obtaining the EC.	The Slope Stability report will be included in the final EIA report.
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 30m below ground level.	The Slope Stability report will be included in the final EIA report.
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	The affidavit for blasting has been enclosed in the approved mining plan report in Annexure III.

		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.	A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.16-22.
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.	The lease has one rough stone and gravel mines in Kuppam Village, Pugalur Taluk, Karur District. The lease period grant for 5 years. The EC granted for rough stone and gravel in S.F.No 171/2 over an extent of 4.03.0 ha. Lr.No.DEIAA/DIA/TN/MIN/18650/2018-KRR.EC.No.133/2018 dated.02.11.2018.
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	a.	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	The proponent lease area was previously granted to quarrying of rough stone I favour of M/s.Tata Blue Metal by the district collector Karur proceeding vide. Rc.D/149/2005 in S.F.No.171/2 & 1771/1A, Karur District, Aravakurichi Taluk, Kuppam Village over an extent of 5.51.5 ha for a period of 5 years. The lease was executed 24.12.2005 to 23.12.2010 for a period of 5 years.
14	b.	Quantity of minerals mined out.	
	c.	Highest production achieved in any one year.	
	d.	Detail of approved depth of mining.	
	e.	Actual depth of the mining achieved earlier.	

	f.	Name of the person already mined in that leases area.	The details of previous lease details is attached in the Approved Mining Plan in Annexure III.
	g.	If EC and CTO already obtained, the copy of the same shall be submitted.	
	h.	Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
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 and other ecological features of the study area (core and buffer zone).	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, p.12.
16		The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	Drone video showing fencing and greenbelt development will be submitted during 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 showing fencing, green belt is shown in Figure 4.5 under Chapter IV, p.97.
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 mineral reserves of the project have been discussed in Section 2.5 under Chapter II, pp.14-15. The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.82 - 102.

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 safety and to protect the environment.	Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.22.
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, pp.34-46.
21	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III, pp. 23-81.
22	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.113-116.

	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.	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
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.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.25-33. The details of surrounding sensitive ecological features have been provided in Table 3.40 under Chapter III, p.80. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.18 & 19.
25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects	This condition is not applicable to this project because no dumps have been

	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.	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.	This condition is not applicable to this project because this project is not located in proximity to the areas of areas declared as 'Critically Polluted' (or) the project areas which attracts the court restrictions for mining operations.
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.	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
28	Impact on local transport infrastructure due to the Project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III, pp.77-79.
29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III, pp.60-72.
30	A detailed mine closure plan for the proposed project shall be included in	A progressive mine closure plan has been attached with the approved mining plan

	EIA/EMP report which should be site-specific.	report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.19.
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, pp.95-98.
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	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.

	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.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII, pp.112-113.
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, pp.109-111.
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.	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.99-100.
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, pp.119 & 120.
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	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 27 people directly as discussed in Section 8.1 under

	indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Chapter VIII, p.118.
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, pp.118-120.
41	If any quarrying operation were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	The CCR details will be included in the final EIA report.
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, pp.122-128. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted in the final EIA report.
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	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

	attracting penal provisions in the Environment (Protection) Act' 1986.	of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.
<p>The SEAC in its 416th meeting held on 13.10.2023 furnished its recommendations for granting Terms of Reference (ToR) along with Public Hearing subject to the conditions stated therein.</p> <p>In this connection, in the 670th authority meeting held on 06.11.2023 the authority decided to defer and to call for additional particulars as follows</p>		
1	The proponent shall furnish registered land deed /lease agreement for all the Survey nos of the proposed mining lease area.	The details will be included in the final EIA report.
<p>In this condition, the PP has furnished reply Dt: 26.12.2023 and the proposal was placed in the 685th authority meeting held on 02.01.2024, SEAC after detailed discussion accepts the decision of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions in 'Annexure B' of this minute.</p>		
1	The project proponent shall prepare mine closure plan considering quantity of Topsoil & Weathered rock, If any	The mine closure plan as discussed in Section 2.6.4 under Chapter II, p.19.
2	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserves etc, up to a radius of 25km from the proposed site.	The DFO letter will be submitted in the final EIA letter.
Annexure 'B'		
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective

		implementation of green belt development plan, water sprinkling, blasting, etc.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 & 2.7 under Chapter II, pp.16-22.
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.

7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The committee will submit the fire safety and evacuation plan as discussed in Section 7.3 under Chapter VII, pp.112-113.
Impact study of Mining		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following	
	a) Soil health & soil biological, physical land chemical features.	Soil health and biodiversity have been discussed in Sections 3.1 and 3.5 respectively under Chapter III, pp.25-33 & pp.60-72.
	b) Climate change leading to Droughts, Floods etc.	Climatic condition of the proposed project area has been discussed in Section 3.3 under Chapter III, pp.46-56.
	c) Pollution leading to release of	The information about CO ₂ emission has

	Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local People.	been added to Section 4.6 under Chapter IV, pp.95-98.
	d) Possibilities of water contamination and impact on aquatic ecosystem health.	Possibilities of both surface and ground water contamination have been discussed in Section 4.3 under Chapter IV, pp.83-84. The impact on aquatic species has been discussed in Section 4.6 under Chapter IV, pp.95-98.
	e) Agriculture, Forestry, & Traditional practices.	Sorgum, millet, groundnut, and coconut are the primary crops that are cultivated in the study area.
	f) Hydrothermal/Geothermal effect due to destruction in the Environment.	The average geothermal gradient of earth is 25 ⁰ C/km. As the proposed depth of mining is 50 m below the local ground level, the temperature will increase by 1.25 ⁰ C at the depth of mining.
	g) Bio-geochemical processes and its foot prints including environmental stress.	Data is not included.
	h) Sediment geochemistry in the surface streams.	The details regarding is discussed in the Table 3.4 under Chapter III, p.33.
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining area.	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, as shown in Section 4.6 under Chapter IV, pp.95-98.
14	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III, pp.60-

		72. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area shall be given and if so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Details of vegetation in the lease area have been provided in Section 3.5 under Chapter III, pp.60-72. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.95-98.
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III, pp.60-72 and measures have been provided in Section 4.6 under Chapter IV, pp.95-98.
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV, pp.82-102.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV, p.82.
Forests		
19	The project proponent shall study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.

20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV, pp.95-98.
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV, pp.95-98.
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site.	There are no protected areas, National Parks, Corridors and Wildlife pathways near project site. The list of environmentally sensitive areas within 10 km radius has been provided in Table 3.40 under Chapter III, p.80.
Water Environment		
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.34-46.
24	Erosion control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV, pp.83.

25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.82-102.
26	The project proponent shall study impact on fish habitats and the food WEB/food chain in the water body and Reservoir.	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.5.1 under Chapter 3, pp.60-67.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp.82-102.
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV, pp.95-98.
29.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, p.83.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV, pp.83.
Energy		
31	The measures taken to control Noise, Air, water, Dust control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures taken to control noise, air, water, and dust have been given under Chapter IV, pp. 82-102.

Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV, pp.95-98.
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The matter has been discussed in Chapter IV, pp. 82-102.
Mine Closure Plan		
34	Detailed Mine closure plan covering the entire mine lease period as per precise area communication order issued.	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, p.19.
EMP		
35	Detailed Environment Management plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X, pp.122-128.
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X, pp.123-128.

Risk Assessment		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII, pp.109-111.
Disaster Management Plan		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.112-113.
Others		
39.	The project proponent shall furnish VAO certificate with reference to 300 m radius regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc.	The VAO certificate has been submitted in the Annexure IV.
40	As per the MoEF & CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management plan.	The concerns raised during public consultation will be submitted in the final EIA report.
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The	The matter on plastic waste management will be included in the final EIA report

	ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	
STANDARD TERMS OF REFERENCE		
1.	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable. This is not a violation category project. This proposal falls under B1 category.
2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	The proposed site for quarrying is a private land. A copy of the document showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure III.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents are in the name of the lessee.
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	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, p.12.

5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III, pp.23-81.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The Environmental Policy will be included in the final EIA report.
8.	Issues relating to Mine Safety, including subsidence study in case of underground	It is an opencast quarrying operation proposed to operate in Manual method.

	<p>mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.</p>	<p>The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90⁰ bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.</p>
9.	<p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.</p>	<p>The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation etc., is for the life of the mine / lease period.</p>
10.	<p>Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p>	<p>Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1, under Chapter III, pp.25-33. The details of surrounding sensitive ecological features have been provided in Table 3.40 under Chapter III, p.80. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, pp.18-19.</p>

11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers.
12.	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.40 under Chapter III, p.80.
13.	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	It is not applicable as the proposed project area does not involve any forest land.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease

		area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Reserve Forest is found within the study area. The matter has been discussed Section 3.5.1, under Chapter III, pp.62-67.
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.40 under Chapter III, p.80.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.40 under Chapter III, p.80.
18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section

	<p>carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.</p>	<p>3.5 under Chapter III, pp.60-72.</p>
19.	<p>Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.</p>	<p>Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range'.</p>
20.	<p>Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).</p>	<p>Not Applicable The project doesn't attract the C.R.Z. Notification, 2018.</p>

21.	<p>R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.</p>	<p>Not Applicable.</p> <p>There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project Affected People (PAP) are not provided.</p>
22.	<p>One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified</p>	<p>Baseline data were collected for the period of October – December 2023 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.8 under Chapter III, pp. 25-80.</p>

	<p>keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	
23.	<p>Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.</p>	<p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.84-91.</p>
24.	<p>The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.</p>	<p>The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II, p.20.</p>
25.	<p>Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.</p>	<p>Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors</p>

		through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, p.83.
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Not Applicable. The ground water table is found at the depth of 65m below ground level. The ultimate depth of quarry is 50 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2 under Chapter III, pp.34-46.

29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 196 m AMSL. Ultimate depth of the mine is 50 m BGL. Depth to the water level in the area is 65 m BGL.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.95-98.
32.	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network	Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no

	(including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III, pp.77 - 79.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.6 under Chapter II, pp.19.
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Progressive mine closure plan has been prepared for this project and is given in Section 2.6.4 under Chapter II, p.19.
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.99 - 100.
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically	No public health implications are anticipated due to this project. Details of CSR and CER activities have been

	evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.119 & 120.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	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 27 people directly as discussed in Section 8.1 under Chapter VIII, p.118.
38.	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.123-128.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be submitted during the final EIA report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs.88,46,000/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs.12816971 as capital cost and recurring

		cost as Rs.4284180 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 36636142, as shown in Tables 10.1 & 10.2 under Chapter X, pp.123-128.
42	A disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.112-113.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.118-120.
44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available	Original Baseline monitoring reports will be submitted in the final EIA report.

	during appraisal of the Project	
e)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.
f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be submitted in the final EIA report.
g)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009 have been followed while preparing the EIA report.
h)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	No changes are made in the basic scope and the project parameters.
i)	As per the circular no. J-11011/618/2010-IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of	The CCR report will be submitted in the final EIA report.

	Ministry of Environment, Forest and Climate Change, as may be applicable.	
j)	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III.

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CHAPTER I

INTRODUCTION

1.0 PREAMBLE

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

In compliance with ToR obtained vide Lr.No. SEIAA-TN/F.No.10358/SEAC/ToR-1642/2023 Dated:02.01.2024, this EIA report has been prepared for the project proponent, M/s.Shri Selva Vinaayaga Blue Metal applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.171/1A(P), and 171/1B(P) over an extent of 4.30.5 ha in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects known as P1, P2 and one existing project known as E1. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016. The total extent of all the quarries is 12.20.50 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

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

Proposed Quarries					
Code	Name of the Owner	S.F. No	Village	Extent (ha)	Status
P1	M/s.Shri Selva Vinaayaga Blue Matel	171/1A(P), 171/1B(P)	Kuppam	4.30.50	Proposed Area
P2	Thiru.N.Sakthivel	105/1B(P), 112/1A, 112/2A	Kuppam	3.87.00	Applied Area
Existing Quarry					
E1	Tvl.Sri Selva Vinaayaga Blue Metal	171/2	Kuppam	4.03.00	26.11.2018 to 25.11.2023
Expired Quarries					
--	--	--	--	--	--
Total Cluster Extent				12.20.50	

Source:

DD Letter - Rc.No.64Mines/2023, Dated:17.08.2023.

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

1.1 PURPOSE OF THE REPORT

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **October-December2023** 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/441271/2023, dated 22.08.2023) 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 24.08.2023.

Scoping

The proposal was placed in the 416th meeting of SEAC on 13.10.2023. 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.

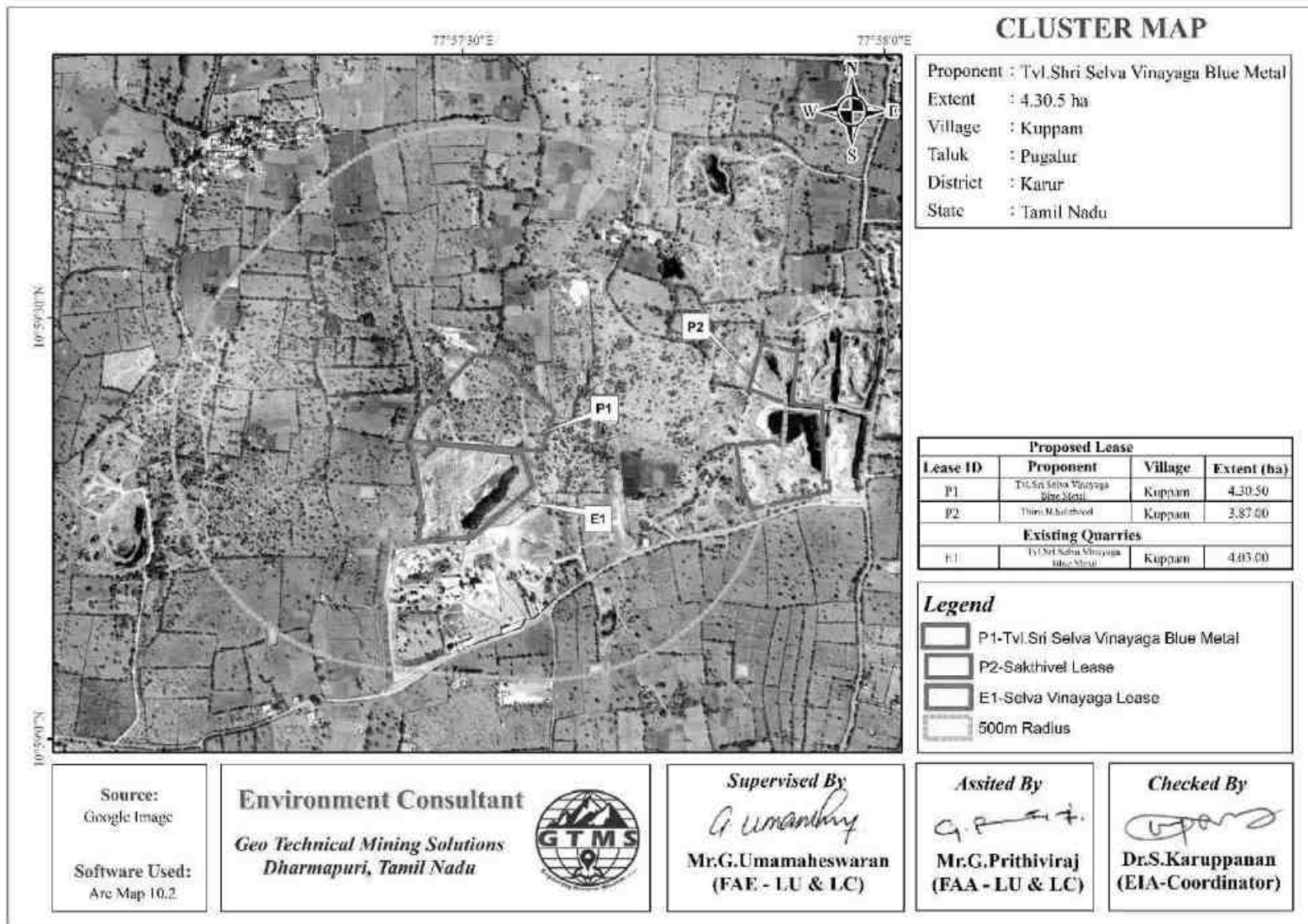


Figure 1.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

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 **Lr.No.SEIAA-TN/F.No.10358/SEAC/ToR-1642/2023**
Dated:02.01.2024.

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, 2010).

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.Shri Selva Vinaayaga Blue Metal
Address	Survey No.162/1, Thalaiyuthuppatti, Kuppam Post, Pugalur Taluk, Karur District- 639 111
Status	Proprietor

1.7 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel 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 Kuppam Village, Pugalur Taluk, Karur District, and 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.Shri Selva Vinaayaga Blue Metal Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	4.30.50 Ha	
S.F. No	171/1A(P), 171/1B(P)	
Toposheet No	58-F/13	
Location of Project Site	10° 59'20.50"N to 10° 59'27.29"N 77°57'25.79"E to 77°57'36.49"E	
Highest Elevation	196 m AMSL	
Proposed depth of Mining	50 m BGL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	2064816	86034
Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	1048968	74332
Proposed reserves for five years	Rough Stone in m ³	Gravel in m ³ /1 year
	1048968	74332
Method of Mining	Open-Cast Semi Mechanized mining	
Topography	Flat Topography	
Machinery proposed	Jack Hammer	4
	Compressor	3
	Tipper	10
	Excavator	2
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 Deployment	27 Nos	
Project Cost	Rs.88,46,000	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	5.25 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 **October – December 2023** 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.IA3-22/10/22-IA.III(E177258), the baseline monitoring data were collected during the period of **October-December 2023** and utilized for preparation of this EIA report*

CHAPTER II

PROJECT DESCRIPTION

2.0 GENERAL INTRODUCTION

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

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

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

2.1 DESCRIPTION OF THE PROJECT

The proponent, **M/s.Shri Selva Vinaayaga Blue Metal** 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 and gravel. Therefore, the proponent had applied for quarry lease on 17.02.2023 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.64/Mines/2023 Dated:14.07.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Karur Rc.No.64/Mines/2023 Dated:02.08.2023. The overall view of the project site is shown in Figure 2.1.



Figure 2.1 Overall View of Proposed Project Site

2.2 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu as shown in Figure 2.2. The area lies between Latitudes from 10°59'20.50"N to 10°59'27.29"N and Longitudes from 77°57'25.79"E to 77°57'36.49"E. The maximum altitude of the project area is 196 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

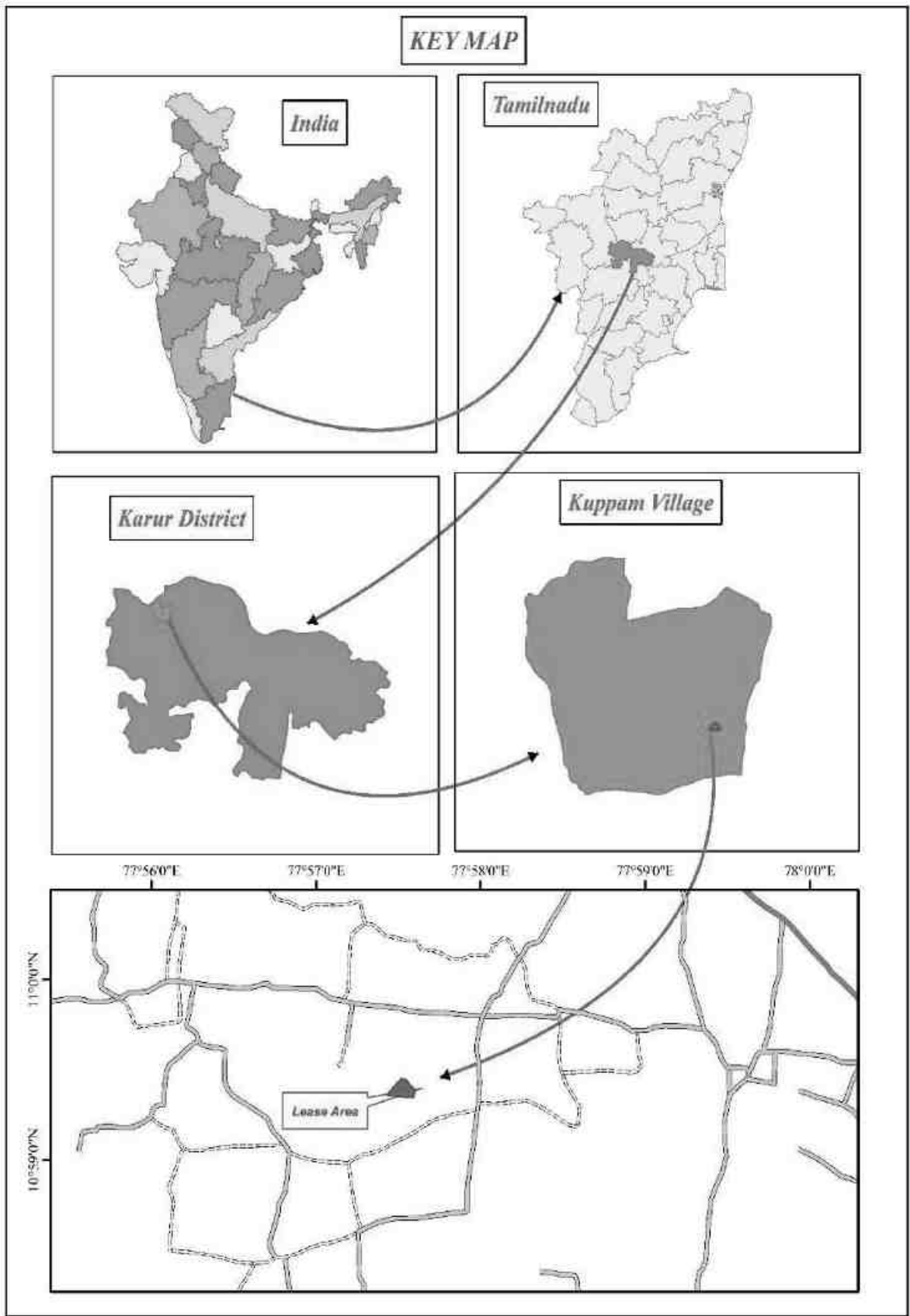


Figure 2.2 Key Map Showing Location of the Project Site

Table 2.1 Site Connectivity to the Project Area

Nearest Roadways	SH – 84 Noyal – Karur	3.1 km N
	NH – 81 Vellakovil - Karur	3.56 km S
	MDR – 332 Noyal – K.Paramathi	4.38 km W
Nearest Town	K.Paramathi	6.35 km SW
Nearest Railway Station	Pugalur	7.7 km NE
Nearest Airport	Trichy	84.2 km SE
Nearest Seaport	Tuticorin	252 km S
Nearest Villages	Salipalayam	2.1 km NW
	Punnam	3.4 km NE
	Kurumpapatti	2.2 km SE
	Karudampalayam	2.5 km SW

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 4.30.5 ha.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

2.3.1 Corner Coordinates

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

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude
1	10°59'27.08"N	77°57'32.89"E
2	10°59'25.24"N	77°57'34.37"E
3	10°59'23.23"N	77°57'36.49"E
4	10°59'22.45"N	77°57'36.24"E
5	10°59'20.50"N	77°57'35.60"E
6	10°59'20.96"N	77°57'28.76"E
7	10°59'21.22"N	77°57'25.79"E
8	10°59'21.83"N	77°57'26.08"E
9	10°59'22.40"N	77°57'26.20"E
10	10°59'27.29"N	77°57'30.85"E
11	10°59'27.14"N	77°57'31.95"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.

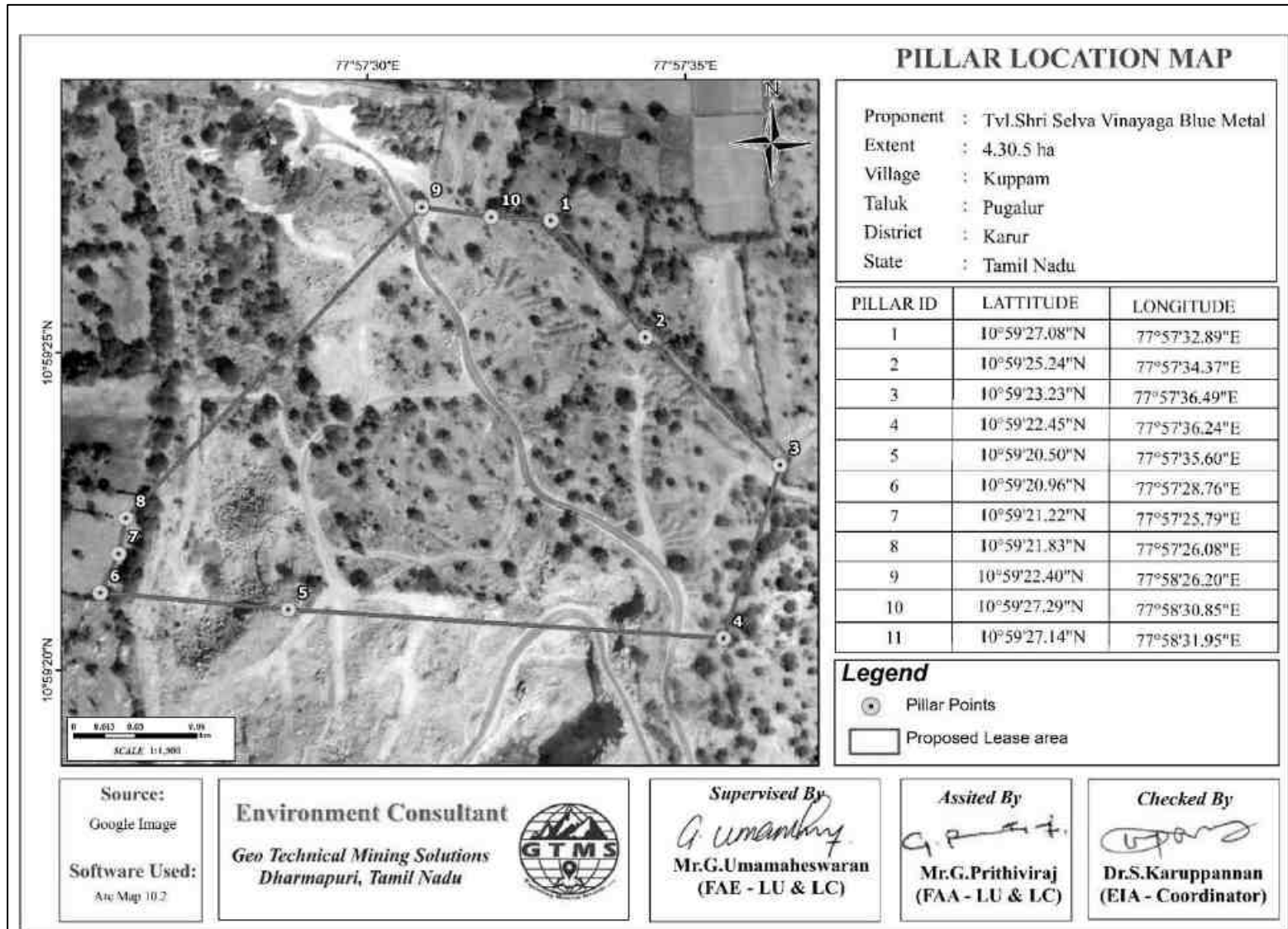


Figure 2.3 Google Earth Image Showing Lease Area with Pillars

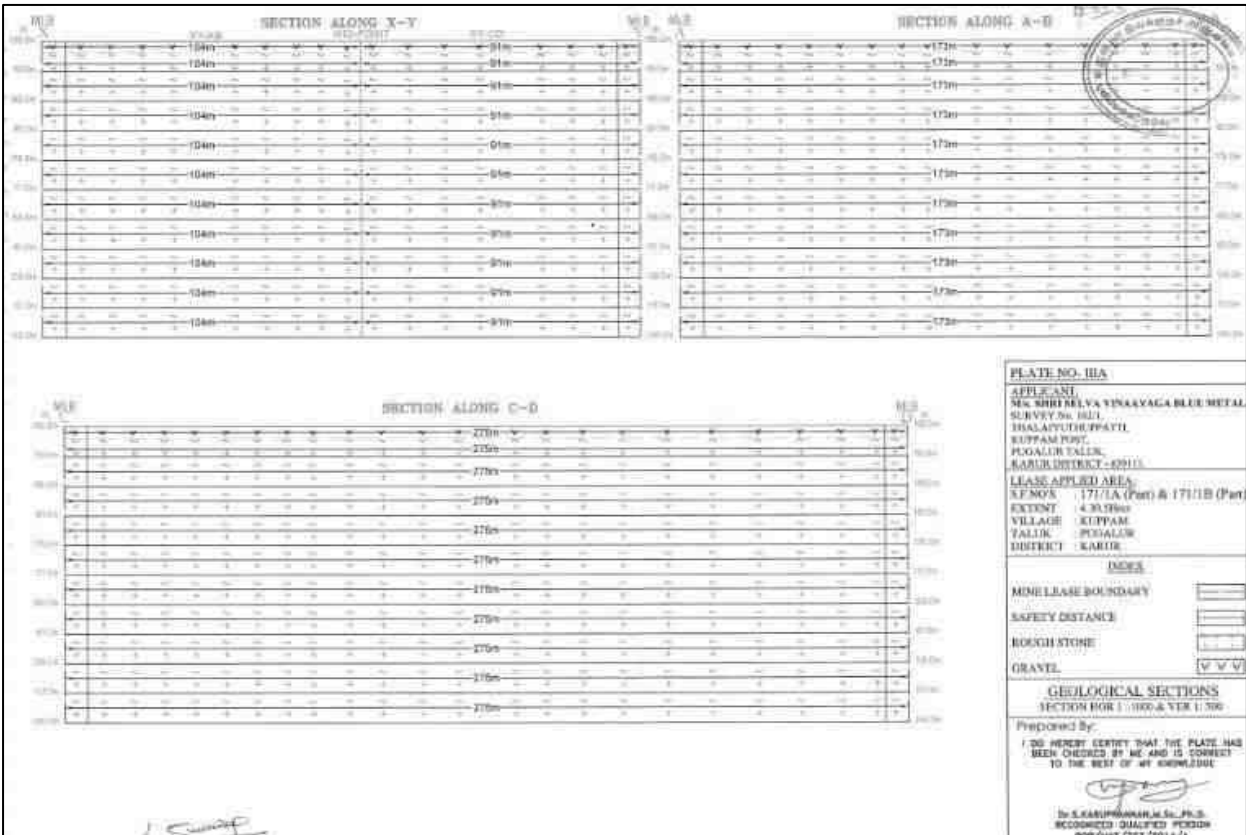
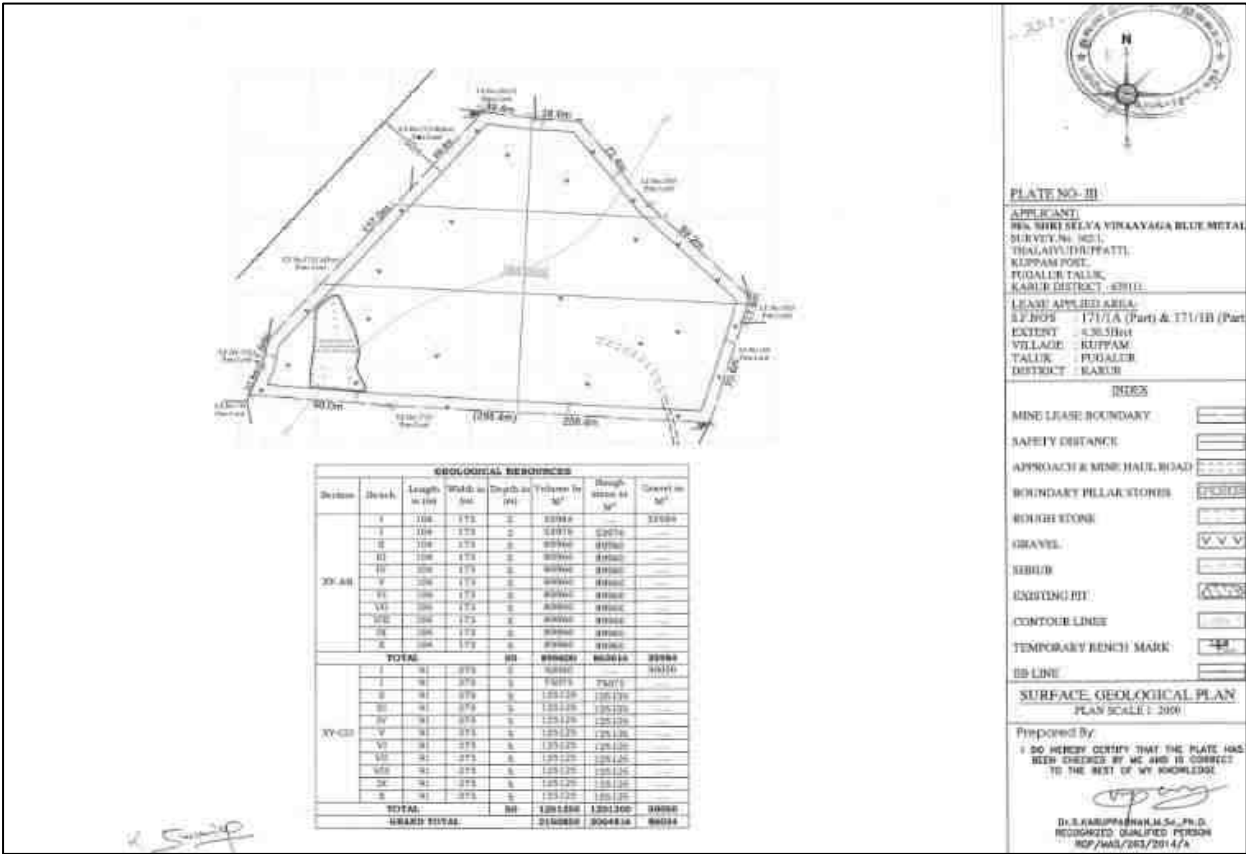


Figure 2.4 Surface Geological Plan and Section

2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5m 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 50m 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 2.4 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	2064816	86034
Mineable Reserves in m ³	1048968	74332
Proposed production for 5 years m ³	1048968	74332

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.5.

Table 2.4 Year-Wise Production Details

Year	Rough Stone in (m ³)/5 years	Gravel in (m ³) / 3 years
I	171050	23700
II	224288	24112
III	279480	26520
IV	187660	--
V	186490	--
Total	1048968	74332

Source: Approved Mining Plan & Tord

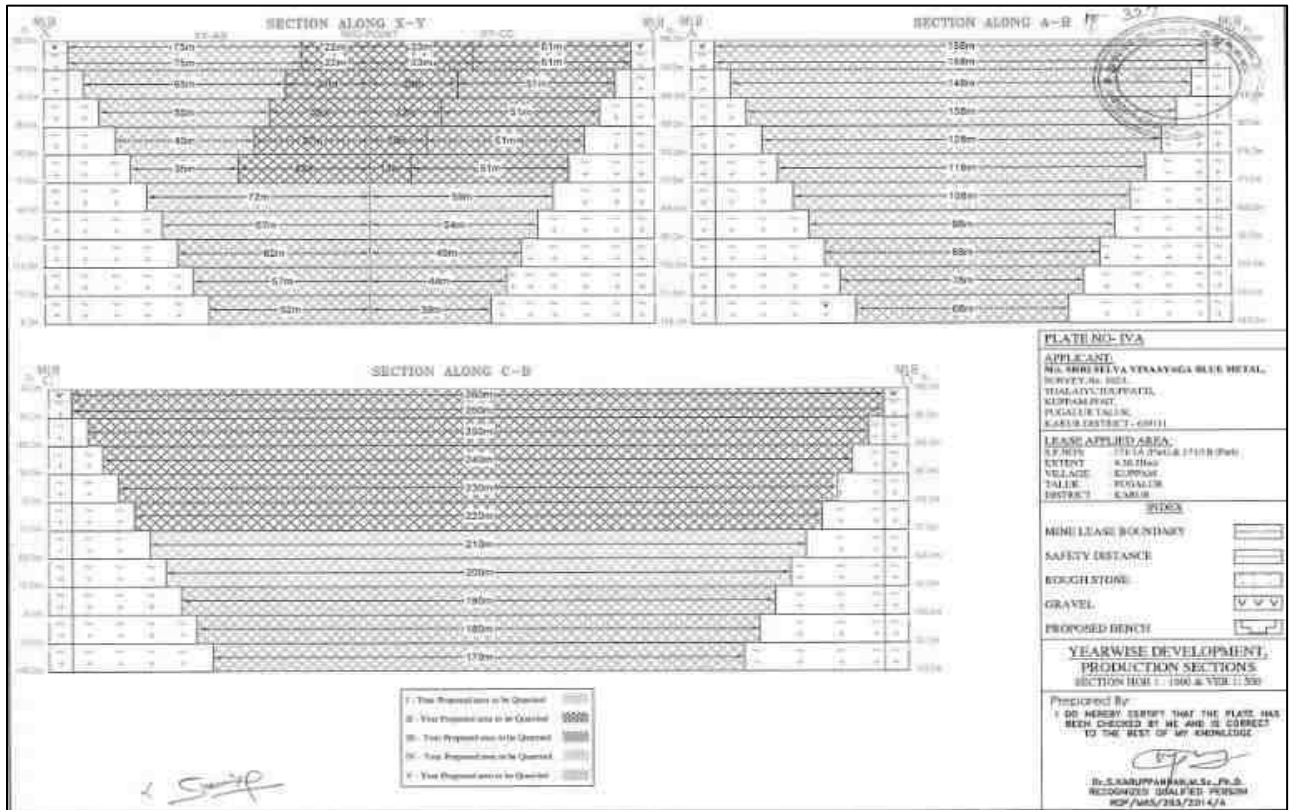
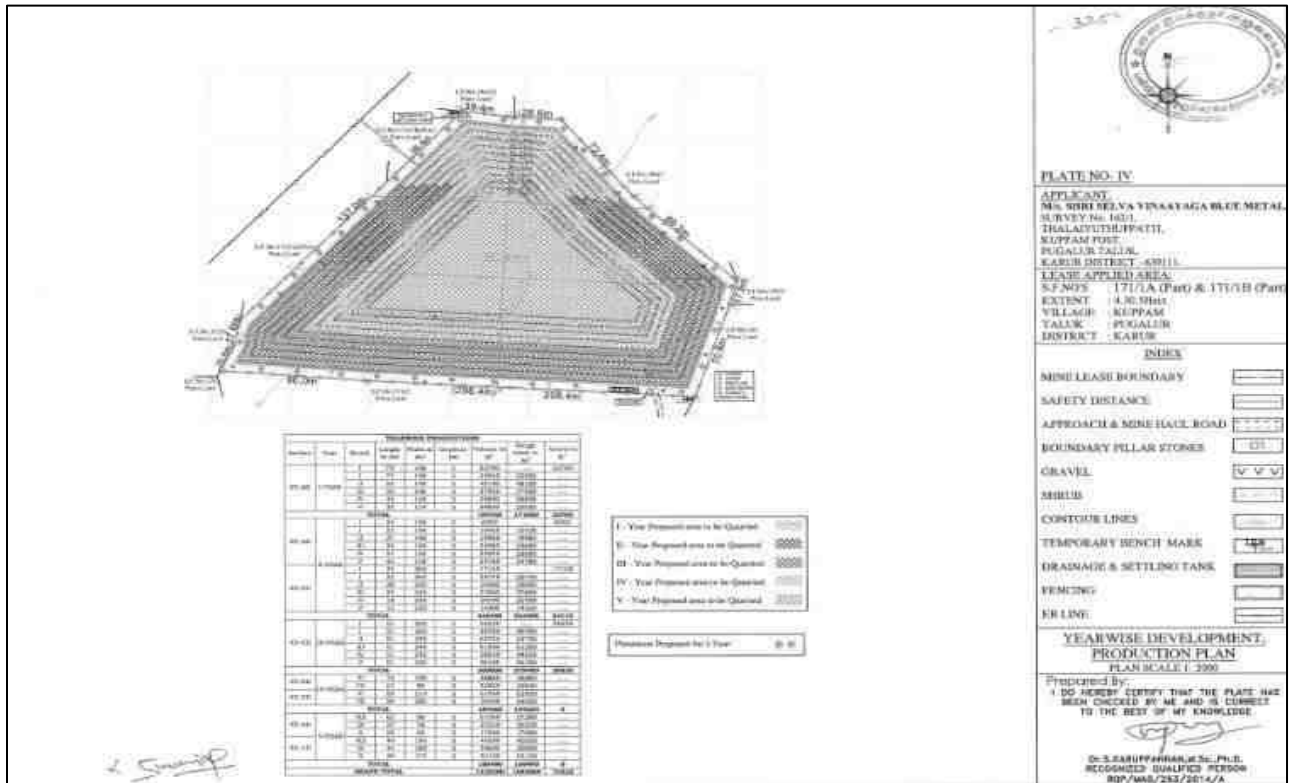


Figure 2.5 Year wise Development, Production Plan & Sections

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 and gravel. 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	777
Number of blastholes/day	187

Blasthole pattern	Staggered
Mass of explosive /day in kg	74.50
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 5 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 m³ 5 years	Gravel in m³ 3 years
Proposed production for 5 years	1048968	74332
Number of Working Days /Annum	270	270
Production of /Day (m ³)	777	55
No. of Lorry Loads	130	9

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	4	Hand held	--	Diesel
2	Compressor	3	Air	--	Diesel
3	Hydraulic Excavator	2	2.9-4.5 m ³	--	Diesel
4	Tipper	10	15 MT	--	Diesel

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 4.12.35 ha of land is unutilized, Whereas, at the end of the mine life, about 0.45.48 ha of land is used for green belt and 0.05.0 will be used for roads and 0.03.0 is used for infrastructure and 3.68.62 ha of land is used for area under mining.

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 mining	0.16.15	3.68.62
Infrastructure	Nil	0.03.0

Road	0.02.0	0.05.0
Green Belt	Nil	0.45.48
Drainage & Settling Tank	Nil	0.08.4
Unutilized area	4.12.35	Nil
Total`	4.30.5	4.30.5

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
861 plants inside the lease area	172200
1292 plants outside the lease area	387450
Wire Fencing	861000
Renovation of Garland Drain	43050
Total	14,63,700

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.

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth (m)
I	97	260	50

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.

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 5.25 KLD is given in Table 2.11.

Table 2.11 Water Requirement for the Project

Purpose	Quantity	Source
Dust Suppression	2.0 KLD	Existing bore wells nearby the lease area
Green Belt development	1.75 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.5 KLD	Existing bore wells and approved water vendors
Total	5.25 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 46,96,876 litres of HSD will be used for rough stone and gravel extraction during this 5 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 (821400 m ³)	Gravel (173850 m ³)	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m ³ /hr)	20	60	---
Time Required (hours)	52448	1239	---
Total Diesel Consumption for 5 years (litre)	839174	12389	851563
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	187	---	---
Total Diesel Consumption for 5 years (litre)	100980	---	100980
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m ³	6	6	---
Number of Trips / days	130	9*	---
Number of Trips / 5 years	174828	12389	---
Total Diesel Consumption for 5 years (litre)	3496560	247773	3744333
Total Diesel Consumption by Excavator, Compressor and Tipper			46,96,876

* Number of truck loads for gravel has been normalized for 5 years.

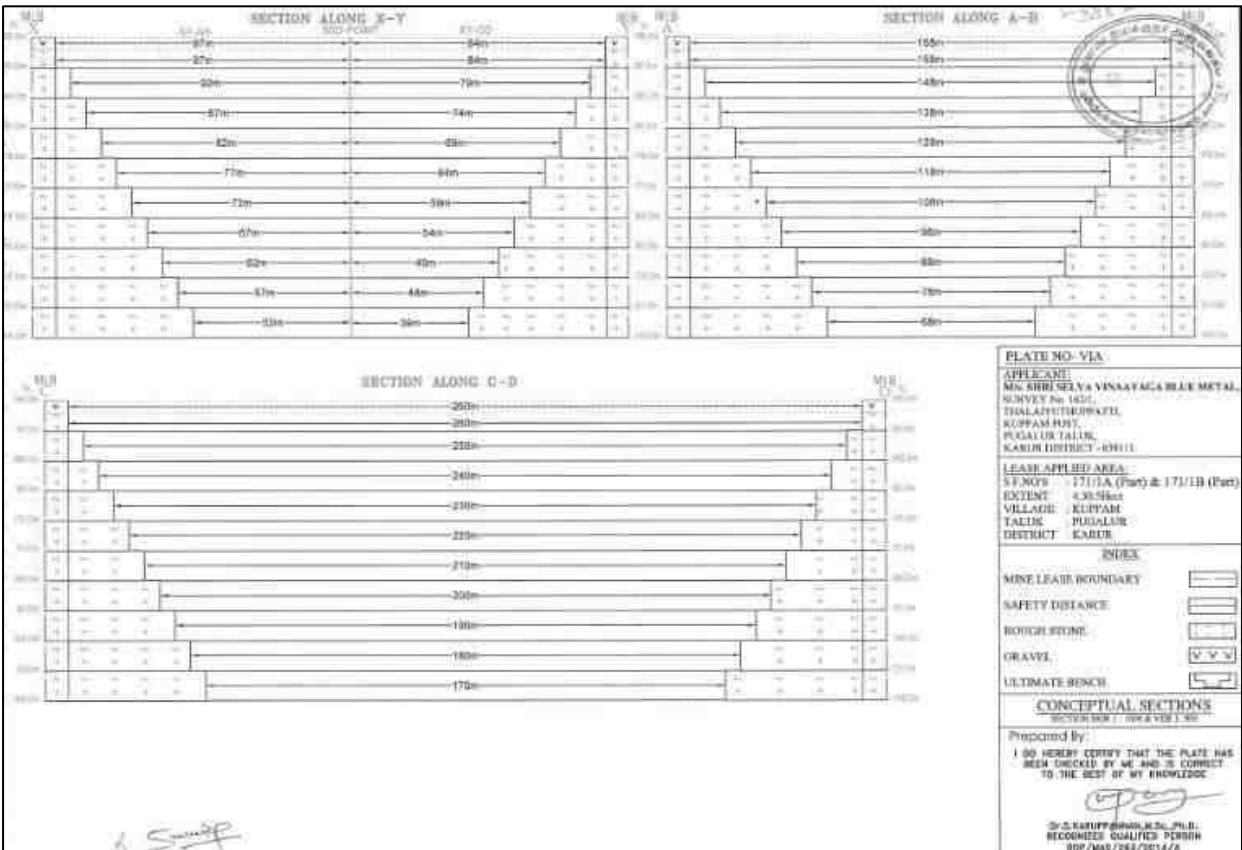
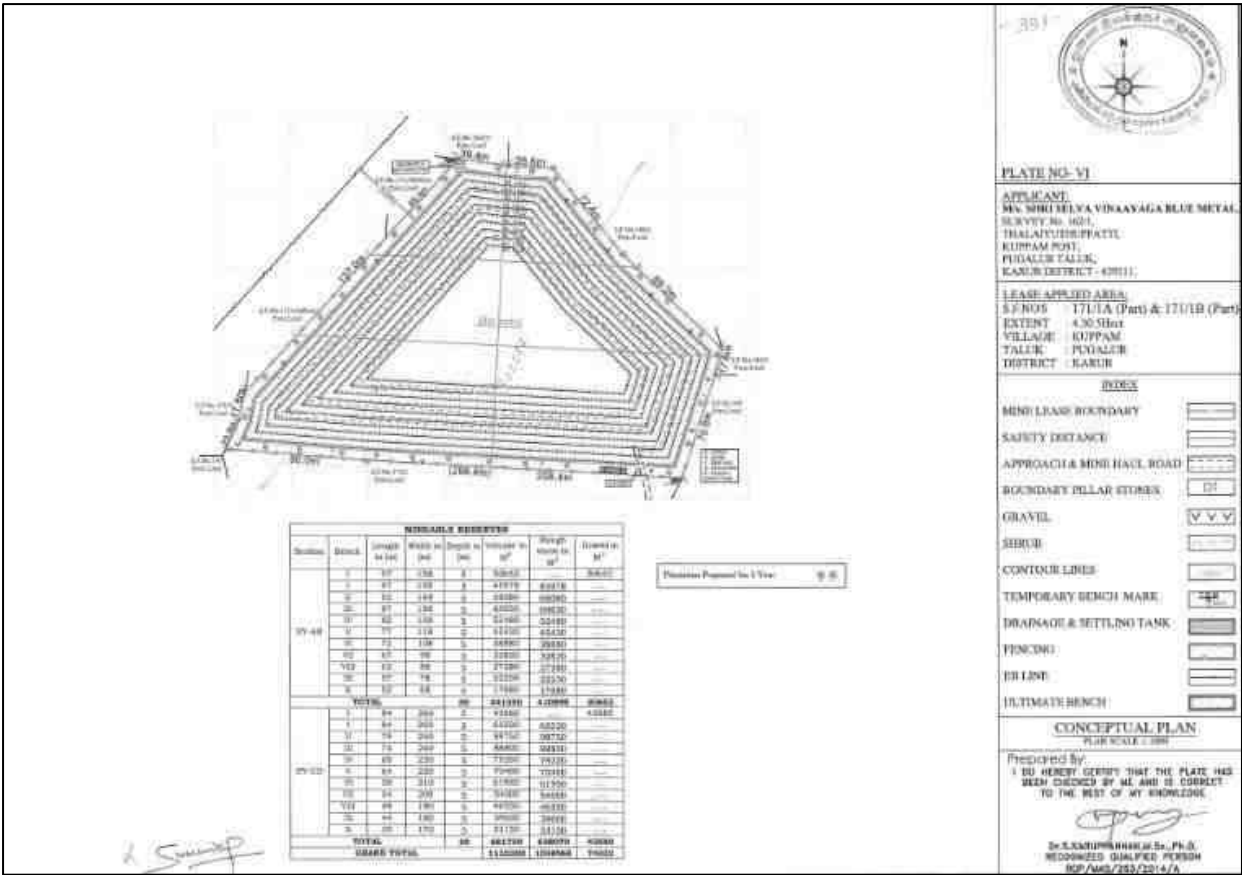


Figure 2.6 Conceptual Plan and Sections

2.6.9 Capital Requirement

The project proponent will invest **Rs.88,46,000/-** 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	14,75,000/-
2	Machinery cost	30,00,000/-
3	EMP Cost	43,71,000/-
Total Project Cost		88,46,000/-

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	Nil
2.	Unskilled	Musdoor/ Labours	23
Total			27

Source: Feasibility 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
		1 st	2 nd	3 rd	4 th	5 th	
1	Environmental Clearance						
2	Consent to Establish						Project Establishment Period
3	Consent to operate						Production starting period.
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

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

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. This cluster is about 510m away from the periphery of the other cluster located in the same village panchayat named Kuppam. The environmental consultant for both the clusters are the same. The monitoring of ambient air quality, noise levels, water quality and soil analysis for the nearby cluster were done in post monsoon season from October to December 2022 through the third party NABL accredited laboratory. The baseline monitoring done for 5km radius (TERMS OF REFERENCE [TOR] FOR EIA REPORT FOR ACTIVITIES / PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE Prepared by Administrative Staff College of India, Bellavista, Khairatabad, AUGUST 2009, Page No.86) not varied as much. Therefore, we utilize the baseline data for this cluster which is collected for the adjacent cluster in the year 2022 between October to December as per the Office Memorandum F. No. IA3-22/10/2022-IA.III [E 177258] issued by Government of India Ministry of Environment, Forest and Climate Change (IA Division) dated 8th June 2022. We also collected the baseline data in one location i.e, in the core for the present cluster in the post monsoon season October to December 2023 for cross verification. Field monitoring studies to evaluate the base line status of the project site were carried out covering **October through December 2023** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Excellence Laboratory 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	10 (1 in core & 9 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 (8 ground water)	IS 10500& CPCB Standards
Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/automatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM ₁₀ PM _{2.5} SO ₂ NO _x	24 hours, twice a week	10 (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	10 (1 core & 11 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrant & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, Population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

**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 geomorphic units, shallow weathered/buried pediment and pediplain dominate the study area, as shown in Figure 3.2. The lease area occurs in shallow weathered/buried pediplain terrain.

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, 5 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 229.16 ha accounting for 2.94 %, of which lease area of 4.30.5 ha contributes only about 0.052 %. 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.	LU/LC Type	Extend (ha)	Percentage
1	Barren Rocky / Stone waste	22.17	0.28
	Crop Land	7010.31	89.99
2	Dense Forest	69.44	0.89
3	Land with/without scrub	197.08	2.53
4	Mining/Industrial lands	229.16	2.94
5	Plantations	256.30	3.29
	Total	7789.74	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 196 m AMSL was observed in Northern side.

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 Center 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.

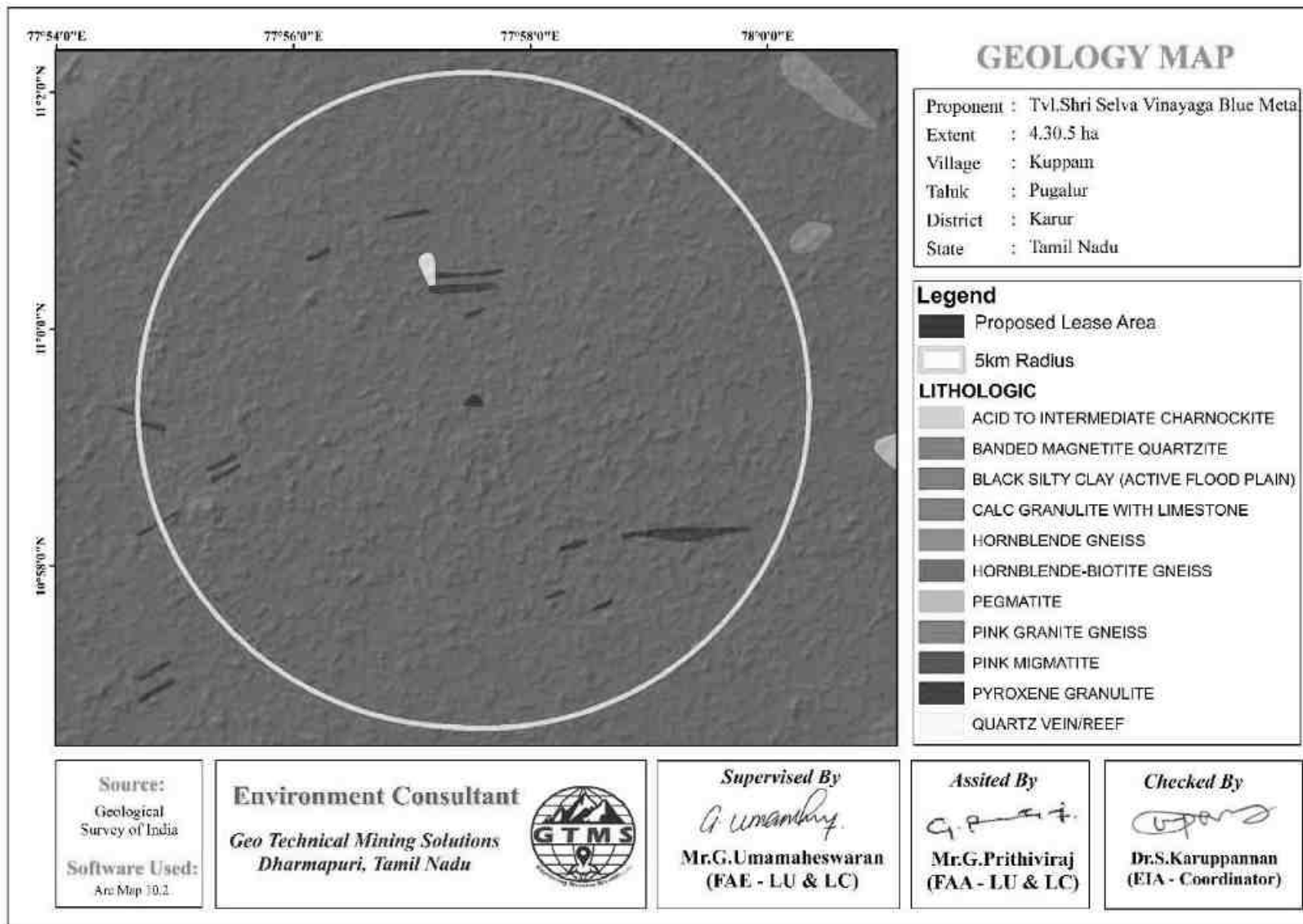


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

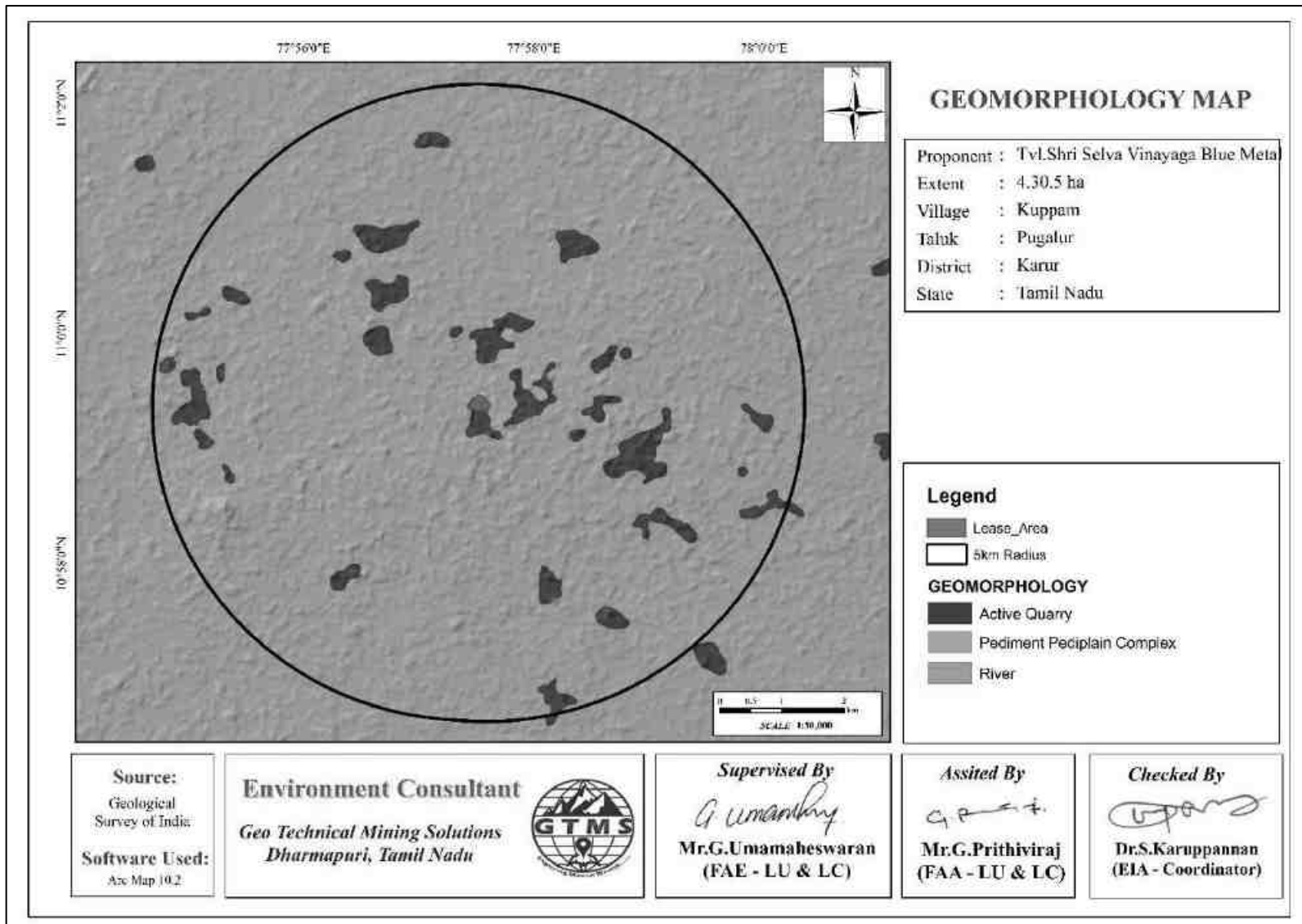


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site

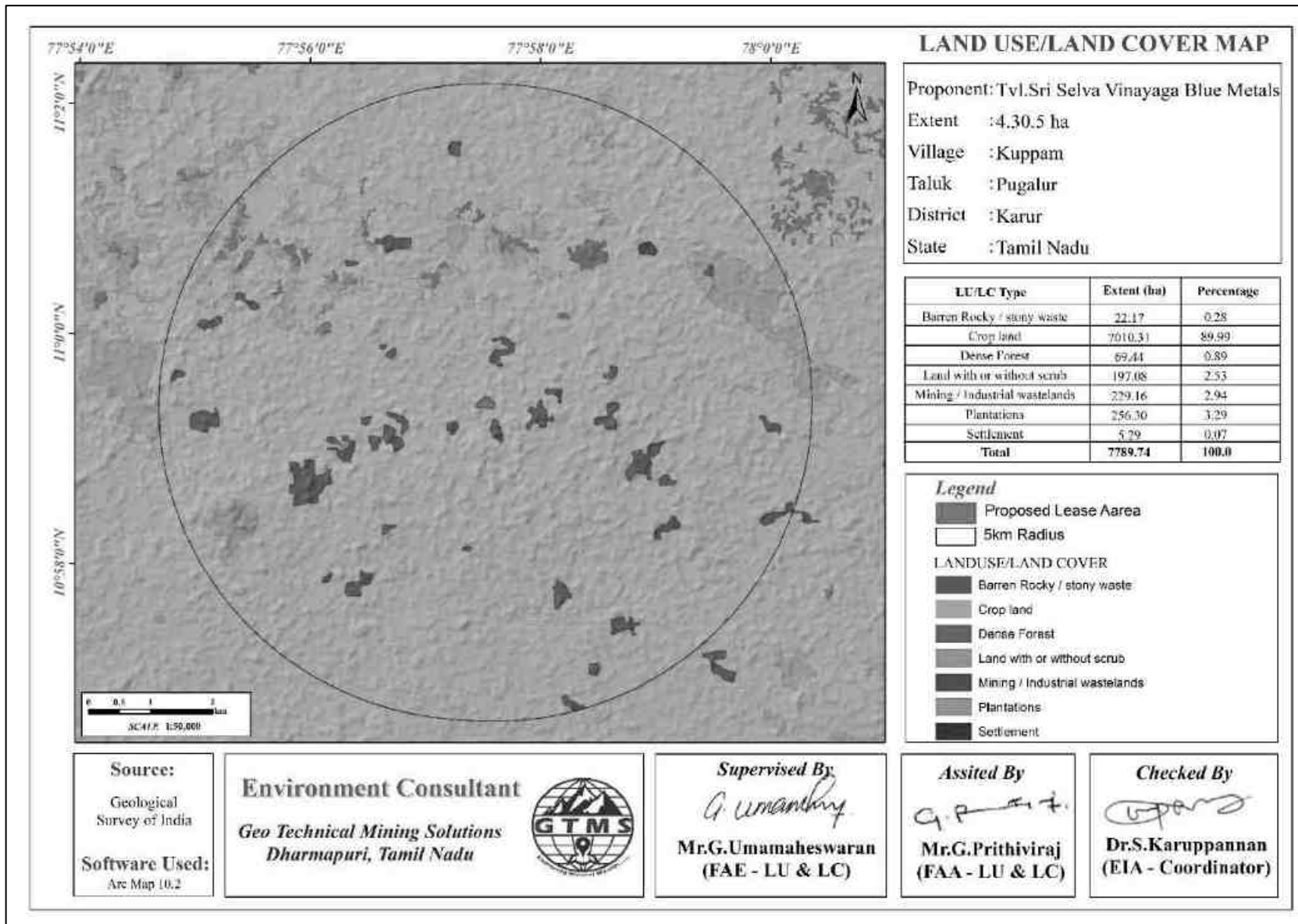


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site

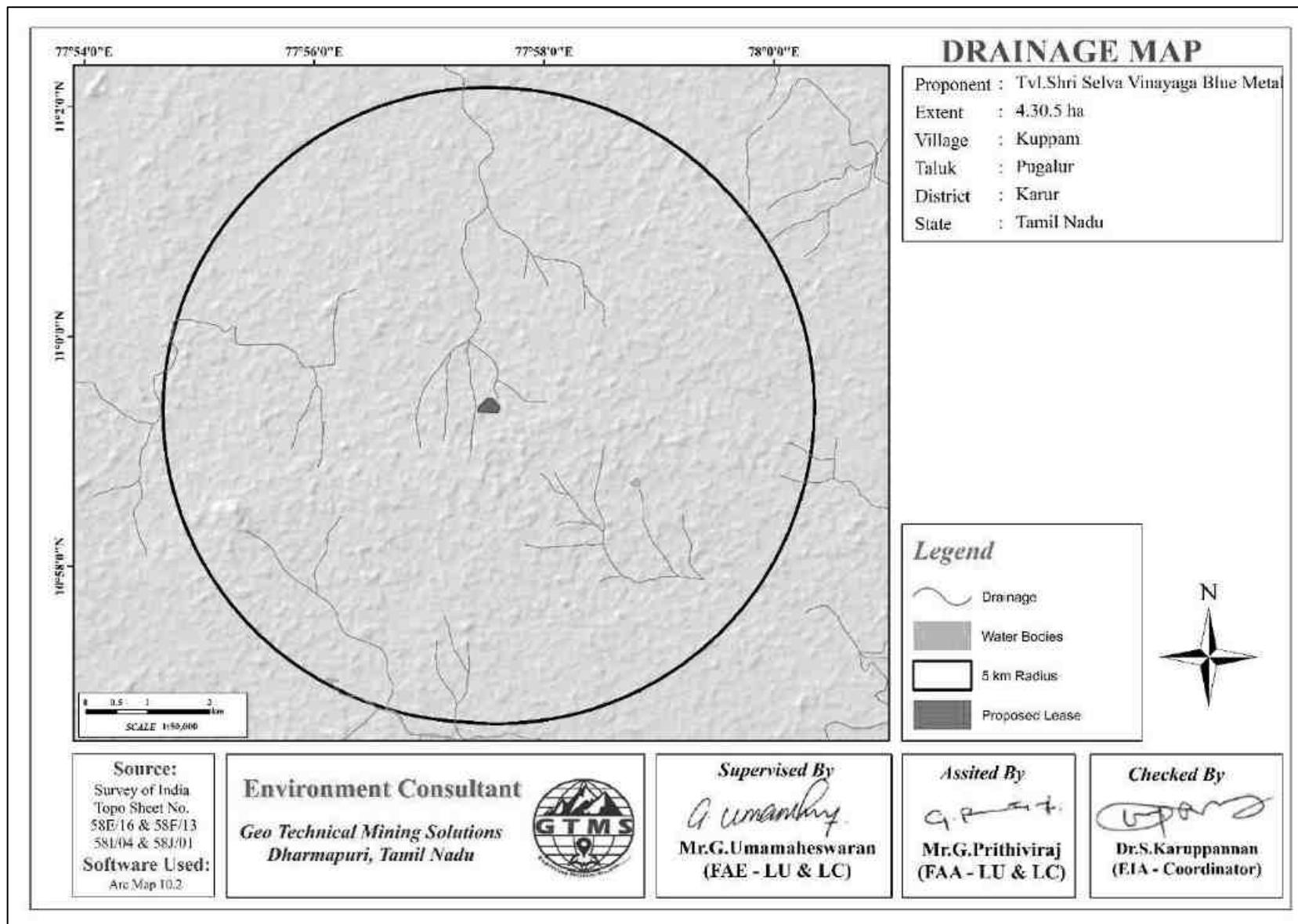


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site

3.1.6 Soil

Composite soil samples were collected from 10 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 3.4.

Table 3.3 Soil Sampling Locations

S. No	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	S01	Devaraj Laese area	0.66	E	10°59'29.11"N 77°57'55.95"E
2	S02	Vetamangalam	4.31	NNW	11° 2'4.11"N 77°56'57.26"E
3	S03	Uppupalayam	2.33	NNE	11°0'40.39"N 77°57'52.96"E
4	S04	Valipuram	3.35	W	10° 59'7.58"N 77°55'36.44"E
5	S05	Karudayampalayam	2.86	SSW	10°57'51.43"N 77°57'0.62"E
6	S06	Punnam	3.95	E	10°59'14.77"N 77°59'46.45"E
7	S07	Punnam	4.70	NE	11°00'51.87"N 77°59'42.66"E
8	S08	Pavithram	4.86	SE	10°57'25.20"N 77°59'29.09"E
9	S09	Sathya Lease Area	0.77	SW	10°59'24.80"N 77°58'1.67"E
10	S10	Core	--	--	10°59'24.78"N 77°57'31.18"E

Source: On-site monitoring/sampling Excellence Laboratory, in association with GTMS.

Physical Characteristics & Chemical Characteristics

The soil samples in the study area sandy loam textures varying between, silty loam and sandy loam. pH of the soil varies from 6.5 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 161 to 338 $\mu\text{S}/\text{Cm}$. Bulk density ranges between 1.2 and 9.2 g/cm^3 . Nitrogen ranges between 0.04 and 2.05 %. Potassium ranges between 0.12 and 0.27 %. Calcium ranges between 301 and 513 mg/kg . Organic matter content ranges between 0.25 and 4.2 %. Manganese ranges between 1.5 and 45 mg/kg .

Soil erosion

The soil erosion map shows in Figure 3.6 that there is no soil erosion in the mining lease area and moderate soil erosion in the southwest part of the lease area.

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, CEC and BD were taken into account. The soil quality score for each sample has been provided in Table 3.4a.

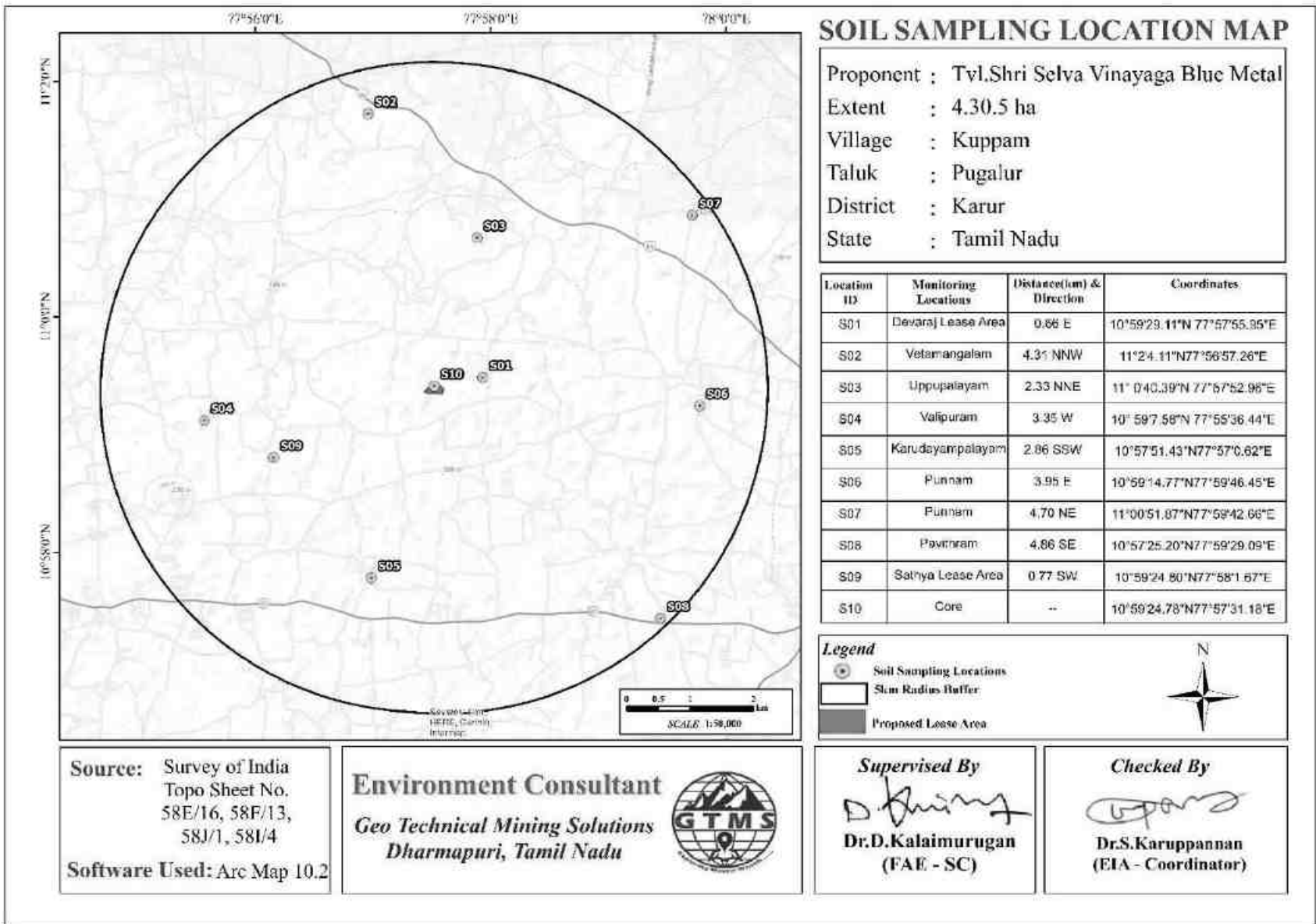


Figure 3.5 Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

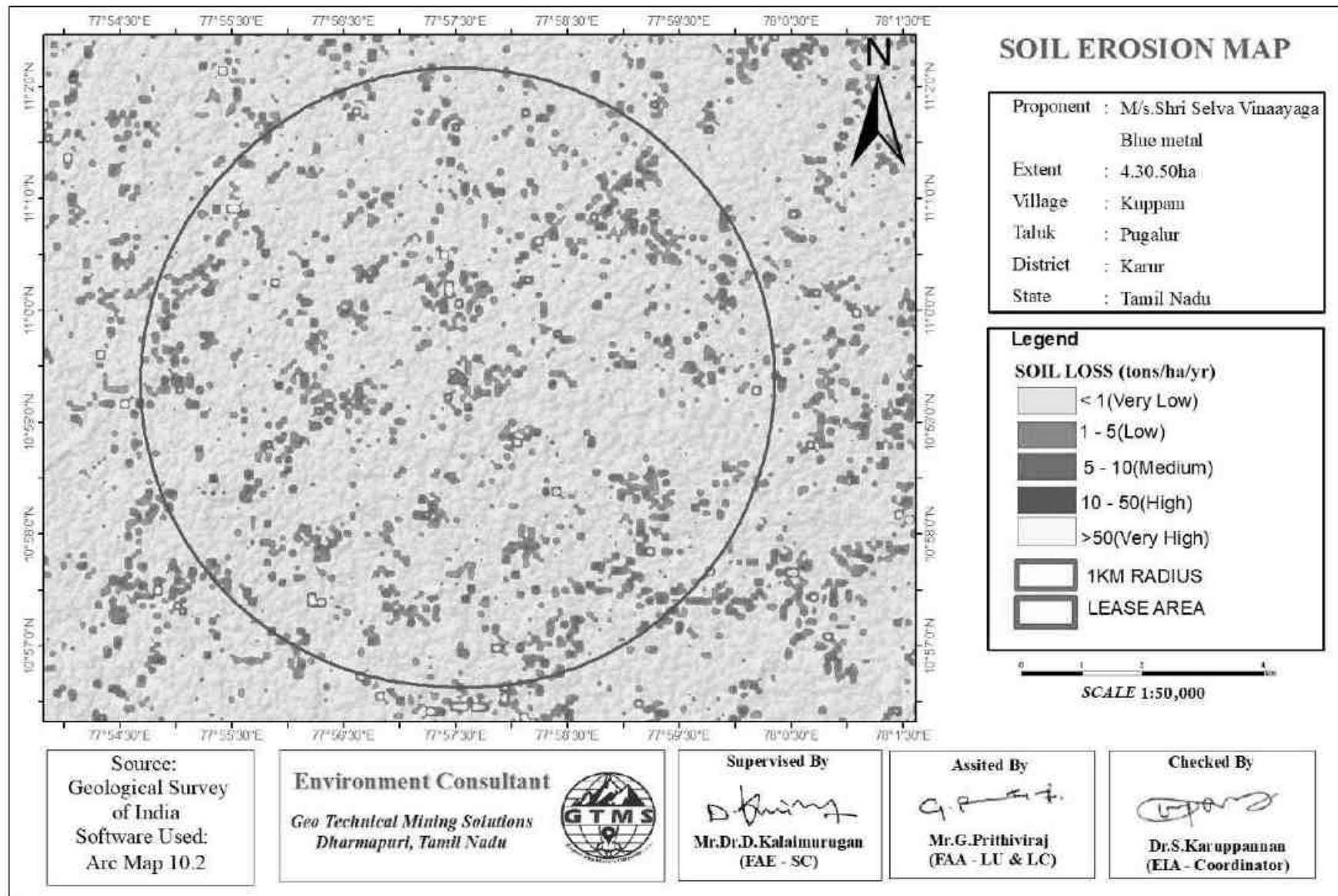


Figure 3.6 Soil Erosion map within 5 km Radius around the Proposed Project Site

Table 3.4 Soil Quality of the Study Area

S.No.	Parameters	Unit	Result in Core	Result in Buffer		
				Minimum	Maximum	Average
1	Bulk Density	g/cm ³	1.6	1.2	9.2	3.08
2	Cadmium (Cd)	mg/kg	<1.0	<1.0	<1.0	<1.0
3	CEC	meq%	15.6	14.5	24	19.49
4	Chromium (Cr)	mg/kg	<1.0	<1.0	<1.0	<1.0
5	Copper (Cu)	mg/kg	1.5	1.6	10	2.97
6	Iron (Fe)	mg/kg	7397	6432	37397	15898.78
7	Lead (Pb)	mg/kg	<1.0	<1.0	<1.0	<1.0
8	Manganese (Mn)	mg/kg	1.45	1.5	45	11.03
9	Nitrogen (N)	%	1.01	0.04	2.05	1.20
10	Organic Matter @ 155°C	%	1.42	0.25	4.2	1.47
11	pH value @ 25°C	--	7.2	6.5	7.7	7.17
12	Phosphate (P)	%	1.6	0.16	2.9	1.71
13	Potassium (K)	%	0.17	0.12	0.27	0.16
14	EC @ 25°C	µS/cm	215	161	338	222.89
15	Total Carbon	%	3.3	2	17.4	5.86
16	Sulphates (SO ₄)	%	0.27	0.15	0.73	0.40
17	Zinc (Zn)	mg/kg	26	17	31	22.33
18	Boron (B)	mg/kg	0.46	0.32	0.84	0.57
19	Calcium (Ca)	mg/kg	315	301	513	377.78
20	Chlorides (Cl)	mg/kg	294	160	318	229.89
21	Magnesium (Mg)	mg/kg	112	110	180	144.89
22	Texture	-	Silty	Sandy loam- Silty Clay Loam		
	Sand	%	Loam	16.23	55.45	36.61
	Silt	%	35.4	12.21	58.58	41.03
	Clay	%	52.26	12.34	37.43	22.47

Source: Sampling Results by Excellence Laboratory, in association with GTMS.

Table 3.4a Assigning Scores to Soil Quality Indicators

Soil Quality Score							Recommendation
S. No.	OM	BD	pH	CEC	EC	Total Score	
S01	30	12	12	6	10	70	The soil requires major and immediate treatment
S02	30	6	12	6	10	64	
S03	30	2	12	6	10	60	
S04	30	12	12	6	10	70	
S05	30	2	18	6	10	66	
S06	30	2	18	2	10	62	
S07	30	2	12	6	10	60	
S08	50	2	18	2	10	82	The soil requires moderate treatment
S09	30	12	12	6	10	70	The soil requires major and immediate treatment
S10	30	2	12	6	10	60	The soil requires major and immediate treatment

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

Source: PSS-2262 Soil Quality Monitoring.pdf (okstate.edu)

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 3.5 Water Sampling Locations

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	OW01	Near core	0.76	NE	10°59'30.44"N,77°58'1.36"E
2	OW02	Arasampalaiyam	2.68	NW	11°0'42.51"N,77°56'45.26"E
3	BW01	MGR Nagar	3.45	NE	10°58'50.44"N,77°55'53.77"E
4	BW02	Vedirimattam Pudur	2.96	SW	11°02'3.05"N,77°54'80.38"E
5	BW03	Punnamchatram	4.82	N	11°0'50.37"N,77°58'49.79"E
6	BW04	Pavithiram	3.82	SE	10°58'16.75"N,77°59'23.38"E
7	BW05	Punnam	2.26	SE	10°59'15.94"N,77°58'49.13"E
8	BW06	Nedungur	3.88	S	10°57'17.64"N,77°56'58.86"E

Source: On-site monitoring/sampling Excellence Laboratory, in association with GTMS.

3.2.1 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.

Eight groundwater samples, known as OW01, OW02, BW01, BW02, BW03, BW04, BW05 and BW06 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 3.6 summarizes ground water quality data of the eight samples.

Results for ground water samples in the Table 3.6 indicate that the physical, chemical and biological parameters are within permissible limits in comparison with standards of IS10500:2012.

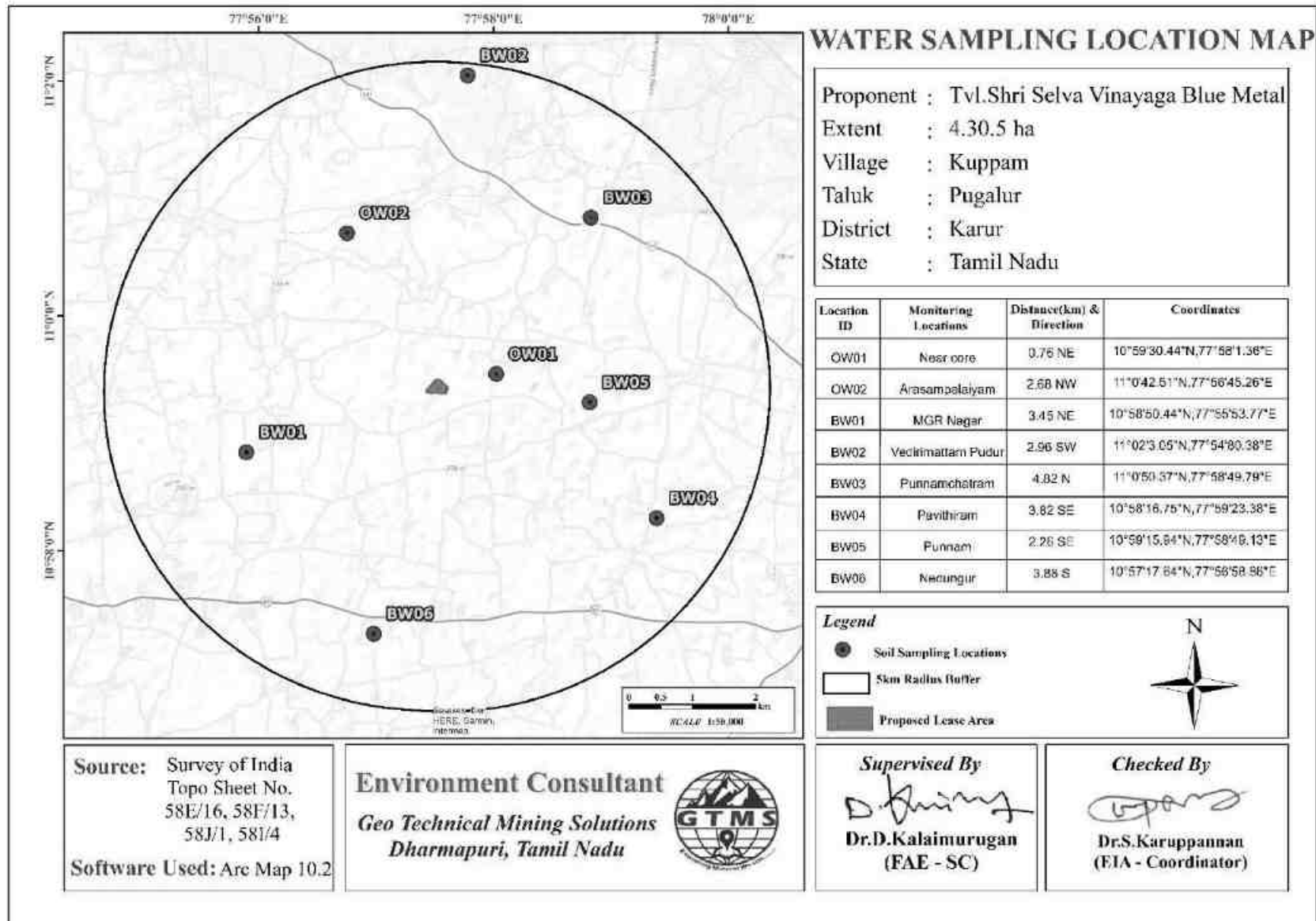


Figure 3.7 Toposheet Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.6 Ground Water Quality Result

S.No.	Parameters	Units	Result in core	Result in buffer		10500:2012 (Acceptable)	10500:2012 (Permissible)
				Minimum	Maximum		
1	Coliforms Bacteria	MPN	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample
2	E.Coli	MPN	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample
3	Aluminium (Al)	mg /l	<0.02	<0.02	<0.02	0.03	0.2
4	Ammonia (NH ₃)	mg /l	<0.1	<0.1	<0.1	0.5	No relaxation
5	Anionic Detergents	mg /l	<0.01	<0.01	<0.01	0.2	1.0
6	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	0.5	No relaxation
7	Boron (B)	mg /l	<0.1	<0.1	<0.1	0.5	1.0
8	Cadmium (Cd)	mg /l	<0.003	<0.003	<0.003	0.003	No relaxation
9	Calcium (Ca)	mg /l	112	58	146	75	200
10	Chloride (Cl)	mg /l	187	175	297	250	1000
11	Colour	Hazen	<1.0	<1.0	<1.0	5	15
12	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	0.05	1.5
13	Cyanide (CN)	mg/l	<0.02	<0.02	<0.02	0.05	No relaxation
14	Fluoride (F)	mg/l	1.1	0.19	1.2	1.0	1.5
15	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	0.2	1.0
16	Iron (Fe)	mg/l	<0.05	<0.05	<0.05	0.3	No relaxation
17	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	0.01	No relaxation

18	Magnesium (Mg)	mg/l	27	14	75	30	100
19	Manganese (Mn)	mg/l	<0.01	<0.01	<0.01	0.1	0.3
20	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	No relaxation
21	Molybdenum	mg/l	<0.05	<0.05	<0.05	0.07	No relaxation
22	Nitrate (NO ₃)	mg/l	2.5	1.9	6.3	45	No relaxation
23	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
24	pH value @ 25°C	--	7.6	6.7	7.9	6.5-8.5	No relaxation
25	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	0.001	0.002
26	Selenium (Se)	mg/l	<0.01	<0.01	<0.01	0.01	No relaxation
27	EC @ 25°C	µS/Cm	1240	1340	3570	-	-
28	Sulphates (SO ₄)	mg/l	111	102	247	200	400
29	Sulphide (H ₂ S)	mg/l	<0.05	<0.05	<0.05	0.05	No relaxation
30	Total Alkalinity	mg/l	245	283	615	200	600
31	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	0.01	0.05
32	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	0.05	No relaxation
33	TDS	mg/l	654	560	1753	500	2000
34	TH (CaCO ₃)	mg/l	388	204	1022	200	600
35	TSS @ 105°C	mg/l	<5.0	<5.0	<5.0	-	-
36	Turbidity	NTU	<0.01	<0.01	<0.01	1	5
37	Zinc (Zn)	mg/l	<0.05	<0.05	<0.05	5	15

* IS: 10500:2012-Drinking Water Standards. The water can be used for drinking purpose in the absence of alternate sources.

Source: On-site monitoring/sampling Excellence Laboratory, in association with GTMS.

3.2.2 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.

3.2.2.1 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 3.13 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in April through August and October of 2022 is higher than the previous years.

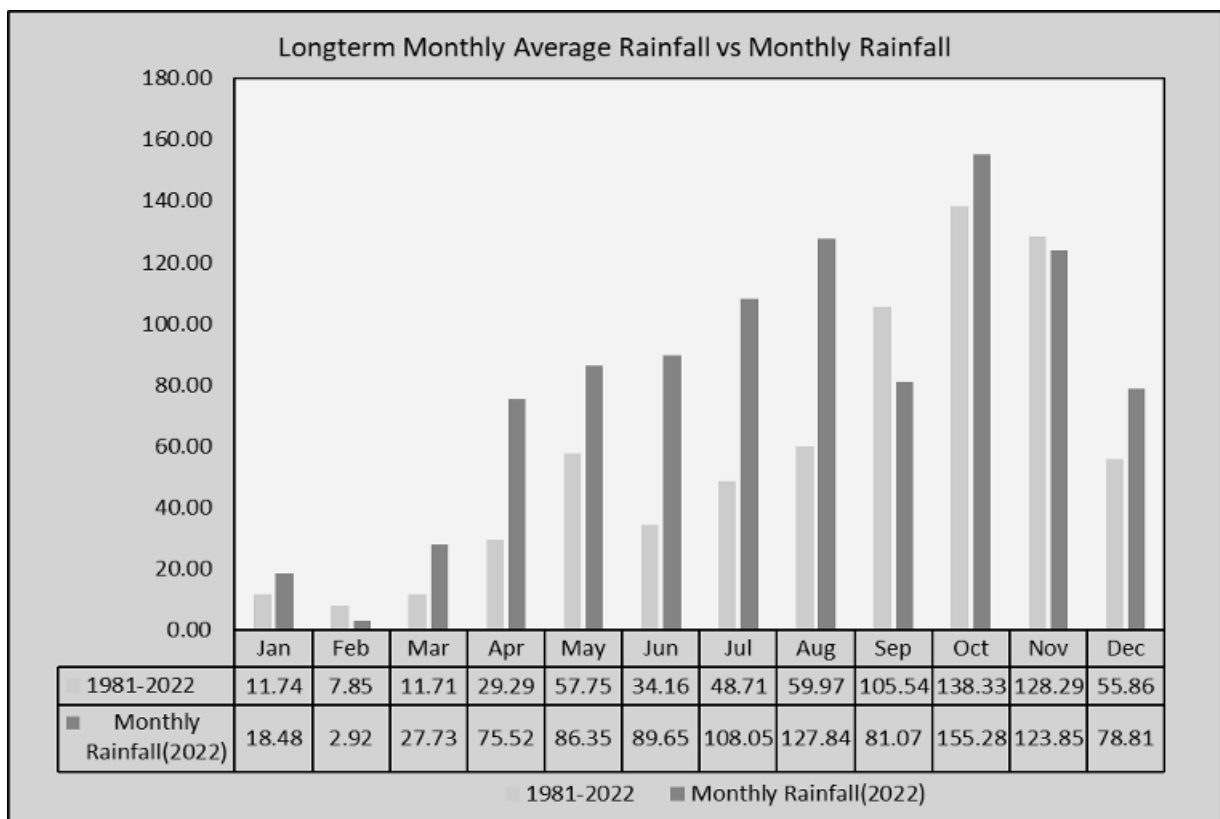


Figure 3.8 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.2.2.2 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 8 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 2023, (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 14.2 to 16.3 m BGL in pre monsoon and 10.6 to 11.3 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 67.3 m and from 63.7 to 70.7 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.

Table 3.7 Pre-Monsoon Water Level of Open Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2023	Apr-2023	May-2023	Average		
OW01	9.5	10.9	11.5	10.6	11° 0'9.19"N	77°57'21.43"E
OW02	10.5	11.7	12.5	11.5	11° 0'5.12"N	77°57'12.82"E
OW03	9.7	10.9	11.5	10.7	10°59'37.58"N	77°57'22.04"E
OW04	11	12.5	13.5	12.3	11° 0'7.08"N	77°58'18.74"E
OW05	10.5	11.7	12.9	11.7	10°59'47.33"N	77°57'54.37"E
OW06	12.7	13	13.5	13	10°59'41.53"N	77°59'0.97"E
OW07	13	14.5	15	14.1	10°58'51.51"N	77°57'56.17"E
OW08	10.6	11.9	12.4	11.6	10°58'59.07"N	77°59'6.91"E
OW09	12.7	13.5	14.5	13.5	10°58'25.98"N	77°57'47.58"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2023	Nov- 2023	Dec-2023	Average		
OW01	12.5	11.9	10.4	20.00	11° 0'9.19"N	77°57'21.43"E
OW02	13.4	12.8	11.5	21.00	11° 0'5.12"N	77°57'12.82"E
OW03	12.2	11.5	10.2	19.00	10°59'37.58"N	77°57'22.04"E
OW04	14.5	13.5	12.4	18.00	11° 0'7.08"N	77°58'18.74"E
OW05	13.7	12.4	11.5	21.00	10°59'47.33"N	77°57'54.37"E
OW06	15.5	14.5	13.7	17.00	10°59'41.53"N	77°59'0.97"E
OW07	16.7	15.5	14.7	19.00	10°58'51.51"N	77°57'56.17"E
OW08	17.4	16.9	15.6	18.00	10°58'59.07"N	77°59'6.91"E
OW09	16.9	15.5	14.7	17.68	10°58'25.98"N	77°57'47.58"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2023	Apr-2023	May- 2023	Average		
BW01	65	66.5	68	66.1	11° 0'7.86"N	77°57'44.93"E
BW02	64.5	65.7	66.5	65.6	11° 0'1.38"N	77°58'16.31"E
BW03	65	66.2	67.5	66.2	0°59'26.65"N	77°58'19.99"E
BW04	66.2	67	68	67	0°59'40.40"N	77°57'9.97"E
BW05	66	67.5	68.5	67.3	10°59'18.39"N	77°56'48.72"E
BW06	61	62.5	63.5	62.3	11° 0'8.04"N	77°58'51.80"E
BW07	64.5	65	66	65.1	10°59'38.51"N	77°59'0.43"E
BW08	65.3	66.5	67.5	66.4	10°58'23.57"N	77°58'21.53"E

Source: Onsite monitoring data

Table 3.10 Post-Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2023	Nov-2023	Dec-2023	Average		
BW01	69.7	68.5	67.2	68.4	11° 0'7.86"N	77°57'44.93"E
BW02	67.5	66.7	65.5	66.5	11° 0'1.38"N	77°58'16.31"E
BW03	68.9	77.2	66.2	70.7	10°59'26.65"N	77°58'19.99"E
BW04	69.7	68.2	67.2	68.3	10°59'40.40"N	77°57'9.97"E
BW05	69.5	68	67	68.1	10°59'18.39"N	77°56'48.72"E
BW06	64.7	63.5	62.2	63.4	11° 0'8.04"N	77°58'51.80"E
BW07	67.9	66.7	65.5	66.7	10°59'38.51"N	77°59'0.43"E
BW08	68.7	67.5	66.3	67.5	10°58'23.57"N	77°58'21.53"E

Source: Onsite monitoring data

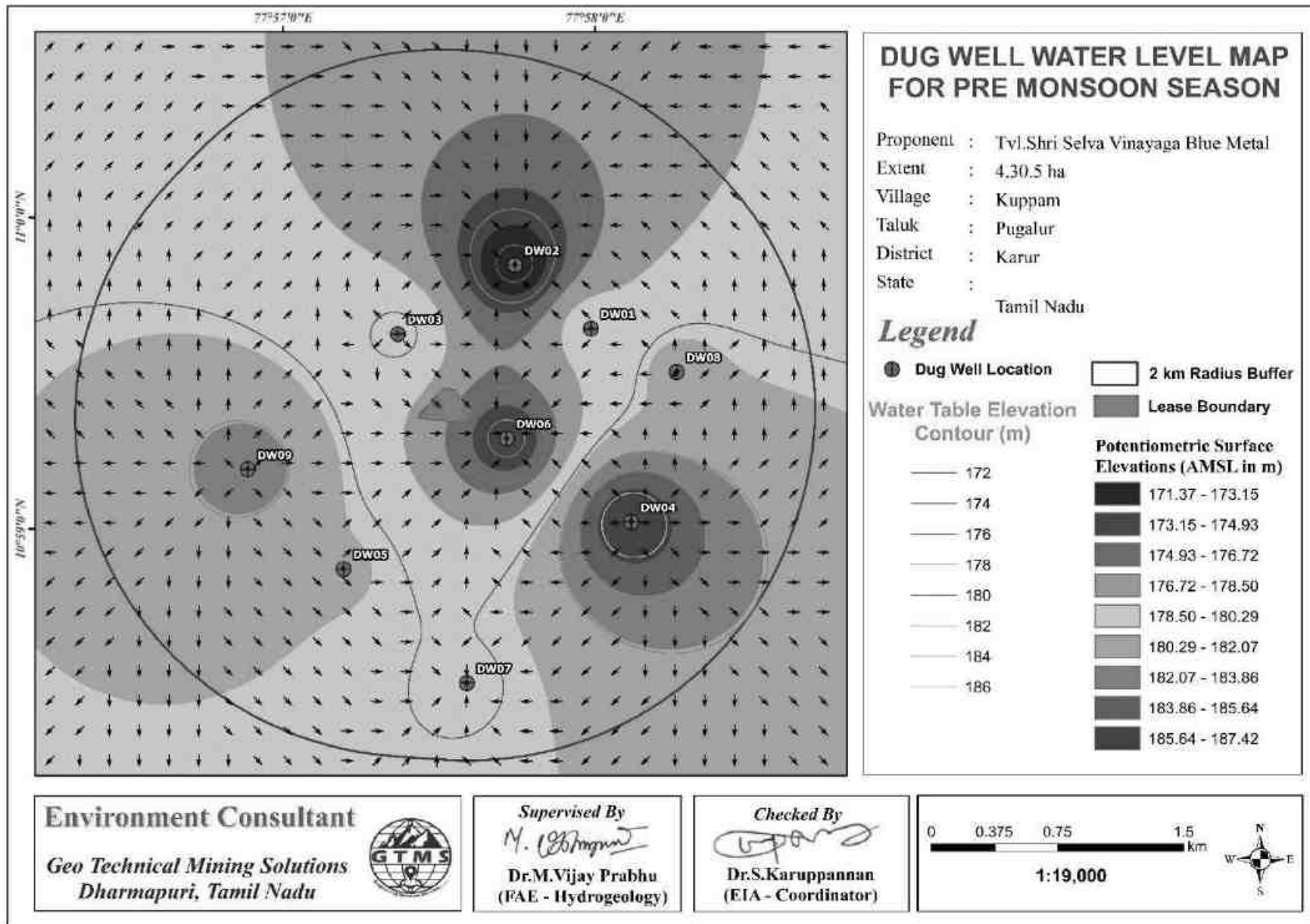


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

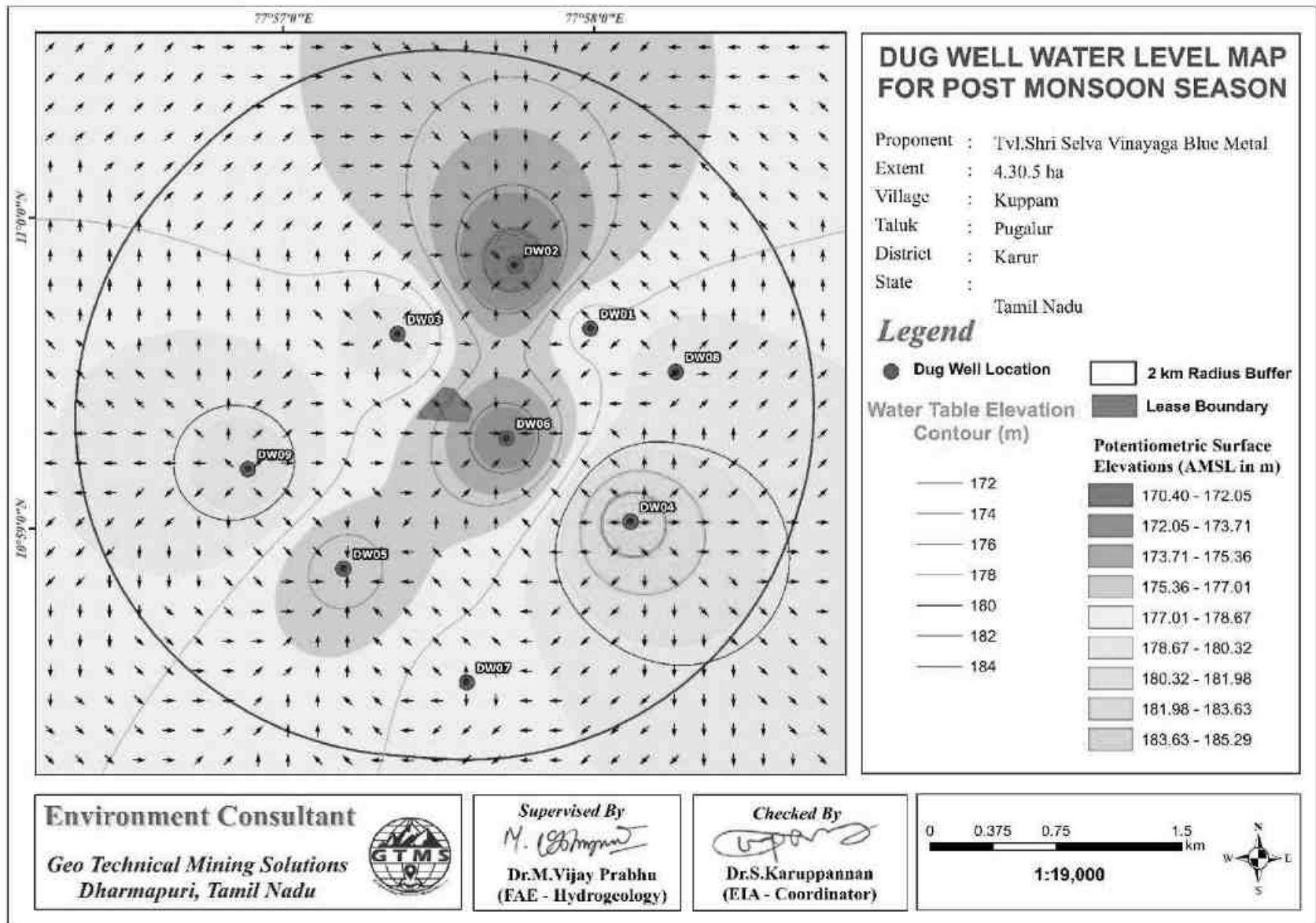


Figure 3.10 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

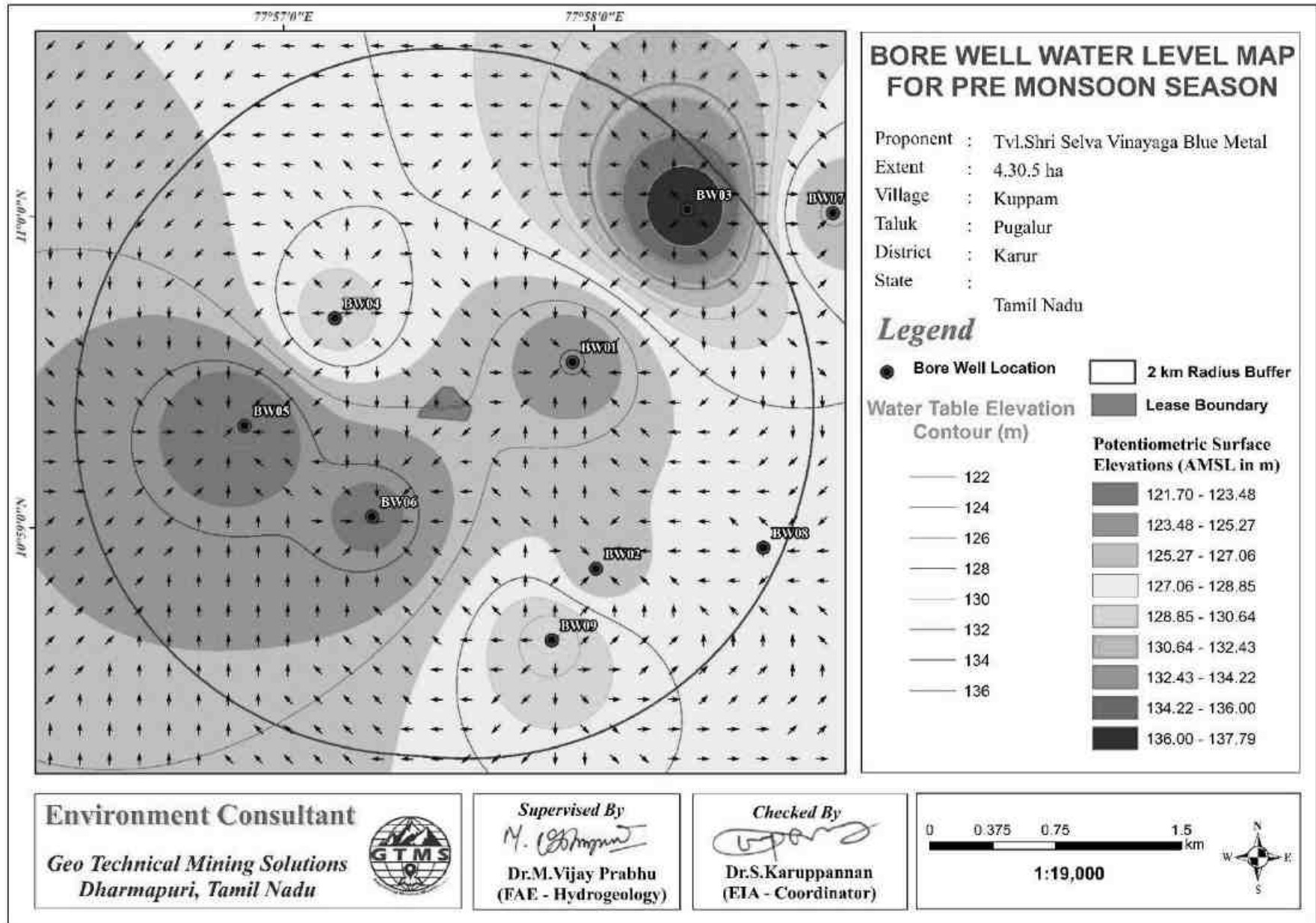


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

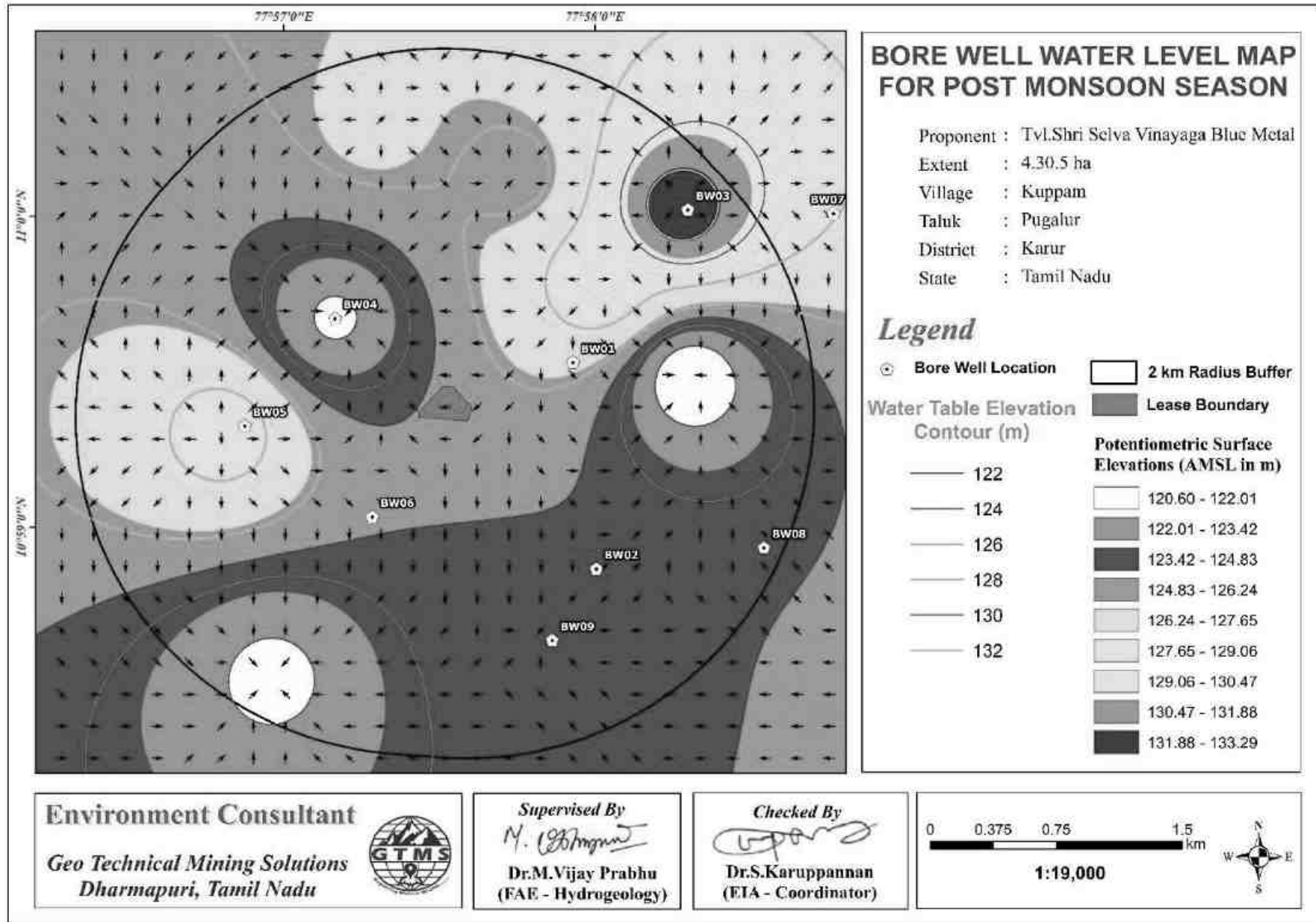


Figure 3.12 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

3.2.2.3 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 3.13.

Table 3.11 Vertical Electrical Sounding Data

Location Coordinates - 10°58'50.14"N 77°56'10.61"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	156.06
2	4	2	49.46	6.127	303.04
3	6	5	112.26	3.937	441.97
4	8	5	200.18	2.798	560.10
5	10	5	75.36	8.997	678.01
6	15	10	173.49	5.188	900.07
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	3.16	1562.78
12	45	10	628	2.683	1684.92
13	50	10	777.15	1.943	1510.00
14	65	20	453.6	2.213	1003.82
15	70	20	989.1	2.651	2622.10
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

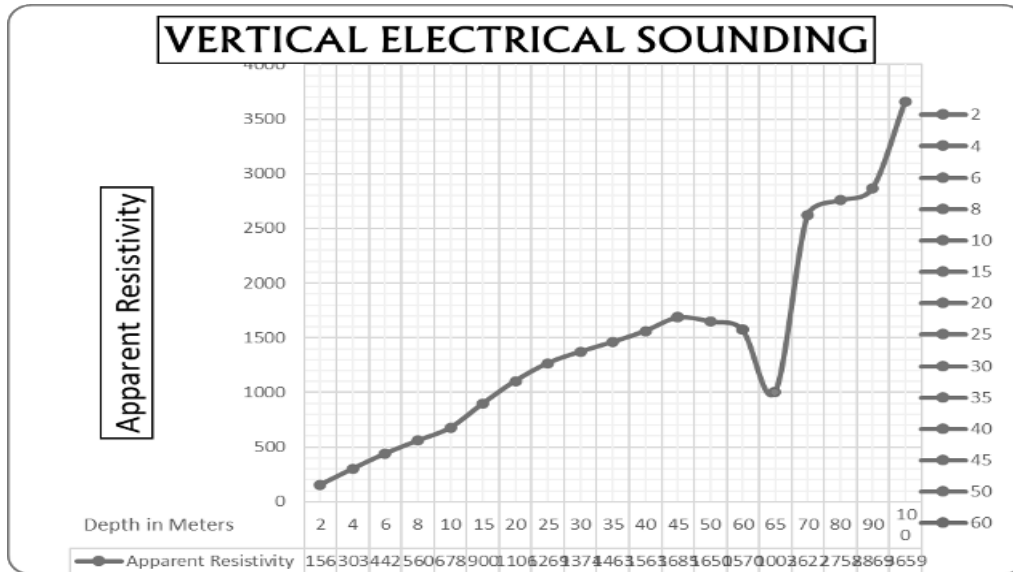


Figure 3.13 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 65 m Below Ground Level in Proposed Project

The rock formation of low resistivity values indicates occurrence of water at the depth of about 65 m below ground level. The maximum depth proposed for the proposed project is 50 m 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 October, 2023 varied from 21.74 to 37.41°C with the average of 27.75°C; in November, 2023 from 20.08 to 32.32°C with the average of 26.08°C; and in December, 2023 from 18.16 to 33.01°C with the average of 25.13°C. In October, 2023, relative humidity ranged from 22.38 to 98.19% with the average of 72.91%; in November, 2023, from 46.12 to 100 % with the average of 82.71%; and in December, 2023,

from 44.19 to 100% with the average of 81.02%. The wind speed in October,2023 varied from 0.02 to 9.47 m/s with the average of 2.29 m/s; in November, 2023 from 0.50 to 6.92 m/s with the average of 2.63 m/s; and in December,2023 from 0.05 to 7.37m/s with the average of 3.24m/s. In October,2023, wind direction varied from 3.99 to 359.75⁰ with the average of 157.64⁰; in November, 2023, from 0.00 to 359.23⁰ with the average of 81.70⁰; and in December,2023, 0.85 to 357.87⁰ with the average of 89.41 ⁰. In October,2023, surface pressure varied 98.04 to 99.01 kPa with the average of 98.61kPa; in November, 2023, from 98.24 to 99.07 kPa with the average of 98.66kPa; and in December,2023, from 98.02 to 99.25 kPa with the average of 98.70kPa

Table 3.12 Onsite Meteorological Data

S. No.	Parameters		OCT,2023	NOV,2023	DEC,2022
1	Temperature (°C)	Min	21.74	20.08	18.16
		Max	37.41	32.82	33.01
		Avg	27.75	26.08	25.13
2	Relative Humidity (%)	Min	22.38	46.12	44.19
		Max	98.19	100.00	100.00
		Avg	72.91	82.71	81.02
3	Wind Speed (m/s)	Min	0.02	0.50	0.05
		Max	9.47	6.92	7.37
		Avg	2.29	2.63	3.24
4	Wind Direction (degree)	Min	3.99	0.00	0.85
		Max	359.71	359.23	357.87
		Avg	157.64	81.70	89.41
5	Surface Pressure(kPa)	Min	98.04	98.24	98.02
		Max	99.01	99.07	99.25
		Avg	98.61	98.66	98.70

Source: On-site monitoring/sampling by **Excellence Laboratory** 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 October through December of the years from 2019 to 2022 and the seasonal wind rose for the study period of October through December 2023. The wind rose diagrams thus produced are shown in Figures 3.14-3.14a. Figure 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 2.72m/s.
- ❖ Predominant wind was dominant in the directions ranging from Northeast to Southeast.

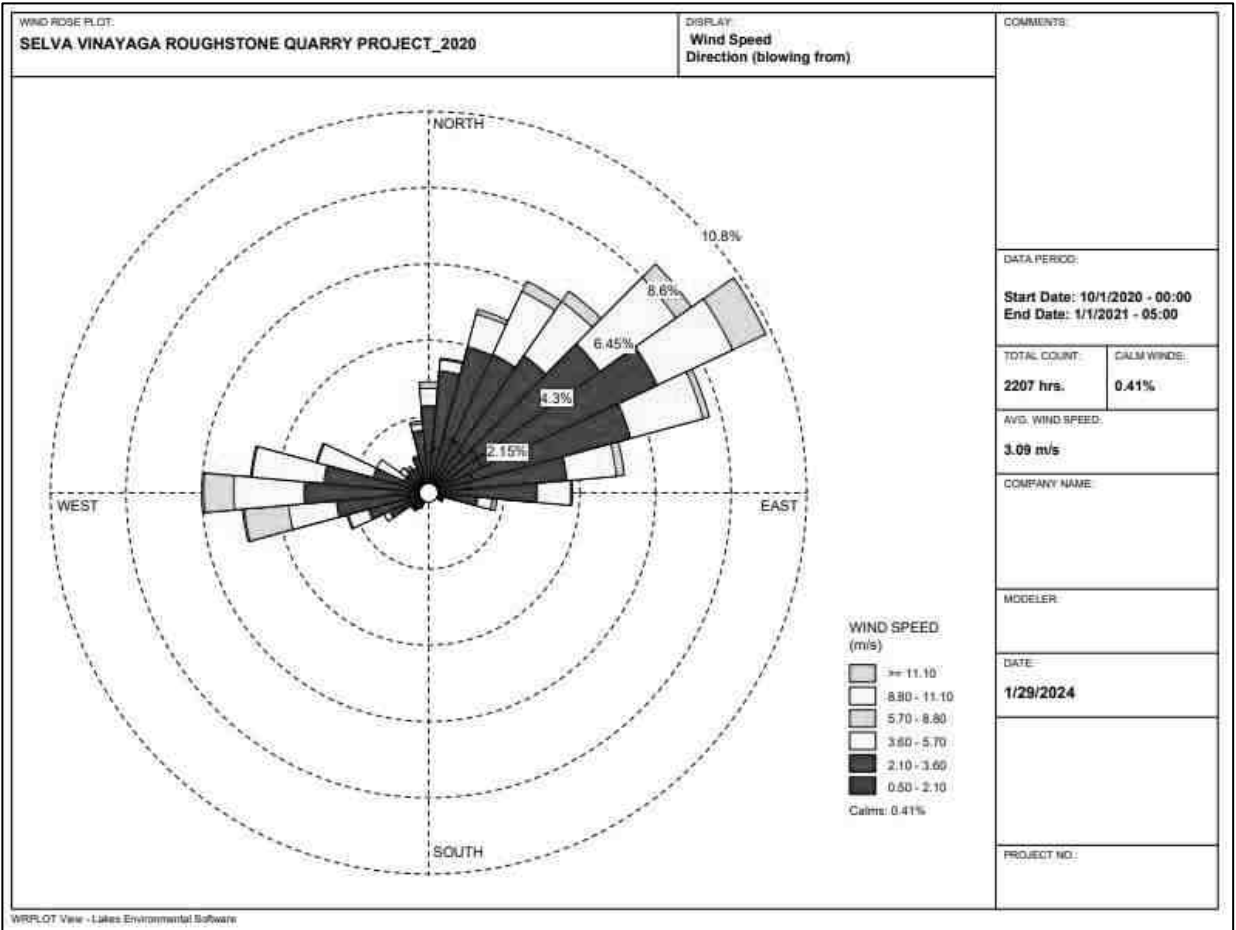
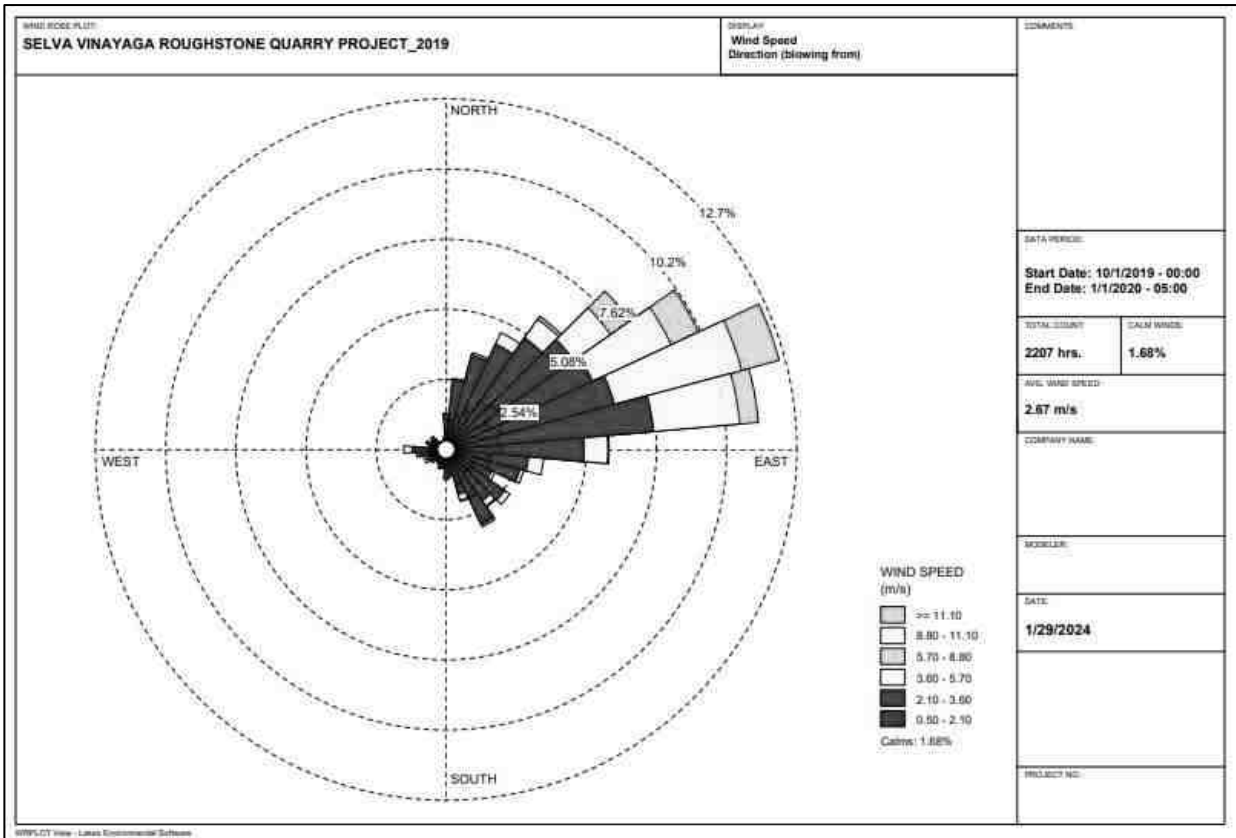


Figure 3.14 Windrose Diagram for 2019 and 2020 (October to December)

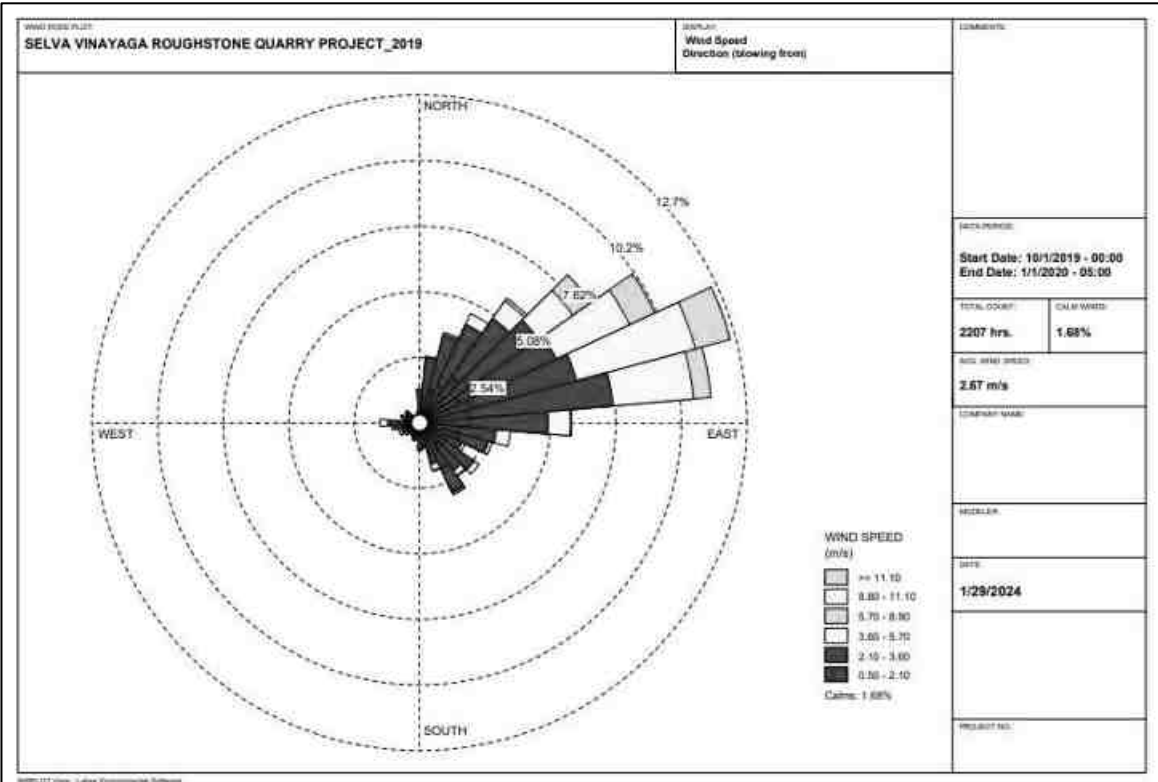
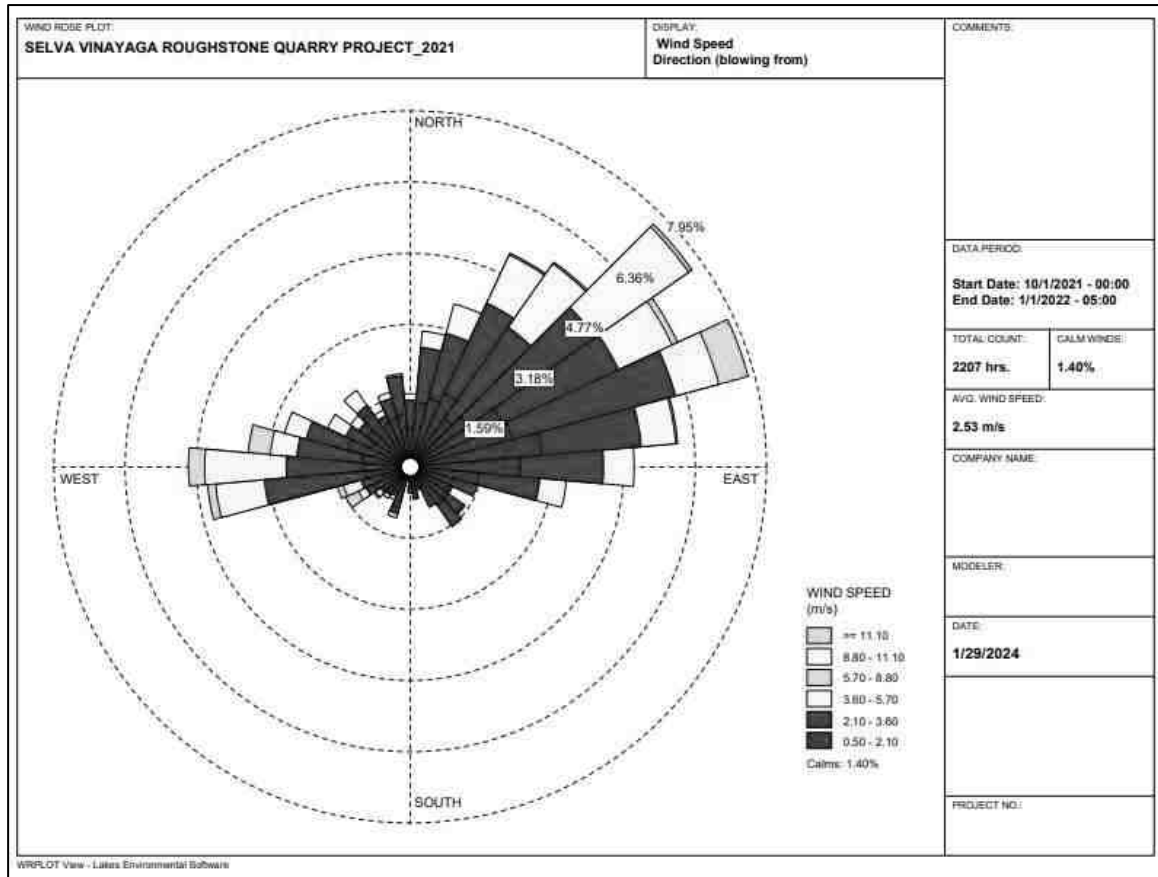


Figure 3.14a Windrose Diagram for 2021 and 2022 (October to December)

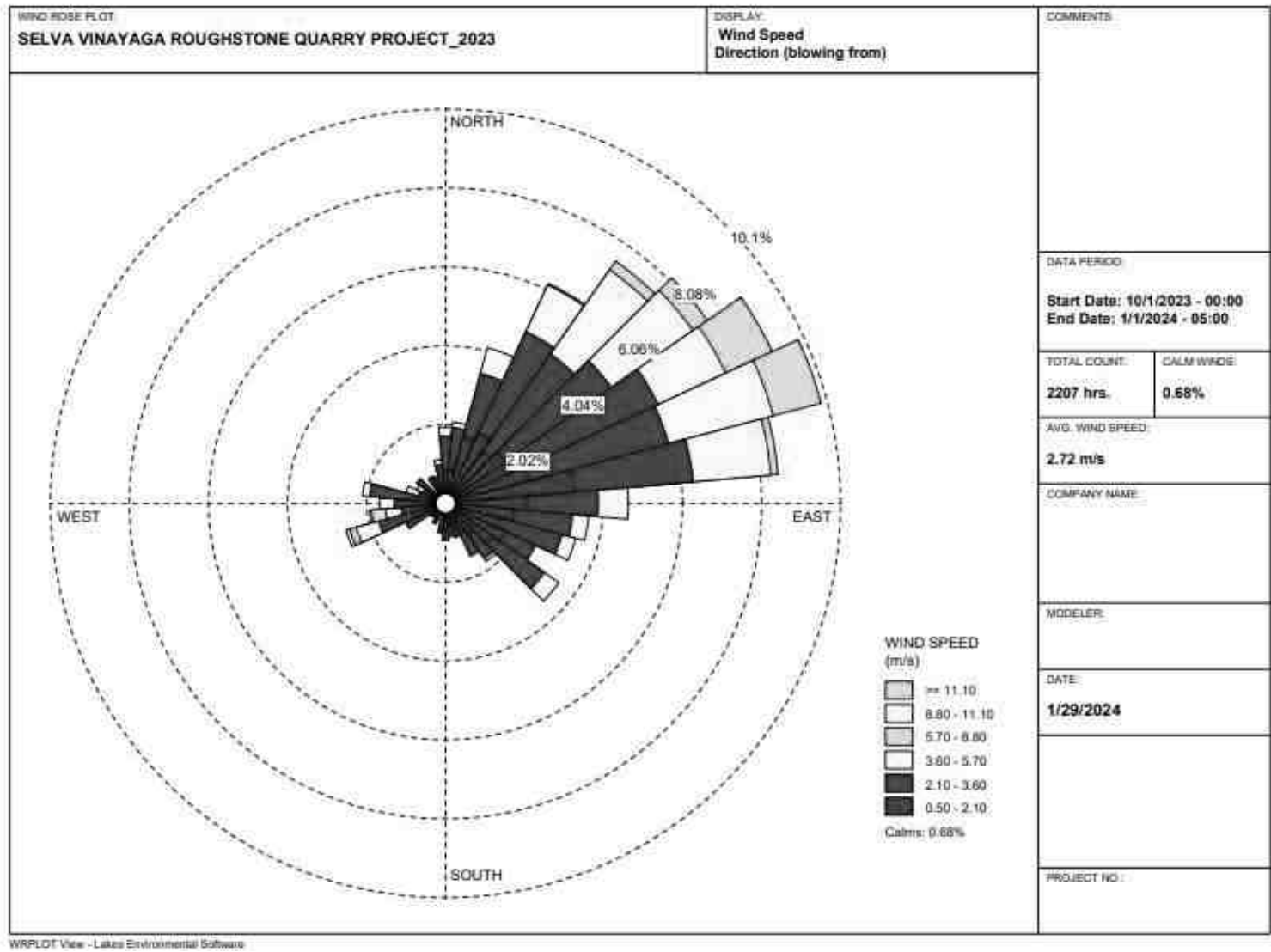


Figure 3.15 Onsite Wind Rose Diagram

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
NO _x	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 *Excellence Laboratory* & 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 (µg/m ³)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO _x (µg/m ³)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM ₁₀ (µg/m ³)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	PM _{2.5} (µg/m ³)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at Ten (10) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October to December, 2023 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least $3 \pm 0.5\text{m}$ above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at 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 $\text{PM}_{2.5}$, PM_{10} , sulphur dioxide (SO_2) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.16 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	
					Latitude	Longitude
1	AAQ1	Near Core	0.74	E	10°59'31.41"N	77°57'55.80"E
2	AAQ2	VST Blue Metals core	1.51	SE	10°58'53.04"N	10°58'53.04"N
3	AAQ3	Near ponvinayaga Blue Metals	2.25	SW	10°58'09.02"N	77°57'14.40"E
4	AAQ4	Andisangilipalayam	2.82	NE	11° 00'02.45"N	77°56'6.69"E
5	AAQ5	Punnam Velayuthampalayam	3.49	SSW	10°59'04.19"N	77°55'32.63"E
6	AAQ6	Punnam chatram	3.40	NNE	11°00'48.64"N	77°58'47.07"E
7	AAQ7	Pavithiram	4.45	SSE	10°57'30.93"N	77°59'9.93"E
8	AAQ8	Nochipalayam	4.84	E	10°59'21.43"N	78° 0'46.92"E
9	AAQ9	Sathiya Core	0.89	E	10°59'25.94"N	77°58'2.66"E
10	AAQ10	Selva vinayaga Core	--	--	10°59'26.67"N	77°57'32.13"E

Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

Results

As per the monitoring data, $\text{PM}_{2.5}$ ranges from $17.4\mu\text{g}/\text{m}^3$ to $21.9\mu\text{g}/\text{m}^3$; PM_{10} from $37.2\mu\text{g}/\text{m}^3$ to $42.5\mu\text{g}/\text{m}^3$; SO_2 from $6.5\mu\text{g}/\text{m}^3$ to $9.4\mu\text{g}/\text{m}^3$; NO_x from $15.7\mu\text{g}/\text{m}^3$ to $17.4\mu\text{g}/\text{m}^3$. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index (AQI)

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

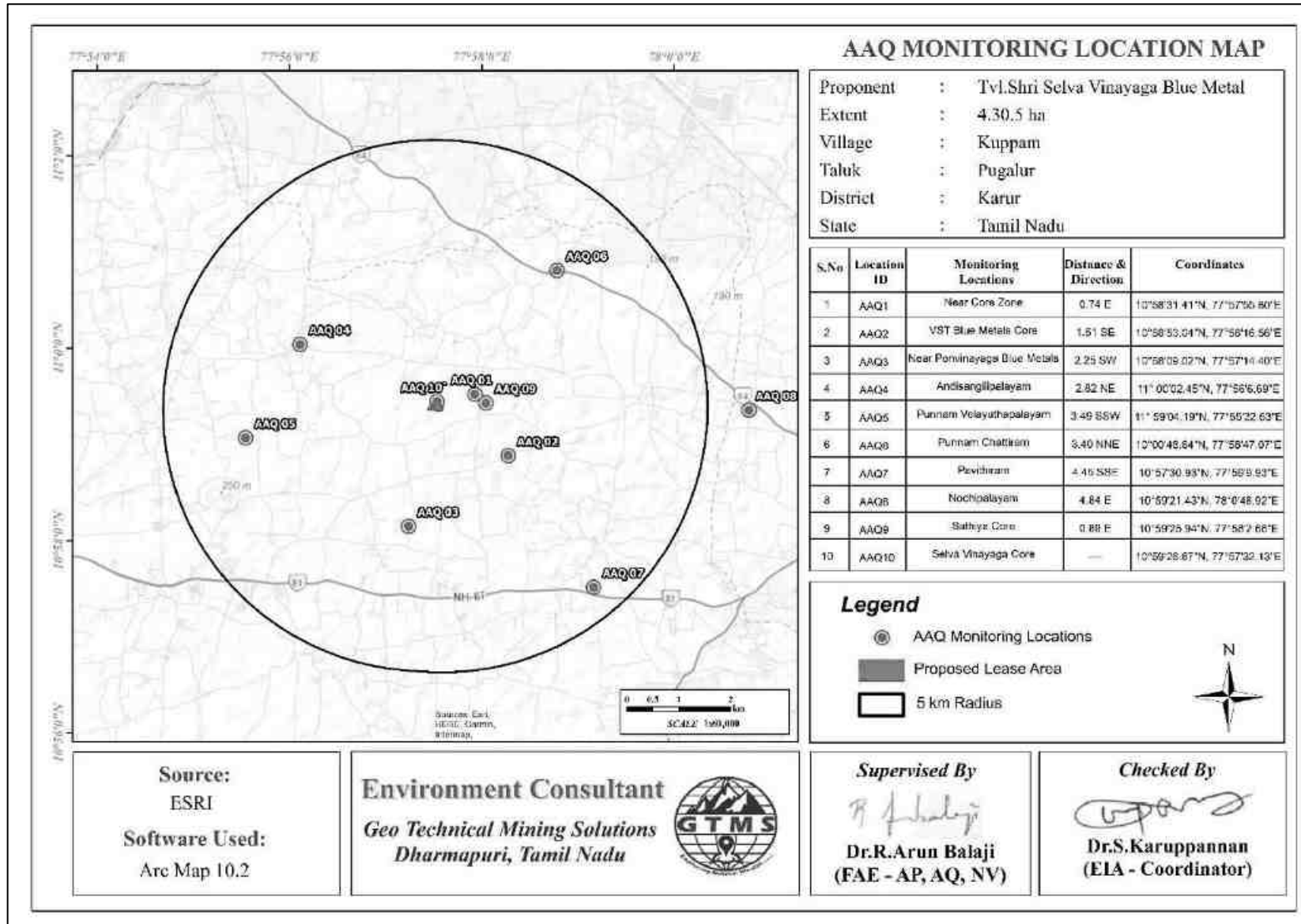


Figure 3.16 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

Table 3.16 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Station ID	Max	Station ID	Max	Station ID	Max	Station ID
AAQ1	23.8	AAQ1	23.8	AAQ1	23.8	AAQ1	23.8	AAQ1
AAQ2	25.8	AAQ2	25.8	AAQ2	25.8	AAQ2	25.8	AAQ2
AAQ3	24.3	AAQ3	24.3	AAQ3	24.3	AAQ3	24.3	AAQ3
AAQ4	19.1	AAQ4	19.1	AAQ4	19.1	AAQ4	19.1	AAQ4
AAQ5	22.9	AAQ5	22.9	AAQ5	22.9	AAQ5	22.9	AAQ5
AAQ6	23.3	AAQ6	23.3	AAQ6	23.3	AAQ6	23.3	AAQ6
AAQ7	22.2	AAQ7	22.2	AAQ7	22.2	AAQ7	22.2	AAQ7
AAQ8	22.8	AAQ8	22.8	AAQ8	22.8	AAQ8	22.8	AAQ8
AAQ9	17.6	AAQ9	17.6	AAQ9	17.6	AAQ9	17.6	AAQ9
AAQ10	17.3	AAQ10	17.3	AAQ10	17.3	AAQ10	17.3	AAQ10
SO ₂					NO _x			
AAQ1	10.4	AAQ1	10.4	AAQ1	10.4	AAQ1	10.4	AAQ1
AAQ2	11.3	AAQ2	11.3	AAQ2	11.3	AAQ2	11.3	AAQ2
AAQ3	10.9	AAQ3	10.9	AAQ3	10.9	AAQ3	10.9	AAQ3
AAQ4	9.6	AAQ4	9.6	AAQ4	9.6	AAQ4	9.6	AAQ4
AAQ5	10.6	AAQ5	10.6	AAQ5	10.6	AAQ5	10.6	AAQ5
AAQ6	10.2	AAQ6	10.2	AAQ6	10.2	AAQ6	10.2	AAQ6
AAQ7	7.9	AAQ7	7.9	AAQ7	7.9	AAQ7	7.9	AAQ7
AAQ8	9.5	AAQ8	9.5	AAQ8	9.5	AAQ8	9.5	AAQ8
AAQ9	6.9	AAQ9	6.9	AAQ9	6.9	AAQ9	6.9	AAQ9
AAQ10	6.5	AAQ10	6.5	AAQ10	6.5	AAQ10	6.5	AAQ10

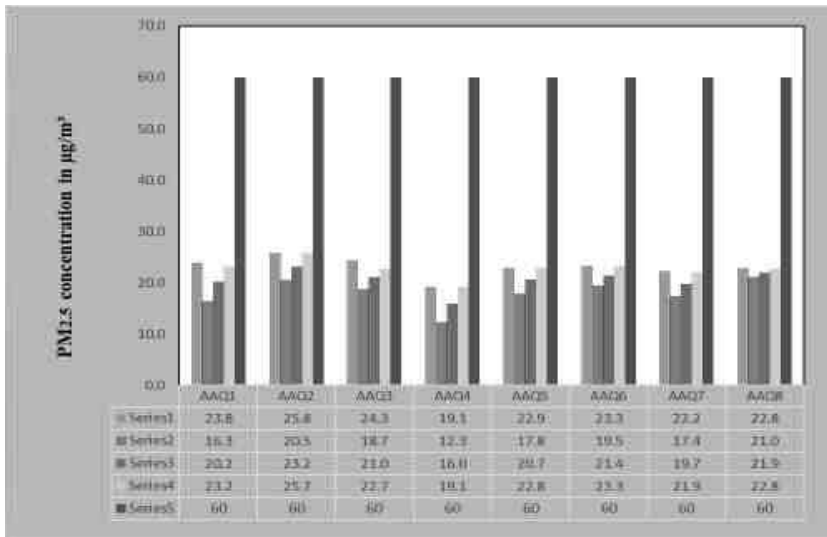


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM2.5 Measured from 10 Air Quality Monitoring Stations within 5 km Radius

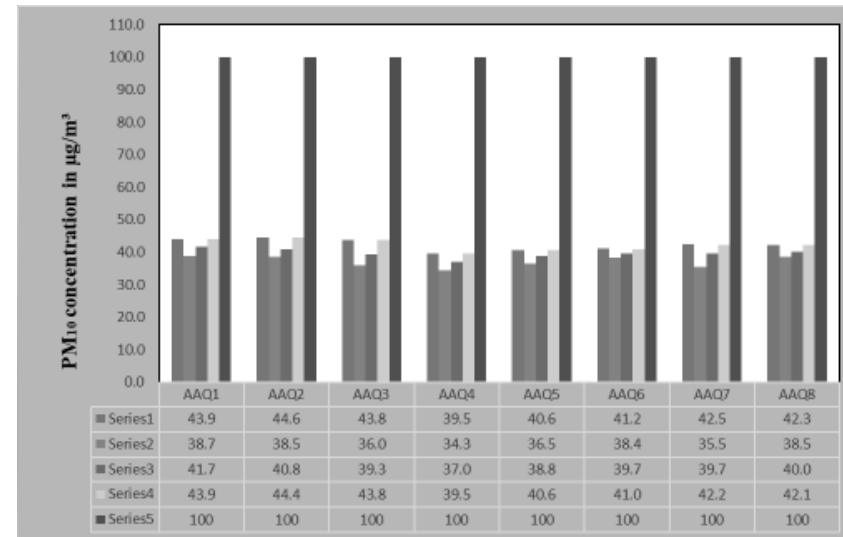


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM10 Measured from 10 Air Quality Monitoring Stations within 5 km Radius

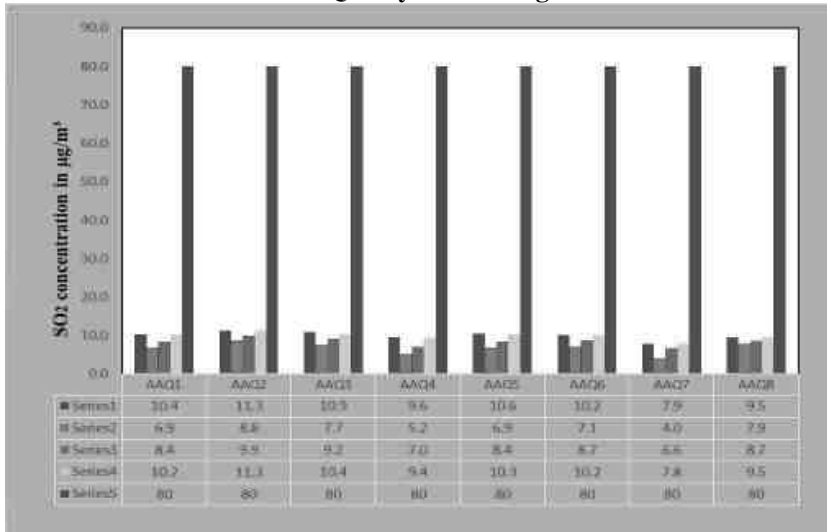


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO2 Measured from 10 Air Quality Monitoring Stations within 5 km Radius

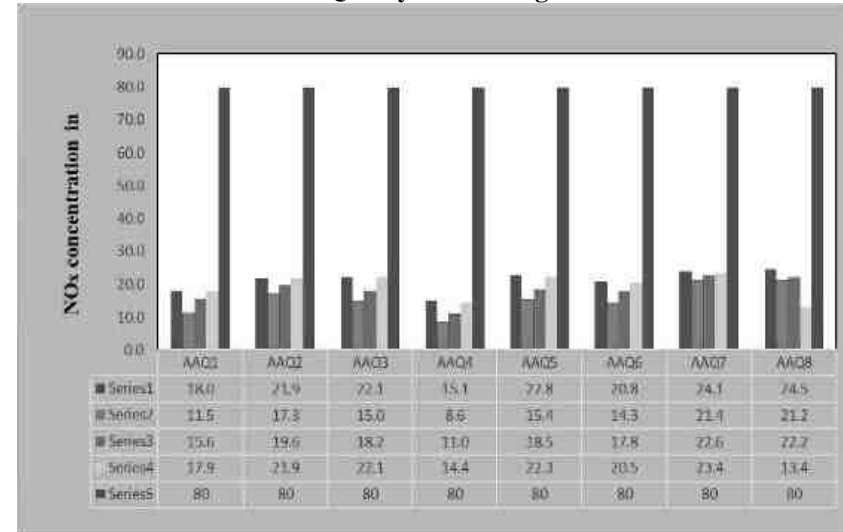


Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NOx Measured from 10 Air Quality Monitoring Stations within 5 km Radius

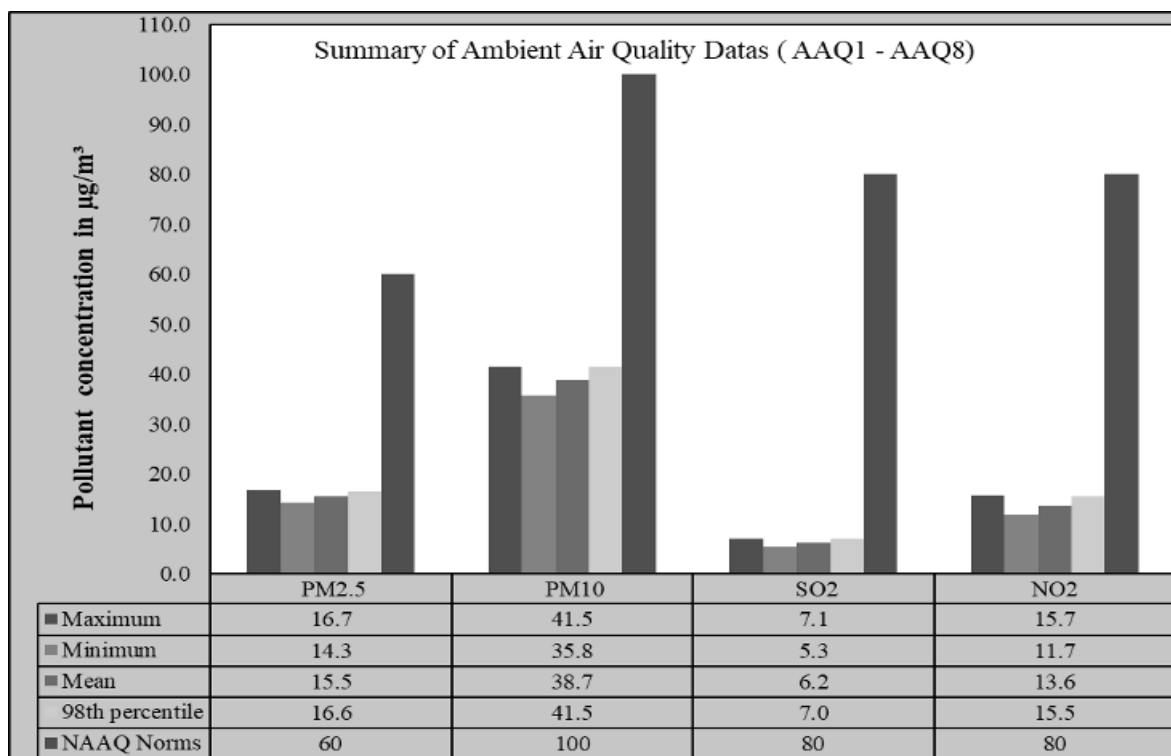


Figure 3.21 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius

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 Eleven (11) 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 3.22.

Table 3.17 Noise Monitoring Locations

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	N1	Devaraj Core	0.80	E	10°59'25.94"N	77°58'2.66"E
2	N2	Pullaiyampalayam	1.06	NNE	10°59'48.21"N	77°58'00.72"E
3	N3	VST Blue metals Core	1.48	SSE	10°58'53.04"N	77°58'16.56"E
4	N4	Near Ponvinayaga Blue Metals	2.20	S	10°58'09.02"N	77°57'14.40"E
5	N5	Andisangilipalayam	2.72	NNW	11°00'02.45"N	77°56'06.69"E

6	N6	Punnam Velayuthampalayam	3.48	SW	10°59'4.19"N	77°55'32.63"E
7	N7	Punnam Chattiram	2.83	NE	11°0.48'.64"N	77°58'47.07"E
8	N8	Pavithiram	4.45	SSE	10°57'30.93"N	77°59'09.93"E
9	N9	Nochipalayam	5.84	NE	77°59'21.43"E	78° 0'46.92"E
10	N10	Sathiya Core	0.64	NNE	10°59'26.67"N	77°57'32.13"E
11	N11	Selva Vinayaga Core	--	--	10°58'53.04"N	77°58'16.56"E

Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

Table 3.18 Ambient Noise Quality Result

S. No.	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time (6AM-10 PM)	Night Time (10 PM-6 AM)	
1	Devaraj Core	41.4	31.8	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Pullaiyampalayam	39.4	30.2	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
3	VST Blue metals Core	41.6	32.6	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
4	Near Ponvinayaga Blue Metals	41.2	32.4	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
5	Andisangilipalayam	36.2	30.8	
6	Punnam Velayuthampalayam	39.6	30.1	
7	Punnam Chattiram	42.6	35.4	
8	Pavithiram	43.8	40.1	
9	Nochipalayam	41.3	36.2	
10	Sathiya Core	45.5	38.4	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
11	Selva Vinayaga Core	44.8	36.8	

Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

The Table 3.18 shows that noise level in core zone was 44.8 dB (A) Leq during day time and 36.8dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.2 to 45.5dB (A) Leq and during night time from 30.1 to 40.1dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.23 and 3.24.

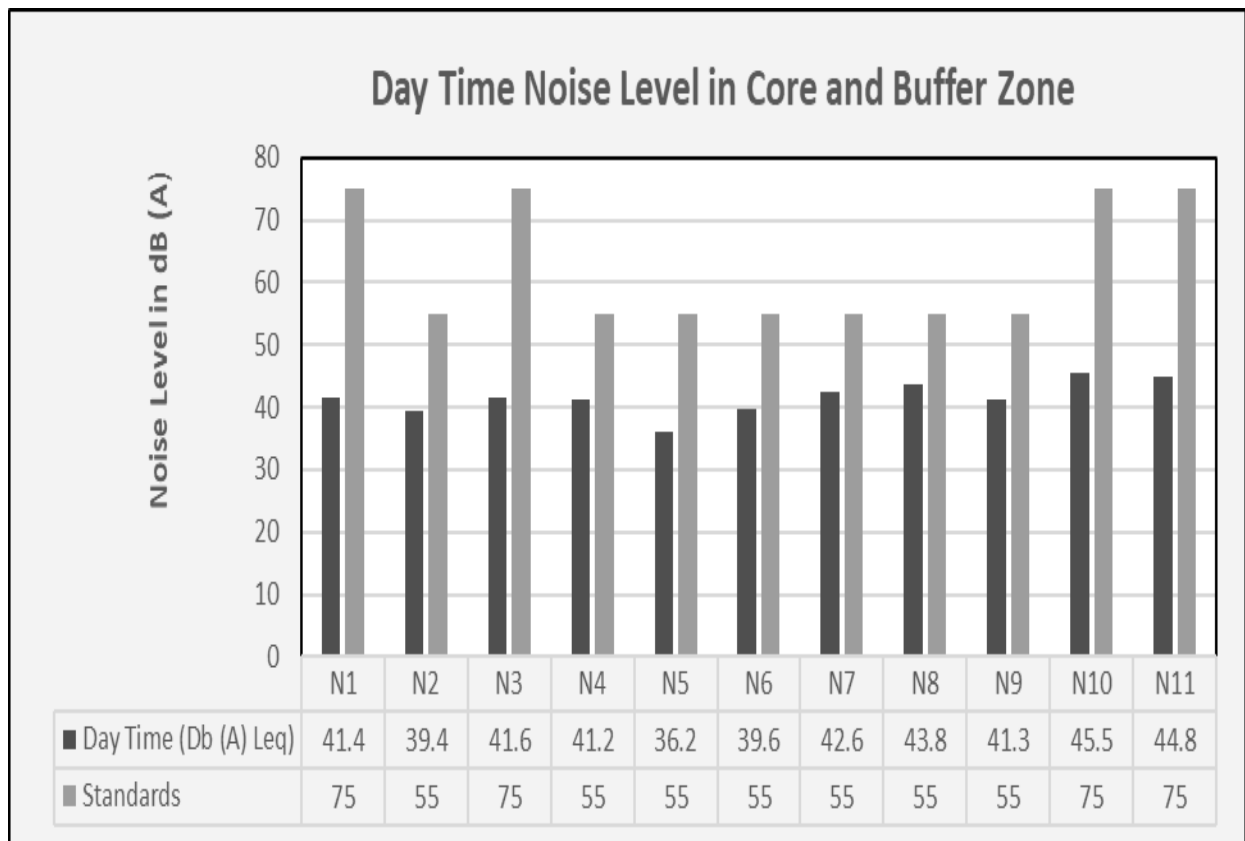


Figure 3.22 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

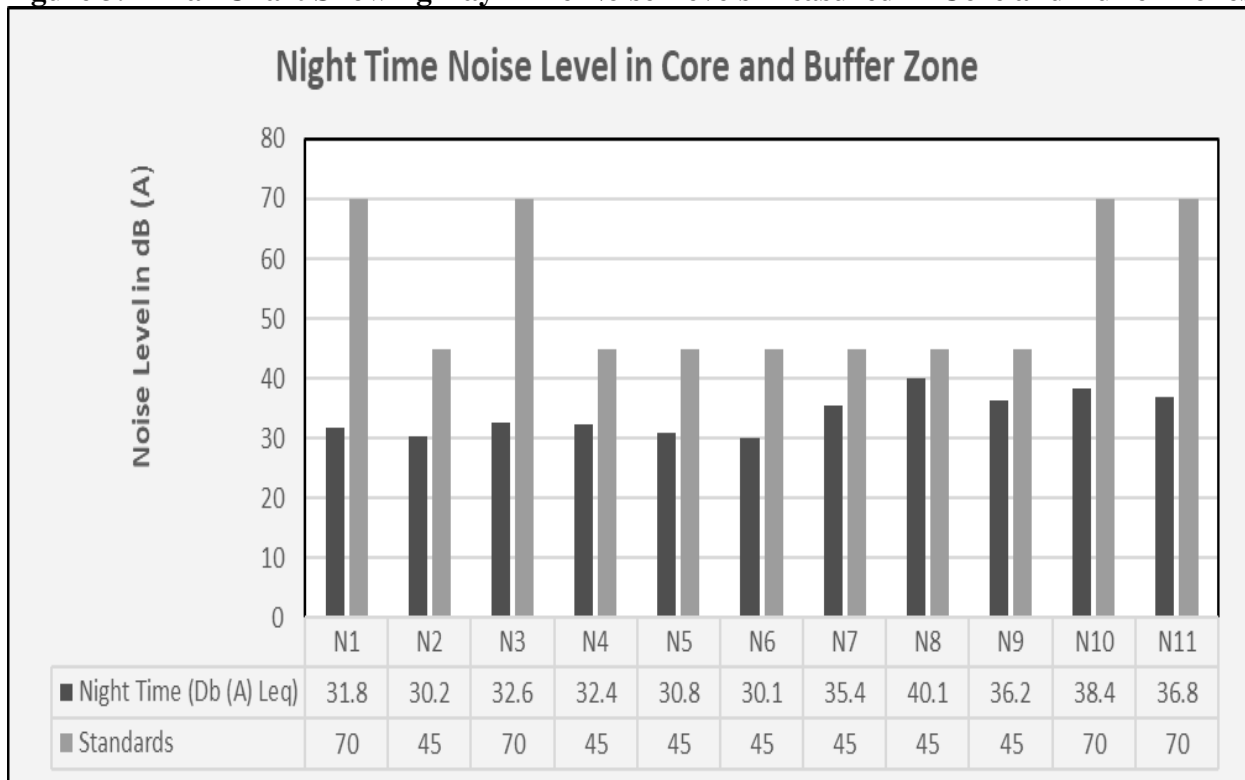


Figure 3.23 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

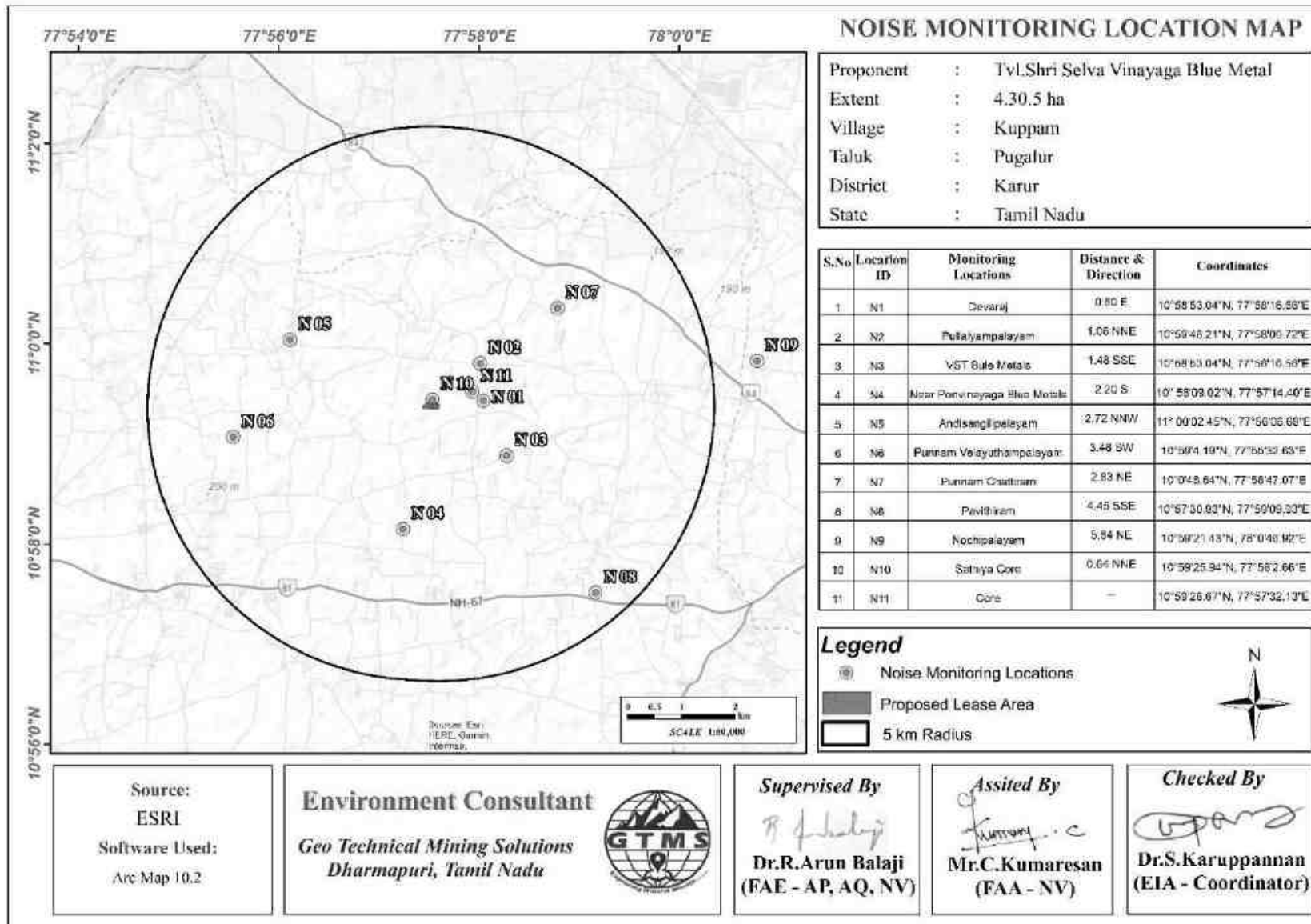


Figure 3.24 Toposheet Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site

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 3.25.



Figure 3.25 Quadrates Sampling Methods of Flora

Phyto-Sociological Studies

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

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

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

Shannon – Wiener Index, Evenness and Richness

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

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

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

3.5.1 Flora

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

Flora in mine lease area (core zone)

The mine lease area contains total of 15 species belonging to 8 families have been recorded from the mine lease area. 4 Trees, 4 shrubs, 7 herbs were identified. It is a grassy land. There are no endangered species in mine lease area. Details of vegetation with scientific name indicated in Table 3.21.

Table 3.21 Flora in mine lease area

S.no	Local name	Scientific name	Family name	No of plants
Trees				
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4
2	Unjai maram	<i>Albizia amara</i>	Fabaceae	3
3	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	2
4	Vealli vealan	<i>Vachellia leucophloea</i>	Fabaceae	6
Shrubs				
1	Avaram chadi	<i>Senna auriculata</i>	Fabaceae	3
2	Earuku	<i>Calotropis gigantea</i>	Apocynaceae	4
3	communist pacha	<i>Chromolaena odorata</i>	Asteraceae	6
4	Unnichadi	<i>Lantana camara</i>	Verbenaceae	5
Herbs /Climber				
1	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	2
2	Thathapondu	<i>Tridax procumbens</i>	Asteraceae	11
3	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	7
4	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	5
5	Nearunji mull	<i>Tribulus zeyheri Sond</i>	Zygophyllaceae	12
6	Pulapoo	<i>Aerva lanata</i>	Amaranthaceae	3
7	American mint	<i>Hyptis suaveolens</i>	Lamiaceae	5

Flora in 300 m radius zone

Vegetation species within 300 meters radius around the lease area. It is an arid landscape. There is no agricultural land nearby. It contains a total of 18 species belonging to 11 families have been recorded from the buffer zone. Trees 4 (22%), Shrubs 4 (22%) Herbs 10 (55%) were identified. Details of flora with the scientific name details and diversity species Rich ness index were mentioned in Table 3.22-3.24. There is no threat to the Flora and Fauna species in 300-meter radius

Flora in 10 km radius zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because nearby agriculture land was found to dominate mostly in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of 66 species belonging to 37 families have been recorded from the buffer zone consisting of 30 Trees (45%), 15 Shrubs (22%) Herbs and 21 (31%) Climbers, Creeper, Grass & Cactus were identified. Details of flora with the scientific name details mentioned in Table 3.25

Table 3.22 Flora in 300 Meter 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	Importance Value Index	IUCN Conservation Status
Trees													
1	Karuvelam	<i>Vachellia Nilotica</i>	Fabaceae	6	4	5	1.2	80.0	1.5	40.0	36.4	76.4	Not Listed
2	Usilai Wunja	<i>Albizia Amara</i>	Fabaceae	4	3	5	0.8	60.0	1.3	26.7	27.3	53.9	Not Listed
3	Vembu	<i>Azadirachta Indica</i>	Meliaceae	3	2	5	0.6	40.0	1.5	20.0	18.2	38.2	Not Listed
4	Vealli Vealan	<i>Vachellia Leucophloea</i>	Fabaceae	2	2	5	0.4	40.0	1.0	13.3	18.2	31.5	Lc
Shrubs													
1	Erukku	<i>Calotropis Gigantea</i>	Apocynaceae	7	6	8	0.9	75.0	1.2	26.9	30.0	56.9	Not Listed
2	Uumaththai	<i>Datura Metel</i>	Solanaceae	4	3	8	0.5	37.5	1.3	15.4	15.0	30.4	Not Listed
3	Thuthi	<i>Abutilon Indicum</i>	Meliaceae	8	6	8	1.0	75.0	1.3	30.8	30.0	60.8	Not Listed
4	Avarai	<i>Senna Auriculata</i>	Fabaceae	7	5	8	0.9	62.5	1.4	26.9	25.0	51.9	Not Listed
Herbs													
1	Nayuruv	<i>Achyranthes Aspera</i>	Amaranthaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
2	Veetukaayapundu	<i>Tridax Procumbens</i>	Asteraceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	Nyctaginaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
4	Thumbai	<i>Leucas Aspera</i>	Lamiaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
5	Nai Kadugu	<i>Celome Viscosa</i>	Capparidaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
6	Partiniyam	<i>Parthenium Hysterophorus</i>	Asteraceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
7	Mukurattai	<i>Boerhavia Diffusa</i>	Nyctaginaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
8	Kovakkai	<i>Trichosanthes Dioica</i>	Cucurbitaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
9	Mookuthi Poondu	<i>Wedelia Trilobata</i>	Asteraceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
10	Perandai	<i>Cissus Quadrangularis</i>	Vitaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed

Table 3.23 Calculation of Species Diversity in 300 Meter Radius

S.No	Common Name	Scientific Name	No. Of Species	Pi	In (Pi)	Pi X In (Pi)
Trees						
1	Karuvelam	<i>Vachellia Nilotica</i>	6	0.40	-0.92	-0.37
2	Usilai Wunja	<i>Albizia Amara</i>	4	0.27	-1.32	-0.35
3	Vembu	<i>Azadirachta Indica</i>	3	0.20	-1.61	-0.32
4	Vealli Vealan	<i>Vachellia Leucophloea</i>	2	0.13	-2.01	-0.27
H (Shannon Diversity Index) =1.31						
Shrubs						
1	Erukku	<i>Calotropis Gigantea</i>	7	0.27	-1.31	-0.35
2	Uumaththai	<i>Datura Metel</i>	4	0.15	-1.87	-0.29
3	Thuthi	<i>Abutilon Indicum</i>	8	0.31	-1.18	-0.36
4	Avarai	<i>Senna Auriculata</i>	7	0.27	-1.31	-0.35
H (Shannon Diversity Index) =1.36						
Herbs						
1	Nayuruv	<i>Achyranthes Aspera</i>	10	0.13	-2.07	-0.26
2	Vetukaayapoondur	<i>Tridax Procumbens</i>	8	0.10	-2.29	-0.23
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	9	0.11	-2.17	-0.25
4	Thumbai	<i>Leucas Aspera</i>	8	0.10	-2.29	-0.23
5	Nai Kadugu	<i>Celome Viscosa</i>	7	0.09	-2.42	-0.21
6	Parttiniyam	<i>Parthenium Hysterophorus</i>	8	0.10	-2.29	-0.23
7	Mukurattai	<i>Boerhavia Diffusa</i>	7	0.09	-2.42	-0.21
8	Kovakkai	<i>Trichosanthes Dioica</i>	7	0.09	-2.42	-0.21
9	Mookuthi Poondur	<i>Wedelia Trilobata</i>	9	0.11	-2.17	-0.25
10	Perandai	<i>Cissus Quadrangularis</i>	6	0.08	-2.58	-0.20
H (Shannon Diversity Index) =2.29						

Table 3.24 Species Richness (Index) In 300-Meter Radius

Details	H	H Max	Evenness	Species Richness
Tree	1.31	1.39	0.94	1.11
Shrubs	1.36	1.39	0.98	0.92
Herbs	2.29	2.30	1.00	2.06

Table 3.25 Flora in Buffer Zone

S. No	Local Name	Scientific Name	Family Name
Trees			
1	Manga	<i>Mangifera Indica</i>	Anacardiaceae
2	Puliyamaram	<i>Tamarindus Indica</i>	Legumes
3	Vadanarayani	<i>Delonix Elata</i>	Fabaceae
4	Thenpazham	<i>Muntingia Calabura</i>	Tiliaceae
5	Punnai	<i>Calophyllu Inophyllum</i>	Calophyllaceae
6	Ilanthai	<i>Ziziphus Jujubha</i>	Rhamnaceae
7	Vembu	<i>Azadirachta Indica</i>	Meliaceae
8	Thekku	<i>Tectona Grandis</i>	Verbenaceae
9	Pongam Oiltree	<i>Pongamia Pinnata</i>	Fabaceae
10	Thennai Maram	<i>Cocos Nucifera</i>	Arecaceae
11	Nochi	<i>Vitex Negundo</i>	Lamiaceae
12	Karimurungai	<i>Moringa Olefera</i>	Moraginaceae
13	Pappali Maram	<i>Carica Papaya L</i>	Caricaceae
14	Poovarasu	<i>Thespesia Populnea</i>	Malvaceae
15	Arasanmaram	<i>Ficus Religiosa</i>	Moraceae
16	Vilvam	<i>Aegle Marmelos</i>	Rutaceae
17	Alamaram	<i>Ficus Benghalensis</i>	Moraceae
18	Vazhaimaram	<i>Musa</i>	Musaceae
19	Karuvelam Maram	<i>Vachellia Nilotica</i>	Fabaceae
20	Nelli	<i>Emblica Officinalis</i>	Phyllanthaceae
21	Eucalyptus	<i>Eucalyptus Globules</i>	Myrtaceae
22	Maramalli	<i>Millingtonia Hortensis</i>	Bignoniaceae
23	Kuduka Puli	<i>Pithecellobium Dulce</i>	Mimosaceae
24	Karungali	<i>Acacia Sundra</i>	Legumes
25	Karuvelam	<i>Acacia Nilotica</i>	Mimosaceae
26	Nettilinkam	<i>Polylathia Longifolia</i>	Annonaceae
27	Arai Nelli	<i>Phyllanthus Acidus</i>	Euphorbiaceae
28	Panai Maram	<i>Borassus Flabellifer</i>	Arecaceae
29	Sapota	<i>Manilkara Zapota</i>	Sapotaceae

30	Navalmaram	<i>Sygygium Cumini</i>	Myrtaceae
Shrubs			
1	Avarai	<i>Senna Auriculata</i>	Fabaceae
2	Sundaika	<i>Solanum Torvum</i>	Solanaceae
3	Purapirakkai	<i>Chrozophora Rottleri</i>	Euphorbiaceae
4	Arali	<i>Nerium Indicum</i>	Apocynaceae
5	Seemaigaththi	<i>Cassia Alata</i>	Caesalpinaceae
6	Chemparuthi	<i>Hibiscu Rosa-Sinensis</i>	Malvaceae
7	Kattamanakku	<i>Jatropha Curcas</i>	Euphorbiaceae
8	Chaturakalli	<i>Euphorbia Antiquorum</i>	Euphorbiaceae
9	Idlipoo	<i>Xoracoc Cinea</i>	Rubiaceae
10	Thuthi	<i>Abutilon Indicum</i>	Meliaceae
11	Nithyakalyani	<i>Cathranthus Roseus</i>	Apocynaceae
12	Uumaththai	<i>Datura Metel</i>	Solanaceae
13	Kundumani	<i>Abrus Precatorius</i>	Fabaceae
14	Erukku	<i>Calotropis Gigantea</i>	Apocynaceae
15	Neermulli	<i>Hydrophila Auriculata</i>	Acanthaceae
Herbs, Climber, Creeper & Grasses			
1	Nayuruv	<i>Achyranthes Aspera</i>	Amaranthaceae
2	Veetukaayapoondur	<i>Tridax Procumbens</i>	Asteraceae
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	Nyctaginaceae
4	Kuppaimeni	<i>Acalypha Indica</i>	Euphorbiaceae
5	Karisilanganni	<i>Eclipta Prostata</i>	Asteraceae
6	Korai	<i>Cyperus Rotundus</i>	Cyperaceae
7	Thumbai	<i>Leucas Aspera</i>	Lamiaceae
8	Nai Kadugu	<i>Celome Viscosa</i>	Capparidaceae
9	Partiniyam	<i>Parthenium Hysterophorus</i>	Asteraceae
10	Mukurattai	<i>Boerhavia Diffusa</i>	Nyctaginaceae
11	Thulasi	<i>Ocimum Tenuiflorum</i>	Lamiaceae
12	Arugampul	<i>Cynodon Dactylon</i>	Poaceae
13	Manathakkali	<i>Solanumnigrum</i>	Solanaceae
14	Kudai Korai	<i>Cyperus Difformis</i>	Cyperaceae

15	Thoiya Keerai	<i>Digeria Muricata</i>	Amaranthaceae
16	Kovai	<i>Coccinia Grandis</i>	Cucurbitaceae
17	Perandai	<i>Cissus Quadrangularis</i>	Vitaceae
18	Mudakkotan	<i>Cardiospermum Helicacabum</i>	Sapindaceae
19	Kovakkai	<i>Trichosanthes Dioica</i>	Cucurbitaceae
20	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae
21	Siru Puladi	<i>Desmodium Triflorum</i>	Fabaceae

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 3.26

Table 3.26 Aquatic Vegetation

S. No.	Scientific Name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Eichornia Crassipe</i>	Water Hyacinth	Agayatamarai	NA
2	<i>Aponogeton natans</i>	Floating Lace Plant	Kottikizhangu	NA
3	<i>Nymphaea Nouchali</i>	Blue Water Lily	Nellambal	LC
4	<i>Carex Cruciata</i>	Cross Grass	Koraipullu	NA
5	<i>Cynodon Dactylon</i>	Scutch Grass	Arugampullu	LC
6	<i>Cyperus Exaltatus</i>	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 *Artiola gray*.

Ex: Phytoplankton → Zooplankton → small fish → large fish

Forest Vegetation

There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. The Thampalayam RF Located in 7.02 km SE Side. There Are Few Plants and No Endangered Species in Thampalayam Reserve Forest. The *Prosopis Juliflora*, *Azadirachta Indica*, *Vachellia Leucophloea*, *Albizia Amara* These Three Types of Plants Are Abundant in Thathmpalayam Reserve Forest. Thus, The Area Under Study (Mine Lease Area and the 10 Km Buffer Zone) Is Not Ecologically Sensitive.

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 3.27 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 18 varieties of species belonging to 18 families were observed in the core zone. Among them are 6 Insects, 3 Reptiles, 1 Mammal and 8 Avian. Number of species decreases towards the mining area due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and 6 species are under schedule IV according to Indian wild life Act 1972. There are no critically endangered, endangered, vulnerable and endemic species there. Details of fauna in core zone and their scientific name were mentioned in Table. 3.28.

Fauna in Buffer Zone

A total of 42 species belonging to 41 families were recorded in the buffer zone. Based on habitat classification the majority of species were 15 Birds (35%), followed by 13 Insects (30%), 7 Reptiles (16%), 4 Mammals (9%) and 3 Amphibians (7%). There are 4 schedule II species and 23 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed. List of fauna in the buffer zone is mentioned in Table 3.29.

Table 3.28 Fauna in Core Zone

S. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
Insects					
1	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	NL	NL
2	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
3	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
4	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
5	Stick insect	Lonchodidae	<i>carausius morosus</i>	NL	LC
6	Mottled emigrant	Peridae	<i>Catopsilia pyranthe</i>	NL	LC
Reptiles					
7	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC

8	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
9	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
Mammals					
10	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
Aves					
11	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
12	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
13	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
14	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
15	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
16	Crow Pheasant	Cucalidae	<i>Centropus sinensis</i>	Schedule IV	LC
17	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
18	Grey drongo	Dicruridae	<i>Dicrurus leucophaeus</i>	Schedule IV	LC

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

Table 3.29 Fauna in Buffer Zone

S.No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
Insects					
1	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
4	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
7	Lime butterfly	Papilionidae	<i>Papilio demoleus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
10	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
11	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
12	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
13	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
Reptiles					
14	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
15	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC

16	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
17	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
18	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
19	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
20	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
Mammals					
21	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
22	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
23	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
24	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
Aves					
25	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
26	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
27	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
28	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
29	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
30	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
31	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
32	Koel	Cuculidae	<i>Eudynamys</i>	Schedule IV	LC
33	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
34	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
35	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
36	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
37	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
38	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
39	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
Amphibians					
40	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
41	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
42	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

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

3.5.3 Agriculture & Horticulture in Karur district:

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

Major Agricultural Crops

Major horticulture crops cultivated in this district are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.30.

Table 3.30 Major Crops in 1km radius

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

Major Horticulture Crops

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

Major horticulture crops cultivated in Karur district are fruit crops like mango, banana, Sapota and guava, 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 3.31.

Table 3.31 Major Field Crops & Horticulture cultivation in 1km radius.

S. No	Common Name	Scientific Name	Family
Major Horticultural Crops			
1	Guava	<i>Psidium guajava</i>	Myrtaceae
2	Sapota	<i>Manilkara zapota</i>	Sapotaceae
3	Lemon	<i>Citrus × limon</i>	Rutaceae
4	Papaya	<i>Carica papaya</i>	Caricaceae

Vegetables			
8	Onion	<i>Allium cepa</i>	Amaryllidaceae
9	Tapioca	<i>Manihot esculenta</i>	Spurges
10	Brinjal	<i>Solanum melongena</i>	Nightshade
11	Tomato	<i>Solanum lycopersicum</i>	Nightshade
12	Bottle Gourd	<i>Lagenaria siceraria</i>	Cucurbits
13	Veandai kai	<i>Abelmoschus esculentus</i>	Mallows
14	Moringa	<i>Moringa oleifera</i>	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

3.6.1 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.

3.6.2 Objectives 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.

3.6.3 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

3.6.4 Socio-Economic Status of Study area

The study area covers 10 villages including Ariyur, Athipalayam, K.Paramathi, Karudayampalayam, Kuppam, Munnur, Nedungur, Pavithiram, Punnam, Vettamangalam(East) , Vettamangalam (West) is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.32 and for other 10 villages in Tables 3.33 - 3.35

Table 3.32 Kuppam Village Population Facts

Kuppam Village	
Number of Households	1120
Population	3503
Male Population	1697
Female Population	1806
Children Population	264
Sex-ratio	1064
Literacy	60.11%
Male Literacy	72.80%
Female Literacy	48.17%
Scheduled Tribes (ST)	0
Scheduled Caste (SC)	600
Total Workers	2246
Main Worker	1941
Marginal Worker	305

Table 3.33 Population and Literacy Data of Study Area

Village	No of Households	Total Population Person	Total Population Male	Total Population Female	Literates Population Person	Literates Population Male	Literates Population Female	Illiterate Persons	Illiterate Male	Illiterate Female
Ariyur	443	1378	694	684	887	512	375	491	182	309
Athipalayam	730	2062	1014	1048	1271	757	514	791	257	534
K.Paramathi	25475	82268	40825	41443	53384	30733	22651	28884	10092	18792
Karudayampalayam	577	2347	1211	1136	1614	977	637	733	234	499
Munnur	826	2582	1289	1293	1649	980	669	933	309	624
Nedungur	403	1190	586	604	800	469	331	390	117	273
Pavithiram	1799	5881	2862	3019	3738	2165	1573	2143	697	1446
Punnam	1452	5446	2839	2607	3679	2208	1471	1767	631	1136
Vettamangalam (East)	807	2657	1310	1347	1521	900	621	1136	410	726
Vettamangalam (west)	1827	5882	2887	2995	3953	2225	1728	1929	662	1267

Table 3.34 Details on Educational Facilities, Water, and Drainage & Health Facilities

Village	Private Primary School (Numbers)	Govt. Vocational Training School/ITI (Numbers)	Primary Health Centre (Numbers)	Tap Water Untreated	River/Canal	Is the Area Covered under Total Sanitation Campaign (TSC)?	Telephone (landlines)	Public Bus Service	Gravel (kutcha) Roads	Commercial Bank	Agricultural Credit Societies	Self - Help Group (SHG)	Nutritional Centres- Anganwadi Centre	Community Centre with/without TV	Power Supply for Domestic Use
Ariyur	0	0	0	1	2	2	1	1	1	2	2	1	1	1	1
Athipalayam	0	0	0	1	2	1	1	2	1	2	2	1	1	1	1
K.Paramathi	0	0	1	1	2	2	1	1	1	1	1	1	1	2	1
Karudayampalayam	0	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Munnur	0	0	0	1	2	1	1	1	1	2	2	1	1	2	1
Nedungur	0	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Pavithiram	1	0	0	1	1	2	1	1	1	2	2	1	1	1	1
Punnam	1	0	1	1	1	2	1	1	1	2	1	1	1	1	1
Vettamangalam (East)	0	0	1	1	1	1	1	1	1	2	1	1	1	1	1
Vettamangalam (west)	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1

Table 3.35 Workers' Profile of Study Area

Village	Total Worker Population Person	Total Worker Population Male	Total Worker Population Female	Main Working Population Person	Main Working Population Male	Main Working Population Female	Main Cultivator Population Person	Main Agricultural Labourers Population Person	Main Other Workers Population Person	Non-Working Population Person
Ariyur	790	493	297	790	493	297	337	309	130	588
Athipalayam	1372	713	659	1309	701	608	442	551	281	690
K.Paramathi	49254	27760	21494	46414	26489	19925	14265	17270	13726	33014
Karudayampalayam	1176	646	530	847	501	346	301	265	251	1171
Munnur	1577	882	695	1434	805	629	420	638	355	1005
Nedungur	753	432	321	734	418	316	409	241	81	437
Pavithiram	3293	1875	1418	2879	1682	1197	747	829	1242	2588
Punnam	2718	1531	1187	2665	1504	1161	731	632	1269	2728
Vettamangalam (East)	1609	894	715	1593	886	707	419	940	210	1048
Vettamangalam (west)	3541	1966	1575	3455	1920	1535	1268	1410	729	2341

3.6.5 Recommendation and Suggestion

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

3.6.6 Summary & Conclusion

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

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Karur to Vellaikovil (NH-81) as shown in Table 3.36-3.39 and in Figure 3.27. 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 3.36 Traffic Survey Locations

Station Code	Road Names	Distance and Direction	Type of Road
TS1	Village Road	0.70 Km-North	Village Road
TS2	Erode to Karur (MDR)	3.17 Km-NE	Erode to Karur (MDR)
TS3	Karur to Vellaikovil (NH-81)	3.54 Km-South	Karur to Vellaikovil (NH 81)

Source: On-site monitoring by GTMS FAE & TM

Table 3.37 Existing Traffic Volume

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

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 3.38 Rough Stone Transportation Requirement

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	5	15

Source: Approved Mining Plan

Table 3.39 Summary of Traffic Volume

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Village Road	177	15	192	1200
Erode to Karur Road (SH)	438	15	453	1200
Vellakoil to Karur Road (NH)	657	15	672	1500

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 transportatio

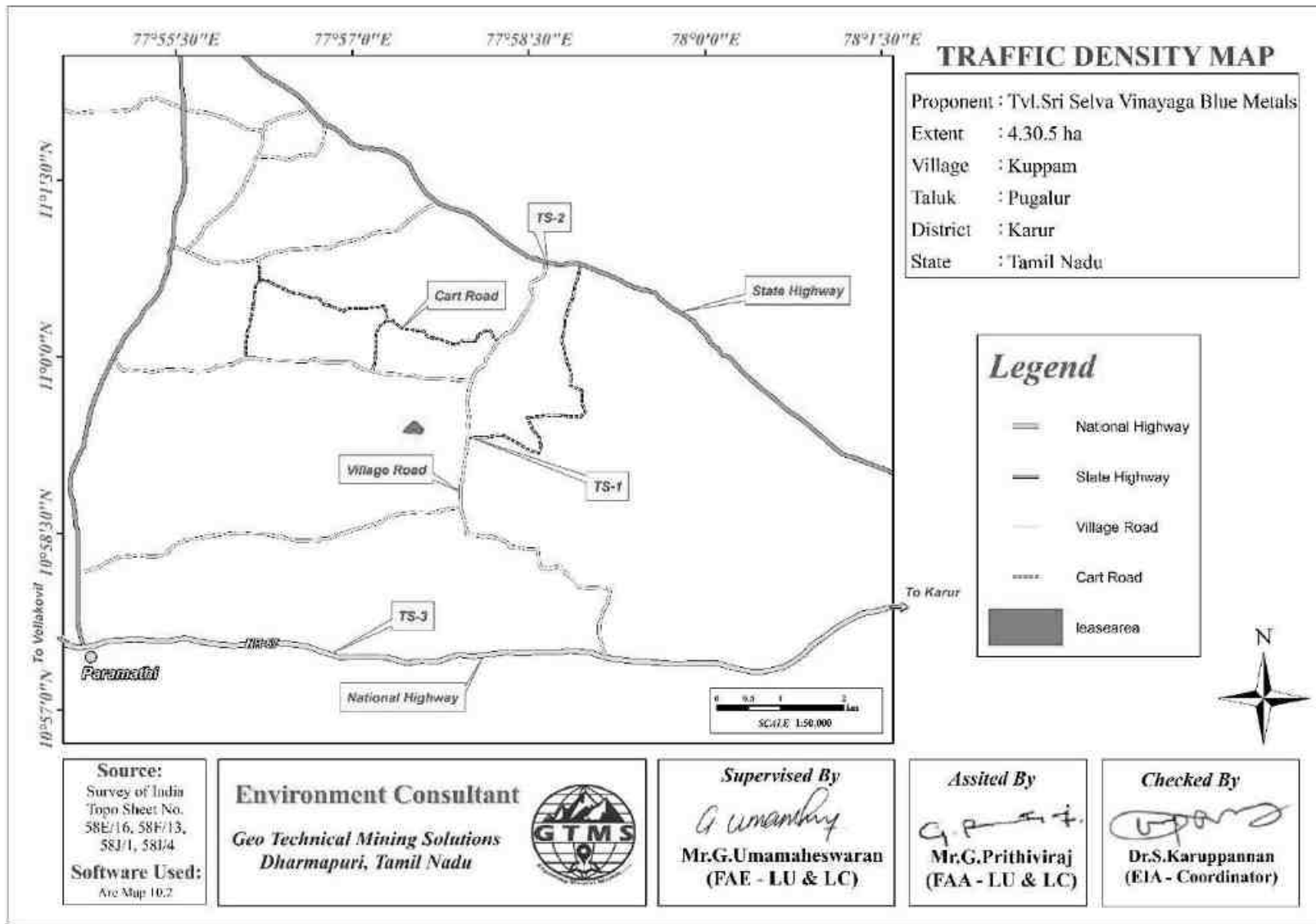


Figure 3.26 Traffic Density Map

3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, Reserve Forest 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 3.40.

Table 3.40 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	Thathampalayam R. F	7.09 km SE
		Amaravathi River	8.55 km SE
		Cauvery River	7.96 km North
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	TNPL Tamilnadu Newsprint and Papers Limited	7.73km NE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet





Figure 3.27 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
- ❖ Increase in agricultural productivity of land when mine water is discharged to the surrounding lands for irrigation

4.1.2 Common Mitigation Measures from Proposed Project

- ❖ 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
- ❖ 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

- ❖ Deterioration of soil quality in the surrounding area due to runoff from the project area
- ❖ Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

4.2.2 Common Mitigation Measures from proposed project

- ❖ Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- ❖ 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 the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site.
- ❖ Retain existing or re-plant the vegetation will be retained 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 5.25KLD 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 Common 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, SO₂, and NO_x emission estimation have been given in Table 4.1.

Table 4.1 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E = [u0.4a0.2\{9.7 + 0.01p + b/(4 + 0.3b)\}]$	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).
Overall Mine	SO ₂	Area	$E = a0.14\{u/(1.83 + 0.93u)\} [\{p/(0.48 + 0.57p)\} + \{b/(14.37 + 1.15b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	NO _x	Area	$E = a0.25\{u/(4.3 + 32.5u)\} [1.5p + \{b/(0.06 + 0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that PM₁₀ emission rate is derived from the SPM

estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM_{2.5}, PM₁₀, SO₂ and NO_x emission results have been given in Table 4.2.

Table 4.2 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m ²	Calculated Value (g/s/m ²)
Overall Mine	PM _{2.5}	0.200524538	43050	4.65795E-06
Overall Mine	PM ₁₀	1.336830255	43050	3.1053E-05
Overall Mine	SO ₂	0.270456788	43050	6.28239E-06
Overall Mine	NO _x	0.016532537	43050	3.84031E-07

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 4.3-4.6.

4.4.2.2 Model Results

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

Table 4.3 Incremental & Resultant GLC of PM_{2.5}

Station ID	Distance to core area (km)	Direction	PM _{2.5} concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.74	E	20.2	5	25.2	Below standard	24.8	Not significant
AAQ2	1.51	SE	23.2	1	24.2		4.3	
AAQ3	2.25	SW	21.0	0	21		0.0	
AAQ4	2.82	NE	16.0	0.5	16.5		3.1	
AAQ5	3.49	SSW	20.7	0	20.7		0.0	
AAQ6	3.40	NNE	21.4	0.5	21.9		2.3	
AAQ7	4.45	SSE	19.7	0.5	20.2		2.5	
AAQ8	4.84	E	21.9	0	21.9		0.0	
AAQ9	0.89	E	16.7	5	21.7		29.94	
AAQ10	--	--	16.3	5.84	22.14		35.83	

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station ID	Distance to core area (km)	Direction	PM ₁₀ concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.74	E	41.7	5	46.7	Below standard	12.0	Not significant
AAQ2	1.51	SE	40.8	5	45.8		12.3	
AAQ3	2.25	SW	39.3	0.5	39.8		1.3	
AAQ4	2.82	NE	37.0	0.5	37.5		1.4	
AAQ5	3.49	SSW	38.8	0.5	39.3		1.3	
AAQ6	3.40	NNE	39.7	1	40.7		2.5	
AAQ7	4.45	SSE	39.7	0.5	40.2		1.3	
AAQ8	4.84	E	40.0	0.5	40.5		1.3	
AAQ9	0.89	E	41.8	5	46.8		11.96	
AAQ10	--	--	39.7	12	51.7		30.23	

Table 4.5 Incremental & Resultant GLC of SO₂

Station ID	Distance to core	Direction	SO ₂ concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.74	E	8.4	1	9.4	Below standard	11.9	Not significant
AAQ2	1.51	SE	9.9	0.5	10.4		5.1	
AAQ3	2.25	SW	9.2	0	9.2		0.0	
AAQ4	2.82	NE	7.0	0.1	7.1		1.4	
AAQ5	3.49	SSW	8.4	0	8.4		0.0	
AAQ6	3.40	NNE	8.7	0.5	9.2		5.7	
AAQ7	4.45	SSE	6.6	0.1	6.7		1.5	
AAQ8	4.84	E	8.7	0	8.7		0.0	
AAQ9	0.89	E	6.2	1	7.2		16.13	
AAQ10	--	--	5.7	2.93	8.63		51.40	

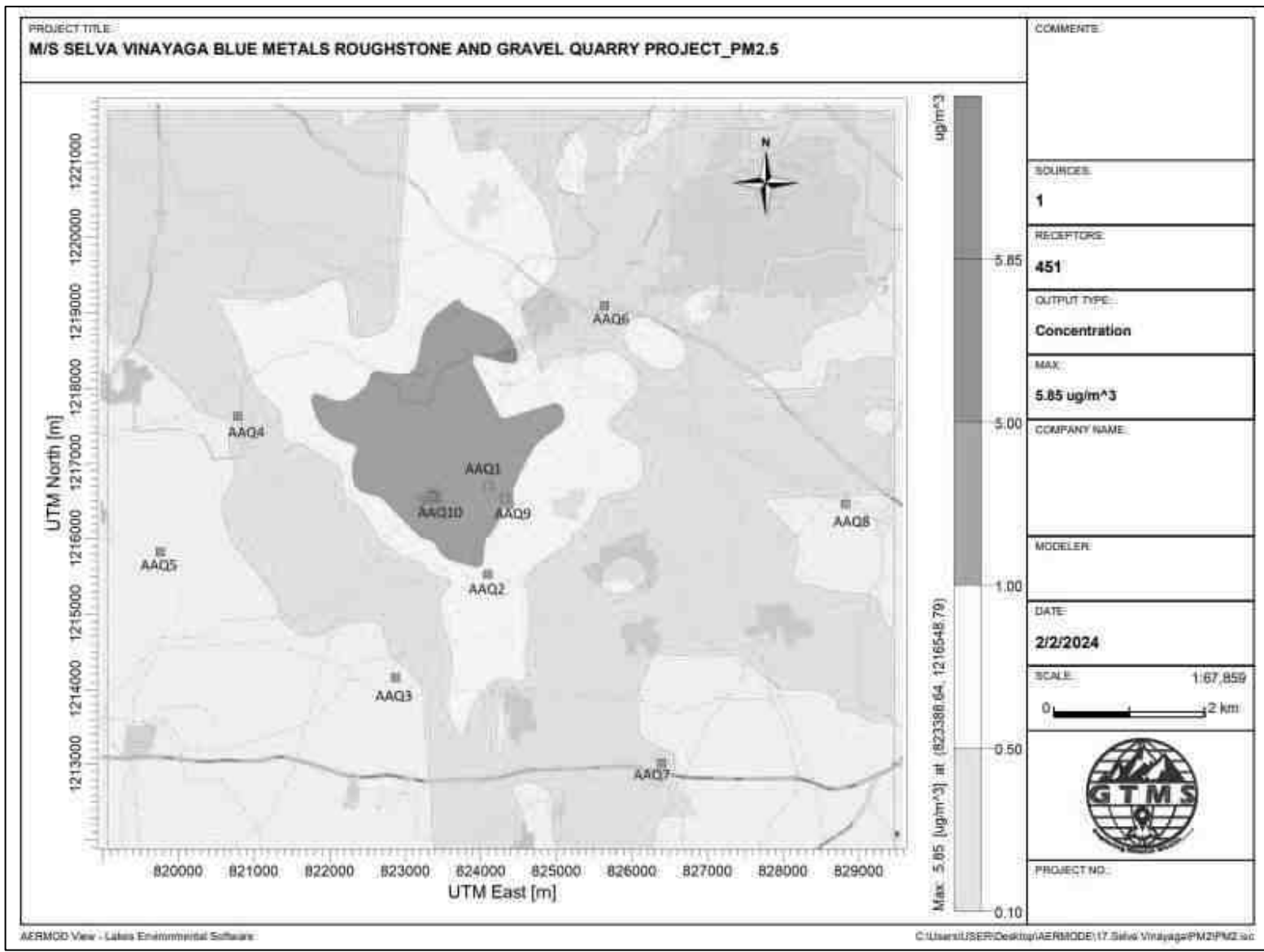


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

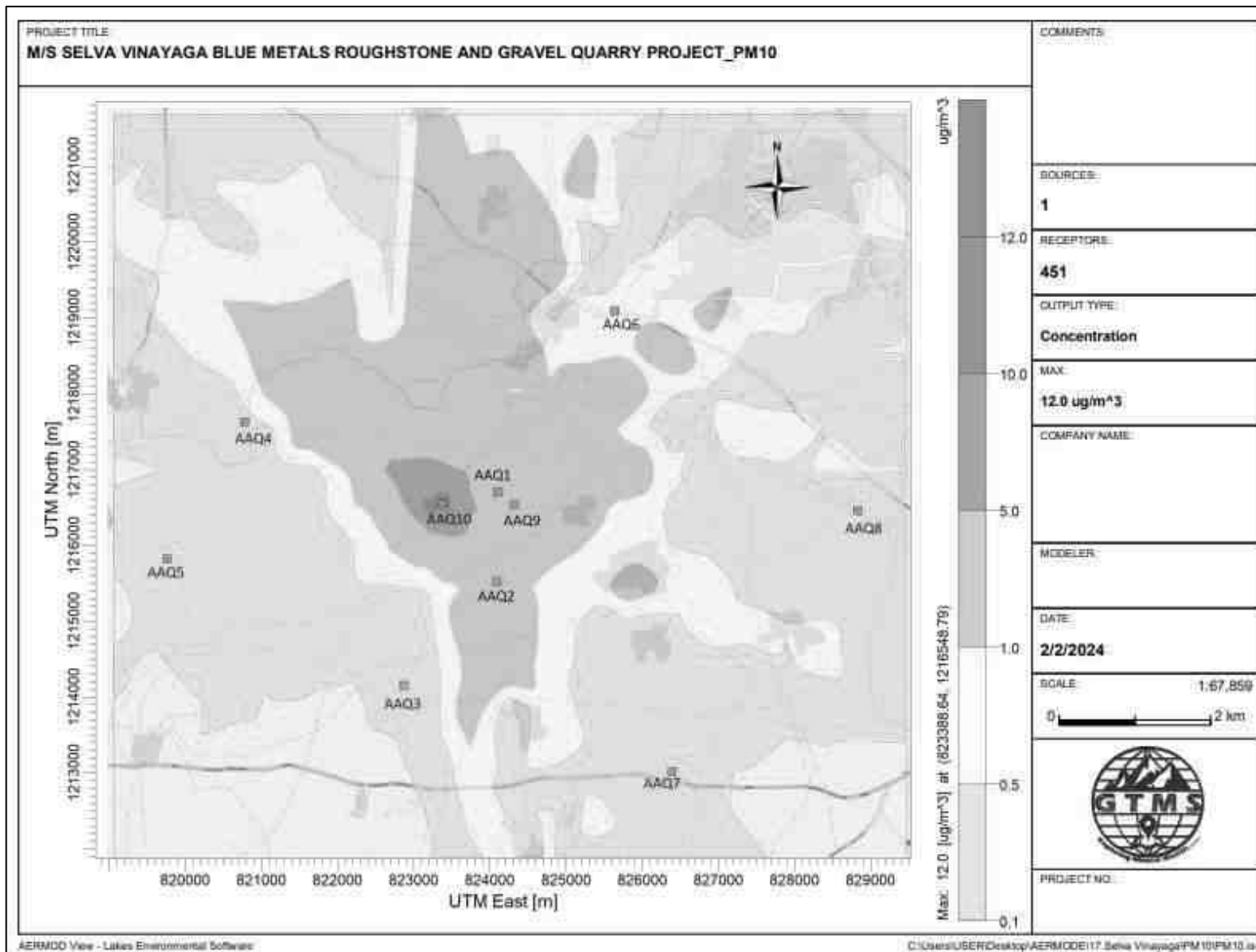


Figure 4.2 Predicted Incremental Concentration of PM₁₀

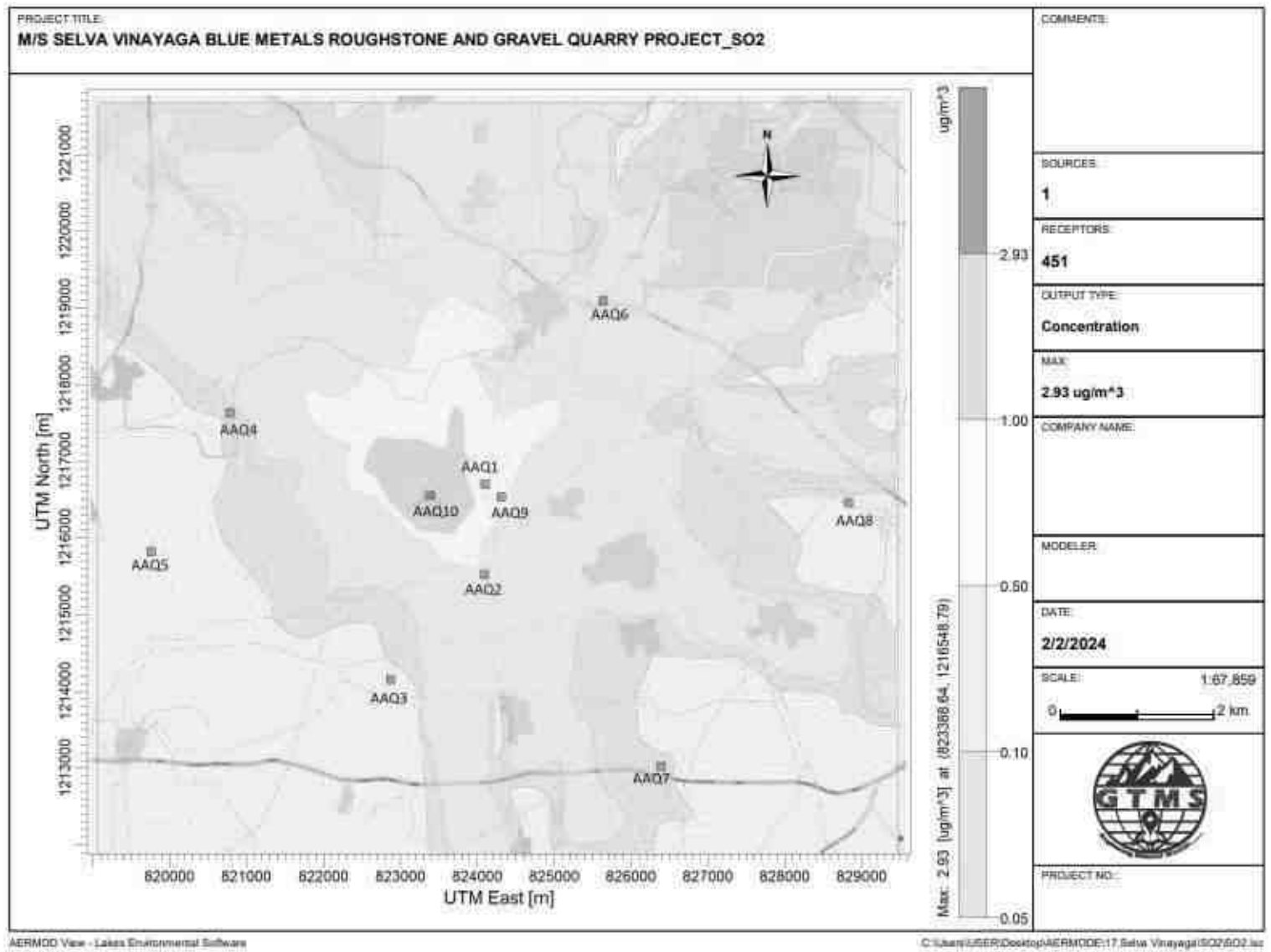


Figure 4.3 Predicted Incremental Concentration of SO₂

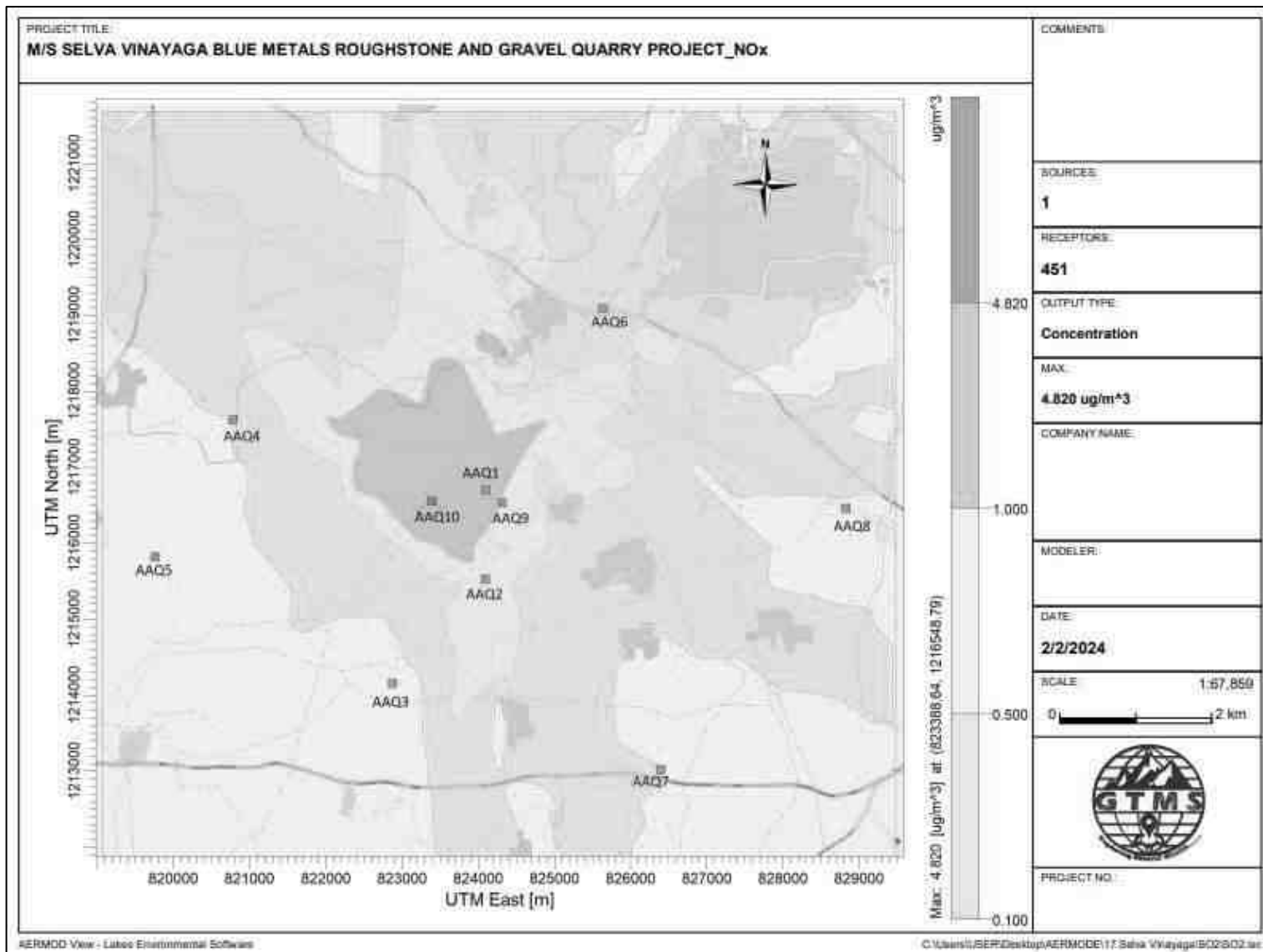


Figure 4.4 Predicted Incremental Concentration of NOx

Table 4.6 Incremental & Resultant GLC of NO_x

Station ID	Distance to core	Direction	NO _x concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.74	E	15.6	4.82	20.42	Below standard	30.9	Not significant
AAQ2	1.51	SE	19.6	1	20.6		5.1	
AAQ3	2.25	SW	18.2	0	18.2		0.0	
AAQ4	2.82	NE	11.0	0.5	11.5		4.5	
AAQ5	3.49	SSW	18.5	0	18.5		0.0	
AAQ6	3.40	NNE	17.8	0.5	18.3		2.8	
AAQ7	4.45	SSE	22.6	0	22.6		0.0	
AAQ8	4.84	E	22.2	0	22.2		0.0	
AAQ9	0.89	E	12.9	1	13.9		7.75	
AAQ10	--	--	15.3	4.82	20.12		31.50	

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

4.5 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, Lp₁ & Lp₂ are sound levels at points located at distances r₁ and r₂ from the source; Ae_{1,2} is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

4.5.1 Anticipated Impact

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 4.7.

Table 4.7 Activity and Noise Level Produced by Machinery

S. No.	Machinery / activity	Impact on environment?	Noise produced in dB(A) at 50 ft from source*
1	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). We have considered equipment and operation noise levels (max) to be approx. 95.8dB (A) for noise prediction modelling.

Table 4.8 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level (dBA)	Total (dBA)
Devaraj Core	800	41.4	25.90	41.52
Pullaiyampalayam	1060	39.4	23.45	39.51
VST Blue metals Core	1480	41.6	20.55	41.63
Near Ponvinayaga Blue Metals	2200	41.2	17.11	41.22
Andisangilipalayam	2720	36.2	15.27	36.23
Punnam Velayuthampalayam	3480	39.6	13.13	39.61
Punnam Chattiram	2830	42.6	14.92	42.61

Pavithiram	4450	43.8	10.99	43.80
Nochipalayam	5840	41.3	8.63	41.30
Sathiya Core	640	45.5	27.84	45.57
Selva Vinayaga Core	100	44.8	43.96	47.41
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 through 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

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. 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 4.9 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	74.50	680	0.462	19	0.23	141

Table 4.10 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	74.50	100	9.92	19	2.32	161
		200	3.27		1.01	154
		300	1.71		0.62	150
		400	1.08		0.44	147
		500	0.75		0.34	145

The PPV results shows that the ground vibration is well below the permissible limits set by DGMS through circular 7,1997 for domestic houses near by the lease area at the dominant frequency of <8 Hz.

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

- ❖ 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 table 3.21 which vegetation in the lease area may be removed during mining.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 9324 kg per day, 2517526 kg per year and 12587629 kg over five years, as provided in Table 4.11.

Table 4.11 Carbon Released During Five Years of Rough Stone and Gravel Production

	Per day	Per year	Per five years
Fuel consumption of excavator	631	170313	851563
Fuel consumption of compressor	74.8	20196	100980
Fuel consumption of tipper	2774	748867	3744333
Total fuel consumption in liters	3479	939375	4696876
CO ₂ emission in kg	9324	2517526	12587629

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.
- ❖ To mitigate carbon emission due to mining activities, 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, about 2153 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 102747 kg of the total carbon, as provided in Table 4.12.

Table 4.12 CO₂ Sequestration

CO ₂ sequestration in kg	191	51608	258042
Remaining CO ₂ not sequestered in kg	9133	2465917	12329587
Trees required for environmental compensation	102747		
Area Required for environmental compensation in ha	205		

Table 4.13 Recommended Species for Greenbelt Development Plan

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	

3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	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
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	
6	<i>Bauhinia racemose</i>	Fabaceae	Aathi	Tree	
7	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Tree	
8	<i>Aegle marmelos</i>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	



Figure 4.5 Green belt and fencing photos

Table 4.14 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	861	689	7749
	Number of plants outside the mine lease area		
	1292	1033	11624
Total	2153	1722	19373

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

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

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 discharge likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

4.10.1.3 Biological Stability

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

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

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

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

CHAPTER V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

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

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

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

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the project area; hence no R & R issues exist.
- ❖ There is no river, stream, nallah and water bodies in the applied mine lease 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.

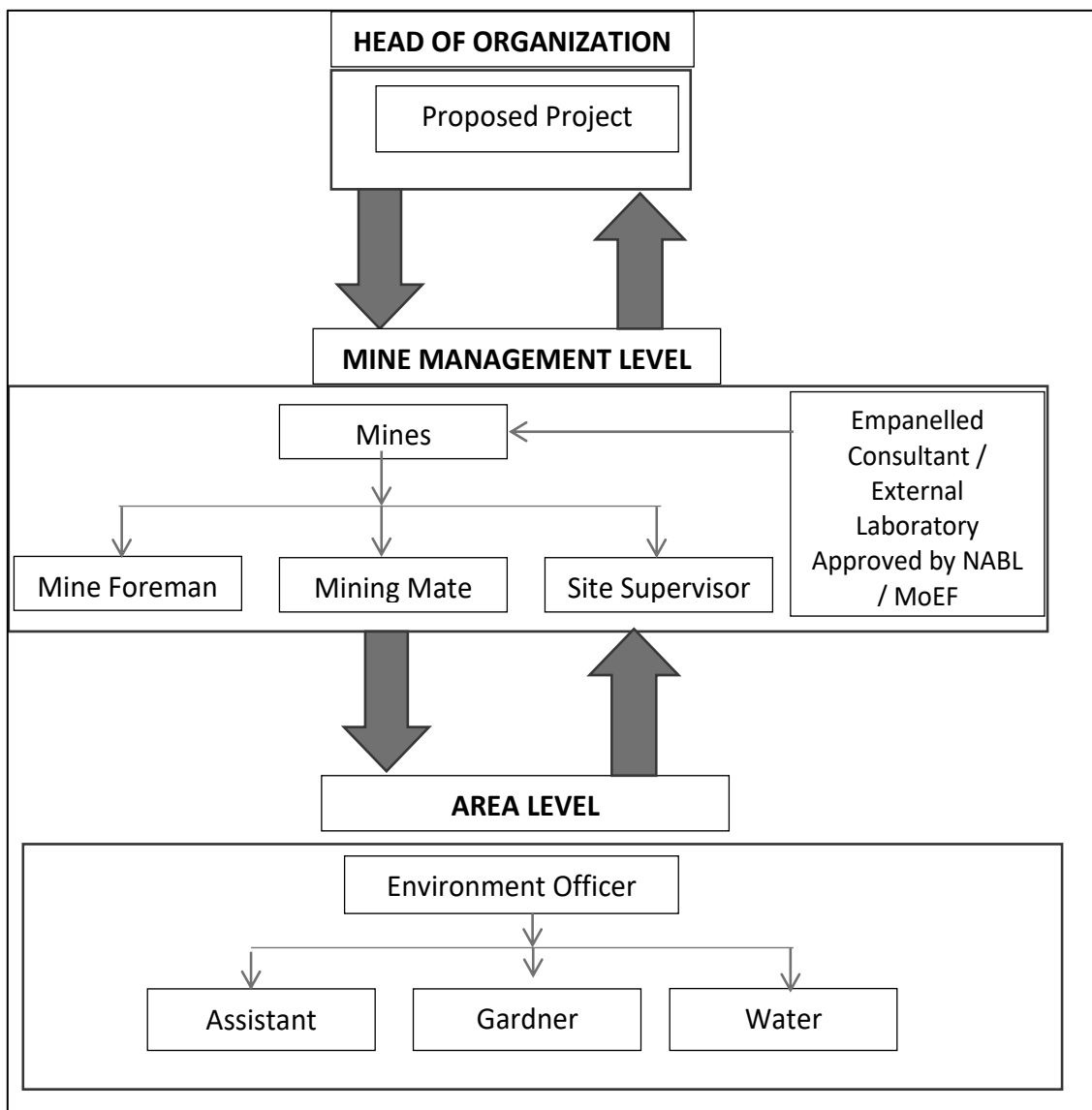


Figure 6.1 Proposed environmental monitoring chart

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 (1 OW & 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	<ul style="list-style-type: none"> ✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations. ✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited. ✓ Fire-fighting and first-aid provisions in the mine office complex and mining area. ✓ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use. ✓ Working of quarry, as per approved plans and regularly updating the mine plans. ✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut. ✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager. ✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.
2	Drilling	Improper and unsafe practices; Due to high pressure of compressed air, hoses may burst; Drill Rod may break;	<ul style="list-style-type: none"> ✓ Safe operating procedure established for drilling (SOP) will be strictly followed. ✓ Only trained operators will be deployed. ✓ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, ✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other.

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

Source: Analysed and proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

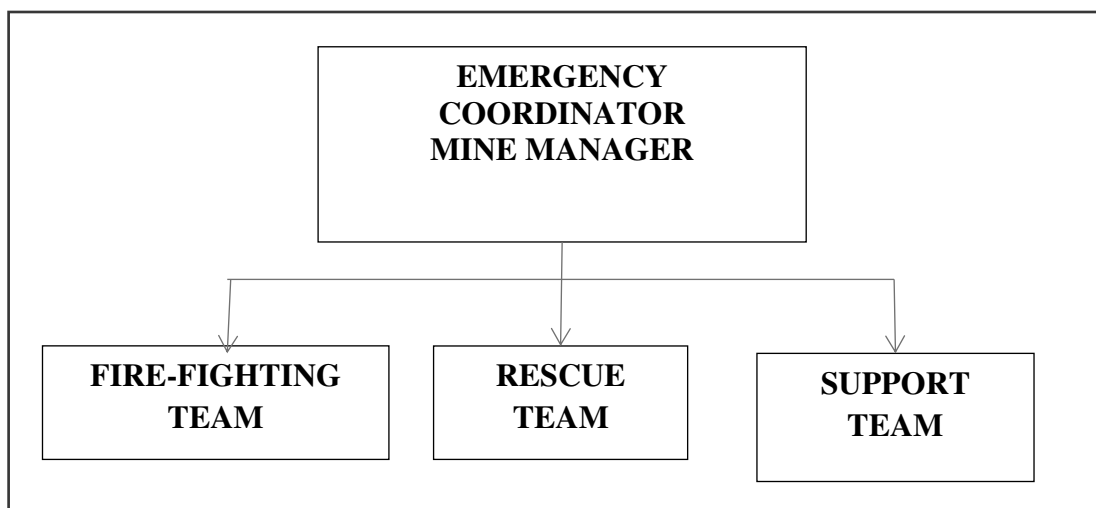


Figure 7.1 Disaster management team layout for proposed project

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, 2 proposed projects, known as P1, P2 are taken into consideration. The details of P1 have been given in Table 1.3 and the details of P2 is given in the Table 7.2

Table 7.2 Salient Features of the Proposed Project P2

Name of the Quarry	Mr.N.Sakthivel Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	3.87.0 ha	
S.F.No	105/1B (Part), 112/1A (Part) & 112/2A (Part)	
Toposheet No	58-F/13	
Location of Project Site	10°59'16.35"N to 10°59'28.13"N 77°57'49.44"E to 77°57'56.12"E	
Highest Elevation	200 m AMSL	
Proposed depth of Mining	50 m BGL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	1405076	47568

Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	338747	39168
Proposed reserves for five years	Rough Stone in m ³	Gravel in m ³ /1 year
	338747	39168
Method of Mining	Open-Cast Semi Mechanized mining	
Topography	Flat Topography	
Machinery proposed	Jack Hammer	3
	Compressor	2
	Excavator	1
	Tipper	7
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 Deployment	20 Nos	
Project Cost	Rs.75,79,500	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	4.75 KLD	

7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from the 2 proposed project have been given in Tables 7.3 and 7.4.

Table 7.3 Cumulative Production Load of Rough Stone

Proposed Production Details				
Quarry	5 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	1048968	209794	777	130
P2	338747	67749	251	42
Grand Total	1387715	277543	1028	172

Table 7.4 Cumulative Production Load of Gravel

Quarry	Production for 5 Year in m ³	Yearly Production (m ³)	Daily Production (m ³)	Number of Lorry Loads Per Day
P1	74332	14866	55	9
P2	39168	7834	29	5
Grand Total	113500	22700	84	14

The cumulative study shows that the overall production of rough stone from the quarry is 1028 m³ per day with a capacity of 172 trips of rough stone per day and that production of gravel from the 2 proposed quarry is 84 m³ per day accounting for 14 trips/day.

7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 2 proposed projects on air environment of the cluster have been provided in Table 7.5. The cumulative values resulting from the 2 projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.5 Cumulative Impact Results from the 2 proposed projects

Pollutants	Baseline Data (µg/m ³)	Incremental Values (µg/m ³)		Cumulative Value (µg/m ³)
		P1	P2	
PM _{2.5}	19.7	5.85	9.84	35.39
PM ₁₀	39.9	12.0	14.32	66.22
SO ₂	7.9	2.93	7.47	18.3
NO _x	17.4	4.80	6.49	28.69

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.7.6 Cumulative Impact of Noise from 2 Proposed Quarries

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	1060	NNE	39.4	23.45	39.51	55
Habitation Near P2	580	N	39.4	24.11	39.53	
Cumulative Noise (dB (A))					42.5	

Source: Lab Monitoring Data

The cumulative analysis of noise due to 2 proposed projects shows that habitation will receive about 42.5dB (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 all the 2 Quarries have been shown in Table 7.7.

Table 7.7 Cumulative Effect of Ground Vibrations Resulting from 2 Quarries

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	74.50	1060	0.22
P2	24.10	580	0.24
Total			0.46

Results from the above tables 7.7 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 proposed project were calculated and the results have been shown in Table 7.8 the project together will contribute Rs. 10,00,000/-towards CER fund.

Table 7.8 Socio Economic Benefits from 2 Quarries

Location ID	Project Cost	CER Cost
P1	Rs.88,46,000	Rs. 5,00,000
P2	Rs.75,79,500	Rs. 5,00,000
Grand Total	Rs.1,64,25,500	Rs. 10,00,000

Table 7.9 Employment Benefits from 2 Quarries

Location ID	Employment
P1	27
P2	20
Grand Total	47

A total of 47 people will get employment due to 2 proposed Quarries in cluster

7.4.4 Ecological Environment

Table 7.10 Greenbelt Development Benefits from Quarries

Code	Number of Trees proposed	Area to be covered (m ²)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	2153	19373	1722	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	1935	17415	1548	
Total	4088	36788	3270	

Cumulative studies show that the two proposed project will plant about 4088 native tree species like *Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 3270 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 7.11.

Table 7.11 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 Kuppam Village aims to produce **1048968 m³** of rough stone and **74332 m³** of gravel over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 27 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 15 indirect employments 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 Kuppam Village, Pugalur Taluk, Karur 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 Kuppam 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 \leq 100 crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, Rs. 5,00,000 is allocated for CER. The proposed utilization of the budget of CER activities is given in Table 8.1.

Table 8.1 CER Action Plan

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

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs.11,87,83,654** 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/ Rs.56/m ³ of gravel	9,44,07,120	41,62,592
District Mineral Foundation Tax @ 10% of Seigniorage	94,40,712	4,16,259
Green Tax @ 10% of Seigniorage	94,40,712	4,16,259
Total	11,37,88,544	49,95,110

CHAPTER IX
ENVIRONMENTAL COST BENEFIT ANALYSIS

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

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. Shri Selva Vinaayaga Blue Metal** 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/annu m
			(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	43050	43050
	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	100000	10000
	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	50000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	12500
	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	86100
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			1043050	291650
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	Provision made in Operating Cost	0	0

	vehicles carry a fitness certificate.			
	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	2937110
Total Noise Environment			50000	2939110
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum (4.82.7 ha X 10000)	43050	21525
Total Water Environment			43050	21525
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal).	25000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine	Provision made in Operating Cost	0	0

	lease on the land of owner itself			
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)	108000	27000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	27000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	17220
	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 (4.82.7 hectare)	861000	43050
	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	215250	43050
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000

	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 st Class / 2 nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
Total Occupational Health and Safety			1224250	944320
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))"	172200	25830
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	387450	38745
Total Development of Green Belt			559650	64575
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	146370
	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 and gravel = Rs.56)	9856971	0
TOTAL			12816971	4284180 (Excl. Mine Closure)

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

Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year (including Mine Closure Cost)	Total Recurring Cost	Total EMP Cost
4284180	4498389	4723309	4959474	5353818	23819171	36636142

In order to implement the environmental protection measures, an amount of **Rs.12816971** as capital cost and recurring cost as **Rs.4284180** 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.36636142** 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 12.20.50 ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No.171/1A(P), and 171/1B(P) over the extent of 4.30.5 ha is situated in the cluster falling in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. The quarries involved in the calculation of cluster extent are two proposed quarries, one existing quarry.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 10° 59'20.50"N to 10° 59'27.29"N and Longitudes from 77°57'25.79"E to 77°57'36.49"E in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. According to the approved mining plan, about 1048968 m³ of rough stone and 74332 m³ of gravel will be mined up to the depth of 50 m BGL in the five years. The quarrying operation is proposed to be carried out by opencast semi mechanized mining method involving drilling, blasting, 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 October to December, 2023 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified Excellence Laboratory 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 1.

Table.11.1 LULC Statistics of the Study Area

S. No.	LU/LC Type	Extend (ha)	Percentage
1	Barren Rocky / Stone waste	22.17	0.28
2	Crop Land	7010.31	89.99
3	Dense Forest	69.44	0.89
4	Land with/without scrub	197.08	2.53
5	Mining/Industrial lands	229.16	2.94
6	Plantations	256.30	3.29
Total		7789.74	100.0

Source: Sentinel II Satellite Imagery

11.3.2 Soil Environment

The soil samples in the study area sandy loam textures varying between, silty loam and sandy loam. pH of the soil varies from 6.5 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 161 to 338 $\mu\text{S}/\text{Cm}$. Bulk density ranges between 1.2 and 9.2 g/cm^3 . Nitrogen ranges between 0.04 and 2.05 %. Potassium ranges between 0.12 and 0.27 %. Calcium ranges between 301 and 513 mg/kg . Organic matter content ranges between 0.25 and 4.2 %. Manganese ranges between 1.5 and 45 mg/kg .

11.3.3 Water Environment

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. 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. Eight groundwater samples 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. The results of all the ground water samples fall within the permissible limits of IS10500:2012.

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Therefore, data regarding groundwater elevations were collected from 9 open wells and 8 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 2023, (Post Monsoon Season). According to the data, average depths to the static water table in open wells range from 18.96 to 21.00 m BGL in pre monsoon and 14.33 to 16.00 m BGL in post monsoon. The average depths to static potentiometric surface in bore wells vary from 72.7 to 75.5 m in pre monsoon and from 62.3 to 65.8 m in post monsoon.

11.3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 14.3µg/m³ to 16.7µg/m³; PM₁₀ from 35.8µg/m³ to 41.5 µg/m³; SO₂ from 5.3 µg/m³ to 7.1µg/m³; NO_x from 11.7µg/m³ to 15.7g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

11.3.5 Noise Environment

Noise levels recorded in core zone was 47.2 dB (A) Leq during day time and 35.4 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.6 to 52.4dB (A) Leq and during night time from 30.6 to 42.2dB (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.

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

- Change in land use and land cover and topography of the mine lease area
- Problems to human habitations due to dust and noise caused by movement of heavy vehicles
- Soil erosion and sediment deposition in the nearby water bodies during the rainy season
- Siltation of water course due to wash off from the exposed working area
- Deterioration of soil quality in the surrounding area due to runoff from the project area
- Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

Mitigation Measures

- Construction of garland drains, settling pits, and check dams to prevent runoff and siltation

- Runoff water will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site
- The vegetation will be retained at the site wherever possible
- Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

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 5.25 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

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software. 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

- 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-metalled 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 74.50kg 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

- 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
- 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 9324 kg per day, 2517526 kg per year and 12587629 kg over five years

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.

- 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.
- To mitigate carbon emission due to mining activities, 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, about 2153 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 102747 kg of the total carbon,

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, Spirometric 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

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 (1OW & 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 two proposed quarries 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 two proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed two projects will allocate Rs. 10,00,000/- towards CER as recommended by SEAC
- The proposed two projects will directly provide jobs to 47 local people, in addition to indirect jobs
- The proposed two projects will plant 4088 about trees in and around the lease area
- The proposed two projects will add 558 PCU per day to the nearby roads.

11.7 Project Benefits

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

- Direct employment to 27 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.12816971** as capital cost and recurring cost as **Rs.4284180** 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.36636142**.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, M/s. **Shri Selva Vinaayaga** 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.

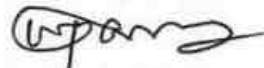
The accredited experts and associated members who were engaged in this EIA study are given below:

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	B
3.	Dr. J. Rajarajeswari	In-house, FAE	1(a)(i)	EB	B
4.	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
5.	Dr. R. Arunbalaji	In-house, FAE	1(a)(i)	AQ, NV	B
6.	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SH, AP	B
7.	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
8.	G. Umamaheswaran	In-house, FAE	1(a)(i)	LU	B
9.	S. Gopalakrishnan	In-house, FAE	1(a)(i)	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)	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

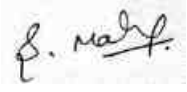





Name of the EIA Consultant Organization : Geo Technical Mining Solutions




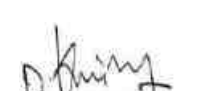
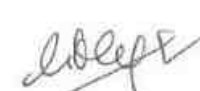
Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **M/s.Shri Selva Vinaayaga** rough stone and gravel quarry project with the extent of 4.30.5 ha situated in the cluster with the extent of 12.20.50 ha in Kuppam Village, Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our knowledge.


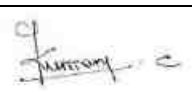
List of Functional Area Experts Engaged in this Project




S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity	J.N. Manikandan	
		○ Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	

2	WP	<ul style="list-style-type: none"> ○ Suggesting water treatment systems, drainage facilities ○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures. 	Dr.S. Malar	
3	HG	<ul style="list-style-type: none"> ○ Interpretation of ground water table and predict impact and propose mitigation measures. ○ Analysis and description of aquifer Characteristics 	Dr.M. VijayPrabhu	
4	GEO	<ul style="list-style-type: none"> ○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology. 	G.Gopala Krishnan	
5	SE	<ul style="list-style-type: none"> ○ Revision in secondary data as per Census of India, 2011. ○ Impact Assessment & Preventive Management Plan ○ Corporate Environment Responsibility. 	Dr. G. Prabhakaran	
6	EB	<ul style="list-style-type: none"> ○ Collection of Baseline data of Flora and Fauna. ○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list. ○ Impact of the project on flora and fauna. ○ Suggesting species for greenbelt development. 	Dr.J.Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> ○ Identification of hazards and hazardous substances ○ Risks and consequences analysis ○ Vulnerability assessment 	J.N. Manikandan	

		<ul style="list-style-type: none"> ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety. 		
8	LU	<ul style="list-style-type: none"> ○ Construction of Land use Map ○ Impact of project on surrounding land use ○ Suggesting post closure sustainable land use and mitigative measures. 	G.Uma Maheswaran	
9	NV	<ul style="list-style-type: none"> ○ Identify impacts due to noise and vibrations ○ Suggesting appropriate mitigation measures for EMP. 	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> ○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ○ Recommending mitigations measures for EMP 	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> ○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr. D.Kalaimurugan	
12	SHW	<ul style="list-style-type: none"> ○ Identify source of generation of non-hazardous solid waste and hazardous waste. ○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled. 	J.N. Manikandan	

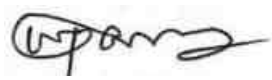
List of Functional Area Associate Engaged in this Project

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithiviraj	LU, HG	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG 	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> ○ Assistance to FAE in both primary and secondary data collection 	

			○ Assistance in noise prediction modelling	
3	P. Vellaiyan	GEO	○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection	
4	P. Dhatchayini	AQ	○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data	
5	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. Shri Selva Vinaayaga** rough stone and gravel quarry project with the extent of 4.30.5 ha situated in the cluster with the extent of 12.20.50 ha in Kuppam Village, Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our 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/2124/SA 0184

Validity : Till 02.04.2024



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

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU

3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.

Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No. SEIAA-TN/F.No.10358/SEAC/ToR-1642/2023 dated:02.01.2024

To

M/s.Shri Selva Vinaayaga Blue Metal,
Survey No.162/1,
Thalaiyuthuppatti,
Kuppam Post,
Aravakurichi Taluk,
Karur District-639111

Sir/Madam,

Sub: SEIAA-TN – Terms of Reference with public hearing for the Proposed Rough Stone & Gravel Quarry lease over an extent of 4.30.5Ha (Patta Land) S.F.No's:171/1A (Part) and 171/1B (Part), Kuppam Village, Pugalur Taluk, Karur District by M/s. Shri Selva Vinaayaga Blue Metal – under project category – “B1” and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

- Ref:
1. Online Application No SIA/TN/MIN/441271/2023, dt: 22/08/2023
 2. Your application for Terms of Reference dated: 24.08.2023
 3. Minutes of the 416th SEAC Meeting held on 13.10.2023
 4. Minutes of the 670th authority meeting held on 06.11.2023.
 5. The Project proponent has furnished reply Dt: 26.12.2023.
 6. Minutes of the 685th authority meeting held on 02.01.2024.

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


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SEIAA-TN

The proponent, M/s. Shri Selva Vinaayaga Blue Metal has submitted application for Terms of Reference (ToR) with public Hearing, in Form-I, Pre- Feasibility report for the Proposed Rough Stone & Gravel Quarry lease over an extent of 4.30.5Ha (Patta Land) S.F. No's:171/1A (Part) and 171/1B (Part), Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.

Remarks by SEAC:

Proposed Rough Stone & Gravel Quarry lease over an extent of 4.30.5Ha (Patta Land) S.F. No's:171/1A (Part) and 171/1B (Part), Kuppam Village, Pugalur Taluk, Karur District by M/s. Shri Selva Vinaayaga Blue Metal - For Terms of Reference.

(SIA/TN/MIN/441271/2023, dt: 22/08/2023)

The proposal was placed in the 416th SEAC Meeting held on 13.10.2023. The details of the minutes are available in the website (Parivesh.nic.in). **The SEAC noted the following:**

1. The project proponent, M/s. Shri Selva Vinaayaga Blue Metal has applied for Terms of Reference for the proposed Rough Stone & Gravel Quarry lease over an extent of 4.30.5Ha S.F. No's:171/1A (Part) and 171/1B (Part), Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. As per the precise area communication the lease period is for 5 years. The mining plan is for 5 Years. The Mineable reserve /production for 5 Years shall not to exceed 1048968m³ of Rough Stone & 74332m³ of Gravel and the ultimate depth of 50m BGL.
4. The proposed lease area was previously granted to quarrying of rough stone in favor of M/s. Tata Blue Metal by the District Collector, Karur proceedings vide Rc. D/149/2005, dated 08.09.2005 in S.F.No. 171/2 & 171/1A, Karur District, Aravakurichi Taluk, Kuppam Village, over an extent of 5.51.5hectares for a period of 5 years. The lease was executed 24.12.2005 to 23.12.2010 for a period of 5 Years.
5. 1st Renewal application for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Karur dated 17.02.2023 and the Deputy Director, recommended to his precise area communication letter Rc.No.64/Mines/2023 Dated: 14.07.2023 for period of five years recommended to favor of M/s. Shri Selva Vinaayaga Blue Metal, Karur for quarrying lease rough stone and gravel at Tamil Nadu State, Karur District,

Pugalur Taluk, Kuppam Village in S.F.No: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares . Pit -I – (62m(L) x 28m(W) x 2m (D)).

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

1. The proponent shall furnish registered land deed/lease agreement for all the Survey nos. of the proposed mining lease area.
2. The PP shall furnish the letter commenting the depth of 2 m quarried earlier in the same survey numbers from the concerned AD (Mines) after having inspected the site.
3. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
4. The Proponent shall provide a Controlled Blast design & Vibration Prediction for the structures located within 500 m from the lease boundary and any other sensitive structures.
5. The project proponent shall furnish details of photographs of adequate barbered fencing, greenbelt and garland drain around the boundary of the proposed quarry.
6. The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.
7. The proponent shall furnish a revised EMP budget for entire life of proposed mining including progressive mine closure plan.
8. The PP shall mark the DGPS reference pillars painted with blue & white colour indicating the safety barrier of 7.5 m to be left under the Rule 13 (I) of MCDR, 1988 within the lease boundary and protective bunds.
9. The PP shall develop Green belt/plantation all along the mining lease boundary in a safety barrier.
10. The PP shall furnish the total manpower required for the proposed mining project including Statutory officials, Supervisory staff, Skilled, Semi-skilled & Unskilled staff with showing the representation of the local people as per their eligibility and experience.


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Annexure I

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.
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 /

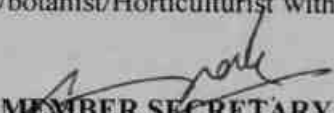
Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time 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


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SEIAA-TN

- 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 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.
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


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- 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.

Appendix -I
List of Native Trees Suggested for Planting

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


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40	<i>Premna mollissima</i>	Munnai	முன்னை
41	<i>Premna serratifolia</i>	Narumunnai	நறு முன்னை
42	<i>Premna tomentosa</i>	Malaipoovarasu	மலை பூவரசு
43	<i>Prosopis cinerea</i>	Vanni maram	வன்னி மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vennangu, Tada	வெண்ணாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	புலவு
47	<i>Puthranjiva roxburghii</i>	Karipala	கறிபாலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus emarginatus</i>	Manipungan, Soapukai	மணிப்புங்கன் சோப்புக்காய்
50	<i>Saraca asoca</i>	Asoca	அசோகா
51	<i>Streblus asper</i>	Piray maram	பிராய் மரம்
52	<i>Strychnos nuxvomica</i>	Yetti	எட்டி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேத்தான் கொட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Thandri	தாண்டிரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வெண் மருது
57	<i>Toona citrate</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Thespesia populnea</i>	Puvarasu	பூவரசு
59	<i>Walsuratrifoliata</i>	valsura	வால்சுரா
60	<i>Wrightia tinctoria</i>	Veppalai	வெப்பாலை
61	<i>Pithecellobium dulce</i>	Kodukkapuli	கொடுக்காப்புளி

Appendix –II
Display Board
(Size 6' x5' with Blue Background and White Letters)

.....சுரங்கம்

சுரங்கத்தில் குவாரி செயல்பாடுகளுக்கான சுற்றுச்சூழல் அனுமதி கீழ்க்கண்ட நிபந்தனைகளுக்கு உட்பட்டு வழங்கப்பட்டுள்ளது எனவும், தேதி....., சுற்றுச்சூழல் அனுமதி தேதி வரை செல்லத்தக்கதாக உள்ளது.

பகலம் பகுதி வளர்ச்சி செயல்பாட்டுக்கான சுரங்கத் திட்டம்	குவாரியின் எல்லைகளில் சுற்றி வேலி அமைக்க வேண்டும். சுரங்கப்பாதையில் ஆழம் தளையட்டத்திலிருந்து மீட்டர்க்கு கிடைக்க இடக்க வேண்டும். காற்றில் மாக ஏற்படாதவாறு சுரங்க பணிகளை மேற்கொள்ள வேண்டும்.
நடப்பட்டு பராமரிக்கப்பட வேண்டிய மரங்கள் எண்ணிக்கை:	வாகனங்கள் செல்லும் பாதையில் மாக ஏற்படாத அளவிற்கு தண்ணீரை முறையாக தண்ணீர் வாரிகளின் மூலமாக அவ்வப்போது தெளிக்க வேண்டும். இனஞ்சல் அளவைகள் தூசி மாகபாட்டையும் குறைப்பதற்காக குவாரியின் எல்லைகளில் சுற்றி அடர்த்தியான பகலம் பகுதியை ஏற்படுத்த வேண்டும்.
சுரங்கத்தில் வெடி வைக்கும்பொழுது நிலஅதிர்வுகள் ஏற்படாதவாறும் மற்றும் சுரங்க பறக்காதவாறும் பாதுகாப்பு நடவடிக்கைகளை உள்விப்பாக செயல்படுத்தப்பட வேண்டும்.	
சுரங்கத்தில் இருந்து ஏற்படும் இனஞ்சல் அளவு 85 டெசிபெல் (dB) அளவிற்கு மேல் ஏற்படாதவாறு தகுந்த கட்டுப்பாடுகளை மேற்கொள்ள வேண்டும்.	
சுரங்க சட்ட விதிகள் 1955ன் கீழ் சுரங்கத்தில் உள்ள பணியாளர்களுக்கு தகுந்த பாதுகாப்பு கருவிகள் வழங்குவதோடு கைதாள்முள்ள கழிப்பறை வசதிகளை செய்து தர வேண்டும்.	
சிரமம் அல்லது படுக்காத்து வழியாக வாகனங்கள் செல்லும் சாலைகளை தொடர்ந்து நன்ற பராமரிக்க வேண்டும்.	
சுரங்கப்பணிகளால் அருகில் உள்ள வீவசாயப் பணிகள் மற்றும் தீர்நிலைகள் பாதிக்கப்படக் கூடாது.	
தீர்நிலைகள் பாதிக்கப்படாமல் இருப்பதை உறுதி செய்யும் வகையில் நிலத்தடி நீர் தரத்தினை தொடர்ந்து கண்காணிக்க வேண்டும்.	
சுரங்கத்திலிருந்து கனிம பொருட்களை எடுத்துச் செல்லு கிராம மக்களுக்கு எந்த சிரமத்தினையும் ஏற்படுத்தாதவாறு பாதுகாப்போடும் மற்றும் சுற்றுச்சூழல் பாதிக்காத வண்ணம் வாகனங்களை இயக்க வேண்டும்.	
சுரங்கப்பணிகள் முடிக்கப்பட்டவுடன் சுரங்க முட்டி திட்டத்தில் உள்ளவாறு சுரங்கத்தினை முட வேண்டும்.	
சுரங்க நடவடிக்கைகளை முடித்தபின்னர் சுரங்கப் பகுதி மற்றும் சுரங்க நடவடிக்கைகளால் இடைபட்ட ஏற்படக்கூடிய வேறு ஏக்கப் பகுதியையும் மறுகட்டுமானம் செய்து தாவரங்கள் விலங்குகள் ஆகியவற்றின் வளர்ச்சிக்கு ஏற்ற வகையில் பகலம்பகுதியை உருவாக்க வேண்டும்.	
முழுமையான நிபந்தனைகளை அறிய பாதிவேடு (http://pwaebn.in) என்ற இணையதளத்தைப் பார்க்கப்படும். மேலும் எந்தவித சுற்றுச்சூழல் சார்ந்த புகர்களுக்கு சென்னைவில் உள்ள சுற்றுச்சூழல் மற்றும் வன அமைச்சகத்தின் ஒருங்கிணைந்த வட்டார அலுவலகம்: 044 - 26222325 (அல்லது) தமிழ்நாடு மாக கட்டுப்பாடு வாரியத்தின் மாவட்ட சுற்றுச்சூழல் பொறியாளரை அணுகவும்.	


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Remarks by SEIAA:

The SEAC in its 416th meeting held on 13.10.2023 furnished its recommendations for granting **Terms of Reference (ToR) along with Public Hearing** subject to the conditions stated therein.

In this connection, in the 670th authority meeting held on 06.11.2023 the Authority decided to defer and to call for additional particulars as follows

11. The proponent shall furnish registered land deed/lease agreement for all the Survey nos. of the proposed mining lease area.

In this connection, the PP has furnished reply Dt: 26.12.2023 and the proposal was placed in the 685th authority meeting held on 02.01.2024. SEAC after detailed discussion accepts the decision of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in '**Annexure B**' of this minute.

1. The project proponent shall prepare mine closure plan considering quantity of Topsoil & Weathered rock. If any.
2. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.

Annexure 'B'**Cluster Management Committee**

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.


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6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & soil biological, physical land chemical features.
 - b) Climate change leading to Droughts, Floods etc.
 - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - d) Possibilities of water contamination and impact on aquatic ecosystem health.
 - e) Agriculture, Forestry & Traditional practices.
 - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g) Bio-geochemical processes and its foot prints including environmental stress.
 - h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.


17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

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

Water Environment

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


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30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

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

Climate Change

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

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

Mine Closure Plan

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

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.

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

Risk Assessment

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

Disaster Management Plan

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


Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.

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

A. STANDARD TERMS OF REFERENCE

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


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

- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out

- with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
 - 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
 - 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
 - 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
 - 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic


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aspects should be discussed in the Report.

- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification /

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


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- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
 - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH


again with the revised documentation.

- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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



1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.


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14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

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


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Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.

3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Karur District.
7. Stock File.



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

To
M/s.Shri Selva Vinaayaga Blue
Metal, Survey No.162/1,
Thaliyuthuppatti,
Kuppam Post,
Pugalur Taluk,
Karur District - 639 111

Rc.No.64/Mines/2023, Dated:17.08.2023

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District - Pugalur Taluk - Kuppam Village - S.F.Nos.171/1A(Part) (0.76.00 hectares) and 171/1B(Part) (3.54.50 hectares) over an extent 4.30.50 hectares - Quarry lease application for Rough Stone and Gravel - Preferred by M/s.Shri Selva Vinaayaga Blue Metal - Mining Plan approved - requested for the details of Existing/ Proposed/Expired and Abandoned quarries situated within 500 mts radial distance - furnished - Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel preferred M/s.Shri Selva Vinaayaga Blue Metal, Survey No.162/1, Thaliyuthuppatti, Kuppam Post, Pugalur Taluk, Karur District - 639 111, dated:17.02.2023
2. Precise Area Communication Notice Rc.No. 64/Mines/2023, Dated: 14.07.2023
3. Mining Plan submitted by M/s.Shri Selva Vinaayaga Blue Metal Letter dated: 24.07.2023.
4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter Rc.No.64/Mines/2023, Dated:02.08.2023.
5. M/s.Shri Selva Vinaayaga Blue Metal letter dated: 11.08.2023.

In the reference 1st cited, M/s.Shri Selva Vinaayaga Blue Metal has applied quarry lease for quarrying Rough stone and Gravel in S.F.Nos.171/1A(Part) (0.76.00 hectares) and 171/1B(Part) (3.54.50 hectares) over an extent 4.30.50 hectares of patta land in Kuppam Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur had issued precise area letter to the proposed lease area vide reference 2nd cited.

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

In the reference 5th cited, the applicant firm has requested the Deputy Director of Geology and Mining, Karur to provide the details of existing, proposed and abandoned quarries situated within 500 meter radial distance from subject area and the same has been furnished as follows:-

I. Existing Quarries: -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	Tvl.Sri Selva Vinayaga Blue Metal, S.F.No.162/1, Thalaiuthupatty, Kuppam Post, Aravakurichi Taluk, Karur District.	Rough Stone & Gravel	Pugalur Taluk Kuppam Village,	171/2	4.03.0	26.11.2018 to 25.11. 2023

II. Proposed Quarries: -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	M/s.Shri Selva Vinaayaga Blue Metal, Survey No.162/1, Thaliyuthuppatti, Kuppam Post, Pugalur Taluk, Karur District - 639 111	Rough Stone & Gravel	Pugalur Taluk Kuppam Village,	171/1A(Part) 171/1B(Part)	4.30.50	Proposed Area
2	Thiru.N.Sakthivel, S/o.Nallappagounder, Andipatty, Karudaiyampalayam, Kuppam village, Pugalur Taluk, Karur District.	Rough Stone & Gravel	Pugalur Taluk Kuppam Village,	105/1B(P) 112/1A 112/2A	0.97.50 1.81.00 1.08.50 3.87.00	Adjacent area applied for quarry lease

III. Lease Expired Quarries : -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	-- Nil --					

IV. Abandoned Quarries :-

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	--- Nil---					

[Signature]
17/08/2023
Deputy Director,
Geology and Mining,
Karur

[Signature]
17/08/2023

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

To
M/s.Shri Selva Vinaayaga
Blue Metal,
Survey No.162/1,
Thalaiyuthuppatti,
Kuppam Post,
Pugalur Taluk,
Karur District - 639 111.

Rc.No.64/Mines/2023, Dated: 02.08.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Kuppam Village - S.F.Nos.171/1A(Part) (0.76.00 hectares) and 171/1B(Part) (3.54.50 hectares) over an extent 4.30.50 hectares - Quarry lease application for Rough Stone and Gravel – Preferred by M/s.Shri Selva Vinaayaga Blue Metal - Precise area communicated - mining plan submitted for approval – Approved – Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by M/s.Shri Selva Vinaayaga Blue Metal, Survey No.162/1, Thaliyuthuppatti, Kuppam Post, Pugalur Taluk, Karur District - 639 111, dated:17.02.2023
 2. Order of the Hon'ble Supreme Court of India in I.A.Nos.12-13/2011 in SLP (C) No.19628-19629/2009, dt: 27.02.2012.
 3. Government of India, Ministry of Environment and Forest Office Memorandum, Dated:18.05.2012.
 4. The Chairman, State Level Environment Impact Assessment Authority, Tamil Nadu D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated: 17.09.2012.
 5. The Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dt: 19.11.2012.
 6. Deputy Director, Geology and Mining, Karur Notice Rc.No.64/Mines/2023, Dated:14.07.2023
 7. Mining Plan submitted by M/s.Shri Selva Vinaayaga Blue Metal letter Dated: 24.07.2023.



M/s.Shri Selva Vinaayaga Blue Metal applied for quarry lease to quarry Rough Stone and Gravel vide in the reference 1st cited and Precise area communicated to the applicant firm regarding to submit the mining plan for approval as per rule 41 and also submit the Environmental Clearance as per Rule 42 of Tamil Nadu Minor Mineral Concession Rules.

Accordingly the applicant firm M/s.Shri Selva Vinaayaga Blue Metal have submitted three copies of draft mining plan for approval in respect of Rough stone and Gravel quarry lease applied areas, over an extent of 4.30.50 hectares of patta lands in S.F.Nos.171/1A(Part) (0.76.00 hectares) and 171/1B(Part) (3.54.50 hectares) of Kuppam Village, Pugalur Taluk, Karur District in the reference 7th cited.

The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.Nos.171/1A(Part) (0.76.00 hectares) and 171/1B(Part) (3.54.50 hectares) over an extent 4.30.50 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District has been examined in detail.

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

- (i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (ii) This approval of the mining plan does not in any way imply the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest

Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

- (III) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (IV) As per the Deputy Director, Geology and Mining, Karur notice in Rc.No.64/Mines/2023, Dated.14.07.2023 the following conditions are incorporated in the Mining Plan plates.
1. விண்ணப்ப புலத்திற்கு வடமேற்கில் 43 மீட்டர் தொலைவில் செல்லும் உயரமுத்த மின்கோபுர கம்பிபாறைக்கு மின் வாரியத்திடமிருந்து தடையின்மை சான்றினை பெற்று குவாரி குத்தகை உரிமம் பத்திரம் நிறைவேற்றுவதற்கு முன்பு சமர்ப்பிக்கப்பட வேண்டும்.
 2. விண்ணப்ப புலங்களுக்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
 3. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
 4. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Metalliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
 5. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.

- (V) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (VI) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

Encl: Two copies of Approved Mining Plan.

[Handwritten Signature]
02/18/23

Deputy Director,
Geology and Mining,
Karur.

Copy to:
Dr.S.Karuppanan, 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 - 636 705.

[Handwritten Signature]
02/18/23

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MINING PLAN

FOR KUPPAM VILLAGE ROUGH STONE AND GRAVEL MINING LEASE

PROGRESSIVE QUARRY CLOSURE PLAN

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

Lease period 5 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 : KARUR
TALUK : PUGALUR
VILLAGE : KUPPAM
S.F. NO'S : 171/1A (Part) & 171/1B (Part)
EXTENT : 4.30.5 HECTARES

ADDRESS OF THE APPLICANT

M/s. Shri Selva Vinaayaga Blue Metal,

Survey.No. 162/1,

Thalaiyuthuppatti,

Kuppam Post,

Pugalur Taluk,

Karur District - 639111.

(This Mining Plan is approved subject
to the conditions/stipulations
indicated in the Mining Plan approval
Letter No: 64/mine/2023
Dated: 02/08/2023

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



Signature

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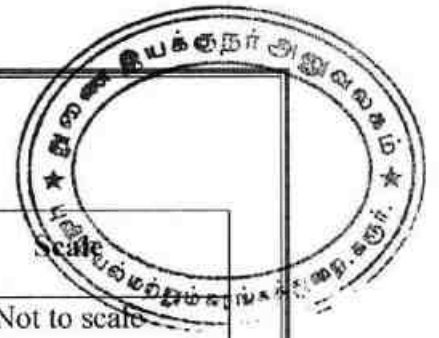
S. No	Description	Page
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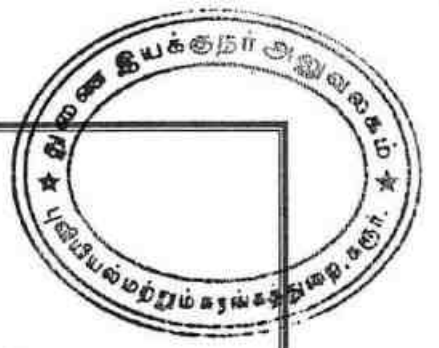
ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of Previous Lease deed	II
3.	Copy of FMB (Field Measurement book)	III
4.	Copy of combined sketch	IV
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8.	Copy of GST and Partnership deed Document	VIII
9.	Photocopy of the proposed lease area	IX
10.	Copy of ID Proof of the authorized signature	X
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LIST OF PLATES

S. No	Description	Plate No.	Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
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4.	Satellite imagery map	I-C	Scale 1: 5,000
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11.	Mine layout plan and land use pattern	V	Plan scale: 1:2000
12.	Conceptual plan	VI	Plan scale: 1:2000
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M/s. Shri Selva Vinaayaga Blue Metal,
Survey.No. 162/1,
Thalaiyuthuppatti,
Kuppam Post,
Pugalur Taluk,
Karur District - 639111.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan for rough stone and gravel quarry lease in S.F.No's: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

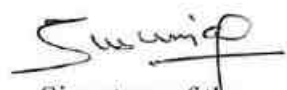
Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Regn. No. RQP/MAS/263/2014/A)

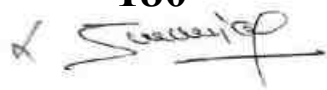
I request the **Deputy Director, Department of Geology and Mining, Karur District** to make further correspondence regarding modifications of the Mining Plan with the said Recognized Qualified Person on this following address.

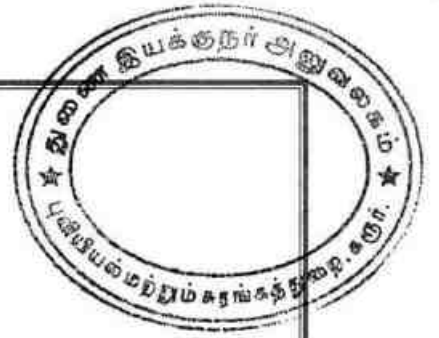
Dr. S. KARUPPANNAN. M.Sc., Ph.D.
(Regn. No. RQP/MAS/263/2014/A)
GEO TECHNICAL MINING SOLUTIONS
(A NABET accredited & ISO certified Company)
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Oddapatti, Collectorate Post office, Dharmapuri-636705
Ph: +91 9443937841, +91 7010076633
E-mail: info.gtmsdpi@gmail.com,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

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: Karur, TN
Date:


Signature of the applicant
(M/s. Shri Selva Vinaayaga Blue Metal)





M/s. Shri Selva Vinaayaga Blue Metal,
Survey.No. 162/1,
Thalaiyuthuppatti,
Kuppam Post,
Pugalur Taluk,
Karur District - 639111.

DECLARATION

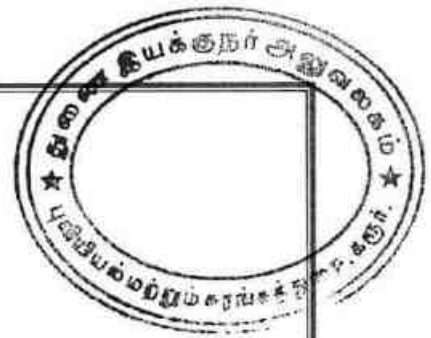
The Mining Plan of rough stone and gravel quarry lease in S.F.No's: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Karur, TN

Date:

Signature of the applicant
(M/s. Shri Selva Vinaayaga Blue Metal)

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Dr. S. KARUPPANNAN. M.Sc., Ph.D.

(Regn. No. RQP/MAS/263/2014/A)

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Ph: +91 9443937841, +91 7010076633

E-mail: info.gtmsdpi@gmail.com.

Website: www.gtmsind.com

CERTIFICATE

This is to certify that the provisions of 19(1), 20 and 33 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the mining plan for the grant of rough stone and gravel quarry lease in S.F.No's: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamilnadu State applied to **M/s. Shri Selva Vinaayaga Blue Metal**, Karur District, Tamil Nadu.

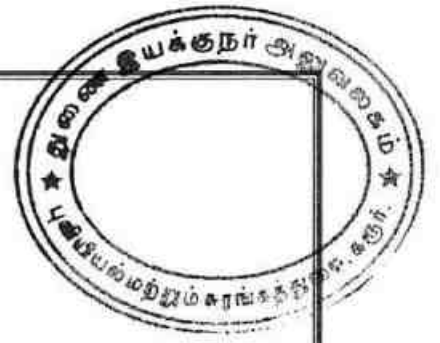
Wherever specific permission / exemptions / relaxations or approvals are required the applicant will approach the concerned authorities of State and Central governments for granting such permissions etc.

Place: Dharmapuri, TN

Date: 21/7/23

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
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E-mail: info.gtmsdpi@gmail.com,

Website: www.gtmsind.com

CERTIFICATE

I certify that the preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu prepared to **M/s. Shri Selva Vinaayaga Blue Metal**, Karur District, Tamil Nadu, covers all the provisions of Mines Act, Rules and Regulations etc. made there in and if any specific permission is required the applicant will approach "**The Director General of Mines Safety**", Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

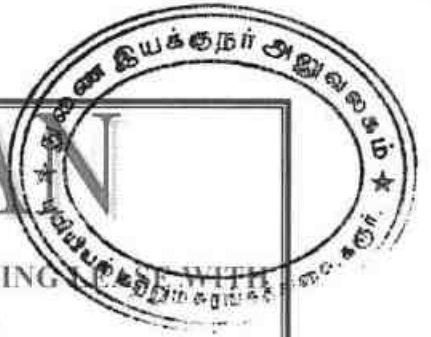
Place: Dharmapuri, TN

Date: 21/7/23

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post Office,
Dharmapuri - 636 705. Tamil Nadu, India.
E-mail : info.gtmsdpi@gmail.com
website : www.gtmsind.com

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MINING PLAN

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

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

Lease period 5 Years from the date of lease execution

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

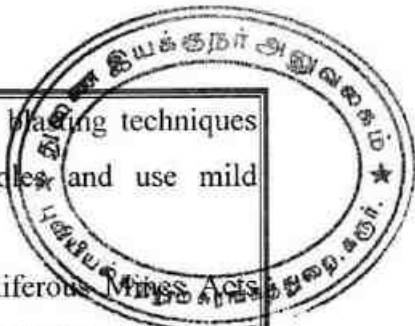
INTRODUCTORY NOTES:

- 1) **Introduction:** The applicant M/s. Shri Selva Vinaayaga Blue Metal office at Survey.No. 162/1, Thalaiyuthuppatti, Kuppam Post, Pugalur Taluk, Karur District - 639111, Tamil Nadu State. The applicant was submit application on 17.02.2023 for request to the Deputy Director, Department of Geology and Mining, Karur, renewed to be continued quarrying operation for rough stone and gravel at S.F.No's: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares of Kuppam south Village, Pugalur Taluk, Karur District, Tamil Nadu State further the period of 5 years.
- 2) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, Karur has directed to the applicant M/s. Shri Selva Vinaayaga Blue Metal through his precise area communication letter Rc.No.64/Mines/2023 Dated: 14.07.2023 has recommended quarrying lease for rough stone and gravel quarry lease at Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No's: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an area of 4.30.5 hectares and should be submitted draft mining plan for approval for the period of 90 days the following conditions for a period of five (5) years under Rule 19 (1), 20 & 33 of Tamil Nadu Minor Mineral Concession Rules, 1959.
 - i) A Clearance certificate from the electricity board for the high-tension power line running 43 meters Northwest of the applied lease area should be submitted before execution of the quarry lease deed.
 - ii) A safety distance should be left out nearby the applied area 7.5m and 10m of Patta and Poramboke lands as respectively while quarrying activities.

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval
Letter No: 64 | mines | 2023

Dated: 02/08/2023

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S. Suresh



- iii) Quarrying operation to be carried out with controlled blasting techniques viz, hand-hack-Hammer, Driller for drilling shot holes and use mild explosives substance for blasting the rocks.
- iv) To ensure the safety of quarry workers as per Metalliferous Mines Act should formed wide, safe benches. Inside the quarry in safe manner vehicles come and go, do the quarry work ensuring the safety of the quarry workers.
- v) To provide quarrying lease by the Deputy Director, Karur, approved mining plan, obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and should be submitted.

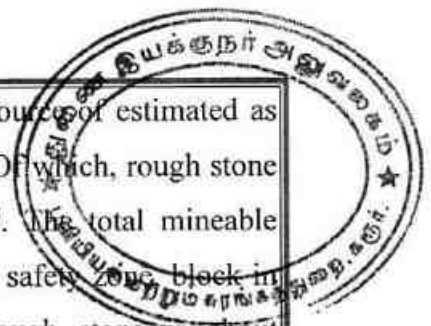
3) **The previous lease particulars:** The proposed lease area was previously granted to quarrying of rough stone in favor of M/s. **Tata Blue Metal** by the District Collector, Karur proceedings vide Rc.D/149/2005, dated 08.09.2005 in S.F.No. 171/2 & 171/1A, Karur District, Aravakurichi Taluk, Kuppam Village, over an extent of 5.51.5hectares for a period of 5 years. The lease was executed 24.12.2005 to 23.12.2010 for a period of 5 years.

Now, 1st **Renewal application** for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Karur dated 17.02.2023 and the Deputy Director, recommended to his precise area communication letter Rc.No.64/Mines/2023 Dated: 14.07.2023 for period of five years recommended to favor of M/s. Shri Selva Vinaayaga Blue Metal, Karur for quarrying lease rough stone and gravel at Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No: 171/1A (Part) (0.76.0Hect) and 171/1B (Part) (3.54.5Hect) over an extent of 4.30.5hectares

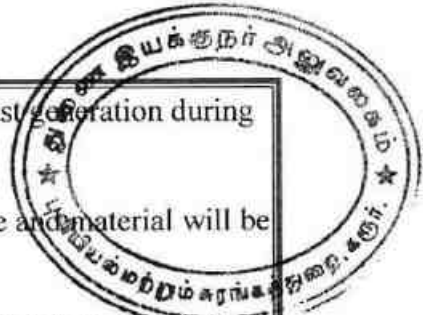
There is an existing pit was noticed with an average pit dimension as given under the table and the existing pit marked in the surface and geological plan (Ref Plate No's: III).

Avg.Existing pit Dimension			
Pit	Length (m)	Width (m)	Depth(m)
I	62	28	2

4) **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.64/Mines/2023 Dated: 14.07.2023



- 5) **Geological resources and Mineable reserves:** Geological resources of estimated as **2150850m³** including the resources of safety zone, and gravel. Of which, rough stone resources of about **2064816m³** and gravel is about **86034m³**. The total mineable reserve is estimated to be **1123300m³** by deducting the reserve safety block in benches from the total Geological resources. Of which, rough stone is about **1048968m³** and gravel is about **74332m³** up to a depth of 50m below the ground level (R.L.196m-146m) (Refer Plate No. IIIA & VIA).
- 6) **Proposed production schedule:** Total proposed production of **1123300m³**. Of which, rough stone is **1048968m³** and gravel is **74332m³** up to a depth of 50m below the ground level (R.L.196m-146m) for five years plan period. Average production is **209793m³** of rough stone per year. (Refer Plate No. IVA).
- 7) **Environmental Sensitivity of the proposed lease area: -**
 - i. **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
 - ii. **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.
 - iii. **Indian Reserve Forest Act, 1980:** No reserved forest situated within radius of 1Km periphery of the proposed site. The Nearest reserve forest is
1.Thathampalayam R.F - 6.9km - Southeast
 - 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.
- 8) **Environmental measures to be adopted during the ongoing activity period,**
 - a) Controlled blasting includes adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
 - b) Usage of sharp drill bits while drilling which will help in reducing noise.
 - c) Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.
 - d) Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
 - e) Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.



- f) Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- g) Transportation of material will be carried out during day time and material will be covered with tarpaulin.
- h) The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- i) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

1.0 GENERAL:

a.	Name of the Applicant	:	M/s. Shri Selva Vinaayaga Blue Metal
	Applicant address	:	Survey.No. 162/1, Thalaiyuthuppatti, Kuppam Post, Pugalur Taluk,
	District	:	Karur District
	State	:	Tamilnadu
	Pin code	:	639111
	Phone	:	----
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	.....
b.	Status of the Applicant		
	Private individual	:	---
	Cooperative Association	:	---
	Private company	:	Private company
	Public Company	:	---
	Public Sector Undertaking	:	---
	Joint Sector Undertaking	:	---
	Other (pl. specify)	:	---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	:	Rough stone and gravel quarry lease

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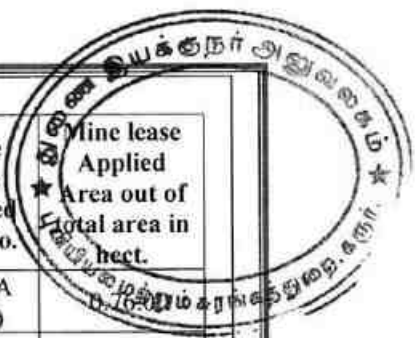


d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of five (5) years.
e.	Name of the RQP preparing the Mining Plan	:	Dr. S.KARUPPANNAN.M.Sc.
	Address	:	Geo Technical Mining Solutions (A NABET Accredited & 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, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, District Collectorate, Karur Vide Rc.No.64/Mines/ 2023 Dated: 14.07.2023

2.0 LOCATION AND ACCESSIBILITY:

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

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K. Suresh



Khasra No./ Plot No./ Block Range/ Felling Series etc.

Survey No.	Sub division	Total Extent in Hect	Patta No.	Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area out of Total area in hect.
171	1A	2.01.0	3704	1.Mr.R.Subramaniyan 2.Mr.K.Kanthasamy 3.Mr.N. Thangavel 4.Mr.K.Sakthivel	171/1A (Part)	
171	1B	3.59.0	3687		171/1B (Part)	3.54.5
Total Extent		5.60.0		Applied lease area extent		4.30.5

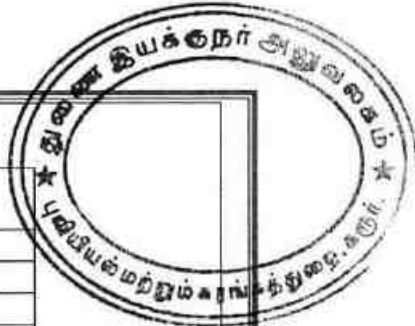
Lease area (hectares) : 4.30.5 Hectare

Whether the area is recorded to be in forest (please specify whether protected, reserved, etc) : No, forest is involved. This is recorded as patta Land.

Ownership / Occupancy : This is a Patta land S.F.No. 171/1A (Part) and 171/1B (Part) is registered in the name of 1.Mr.R.Subramaniyan, 2.Mr.K.Kanthasamy, 3.Mr.N. Thangavel & 4.Mr.K.Sakthivel vides Patta No.3704 & 3687. Hence the pattadhar given consent to the applicant. (Ref. Annex. No:VI & VII).

Existence of Public Road / Railway line if any nearby and approximate distance :
 ✓ Excavated materials will be transported through the approach road on the southeast side of the lease applied area.
 ✓ There is an NH-81 road are situated about 3.56km away from the southern side which is connecting Vellakoil- Karur Rd.
 ✓ There is an SH-84 road are situated about 3.1km away from the Northern side which is connecting Noyal- Karur Rd.
 ✓ There is an MDR-332 road are situated about 4.38km away from the western side which is connecting Noyal- K.Paramathi Rd.
 ✓ There is no railway line are situated about 5.0km radius.

Toposheet No. with latitude and longitude : SOI Toposheet No. **58-F/13**
 Latitude : From 10°59'20.50"N to 10°59'27.29"N
 Longitude : From 77°57'25.79"E to 77°57'36.49"E



Geo-Coordinates of the lease boundary:

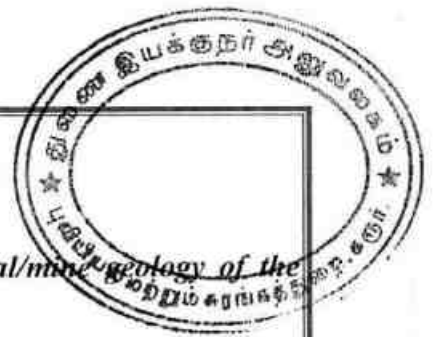
PILLAR STONES	LATITUDE	LONGITUDE
1	10°59'27.08"N	77°57'32.89"E
2	10°59'25.24"N	77°57'34.37"E
3	10°59'23.23"N	77°57'36.49"E
4	10°59'22.45"N	77°57'36.24"E
5	10°59'20.50"N	77°57'35.60"E
6	10°59'20.96"N	77°57'28.76"E
7	10°59'21.22"N	77°57'25.79"E
8	10°59'21.83"N	77°57'26.08"E
9	10°59'22.40"N	77°57'26.20"E
10	10°59'27.29"N	77°57'30.85"E
11	10°59'27.14"N	77°57'31.95"E

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

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

i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Karudaiyampalayam	2.8Km	South
b.	Nearest police station	K.Paramathi	6.35km	Southwest
c.	Nearest fire station	Karaipalayam	10.3km	Northeast
d.	Nearest medical facility	Punnam	3.4Km	East
e.	Nearest school	Salipalayam	2.2Km	West
f.	Nearest railway station	Pugalur	7.7km	Northeast
g.	Nearest port facility	Tuticorin	252km	South
h.	Nearest airport	Trichy	84.2km	Southeast
i.	Nearest DSP office	Karur	10.8m	East
j.	Nearest villages	Salipalayam	2.1km	Northwest
		Punnam	3.4km	Northeast
		Kurumpapatti	2.2km	Southeast
		Karudampalayam	2.5km	Southwest



PART - A

3.0 GEOLOGY AND MINERAL RESERVES:

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

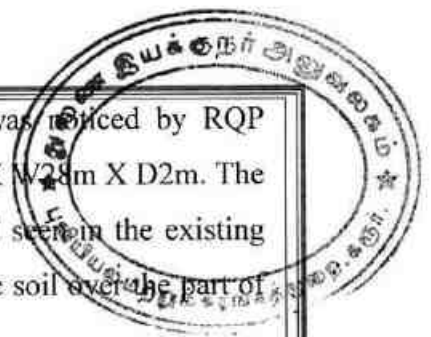
(i)	Topography	: The proposed lease area exhibits flat topography. The maximum elevation (196m) was observed in Northern side of the site. The slope is towards southern side and falls in Toposheet no. 58 F/13.
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(ii) a) Geology of the District:

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

The Granite gneiss rocks are found to occur in K.Paramathi, Athur, Thennilai, Punnam, Godanthur South, Munnur, Punnam, Anjur villages in Karur and Aravakurichi Taluk are exploited to produce building materials and road metal (Jelly) and over burden soil appear as gray to reddish in colour called as gravel. The commercially known "Coloumbo Zubrana" the unique type in the Multi coloured granite / Granite gneiss category is occurring in Thogamalai, Naganur and Kazhugur Villages in Kulithalai Taluk. These rock type belong to minor mineral category. The arrangement of alternate layers of felsic and mafic minerals in linear pattern and exhibits wavy pattern in the rock and giving very good structure for the rock type. The well-developed gneissic pattern with linear arrangement, the rock type have attracted the granite market and found to be suitable for the exploitation of granite blocks. But in this area the banded gneissic rock has many fractures and foliation in it. So, this is not viable for dimensional stone. **Order of superposition of the proposed lease area,**

Age	Group	Rock Formation
Recent to Sub recent	---	Topsoil (1-2m thick),
Proterozoic	Acid intrusive	Pink medium grained granite/ Granite gneiss



a. Present status	There is an existing pit was noticed by RQP with a pit level-I is L62m X W28m X D2m. The Charnockite rocks are well seen in the existing pit with covered by lateritic soil over the part of lease area.
b. Surface Plan	Surface plan showing elevation contour, rock exposure, and accessibility road was prepared at the scale of 1: 2000, 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)	<p><i>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:</i></p> <p>No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.</p>
(e)	<p><i>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.</i></p> <p>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 longitudinal and two transverse sections to calculate the volume of material up to the depth of 50m 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 2150850m³ including the resources of safety zone, and gravel. Of which, rough stone is about 2064816m³ and gravel resource of about 86034m³.</p> <p>The gravel is obtained about 0-2m (R.L.196-194m) from the surface and a rough stone starts from 2 to 50m (R.L.194-146m) below ground level. (Refer plate no.IIIA).</p>

Signature



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	104	173	2	35984	.....	35984
	I	104	173	3	53976	53976	.....
	II	104	173	5	89960	89960	.....
	III	104	173	5	89960	89960	.....
	IV	104	173	5	89960	89960	.....
	V	104	173	5	89960	89960	.....
	VI	104	173	5	89960	89960	.....
	VII	104	173	5	89960	89960	.....
	VIII	104	173	5	89960	89960	.....
	IX	104	173	5	89960	89960	.....
X	104	173	5	89960	89960	.....
TOTAL				50	899600	863616	35984
XY-CD	I	91	275	2	50050	.....	50050
	I	91	275	3	75075	75075	.....
	II	91	275	5	125125	125125	.....
	III	91	275	5	125125	125125	.....
	IV	91	275	5	125125	125125	.....
	V	91	275	5	125125	125125	.....
	VI	91	275	5	125125	125125	.....
	VII	91	275	5	125125	125125	.....
	VIII	91	275	5	125125	125125	.....
	IX	91	275	5	125125	125125	.....
X	91	275	5	125125	125125	.....
TOTAL				50	1251250	1201200	50050
GRAND TOTAL					2150850	2064816	86034

(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 **1123300m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 50m (R.L.196-146m) below ground level. Of which, rough stone is about **1048968m³** and gravel is about **74332m³**. The commercially viable rough stone has been prepared on 1: 2000 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	97	158	2	30652	.....	30652
	I	97	158	3	45978	45978	.....
	II	92	148	5	68080	68080	.....
	III	87	138	5	60030	60030	.....
	IV	82	128	5	52480	52480	.....
	V	77	118	5	45430	45430	.....
	VI	72	108	5	38880	38880	.....
VII	67	98	5	32830	32830	.....



	VIII	62	88	5	27280	27280	.....
	IX	57	78	5	22230	22230	.....
	X	52	68	5	17680	17680	.....
	TOTAL			50	441550	4108920	30652
XY-CD	I	84	260	2	43680	.....	43680
	I	84	260	3	65520	65520	.....
	II	79	250	5	98750	98750	.....
	III	74	240	5	88800	88800	.....
	IV	69	230	5	79350	79350	.....
	V	64	220	5	70400	70400	.....
	VI	59	210	5	61950	61950	.....
	VII	54	200	5	54000	54000	.....
	VIII	49	190	5	46550	46550	.....
	IX	44	180	5	39600	39600	.....
	X	39	170	5	33150	33150	.....
	TOTAL			50	681750	638070	43680
	GRAND TOTAL				1123300	1048968	74332

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 an existing grant lease. The mining operation is open-cast, semi-mechanized method 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

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

Total proposed production **1123300m³**. Of which, rough stone is **1048968m³** and gravel is **74332m³** up to a depth of 50m below the ground level (R.L.196m-146m) for five years plan period. Average production is **209793m³** of rough stone per year (Refer Plate No. IVA).



Year	Pit No.(s)	Topsoil/Overburden (m ³)	ROM (m ³)	Saleable rough stone (m ³) @ 100%	Rough stone rejects(m ³)	Sub grade/Weathered rock in (m ³)	Saleable Gravel (m ³)	Rough stone to topsoil ratio
First	I	---	194750	171050	...	...	23700	....
Second	I	---	248400	224288	...	...	24112	....
Third	I	---	306000	279480	...	...	26520	....
Fourth	I	---	187660	187660	...	...	....	....
Fifth	I	---	186490	186490	...	...	....	....
Total	---	...	1123300	1048968	...	...	74332	....

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 PRODUCTIONS								
Section	Year	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-YEAR	I	75	158	2	23700	.....	23700
		I	75	158	3	35550	35550	.....
		II	65	148	5	48100	48100	.....
		III	55	138	5	37950	37950	.....
		IV	45	128	5	28800	28800	.....
		V	35	118	5	20650	20650	.....
TOTAL						194750	171050	23700
XY-AB	II-YEAR	I	22	158	2	6952	.....	6952
		I	22	158	3	10428	10428	.....
		II	27	148	5	19980	19980	.....
		III	32	138	5	22080	22080	.....
		IV	37	128	5	23680	23680	.....
		V	42	118	5	24780	24780	.....
XY-CD	II-YEAR	I	33	260	2	17160	.....	17160
		I	33	260	3	25740	25740	.....
		II	28	250	5	35000	35000	.....
		III	23	240	5	27600	27600	.....
		IV	18	230	5	20700	20700	.....
		V	13	220	5	14300	14300	.....
TOTAL						248400	224288	24112
XY-CD	III-YEAR	I	51	260	2	26520	.....	26520
		I	51	260	3	39780	39780	.....
		II	51	250	5	63750	63750	.....
		III	51	240	5	61200	61200	.....
		IV	51	230	5	58650	58650	.....
		V	51	220	5	56100	56100	.....
TOTAL						306000	279480	26520
XY-AB	IV-YEAR	VI	72	108	5	38880	38880	.....
		VII	67	98	5	32830	32830	.....
XY-CD		VI	59	210	5	61950	61950	.....
		VII	54	200	5	54000	54000	.....
TOTAL						187660	187660	0



XY-AB	V- YEAR	VIII	62	88	5	27280	27280	.....
		IX	57	78	5	22230	22230	.....
		X	52	68	5	17680	17680	.....
XY-CD	V- YEAR	VIII	49	190	5	46550	46550	.....
		IX	44	180	5	39600	39600	.....
		X	39	170	5	33150	33150	.....
TOTAL						186490	186490	
GRAND TOTAL						1123300	1048968	74332

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 "B₂" 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 = 1048968m³
 Yearly production of rough stone = 209793m³
 Monthly production of rough stone = 17483m³

Gravel:

Mineable reserves of gravel = 74332m³
 Yearly production of gravel = 24777m³

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 50m below ground level (R.L.196m-146m) from the petrogenetic character of the rock as well as from the actual mining practice in the

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area and with the current trend of rough stone production the quarry may sustain for 5 years.

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

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

ULTIMATE PIT LIMIT-(XY-AB)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.196-194m	Five years	Gravel	97	158	2
I	R.L.194-191m		Rough stone	97	158	3
II	R.L.191-186m		Rough stone	92	148	5
III	R.L.186-181m		Rough stone	87	138	5
IV	R.L.181-176m		Rough stone	82	128	5
V	R.L.176-171m		Rough stone	77	118	5
VI	R.L.171-166m		Rough stone	72	108	5
VII	R.L.166-161m		Rough stone	67	98	5
VIII	R.L.161-156m		Rough stone	62	88	5
IX	R.L.156-151m		Rough stone	57	78	5
X	R.L.151-146m	Rough stone	52	68	5	
Total						50m

ULTIMATE PIT LIMIT-(XY-CD)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.196-194m	Five years	Gravel	84	260	2
I	R.L.194-191m		Rough stone	84	260	3
II	R.L.191-186m		Rough stone	79	250	5
III	R.L.186-181m		Rough stone	74	240	5
IV	R.L.181-176m		Rough stone	69	230	5
V	R.L.176-171m		Rough stone	64	220	5
VI	R.L.171-166m		Rough stone	59	210	5
VII	R.L.166-161m		Rough stone	54	200	5
VIII	R.L.161-156m		Rough stone	49	190	5
IX	R.L.156-151m		Rough stone	44	180	5
X	R.L.151-146m	Rough stone	39	170	5	
Total						50m

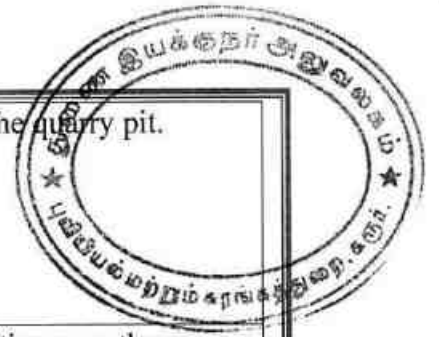
iii) Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long-term use in the event of continuation of mining activity: -

: The recovery of rough stone in this quarry is 100%. There is no waste rock will be proposed in this lease area.

iv) Whether back filling of pits after recovery of mineral up to

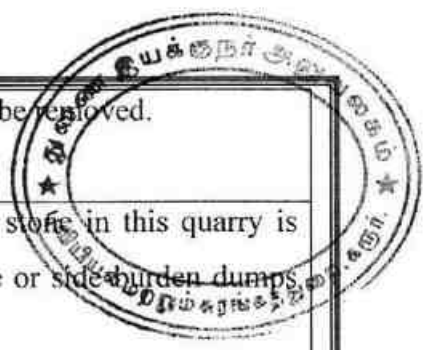
: As the depth of persistence of the deposit may likely to continue for further depth, it is

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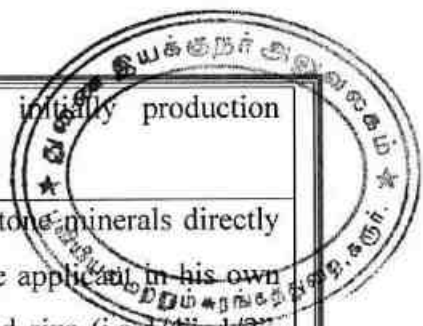


<p>techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -</p>	<p>proposed not to backfilled the quarry pit.</p>
<p>v) Whether post mining land use envisaged: -</p>	<p>: At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.</p>
<p>g. Open cast Mines:</p>	
<p>i). Describe briefly giving salient features of the mode of working (Mechanized, Semi-mechanized, manual)</p>	<p>: It is an existing 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.</p> <p>Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Excavators and tipper combination are adapted.</p>
<p>ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden /waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice</p>	<p>: 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.</p> <p>Bench height = 5mts. Bench width = 5mts.</p>

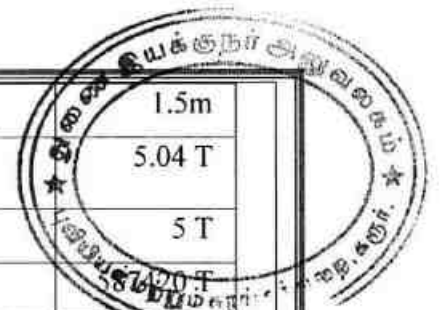
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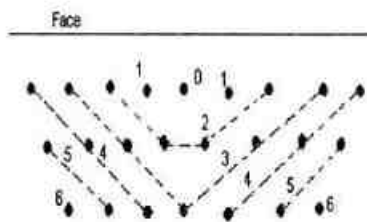
a. Details of topsoil/ overburden	:	There is no topsoil will be removed.																					
b. Rough stone waste and side burden waste:-	:	The recovery of rough stone in this quarry is 100%. Any other waste or side burden dumps are doesn't proposed.																					
h. Underground Mines:	:	Not 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. <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P</th> </tr> </thead> <tbody> <tr> <td>Jack Hammer</td> <td>4</td> <td>32 mm</td> <td>Hand held</td> <td>---</td> <td>Diesel</td> <td>--</td> </tr> <tr> <td>Compressor</td> <td>3</td> <td>---</td> <td>Air</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>			Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Jack Hammer	4	32 mm	Hand held	---	Diesel	--	Compressor	3	---	Air	--	Diesel	--
Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P																	
Jack Hammer	4	32 mm	Hand held	---	Diesel	--																	
Compressor	3	---	Air	--	Diesel	--																	
(2) Loading Equipment: <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Hydraulic Excavator</td> <td>2</td> <td>2.9-4.5m³</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>			Type	Nos	Size / Capacity	Make	Motive power	H.P.	Hydraulic Excavator	2	2.9-4.5m ³	--	Diesel	--									
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(3) Haulage and Transport Equipment (a) Haulage within the mining leasehold: <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>10</td> <td>15MT</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>			Type	Nos	Size / Capacity	Make	Motive power	H.P.	Tipper	10	15MT	--	Diesel	--									
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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.																					



<p>d. Ore transported by : own trucks / hired trucks</p>	<p>: Hired trucks for initially production purposes.</p>												
<p>e. Main destination to which ore is transported (giving to and from distance)</p>	<p>: 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%.</p>												
<p>f. Details of hauling / transport equipment:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 15%;">Type</th> <th style="width: 10%;">Nos</th> <th style="width: 25%;">Size / Capacity</th> <th style="width: 15%;">Make</th> <th style="width: 15%;">Motive power</th> <th style="width: 20%;">H.P.</th> </tr> </thead> <tbody> <tr> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>		Type	Nos	Size / Capacity	Make	Motive power	H.P.	--	--	--	--	--	--
Type	Nos	Size / Capacity	Make	Motive power	H.P.								
--	--	--	--	--	--								
<p>(4). Miscellaneous: Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.</p>													
<p>(A) Operations</p>	<p>: The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only.</p>												
<p>(B) Machineries deployed</p>	<p>: 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))</p>												
<p>5. BLASTING: a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc. <u>Blasting pattern:</u> 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. <u>Drilling and Blasting parameters are as follows,</u></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tbody> <tr> <td style="width: 5%;">1</td> <td style="width: 75%;">Diameter of the hole</td> <td style="width: 20%;">32 mm</td> </tr> <tr> <td>2</td> <td>Spacing between hole</td> <td>1.2m</td> </tr> <tr> <td>3</td> <td>Burden for hole</td> <td>1.0m</td> </tr> </tbody> </table>		1	Diameter of the hole	32 mm	2	Spacing between hole	1.2m	3	Burden for hole	1.0m			
1	Diameter of the hole	32 mm											
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4	Depth of each hole	1.5m
5	Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8 \times 2.8$	5.04 T
6	Output per hole = $1.8 \times 2.8 = 5 T$	5 T
7	Production per annum $209793m^3 \times 2.8 = 587420 T$	2098 T
8	Total handling per day (280 working day)	2098 T
9	Nos. of holes per day ($2098/5.04 = 416$)	416 holes
10	Meterage required per day ($416 \times 5.5 = 2288$)	2288meters
11	Charge per hole	0.375 kg
12	Powder factor ($416 \text{holes} \times 0.375 \text{ kg} = 156$)	156 kg
13	Sequence of blasting = Cord relay with electric detonators / Nonel	--



Staged method of mining

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:

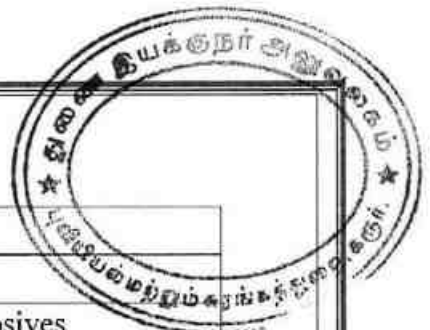
The control blasting measures is being adopted for minimizing ground vibration and fly rock. Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock.

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
- ❖ Reduction in over break
- ❖ Improved fragmentation



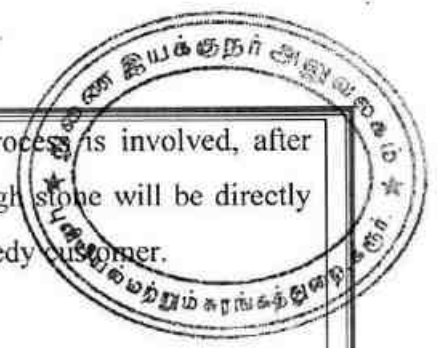
❖ Better control of fly rock Blasting program for the production per day	
No of holes	: 416holes
Yield	: 2098 tons
Total explosive required	: 156kg-Slurry explosives
Charge per hole	: 0.375kg
Blasting at day time only	: 12.0p.m-1.0p.m
d) Powder factor in ore and overburden / waste / development heading / stope	: Powder factor is proposed as 0.375kg 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)	: <ol style="list-style-type: none"> 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 80m in rainy season and 85m 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 ultimate depth of mining is 50m bgl. Now, the present Mining lease will be proposed above the water table and hence, quarrying may not affect the ground water.
c) Quantity and quality of water likely to be encountered, the	: The ground water may not rise immediately in this type of mining.

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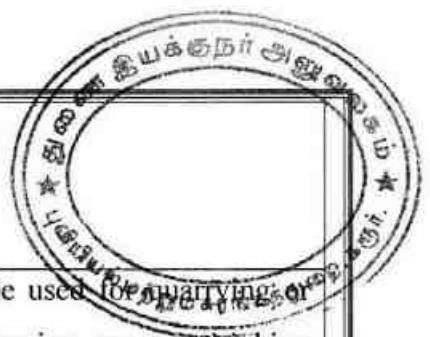


<p>pumping arrangements and places where the mine water is finally proposed to be discharged</p>	<p>However, the rain water percolation and collection of water from the seepage will be less than 300 Lpm and it will be pumped out periodically by stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.</p>
<p>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</p>	
<p>(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.</p>	
<p>(b) Land chosen for disposal of waste with proposed justification</p>	<p>: There is no waste are proposed.</p>
<p>(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.</p>	<p>: There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.</p>
<p>8. USE OF MINERAL:</p>	
<p>(a) Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)</p>	<p>: 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</p>
<p>(b) Indicate physical and chemical specifications stipulated by buyers</p>	<p>: 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.</p>

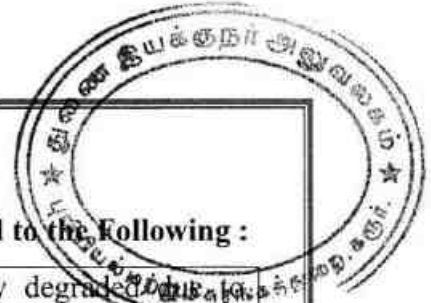
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(c)	:	Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.																								
9. OTHERS																										
(a)	:	Describe briefly the following Site services : Infrastructure required for such mines 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)	:	<p>Employment potential :</p> <p>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.</p> <p>The following man power is proposed for quarrying stone material during the five years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.</p> <table border="1"> <tr> <td>1.</td> <td>Highly Skilled</td> <td>Mines Manager</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Engineer</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Geologist</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Blaster</td> <td>1No.</td> </tr> <tr> <td>2.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>23 No's</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total =</td> <td>27 No's</td> </tr> </table>	1.	Highly Skilled	Mines Manager	1No.			Mine Engineer	1No.			Mine Geologist	1No.			Blaster	1No.	2.	Unskilled	Musdoor / Labours	23 No's	Total =			27 No's
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10 MINERAL PROCESSING/BENEFICIATIONS:																										
(a)	:	<p>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</p> <p>Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size 1/2, 3/4 and 1 1/2 inches Jelly which are mainly used in road and building construction purpose.</p> <p>The recovery of rough stone in this</p>																								



	size and grade of feed material and concentrate (finished marketable product), recovery rate.	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 of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).	: No water 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 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 0.5KLD, utilized water is 1.0KLD, Dust suppression is 2.0KLD and Green Belt is 1.75KLD. Minimum quantity of water 5.25KLD 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.



PART - B

11.0 ENVIRONMENTAL MANAGEMENT PLAN :

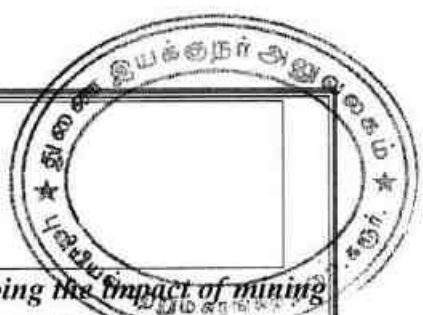
a) Attach a note on the status of Baseline information with regard to the following :

11.1	Existing land use pattern indicating the area already degraded by quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below.	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>0.16.15</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>Nil</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.02.0</td> </tr> <tr> <td>4</td> <td>Green belt & Dump</td> <td>Nil</td> </tr> <tr> <td>5</td> <td>Drainage & Settling Tank</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>4.12.35</td> </tr> <tr> <td colspan="2" style="text-align: center;">Grand total</td> <td>4.30.5</td> </tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under mining	0.16.15	2	Infrastructure	Nil	3	Road	0.02.0	4	Green belt & Dump	Nil	5	Drainage & Settling Tank	Nil	6	Un-utilized area	4.12.35	Grand total		4.30.5
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11.2	Water Regime	: Water table in this area is noticed at a depth of 85m in summer and 80m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 50m 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.																								



11.5	<p>Climatic conditions:</p> <p>Climate:</p> <p>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.</p> <p>Rainfall:</p> <p>The annual rainfall normal (1970-2000) of Karur district is 742 mm. 4 Projections of rainfall over Karur for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively.</p>																									
11.6	<p>Human Settlement:</p> <p>The nearest villages are found in the buffer zone with population as per 2011 census.</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>Village</th> <th>Direction</th> <th>Distance in Kms</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Salipalayam</td> <td>Northwest</td> <td>2.1km</td> <td>898</td> </tr> <tr> <td>2</td> <td>Punnam</td> <td>Northeast</td> <td>3.4km</td> <td>5446</td> </tr> <tr> <td>3</td> <td>Kurumpapatti</td> <td>Southeast</td> <td>2.2km</td> <td>746</td> </tr> <tr> <td>4</td> <td>Karudampalayam</td> <td>southwest</td> <td>2.5km</td> <td>2347</td> </tr> </tbody> </table>	S.N	Village	Direction	Distance in Kms	Population	1	Salipalayam	Northwest	2.1km	898	2	Punnam	Northeast	3.4km	5446	3	Kurumpapatti	Southeast	2.2km	746	4	Karudampalayam	southwest	2.5km	2347
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11.7	<p>Public buildings, places of worship and monuments : No infrastructure like residential building, places of special interest like archeological monuments, sanctuaries etc., are found around 10km radius.</p>																									
11.8	<p>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.</p>																									
11.9	<p>Does area (partly or fully) fall under notified area : The proposed area not fall under notified area under water (Prevention & Control of</p>																									

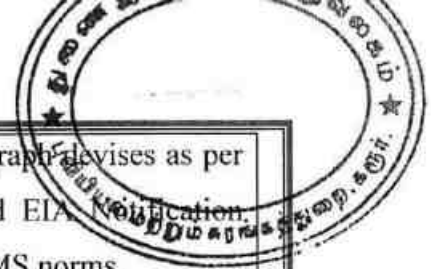
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under Water (Prevention & Control of Pollution), Act, 1974	Pollution), Act, 1974
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b) Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)

i)	<p>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</p> <p>Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Area in use during the quarrying period (Hect)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>3.68.62</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>0.03.0</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.05.0</td> </tr> <tr> <td>4</td> <td>Green belt</td> <td>0.45.48</td> </tr> <tr> <td>5</td> <td>Drainage & Settling Tank</td> <td>0.08.4</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>Nil</td> </tr> <tr> <td colspan="2">Grand total</td> <td>4.30.5</td> </tr> </tbody> </table>	Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Area under mining	3.68.62	2	Infrastructure	0.03.0	3	Road	0.05.0	4	Green belt	0.45.48	5	Drainage & Settling Tank	0.08.4	6	Un-utilized area	Nil	Grand total		4.30.5
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ii).	<p>Air Quality</p> <p>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.</p>																								
iii).	<p>Water quality</p> <p>A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.</p>																								
iv).	<p>Noise levels</p> <p>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.</p>																								
v).	<p>Vibration levels (due to blasting)</p> <p>No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity will be</p>																								



		recoded using mini seismograph devices 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 near by villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km radius.

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

i).	Temporary storage and utilization of topsoil	:	There is no topsoil will be removed.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case 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 50m 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.

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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	0.45.48	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 first five years (and up to conceptual plan period for 'A' category mines).	:	No waste or rejects removed in this lease area.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this 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.
viii).	Protective measures for ground vibrations / air blast caused by blasting,	: It is a small B2 category of semi mechanized 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.

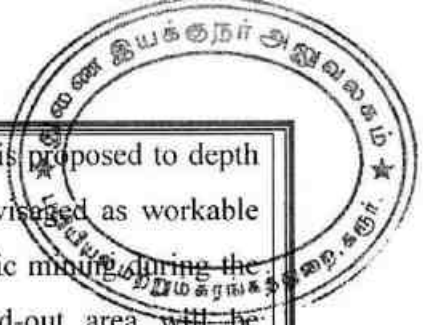
d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (for 'A' category mines only)

Not applicable. It is B2 category quarry

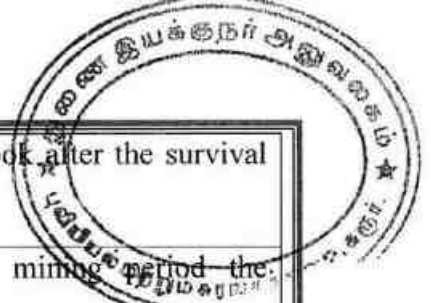
12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The Ultimate mining is proposed to an average depth of 50m 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 the quarry 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 an existing mining lease. No mitigation measures adopted.

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12.4	Mine closure activity	: The present mining plan is proposed to depth of 50m bgl has been envisaged as workable depth for safe & economic mine 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	: Open cast semi mechanized method of mining is adopted in this quarry. If the benches are made with proposed height and with no risk will be there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	: A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for

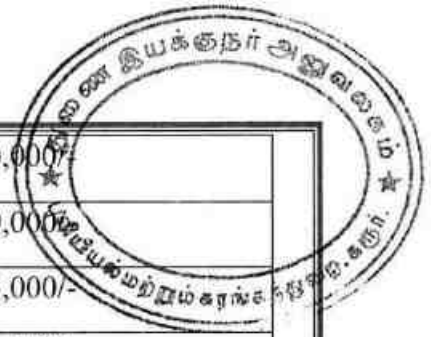


		security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 27 labors will be improved.
12.9	Reclamation and Rehabilitation	: Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes.

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

A	Fixed Asset Cost:	
	1. Land Cost (Consent land)	: Rs. 5,00,000/-
	2. Labour Shed	Rs. 1,50,000/-
	3. Sanitary Facility	: Rs. 1,50,000/-
	4. Fencing	: Rs. 3,75,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 3,00,000/-
	Total	: Rs. 14,75,000/-
B	B. Machinery cost	: Rs. 30,00,000/- (Hire Basis)
C	Total Expenditure of EMP cost (for five years)	
	1. Drinking Water Facility	: Rs. 1,50,000/-
	2. Sanitary facility & Maintenance	: Rs. 50,000/-
	3. Permanent water sprinkler	: Rs. 1,00,000/-

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4. Afforestation and its maintenance	:	Rs. 1,10,000/-
5. Safety Kits	:	Rs. 50,000/-
6. Provision of tyre washing facility	:	Rs. 75,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.08.4Ha/ 840 Sq.m X 400 Rs)	:	Rs. 3,36,000/-
8. Blasting materials with blast mat cost	:	Rs. 30,00,000/-
9. Environment monitoring	:	Rs. 5,00,000/-
Total	:	Rs. 43,71,000/-
D	Total Project Cost (A+B+C)	Rs. 88,46,000/-

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 Deputy Director of Geology and Mining, Karur vide letter **Rc.No.64/Mines/2023 Dated: 14.07.2023.**
- (iv) Total proposed production of **1123300m³**. Of which, rough stone is about **1048968m³** and gravel is about **74332m³** up to a depth of 50m below the ground level (R.L.196m-146m) for five years plan period. Average production is **209793m³** of rough stone per year.



17.0 CSR Expenditure:

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

Place: Dharmapuri, TN

Date: 21/7/23

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post Office,
Dharmapuri - 636 705. Tamil Nadu, India.
E-mail : info.gtmsdpi@gmail.com
website : www.gtmsind.com

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

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 64/mines/2023 Dated: 02/08/2023

Deputy Director of Geology and Mining
Karur District



ந.க.எண்.64/கனிமம்/2023

மாவட்ட ஆட்சியர் அலுவலகம்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்

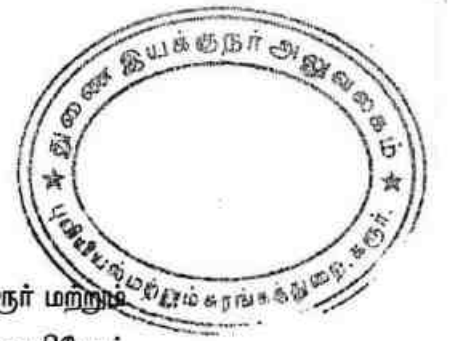
நாள்: 14.07.2023.

குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - குப்பம் கிராமம் - பட்டா புல எண்கள்.171/1A(பகுதி) (0.76.00 ஹெக்டேர்ஸ்) மற்றும் 171/1B(பகுதி) (3.54.50 ஹெக்டேர்) ஆகியவற்றின் மொத்தம் 4.30.50 ஹெக்டேர்ஸ் பரப்பில் - சாதாரணகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ் என்ற நிறுவனத்தினர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

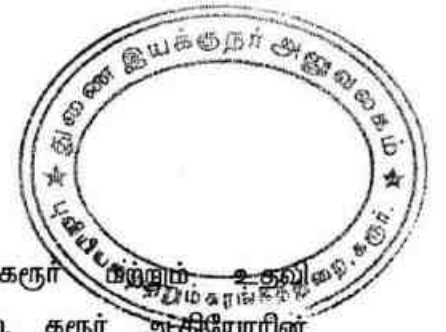
- பார்வை:**
1. தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ், சர்வே எண்.162/1, தலையீத்துப்பட்டி, குப்பம் அஞ்சல், புகளூர் வட்டம், கரூர் மாவட்டம் என்ற நிறுவனத்தின் விண்ணப்பம் நாள்: 17.02.2023.
 2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் கடிதம் ந.க.எண். அ1/1153/2023, நாள்:20.06.2023
 3. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:12.07.2023.
 4. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.171/1A(பகுதி) (0.76.00 ஹெக்டேர்ஸ்) மற்றும் 171/1B(பகுதி) (3.54.50 ஹெக்டேர்) ஆகியவற்றின் மொத்தம் 4.30.50 ஹெக்டேர்ஸ் பரப்பு நிலத்திலிருந்து ஐந்து ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ், சர்வே எண்.162/1, தலையீத்துப்பட்டி, குப்பம் அஞ்சல், புகளூர் வட்டம், கரூர் மாவட்டம் என்ற நிறுவனத்தினர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளனர்.



மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.171/1A(பகுதி) (0.76.00 ஹெக்டேர்ஸ்) மற்றும் 171/1B(பகுதி) (3.54.50 ஹெக்டேர்) ஆகியவற்றின் மொத்தம் 4.30.50 ஹெக்டேர்ஸ் பரப்பில் தமிழ்நாடு சிறு கனிமச்சலுகை விதிகளில் விதி எண்கள்.19-(1) 20 மற்றும் 33-இன் கீழ் தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ் என்ற நிறுவனம் ஐந்து ஆண்டுகளுக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பார்வை 2 மற்றும் 3-இல் கண்டுள்ளவாறு பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புலத்திற்கு வடமேற்கில் 43 மீட்டர் தொலைவில் செல்லும் உயரழுத்த மின்கோபுர கம்பிபாதைக்கு மின் வாரியத்திடமிருந்து தடையின்மை சான்றினை பெற்று குவாரி குத்தகை உரிமம் பத்திரம் நிறைவேற்றுவதற்கு முன்பு சமர்ப்பிக்கப்பட வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
3. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Metalliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.



எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவி வருவாய் அதிகாரிகள், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள்.171/1A(பகுதி) (0.76.00 ஹெக்டேர்ஸ்) மற்றும் 171/1B(பகுதி) (3.54.50 ஹெக்டேர்) ஆகியவற்றின் மொத்தம் 4.30.50 ஹெக்டேர்ஸ் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண். 19(1), 20 மற்றும் 33-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 5 (ஐந்து) ஆண்டு காலத்திற்கு சாதாரணக்கற்கள் மற்றும் கிராவல் குவாரி உரிமம் வழங்க தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு அரிதியிட்ட (Precise area) நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண்.41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ் என்ற நிறுவனத்தினர் கேட்டுக்கொள்ளப்படுகின்றார். மேலும், ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ஆம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-இன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்.

பெறுநர்
தி/ள்.ஸ்ரீ செல்வ விநாயகா புளூமெட்டல்ஸ்,
சர்வே எண்.162/1,
தலையீத்துப்பட்டி,
குப்பம் அஞ்சல்,
புகளூர் வட்டம்,
கரூர் மாவட்டம்.

நகல்:-

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



M. RAVICHANDRAN, ASSISTANT T. & D. OFFICER
 S.V. 70 & P. D. NAGAR, KARUR S.
 T. No. 5197 KAR

N. BALU,
 SUB TREASURY-KARUR,

224
 6-10-05
 1000

SEIGNIORAGE AMOUNT (5 years) Rs 24,000/-
 SECURITY DEPOSIT (5 years) Rs 5,000/-
 AREA ASSESSMENT (5 years) Rs 2,760/-
 (Proceedings of the District Collector, Karur Rc. D. 149/2005 dated 08.09.2005)

APPENDIX V
 (See Rule 33)

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

AGREEMENT made this 24th day December of 2005 between T. K. Maniam, S/o. Kandasamy Chounder, Kattusalai, P. S. D. Kanda Nagar, Velur, Paramathi Velur

[Handwritten Signature]

DISTRICT COLLECTOR
 KARUR.

For TATA BLUE METALS,
 L. Maniam

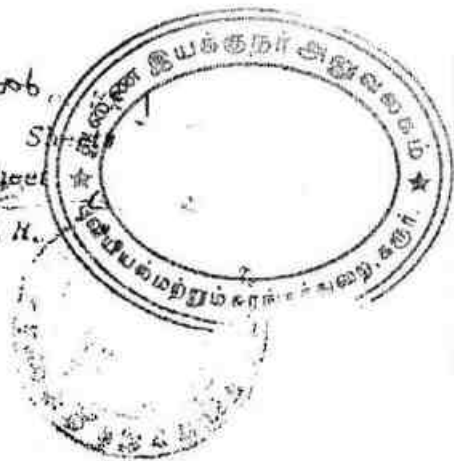


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.....

ORIGINAL No 148 of 2006

Consists of 12 Sheets
H. H. S. N.



321
148/06

Executed in the office of the Joint
Sub Registrar II and recorded by 2440-
[illegible] on the 30th day of July 2006

K. Manan

Execution Admitted by

LEFT THUMB



K. Manan S/o Kandasamy (Sri) Kallivalsar
S/o Kandanayagan, Velur, Taluk, Namakkal (Sri)
Namakkal District. Family Card 11/W/000976
verified.

LEFT THUMB



K. Manan S/o Kandasamy, m: 125, Nalliyam Palayam,
Velur, Namakkal Taluk, Namakkal District. Family Card 11/W/0010054
verified.

Identified by

S/o [illegible] S/o [illegible] S/o [illegible]
[illegible] (S) [illegible]
[illegible] S/o [illegible] [illegible]

I have satisfied myself as to the execution
of instrument by this A. K. N. S. J. A. S.
[illegible] [illegible] [illegible]
under Sec 80 of the Registration Act

3.1.07

JOINT SUB REGISTRAR II
BARUR



[Signature]

- 231 -

37th day of February
2006
Joint Sub Registrar II
KARUR,



Registered As No. 148 of 2006
of Book 1

3-2-06 Joint Sub Registrar II
KARUR,



Note: A Duplicate has been registered
along with this.

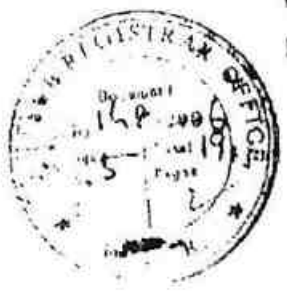
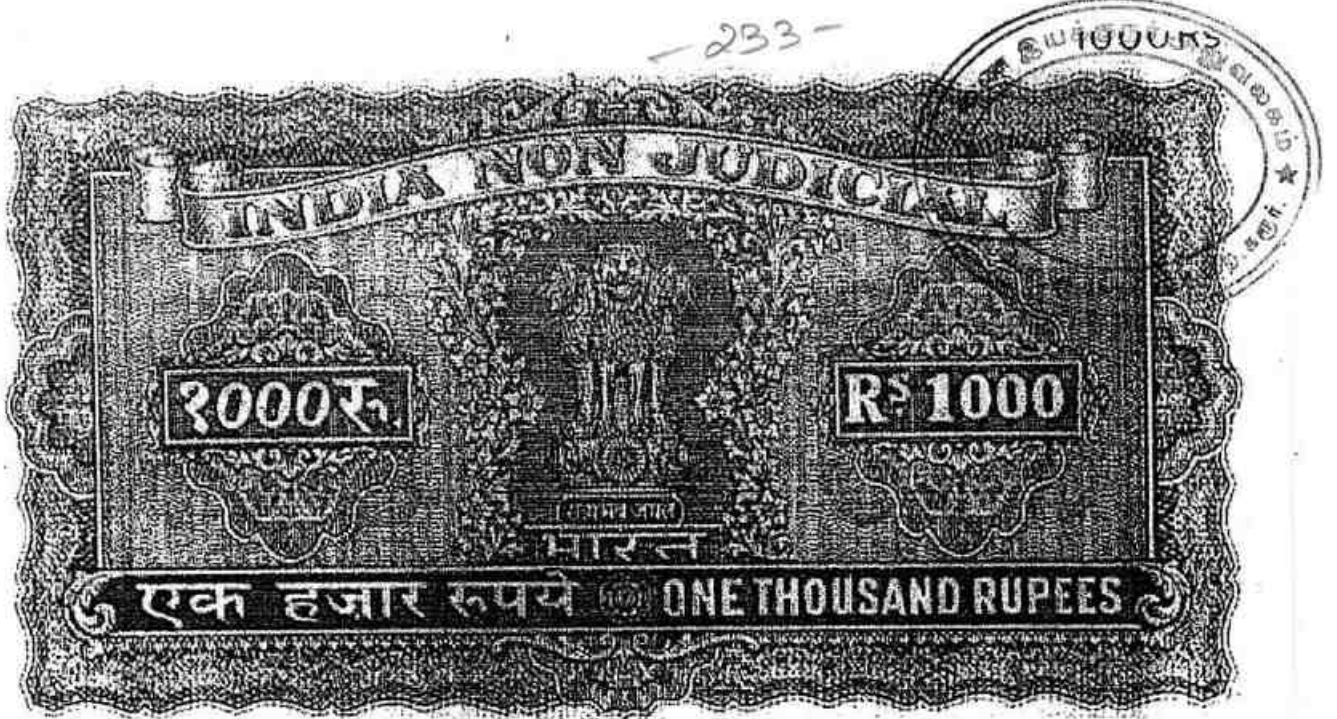
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JOINT SUB REGISTRAR II
KARUR
3/2/06

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R. H. S. K.

223
S. S. S.

சுற்றுலா துறை

- 233 -



TATA Blue Metal
KUPAIN.
M. RAVICHANDRAN
S. V. SURE
KABUR
L. No. 102/2 K.M.

273 P. 1000
6.10.05



and the Governor of Tamil Nadu (hereinafter referred to as "the Government" which expression where the context so admits, include also his successors in office and assigns) of the third part

Whereas the registered holders hold the lands described in the Schedule hereto and intend to lease out to the lessee of the said lands for the purpose of quarrying ARALAI, ILLEY AND SHOOTING ONLY in the said lands and to deposit quarrying waste in the said lands and has lodged with Collector the lease and accurate map or sketch of the said land.

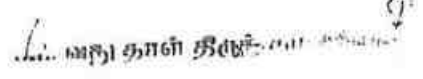
In witness


DISTRICT DIRECTOR
KABUR.

FOR AND TO THE METALS.

In witness

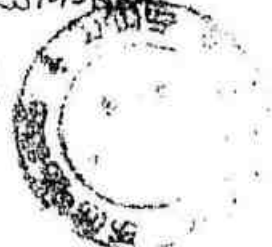






TATA BLUE METAL - KUPPA

276 M. REVINANDRAN
6-10-07 S. S. S. NAGAR,
KANNIYUR S.
C-2007, L. NO: 4/97 KRR



AND WHEREAS the lessee or tenant of the registered holder has made application to the Collector of the District of Karur (hereinafter referred to as "the Collector") seeking grant of quarrying lease for ARAIAL HILLY AND SIBOILING HILLS in the said lands and to deposit quarrying waste in the said lands and has lodged with the Collector an accurate map or sketch of the said lands

AND WHEREAS the Collector, acting for and on behalf of the Government, has granted a quarrying lease to the lessee or tenant of the registered holder and allowed him to

In witness


DISTRICT REGISTRAR
KARUR.



For TATA BLUE METALS,
In witness





commence quarrying operations for ARALAI JELLY AND SHOELING ONLY in the said land and to deposit quarrying waste thereon by the lessee or tenant of the registered holder

AND WHEREAS the Collector is prepared to allow the said registered holders or lessee to commence quarrying operations and to deposit quarrying waste in or on the said lands described in the Schedule for a period of Five years from 24th day of December 2005 to 23rd day of December 2010 upon the registered holders and the lessee entering into the agreement herein contained.

AND WHEREAS the lessee has deposited with the Collector, the sum of Rs 5,000/- (Rupees five thousand only) as Security for the due performance of the covenants, agreements and provisos or damage which may be incurred by the Government by reason of any of the said lands described in the schedule hereto being rendered unfit for cultivation by the quarrying operations thereon or by the deposit of quarrying waste thereon by either the registered holders or the lessee

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

NOW THIS PRESENTS WITNESS and the registered holders and lessee do hereby jointly and severally and each of them doth individually herobly covenant and agree with the government as follows:

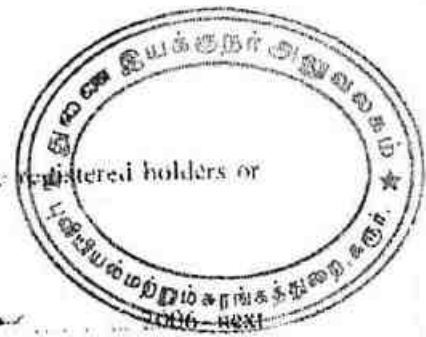
1 To carry on quarrying operations during the said term in a proper and workman like manner and to deposit quarrying waste on the lands described in the schedule hereto and to answer and to account at all reasonable times to the Government for all acts and

D. L. Manian


DISTRICT COLLECTOR
KANAR.



S. அனுநாள் திருந்தம் கேள்யம்



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

2 To pay on the 23rd day of December and on the 23rd day of December every succeeding year during so long as the operations as aforesaid are carried on, into the Government Treasury to the credit of the Government in addition to the land assessment for the time being payable in respect of the said lands, seigniorage on the minerals quarried at the rates prescribed by the Government from time to time

3 To abide by the rules prescribed by the Government from time to time regarding quarrying of ARALAI, JELLY AND SHOLING ONLY.

4. To keep correct accounts in such form as the Collector shall from time to time require and direct showing the quantities and other particulars of all minerals obtained by the registered holders or the lessee from the said lands and also the number of persons employed in carrying on the said quarrying operations therein and to prepare and maintain from time to time when so directed by the said Collector complete and correct plans of all mines and workings in the said lands and to allow any officer hereunto authorised by the Commissioner of Geology and Mining, Chennai from time to time and at all times to examine such accounts and any such plans and to supply and furnish when so required all such information and returns regarding all or any of the matter aforesaid as the Government may, from time to time, require and direct;

5 To allow any officer authorised by the Commissioner of Geology and Mining, Chennai in that behalf from time to time and at all times to enter upon any part of the said lands where any mining operations may be carried on for the purpose of inspecting the same.

to the manager

JH
DISTRICT COLLECTOR
KAILASH



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சென்னை அரசாங்கப் பதிவுகாரியகம்



6. To forthwith send to the Collector a report of any accident which may occur at or on the said lands and also of the discovery therein of any mineral or other valuable substance.

7. Not to claim any remission of assessment in respect of any of the said lands which shall be rendered unfit for surface cultivation by the carrying on of any quarrying operations or by the deposit of quarrying waste unless thirty times of the assessment thereon has been deducted under proviso 2 hereunder.

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

1. That it shall be lawful for the registered holders or lessee as the case may be at any time to cease quarrying operations under these presents provided the registered holders or lessee shall pay the Government or the Collector the land assessment, cess and seigniorage payable by the registered holders or the lessee under these presents upto the end of the year in which the registered holders or the lessee shall cease such quarrying operations and shall restore the said lands fence or fill in abandoned pits and excavations therein if required by the Collector as next hereinafter provided and upon, the registered holders or the lessee so doing these presents shall cease and determine.

2. That in case the registered holder shall relinquish the whole or part of the said lands in case of the expiry of sooner determination of this agreement then and in any such case, The registered holders in the case of relinquished and the registered holders and the lessee in other cases shall restore said lands or the area relinquished or so much thereof as the Collector shall require to be restored to a state fit for cultivation and shall securely and permanently fence or fill in all abandoned pits and excavations therein as the Collector shall require to be so fenced

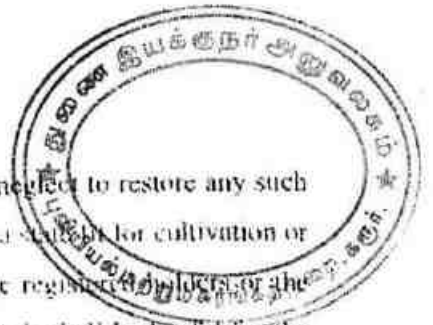
J. Manan


DISTRICT COLLECTOR
KARUR.



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REGISTRAR
கரூர் பதிவு அலுவலர்



or filled in and in case the registered holder or the lessee shall fail or neglect to restore any such lands with the registered holders or the lessee be required to restore to a state fit for cultivation or to so fence or fill in any such abandoned pit or excavation which the registered holders or the lessee shall be required to so fence, or fill them and in any such case, it shall be lawful for the Collector to so restore any such lands, or as the case may be, to so fence or fill in any such pit or excavation at the expense of the registered holders and to apply the said sum of Rs.5,000/- so deposited in or towards the cost of so doing and to deduct from the amount of the said deposit and retain on behalf of the Government a sum equal to thirty times the assessment of the said lands which shall have been rendered unfit for cultivation

If however, the amount of deposit is not sufficient to cover the cost of such restoration of fencing or filling as the case may be or to meet thirty times the assessment in the area rendered uncultivable, it shall be lawful for the Government to recover the balance by resort to Civil Court

3 That all area assessment, cess and seigniorage payable under these presents shall recoverable under the provisions of the Tamil Nadu Revenue Recovery Act, 1864, or any subsisting statutory modification thereof, as if the same were arrear of land revenue.

4 That in the event of any breach of the registered holder or any of the conditions of these presents it shall be lawful for the Government to levy enhanced seigniorage subject to the maximum of five times of the normal rate or for the Collector to give notice in writing to the registered holder of their intention to cancel these presents whereupon the same shall stand cancelled but without prejudice to any rights which the Government may have against the registered holders in respect of any antecedent claim or breach of covenant or condition.

31/1/2011


DISTRICT COLLECTOR
KARUR.

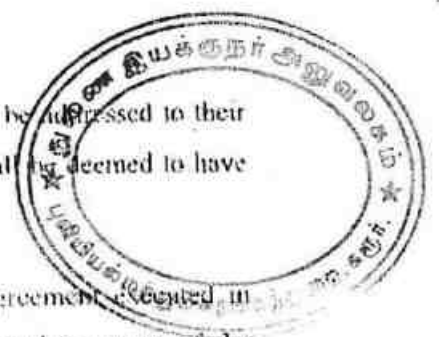
20/1/2011

For TATA LIFE LIMITEDS.



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11/1/2011



5. That any notice to be given to the registered holder may be addressed to their best known place of abode and where a notice has been so addressed it shall be deemed to have been duly served for the purpose of these provisions.

6. Should any question or dispute arise regarding an agreement entered in pursuance of these rules or any matter or thing connected therewith or the powers of the registered holders thereunder, the amount or payment of the seigniorage fee or area assessment made payable thereby, the matter in issue shall be decided by the Commissioner of Geology and Mining, Chennai. In case the registered holders/lessee is not satisfied with the decision of the Commissioner of Geology and Mining, the matter shall be referred to the State Government.

7. The lessee shall abide by the conditions laid down in the Payment of Wages Act, 1936 (Central Act IV of 1936), the Mines Act, 1952 (Central Act XXXV of 1952) and the Indian Explosives Act, 1884 (Central Act IV of 1884).

OTHER CONDITIONS

1) The permission granted to the lessee to quarry ARALAI, JELLY AND SHOLING ONLY in the said patta land is valid for from 24th day of December 2005 to 22nd day of December, 2010.

2) The lessee should register the agreement deed in the concerned Sub-Registrar Office, at the expense of the lessee within 30 days from the date of execution of the agreement.

3) The lessee shall remove or transport the ARALAI, JELLY AND SHOLING ONLY from the lease area only after payment of area assessment, seigniorage fee or dead rent whichever is higher at the rates prescribed from time to time in Appendix-II to the Tamil Nadu

V. K. Masan


DISTRICT COLLECTOR
KARUR.



For TATA BLUE METALS,
V. K. Masan
MANAGING PARTNER.



REGISTERED HOLDER

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2



Major Mineral Concession Rules 1959 and after obtaining transport permit and despatch slips from the District Collector or the Officer authorized by him in this behalf

4) The lessee should keep correct accounts showing the quantities and other particulars of all minerals obtained from the leasehold area and maintain registers at the quarry site

5) The lessee should send monthly report to the Assistant Commissioner of Geology and Mining, Karur furnishing the particulars of the quantities of Minerals quarried, transported etc., before 5th day of every month.

6) The lessee shall not disturb nearby habitations, buildings, water course, banks or water tanks, rivers, trees, roads, cart tracks, foot path and other public properties while quarrying in the leasehold area.

7) The lessee shall not cause hindrance to the adjoining pattadars or public while quarrying in the leasehold area.

8) A safety distance of 500 metres to the nearby habitations, and 50 metres to the roads, railway lines and electric and Telephone lines and 10 metres to foot paths, village roads should be left while quarrying

9) The lessee should allow any officer authorised by the District Collector or any officer authorised by him in this behalf or any other officer authorised by the State Government in this behalf to inspect the area and verify records and accounts and furnish such information under the terms as may be required by them

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DISTRICT COLLECTOR
KARUR.

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For TATA BLUE METALS,

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MANAGER



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13. வறு காள் பித்தல்
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10) The lessee shall carry out the quarrying operations in a full, scientific and systematic manner keeping in view of the proper safety of the labour, conservation of minerals and preservation of environmental ecology

11) The lessee shall allow any officer authorised by the District Collector and Commissioner of Geology and Mining to enter upon the area and inspect for the purpose mentioned to conditions (4) and (10) above and also carry out the directions issued to the satisfaction of the above said authorities

12) No quarrying and activities connected thereto shall be done before the execution of lease deed and its registration at the cost of the lessee.

13) The lessee should restrict his quarrying operation strictly within the permitted area as defined in the sketch.

14) The lessee should maintain at his cost proper sign boards indicating the Survey numbers, Years of the lease, Name of the lessee and the lease period to the satisfaction of the District Collector/Commissioner of Geology and Mining and maintain it at all time at the quarry site

15) No working shall be made within a distance of 7.5 metres of the boundaries of the permitted area.

16) The lessee should make his own arrangements to form the approach road from the public road to the place of his quarry.

17) The lessee shall, at his own cost, erect boundary marks round the area shown in the plan annexed to the lease deed and in which he works minerals and at all times maintain and keep such boundary marks in good repair and condition

13. L. Masan


DISTRICT COLLECTOR
KANNIYAKUMARI

14. K. Suresh

For TATA BLUE METALS,
L. Masan



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15. கருணா குமார்
2



18) The lessee shall remove or allow removal and transportation of ARALAI, JELLY AND SHOLING from the area where quarrying is permitted only after obtaining bulk transport permit and fascimiled despatch slips in the forms prescribed in Appendix III to Tamil Nadu Minor Mineral Concession Rules, 1959 from the officer authorised in this behalf by the District Collector. The registered holder or his men in turn shall issue the fascimiled despatch slips to the vehicles used for removal or transportation of ARALAI, JELLY AND SHOLING furnishing the particulars in the despatch slips specifically indicating the vehicle number, the quantity of ARALAI, JELLY AND SHOLING allowed to be transported by the vehicle by using that despatch slip and the time of issue of the despatch slips to the vehicle. All the vehicles used for transporting ARALAI, JELLY AND SHOLING from the said lands shall be in possession of the individual despatch slips for the quantity of the ARALAI, JELLY AND SHOLING available in the vehicle at all the times of transportation of the ARALAI, JELLY AND SHOLING by the vehicle. Proper accounts should be maintained for permit and despatch slips obtained, issued etc.

19) The lessee shall use the said lands only for the purpose of quarrying ARALAI, JELLY AND SHOLING specified in the quarry lease. If any error or wrong description of the mineral is found in the order granting the quarrying lease or in the lease deed, it is liable to be corrected at any time and the lessee shall not claim any right whatsoever based on any such error or wrong description of the minerals found in the order granting quarrying lease or in the lease deed.

20) The lessee should not quarry stones in block which can be used for polishing and export purposes.

21) The lessee should not quarry stones more than 30 Cubic Centimetre in size.

10 In Manam

10/10/11


 DISTRICT COLLECTOR
 KARUR



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15. வந்தி நாள் தந்தது 21. 11. 1991



22) If any mineral not specified in the lease deed is discovered the registered holder shall not win or dispose of such mineral without obtaining the permission of the authority empowered to grant lease for quarrying of the discovered minerals and without payment of seigniorage fee. If the registered holder fails to intimate the Collector the discovery of such new minerals within a period of 30 days from the date of discovery of the mineral, the Collector may levy enhanced seigniorage fee upto 15 times of ordinary seigniorage fee.

23) The lessee is not entitled to remove the ARAI AJELLY AND SHOLING from the said land after expiry of the period of the quarrying lease granted.

24) The lessee shall not sublet the lease to anybody

25) The lessee shall not claim compensation from the Government for the losses if any incurred by him in quarrying.

26) The lessee shall be held responsible for accidents if any happened to the labourers and others while quarrying and Government shall not be held responsible for this.

27) The lessee shall be held responsible for all losses due to improper working of the quarry during and after the period of lease and he should pay the penalty to be levied for this

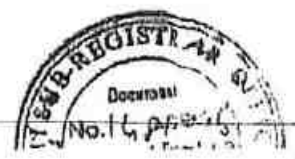
28) Simple interest at the rate of 24% per annum or at the rates prescribed by the Government from time to time shall be levied, if the amount due to Government is not paid within the due date

29) The arrears of any amount payable shall be recovered under the provisions of the Tamil Nadu Revenue Recovery Act, 1864

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Signature
DISTRICT COLLECTOR
KARUR.

FOR TATA BLUE METALS.



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Signature 234

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30) In case of breach by the lessee or his transferee or assignee of any of the conditions of the Tamil Nadu Minor Mineral Concession Rules, 1959 or of the conditions of the lease, the Government/the Commissioner of Geology and Mining/the District Collector without prejudice to any other penalty which may be therein imposed in respect of such breach, may cancel the lease after granting an opportunity of hearing to the said person

31) The terms and conditions are also subject to such further modifications, deletion and additions alterations as may be ordered by the Government from time to time.

32) The lessee shall pay seigniorage or dead rent whichever is more in respect of the actual quantity of ARAI ALJELLY AND SHOLING removed at the rates prescribed from time to time in Appendix-II of the Tamil Nadu Minor Mineral Concession Rules, 1959. Besides seigniorage or dead rent the lessee has to pay area assessment. The lessee has also to pay any other amount prescribed by the Government from time to time.

33) The lessee shall comply with provisions of Labour Laws applicable to stone quarry. Any contravention of the provisions shall attract legal proceedings of the appropriate Government.

34) Besides the above said conditions, the lessee shall abide by the conditions laid down in Tamil Nadu Minor Mineral Concession Rules, 1959 and Mines and Minerals (Development and Regulation) Act, 1957 and the orders of the Government, Commissioner of Geology and Mining and Collector to be issued from time to time.

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DISTRICT COLLECTOR
KARUR.

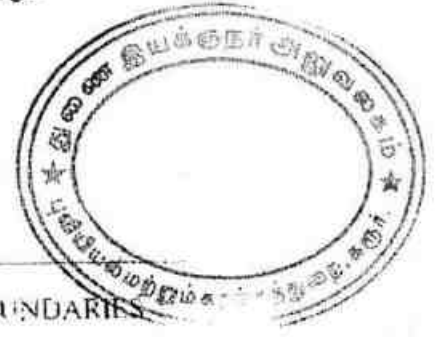
For TATA BLUE METALS,
J. M. AN
MANAGING PARTNER.



Handwritten signature and the number 235.

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257-



THE SCHEDULE

Name of Taluk	Name of Village	S.F. No	Extent in Hectare	Assessment	BOUNDARIES
Aravakurichi	Kuppam	171/2	5.11.0	Rs 100/- per hectare per annum	NORTH : SF No. 171/A, 1A SOUTH : SF No. 161, 162, 163 EAST : SF No. 109 WEST : SF No. 170, 172
		171/A (part)	0.40.5		NORTH : SF No. 171/A (part)
		Total	5.51.5		SOUTH : SF No. 171/2 EAST : SF No. 171/1B WEST : SF No. 172

Handwritten notes and signatures in the left margin.

DISTRICT COLLECTOR
KARUR.

For TATA BLUE METALS.

Handwritten signature and the number 236.

Handwritten notes and a small logo at the bottom right.



IN WITNESS Whereof I, K. Manan (D. K. Thangavel), registered holder
of TATA Blue Metals - the lessee Thiru A. Karthik I.A.S. District Collector
and on behalf of and by the order and direction of the Government of Tamil Nadu
set their hands

1) K. Manan

Signed by the above named

REGISTERED HOLDER

Witness

1. N. Myravan 870 P. K. K. Nagar, Chennai, Chennai
N. Myravan
N. P. Periyaswami, K. Palaniappan
N. P. Periyaswami, K. Palaniappan
Signed by the above named

For TATA BLUE METALS,

K. Manan

MANAGING PARTNER.

Witness

1. Akumar A. Kumar
P. S. Anandaram
Andhra Pradesh
Reddikalayam Kovvur-2

Signed by the above named

DISTRICT COLLECTOR
KARUR.

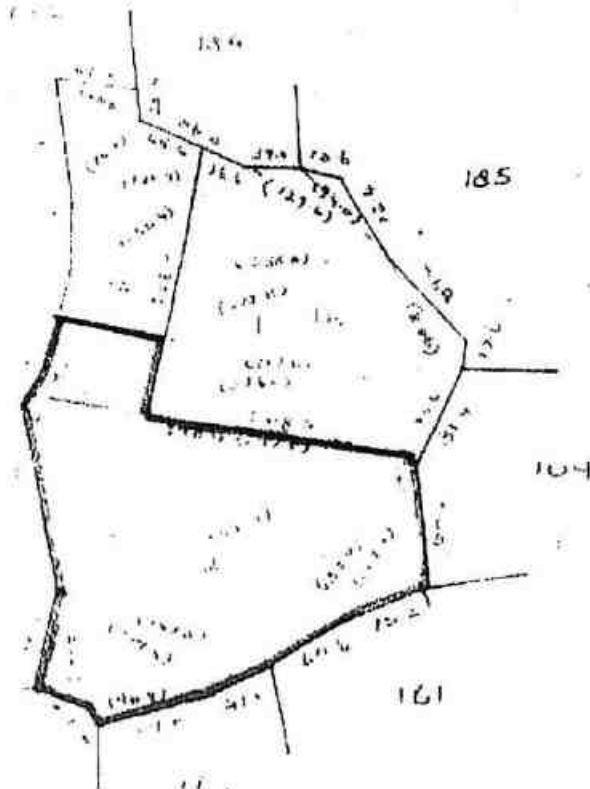
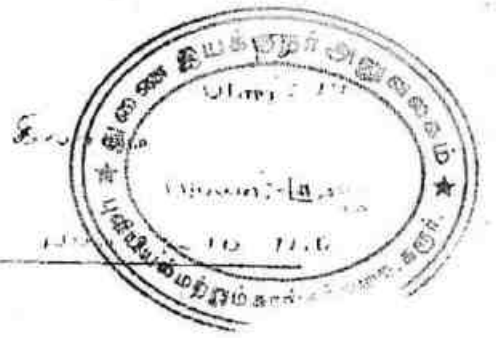
Witness

R. SINDARAM.

2) ...
...

K. Manan

- 261 -



17/11	2-01-01
18	3 59-0
	6-60-0
17/12	5-11-0
	<u>10-71-0</u>

சரிசெய்துள்ள பத்திரம் 2 பக்கம்
 சரிசெய்து
 (True Copy)



P. Ramesh Pami
 வாரிசு
 கவுண்டி
 கவுண்டி

Ayan ground

WA

238
 [Signature]

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 சமீபத்தில் தான் சிபார்சு செய்துள்ளேன்

பக்கம் 23

107

தமிழ்நாடு

பா. 98

சுலாபம். திருச்சிராப்பள்ளி

சுலாபம். கட்டு

4ல எண். 171

- 263 -

அளவைப்பயிற்சி 23

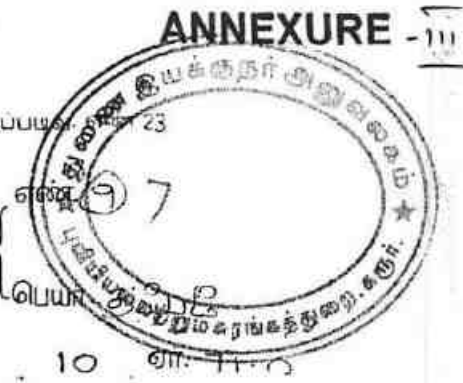
சிராமம்

பெயர்

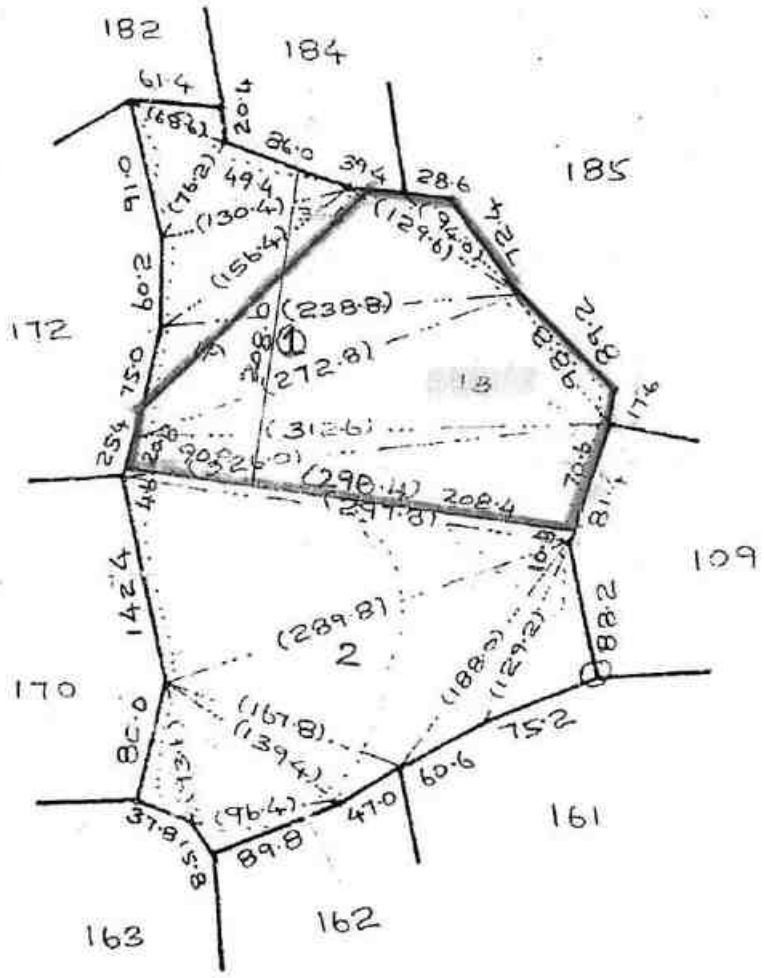
பரப்பு: ஹெக்டேர்

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பா. 110



New Sub-Division plotted
 98 Per T.K. SA/531417 of 21.305
 B. Subramaniam
 25.4.05
 M.P.S.U



New subdivisions land 2 Plotted
 98 Per T.K. SA. 2/1409 of 26.779
 6.8.49
 V.S.P.

LEASE APPLIED AREA

239

[Signature]

சுலாபம்

சு. நாமராஜ்

அளவு: 1:5000

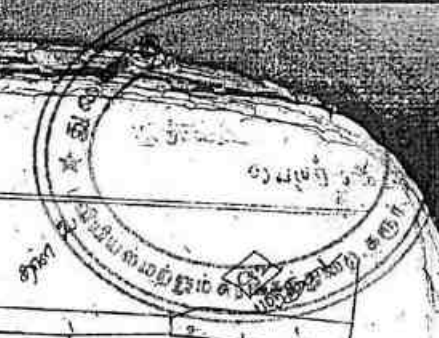
வளர்ச்சி

பக்கம் 30

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பெரிய கிணர்

பி.சி. 9



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பெரிய கிணர் 14

LEASE APPLIED AREA



1	2	3	4	5	6	7	8	9	10	11	
170	...	170	ர	4	...	8-4	6	1 38	3 98.5	5 52	633 வி. பழனியப்ப கவுண்டர் (1) மற்றும் ந. சங்கரப்ப கவுண்டர் (2).
171	...	171	ர	4	...	8-4	6	1 38	10 71.0	14 82	1293 க. வெள்ளையப்பகவுண்டர் மற்றும் பத்து பேர்களும்.*
172	...	172	ர	4	...	8-4	6	1 38	4 13.5	5 72	1326 கா. பழனியப்பன் மற்றும் பதிமூன்று பேர்களும்.*
173	...	173	ர	4	...	8-4	6	1 38	0 74.0	1 02	836 வி. பழனியப்பன்(1), வி. பெரியசாமி(2), வி. ராமசாமி(3).
174	...	174	ர	4	...	8-4	6	1 38	1 16.5	1 61	836 வி. பழனியப்பன்(1), வி. பெரியசாமி(2), வி. ராமசாமி(3).
175	A	175-A	அ	தி. ஏ. த	...	...	...	...	3 30.5	...	.....
	B	-B	ர	4	...	8-4	6	1 38	1 69.5	2 35	1310 மச. நடராஜன் மற்றும் பதினேழு பேர்களும்.*
									5 00.0	2 35	
176	1	176-பா	ர	4	...	8-2	4	2 77	0 34.0	0 94	168 த. சங்கரப்ப கவுண்டர்.
	2	-பா	ர	4	...	8-2	4	2 77	0 35.0	0 98	634 க. வெள்ளையப்பன் (1), க. செல்லப்பன் (2).
	3	-பா	ர	11	...	8-2	4	2 77	0 64.5	1 78	216 ந. செல்லம்மாள்.
	4	-பா	ர	4	...	8-2	4	2 77	0 02.0	0 06	1046 ந. சங்கரப்ப கவுண்டர் மற்றும் நான்கு பேர்களும்.*
	5	-பா	ர	4	...	8-2	4	2 77	0 92.5	2 56	270 ரா. நாச்சம்மாள்.
									2 28.0	6 32	

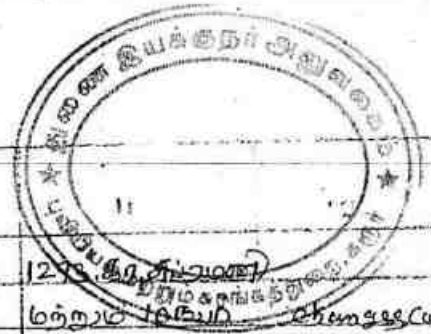
கிராம நிர்வாக அலுவலர்

18, குப்பம் கிராமம்

புகளூர் வட்டம்

கருநர் மாவட்டம்

* . விவரப்பட்டியலைப் பார்க்கவும்.



	2	3	4	5	6	7	8	9	10	
1. 171-பு	2	4	-	8-4	6	1-38	5-60-0	7-75	1275	சு. சண்முகவேலு மற்றும் இதுவர்
2. 171-பு	2	4	-	8-4	6	1-38	5-11-0	7-07	1377	சு. சண்முகவேலு மற்றும் இதுவர்
							10-71-0	14-82		சு. சண்முகவேலு மற்றும் இதுவர்
171-பு	2	4	-	8-4	6	1-38	2-01-0	2-77	1149	சு. சண்முகவேலு மற்றும் இதுவர்
171-பு	2	4	-	8-4	6	1-38	3-57-0	4-98	1293	சு. சண்முகவேலு மற்றும் இதுவர்
							5-56-0	7-75		
175	A1	175	2	4	...	...	...	2-22-5	...	
A2	175	2	4	...	8-4	6	1-38	0-54-0	0-75	1468
A2	175	2	4	...	8-4	6	1-38	0-54	0-75	1469
							3-30-5	3-30-5		

232
For House

ASPER T.
SA/6/14
dt. 21.3.0

For
20.5.05

சு. சண்முகவேலு

ASPER T.
SA:35/14
dated: 12.
For Tc

9/4/05

2 ஸ்ரீமதி நகர் /
11/2023
கிராம நிர்வாக அலுவலர்
18, குப்பம் கிராமம்
புகளூர் வட்டம்
கரூர் மாவட்டம்

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தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 3704

உரிமையாளர்கள் பெயர்

1. ராமசாமி	மகன்	சுப்பிரமணியன்	-
2. கருப்பண்ண கவுண்டர்	மகன்	கந்தசாமி	-
3. P.S நல்லசாமி	மகன்	தங்கவேல்	-
4. கிட்டுசாமி	மகன்	சக்திவேல்	-

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	
171	1A	2 - 1.00	2.77	--	--	--	--	2018/0103 /14/061595--53/1414 -- 20-07-2018
		2 - 1.00	2.77					

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/03704/30814 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 29-10-2022 அன்று 12:07:28 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 3687

உரிமையாளர்கள் பெயர்

1. ராமசாமி	மகன்	சுப்பிரமணியன்	-
2. கருப்பண்ணகவுண்டர்	மகன்	கந்தசாமி	-
3. P.S நல்லசாமி	மகன்	தங்கவேல்	-
4. கிட்டுசாமி	மகன்	சக்திவேல்	-

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	
171	1B	3 - 59.00	4.98	--	--	--	--	2018/0103 /14/062020--53/1414 -- 20-07-2018
184	12	0 - 60.00	0.83	--	--	--	--	2018/0103 /14/062020---- 20-07-2018
		4 - 19.00	5.81					

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/03687/30844 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 29-10-2022 அன்று 12:08:29 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

भारतीय गैर न्यायिक

बीस रुपये

रु.20

Rs.20

TWENTY
RUPEES

INDIA

INDIA NON JUDICIAL

தமிழ்நாடு தமிழ்நாடு TAMIL NADU

07.08.83

கே.எ.எ

21AC 408989

R. சுப்பிரமணியன்

கடூர்.

K.MOHAN, S.V.S.No.21/08

R.DIS.No.3184/A2/08

KARUR WEST

சம்மதக்கடிதம்

கரூர் மாவட்டம், ஆண்டாங்கோவில் கிழக்கு, 4/7, ராஜ் ரெசிடென்சி என்ற முகவரியில் வசிக்கும் ராமசாமி மகன் R.சுப்பிரமணியன்-1, கரூர் மாவட்டம், ஆண்டாங்கோவில் கிழக்கு, நெ.32, ஆண்டாங்கோவில்புதூர் என்ற முகவரியில் வசிக்கும் கிட்டுசாமி அவர்கள் மகன் K.சக்திவேல்-2, கரூர் மாவட்டம், வெஞ்சமாங்குடலூர் மேற்கு, நெ.6, பாறைப்பட்டி என்ற முகவரியில் வசிக்கும் நல்லசாமி அவர்கள் மகன் N.தங்கவேல்-3, கரூர் மாவட்டம், ஆண்டாங்கோவில் கிழக்கு, நெ.4/148, தங்கவேல் நகர் 2வது தெரு என்ற முகவரியில் வசிக்கும் கரும்பண்ணகவுண்டர் மகன் K.கந்தசாமி-4 ஆகிய நாங்கள் நால்வரும் சேர்ந்து முத்திக்கொடுக்கும் உறுதிமொழிப் பத்திரம் என்னவென்றால்.

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14/8/83



Cell: 99944 45289
K. KANMANI, B.A.B.L.,
Advocate & Notary Public
Govt. of India - Regd No. 5877/08
Pudur, Andan Kovil Post
KARUR - 639 008, T.N.



கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், புல எண்.171/1Aல் (2.01.00 ஹெக்டேர்) புல எண்.171/1Bல் (3.59.00 ஹெக்டேர்) புல எண்.184/12ல் (0.60.00 ஹெக்டேர்) பட்டா எண்.3687, 3704ல் மொத்தம் 6.20.00 ஹெக்டேர் புஞ்சை நிலம் எங்களுக்கு கட்டாக பாத்தியப்பட்டது. மேற்படி புலத்தில் புல எண்.171/1A(P)ல் 0.76.00 ஹெக்டேர் மற்றும் 171/1B(P)ல் 3.54.50 ஹெக்டேரில் மொத்த பரப்பு 4.30.50லும் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் அஞ்சல், தலைமீத்துப்பட்டி, சர்வே எண்.162/1 என்ற முகவரியில் இயங்கி வரும் தி/ள்.ஸ்ரீ செல்வ விநாயகா புளுமெட்டல்ஸ் நிறுவனத்திற்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க அரசு அனுமதி பெற்று கல்குவாரி பணி செய்வதற்கு எங்களுக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறோம். கல்குவாரி குத்தகை உரிமம் வழங்க எங்களுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறோம்.

பிரமாணதாரர்.

Swamy

12/1

N. Pramesh

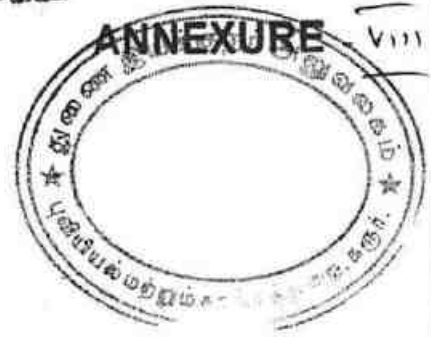
K. Kanmani

0712123
 Cell: 99944 45789
K. KANMANI, B.A.B.L.,
 Advocate & Notary Public
 Govt. of India - Regd No 6877/08
 Pudur, Andan Kovil Post
KARUR - 639 008. T.N.



Swamy

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Government of India
Form GST REG-06
[See Rule 10(1)]

Registration Certificate

Registration Number : 33ADDFS9051Q1Z7

1	Legal Name	SHRI SELVA VINAAYAGA BLUE METAL		
2	Trade Name, if any	SHRI SELVA VINAAYAGA BLUE METAL		
3	Constitution of Business	Partnership		
4	Address of Principal Place of Business	SF NO 162/1, THALAYITHUPATTI KUPPAM PO, KUPPAM VILLAGE, ARAVAKURICHI TK, Karur, Tamil Nadu, 639111		
5	Date of Liability			
6	Period of Validity	From	18/05/2018	To
7	Type of Registration	Regular		NA
8	Particulars of Approving Authority	Centre		
Signature				
Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK 1 Date: 2018.05.18-18:35:22 IST				
Name		BALAJI KANDHADAI PARTTIASARATHY		
Designation		Superintendent		
Jurisdictional Office		KARUR (WEST)		
9. Date of issue of Certificate		18/05/2018		
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 approval of application granted on 18/05/2018 by the jurisdictional authority.

Signature



सत्यमेव जयते

← 281 -



GSTIN 33AD0FS9051Q1Z7
Legal Name SHRI SELVA VINAAYAGA BLUE METAL
Trade Name, if any SHRI SELVA VINAAYAGA BLUE METAL

Details of Additional Places of Business

Total Number of Additional Places of Business in the State 0

← Susana



सत्यमेव जयते

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GSTIN 33AD0FS9051Q1Z7
Legal Name SHRI SELVA VINAAYAGA BLUE METAL
Trade Name, if any SHRI SELVA VINAAYAGA BLUE METAL

Details of Managing / Authorized Partners

1	"	Name	RAMASAMY SUBRAMANIAN
		Designation/Status	MANAGING PARTNER
		Resident of State	Tamil Nadu
2	"	Name	KITTUSAMY SAKTHIVEL
		Designation/Status	partner
		Resident of State	Tamil Nadu
3	"	Name	THANGAVEL
		Designation/Status	partner
		Resident of State	Tamil Nadu
4	"	Name	KARUPPANNA GOUNDER KANDASAMY
		Designation/Status	partner
		Resident of State	Tamil Nadu

K. Suresh

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தமிழ்நாடு தமிழ்நாடு TAMILNADU

SHRI SELVAVINAYAGA
BLUE METAL
KARUR

615
21.1.2018
3100.

BF 726757

K. SIVASAMY,
S.V. 19-A, PNB ST.
L NO: 1/97 KRR.
KARUR.



கூட்டு வியாபார உடன்படிக்கை பத்திரம்.

2018 ஆம் ஆண்டு ஜனவரி மாதம் 29 - ஆம் தேதி முதல் கரூர் மாவட்டம் (639002), ஆண்டாங்கோவில் கிழக்கு, ஆண்டாங்கோவில் அஞ்சல், 4/7, ராஜ் ரெசிடென்சி என்ற முகவரியில் வசிக்கும் ராமசாமி அவர்கள் குமாரர் R.சுப்ரமணியன் (வயது - 52) - 1, கரூர் மாவட்டம் (639002), ஆண்டாங்கோவில், ஆண்டாங்கோவில் கிழக்கு, 32, ஆண்டாங்கோவில் புதூர்

R.S 1 *[Signature]*

K.S 2.2 *[Signature]*

2.7 3. *[Signature]*

K.K 4. *[Signature]*

[Signature]

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தமிழ்நாடு தமிழ்நாடு TAMILNADU



SHRI SELVA VINAYAGA
BLUE METAL
KARUR.

613.
21.1.2018
3100.

BF 726755
K. SIVASAMY,
G.V. 19-A, PHS ST.
L NO: 1/97 KRR.
KARUR

என்ற முகவரியில் வசிக்கும் கிட்டுசாமி அவர்கள் குமாரர் K.சக்திவேல் (வயது - 42) 2, கரூர் மாவட்டம் (639109), வெஞ்சமாங்குடலூர் மேற்கு, எண்.6, பாரப்பட்டி என்ற முகவரியில் வசிக்கும் நல்லசாமி அவர்கள் குமாரர் N.தங்கவேல் (வயது - 51) - 3, கரூர் மாவட்டம், (639002), மண்மங்கலம், ஆண்டாங்கோவில் கிழக்கு, ஆண்டாங்கோவில் அஞ்சல், எண்.4/148, தங்கவேல் நகர் 2வது தெரு என்ற முகவரியில் வசிக்கும் கருப்பணகவுண்டர் அவர்கள்

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3 N. Thyanna

4 14. 1/2018

251

P. Palani

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02.06.18

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தமிழ்நாடு தமில்நாடு TAMILNADU

SHRI SELVA VINAAYAGA
BLUE METAL

KARUR

614
21.11.2018
2100-

BF 726756

G. Sivasamy,
R. SIVASAMY,
9.V. 19-A, PNB ST.
L NO: 1/97 KRR.
KARUR.



குமாரர் K.கந்தசாமி (வயது - 55) - 4 ஆகிய நான்கு பேர்களும் சேர்ந்து எழுதிக்கொண்ட கூட்டு வியாபார உடன்படிக்கைப் பத்திரம்.

இங்கு 1 முதல் 4 வரை இலக்கமிட்ட நான்கு பேர்களும் சேர்ந்து "ஸ்ரீ செல்வ விநாயகா புளு மெட்டல் " SHRI SELVA VINAAYAGA BLUE METAL", என்ற பெயரில் ஜல்லி மற்றும் மணல் உற்பத்தி செய்யும் தொழிலை ஆரம்பித்து கூட்டாக நடத்தி வருவது. இக்கூட்டு நிறுவனம் பின்வரும் நிபந்தனைகளுக்குட்பட்டு நடந்து வரத்தக்கது.

1. Sivasamy

3. N. Thyanna

4. K. Kalyan

252

P. Sathya

Sivasamy

02.06.18

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01. கூட்டு விலாசத்தின் பெயர், முகவரி:-

இக்கூட்டு நிறுவனம் "ஸ்ரீ செல்வ விநாயகா புளு மெட்டல் "SHRI SRI VINAYAGA BLUE METAL", என்ற பெயரில் SF No.162/1, தலையிந்துட்டி, குப்பம் அஞ்சல், குப்பம் கிராமம், அரவக்குறிச்சி வட்டம், கரூர் மாவட்டம் - 639111 என்ற முகவரியில் இயங்கி வரவேண்டியது. மேலும் இக்கூட்டு விலாசத்தின் அபிவிருத்தியை முன்னிட்டு கூட்டாளிகள் விரும்பி தீர்மானித்தால் மேற்படி பெயரை மாற்றி அமைத்துக் கொள்ளவோ அல்லது தொழில் வேறு இடங்களுக்கு மாற்றவோ செய்யலாம். மேலும் நம் கூட்டாளிகள் உள்ளூரிலும் வெளியூர்களிலும் கிளைகள் துவங்கி நடத்தி வரலாம்.

02. ஆரம்பத்தேதி:-

இக்கூட்டு நிறுவன உடன்படிக்கைப் பத்திரத்தின் ஊர்த்துகள் 29/01/2018 - ம் தேதி முதல் கொண்டு அமலுக்கு வந்ததாக கருதவேண்டியது.

03. வியாபார காலம்:-

இக்கூட்டு வியாபாரமானது நம் கூட்டாளிகள் அனைவரும் விரும்பும் காலம் வரையில் அதாவது " பார்ட்னாஸிப் அட்வில்லாக " [PARTNERSHIP AT WILL] தொடர்ந்து நடத்திவரத்தக்கது.

04. கூட்டாளிகள் முதலீடு:-

நம் கூட்டாளிகள் 4 பேர்களும் தலா ரூ.10,00,000/=ஐ அவர் அவர் முதலீட்டுத் தொகைகளாக வைக்க ஒப்புக்கொண்டுள்ளோம். கூட்டாளிகள் விரும்பித் தீர்மானித்தால் மேற்படி முதலீட்டுத் தொகைகளை கூட்டியோ அல்லது குறைத்தோ வைத்துக் கொள்ளலாம். இக்கூட்டின் அபிவிருத்தியை முன்னிட்டு நம் கூட்டாளிகள் யார் வேண்டுமானாலும் கடன் கொடுக்கலாம் அவ்வித கடன்களை கூட்டாளிகளின் கடன் அல்லது டெபாசிட் அல்லது முதலீட்டுக் கணக்குகளில் வரவு வைத்துக் கொள்ளவேண்டியது. மேற்படி முதலீடு மற்றும் கடன் அல்லது டெபாசிட் மற்றும் நடப்புக் கணக்குகளிலும் கூட்டாளிகளின் இதர கணக்குகளிலும் பற்று நீக்கி வரவாக உள்ள தொகைகளுக்கு கூட்டாளிகள் வருடம் ஒன்றுக்கு அதிகப்பட்சமாக 12% வரை, இந்திய வருமான வரி சட்டத்தில் கூறியுள்ள முலதன வட்டி விகிதாசாரத்தை அனுசரித்து, வட்டி போட்டு பொதுவில் செலவு

1. *[Handwritten Signature]*



2. *[Handwritten Signature]*

3. *[Handwritten Signature]*

253

4. *[Handwritten Signature]* P. Sathya

[Handwritten Signature]

02.06.18

293 -



எழுதிக்கொள்ள வேண்டியதே கூட்டாளிகள் விரும்பித்தீர்மானத்தால் வட்டி விகிதத்தை குறைத்து வட்டி போட்டு செலவு எழுதிக்கொள்ளலாம்.

05. வியாபார நோக்கம்:-

இக்கூட்டு வியாபாரத்தின் நோக்கமானது நாம் தற்சமயம் மேற்படி பாராலில் விவரமாக சொல்லப்பட்டிருக்கும் மூலதனத்தைக் கொண்டும் வெளி நபர்களிடமிருந்து டெபாசிட் வாங்கியும் வங்கிகளில் கரண்ட் அக்கௌண்ட், ஓவா டிராப்ட் கணக்குகள் வைத்தும் வரவு, செலவு செய்து ஜல்லி மற்றும் மணல் உற்பத்தி செய்யும் தொழிலையும் மற்றும் கூட்டாளிகள் விரும்பி தீர்மானிக்கும் பிற தொழில்களையும் செய்து வருவதேயாகும்.

06. நிர்வாக பங்குதாரர்:-

இக்கூட்டு வியாபாரத்திற்காக நம்மில் 1 இலக்கமிட்ட R.சுப்ரமணியன் அவர்கள் நிர்வாக கூட்டாளியாகவும், நம்மில் 2 இலக்கமிட்ட K.சக்திவேல், 3 இலக்கமிட்ட N.தங்கவேல் மற்றும் 4 இலக்கமிட்ட K.கந்தசாமி ஆகிய மூவரும் உழைக்கும் கூட்டாளியாகவும் இருந்து நிர்வகித்து வரவேண்டியது.

நிர்வாக மற்றும் உழைக்கும் கூட்டாளிகளின் பொறுப்பு:-

07. கடன் வாங்குதல்:-

இக்கூட்டு வியாபாரத்திற்காக நம் கூட்டாளிகள் வங்கிகள் மற்றும் வெளிநபர்களிடம் ரொக்கமாக கடன்கள் வாங்க நேரிட்டால் அப்படி வாங்கும் கடன்கள், டெபாசிட் தொகைகளை இக்கூட்டு விலாசத்தின் பெயரிலேயே வாங்கி கூட்டின் கணக்குகளில் உடனுக்குடன் வரவு வைத்துக்கொள்வவேண்டியது. புரோ நோட்டுசளில் கையெழுத்திட்டு கடன்களை வாங்கவும், டெபாசிட் ரசீதுகளில் கையெழுத்து செய்து கடன்கள் வாங்கவும், டெபாசிட்டுகளை டிஸ்சார்ஜ் செய்து தரவும், நம்மில் 1, 2, 3 மற்றும் 4 இலக்கமிட்டவர்கள் அனைவரும் கூட்டாக சேர்ந்து (Jointly) கையெழுத்து செய்து வாங்க இதன் மூலம் பூரண அதிகாரம் வழங்கப்படுகிறது.

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2. *[Signature]*

3. *[Signature]*

4. *[Signature]*

[Signature]

P. Sathya



08. அசையா சொத்து வாங்குதல் மற்றும் விற்றல்

இக்கூட்டு வியாபாரத்தின் சார்பாக இக்கூட்டு வியாபாரத்திற்காக அசையா சொத்து வாங்கும்போது இங்கு 1 இலக்கமிட்ட R.சுப்ரமணியன், இலக்கமிட்ட K.சக்திவேலு 3 இலக்கமிட்ட N.தங்கவேலு மற்றும் 4 இலக்கமிட்ட K.சுந்தசாமி ஆகியவர்கள் பெயரில் கிரயம் பெறவும் அவற்றை விற்கும் போது இங்கு 1, 2, 3 மற்றும் 4 இலக்கமிட்டவர்கள் அனைவரும் சேர்ந்து கிரயம் செய்து கொடுக்கவும் அதிகாரம் வழங்கப்படுகிறது.

09. வங்கி கணக்கை இயக்குதல்:-

இக்கூட்டு வியாபாரத்தின் சார்பாக வங்கிகளில் கரண்ட் அக்கௌண்ட், ஓவர்டிராப்ட், கேஸ் கிரிடிட், பில்ஸ் டிஸ்கவுண்ட் முதலிய கணக்குகள் வைக்கவும், அவற்றை ஆப்ரேட் செய்யவும் நம்மில் 1 இலக்கமிட்ட நிரவாக கூட்டாளி R.சுப்ரமணியன் அவர்களுக்கும் மற்றும் 2, 3, 4 இலக்கமிட்ட உழைக்கும் கூட்டாளிகளுக்கும் தனித்தனியாக (Severally) கையெழுத்து செய்ய இதன் மூலம் பூரண அதிகாரம் வழங்கப்படுகிறது.

10. பொது நிரவாகம்:-

இக்கூட்டு நிறுவனத்தின் சார்பாக ரசீது, பில்கள் முதலியவற்றில் கையெழுத்திடவும், தபாலாபீசுகளில் இருந்து இந்நிறுவனத்தின் பெயருக்கு வரும் மணியார்டர்கள், ரிஜிஸ்டர் தபால்கள், வி.பி.பிக்கள், இன்ஸூர்ட் கவர்கள் ஆகியவற்றில் கையெழுத்திட்டுப் பெறவும், இந்நிறுவனத்தின் சார்பில் கோர்ட்டில் சிவில், கிரிமினல் நடவடிக்கைகள் எடுக்கவும், ராசி செய்து கொள்ளவும் இதர நிரவாக காரியங்களைக் கவனிக்கவும் 1 இலக்கமிட்ட நிரவாக கூட்டாளி R.சுப்ரமணியன் அவர்களுக்கும் மற்றும் 2, 3, 4 இலக்கமிட்ட உழைக்கும் கூட்டாளிகளுக்கும் தனித்தனியாக கையெழுத்து செய்ய இதன் மூலம் பூரண அதிகாரம் வழங்கப்படுகிறது.

11. நிரவாக மற்றும் உழைக்கும் கூட்டாளிகளின் ஊதியம்:-

மேற்படி 1 இலக்கமிட்ட நிரவாக கூட்டாளி மற்றும் 2, 3, 4 இலக்கமிட்ட உழைக்கும் கூட்டாளிகள் இக்கூட்டு வியாபாரத்தையும், அன்றாட நிரவாக காரியங்களையும், இக்கூட்டின் வளர்ச்சிக்காக நன்கு கவனித்து நடத்தி

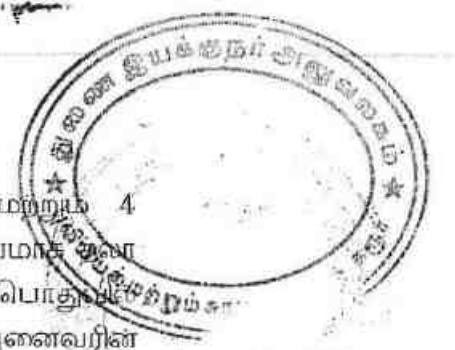
1 *[Signature]*

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[Signature] 2.06.18



வரவேண்டியது. மேற்படி காரியங்களுக்காக மேற்படி 1, 2, 3 மற்றும் 4 இடங்களிட்ட நிரவாக மற்றும் உழைக்கும் கூட்டாளிகளுக்கு மாத ஊதியமாக அலுவலர்-மும் இரண்டு மாத ஊதியம் போனடைகவும் கொடுத்து பொதுமக்களும் எழுதிக்கொள்ள வேண்டியது. மேலும் நம் கூட்டாளிகள் அனைவரின் எசோபித்த சம்மதத்தின் பேரில், மேற்படி நிரவாக மற்றும் உழைக்கும் கூட்டாளிகளின் ஊதியத்தை கூட்டவோ அல்லது குறைக்கவோ செய்யலாம். இந்நிறுவனத்தின் இலாபம் மேற்படி ஊதியம் வழங்க பொதுமானதாக இல்லதபட்சத்தில் மேற்படி ஊதியத்தை குறைத்து வழங்கலாம்.

12. இலாப - லோபத்தை கணக்கிடும் முறை:-

இக்கூட்டின் கணக்குகளை பிரதி வருடம் மார்ச் மாதக் கடைசியிலோ அல்லது கூட்டாளிகள் விரும்பித் தீர்மானிக்கும் இதர காலங்களிலோ இக்கூட்டின் கணக்கைக் கட்டி கூட்டு வியாபாரம் சம்பந்தப்பட்ட சகல செலவுகளும் மேலும் கூட்டாளிகள் விரும்பித் தீர்மானித்து பொதுவில் எழுதக்கூடிய கூட்டாளிகளின் முதலீட்டு கடன் கணக்குகளுக்குண்டான வட்டி போன்ற சகல செலவுகளும் போக பாக்கி ஏற்படும் இலாபலோபத்தை நம் கூட்டாளிகள் நான்கு பேர்களும் சமமாக பிரித்துக்கொள்ள வேண்டியது.

13. கூட்டாளிகளின் இது தவிர மற்ற வியாபாரம்:-

நம்மில் யார் வேண்டுமானாலும் தனியாகவோ அல்லது வேறநபர்களுடன் கூட்டு சேர்ந்தோ வேறு எந்த வியாபாரம் வேண்டுமானாலும் செய்து வரலாம். ஆனால் அப்படி அவர்கள் செய்துவரும் வியாபாரத்திற்கும் அவற்றில் ஏற்படும் லாபலோபத்திற்கும் இக்கூட்டு வியாபாரத்திற்கும் இக்கூட்டு நிறுவனத்திற்கும் யாதொரு விதமான சம்பந்தமும் பாத்தியமும் பின் தொடர்ச்சியும் கிடையாது.

14. கூட்டாளி விலகுதல்:-

நம்மில் யாரேனும் இக்கூட்டிலிருந்து விலக விரும்பினால் அவர் மற்ற கூட்டாளிகளுக்கு ஒரு மாத தவணைகண்டு எழுத்து மூலம் ஒரு நோட்டீஸ் கொடுக்க வேண்டியது. இக்கூட்டு நிறுவனம் தொடங்கிய தேதியிலிருந்து விலகும் தேதிவரை இக்கூட்டின் கணக்கை கூட்டியோ அல்லது உத்தேசமாக இலாபலோபத்தை நிர்ணயம் செய்தோ விலகலாம். விலகும் அல்லது விலக்கப்படும் கூட்டாளிக்கு மேற்கூறியவாறு அவர் கணக்குப்படி சேரவேண்டிய

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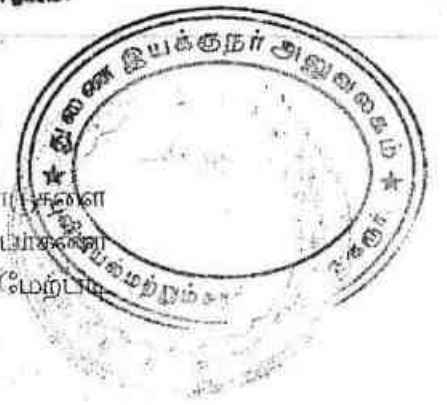
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P. S. Srinivasan

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தொகைகளைக் கொடுத்துவிட்டோ அல்லது கொடுக்கத்தகுந்த ஏற்பாடுகளை செய்துவிட்டோ மற்ற கூட்டாளிகள் தாமாசுவோ அல்லது வேறு நபர்களைச் சேர்த்துக்கொண்டோ இக்கூட்டு வியாபாரத்தை மேற்படி இடத்தில் மேற்படி பெயரிடவேண்டிய நடத்தி வரலாம்.

15. கூட்டாளியை விலக்குதல்:-

நம்மில் யாரேனும் இக்கூட்டின் வளர்ச்சிக்கு தடையாகவோ அல்லது இக்கூட்டுக்கு விரோதமாகவோ நடந்துகொண்டால் மற்ற மெஜாரிட்டி கூட்டாளிகள் விரும்பினால் மேற்படி கூட்டாளியை இக்கூட்டிலிருந்து விலக்கி விடலாம்.

16. கூட்டு கலைப்பு நிர்ப்பந்தம்:-

நம்மில் யாரேனும் இக்கூட்டிலிருந்து விலகினாலும், விலக்கப்பட்டாலும் அல்லது யாரேனும் காலமாகிவிட்டாலும் இக்கூட்டு கலைந்ததாக கருதப்பட மாட்டாது.

17. விலகும் அல்லது விலக்கப்படும் கூட்டாளிகளின் உரிமை, இழப்பு:-

இக்கூட்டிலிருந்து விலகும் அல்லது விலக்கப்படும் கூட்டாளிக்கு இக்கூட்டு வியாபாரத்தின் குட்வில், தளவாடசாமான்கள் மற்றும் முள்ள சகலவிதமான ஆஸ்திப் பொறுப்புகளில் யாதொரு விதமான சம்பந்தமும், பாத்தியமும், பின் தொடர்ச்சியும் கிடையாது.

18. துணை ஒப்பந்த பத்திரத்தின் ஊரத்துக்கள்:-

இக்கூட்டு வியாபார உடன்படிக்கைப் பத்திரத்தின் ஊரத்துக்களை தேவைப் பட்டால் திருத்தி அமைக்கவோ அல்லது மாற்றி அமைக்கவோ செய்யலாம். அதற்கு ஒரு பத்திரம் எழுதிக் கொண்டு அதனை இதன் துணைப் பத்திரமாக [CODICIL] பாவித்து அதன்படி நடந்து கொள்ள வேண்டியது.

19. நம் கூட்டாளிகள் அனைவரும் இதில் கண்டிராத மற்ற விசயங்களைப் பொறுத்தமட்டில் நாம் 1932 - ஆம் ஆண்டின் " இந்தியன் பார்ட்னர்ஸிப் ஆக்ட் " ஐ அனுசரித்து நடந்து கொள்ளவேண்டியது.

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3. N. Thyagarajan

P. Sahni

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மாண்புமிகு நம் கூட்டாளிகள் நான்கு கொள்கையும் சேர்ந்து எழுதிக்கொண்ட
விழாபார் உடன்படிக்கை பத்திரம்.

- 01. S. Subramanian.....
- 02. K.M......
- 03. N. Thyagarajan.....
- 04. I.A. Anwar.....

சாட்சிகள்

- 01. S. I. Mooty S/o Subramanian Punaraga. (P.O) Arusi-chi
(T. 1c)
- 02. [Signature] S/o R. Subramanian, 4/1-5 Raj Residency,
Rettipalayam, Andankovil (Ho)
Kareem - 02.

P. Salami

02-06-18

- 303 -



PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of Rough stone and Gravel quarry lease S.F. No. 171/1A (Part) & 171/1B (Part) - Patta land - over an extent of 4.30.5hectares - Kuppam village - Pugalur

Taluk - Karur District - Tamil Nadu State belongs to M/s. Shri Selva Vinaayaga Blue Metal.



259
[Handwritten signature]



For Shri Selva Vinnayaga Blue Metal

[Handwritten Signature]
 Managing Partner



Signature

अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रमाण पत्र
(खनिज रियायत नियमावली, 1960 के नियम 22सी के तहत)
CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON
(Under Rule 22C of Mineral Concession Rules, 1960)

श्री एस. करुपणन, मॉगनीकाडू, मुत्तमपट्टी पोस्ट, बोम्मीडी वर्यो, 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), Bommedi (Via), Omalur Taluk, Salem District, Tamilnadu - 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है
His registration number is

RQP /MAS/263/2014/A

यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 15.12.2024 को समाप्त होगी।
This recognition is valid for a period of 10 years ending on 15.12.2024.

उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की स्थिति में यह प्रमाण पत्र वापस लिया जाएगा / निरस्त किया जाएगा।

This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai
दिनांक/ Date : 16.12.2014.

Signature

261
क्षेत्रीय खाननियंत्रक / Regional Controller of Mines
भारतीय खानब्यूरो/ Indian Bureau of Mines
चेन्नई क्षेत्र / Chennai Region

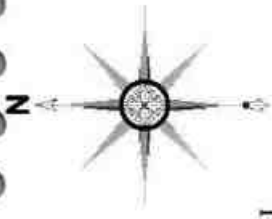


PLATE NO-I

APPLICANT:

M/S. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY NO. 162/I,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:

S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
 VILLAGE : KUPPAM
 TALUK : PUGALUR
 DISTRICT : KARUR

INDEX

- MINE LEASE AREA
- APPROACH ROAD
- CART ROAD
- VILLAGE ROAD
- SH - 84 ROAD
- NH - 81 ROAD

KEY MAP

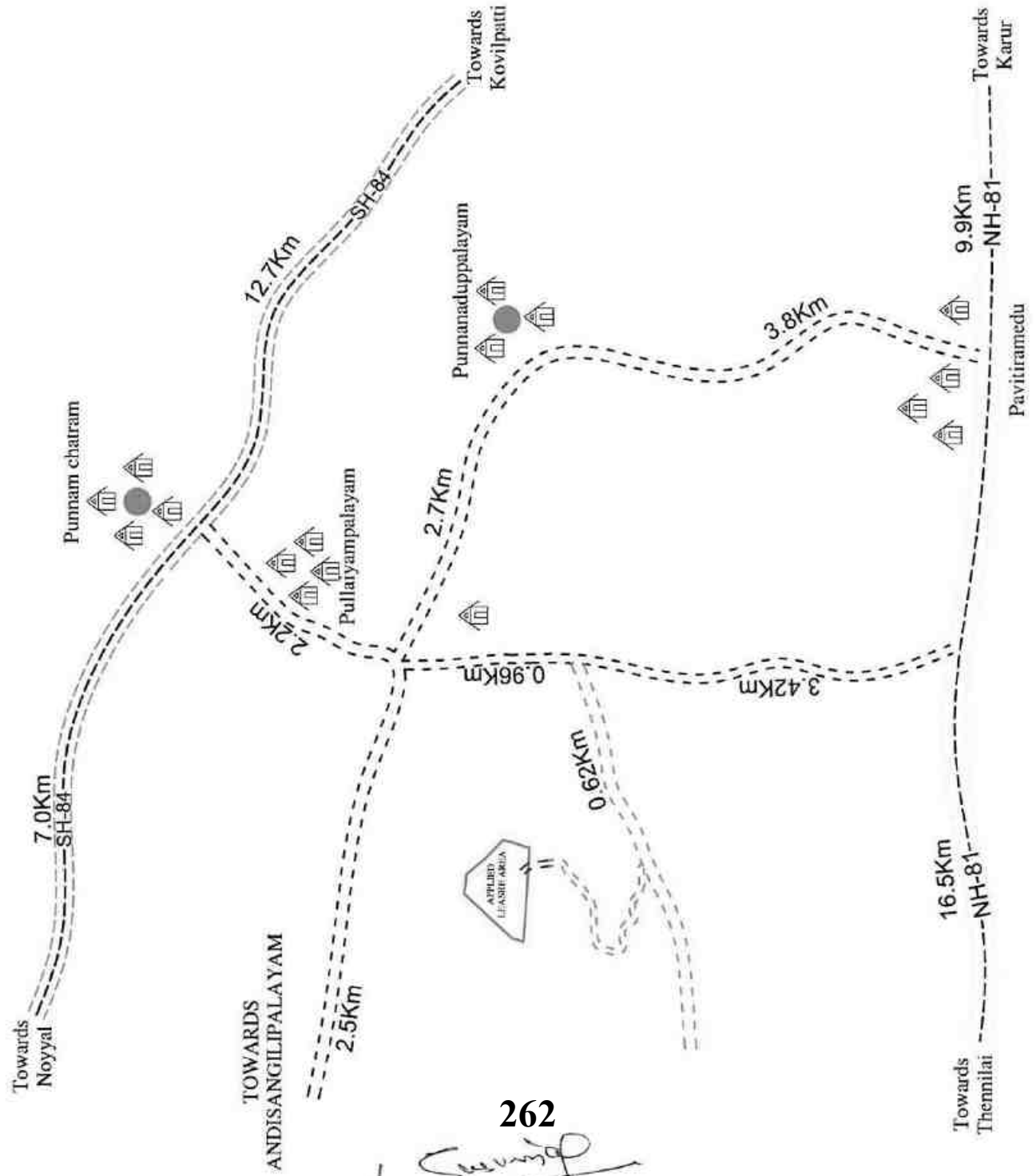
Not to scale

Prepared By:

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

[Signature]

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



10°59'27.29"N



77°57'25.79"E

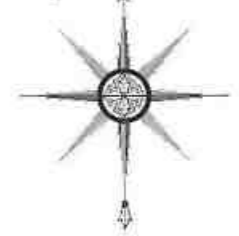
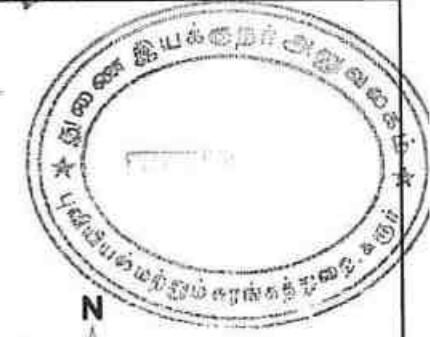


PLATE NO-IA

APPLICANT:
 M/S. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY.NO. 162/1,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
 S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
 VILLAGE : KUPPAM
 TALUK : PUGALUR
 DISTRICT : KARUR

INDEX

MINE LEASE AREA : ●
 TOPO SHEET NO : 58-F/13
 LATITUDE : 10°59'20.50"N to 10°59'27.29"N
 LONGITUDE : 77°57'25.79"E to 77°57'36.49"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

10°59'27.29"N



77°57'25.79"E

- 315 -

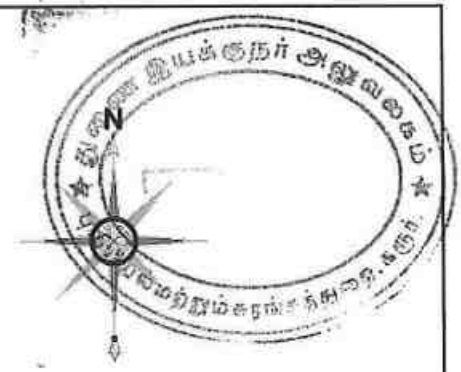


PLATE NO-IC

APPLICANT:
M/S. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY.NO. 162/1,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
 S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
 VILLAGE : KUPPAM
 TALUK : PUGALUR
 DISTRICT : KARUR

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/13
 LATITUDE : 10°59'20.50"N to 10°59'27.29"N
 LONGITUDE : 77°57'25.79"E to 77°57'36.49"E

SATELITE IMAGERY MAP
 SCALE- 1:5000

Prepared By:
 I DO HEREBY CERTIFY THAT THE PLATE
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 TO THE BEST OF MY KNOWLEDGE

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

265

TOWARDS
 K.KALIPALAYAM

TOWARDS
PUNNAM

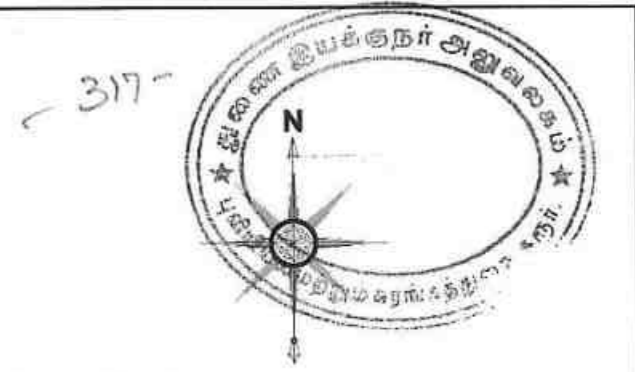
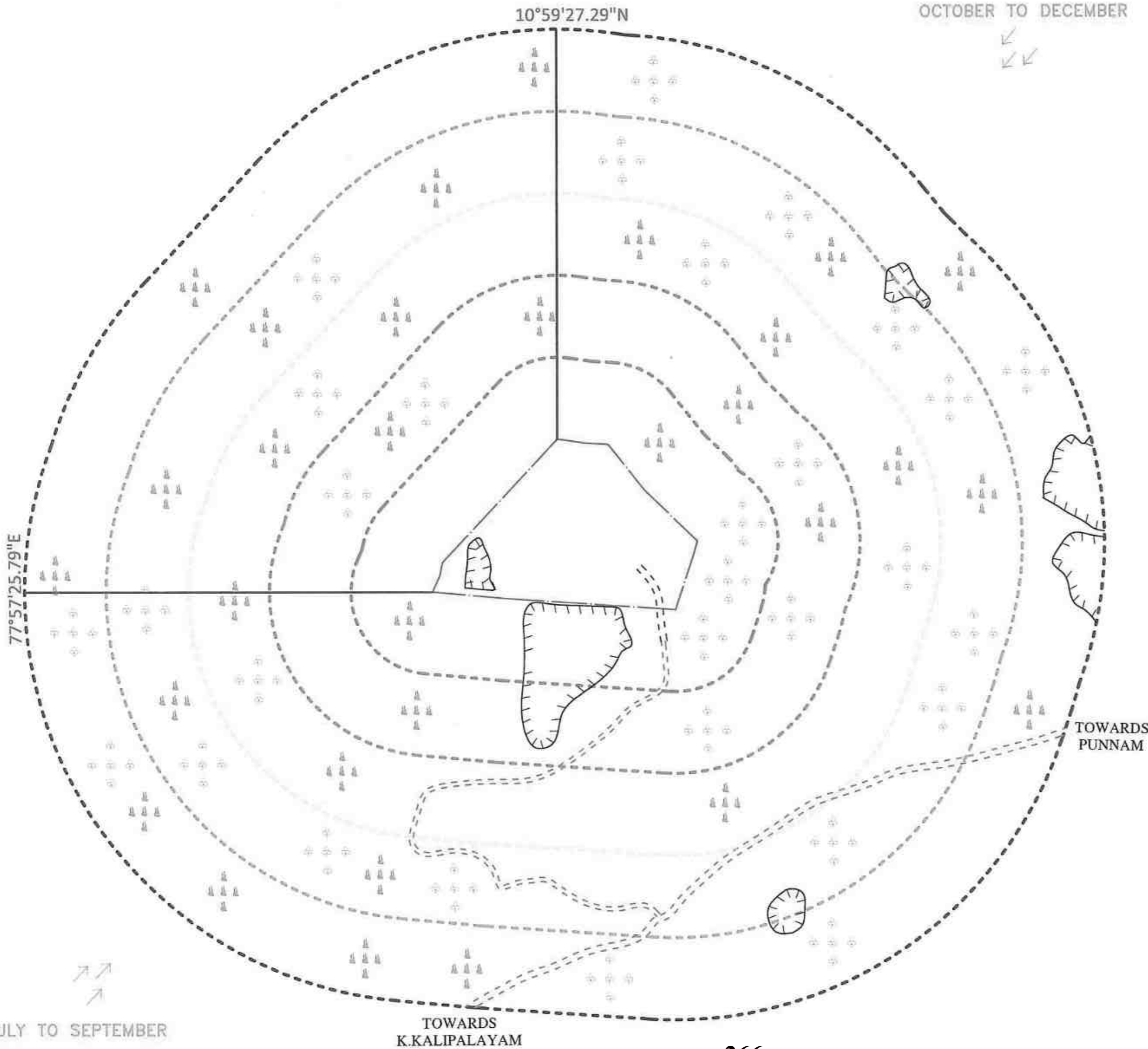


PLATE NO-ID

APPLICANT:
 M/S. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY.NO. 162/1,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
 S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
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 TALUK : PUGALUR
 DISTRICT : KARUR

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MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
SHRUBS & TREES	
EXISTING PIT	

TOPO SHEET NO : 58-F/13
 LATITUDE : 10°59'20.50"N to 10°59'27.29"N
 LONGITUDE : 77°57'25.79"E to 77°57'36.49"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.KARURPANNAN, M.Sc., Ph.D.
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A

JULY TO SEPTEMBER

OCTOBER TO DECEMBER

TOWARDS
K.KALIPALAYAM

TOWARDS
PUNNAM

-319-

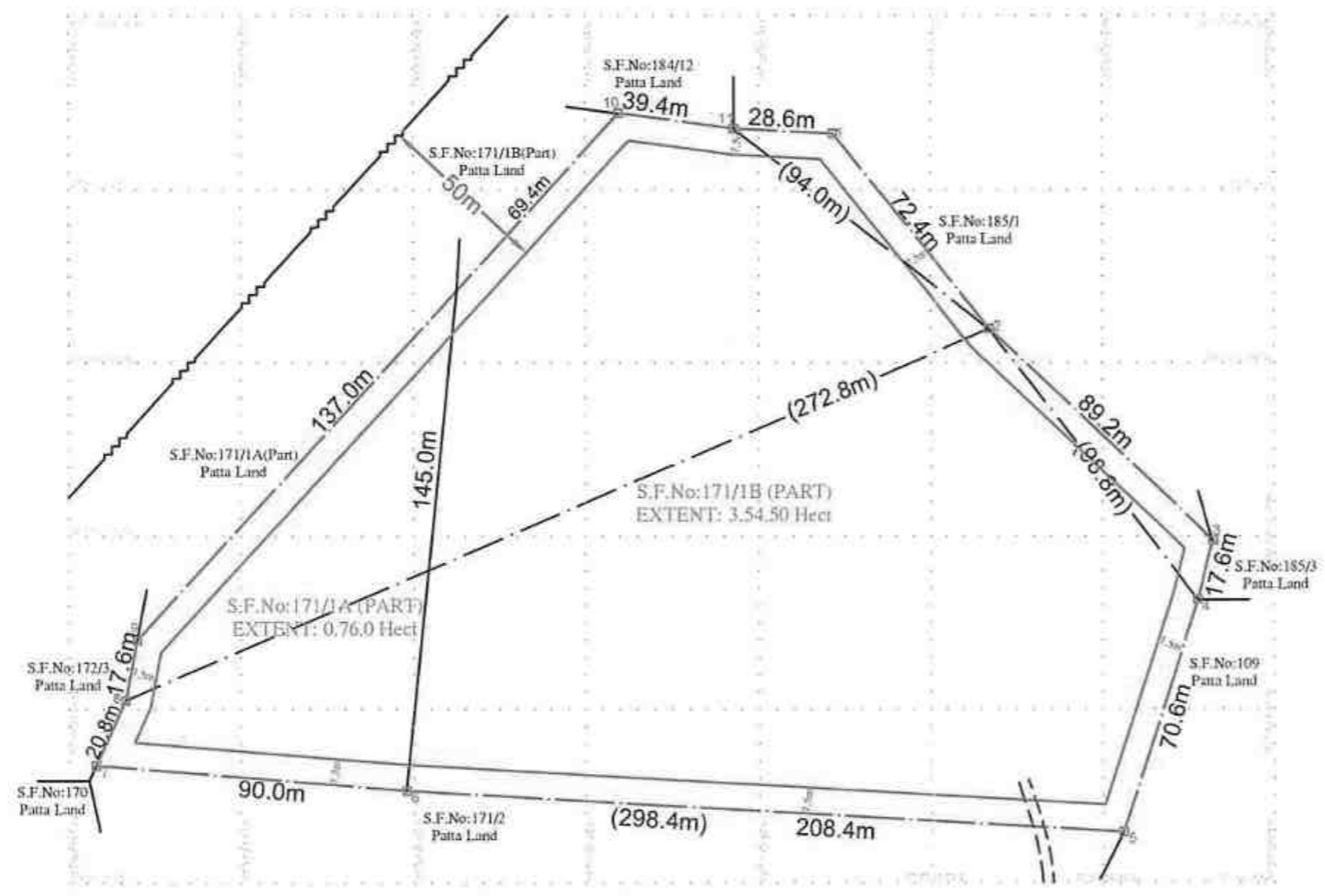
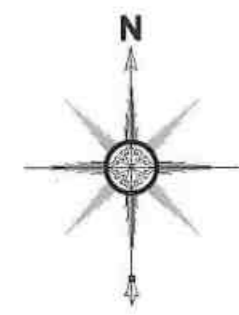
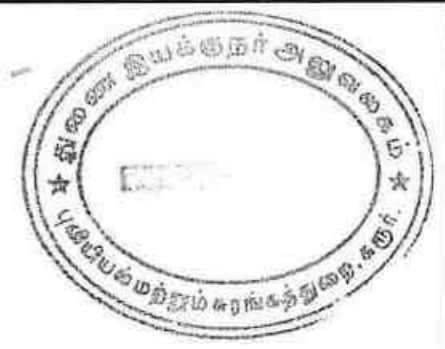


PLATE NO- II

APPLICANT:
M/s. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY.No. 162/1,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
 S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
 VILLAGE : KUPPAM
 TALUK : PUGALUR
 DISTRICT : KARUR

INDEX

MINE LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
BOUNDARY PILLAR STONES	
EB LINE	

MINE LEASE PLAN
 SCALE 1 : 2000

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

PILLAR STONES	LATITUDE	LONGITUDE
1	10°59'27.08"N	77°57'32.89"E
2	10°59'25.24"N	77°57'34.37"E
3	10°59'23.23"N	77°57'36.49"E
4	10°59'22.45"N	77°57'36.24"E
5	10°59'20.50"N	77°57'35.60"E
6	10°59'20.96"N	77°57'28.76"E
7	10°59'21.22"N	77°57'25.79"E
8	10°59'21.83"N	77°57'26.08"E
9	10°59'22.40"N	77°57'26.20"E
10	10°59'27.29"N	77°57'30.85"E
11	10°59'27.14"N	77°57'31.95"E

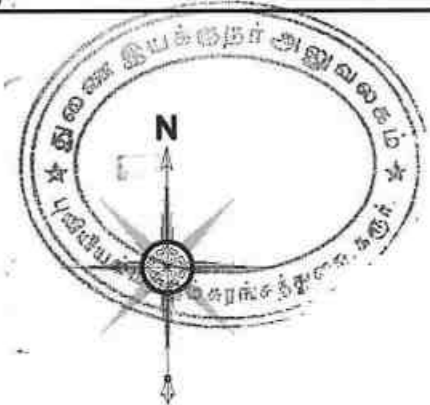
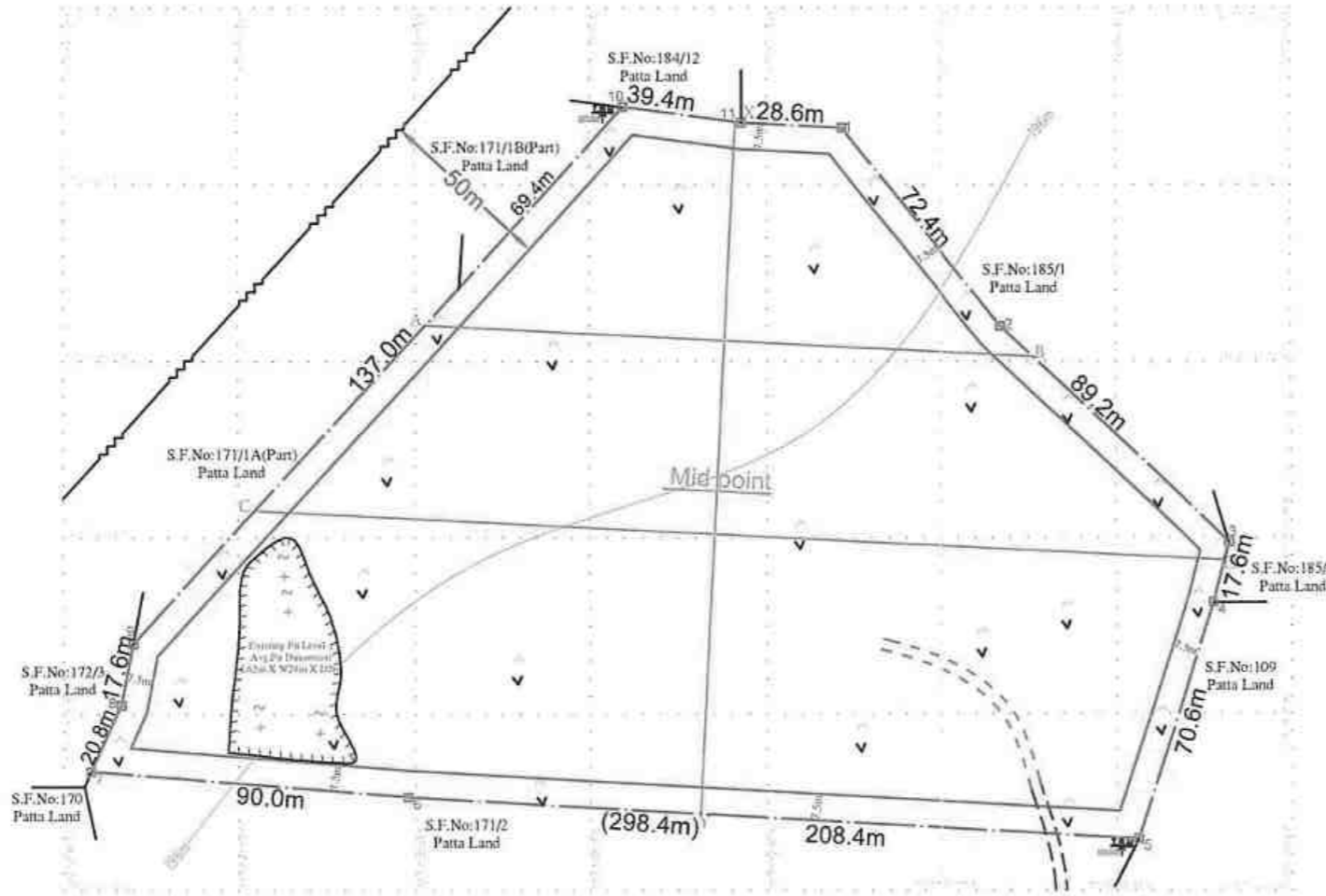


PLATE NO- III

APPLICANT:
 M/s. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY.No. 162/1,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
 S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
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 DISTRICT : KARUR

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- APPROACH & MINE HAUL ROAD
- BOUNDARY PILLAR STONES
- ROUGH STONE
- GRAVEL
- SHRUB
- EXISTING PIT
- CONTOUR LINES
- TEMPORARY BENCH MARK
- EB LINE

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	104	173	2	35984	.....	35984
	I	104	173	3	53976	53976	.....
	II	104	173	5	89960	89960	.....
	III	104	173	5	89960	89960	.....
	IV	104	173	5	89960	89960	.....
	V	104	173	5	89960	89960	.....
	VI	104	173	5	89960	89960	.....
	VII	104	173	5	89960	89960	.....
	VIII	104	173	5	89960	89960	.....
	IX	104	173	5	89960	89960	.....
X	104	173	5	89960	89960	.....
TOTAL				50	899600	863616	35984
XY-CD	I	91	275	2	50050	.....	50050
	I	91	275	3	75075	75075	.....
	II	91	275	5	125125	125125	.....
	III	91	275	5	125125	125125	.....
	IV	91	275	5	125125	125125	.....
	V	91	275	5	125125	125125	.....
	VI	91	275	5	125125	125125	.....
	VII	91	275	5	125125	125125	.....
	VIII	91	275	5	125125	125125	.....
	IX	91	275	5	125125	125125	.....
X	91	275	5	125125	125125	.....
TOTAL				50	1251250	1201200	50050
GRAND TOTAL					2150850	2064816	86034

Handwritten signature

SURFACE, GEOLOGICAL PLAN
 PLAN SCALE 1: 2000

Prepared By:
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 BEEN CHECKED BY ME AND IS CORRECT
 TO THE BEST OF MY KNOWLEDGE

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

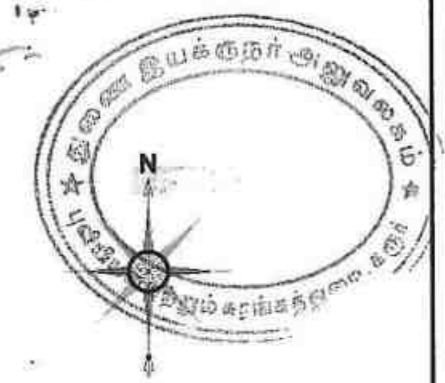
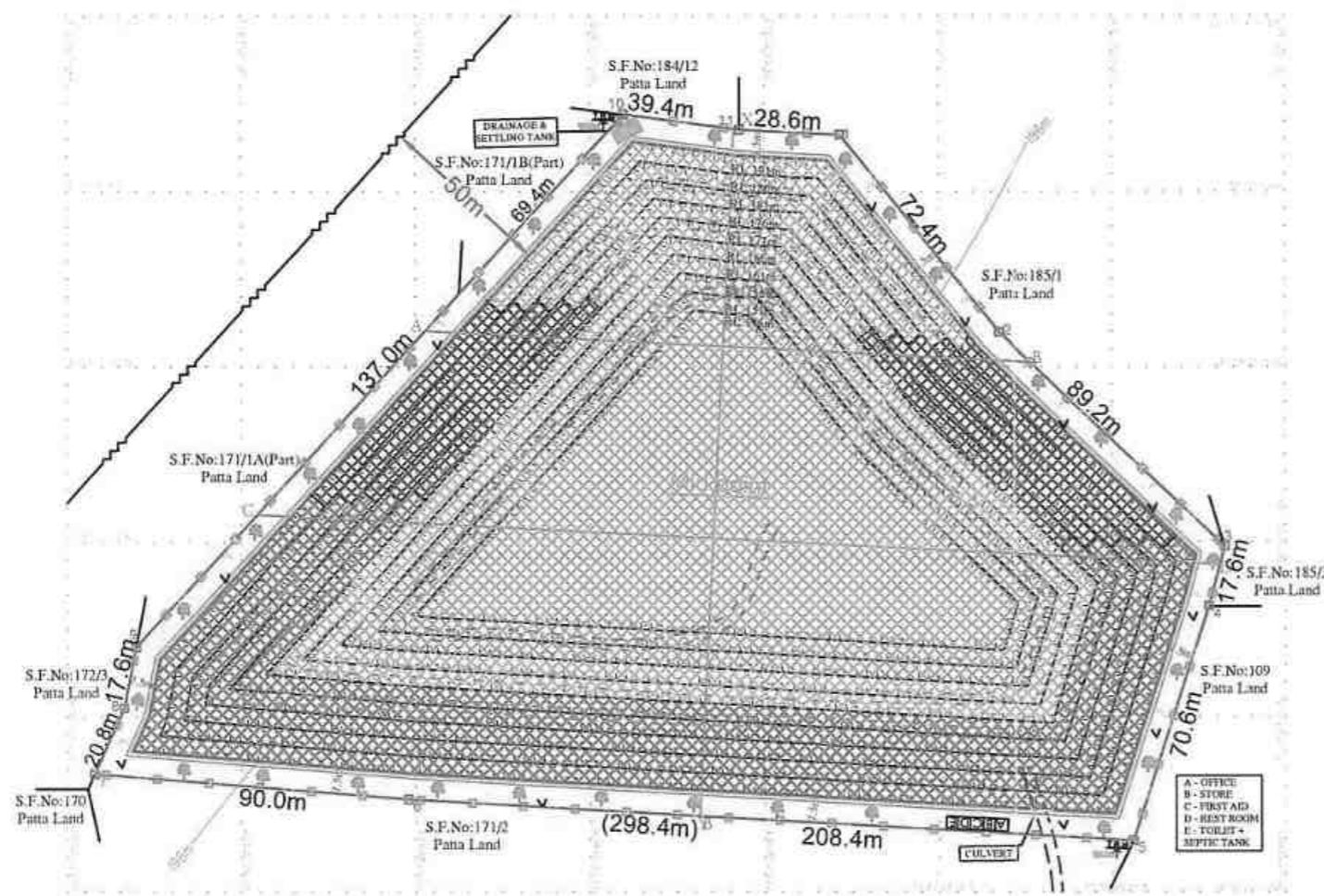


PLATE NO- IV

APPLICANT:
M/s. SHRI SELVA VINAAYAGA BLUE METAL,
 SURVEY.No. 162/1,
 THALAIYUTHUPPATTI,
 KUPPAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
 S.F.NO'S : 171/1A (Part) & 171/1B (Part)
 EXTENT : 4.30.5Hect
 VILLAGE : KUPPAM
 TALUK : PUGALUR
 DISTRICT : KARUR

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- APPROACH & MINE HAUL ROAD
- BOUNDARY PILLAR STONES
- GRAVEL
- SHRUB
- CONTOUR LINES
- TEMPORARY BENCH MARK
- DRAINAGE & SETTLING TANK
- FENCING
- EB LINE

YEARWISE PRODUCTIONS							
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in M ³	Gravel in M ³
XY-AB	I-YEAR	I	75	158	2	23700	23700
		II	65	148	5	48100	48100
		III	55	138	5	37950	37950
		IV	45	128	5	28800	28800
		V	35	118	5	20650	20650
TOTAL						194750	171050
XY-AB	II-YEAR	I	22	158	2	6952	6952
		II	27	148	5	19980	19980
		III	32	138	5	22080	22080
		IV	37	128	5	23680	23680
		V	42	118	5	24780	24780
TOTAL						117170	117170
XY-CD	III-YEAR	I	33	260	2	17160	17160
		II	33	260	3	25740	25740
		III	28	250	5	35000	35000
		IV	23	240	5	27600	27600
		V	18	230	5	20700	20700
TOTAL						106200	106200
XY-AB	IV-YEAR	I	51	260	2	26520	26520
		II	51	250	5	63750	63750
		III	51	240	5	61200	61200
		IV	51	230	5	58650	58650
		V	51	220	5	56100	56100
TOTAL						306000	279480
XY-AB	V-YEAR	VI	72	108	5	38880	38880
		VII	67	98	5	32830	32830
		VIII	59	210	5	61950	61950
		IX	54	200	5	54000	54000
		X	39	170	5	33150	33150
TOTAL						186490	186490
GRAND TOTAL						1123300	1048968

- 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

Plantation Proposed for I-Year

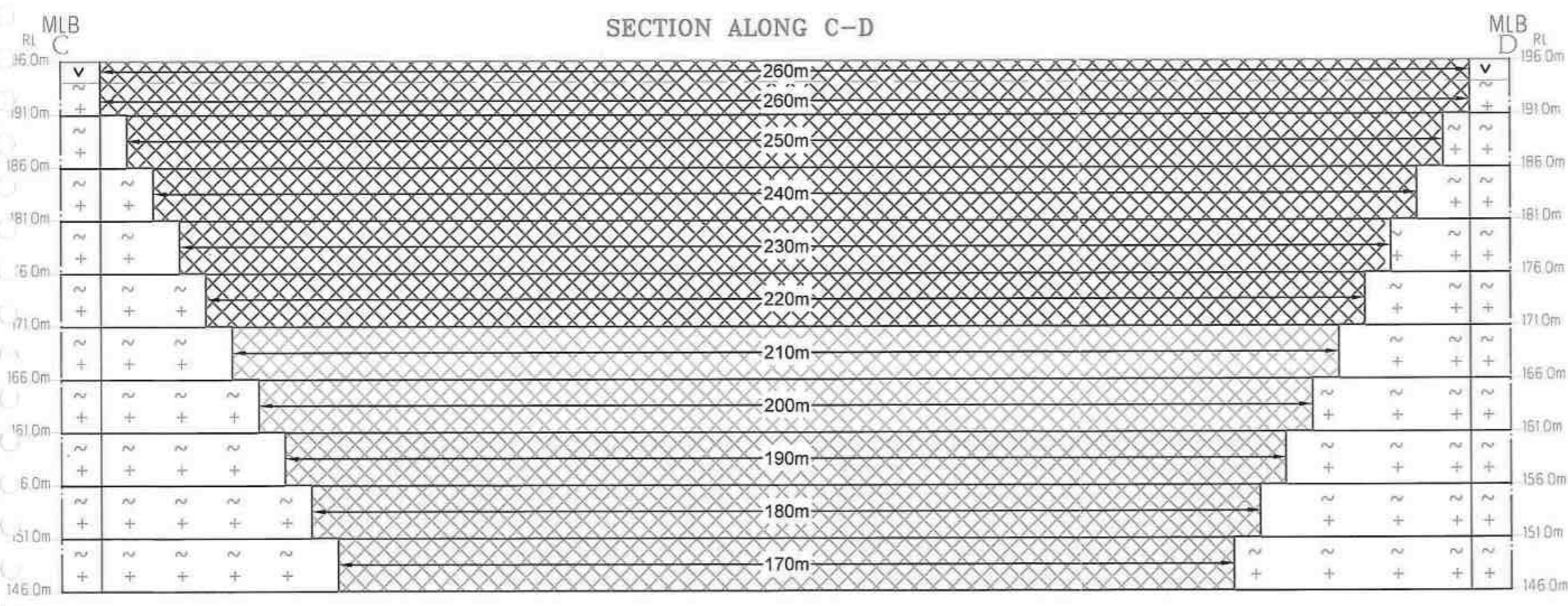
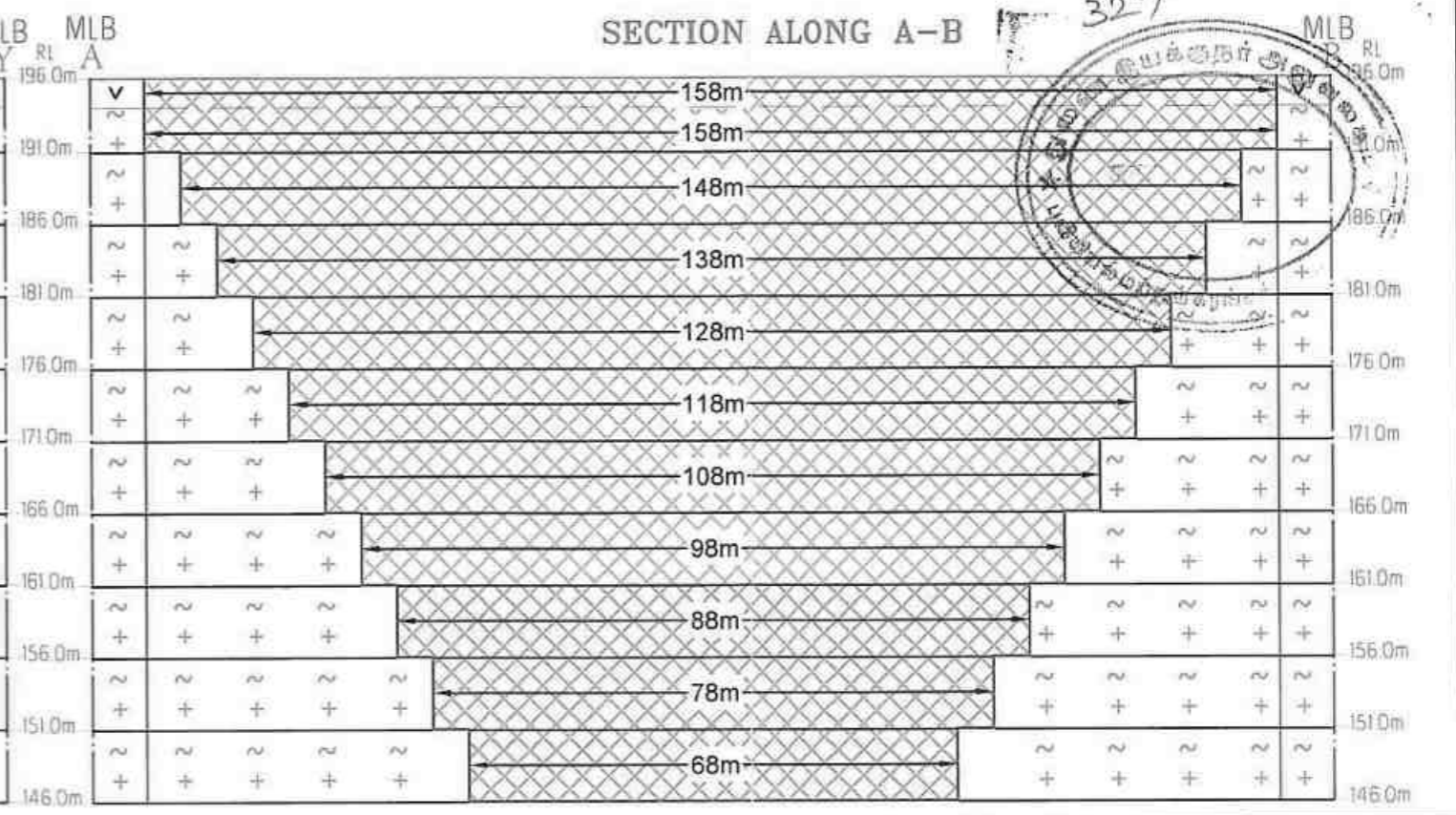
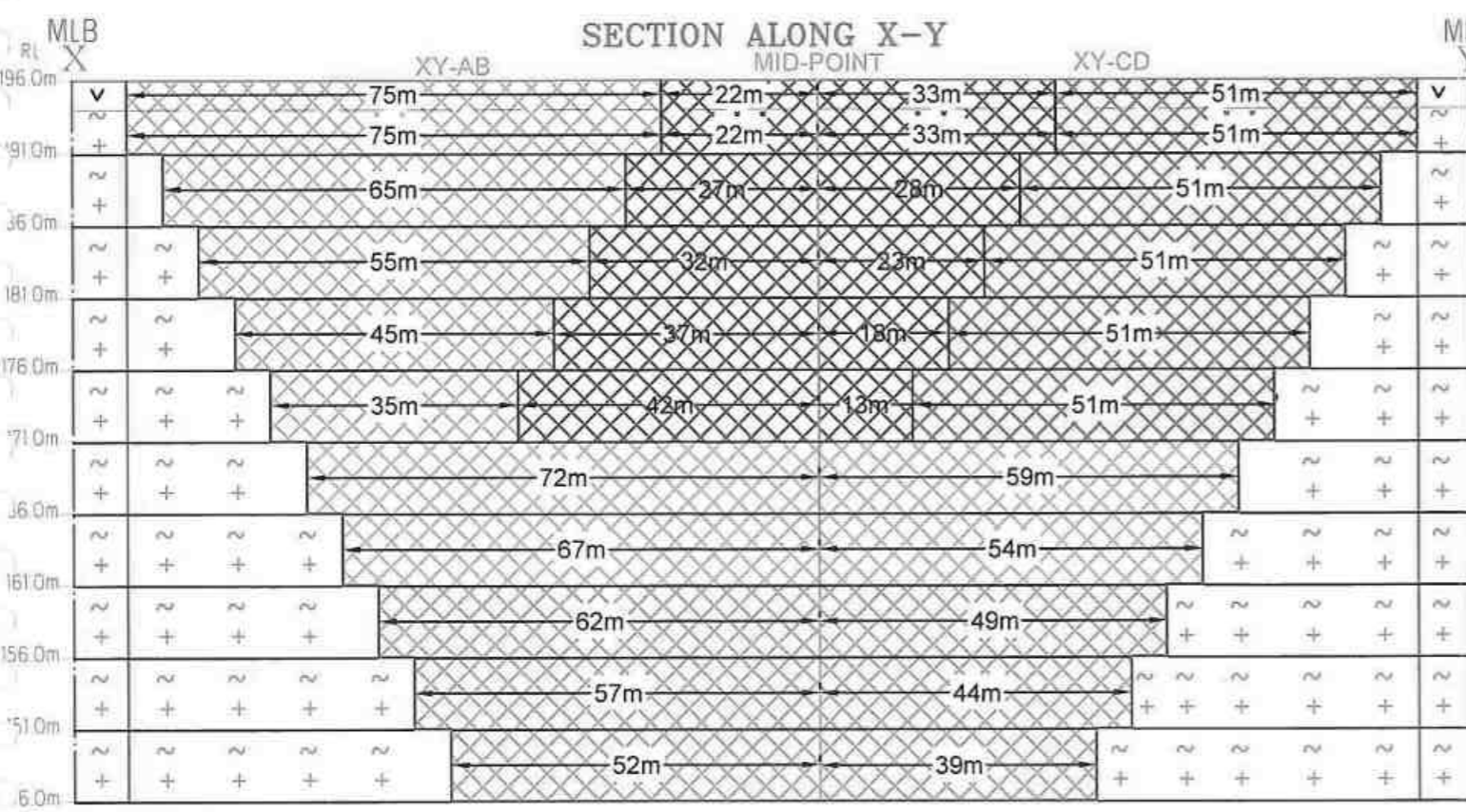
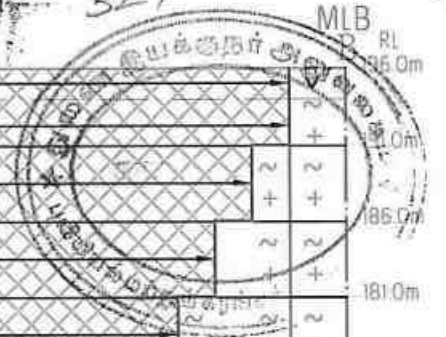
YEARWISE DEVELOPMENT, PRODUCTION PLAN
 PLAN SCALE 1: 2000

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

S. Karuppannan

327



- 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

Signature

PLATE NO- IVA

APPLICANT:
M/s. SHRI SELVA VINAAYAGA BLUE METAL,
SURVEY.No. 162/1,
THALAIYUTHUPPATTI,
KUPPAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
S.F.NO'S : 171/A (Part) & 171/B (Part)
EXTENT : 4.30.5Hect
VILLAGE : KUPPAM
TALUK : PUGALUR
DISTRICT : KARUR

INDEX

MINE LEASE BOUNDARY	
SAFETY DISTANCE	
ROUGH STONE	
GRAVEL	
PROPOSED BENCH	

**YEARWISE DEVELOPMENT,
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

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

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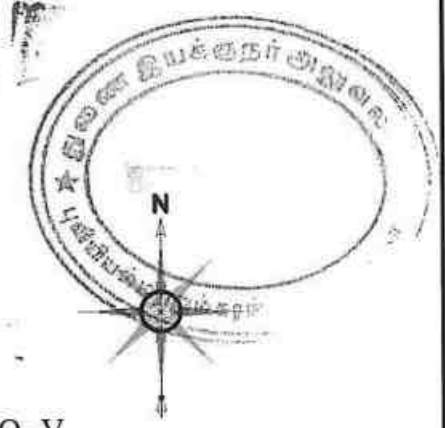


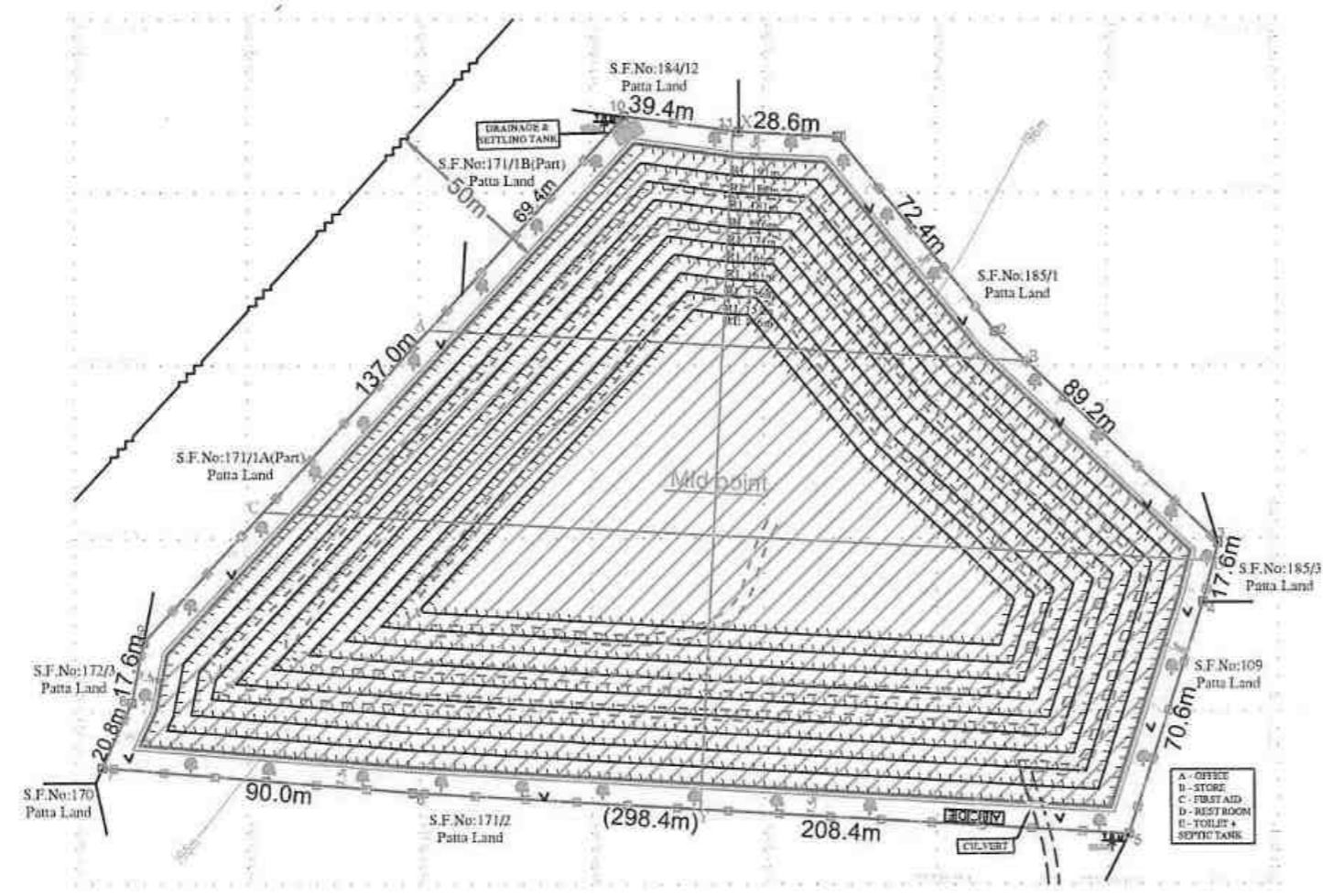
PLATE NO- V

APPLICANT:
M/s. SHRI SELVA VINAAYAGA BLUE METAL,
SURVEY.No. 162/1,
THALAIYUTHUPPATTI,
KUPPAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
S.F.NO'S : 171/1A (Part) & 171/1B (Part)
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SAFETY DISTANCE	
APPROACH & MINE HAUL ROAD	
BOUNDARY PILLAR STONES	
GRAVEL	
SHRUB	
CONTOUR LINES	
TEMPORARY BENCH MARK	
DRAINAGE & SETTLING TANK	
FENCING	
EB LINE	
PROPOSED BENCH	



Plantation Proposed for I-Year

MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	0.16.15	3.68.62	
INFRASTRUCTURE	NIL	0.03.00	
ROADS	0.02.00	0.05.00	
GREEN BELT	NIL	0.45.48	
DRAINAGE & SETTLING TANK	NIL	0.08.40	
UN-UTILIZED AREA	4.12.35	NIL	NIL
GRAND TOTAL	4.30.50	4.30.50	NIL

MINE LAYOUT PLAN AND LAND USE PATTERN
SCALE 1 : 2000

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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331

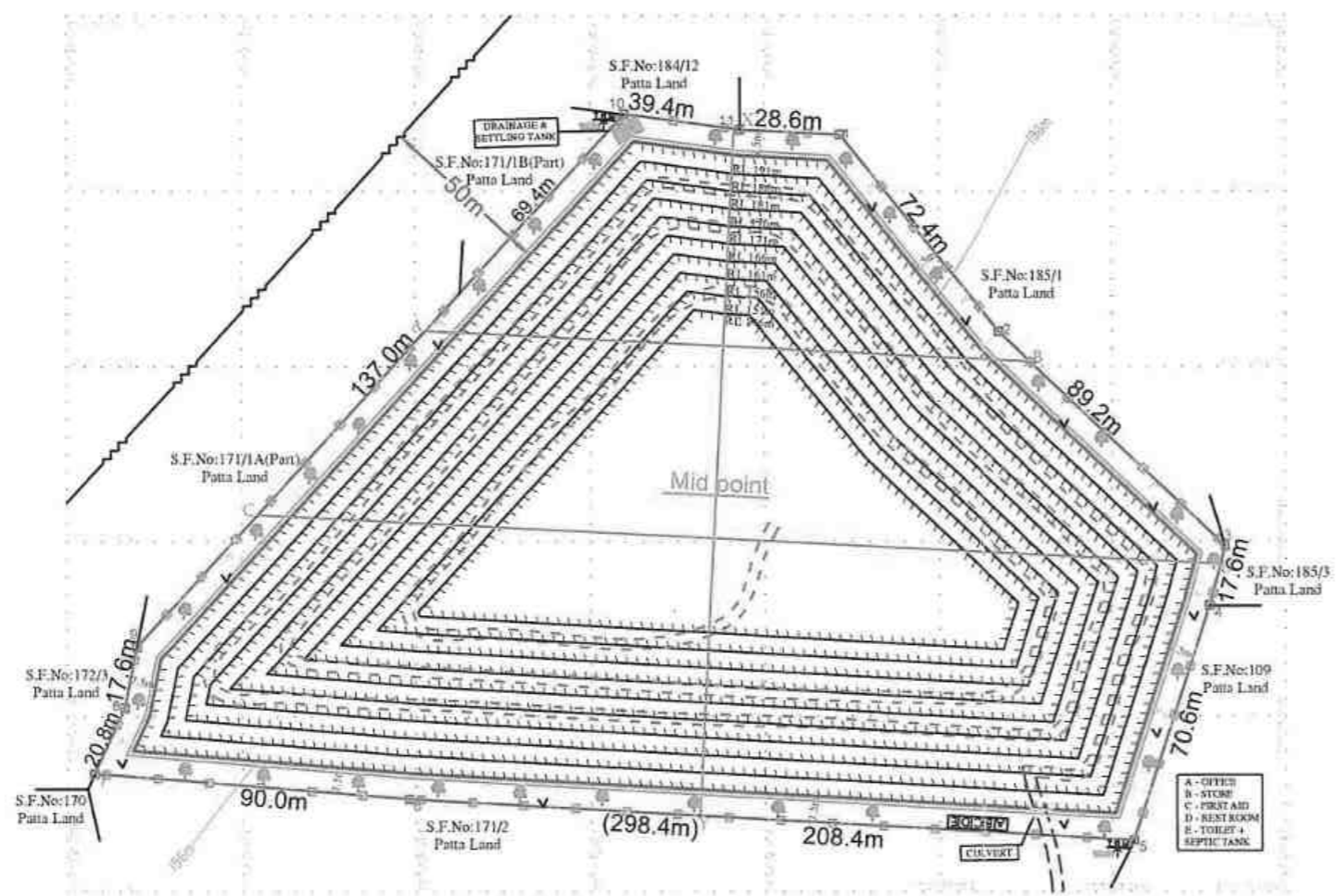
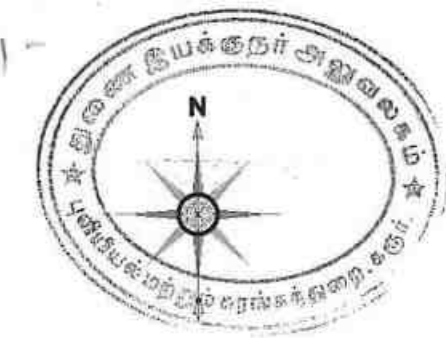


PLATE NO- VI

APPLICANT:
M/s. SHRI SELVA VINAAYAGA BLUE METAL,
SURVEY.No. 162/1,
THALAIYUTHUPPATTI,
KUPPAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639111.

LEASE APPLIED AREA:
S.F.NO'S : 171/1A (Part) & 171/1B (Part)
EXTENT : 4.30.5Hect
VILLAGE : KUPPAM
TALUK : PUGALUR
DISTRICT : KARUR

INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- APPROACH & MINE HAUL ROAD
- BOUNDARY PILLAR STONES
- GRAVEL
- SHRUB
- CONTOUR LINES
- TEMPORARY BENCH MARK
- DRAINAGE & SETTLING TANK
- FENCING
- EB LINE
- ULTIMATE BENCH

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	97	158	2	30652	.....	30652
	I	97	158	3	45978	45978	.....
	II	92	148	5	68080	68080	.....
	III	87	138	5	60030	60030	.....
	IV	82	128	5	52480	52480	.....
	V	77	118	5	45430	45430	.....
	VI	72	108	5	38880	38880	.....
	VII	67	98	5	32830	32830	.....
	VIII	62	88	5	27280	27280	.....
	IX	57	78	5	22230	22230	.....
X	52	68	5	17680	17680	.....
TOTAL				50	441550	410898	30652
XY-CD	I	84	260	2	43680	.....	43680
	I	84	260	3	65520	65520	.....
	II	79	250	5	98750	98750	.....
	III	74	240	5	88800	88800	.....
	IV	69	230	5	79350	79350	.....
	V	64	220	5	70400	70400	.....
	VI	59	210	5	61950	61950	.....
	VII	54	200	5	54000	54000	.....
	VIII	49	190	5	46550	46550	.....
	IX	44	180	5	39600	39600	.....
X	39	170	5	33150	33150	.....
TOTAL				50	681750	638070	43680
GRAND TOTAL					1123300	1048968	74332

Plantation Proposed for 1-Year

Susunif

273

CONCEPTUAL PLAN
PLAN SCALE 1: 2000

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

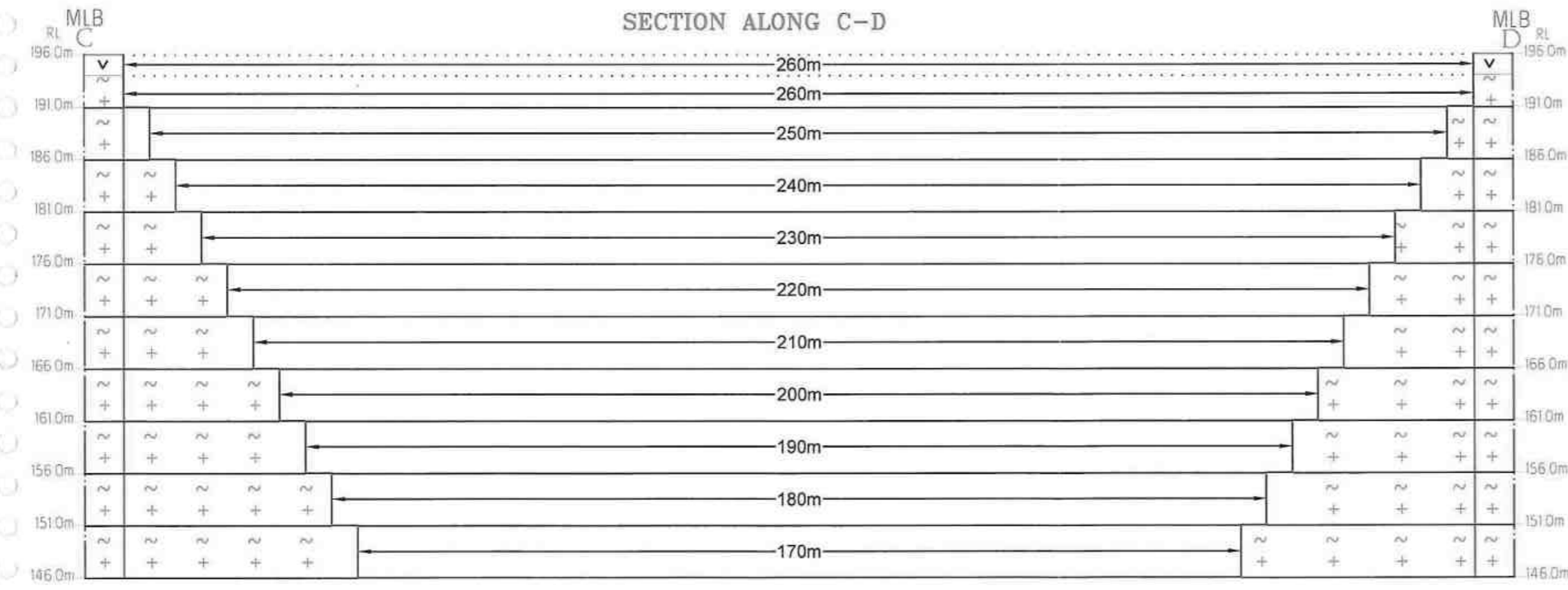
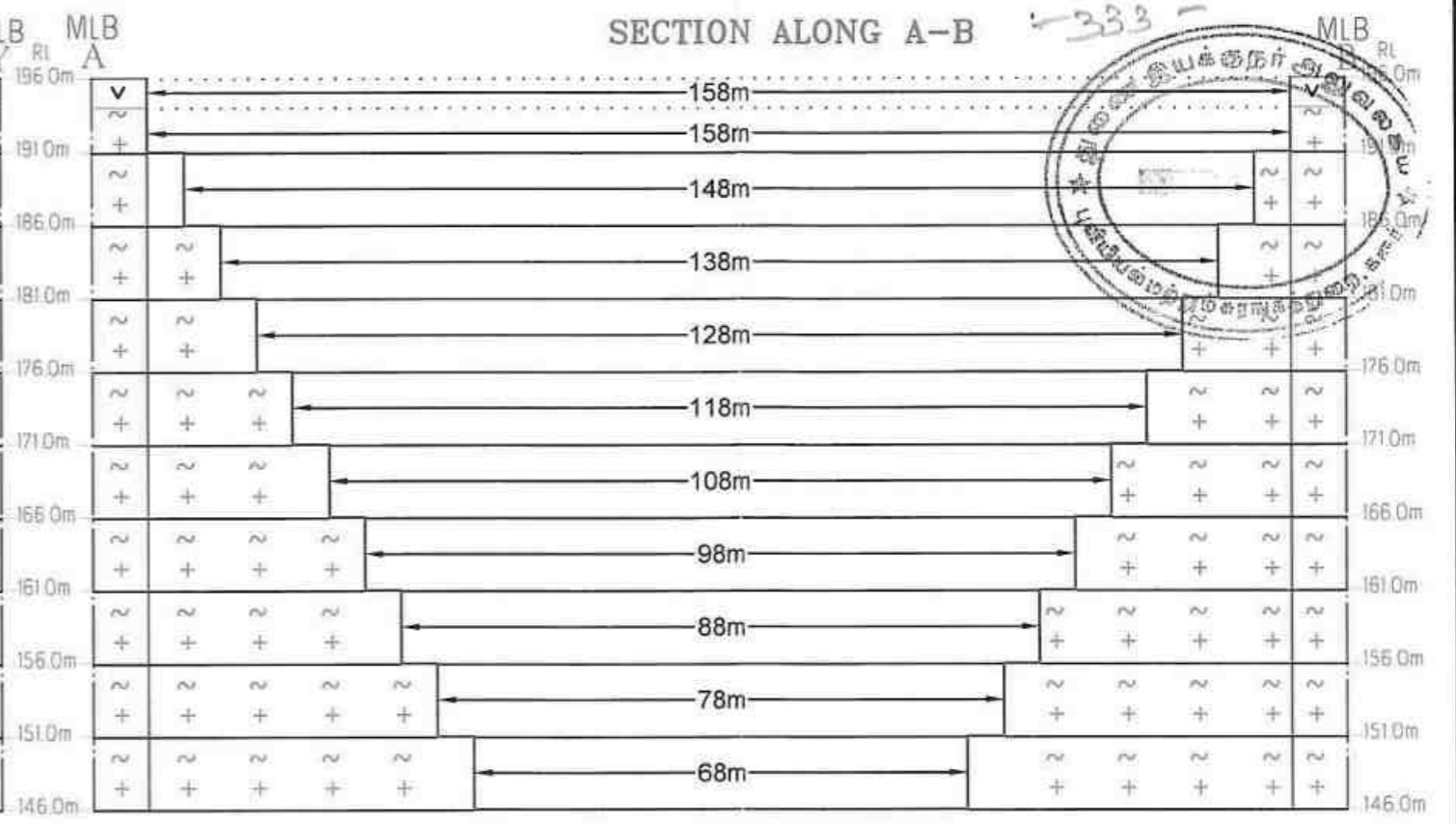
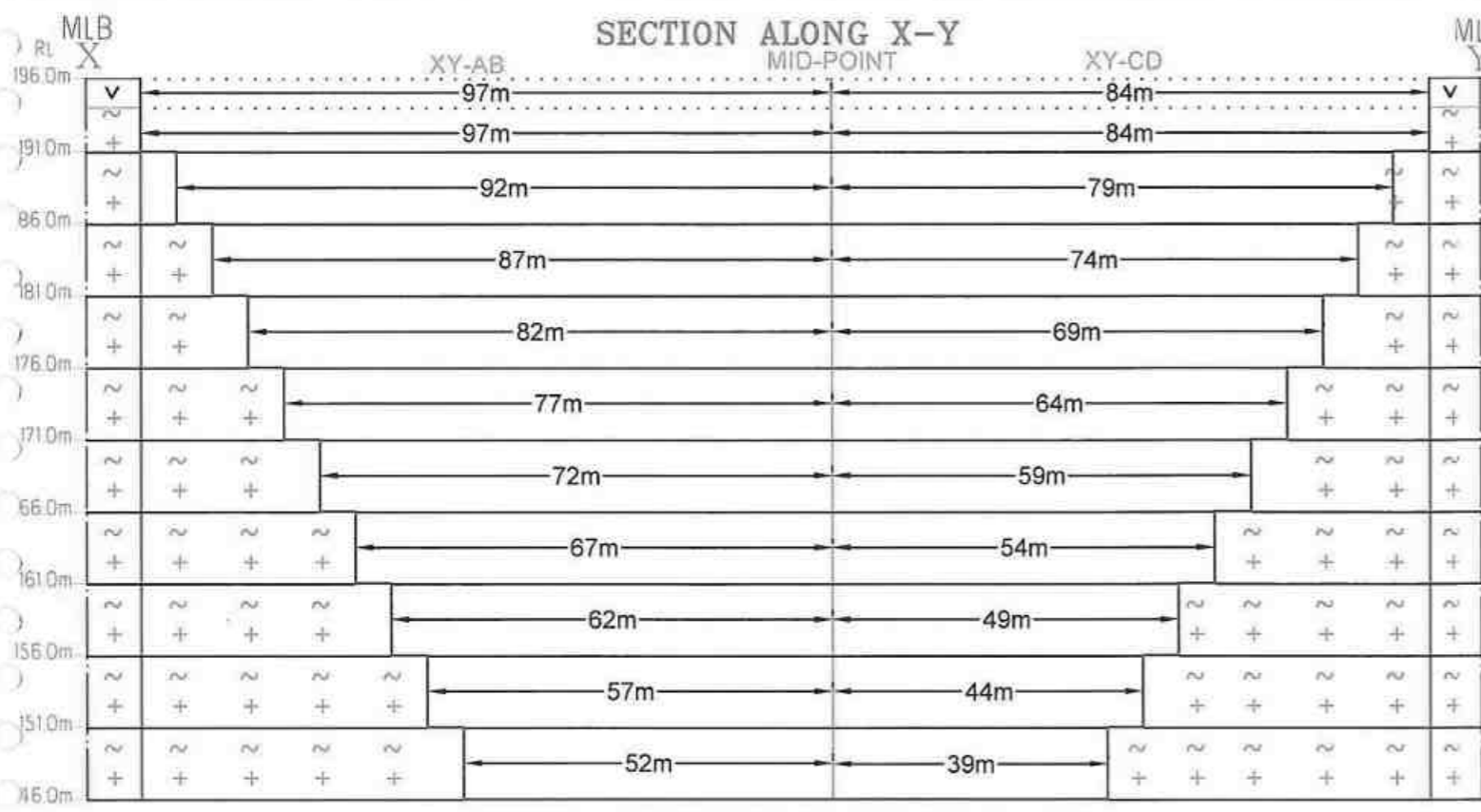


PLATE NO- VIA

APPLICANT:
 M/s. SHRI SELVA VINAAYAGA BLUE METAL,
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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

Survey



National Accreditation Board for Education and Training



Certificate of Accreditation

Geo Technical Mining Solutions

1/213B, Natesan Complex, Dharmapuri Salem Main Road, Oddapatti, Collectorate post office,
Dharmapuri, Tamil Nadu-636705

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/ underground mining	1	1 (a) (i)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated September 13, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2641 dated January 19, 2023. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions following due process of assessment.

Sr. Director, NABET
Dated: January 19, 2023

Certificate No.
NABET/EIA/2124/SA 0184

Valid up to
Dec 31, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.