

**EXECUTIVE SUMMARY OF  
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT  
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 = 18.31.0 hectares**

**M/s. New Star Blue Metals**

**At**

**Kuppam Village, Pugalur Taluk, Karur District**

**ToR issued vide Letter No. SEIAA-TN/F.No. 9423/SEAC/ToR-1275/2022  
dated 08.10.2022**

Name and Address	Extent & S.F.No.
M/s. New Star Blue Metals Poolankaadu Uppupalayam, Kuppam Post Pugalur Taluk Pugalur Karur District - 639 111	1.62.0 ha & S. F. No. 553/2 (Part)

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**



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**NABET ACC. NO: NABET/EIA/2124/SA 0184**

**Valid till : 31 Dec.2023**

**ENVIRONMENTAL LAB  
EXCELLENCE LABORATORY**

**Baseline Study Period – October 2022 to December 2022**

## TERMS OF REFERENCE (ToR) COMPLIANCE

M/s. New Star Blue Metals

ToR issued vide Letter No. SEIAA-TN/F.No.9423/SEAC/ToR-1275/2022 dated  
08.10.2022

SPECIFIC CONDITIONS		
1	The PP shall furnish DFO letter in regard to shortest distance of Reserve Forest & protected areas/Wildlife sanctuaries & wild life corridors etc within 25 km radius	DFO letter has been attached as Annexure IV.
2	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director of Geology and Mining during the time of appraisal for obtaining the EC.	The proposed project is not located in an existing quarry project area. Therefore, the action plan for bench realignment is not necessary.
3	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.	The proposed project is a green field project. The project will form benches with dimensions as proposed in the approved mining plan. Moreover, the ultimate depth of the project is 20 m below ground level. Therefore, the project does not require a conceptual Slope Stability Plan during this plan period.
4	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	The affidavit for blasting has been attached with the approved mining plan report in Annexure III.

	proponent.	
5	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.	NONEL blasting is proposed for this project. A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.17-24.
6	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 video and photographic evidences will be shown at the time of final EIA presentation.
7	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.	
	a.	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
	b.	Quantity of minerals mined out.
	c.	Highest production achieved in any one year
	d.	Detail of approved depth of mining.
	e.	Actual depth of the mining achieved earlier.
	f.	Name of the person already mined in that leases area.
	g.	If EC and CTO already obtained, the copy of the same shall be submitted.
	h.	Whether the mining was carried out as per the approved mine plan (or EC if
		As this is a newly proposed lease area, the conditions are incompatible to this project.

	issued) with stipulated benches.	
8	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on Google Earth Image, as shown in Figure 2.3, p.12 and geology and geomorphology of the lease area have been discussed in Section 2.4 under Chapter II, p.11.
9	The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Drone video photographs showing fencing and greenbelt development will be included in the final EIA report. The drone video will be submitted during the final EIA report appraisal.
10	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 will be included in the final EIA report.
11	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 details of mineral reserves have been discussed in Section 2.5 under Chapter II, pp.14-16. The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.96-122.
12	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	Employment details of the proposed project are provided in Table 2.14 under Chapter II, p.24.

	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.	
13	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) for both monsoon and non-monsoon seasons by a reputed institution / University to assess the impacts on the wells due to quarrying activity vice versa on the quarrying operations.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.36-48.
14	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. 27-95.
15	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.	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.136-142.
16	Rain water harvesting management with	The rainwater harvesting management plan will

	recharging details along with water balance (both monsoon & non-monsoon) be submitted.	be submitted along with the final EIA report.
17	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, pp.27-35 under Chapter III. The details of surrounding sensitive ecological features are provided in Table 3.41 under chapter III, p.91. 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.20.
18	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&R issues. If any, should be provided.	Not Applicable. No dumps have been proposed outside the lease area.
19	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required' clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. This project area is involved in the production of rough stone and gravel materials as per the approved mining plan.
20	Description of water conservation measures proposed to be adopted in the Project	Details about rainwater harvesting structures will be included in the final EIA report.

	should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	
21	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 3.8 under Chapter III, pp.89-91.
22	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.64-84.
23	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the mine closure plan are shown in Section 2.6 under Chapter II, pp.17-24.
24	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF & CC accordingly.	The comments made in public hearing meeting will be updated in the final EIA report after public hearing meeting
25	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Details of advertisement will be updated in the final EIA report.
26	The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	The Tamil version of EIA report, executive summary and other related information will be incorporated in this report.

27	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.
28	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 <b>appendix-I</b> 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 Tables 4.13 and 4.14 in Section 4.6 under Chapter IV, pp.113-119.
29	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities, botanist/Horticulture with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.
30	A Disaster management plan shall be prepared and included in the EIA/EMP	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII,



	Report for the complete life of the proposed quarry (or) till the end of the lease period.	pp.132-135.
31	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.129-131.
32	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.119- 121.
33	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.147 & 148.
34	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 14 people directly as discussed in Section 8.1 under Chapter VIII, p.146.
35	Details of litigation pending against the	No litigation is pending in any court against this

	project, if any, with direction /order passed by any Court of Law against the Project should be given.	project.
36	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.146-148.
37	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 application to the detailed compliance to previous EC conditions is under the process. The compliance report will be submitted at the time of EIA presentation.
38	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.	A detailed EMP plan has been provided in Tables 10.9 & 10.10 under Chapter X, pp.161-168. The affidavit stating to abide EMP will be included in final EIA report.
39	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act' 1986.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.
	The proposal was placed in the 557 <sup>th</sup> Authority meeting held on 08.10.2022. After detailed discussions. the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing for the period 3 years confining to the ultimate depth of mining upto 20m BGL and the quantity of 1,64,992 cu.m of Rough Stone, & 25,088 cu.m of Gravel as per approved mining plan issued by the Department of Geology & Mining	

	under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions and conditions stated therein vide Annexure 'B'.	
	<b>Annexure 'B'</b>	
1	Cluster Management Committee, 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 roughstone 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 under Chapter II, pp.17-24.
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	It will be informed to the committee.

	plan.	
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	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	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following	
	a) Soil health & bio-diversity.	The study is in process. The results will be updated in the final EIA report.
	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.	
11	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.
12	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The fire safety and evacuation plan will be submitted by the committed to the corresponding authority.
13	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures to control air, noise, and water pollution due to dust have been provided in Sections 4.3, 4.4, 4.5 and 4.6 under Chapter IV, pp.97-119.
14	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.64-84. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.113-119.
15	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.113-119.
16	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.97

		and 98.
17	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III, pp.64-84. 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.
18	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.	The matter has been discussed under Chapter IV, pp.96-122.
19	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel. river, lake pond, tank etc.	The VAO certificate of 300 m radius will be attached with the final EIA report.
20	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 the public consultation and all the activities proposed will be updated in the final EIA report.
21	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	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV, pp.113-119.

	including control of other emission and climate mitigation activities.	
22	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.64-84.
23	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The FAE of ecology and biodiversity has advised the project proponent that replantation work, particularly for the project area where plants of 4 years old exist should be carried out in the vacant areas available.
24	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 is under process and report will be added to the final EIA report.
25	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, p.97.
26	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.113-119.
27	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.113-119.
28	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.97 & 98.
29	The Environmental Impact Assessment should hold detailed study on EMP with	A detailed Environment Management Plan has been prepared and provided in Tables 10.9 &

	budget for Green belt development and mine closure plan including disaster management plan.	10.10 under Chapter X, pp.161-168.
30	The Environmental Impact Assessment should study impact on climate change temperature rise, pollution and above soil & below soil carbon stock.	The information will be included in the final EIA report.
31	The Environmental Impact Assessment should study impact on protected areas, Reserve Forest, 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 reserve forests within 10 km radius has been provided in Section 3.8 under Chapter III, p.91.
32	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, pp.96 & 97.
33	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.96-122.
34	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.113-119.
35	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.	The matter on plastic waste management has been given in Section 7.5 under Chapter VII, p.142 &143.



	contemplated during mining may be investigated and reported.	
36	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 among other environmental protection measures.
37	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.36-48.
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.132-135.
39	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.129-131.

40	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan is attached along with the approved mining plan report in Annexure III. The budget details for the mine closure plan are shown in Table 2.9 under Chapter II, p.20.
41	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 in Tables 10.9 & 10.10 under Chapter X, pp.161-168.
<b>STANDARD TERMS OF REFERENCE</b>		
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 patta land. A copy of the ownership document 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 related to mining plan, EIA and public hearing are compatible to each other and have been provided in the annexure part.
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area	The google earth image showing lease area with all corner coordinates has been given in Figure 2.3 under Chapter II, p.12.

	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 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.
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 applied area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or	The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under chapter X, p.150 & 151.

	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.	It is an opencast quarrying operation proposed to operate in Manual method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90 <sup>0</sup> bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
9.	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	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.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use 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.27-35.  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.20.
11.	Details of the land for any over burden dumps outside the mine lease, such as	It is not applicable as no dumps have been proposed outside the lease area.

	extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	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 and the proposed project area is a patta land. The details have been discussed in Table 3.41 under chapter III, p.91.
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.	No Reserve Forest is found within the study area. The matter has been discussed Table 3.41 under Chapter III, p.91.
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 3.41 under Chapter III, p.91.
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 3.41 under Chapter III, p.91.
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	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under Chapter III, pp.64-84.

	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 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable.  Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable  The project doesn't attract The C.R.Z. Notification, 2018.
21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view.	Not Applicable.  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

	<p>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&amp;R and socio-economic aspects should be discussed in the Report.</p>	<p>Affected People (PAP) are not provided.</p>
<p>22.</p>	<p>One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind</p>	<p>Baseline data were collected for the period of October 2021 - December 2021 as per CPCB notification and MoEF &amp; CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.8 under Chapter III, pp. 27-95.</p>



	direction. The mineralogical composition of PM10, particularly for free silica, should be given.	
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	Air quality modelling for prediction of incremental 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.99-108.
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.	The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II, p.23.
25.	Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.	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 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	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

	harvesting proposed in the Project, if any, should be provided.	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, pp. 97-98.
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 65-70 m below ground level. The ultimate depth of quarry is 20 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.36-48.
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	The highest elevation of the project area is 165 m AMSL. Ultimate depth of the mine is 20 m BGL. Depth to the water level in the area is 65-70 m

	schematic diagram may also be provided for the same.	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.113-119.
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	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 significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III, pp.89-90.

	Congress Guidelines.	
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 2.6.7 under Chapter II, pp.22-23.
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, pp.19-20.
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.119-121.
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.	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.147 & 148.
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 14 people directly as discussed in Section 8.1 under Chapter VIII, p.146.

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 10.9 & 10.10 under Chapter X, pp.161-168.
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 updated in the final EIA/EMP report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs. 69,05,000/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs. 1794000 as capital cost and recurring cost as Rs. 1549208 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. 10354354, as shown in Tables 10.9 & 10.10 under Chapter X, pp.161-168.
42	A disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details regarding disaster management plan have been provided in Section 7.3 under Chapter VII, pp.132-135.

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 discussed under Chapter VIII, pp.146 –148.
44.	<b>Besides the above, the below mentioned general points are also to be followed:</b>	
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 during appraisal of the Project	Original Baseline monitoring reports will be included in the final EIA report.
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 enclosed along with final EIA/EMP report.
g)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of	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.

	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.	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 Ministry of Environment, Forest and Climate Change, as may be applicable.	As it is a greenfield project, the project does not require certified report of the status of compliance of the conditions.
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.

## TABLE OF CONTENTS

S No.	TITLE	PAGE No.
<b>I</b>	<b>Introduction</b>	<b>1-8</b>
1.0	Preamble	1
1.1	Purpose of the report	4
1.2	Environmental clearance	4
1.3	Terms of reference (Tor)	5
1.4.	Post environment clearance monitoring	5
1.5	Transferability of environmental clearance	5
1.6	Generic structure of EIA document	5
1.7	Identification of the project proponent	6
1.8	Brief description of the project	6
1.9	Scope of the study	7
1.10	References	8
<b>II</b>	<b>PROJECT DESCRIPTION</b>	<b>9-25</b>
2.0	General introduction	9
2.1	Description of the project	9
2.2	Location and accessibility	10
2.3	Leasehold area	10
2.3.1	Corner Coordinates	10
2.4	Geology and Geomorphology	11
2.5	Quantity of reserves	14
2.6	Mining method	17
2.6.1	Conceptual Blasting design	17
2.6.2	Magnitude of Operation	19
2.6.3	Extent of Mechanization	19
2.6.4	Progressive Quarry closure Plan	19
2.6.5	Quarry Closure Budget	20
2.6.6	Conceptual Mining Plan	22
2.6.7	Infrastructures	22
2.6.8	Water requirement	23
2.6.9	Energy requirement	23
2.6.10	Capital requirement	24
2.7	Manpower requirement	24
2.8	Project Implementation Schedule	25



<b>III</b>	<b>DESCRIPTION OF THE ENVIRONMENT</b>	<b>26-91</b>
3.0	General	26
3.1	Land environment	27
3.1.1	Geology and Geomorphology	27
3.1.2	Land use/Land cover	30
3.1.3	Topography	30
3.1.4	Drainage pattern	30
3.1.5	Seismic sensitivity	30
3.1.6	Soil	33
3.2	Water Environment	36
3.2.1	Surface water Resources and Quality	36
3.2.2	Ground water Resources and Quality	36
3.2.3	Hydrogeological Studies	37
3.2.3.1	Groundwater level and Flow Direction	37
3.2.3.2	Electrical Resistivity Investigation	47
3.3	Air Environment	48
3.3.1	Meteorology	48
3.3.1.1	Climatic Variables	48
3.3.1.2	Wind Pattern	50
3.3.2	Ambient Air Quality Study	54
3.4	Noise Environment	60
3.5	Biological Environment	64
3.5.1	Flora	66
3.5.2	Fauna	80
3.6	Socio-Economics environment	85
3.6.1	Introduction	85
3.6.2	Objectives of the Study	85
3.6.3	Scope of work	85
3.6.4	Methodology and Analysis	85
3.6.5	Socio-Economic status of Study area	85
3.6.6	Presentation of Details	86
3.6.7	Recommendation and Suggestion	88
3.6.8	Summary and Conclusion	88
3.7	Traffic density	89
3.8	Site Specific Features	91

<b>IV</b>	<b>ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES</b>	<b>96-122</b>
4.0	General	96
4.1	Land Environment	96
4.1.1	Anticipated Impact	96
4.1.2	Common Mitigation Measures from Proposed Project	96
4.2	Soil Environment	97
4.2.1	Anticipated Impact	97
4.2.2	Mitigation Measures for Soil Conservation	97
4.3	Water Environment	97
4.3.1	Anticipated Impact	97
4.3.2	Common Mitigation Measures for the Proposed Project	98
4.4	Air Environment	99
4.4.1	Anticipated impact from Proposed Project	99
4.4.1.1	Emission Estimation	99
4.4.1.2	Frame work of Computation and Model Details	100
4.4.1.3	Modelling of Incremental Concentration	100
4.4.1.4	Model Results	101
4.4.2	Common Mitigation Measures	107
4.5	Noise Environment	108
4.5.1	Anticipated Impact	108
4.5.2	Common Mitigation Measures	110
4.5.3	Ground Vibrations	110
4.5.3.1	Common Mitigation Measures	112
4.6	Ecology And Biodiversity	113
4.6.1	Anticipated Impact on Flora	113
4.6.2	Mitigation Measures	113
4.6.3	Anticipated Impact on Fauna	116
4.6.4	Mitigation Measures	116
4.6.5	Summary of Impact Assessment on Biological Environment	117
4.7	Socio Economic Environment	119
4.7.1	Anticipated Impact	119
4.7.2	Common Mitigation Measures	119
4.8	Occupational Health and Safety	119
4.8.1	Respiratory Hazards	120
4.8.2	Noise	120

4.8.3	Physical Hazards	120
4.8.4	Occupational Health Survey	120
4.9	Mine Waste Management	121
4.10	Mine Closure	121
4.10.1	Mine Closure Criteria	121
4.10.1.1	Physical Stability	121
4.10.1.2	Chemical Stability	122
4.10.1.3	Biological Stability	122
<b>V</b>	<b>ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)</b>	<b>123-123</b>
5.0	Introduction	123
5.1	Factors behind the Selection of Project Site	123
5.2	Analysis of Alternative Site	123
5.3	Factors behind Selection of Proposed Technology	123
5.4	Analysis of Alternative Technology	123
<b>VI</b>	<b>ENVIRONMENTAL MONITORING PROGRAM</b>	<b>124-128</b>
6.0	General	124
6.1	Methodology of Monitoring Mechanism	124
6.2	Implementation Schedule of Mitigation Measures	126
6.3	Monitoring Schedule and Frequency	126
6.4	Budgetary provision for Environment Monitoring Program	128
6.5	Reporting schedules of monitored data	128
<b>VII</b>	<b>ADDITIONAL STUDIES</b>	<b>129-144</b>
7.0	General	129
7.1	Public Consultation for Proposed Project	129
7.2	Risk Assessment for Proposed Project	129
7.3	Disaster Management Plan for Proposed Project	132
7.3.1	Roles and Responsibilities of Emergency Team	133
7.3.2	Emergency Control Procedure	134
7.3.3	Proposed Fire Extinguishers	135
7.3.4	Alarm System	135
7.4	Cumulative Impact Study	136
7.4.1	Air Environment	138
7.4.1.1	Cumulative Impact of Air Pollutants	139
7.4.2	Noise Environment	140
7.4.3	Socio Economic Environment	141

7.4.4	Ecological Environment	142
7.5	Plastic Waste management Plan for Proposed Project	142
7.5.1	Objective	143
7.6	Post Covid health management Plan for Proposed Project	144
7.6.1	Post-Covid follow-up Protocol	144
<b>VIII</b>	<b>PROJECTS BENEFITS</b>	<b>146-148</b>
8.0	General	146
8.1	Employment Potential	146
8.2	Socio-Economic Welfare Measures Proposed	146
8.3	Improvement in Physical Infrastructure	146
8.4	Improvement in Social Infrastructure	146
8.5	Other Tangible Benefits	147
8.6	Corporate Social Responsibility	147
8.7	Corporate Environment Responsibility	148
<b>IX</b>	<b>ENVIRONMENTAL COST BENEFIT ANALYSIS</b>	<b>149</b>
<b>X</b>	<b>ENVIRONMENTAL MANAGEMENT PLAN</b>	<b>150-168</b>
10.0	General	150
10.1	Environmental Policy	150
10.1.1	Description of the Administration and Technical setup	150
10.2	Land Environment Management	151
10.3	Soil Management	152
10.4	Water Management	152
10.5	Air Quality Management	152
10.6	Noise Pollution Control	153
10.7	Ground Vibration and Fly rock control	154
10.8	Biological Environment Management	155
10.8.1	Green Belt Development Plan	155
10.9	Occupational Safety & Health Management	156
10.9.1	Medical Surveillance and Examinations	156
10.9.2	Proposed Occupational Health and Safety Measures	157
10.9.3	Health and Safety Training Program	10.9.3
10.9.4	Budgetary Provision for Environmental Management	160
10.10	Conclusion	168
<b>XI</b>	<b>SUMMARY AND CONCLUSION</b>	<b>169-179</b>
11.0	Introduction	169
11.1	Project Description	169

11.2	Description of the Environment	170
11.2.1	Land Environment	170
11.2.3	Soil Characteristics	170
11.2.2	Water Environment	170
11.3	Air Environment	171
11.4	Noise Environment	172
11.5	Biological Environment	172
11.6	Socio-Economic Environment	172
11.7	Anticipated Environmental Impacts and Mitigation Measures for Proposed Project	172
11.8	Analysis of Alternatives	176
11.9	Environmental Monitoring Program	177
11.10	Additional Studies	177
11.11	Project Benefits for Proposed Project	178
11.12	Environment Management Plan	179
11.13	Conclusion	179
<b>XII</b>	<b>DISCLOSURE OF CONSULTANT</b>	<b>180-185</b>

### LIST OF TABLES

<b>TABLE No.</b>	<b>CONTENTS</b>	<b>PAGE No.</b>
1.1	Details of Quarries within the cluster area of 500 m radius	2
1.2	Details of project proponent	6
1.3	Salient Features of Proposed Project	6
2.1	Site connectivity to the project area	10
2.2	Corner coordinates of proposed project	11
2.3	Estimated resources and reserves of the project	14
2.4	Year-wise production details	14
2.5	Conceptual Blasting Design	18
2.6	Operational details for proposed project	18
2.7	Machinery details	19
2.8	Land use data at present, during scheme of mining, and at the end of mine life	20
2.9	Mine closure budget	20

2.10	Ultimate pit dimension	22
2.11	Water requirement for the project	23
2.12	Fuel requirement details	23
2.13	Capital requirement details	24
2.14	Employment potential for the proposed project	24
2.15	Expected time schedule	25
3.1	Monitoring attributes and frequency of monitoring	26
3.2	LULC statistics of the study area	30
3.3	Soil sampling locations	33
3.4	Soil quality of the study area	35
3.5	Water sampling locations	36
3.6	Ground and Surface Water Quality Result	39
3.7	Pre-monsoon water level of Openwells within 2 km radius	41
3.8	Post-monsoon water level of Openwells within 2 km radius	41
3.9	Pre-monsoon water level of Borewells within 2 km radius	42
3.10	Post-monsoon water level of Borewells within 2 km radius	42
3.11	Vertical Electrical Sounding Data	47
3.12	Onsite Meteorological Data	49
3.13	Methodology and Instrument used for AAQ analysis	54
3.14	National Ambient Air Quality Standards	54
3.15	Ambient air quality (AAQ) monitoring locations	55
3.16	Summary of AAQ result	57
3.17	Noise Monitoring Locations	60
3.18	Ambient Noise Quality Result	61
3.19	Calculation of density, frequency (%), dominance, relative density, relative frequency, relative dominance & important value index	65
3.20	Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richnes	65
3.21	Flora in Mine Lease Area	66
3.22	Flora in 300m Radius	68
3.23	Calculation of Species Diversity in in 300m radius	70
3.24	Species richness (index) in 300m radius	70
3.25	Flora in Buffer Zone	71

3.26	Calculation of species diversity in Buffer Zone	74
3.27	Species richness (index) in Buffer Zone	75
3.28	Aquatic Vegetation	80
3.29	Fauna in core zone	82
3.30	Fauna in buffer zone	83
3.31	Munnur village Population Facts	86
3.32	Population and literacy data of study area	86
3.33	Workers Profile of Study Area	87
3.34	Communication & Transport Facilities in the Study Area	87
3.35	Water & Drainage Facilities in the Study Area	87
3.36	Other Facilities in the Study Area	88
3.37	Traffic survey locations	89
3.38	Existing traffic volume	89
3.39	Rough Stone Transportation Requirement	90
3.40	Summary of Traffic Volume	90
3.41	Details of environmentally sensitive ecological features in the study area	91
4.1	Empirical formula for emission rate from overall mine	99
4.2	Estimated emission rate	100
4.3	Incremental & Resultant GLC of PM <sub>2.5</sub>	101
4.4	Incremental & Resultant GLC of PM <sub>10</sub>	101
4.5	Incremental & resultant GLC of SO <sub>2</sub>	106
4.6	Incremental & resultant GLC of NO <sub>2</sub>	106
4.7	Activity and Noise level produced by machinery	109
4.8	Predicted Noise incremental values	109
4.9	Predicted PPV Values due to Blasting	111
4.10	Predicted PPV Values due to Blasting at 100-500 radius	111
4.11	Carbon Released During Five Years of Rough Stone and Gravel Production	113
4.12	CO <sub>2</sub> Sequestration	114
4.13	Recommended Species for Greenbelt development plan	114
4.14	Greenbelt Development Plan	115

4.15	Budget for greenbelt development plan	115
4.16	Ecological Impact Assessments	117
4.17	Anticipated Impact of Ecology and Biodiversity	118
6.1	Implementation schedule for proposed project	126
6.2	Proposed monitoring schedule post EC for the proposed quarry	127
6.3	Environment monitoring budget	128
7.1	Risk assessment& control measures for proposed project	130
7.2	<b>Proposed teams for emergency situation</b>	133
7.3	Proposed fire extinguishers at different locations in (P1)	135
7.4	Salient features of proposed project site (P2)	136
7.5	Salient features of Proposed Project Site (P3)	137
7.6	Salient features of Proposed Project Site (P4)	138
7.7	Cumulative production load of rough stone	139
7.8	Cumulative Production Load of Gravel	139
7.9	Cumulative Impact Results from the 4 proposed projects	139
7.10	Cumulative Impact of Noise from 4 Proposed Quarries on Puthurpatti Habitation	140
7.11	Cumulative Impact of Noise from 4 Proposed Quarries on Andisangillipalayam Habitation	140
7.12	Cumulative Effect of Ground Vibrations resulting from 5 Mines on Habitation of Puthurpatti	141
7.13	Cumulative Effect of Ground Vibrations resulting from 5 Mines on Habitation of Andisangillipalayam	141
7.14	Socio Economic Benefits from 4 Mines	142
7.15	Employment Benefits from 4 Mines	142
7.16	Greenbelt Development Benefits from 4 Mines	142
7.17	Actio Plan to Manage Plastic Waste	143
8.1	CER – action plan	148
10.1	Proposed controls for land environment	151
10.2	Proposed controls for water management	152
10.3	Proposed controls for air environment	153
10.4	Proposed controls for noise environment	153



10.5	Proposed controls for ground vibrations & fly rock	154
10.6	Proposed greenbelt development plan	156
10.7	Medical examination schedule	157
10.8	List of periodical trainings proposed for employees	159
10.9	EMP budget for proposed project	161
10.10	Estimation of overall EMP budget after adjusting 5% annual inflation	168
11.1	Anticipated impacts & mitigation measures	172

### **LIST OF FIGURES**

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
1.1	<b>Location of the proposed and existing rough stone quarries in the cluster of 500m radius</b>	3
2.1	Overall view of proposed project site	10
2.2	Key map showing location of the project site	11
2.3	Google earth image showing Pillar Coordinates of Lease Area	12
2.4	Surface and Geological Plan of Lease Area	13
2.5	Mine Lease Plan	15
2.6	Yearwise development and production plan and section	16
2.7	Mine Layout Plan and Land Use Pattern	21
2.8	Progressive Mine Closure Plan and section	21
2.9	Conceptual Plan and Section	22
3.1	Geology Map of 5km Radius from Proposed Project Site	28
3.2	Geomorphology Map of 5km Radius from Proposed Project Site	29
3.3	LULC Map of 5km Radius from Proposed Project Site	31
3.4	Drainage Map of 5 km Radius from Proposed Project Site	32
3.5	Toposheet showing soil sampling location within 5 km radius around the proposed project site	34
3.6	Toposheet showing water sampling locations within 5 km radius around the proposed project site	38

3.7	Open well static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season	43
3.8	Open well static groundwater elevation map showing the direction of groundwater flow during post-monsoon season	44
3.9	Borewell static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season	45
3.10	Borewell static groundwater elevation map showing the direction of groundwater flow during post-monsoon season	46
3.11	<b>Graph showing occurrence of water bearing fracture zones at the depth range of 65 m below ground level in proposed project</b>	48
3.3.1.2	<b>Long-term monthly average rainfall vs monthly rainfall</b>	50
3.13	<b>Windrose Diagram from 2018 and 2019 (October to December)</b>	51
3.13a	<b>Windrose Diagram from 2020 and 2021 (October to December)</b>	52
3.14	Onsite wind rose diagram	53
3.15	Toposheet showing ambient air quality monitoring station locations around 5 km radius from the proposed project site	56
3.16	Bar chart showing maximum, minimum and the average concentrations of PM <sub>2.5</sub> measured from the 10 air quality monitoring stations within 5 km radius	58
3.17	Bar chart showing maximum, minimum, and the average concentrations of PM <sub>10</sub> measured from 10 air quality monitoring stations within 5km radius	58
3.18	Bar chart showing maximum, minimum, and the average concentrations of SO <sub>2</sub> measured from 10 air quality monitoring stations within 5km radius	59
3.19	Bar chart showing maximum, minimum, and the average concentrations of NO <sub>2</sub> measured from 10 air quality monitoring stations within 5 km radius	59
3.20	Bar chart showing maximum, minimum, and the average concentrations of pollutants in the atmosphere within 5km radius	60
3.21	Toposheet showing noise level monitoring station locations around 5 km	62

	radius from the proposed project site	
3.22	Bar chart showing day time noise levels measured in core and buffer zones	63
3.23	Bar chart showing night time noise levels measured in core and buffer zones	63
3.24	Quadrates sampling methods of flora	64
3.25	Vegetation Inside the Lease Area	67
3.26	Floral diversity species Richness (Index) in buffer zone and 300m Radius	76
3.27	Flora in Core and Buffer area	79
3.28	Traffic Density Map	90
3.29	Field Study Photographs	95
4.1	Predicted incremental concentration of PM <sub>2.5</sub>	102
4.2	Predicted incremental concentration of PM <sub>10</sub>	103
4.3	Predicted incremental concentration of SO <sub>2</sub>	104
4.4	Predicted incremental concentration of NO <sub>x</sub>	105
6.1	Proposed environmental monitoring chart	125
7.1	Disaster management team layout for proposed project	132
10.1	Personal protective equipment to the mine workers	158

### **LIST OF ANNEXURES**

<b>Annexure No.</b>	<b>Contents</b>	<b>Page No.</b>
I	Copy of ToR Letter	187-207
II	Copy of 500 m Radius Letter	208-210
III	Approved Mining Plan Along with Mining Plan AD/DD Letter/Original Mining Plan Plates	211-321
IV	Copy of DFO 25 km Radius Letter	322
V	Copy of VAO 300 m Radius Letter	323
VI	NABET Certificate of EIA Consultant	324

## 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 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> 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 letter No. SEIAA-TN/F.No.9423/ToR-1275/2022 dated 08.10.2022, this EIA report has been prepared for the project proponent, **M/s. New Star Blue Metals** applied for rough stone and gravel quarry lease in the Patta land falling in S. F. No. 553/2(Part), over an extent of 1.62.0 ha in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone and gravel quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains four proposed projects, known as P1, P2, P3 and P4, One Existing Project E1 and two Expired Projects EX1, EX2. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1<sup>st</sup> July 2016. The total extent of all the quarries in the cluster is 18.31.0ha, 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**

<b>Proposed Quarries</b>				
<b>Code</b>	<b>Name of the Owner</b>	<b>S.F. No and Village</b>	<b>Extent (ha)</b>	<b>Status</b>
<b>P1</b>	Tvl. New Star Blue Metals	553/2(P) Kuppam	1.62.0	Proposed Area
<b>P2</b>	M/s. NTC Blue Metals LLP	544/1, 544/2, 544/3 545/1(P) Kuppam	2.15.0	Applied Area
<b>P3</b>	M/s. NTC Blue Metals LLP	543/1, 543/2, 543/3 557/2(P) Kuppam	2.28.5	Applied Area
<b>P4</b>	Tmt.K.Rani	545/2 Kuppam	0.84.5	Applied Area
<b>Existing Quarries</b>				
<b>E1</b>	Thiru,C.Chinnusamy	551/1(Part)	2.00.0	21.2.2018 to 20.02.2023
<b>Expired Quarries</b>				
<b>EX1</b>	Thirumalai Blue Metals	1238/2 Kuppam	4.80.0	14.10.2016 to 13.10.2021
<b>EX2</b>	Tvl. New Star Blue Metals	533/1, 534/1, 550/C3 Kuppam	4.61.0	02.12.2016 to 01.12.2021
<b>Total Cluster Extent</b>			<b>18.31.0</b>	---

**Source:**

- i).DD Letter – Rc.No.482/Mines/2021 Dated 20.07.2022*
- ii) DD Letter: Rc.No.571/Mines/2021, Dated:22.06.2022*
- iii) DD Letter: Rc.No.291/Mines/2021, Dated:04.04.2022*
- iv) DD Letter: Rc.No.435/Mines/2021, Dated:22.06.2022*

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

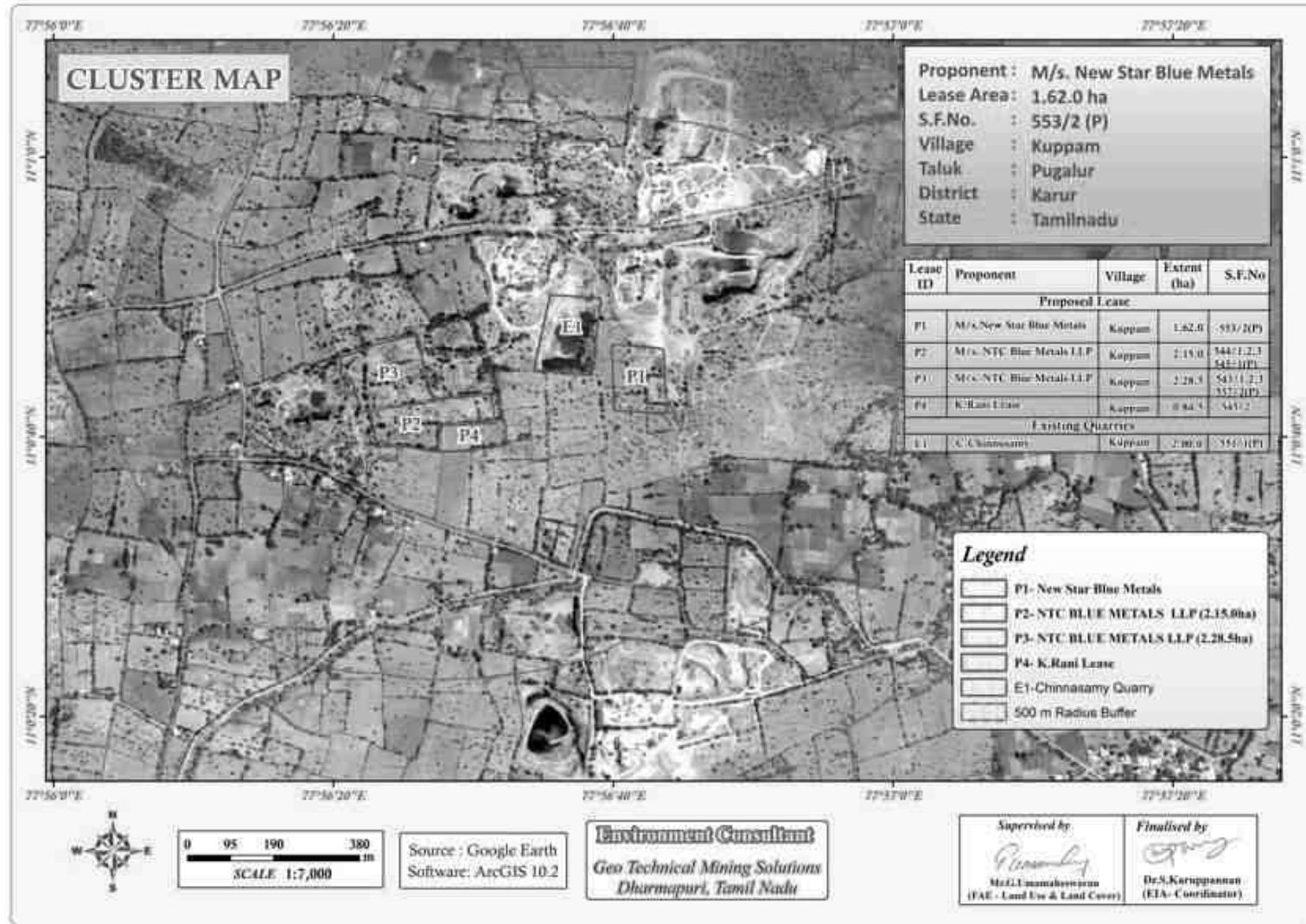


Figure 1.1 Location of Proposed and Existing Rough Stone and Gravel Quarries in the Cluster of 500 m Radius

## **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-December 2022** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015 to analyse impacts and provide mitigation measures.

## **1.2 ENVIRONMENTAL CLEARANCE**

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

### ***Screening***

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/ MIN/ 81223/2022, dated 27.07.2022) 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 01.08.2022.

### ***Scoping***

The proposal was placed in the 312<sup>th</sup> meeting of SEAC on 16.09.2022. 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 (TNPCCB) 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.

### **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 **Letter No: SEIAA-TN/F.No.9423/ToR-1275/2022 Dated :08.10.2022 for the preparation of an EIA report.**

### **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 1<sup>st</sup> June and 1<sup>st</sup> 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 GENERIC STRUCTURE OF EIA DOCUMENT**

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. The generic structure of the EIA document should be as under:

- ❖ Introduction
- ❖ Project Description
- ❖ Description of the Environment
- ❖ Anticipated Environmental Impact & Mitigation Measures



- ❖ Analysis of Alternatives (Technology & Site)
- ❖ Environmental Monitoring Program
- ❖ Additional Studies
- ❖ Project Benefits
- ❖ Environmental Cost Benefit Analysis
- ❖ Environmental Management Plan (EMP)
- ❖ Summary & Conclusion
- ❖ Disclosure of Consultants engaged.

### 1.7 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.

#### 1.2 Details of Project Proponent

<b>Name of the Project Proponent</b>	<b>M/s. New Star Blue Metals</b>
Address	Poolankaadu Uppupalayam, Kuppam Post, Pugalur Taluk Pugalur, Karur - 639111
Status	Proprietor

### 1.8 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 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 Tamil Nadu State. Some of the important features of the proposed project have been provided in Table 1.3.

**Table 1.3 Salient Features of Proposed Project**

Name of the Quarry	<b>M/s. New Star Blue Metals Rough Stone and Gravel Quarry</b>
Type of Land	Patta land
Extent	1.62.0
S.F.No	553/2 (part)
Toposheet No.	58-E/16
Highest Elevation	165 AMSL

Latitude	11°0'41.69"N to 11°0'46.62"N	
Longitude	77°56'36.90"E to 77°56'43.82"E	
Ultimate Depth of Mining	20 m BGL as per ToR	
Geological Resources	Rough stone (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
	694837	32318
Mineable Reserves	234592	25088
Proposed production for 5 years	164992	25088
Method of Mining	Open cast semi mechanized mining method	
Topography	Undulated Terrain	
Machinery proposed	Jack hammer	3
	Excavator	1
	Compressor	1
	Tipper	7
Blasting Method	Controlled blasting method involving shot hole drilling and small dia. of 25 mm slurry explosives is proposed for removal of rough stone.	
Proposed Manpower Deployment	14 persons	
Project Cost	Rs. 69,05,000/-	
Proposed Water Requirement	4.0 KLD	

## 1.9 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 2022** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The

sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

### **1.10 REFERENCES**

The report has been prepared using the following references:

- ❖ Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- ❖ EIA Notification, 14<sup>th</sup> September, 2006
- ❖ Terms of Reference (ToR) issued by SEIAA.
- ❖ Approved Mining Plan of this Project.
- ❖ 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.

## **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. New Star Blue Metals** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone and gravel. Therefore, the proponent had applied for quarry lease on 12.10.2021 to extract rough stone and gravel. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.482/Mines/2021 dated 19.04.2022. 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.482/Mines/2021 dated 11.07.2022). 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, as shown in Figure 2.2. The area lies between Latitudes from 11°0'41.69"N to 11°0'46.62"N and Longitudes from 77°56'39.90"E to 77°56'43.82"E. The maximum altitude of the project area is 165m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

**Table 2.1 Site Connectivity to the Project Area**

<b>Type of Features</b>	<b>Name/Location</b>	<b>Distance (km)</b>	<b>Direction</b>
Nearest Roadways	(SH-84) Erode to Karur	2.60 km	E
	(SH – 332) Noyyal to Paramathi	2.33 km	W
Nearest Railway	Pugalur	6.76	NE
Nearest Airport	Tiruchirapalli	88 km	E
Nearest Seaport	Tutcorin	253 km	S

## **2.3 LEASEHOLD AREA**

- ❖ The extent of the proposed project site is 1.62.0 ha.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

### **2.3.1 Corner Coordinates**

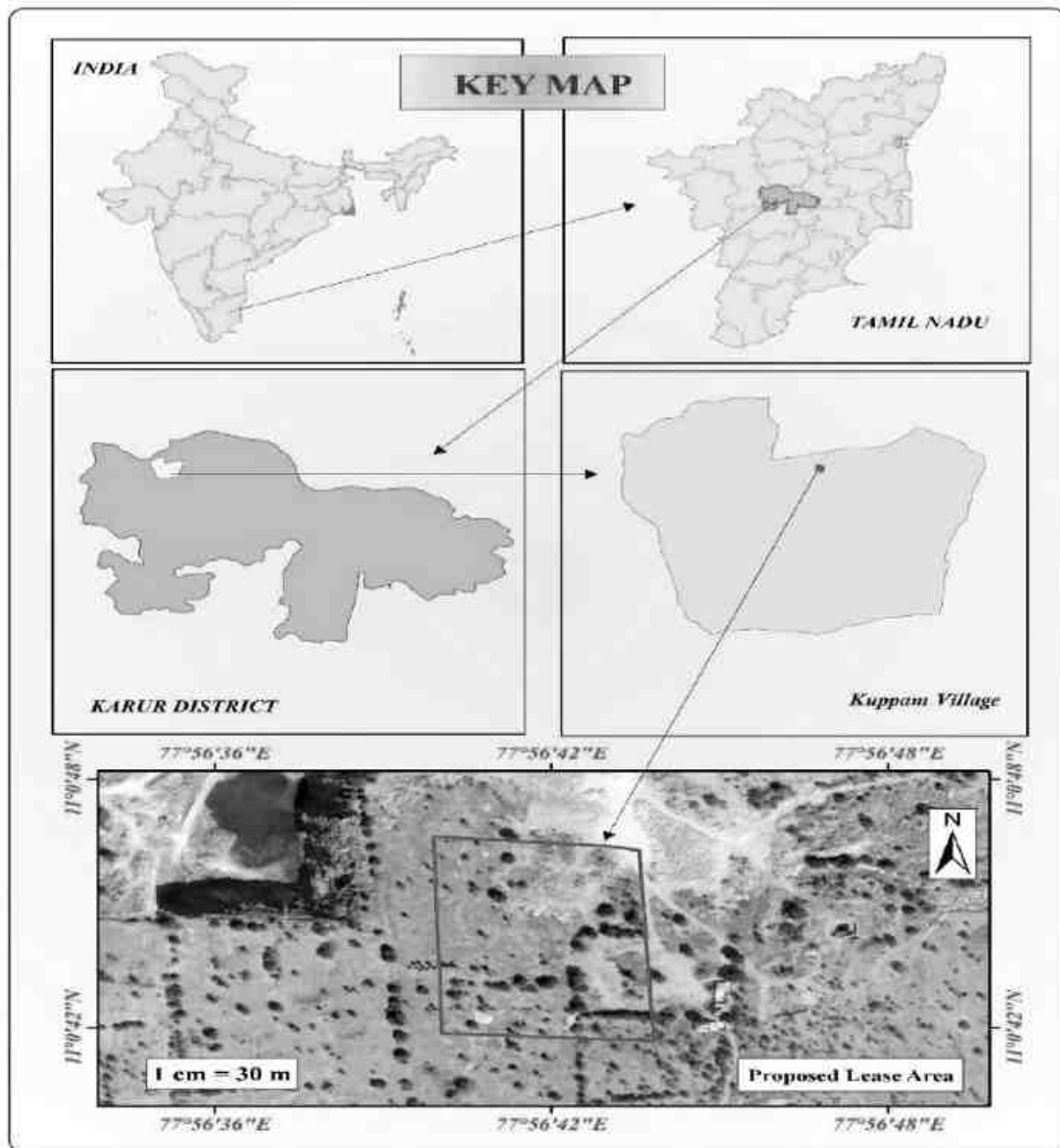
- ❖ The boundary corner geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.3.

**Table 2.2 Corner Coordinates of Proposed Project**

Pillar ID	Latitude	Longitude
1	11°0'46.27"N	77°56'43.56"E
2	11°0'41.69"N	77°56'43.82"E
3	11°0'41.87"N	77°56'40.05"E
4	11°0'46.62"N	77°56'39.90"E
5	11°0'46.38"N	77°56'42.98"E

**2.4 GEOLOGY AND GEOMORPHOLOGY**

The lease area geologically occurs in migmatite terrain. The Charnockite, commercially called as Roughstone occurs within the migmatite rock, as shown in Figure 2.4. Also, the lease area geomorphologically occurs over pediplain.



**Figure 2.2 Key Map Showing Location of Project Site**

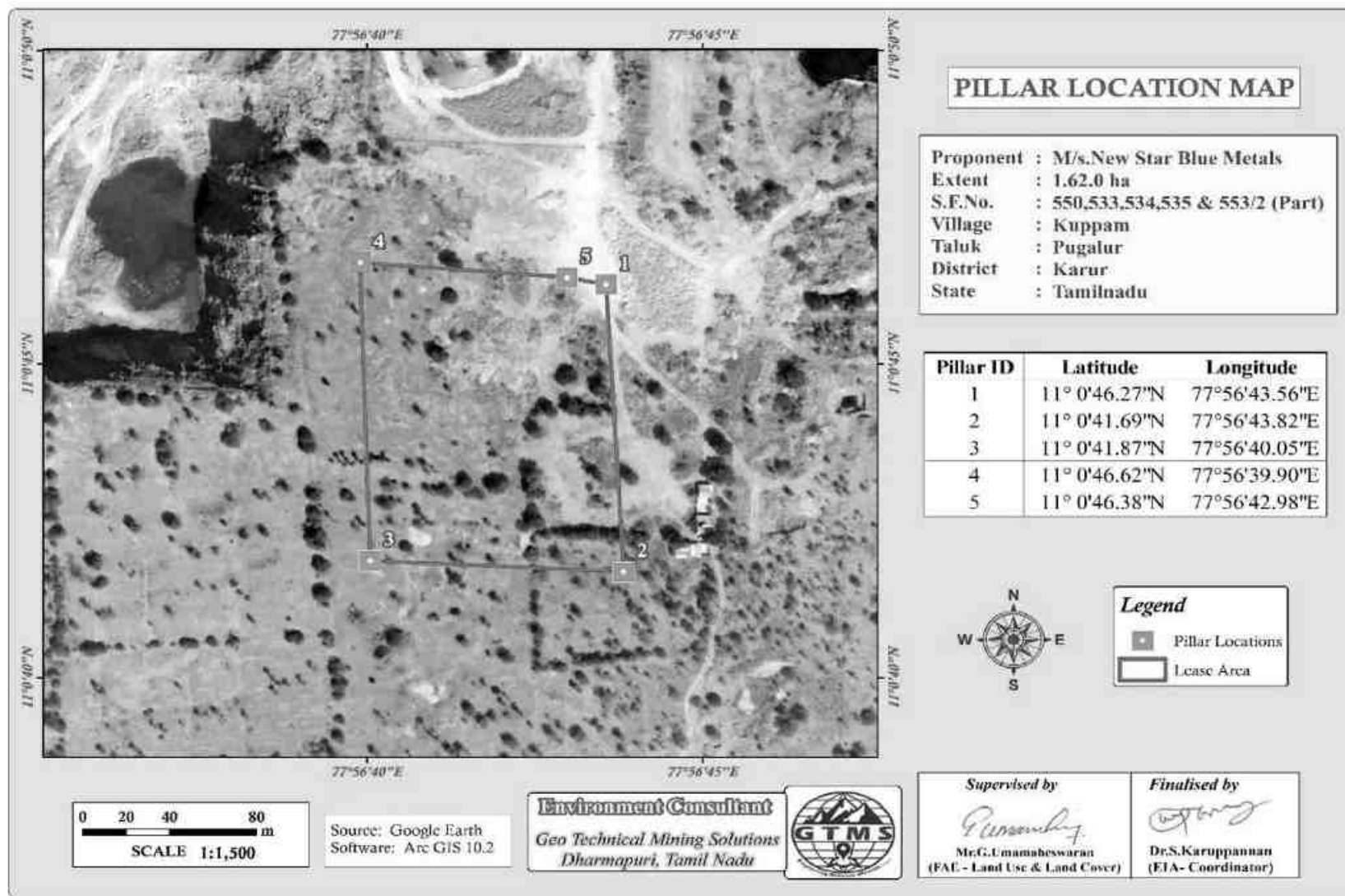


Figure 2.3 Google Earth Image Showing Pillar Coordinates of Lease Area





## 2.5 QUANTITY OF RESERVES

The resources and reserves of rough stone and gravel were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety margins, as shown in Figure 2.5 and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 20 m BGL considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The 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 <sup>3</sup>	Gravel in m <sup>3</sup>
Geological Resource in m <sup>3</sup>	694837	32318
Mineable Reserves in m <sup>3</sup>	234592	25088
Proposed production for 5 years m <sup>3</sup>	164992	25088

Based on the year wise development and production plan and sections, as exemplified in Figures 2.6 the year wise production results have been provided in Table 2.4.

**Table 2.4 Year-Wise Production Details**

Year	Rough Stone (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
I	26282	8428
II	31708	8232
III	31562	8428
IV	42120	-
V	33320	-
<b>Total</b>	<b>164992</b>	<b>25088</b>

*Source: Approved Mining Plan & ToR*

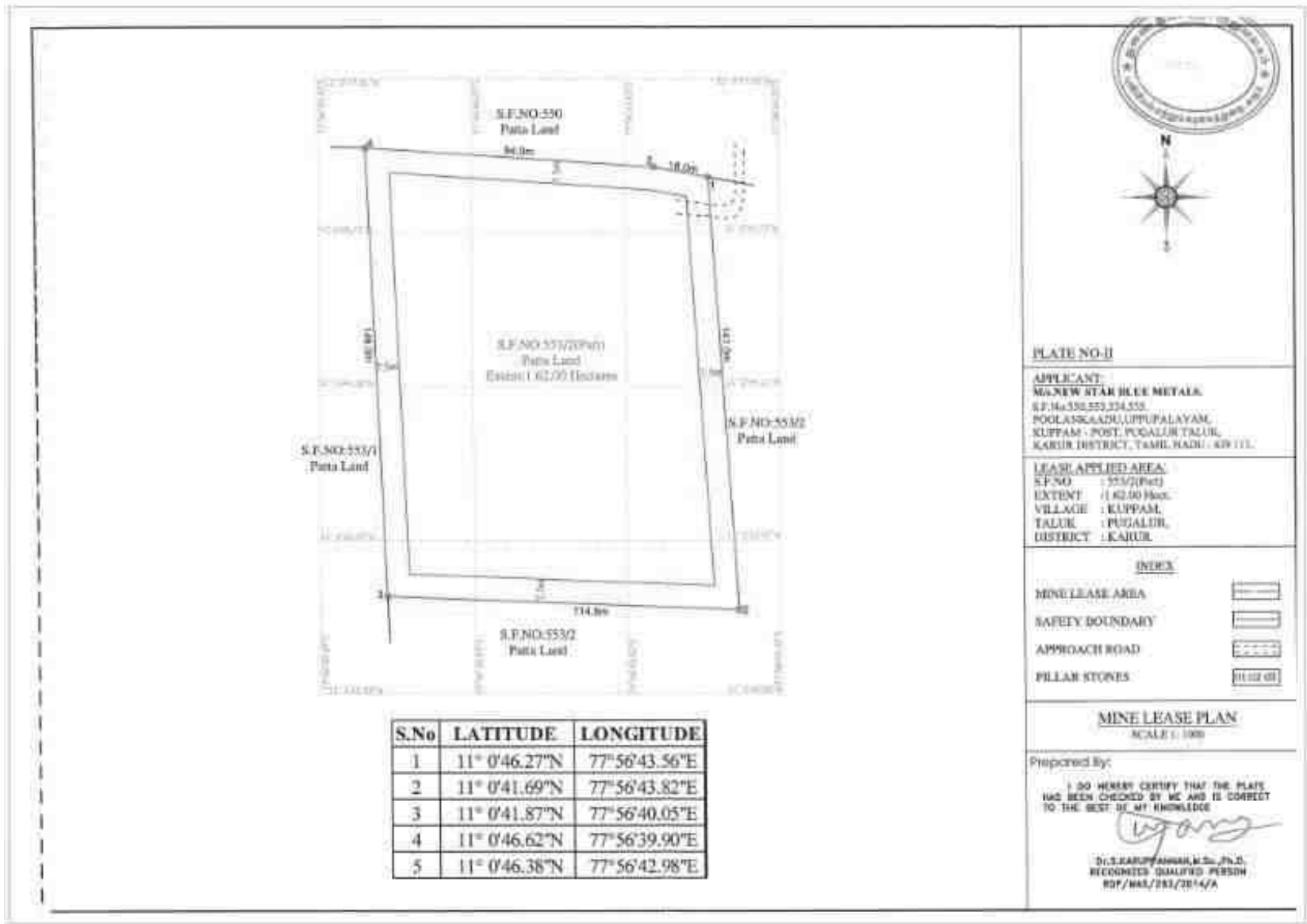


Figure 2.5 Mine Lease Plan

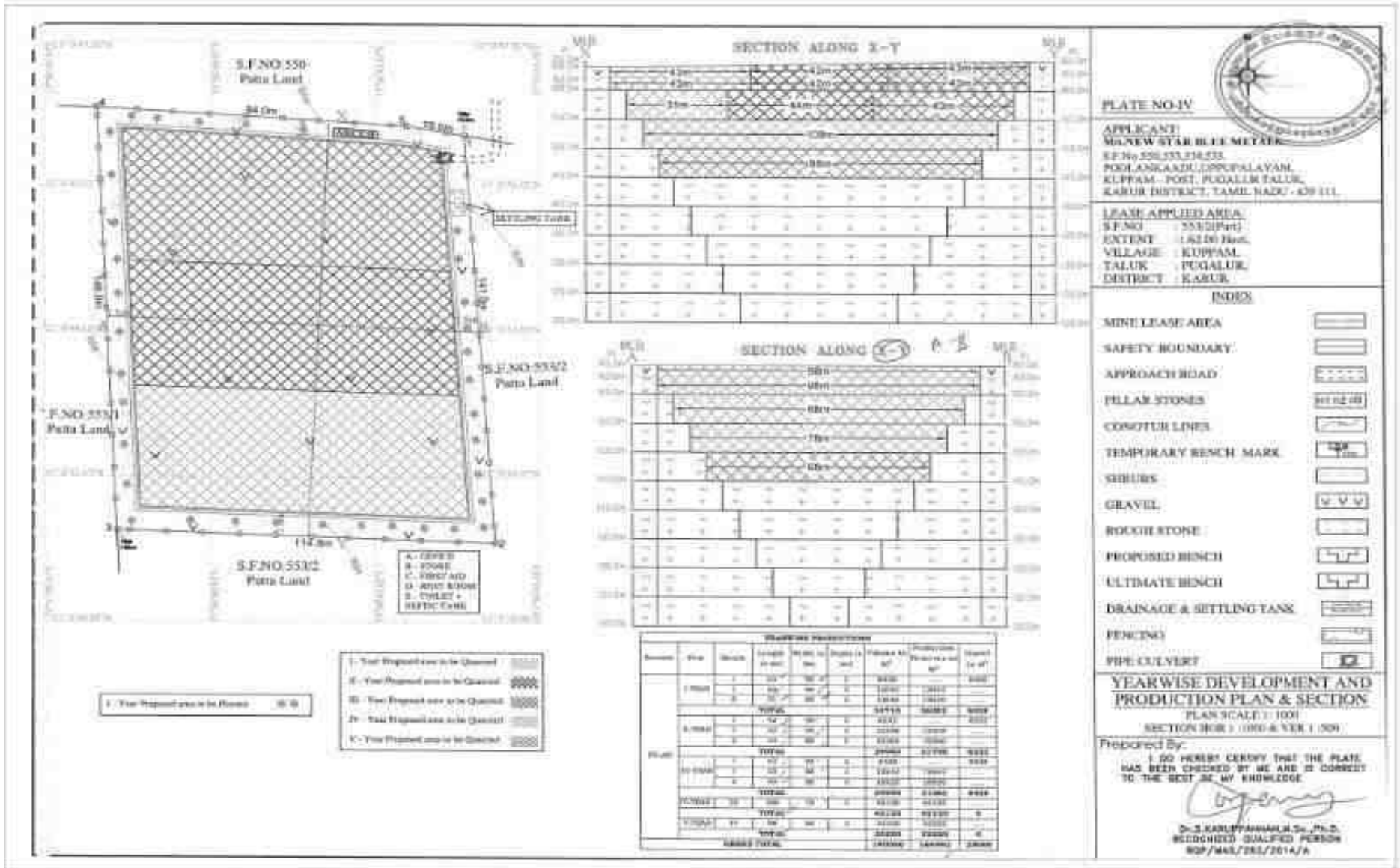


Figure 2.6 Yearwise development and Production Plan and Section

## **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.

### **2.6.1 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
Spacing (S) in m	0.97
Subdrill in m	0.3
Charge length (C) in m	0.64
Stemming	1
Hole Length (L) in m	1.9
Bench Height (BH) in m	1.6
Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.64
Blast volume/hole in m <sup>3</sup>	1.59

Production of rough stone/day in m <sup>3</sup>	122
Number of blastholes/day	77
Blasthole pattern	Staggered/Rectangular
Mass of explosive /day in kg	31
Powder factor in kg/m <sup>3</sup>	0.25
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	23

### 2.6.2 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/5 years	Gravel/3 year
Proposed production	164992	25088
Number of Working Days	270	270
Production /Day (m <sup>3</sup> )	122	31
No. of Lorry Loads	20	5

### 2.6.3 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/Dia of Hole(mm)	Motive Power
1	Jack Hammers	3	Hand Held	32mm	Diesel Drive
2	Compressor	1	Air	Atlas Copco	Diesel Drive
3	Excavator	1	-	Hitachi	Diesel Drive
<b>Haulage &amp; Transport Equipment</b>					
4	Tipper	7	15 M. T	Bharath Benz	Diesel Drive

### 2.6.4 Progressive Quarry Closure Plan

The progressive quarry closure plan (Figure 2.7,2.8) 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 1.62.0 ha of land is designated as unutilized area. Whereas, at the end of the

mine life, about 1.26.2 ha of land would have been quarried; about 0.02.0 ha of land would have been used for establishing infrastructures; about 0.08.0 ha of land would have been used for road development; about 0.20.0 ha of land would have been used for green belt development; about 0.04.0 ha of land would have been used for drainage and settling tank construction; and about 0.01.8 ha of land would have been unutilized.

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

<b>Description</b>	<b>Present Area (ha)</b>	<b>Area at the end of life of quarry (ha)</b>
Area under quarry	Nil	1.26.2
Infrastructure	Nil	0.02.0
Roads	Nil	0.08.0
Green Belt & Dump	Nil	0.20.0
Drainage & Settling tank	Nil	0.04.0
Unutilized area	1.62.0	0.01.8
<b>Total</b>	<b>1.62.0</b>	<b>1.62.0</b>

### 2.6.5 Quarry Closure Budget

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, final mine closure plan is not proposed for now. Based on the environment management plan as discussed in Chapter X, the mine closure cost is given in Table 2.9.

**Table 2.9 Mine Closure Budget**

<b>Activity</b>	<b>Capital Cost</b>	<b>Recurring Cost/Annum</b>
324 Plants Inside the Lease Area	64800	9720
486 Plants Outside the Lease Area	145800	14580
Wire Fencing	324000	16200
Garland Drain	16200	8100
<b>Total</b>	<b>550800</b>	<b>48600</b>

*Source: Environment Management Plan*

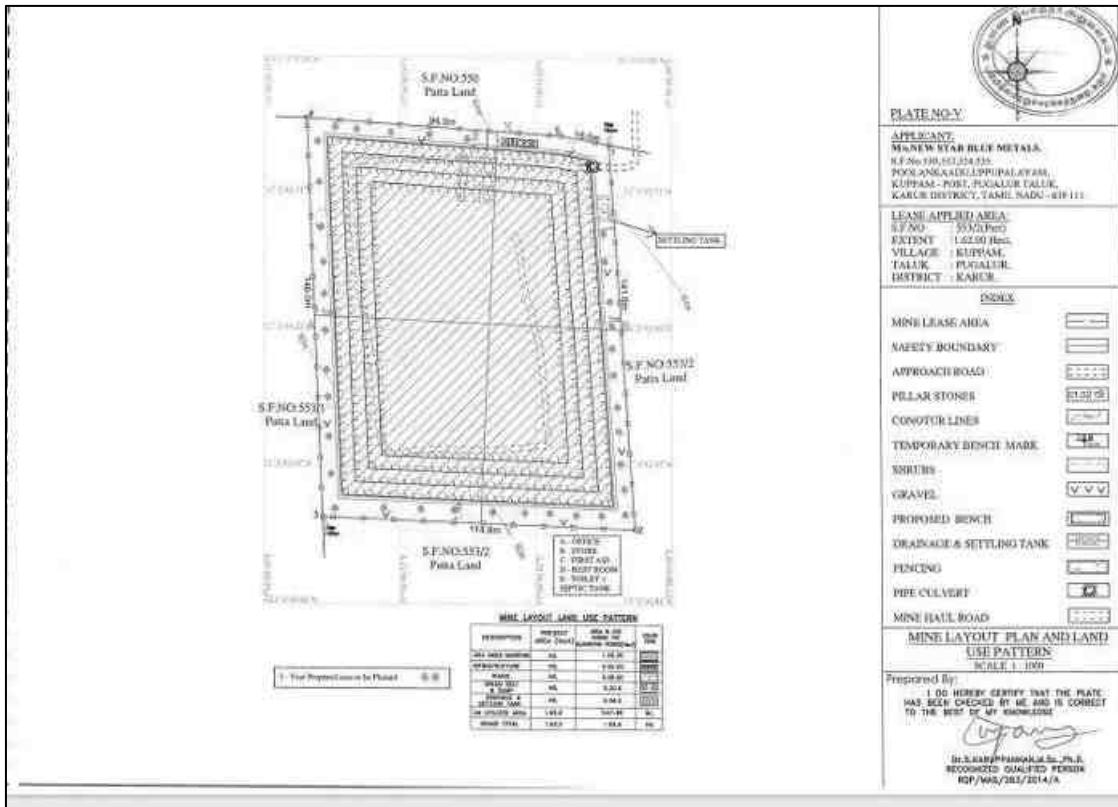


Figure 2.7 Mine Layout Plan and Land Use Pattern

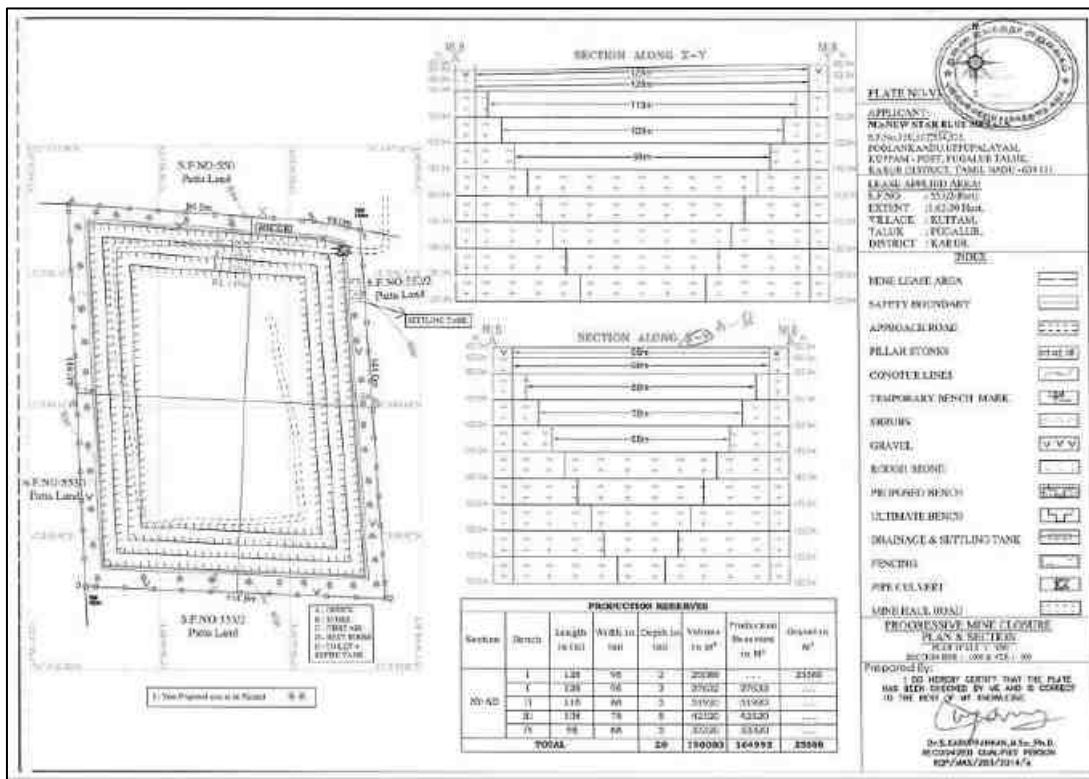


Figure 2.8 Progressive Mine Closure Plan & Section



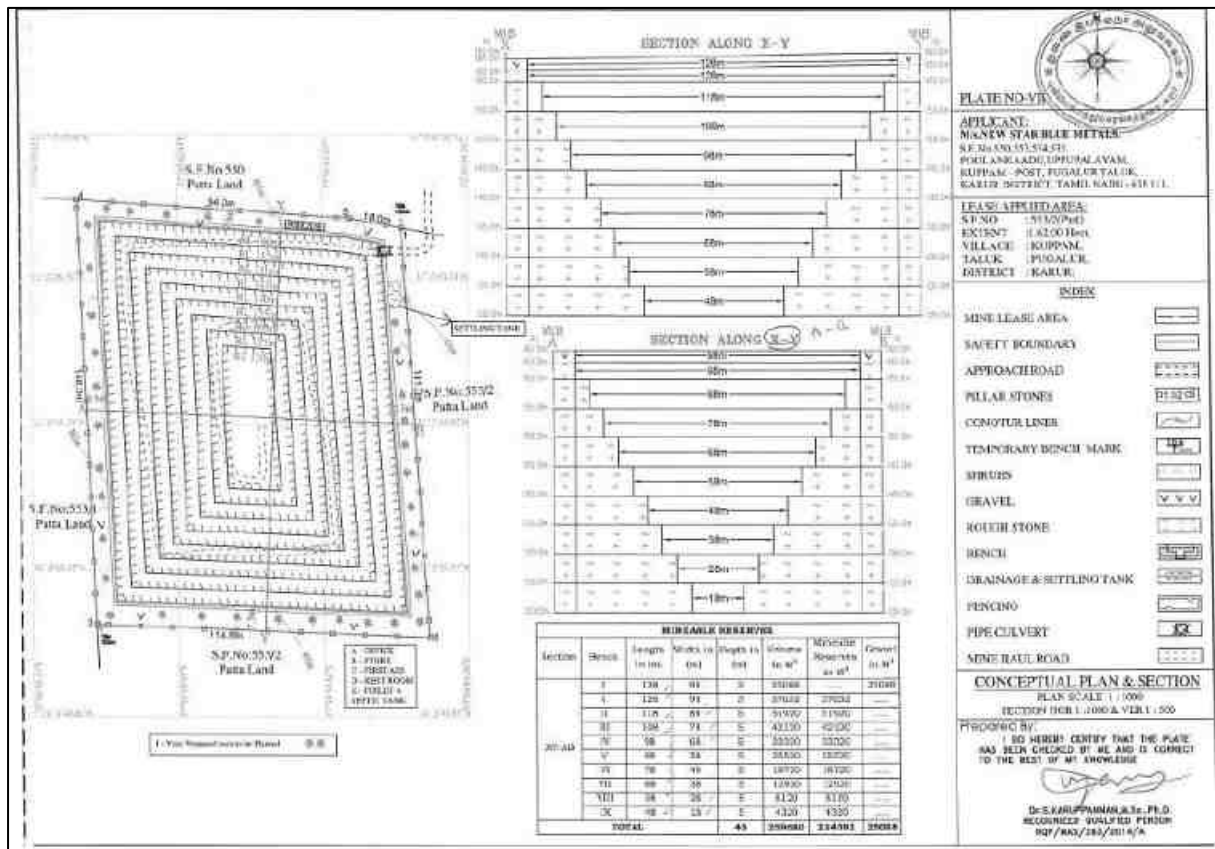


Figure 2.9 Conceptual plan and section

### 2.6.6 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. The ultimate pit dimension derived from Figures 2.9 is provided in Table 2.10.

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m)	Depth(m)
I	128	98	20m

Source: Approved Mining Plan & ToR

### 2.6.7 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.

### **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.

### **2.6.8 Water Requirement**

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

**Table 2.11 Water Requirement for the Project**

<b>Purpose</b>	<b>Quantity</b>	<b>Source</b>
Dust Suppression	1.0 KLD	Existing bore wells nearby the lease area
Green Belt development	0.5 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	2.5 KLD	Existing bore wells and approved water vendors
<b>Total</b>	<b>4.0 KLD</b>	

*Source: Prefeasibility Report*

### **2.6.9 Energy Requirement**

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 811355 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**

<b>Fuel Requirement for Excavator</b>			
<b>Details</b>	<b>Rough Stone (164992 m<sup>3</sup>)</b>	<b>Gravel (25088 m<sup>3</sup>)</b>	<b>Total Diesel (litre)</b>
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m <sup>3</sup> /hr)	20	60	---
Time Required (hours)	8250	418	---
Total Diesel Consumption for 5 years (litre)	131994	4181	136175
<b>Fuel Requirement for Compressor</b>			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	77	---	---

Total Diesel Consumption for 5 years (litre)	41580	---	41580
<b>Fuel Requirement for Tipper</b>			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m <sup>3</sup>	6	6	---
Number of Trips / days	20	3	---
Number of Trips / 5 years	27499	4181	---
Total Diesel Consumption for 5 years (litre)	549973	83627	633600
<b>Total Diesel Consumption by Excavator, Compressor and Tipper</b>			<b>811355</b>

### 2.6.10 Capital Requirement

The project proponent will invest Rs.69,05,000/- 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	15,50,000
2	Machinery	20,00,000
3	EMP	33,55,000
<b>Total Project Cost</b>		<b>69,05,000/-</b>

*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	Mines Manager	1
		Mining Engineer	1
		Mining Geologist	1
		Blaster	1
2	Unskilled	Musdoor/ Labours	10
<b>Total</b>			<b>14</b>

*Source: Prefeasibility Report*

## 2.8 PROJECT IMPLEMENTATION SCHEDULE

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

**Table 2.15 Expected Time Schedule**

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

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

**CHAPTER III**  
**DESCRIPTION OF THE ENVIRONMENT**

**3.0 GENERAL**

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **October through December, 2022** 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**

<b>Attribute</b>	<b>Parameters</b>	<b>Frequency of Monitoring</b>	<b>No. of Locations</b>	<b>Protocol</b>
Land Use/ Land Cover	Land-use Pattern within 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico- Chemical characteristics	Once during the study period	8 (1 in core & 7 in buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi

*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	10 (1 surface water & 9 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 <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> Fugitive dust	24 hours, twice a week (February to April 2022.)	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	12 (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 migmatite and aeolian sediments, as shown in Figure 3.1. The lease area occurs in migmatite terrain.

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

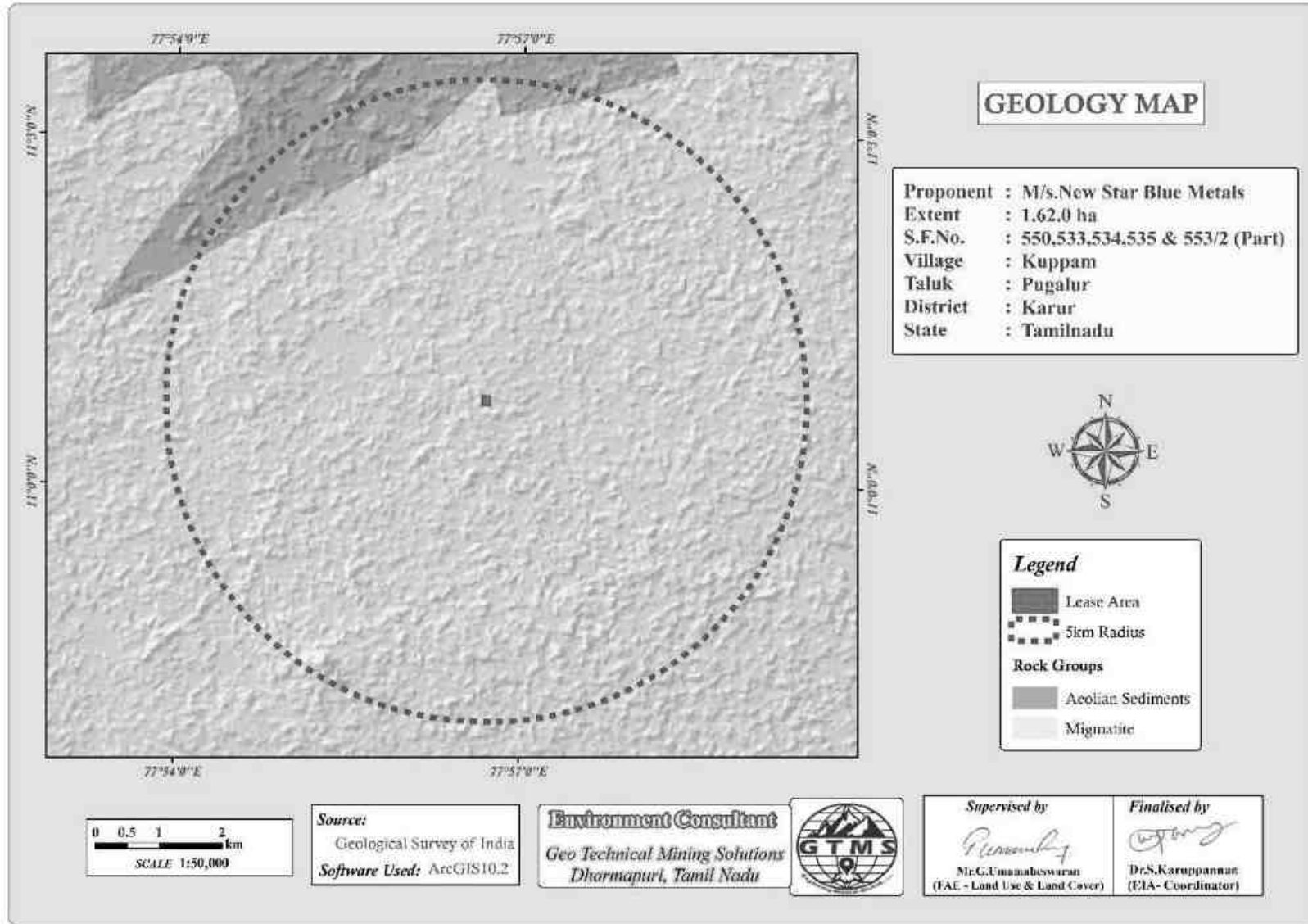


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

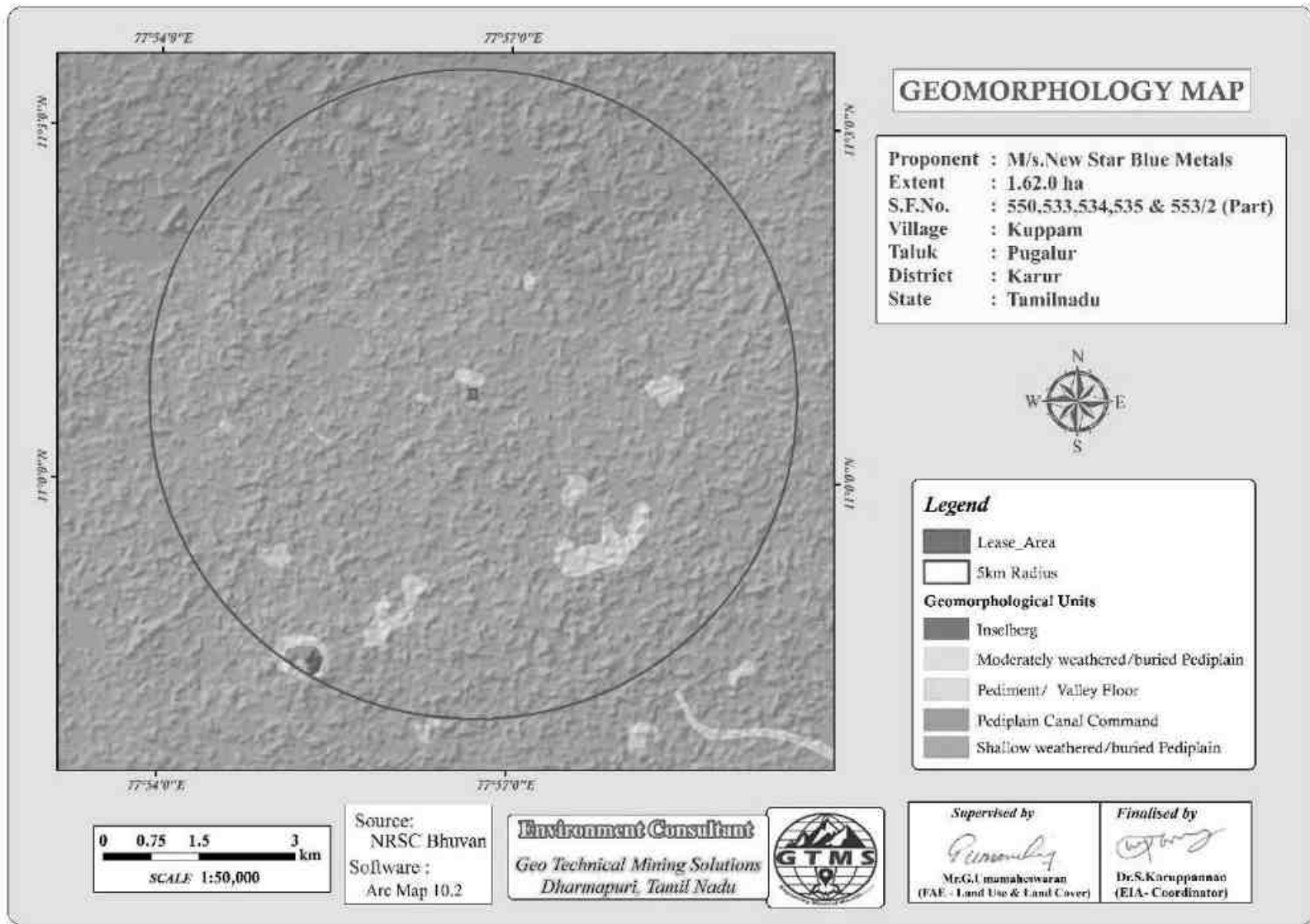


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site



### 3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 7 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 176 ha accounting for 2.31 %, of which lease area of 1.62.0 ha contributes only about 0.02%. This small percentage of mining activities shall not have any significant impact on the land environment.

**Table 3.2 LULC Statistics of the Study Area**

S. No.	Classification	Area (ha)	Area (%)
1	Crop Land	6542	85.80
2	Dense Forest	96	1.26
3	Fallow Land	32	0.42
4	Mining/Industrial lands	176	2.31
5	Plantations	709	9.29
6	Settlements	5	0.07
7	Water Bodies	65	0.85
<b>Total</b>		<b>7626</b>	<b>100</b>

Source: Sentinel II Satellite Imagery

### 3.1.3 Topography

The proposed lease area is located in a flat terrain with an altitude range of 164-165 m AMSL, showing relief of 1 m.

### 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.

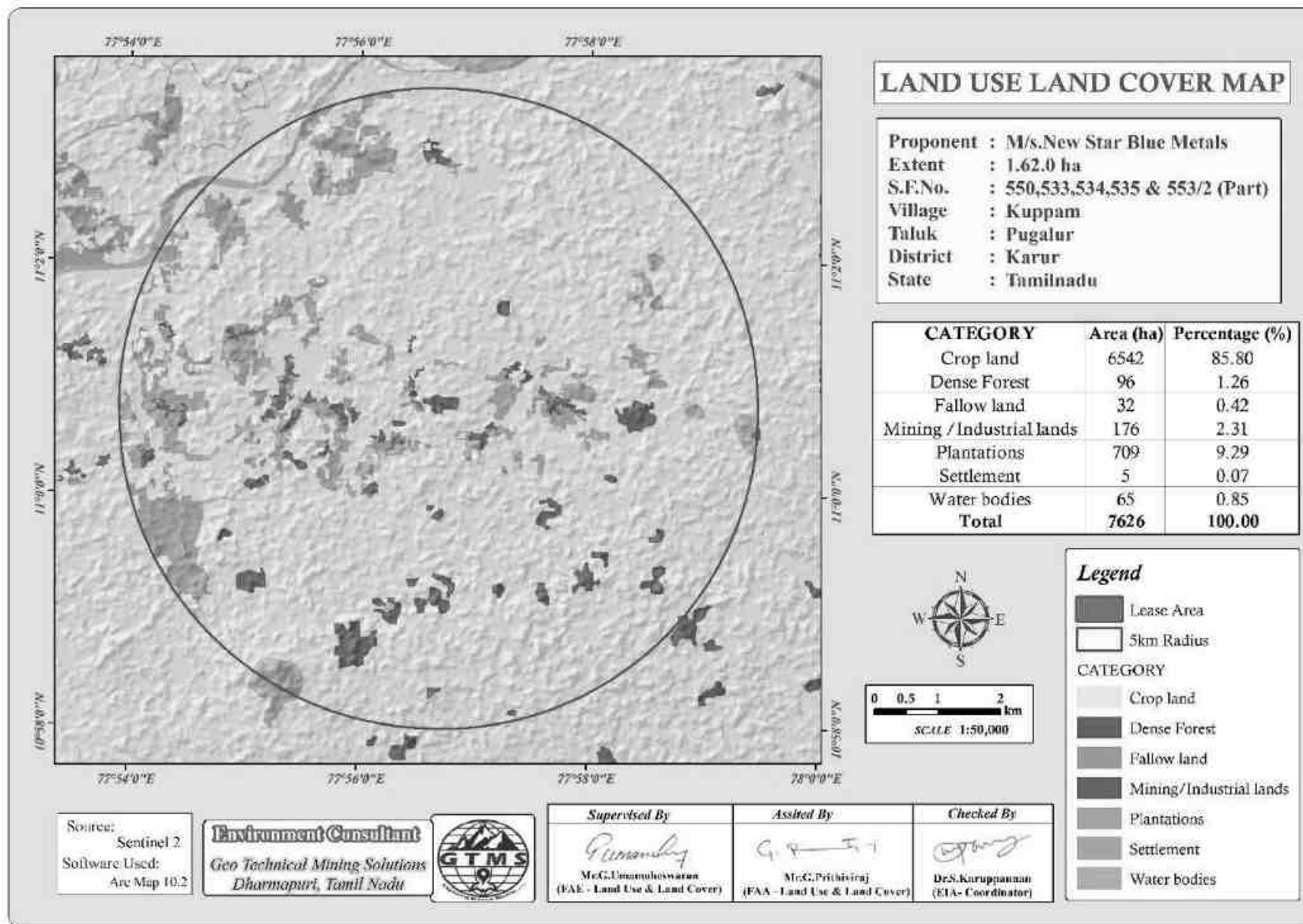
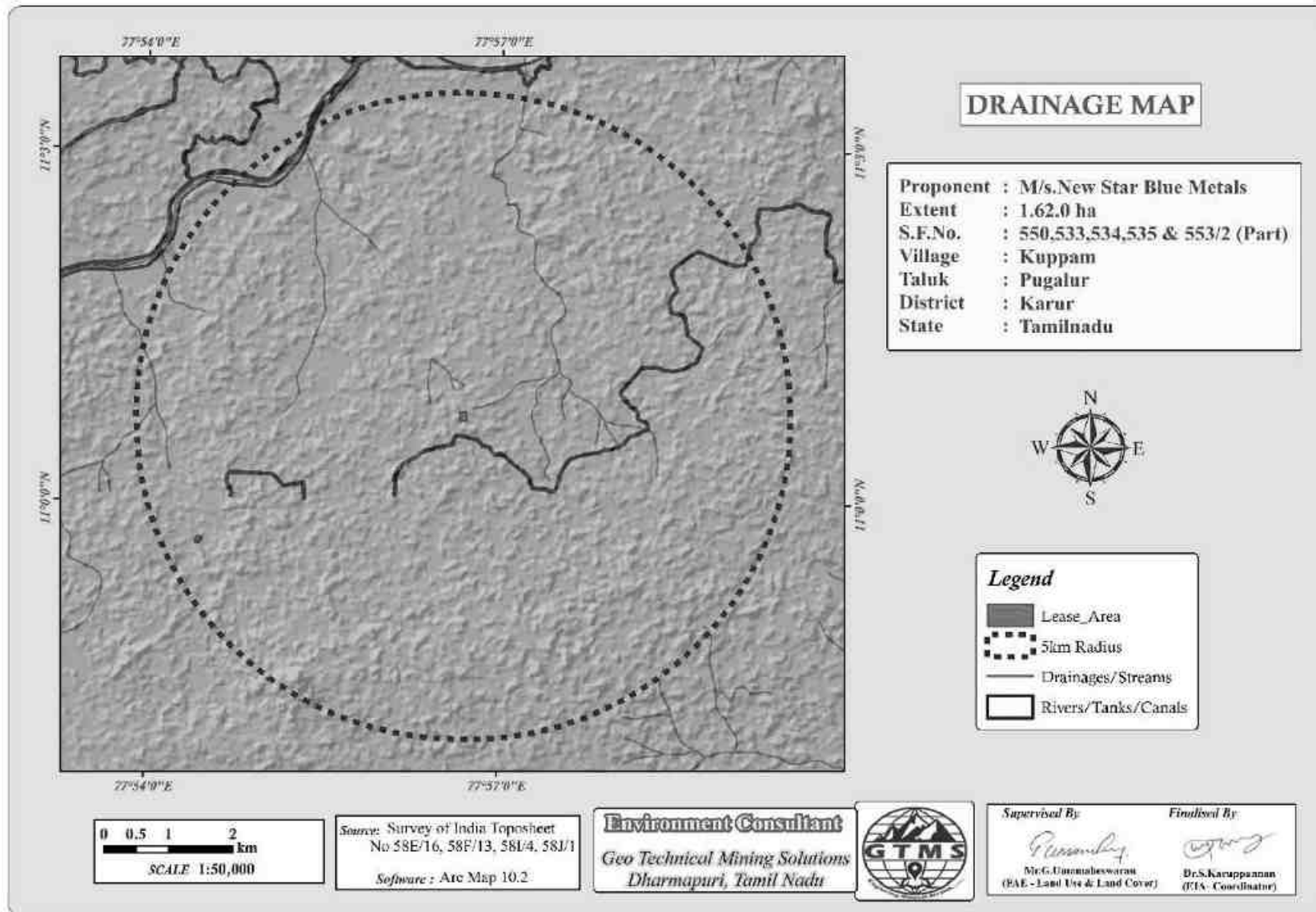


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site



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

### 3.1.6 Soil

Composite soil samples were collected from 8 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.3. 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	Near Rani Lease	0.27	W	11°0'41.88"N,77°56'29.60"E
2	S02	Core	---	---	11°0'43.99"N,77°56'40.41"E
3	S03	Amaravathi Lease	0.94	S	11°0'11.59"N,77°56'35.92"E
4	S04	Vetamangalam	2.55	N	11°2'7.90"N,77°56'27.47"E
5	S05	Uppupalaiyam	2.19	E	11° 0'40.39"N,77°57'52.96"E
6	S06	Valipuram	3.81	SE	10°58'56.01"N,77°57'55.53"E
7	S07	Kuppam	2.31	W	11°0'45.84"N,77°55'23.83"E
8	S08	Munnur	4.87	SW	10°59'13.87"N,77°54'25.10"E

*Source: On-site monitoring/sampling by Excellence Laboratory (P) Limited, in association with GTMS.*

#### **Physical Characteristics**

The soil samples in the study area show loamy textures varying between silty clay loam, 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 143 to 247  $\mu\text{s}/\text{cm}$ . Bulk density ranges between 1.2 and 3.8  $\text{g}/\text{cm}^3$ .

#### **Chemical Characteristics**

Nitrogen ranges between 0.04 and 1.1 %. Phosphate ranges between 0.14 and 3.8 %. Potassium ranges between 0.12 and 0.26 %. Calcium ranges between 161 and 513  $\text{mg}/\text{kg}$ . Organic matter content ranges between 0.35 and 2.0 %.

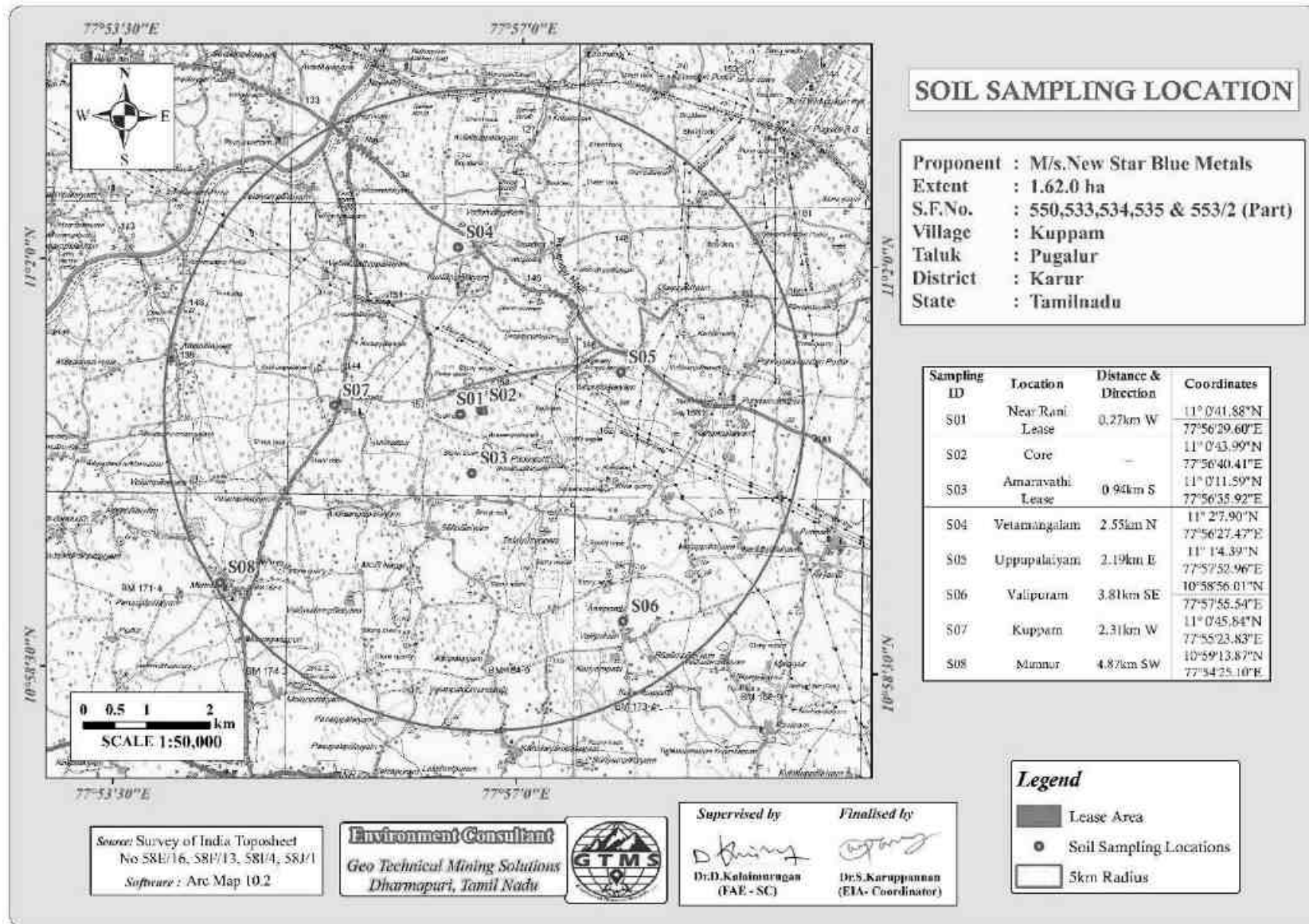


Figure 3.5 Toposheet Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

**Table 3.4 Soil Quality of the Study Area**

S. No	Parameters	Unit	S01	S02	S03	S04	S05	S06	S07	S08
1	Bulk Density	g/cm <sup>3</sup>	1.2	1.4	1.3	1.6	3.8	1.3	3.3	2.9
2	Cadmium (Cd)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
3	CEC	meq%	17.8	14	38	22.7	24	24.5	24	15
4	Chromium (Cr)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	Copper (Cu)	mg/kg	1.6	3.2	1.3	10	1.8	2.3	12	10
6	Iron (Fe)	mg/kg	5345	20537	17648	25986	37397	16978	6734	9436
7	Lead (Pb)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
8	Manganese (Mn)	mg/kg	1.36	2.63	1.58	114	1.7	2.00	76	23
9	Nitrogen (N)	%	1.03	1.06	1.03	0.04	1.02	1.05	1.05	1.1
10	Organic Matter @ 155°C	%	0.58	0.55	0.82	1.1	1.46	2.0	0.35	0.97
11	pH value @ 25°C	--	7.5	7.5	7.6	7.7	7.3	6.5	6.5	6.9
12	Phosphate (P)	%	2.3	1.0	1.9	2.0	1.2	0.14	2.14	3.8
13	Potassium (K)	%	0.23	0.22	0.25	0.16	0.12	0.26	0.26	0.13
14	EC @ 25°C	µS/Cm	165	168	143	161	247	237	237	154
15	Total Carbon	%	2.7	2.0	2.7	2.0	3.7	11.3	6.3	3.2
16	Sulphates (SO <sub>4</sub> )	%	0.17	0.15	0.17	0.19	0.28	0.15	0.15	0.25
17	Zinc (Zn)	mg/kg	14	18	16	17	30	33	33	22
18	Boron (B)	mg/kg	0.68	0.61	0.35	0.53	0.75	0.61	0.61	0.31
29	Calcium (Ca)	mg/kg	270	380	281	372	301	513	245	161
20	Chlorides (Cl)	mg/kg	197	291	297	318	296	115	215	390
21	Magnesium (Mg)	mg/kg	123	132	126	142	110	186	114	111
22	Texture	-	Sandy Clay Loam	Sandy Loam	Sandy Loam	Sandy Loam	Silty Loam	Sandy Loam	Sandy loam	Silty loam

Source: Sampling Results by *Excellence Laboratory (P) Limited*, in association with GTMS.

## 3.2 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the baseline quality of surface and ground water.

**Table 3.5 Water Sampling Locations**

S. No	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	BW01	Karattupalaiyam	0.85	SSE	11°0'14.66"N,77°56'39.17"E
2	BW02	Arasampalaiyam	0.05	E	11°0'42.51"N,77°56'45.26"E
3	BW03	MGR Nagar	3.73	S	10°58'50.44"N,77°55'53.77"E
4	BW04	Vedirimattam Pudur	5.16	NW	11°02'3.05"N,77°54'80.38"E
5	BW05	Punnamchatram	3.80	E	11°0'50.37"N,77°58'49.79"E
6	BW06	Kalipalaiyam	4.39	NEN	11°2'59.51"N,77°57'38.63"E
7	BW07	Vallipuram	4.03	SE	10°58'52.44"N,77°57'57.82"E
8	OW01	Arasampalaiyam	0.66	SW	11° 0'31.10"N,77°56'11.47"E
9	OW02	Kuntanipalaiyam	2.27	N	11°1'55.41"N,77°56'11.47"E
10	SW01	Velaiyampalaiyam	4.53	NW	11°2'42.24"N,77°55'6.12"E

Source: On-site monitoring/sampling by *Excellence Laboratory (P) Limited*, in association with GTMS.

### 3.2.1 Surface Water Resources and Quality

Noyyal River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 4.48 km NW of Noyyal River, as shown in Table 3.5 and Figure 3.4. One surface water sample, known as SW1 were collected from the Noyyal River to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the collected sample.

Result for surface water sample in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

### 3.2.2 Ground Water Resources and Quality

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water

abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Nine groundwater samples, known as BW01, BW02, BW03, BW04, BW05, BW06, BW07, OW01 and OW02 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 3.4. Table 3.6 summarizes ground water quality data of the nine samples.

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

### **3.2.3 Hydrogeological Studies**

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

#### **3.2.3.1 Groundwater Levels and Flow Direction**

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

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 10.1 to 14.1 m BGL in pre monsoon and 11.5 to 16.3 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2022 (Post-Monsoon Season) vary from 63.8 to 66.3 m and from 62.3 to 65.8 m for the period of March through May, 2022 (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.



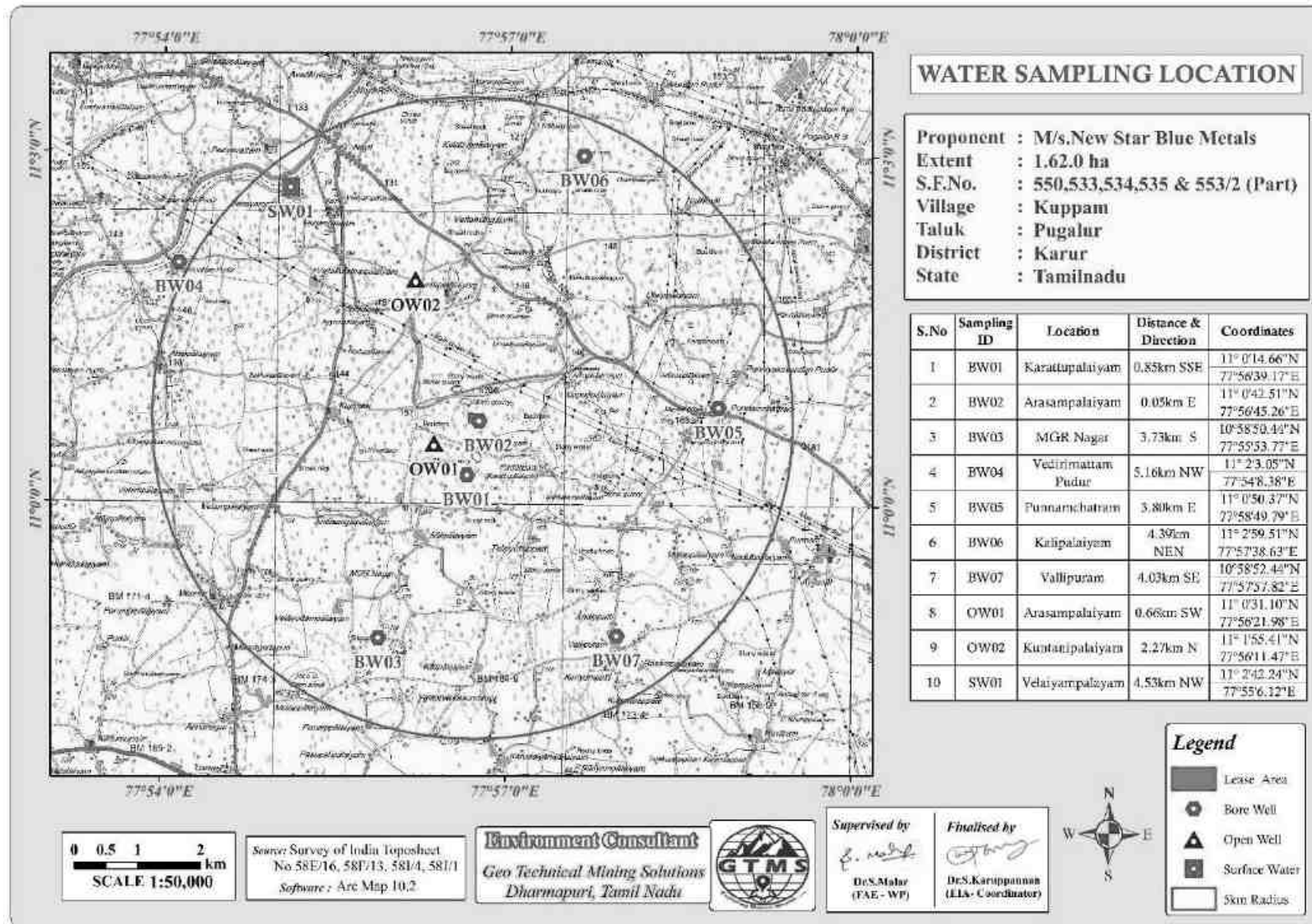


Figure 3.6 Toposheet Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

**Table 3.6 Ground and Surface Water Quality Result**

S. No.	Parameters	Units	Results										Max. Permissible limits (IS: 10500:2012)	
			OW01	OW02	BW01	BW02	BW03	BW04	BW05	BW06	BW07	SW01		
1	Coliforms Bacteria	MPN	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent
2	E.Coli	MPN	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
3	Aluminium (Al)	mg /l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.2
4	Ammonia (NH <sub>3</sub> )	mg /l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5
5	Anionic Detergents	mg /l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0
6	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7
7	Boron (B)	mg /l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.0
8	Cadmium (Cd)	mg /l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003
9	Calcium (Ca)	mg /l	116	134	124	82	85	135	146	75	58	134	134	200
10	Chloride (Cl)	mg /l	241	203	239	150	297	214	228	223	175	442	442	1000
11	Colour	Hazen	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	30	15
12	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.5
13	Cyanide (CN)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	0.05
14	Fluoride (F)	mg/l	1.0	1.2	1.1	0.9	0.31	0.19	0.72	0.31	0.7	1.1	1.1	1.5
15	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Min 1.0
16	Iron (Fe)	mg/l	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.0

17	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
18	Magnesium (Mg)	mg/l	24	48	88	26	74	45	64	45	14	58	100
19	Manganese (Mn)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.3
20	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
21	Molybdenum	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
22	Nitrate (NO <sub>3</sub> )	mg/l	5.8	1.9	14	14	1.9	4.2	5.5	6.7	6.3	2.1	45
23	Odour	--	Agree able	Agree able	Agree able	Agree able	Agree able	Agree able	Agree able	Agree able	Agree able	Agree able	Agreeable
24	pH value @ 25°C	--	7.2	7.0	6.7	6.9	7.3	7.4	6.7	7.2	7.7	7.2	6.5-8.5
25	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
26	Selenium (Se)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
27	EC @ 25°C	mg/l	1160	2110	1890	1043	2400	3570	1578	1202	1705	2440	NA
28	Sulphates (SO <sub>4</sub> )	mg/l	141	102	204	69	196	210	104	90	124	344	400
29	Sulphide (H <sub>2</sub> S)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
30	Total Alkalinity	mg/l	185	615	279	316	458	283	381	242	385	467	600
31	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01
32	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
33	TDS	mg/l	754	1753	1880	678	560	720	1215	783	1108	1580	2000
34	TH (CaCO <sub>3</sub> )	mg/l	388	445	933	312	242	1022	426	366	204	571	600
35	TSS @ 105°C	mg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA
36	Turbidity	NTU	<0.01	<0.01	0.1	1.1	<0.01	<0.01	<0.1	<0.1	<0.1	3.0	5.0
37	Zinc (Zn)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	15

Source: Sampling Results by **Excellence Laboratory (P) Limited**, in association with GTMS.

From the maps of open well groundwater flow direction shown in Figures 3.7-3.8, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 5 located in northwestern direction of the proposed project site. The groundwater flow maps in Figures 3.9-3.10 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 5 and 7. It is located in northwestern and northern direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

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

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2022	Apr-2022	May-2022	Average		
DW01	21.5	22.7	23.0	22.4	11° 0'32.45"N	77°56'15.88"E
DW02	22.0	23.5	24.6	23.3	11° 0'6.43"N	77°56'3.20"E
DW03	21.0	22.5	23.5	22.3	11° 1'5.46"N	77°56'31.22"E
DW04	20.5	21.0	22.5	21.3	11° 1'20.56"N	77°56'38.90"E
DW05	22.5	23.7	24.5	23.5	11° 1'9.31"N	77°55'54.57"E
DW06	20.5	21.7	22.5	21.5	11° 0'32.94"N	77°56'57.09"E
DW07	22.0	23.5	24.7	23.4	11° 0'39.89"N	77°57'14.82"E
DW08	19.5	20.5	21.8	20.6	11° 0'6.95"N	77°56'55.96"E
DW09	21.5	22.7	23.5	22.5	11° 0'34.82"N	77°55'44.25"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-2022	Nov- 2022	Dec-2022	Average		
DW01	10.4	11.9	12.5	11.6	11° 0'32.45"N	77°56'15.88"E
DW02	11.0	12.5	13.4	12.3	11° 0'6.43"N	77°56'3.20"E
DW03	10.5	11.5	12.7	11.5	11° 1'5.46"N	77°56'31.22"E
DW04	12.0	13.5	14.5	13.3	11° 1'20.56"N	77°56'38.90"E
DW05	11.5	12.4	13.7	12.5	11° 1'9.31"N	77°55'54.57"E
DW06	13.0	14.5	15.5	14.3	11° 0'32.94"N	77°56'57.09"E
DW07	14.0	15.5	16.5	15.3	11° 0'39.89"N	77°57'14.82"E
DW08	15.0	16.5	17.5	16.3	11° 0'6.95"N	77°56'55.96"E
DW09	14.0	15.5	16.5	15.3	11° 0'34.82"N	77°55'44.25"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				Latitude	Longitude
	BGL(m)					
	Mar-2022	Apr-2022	May- 2022	Average		
BW01	62.0	63.5	64.5	63.3	11° 0'37.43"N	77°56'47.13"E
BW02	61.0	62.5	63.5	62.3	11° 0'24.89"N	77°57'24.02"E
BW03	63.0	64.0	65.5	64.1	11° 0'37.83"N	77°56'16.07"E
BW04	64.5	66.0	67.0	65.8	11° 0'7.10"N	77°55'42.38"E
BW05	64.0	64.5	66.5	65	11° 0'28.51"N	77°55'47.14"E
BW06	63.0	64.5	66.0	64.5	11° 0'50.33"N	77°56'2.82"E
BW07	61.0	62.5	63.5	62.3	11° 1'24.10"N	77°56'11.59"E
BW08	62.0	63.5	66.0	63.8	11° 0'0.72"N	77°56'48.56"E
BW09	62.5	64.0	65.5	64	11° 1'14.53"N	77°56'48.43"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				Latitude	Longitude
	BGL(m)					
	Oct-2022	Nov-2022	Dec-2022	Average		
BW01	64.0	65.5	66.5	65.3	11° 0'37.43"N	77°56'47.13"E
BW02	63.5	64.0	65.5	64.3	11° 0'24.89"N	77°57'24.02"E
BW03	65.0	66.5	67.5	66.3	11° 0'37.83"N	77°56'16.07"E
BW04	66.5	67.5	69.0	67.6	11° 0'7.10"N	77°55'42.38"E
BW05	66.0	67.5	68.5	67.3	11° 0'28.51"N	77°55'47.14"E
BW06	64.0	65.5	66.5	65.3	11° 0'50.33"N	77°56'2.82"E
BW07	62.0	63.5	66.0	63.8	11° 1'24.10"N	77°56'11.59"E
BW08	65.0	66.5	67.5	66.3	11° 0'0.72"N	77°56'48.56"E
BW09	63.5	65.0	67.5	65.3	11° 1'14.53"N	77°56'48.43"E

Source: Onsite monitoring data

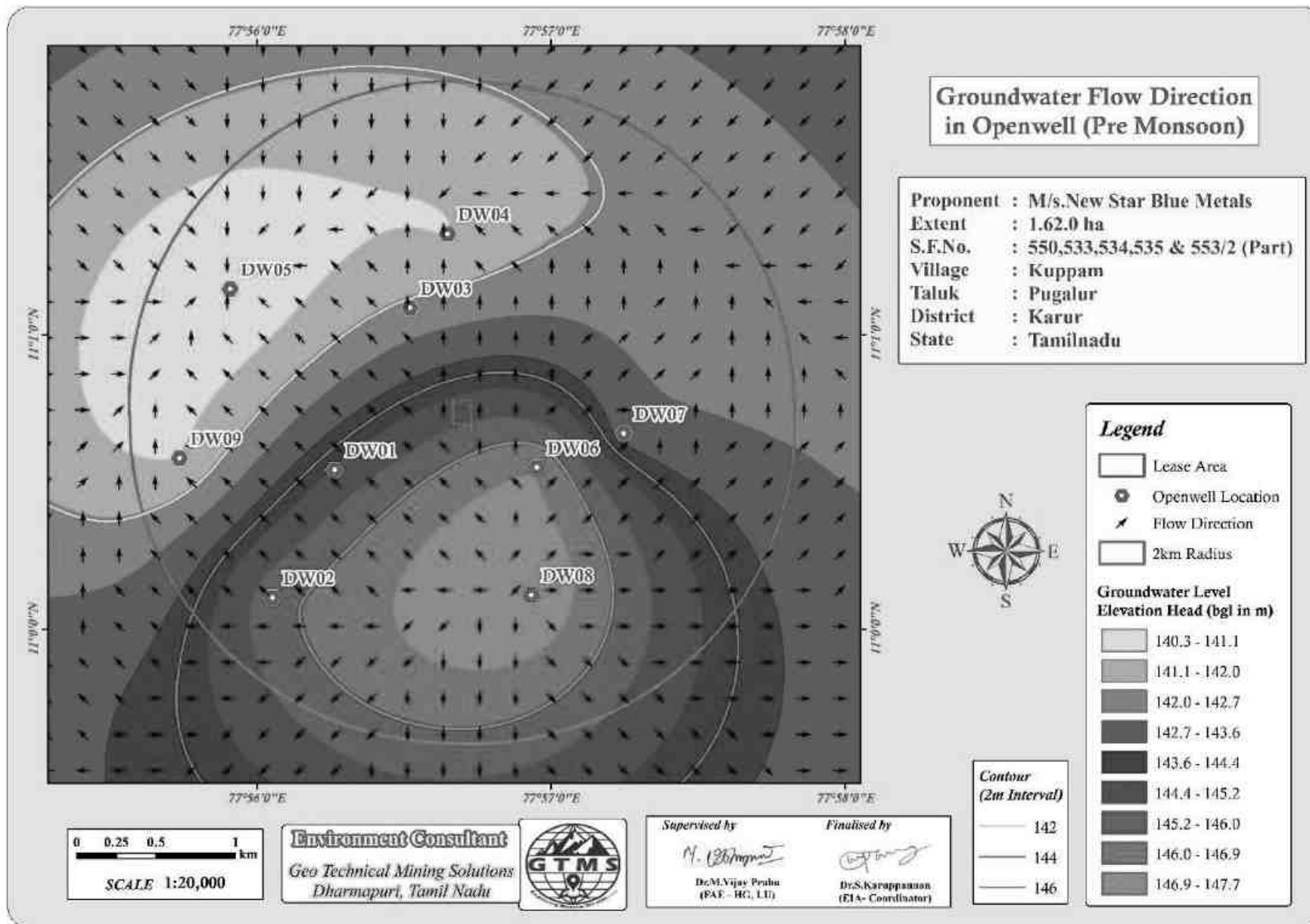


Figure 3.7 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season

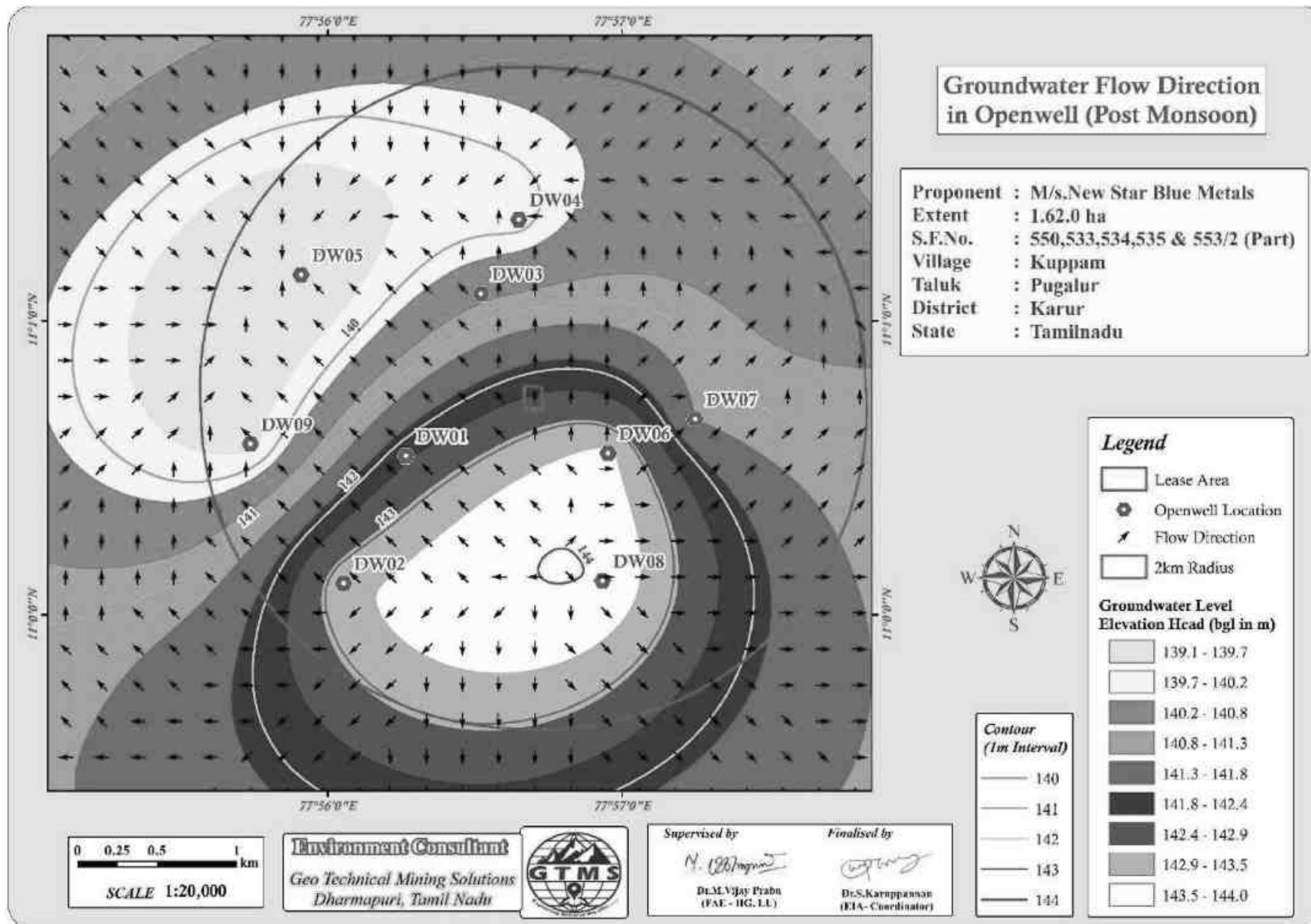


Figure 3.8 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

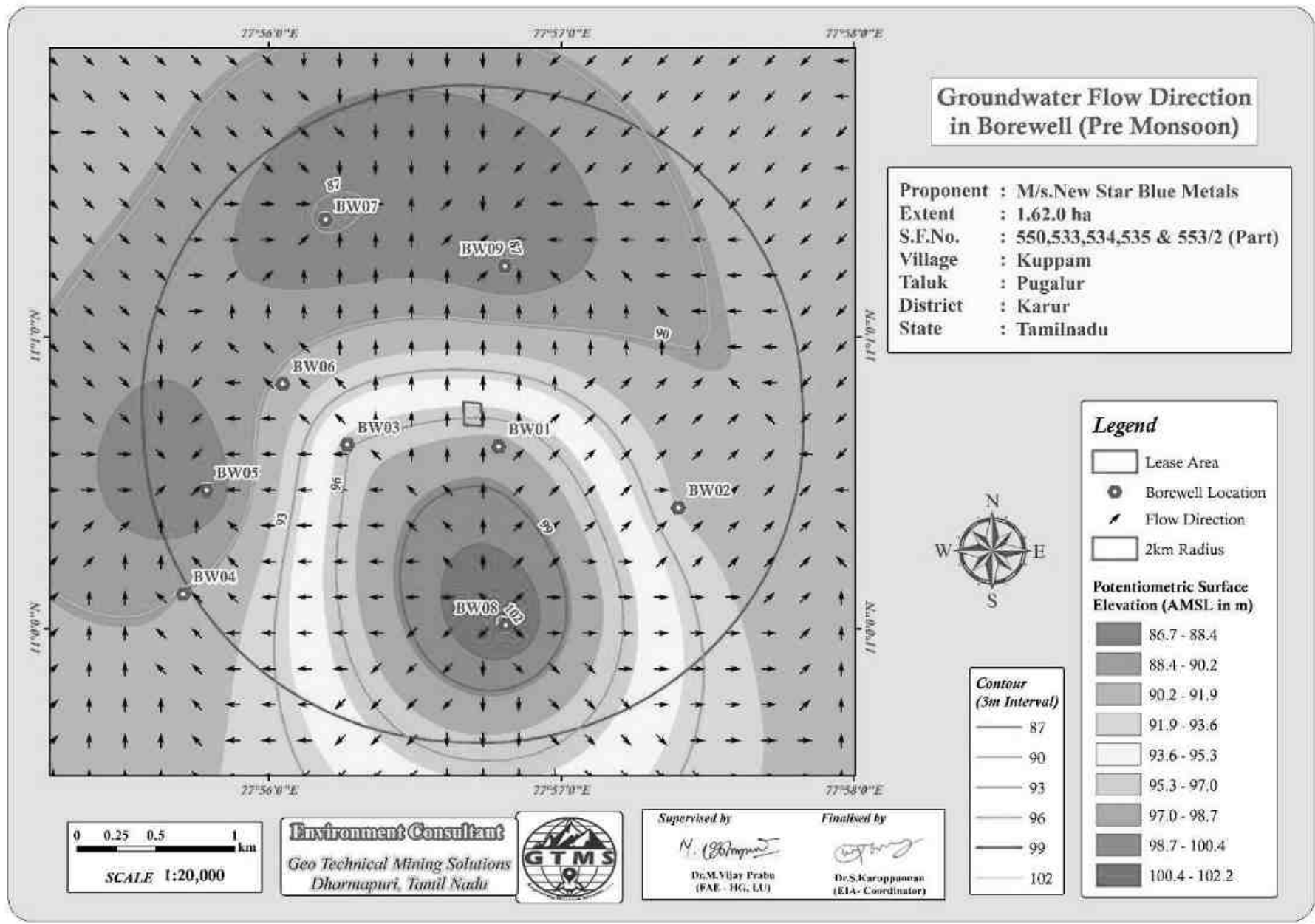


Figure 3.9 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season



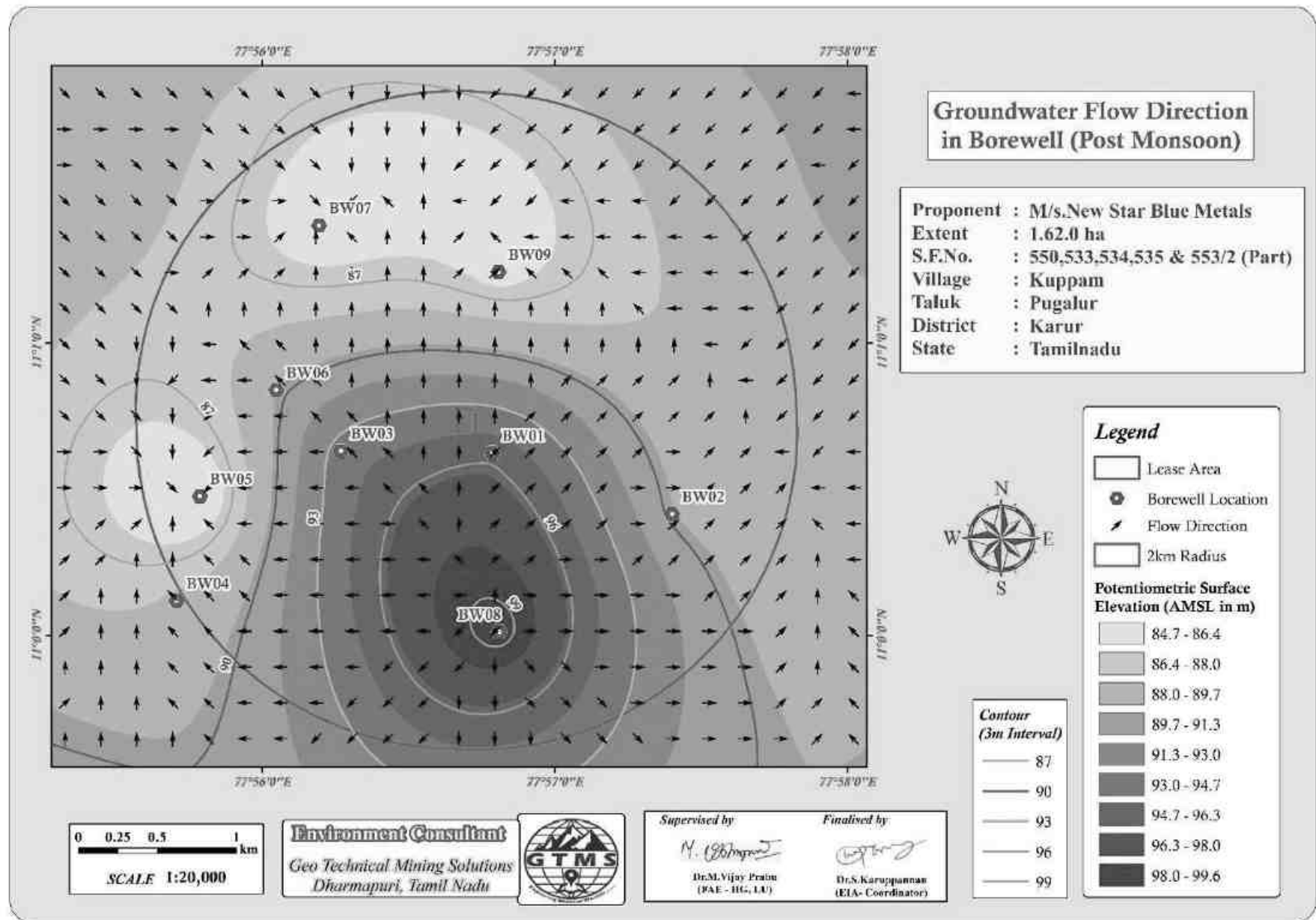


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

### 3.2.3.2 Electrical Resistivity Investigation

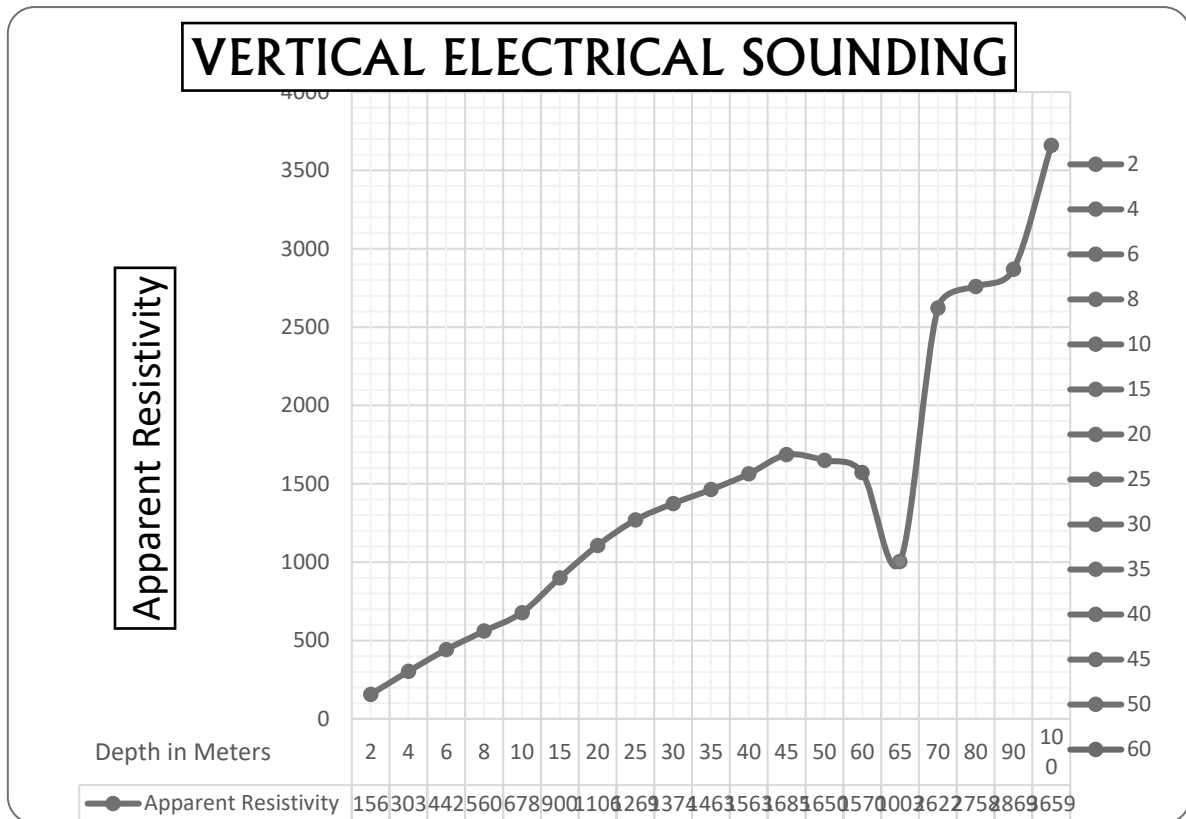
Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses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

#### **Result**

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

**Table 3.11 Vertical Electrical Sounding Data**

Location Coordinates - 11° 0'44.46"N 77°56'40.43"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega\text{m}$
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 3.11 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 65-70 m below ground level. The maximum depth proposed for the proposed project is 20 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, 2022 varied from 15.90 to 31.32<sup>0</sup> C with the average of 24.74<sup>0</sup> C; in November, 2022 from 14.61 to 31.16<sup>0</sup> C with the average of 24.40<sup>0</sup> C; and in December, 2022 from 14.0 to 30.82<sup>0</sup> C with the average of 23.74<sup>0</sup>C. In October, 2022, relative humidity ranged from 51.35 to 100 % with the average of 85.10%; in November, 2022, from 51.35 to 100 % with the average of 85.10 %; and in December, 2022, from 51.42 to 100 % with the average of 85.65 %. The wind speed in October, 2022 varied from 0.06 to 6.48 m/s with the average of 2.53 m/s; in November, 2022 from 0.02 to 6.55 m/s with the average of 2.69 m/s; and in December, 2022 from 0.04 to 6.65 m/s with the average of 2.55 m/s. In October,2022, wind direction varied from 0.07 to 359.70<sup>0</sup> with the average of 161.47<sup>0</sup>; in November, 2022, from 0.00 to 359.63<sup>0</sup> with the average of 145.59<sup>0</sup>; and in December, 2022, from 1.50 to 359.62<sup>0</sup> with the average of 110.36<sup>0</sup>. In October,2022, surface pressure varied from 96.94 to 99.60 kPa with the average of 98.58 kPa; in November, 2022, from 95.68 to 99.86 kPa with the average of 98.64 kPa; and in December, 2022, from 98.02 to 99.56 kPa with the average of 98.84 kPa.

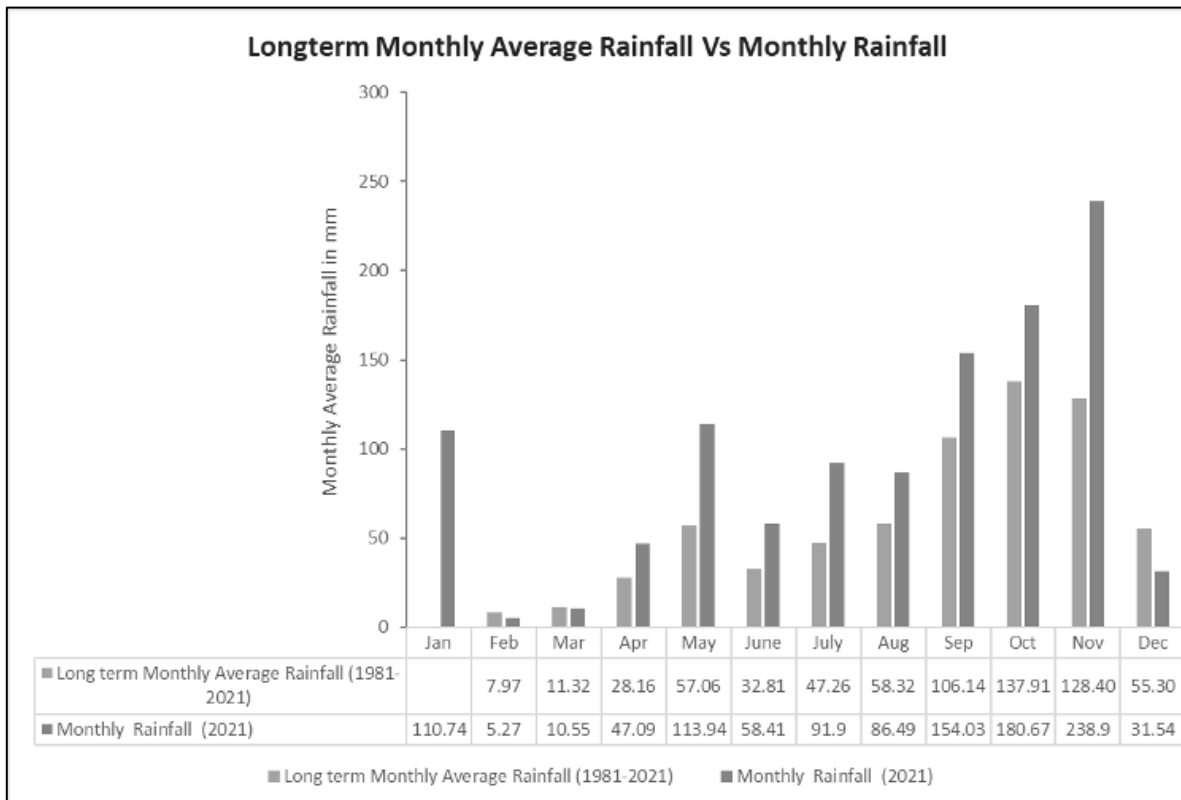
**Table 3.12 Onsite Meteorological Data**

S. No.	Parameters		OCT, 2022	NOV, 2022	DEC, 2022
1	Temperature (°C)	Min	15.90	14.61	14.00
		Max	31.32	31.16	30.82
		Avg	24.74	24.40	23.74
2	Relative Humidity (%)	Min	49.20	51.35	51.42
		Max	100.00	100.00	100.00
		Avg	85.80	85.10	85.65
3	Wind Speed (m/s)	Min	0.06	0.02	0.04
		Max	6.48	6.55	6.65
		Avg	2.53	2.69	2.55
4	Wind Direction (degree)	Min	0.70	0.00	1.50
		Max	359.70	359.63	359.62
		Avg	161.47	145.59	110.36
5	Surface Pressure(kPa)	Min	96.94	95.68	98.02
		Max	99.60	99.86	99.56
		Avg	98.58	98.64	98.84

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

## Rainfall

Rainfall data for the study area were collected for the period of 1981-2021 (POWER | Data Access Viewer (nasa.gov)). Long term monthly average rainfall was estimated from the data of 1981-2021 and compared with the monthly rainfall for the year 2021, shown in Figure 3.10. The Figure 3.12 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in September through November of 2021 is higher than the previous years.



**Figure 3.12 Long-Term Monthly Average Rainfall Vs Monthly Rainfall**

### 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 2018 to 2021 and the seasonal wind rose for the study period of October through December 2022. The wind rose diagrams thus produced are shown in Figures 3.13-3.13a. Figure 3.14 reveals that:

- ❖ The measured average wind velocity during the study period is 2.54 m/s.
- ❖ Predominant wind was dominant in the directions ranging from northeast to southwest.

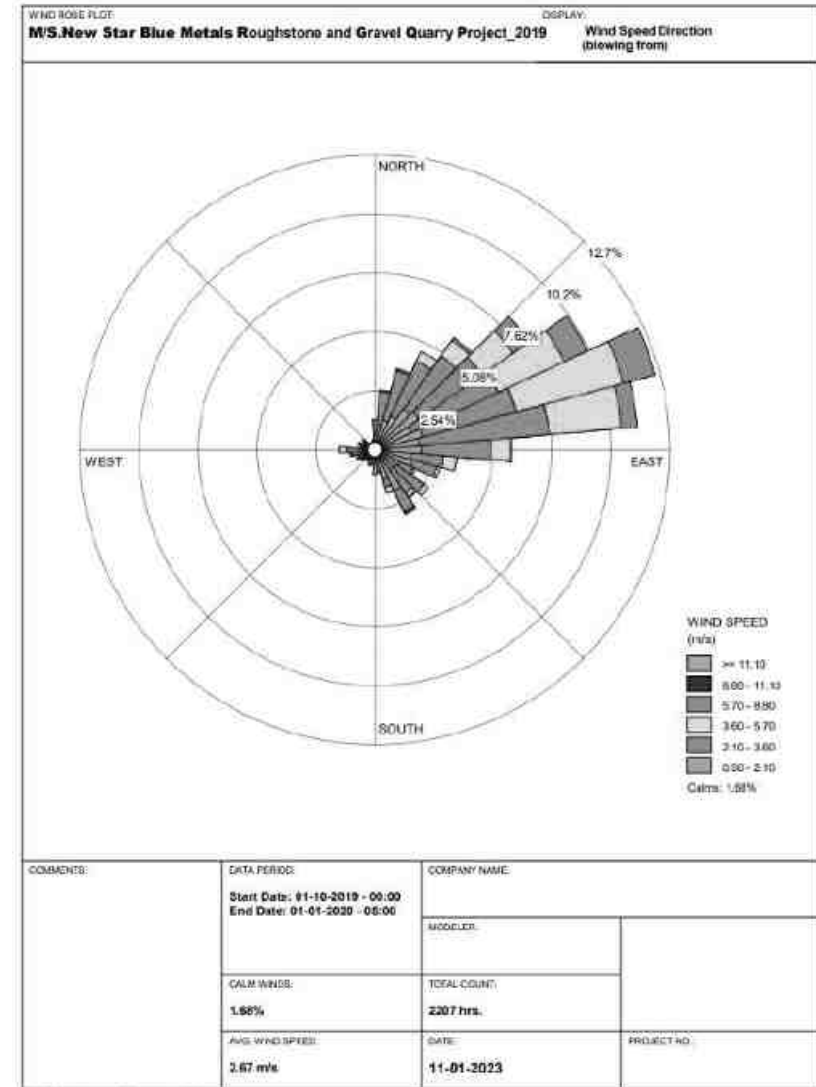
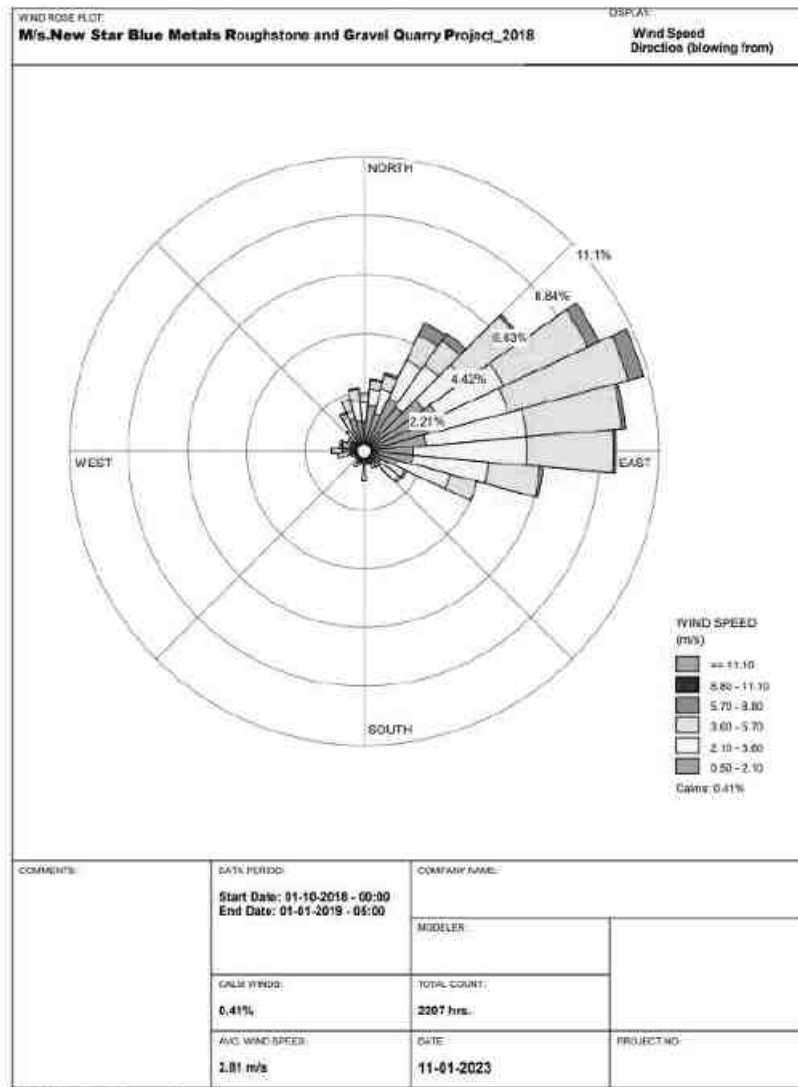


Figure 3.13 Windrose Diagram for 2018 and 2019 (October to December)

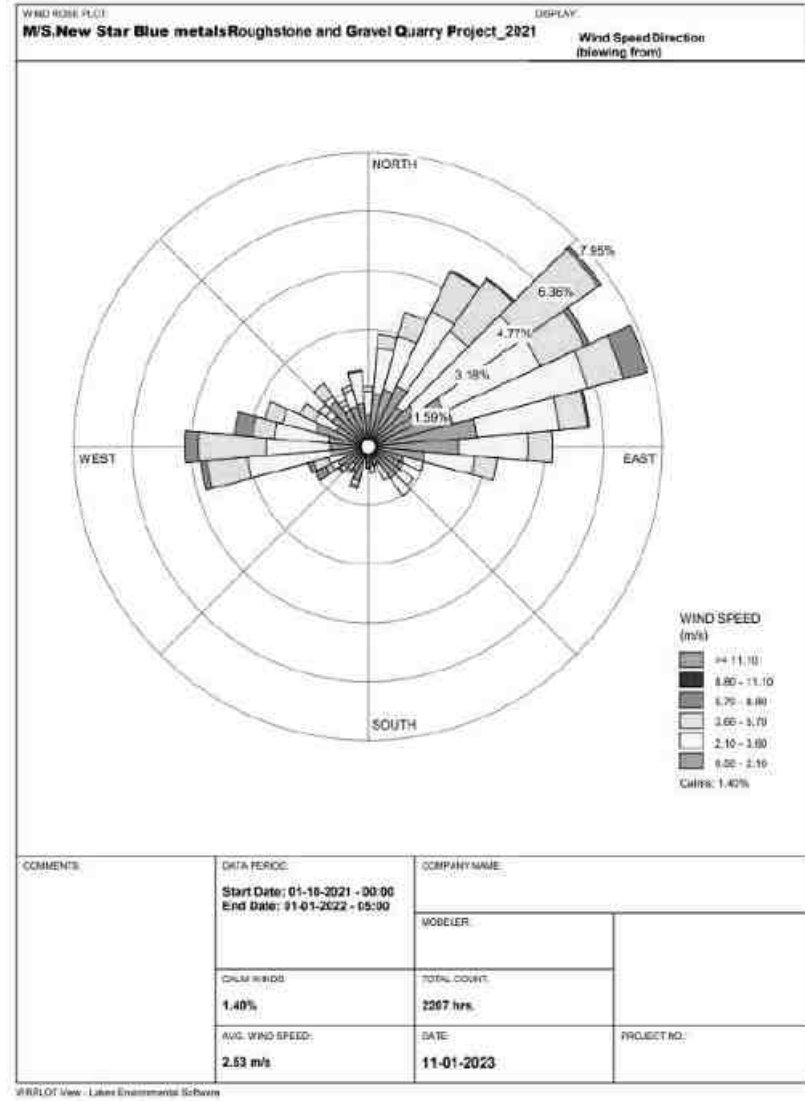
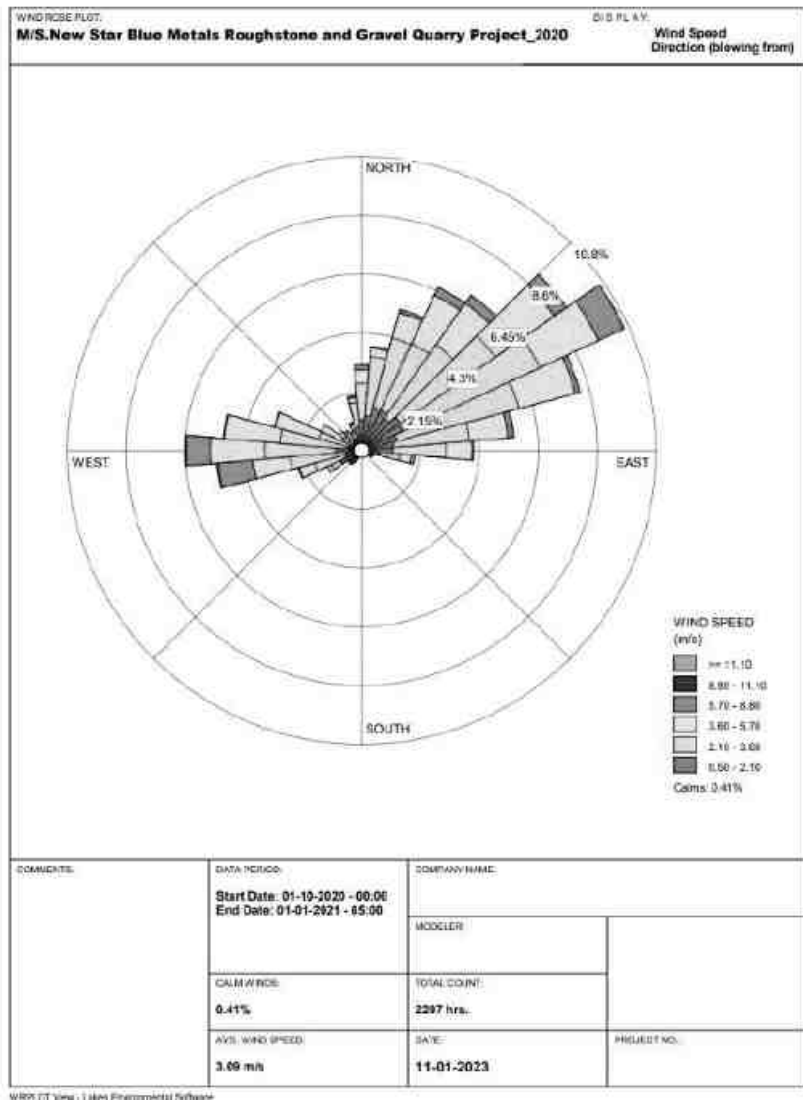


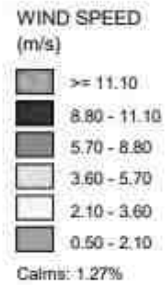
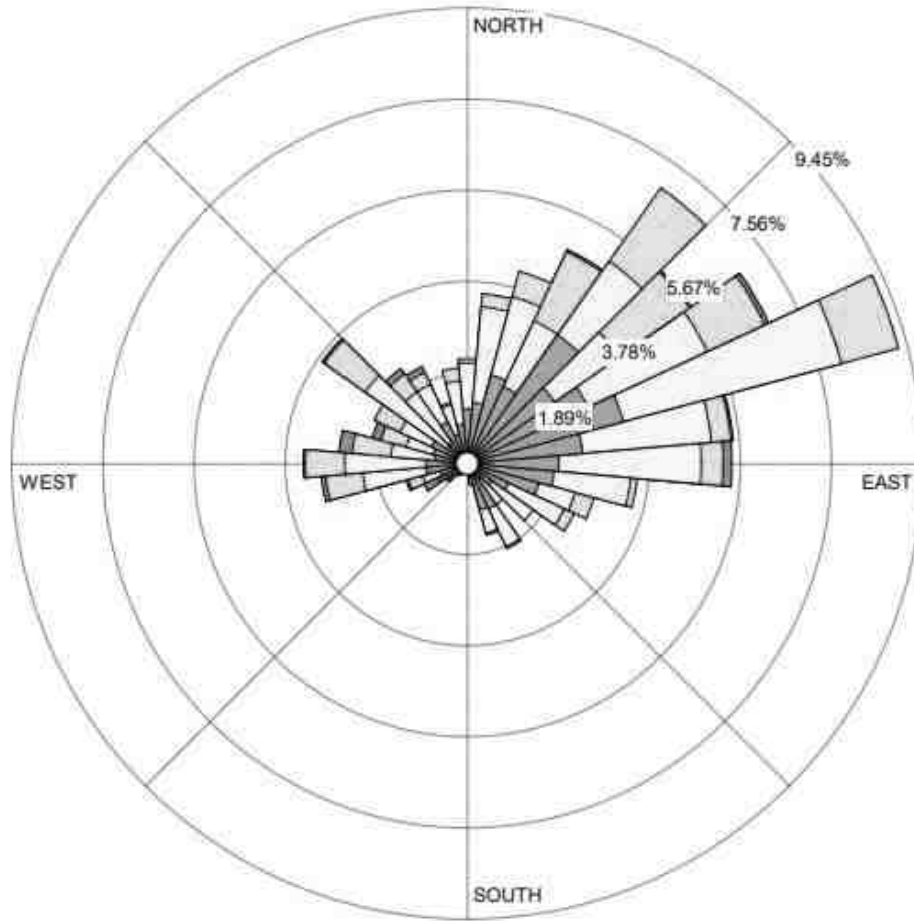
Figure 3.13a Windrose Diagram for 2020 and 2021 (October to December)

WIND ROSE PLOT:

**M/S.New Sar Blue Metals Roughstone and Gravel Quarry Project\_2022**

DISPLAY:

Wind Speed  
Direction (blowing from)



COMMENTS:

DATA PERIOD:

Start Date: 01-10-2022 - 00:00  
End Date: 01-01-2023 - 05:00

COMPANY NAME:

MODELER:

CALM WINDS:

1.27%

TOTAL COUNT:

2207 hrs.

AVG. WIND SPEED:

2.54 m/s

DATE:

12-01-2023

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

**Figure 3.14 Onsite Wind Rose Diagram**



### 3.3.2 Ambient Air Quality Study

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

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

**Table 3.13 Methodology and Instrument Used for AAQ Analysis**

Parameter	Method	Instrument
PM <sub>2.5</sub>	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM <sub>10</sub>	Gravimetric method Beta attenuation method	Respirable Dust Sampler
SO <sub>2</sub>	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO <sub>x</sub>	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 on Excellence Laboratory (P) Limited & 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 <sub>2</sub> (µg/m <sup>3</sup> )	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO <sub>x</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM <sub>10</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	60.0 10 <sup>0</sup> .0	60.0 10 <sup>0</sup> .0
4	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

Source: NAAQS CPCB Notification No. B-29016/20/90/PCI-I Dated: 18<sup>th</sup> 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-December, 2022 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5\text{m}$  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  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$ , sulphur dioxide ( $\text{SO}_2$ ) and nitrogen dioxide ( $\text{NO}_2$ ). The sampling locations are shown in Figure 3.15 and average concentrations of air pollutants are summarized in Tables 3.15 and are shown in Figures 3.16-3.20.

**Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations**

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates
1	AAQ1	Between NTC and Rani Leases	0.42	W	11° 0'41.49"N, 77°56'26.24"E
2	AAQ2	Core	---	---	11° 00'43.39"N, 77°56'41.17"E
3	AAQ3	Amaravathi Lease	0.83	S	11° 00'14.81"N, 77°56'38.02"E
4	AAQ4	Andisangilipalayam	1.58	SW	11° 00'02.46"N, 77°56'06.69"E
5	AAQ5	Velampalayam	4.65	W	11° 00'3.65"N, 77°54'11.26"E
6	AAQ6	Athipalayam	5.03	W	11° 1'13.29"N, 77°53'57.51"E
7	AAQ7	Munnur	4.69	SW	10°59'7.06"N, 77°54'39.06"E
8	AAQ8	Punna chatram	3.75	E	11° 0'48.65"N, 77°58'47.07"E
9	AAQ9	Karudayampalayam	4.75	S	10°58'09.04"N, 77°57'14.40"E
10	AAQ10	Kunthanipalayam	1.87	N	11° 1'46.52"N, 77°56'29.26"E

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

## Results

As per the monitoring data,  $\text{PM}_{2.5}$  ranges from  $22.8 \mu\text{g}/\text{m}^3$  to  $17.4 \mu\text{g}/\text{m}^3$ ;  $\text{PM}_{10}$  from  $42.2 \mu\text{g}/\text{m}^3$  to  $36.8 \mu\text{g}/\text{m}^3$ ;  $\text{SO}_2$  from  $10.5 \mu\text{g}/\text{m}^3$  to  $7 \mu\text{g}/\text{m}^3$ ;  $\text{NO}_2$  from  $20.4 \mu\text{g}/\text{m}^3$  to  $14.3 \text{g}/\text{m}^3$ . The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

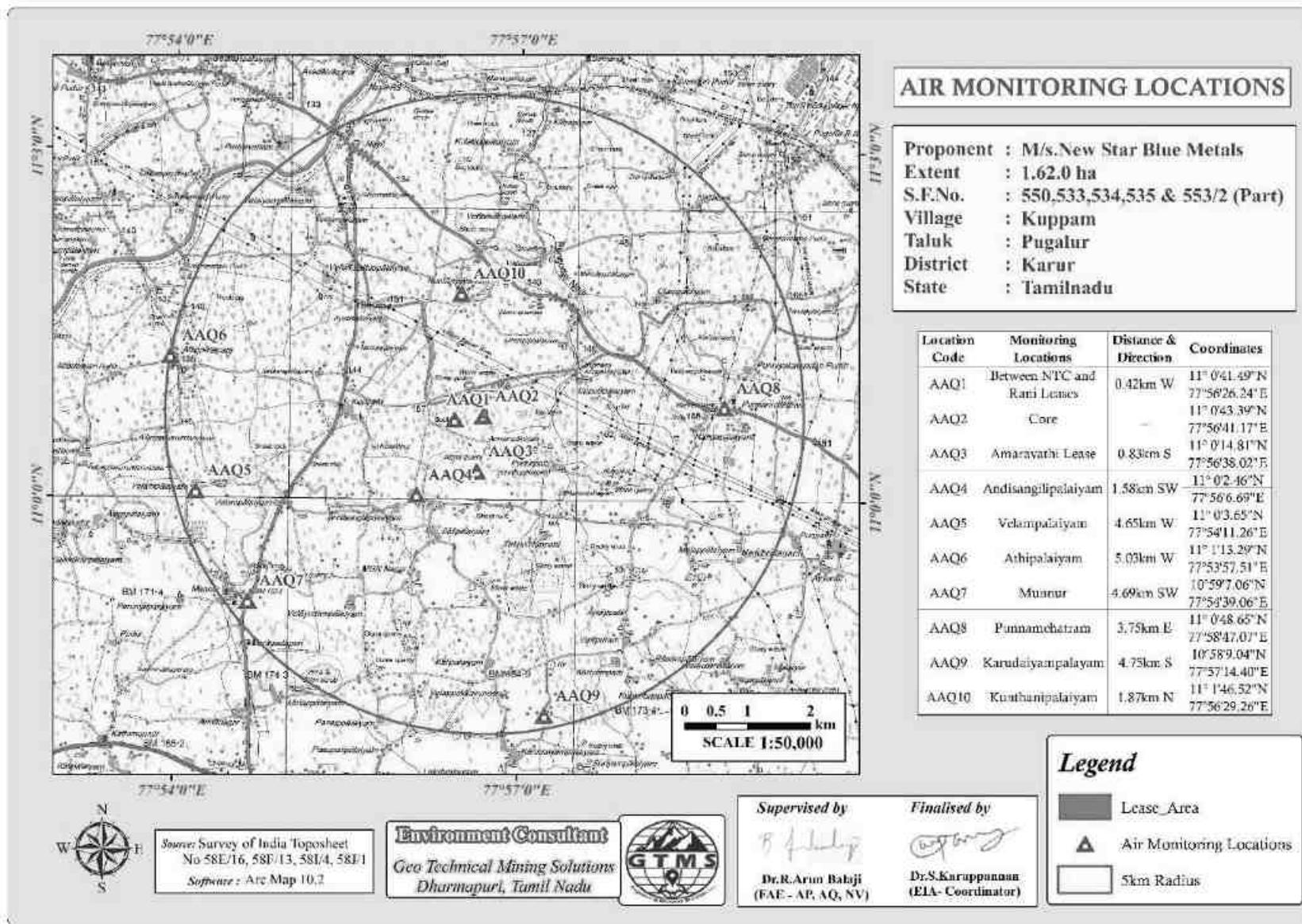
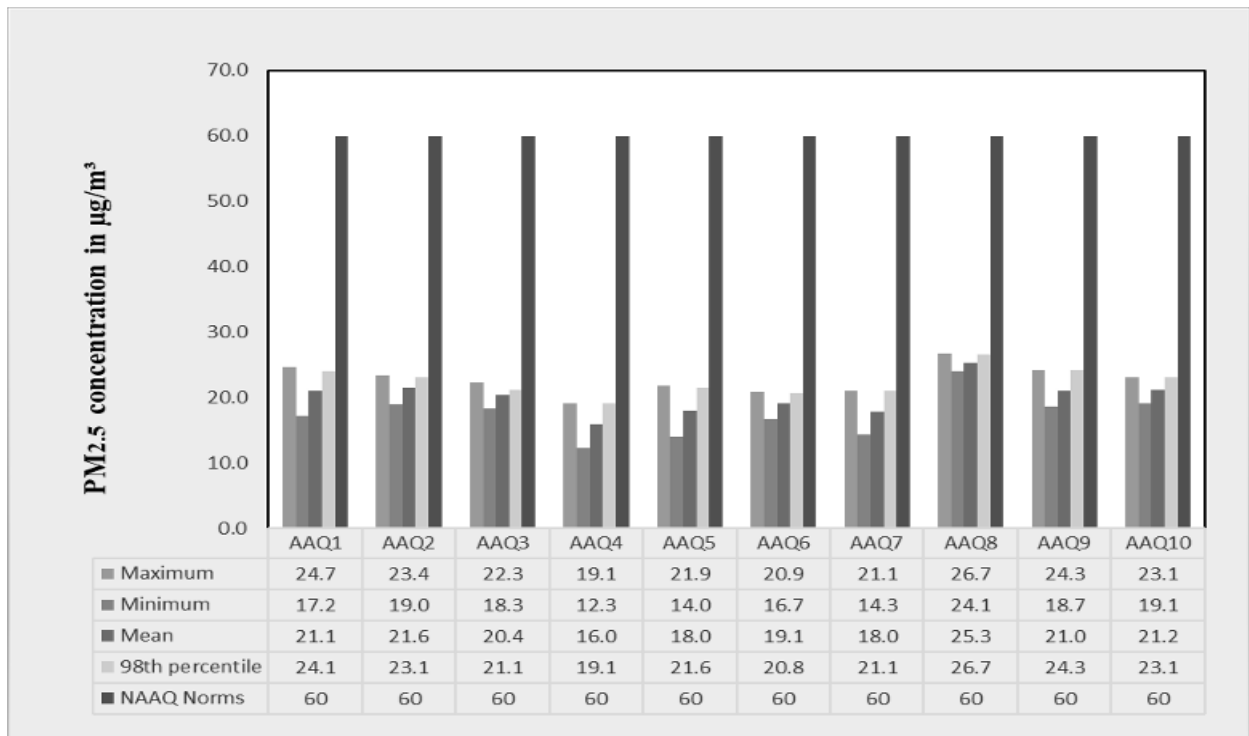


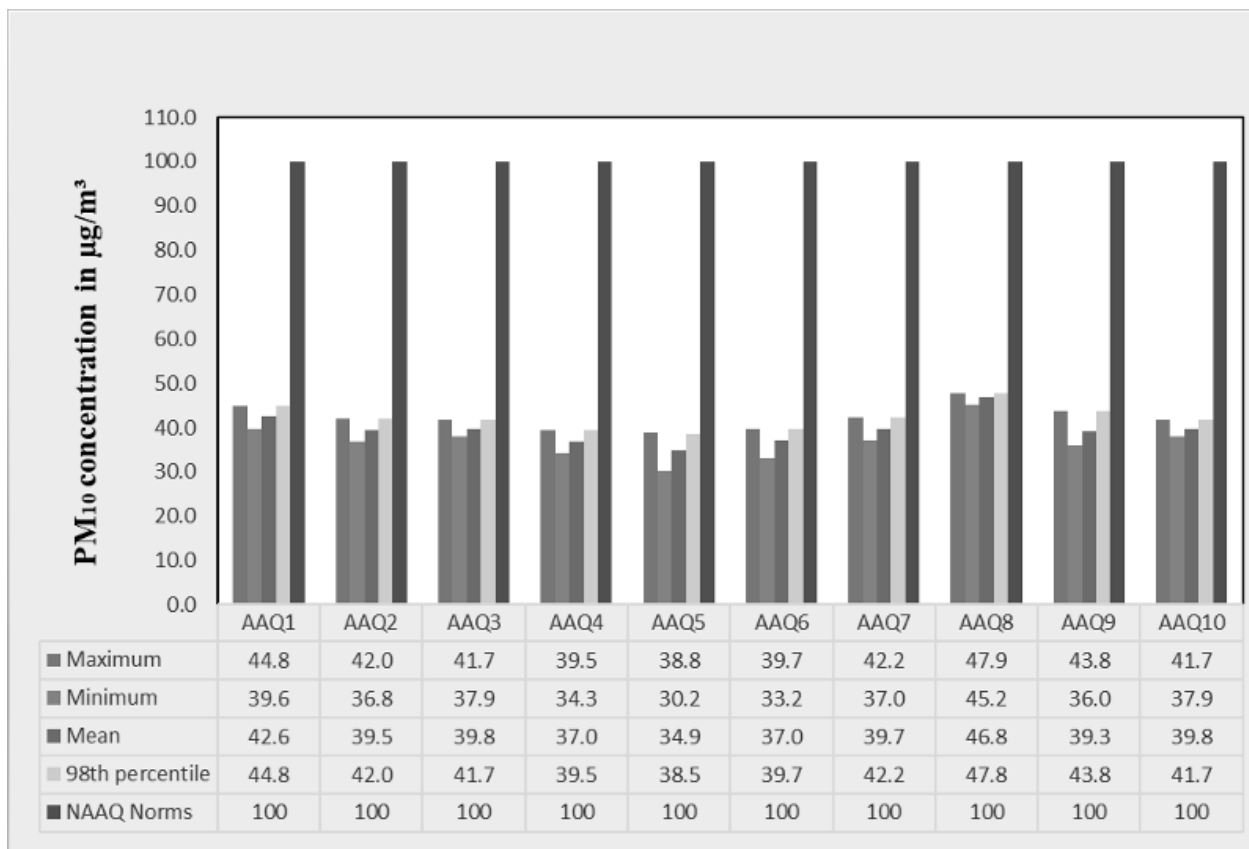
Figure 3.15 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

**Table 3.16 Summary of AAQ Result**

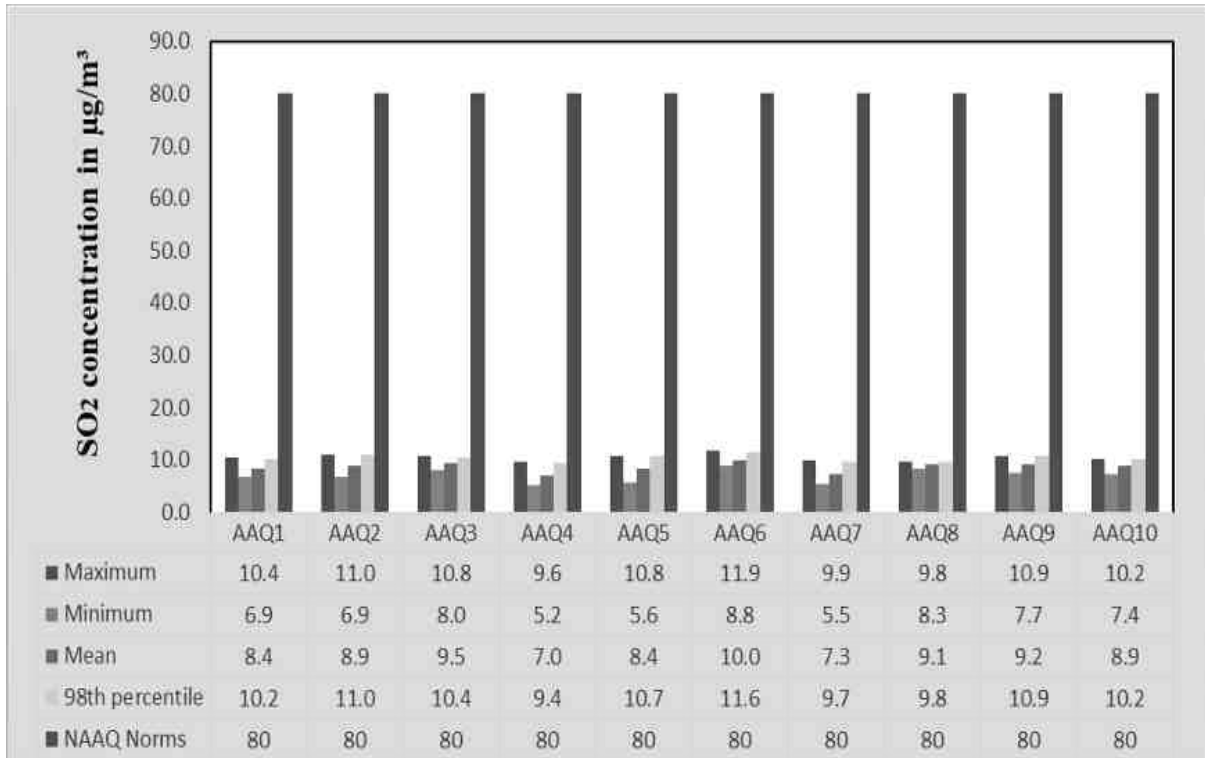
PM <sub>2.5</sub>					PM <sub>10</sub>			
Station ID	Max	Min	Mean	98 <sup>th</sup> Percentile	Max	Min	Mean	98 <sup>th</sup> Percentile
AAQ1	24.7	17.2	21.1	24.1	44.8	39.6	42.6	44.8
AAQ2	23.4	19	21.6	23.1	42.0	36.8	39.5	42.0
AAQ3	22.3	18.3	20.4	21.1	41.7	37.9	39.8	41.7
AAQ4	19.1	12.3	16.0	19.1	39.5	34.3	37.0	39.5
AAQ5	21.9	14	18.0	21.6	38.8	30.2	34.9	38.5
AAQ6	20.9	16.7	19.1	20.8	39.7	33.2	37.0	39.7
AAQ7	21.1	14.3	18.0	21.1	42.2	37.0	39.7	42.2
AAQ8	26.7	24.1	25.3	26.7	47.9	45.2	46.8	47.8
AAQ9	24.3	18.7	21.0	24.3	43.8	36.0	39.3	43.8
AAQ10	23.1	19.1	21.2	23.1	41.7	37.9	39.8	41.7
SO <sub>2</sub>					NO <sub>x</sub>			
AAQ1	10.4	6.9	8.4	10.2	18.7	12.2	16.3	18.6
AAQ2	11	6.9	8.9	11.0	20.1	14.2	16.9	19.9
AAQ3	10.8	8	9.5	10.4	20	13.5	16.6	19.6
AAQ4	17.1	5.2	7.4	13.7	15.1	8.6	11.0	14.4
AAQ5	10.8	5.6	8.4	10.7	20.6	12.8	17.0	20.5
AAQ6	11.9	8.8	10.0	11.6	21.8	17.3	19.1	21.8
AAQ7	17.4	5.5	7.7	14.0	18.1	11.6	14.0	15.7
AAQ8	9.8	8.3	9.1	9.8	27.6	25.3	26.6	27.6
AAQ9	10.9	7.7	9.2	10.9	22.1	15	18.2	22.1
AAQ10	10.2	7.4	8.9	10.2	19.4	12.9	16.0	19.0



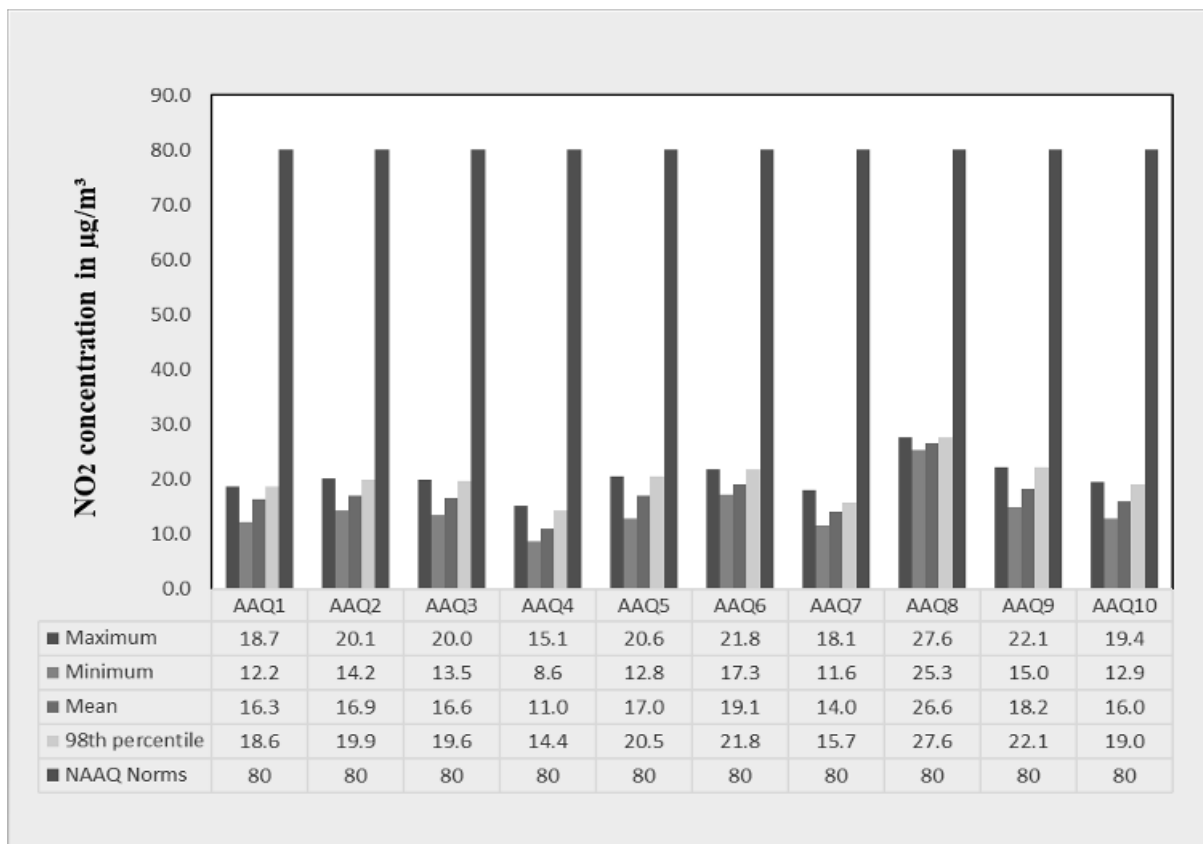
**Figure 3.16 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>2.5</sub> Measured from 10 Air Quality Monitoring Stations within 5 km Radius**



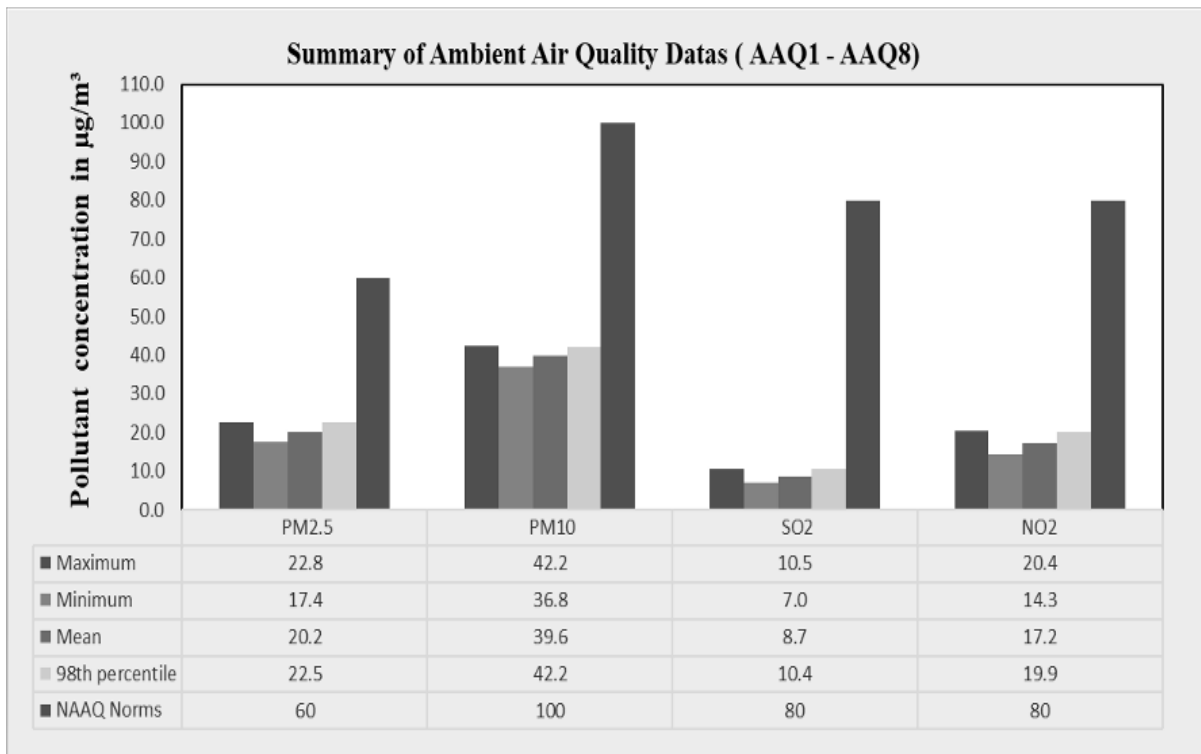
**Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>10</sub> Measured from 10 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO<sub>2</sub> Measured from 10 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of No<sub>x</sub> Measured from 10 Air Quality Monitoring Stations within 5km Radius**



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

### 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at twelve (12) 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 3.21.

**Table 3.17 Noise Monitoring Locations**

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates
1	N1	Between NTC and Rani Leases	0.36	W	11° 0'41.52"N, 77°56'28.14"E
2	N2	Core	---	---	11° 0'42.76"N, 77°56'41.52"E
3	N3	Amaravathi Lease	0.87	S	11° 0'13.89"N, 77°56'36.49"E
4	N4	Kuppam	1.93	W	11° 0'41.35"N, 77°55'36.27"E
5	N5	Puthurpatti	0.89	SE	11° 0'24.93"N, 77°57'07.40"E

6	N6	Andisangilipalayam	1.60	SW	11° 00'0.11"N, 77°56'08.14"E
7	N7	Velampalayam	4.71	W	11° 00'4.03"N, 77°54'09.66"E
8	N8	Athipalayam	4.93	W	11° 1'12.49"N, 77°53'59.34"E
9	N9	Munnur	4.57	SW	10°59'10.74"N,77°54'40.96"E
10	N10	Punna chatram	3.75	E	11° 0'48.65"N 77°58'47.07"E
11	N11	Karudayampalayam	4.83	SES	10°58'07.55"N 77°57'14.55"E
12	N12	Kunthanipalayam	1.93	N	11° 1'48.61"N, 77°56'29.50"E

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

**Table 3.18 Ambient Noise Quality Result**

Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (L <sub>eq</sub> in dB (A))	
N1	Between NTC and Rani Leases	Industrial Area	41.7	34.7	75	70
N2	New Star Blue Metals Lease		40.3	34.5	75	70
N3	Core		40.0	33.9	75	70
N4	Kuppam	Residential Area	35.4	30.6	55	45
N5	Puthurpatti		32.6	29.8	55	45
N6	Andisangilipalayam		36.2	30.8	55	45
N7	Velampalayam		40.3	33.9	55	45
N8	Athipalayam		40.8	35.0	55	45
N9	Munnur		40.8	33.8	55	45
N10	Punna chatram		42.2	37.4	55	45
N11	Karudayampalayam		41.2	32.4	55	45
N12	Kunthanipalayam		41.7	36.6	55	45

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

The Table 3.18 shows that noise level in core zone was 41.7 dB (A) Leq during day time and 34.7 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 32.6 to 42.2dB (A) Leq and during night time from 29.8 to 36.6dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.22 and 3.23.



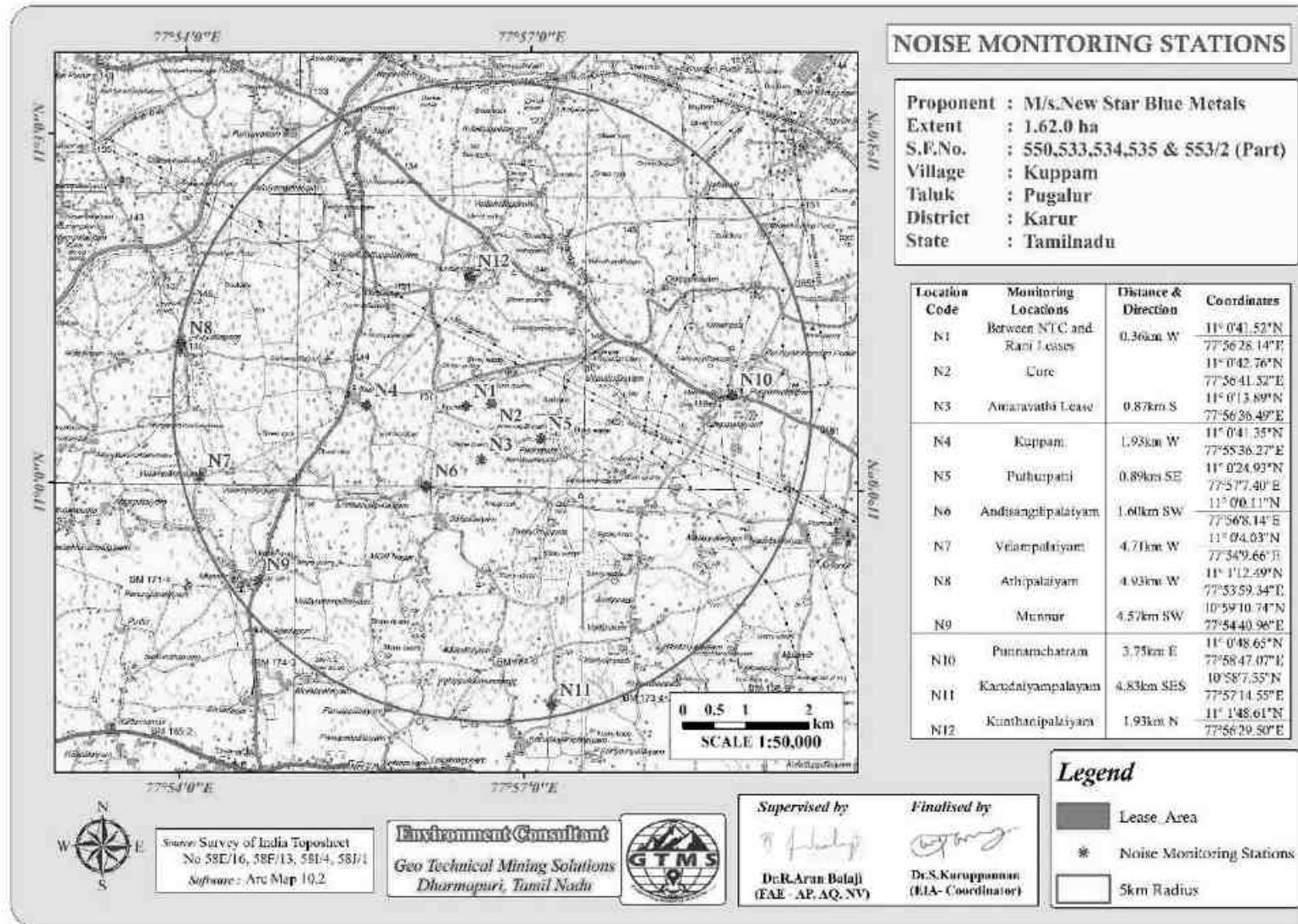
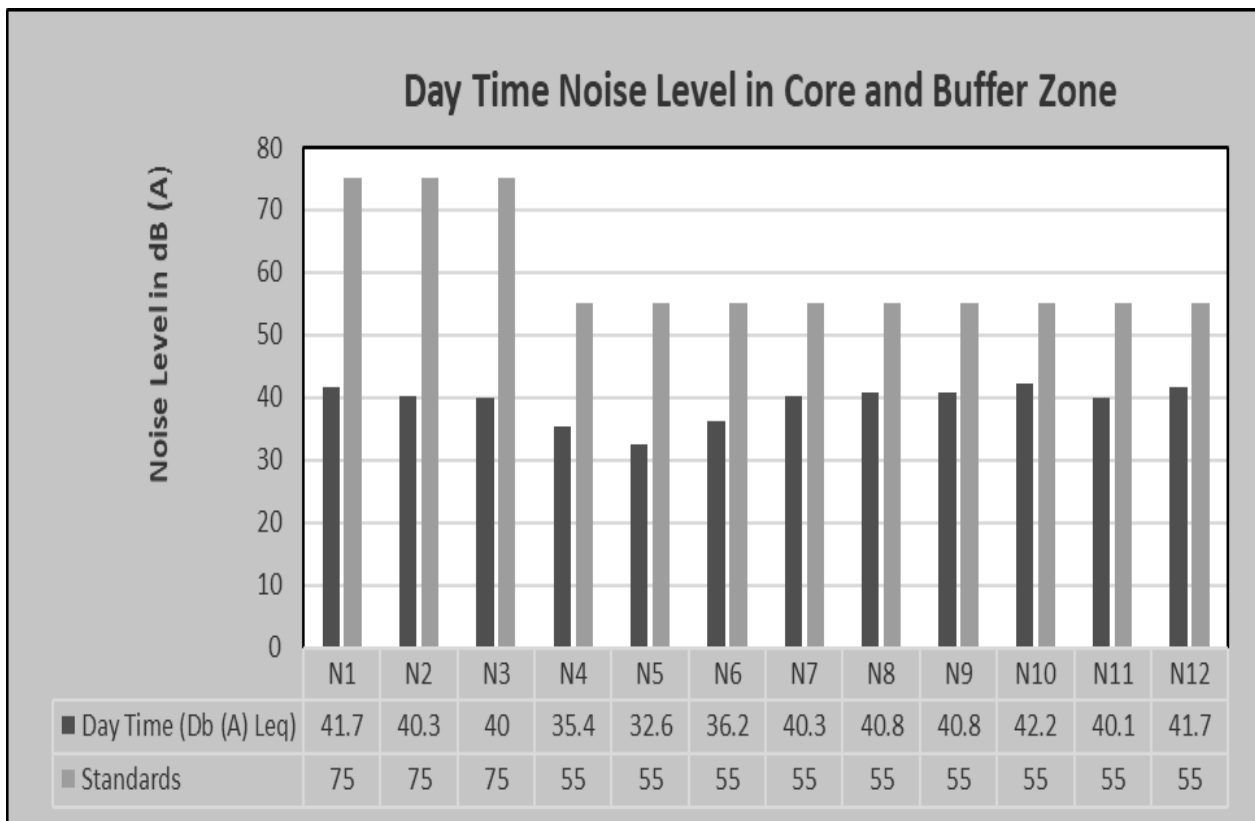
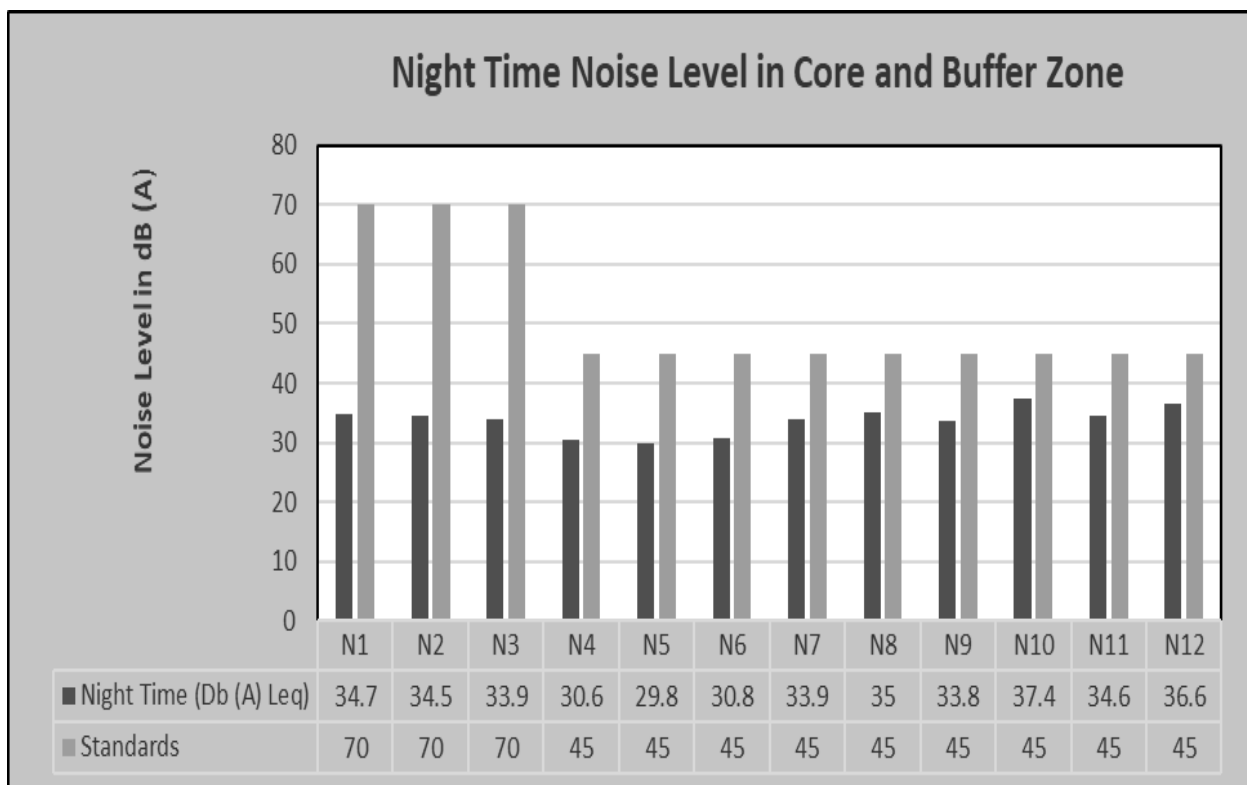


Figure 3.21 Toposheet Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site



**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**

### 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 also collected from different sources, i.e., government departments such as District Forest Office, Government of Tamil Nadu. On the basis of onsite observations as well as forest department records the checklist of flora and fauna was prepared.

#### *Methodology*

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



**Figure 3.24 Quadrates Sampling Methods of Flora**

#### *Phyto-Sociological Studies*

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

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

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

**Shannon – Wiener Index, Evenness and Richness**

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

**Table 3.20 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. Photographs showing various species are provided in Figure 3.27.

#### *Crop Patterns in Pugalur taluk*

The principal crops of the district are paddy, millets, pulses, oilseeds, sugarcane and banana. The major paddy area is in kuppam village and Pugalur 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.

#### *Flora in mine lease area (core zone)*

A total of 16 trees belonging to 4 species such as *Prosopis juliflora*, *Azadirachta indica*, *Vachelia leucoploea*, and *Albizia amara* are present in the mining lease area, as shown in Figure 3.25. 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 were procured at the rate of 10 seedlings per tree. Seedlings are planted and protected in 7.5 m safety zone. Details of vegetation with scientific name and details of mining lease area indicated in Table 3.21 and Figure 3.25

**Table 3.21 Flora in mine lease area**

Local name	Scientific name	Family name	No of Trees
<b>Trees</b>			
Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	3
Vembu	<i>Azadirachta indica</i>	Meliaceae	4
Vealli vealan	<i>Vachellia leucophloea</i>	Babesiae	6
Unjai maram	<i>Albizia amara</i>	Fabaceae	4
<b>Shrubs</b>			
Avaram chadi	<i>Senna auriculata</i>	Fabaceae	4
Earuku	<i>Calotropis gigantea</i>	Apocynaceae	3
<b>Herbs /climber</b>			
Perandai	<i>Cissus quadrangularis</i>	Vitaceae	5
Thathapondu	<i>Tridax procumbens</i>	Asteraceae	10
Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	12

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

Vegetation species within mine lease area and 300 m radius around the lease area. It is an arid landscape. There is no agricultural land nearby. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 6 Shrubs (17%) and 22 Herbs and Climbers, Creeper, Grass & Cactus (64%) were identified. Details of flora with the scientific name details and of diversity species Rich ness index were mentioned in Table 3.22-3.24 and Figure 3.26. There is no threat to the Flora species in 300 m radius.

***Flora in 10 km radius buffer zone***

Similar type of environment also in buffer area but with more flora diversity compare than core zone area. It contains a total of species belonging to 38 families have been recorded from the buffer zone. The floral (75) varieties among them 35 Trees (46%), 20 Shrubs (15%) Herbs and Climbers, Creeper, Grass & Cactus, 25 (33%) were identified. Details of flora with the scientific name details of diversity species Rich ness index were mentioned in Table 3.25-3.27 and Figure 3.26.



**Figure 3.25 Vegetation Inside the Lease Area**

**Table 3.22 Flora in 300 m Radius**

S.No.	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>Tree</b>													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
2	Palm tree	<i>Borassus flabellifer</i>	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
3	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
4	Vealli vealan	<i>Vachellia leucophloea</i>	Babesiae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
5	Unjai maram	<i>Albizia amara</i>	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
6	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
<b>Shrubs</b>													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	10	0.8	70.0	1.1	16.7	16.7	33.3	Not Listed
2	Uumaththai	<i>Datura metel</i>	Solanaceae	9	8	10	0.9	80.0	1.1	18.8	19.0	37.8	Not Listed
3	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7	6	10	0.7	60.0	1.2	14.6	14.3	28.9	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	10	0.9	80.0	1.1	18.8	19.0	37.8	Not Listed
5	Unichadi	<i>Lantana camara</i>	Verbenaceae	8	7	10	0.8	70.0	1.1	16.7	16.7	33.3	Not Listed
6	suraimullu	<i>Zizyphus Oenoplia</i>	Rhamnaceae	7	6	10	0.7	60.0	1.2	14.6	14.3	28.9	Not Listed
<b>Herbs</b>													

1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	
3	pill	<i>Cenchrus ciliaris</i>	Poaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
5	kapok bush	<i>Aerva javani</i>	Amaranthaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
6	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
7	Yanai neariji	<i>pedalium murex</i>	Pedaliaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
8	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
9	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
10	Umathai	<i>Datura metel</i>	Solanaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
11	Sethamutti	<i>Sida cordata</i>	Malvaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
12	Annam	<i>Iva annua</i>	Asteraceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
13	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
14	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
15	Ishappukol Vitai	<i>Plantago coronopus</i>	Plantaginaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
16	vealiparuthi	<i>Pergularia daemia</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
17	Seppu nerinji	<i>Indigofera linnaei</i> Ali	Fabaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
18	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
19	Pal kodi	<i>Cynanchum viminalis</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
20	Ilia perandai	<i>Cissus rotundifolia</i>	Vitaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
21	Katralai	<i>Aloe vera</i>	Asphodelaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
22	Seammulli	<i>Barleria prionitis</i>	Acanthaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed



**Table 3.23 Calculation of Species Diversity in 300 m Radius**

S.No.	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Tree</b>						
1	Karuvealan	<i>Prosopis juliflora</i>	4	0.17	-1.79	-0.30
2	Palm tree	<i>Borassus flabellifer</i>	3	0.13	-2.08	-0.26
3	Vembu	<i>Azadirachta indica</i>	5	0.21	-1.57	-0.33
4	Vealli vealan	<i>Vachellia leucophloea</i>	3	0.13	-2.08	-0.26
5	Unjai maram	<i>Albizia amara</i>	4	0.17	-1.79	-0.30
6	Vetpalai	<i>Wrightia tinctoria</i>	5	0.21	-1.57	-0.33
H (Shannon Diversity Index) =1.77						
<b>Shrubs</b>						
1	Erukku	<i>Calotropis gigantea</i>	8	0.17	-1.79	-0.30
2	Uumaththai	<i>Datura metel</i>	9	0.19	-1.67	-0.31
3	Thuthi	<i>Abutilon indicum</i>	7	0.15	-1.93	-0.28
4	Avarai	<i>Senna auriculata</i>	9	0.19	-1.67	-0.31
5	Unichadi	<i>Lantana camara</i>	8	0.17	-1.79	-0.30
6	suraimullu	<i>Zizyphus Oenoplia</i>	7	0.15	-1.93	-0.28
H (Shannon Diversity Index) =1.79						
<b>herbs</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.04	-3.30	-0.12
2	Nearunji mull	<i>Tribulus zeyheri Sond</i>	7	0.04	-3.15	-0.14
3	pill	<i>Cenchrus ciliaris</i>	8	0.05	-3.01	-0.15
4	pulapoo	<i>Aerva lanata</i>	6	0.04	-3.30	-0.12
5	kapok bush	<i>Aerva javani</i>	7	0.04	-3.15	-0.14
6	Rail poondu	<i>Croton bonplandianus</i>	8	0.05	-3.01	-0.15
7	mookuthi poondu	<i>pedalium murex</i>	6	0.04	-3.30	-0.12
8	Perandai	<i>Cissus quadrangularis</i>	9	0.06	-2.90	-0.16
9	Thumbai chadi	<i>Leucas aspera</i>	7	0.04	-3.15	-0.14
10	Umathai	<i>Datura metel</i>	8	0.05	-3.01	-0.15
11	Sethamutti	<i>Sida cordata</i>	9	0.06	-2.90	-0.16
12	Annanm	<i>Iva annua</i>	6	0.04	-3.30	-0.12
13	Kolunji	<i>Tephrosia purpurea</i>	8	0.05	-3.01	-0.15
14	Nayuruvi	<i>Achyranthes aspera</i>	7	0.04	-3.15	-0.14
15	Ishappukol Vitai	<i>Plantago coronopus</i>	6	0.04	-3.30	-0.12
16	Vealiparuthi	<i>Pergularia daemia</i>	7	0.04	-3.15	-0.14
17	Seppu nerinji	<i>Indigofera linnaei Ali</i>	8	0.05	-3.01	-0.15
18	Sapathikalli	<i>Opuntia ficus-indica</i>	9	0.06	-2.90	-0.16
19	Pal kodi	<i>Cynanchum viminale</i>	7	0.04	-3.15	-0.14
20	Ilia perandai	<i>Cissus rotundifolia</i>	9	0.06	-2.90	-0.16
21	Katralai	<i>Aloe vera</i>	7	0.04	-3.15	-0.14
22	Seammulli	<i>Barleria prionitis</i>	8	0.05	-3.01	-0.15
H (Shannon Diversity Index) =3.08						

**Table 3.24 Species Richness (Index) in 300-meter radius**

Details	H	H max	Evenness	Species Richness
<b>Tree</b>	1.77	1.79	0.99	1.57
<b>Shrubs</b>	1.79	1.79	1.00	1.29
<b>Herbs</b>	3.08	3.09	1.00	4.12

**Table 3.25 Flora in Buffer Zone**

S.No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>TREE</b>													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
2	Thekku	<i>Tectona grandis</i>	Verbenaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
3	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
5	Manga	<i>Mangifera indica</i>	Anacardiaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
7	Vadanarayani	<i>Delonix elata</i>	Fabaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
8	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
9	Punnai	<i>Calophyllu inophyllum</i>	Calophyllaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
10	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
11	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
12	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
13	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
14	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae	6	5	10	0.6	50.0	1.2	3.9	4.2	8.1	Not Listed
16	Navalmaram	<i>Syzygium cumini</i>	Myrtaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
18	Vazhaimaram	<i>Musa</i>	Musaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
19	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
20	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
21	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed

22	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
23	Kudukapul	<i>Pithecellobium dulce</i>	Mimosaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
24	Karungali	<i>Acacia sundra</i>	Legumes	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
25	Nochi	<i>Vitex negundo</i>	Lamiaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
26	Karimurungai	<i>Moringa olefera</i>	Moraginaceae	6	5	10	0.6	50.0	1.2	3.9	4.2	8.1	Not Listed
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
28	Poovarasu	<i>Thespesia populnea</i>	Malvaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
29	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
30	Vilvam	<i>Aegle marmelos</i>	Rutaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
31	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
32	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
33	Koyya	<i>Psidium guajava</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	3.9	4.2	8.1	Not Listed
34	Seethapazham	<i>Annona reticulata</i>	Annonaceae	7	6	10	0.7	60.0	1.2	4.5	5.0	9.6	Not Listed
35	Savukku	<i>Casuarina L.</i>	Casuarinaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
<b>SHRUBS</b>													
1	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
3	Puramuttai	<i>Chrozophora rotleri</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.1	4.9	10.0	Not Listed
4	Arali	<i>Nerium indicum</i>	Apocynaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
5	Seemaiagaththi	<i>Cassia alata</i>	Caesalpinaceae	7	6	15	0.5	40.0	1.2	6.0	5.9	11.9	Not Listed
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
7	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	7	6	15	0.5	40.0	1.2	6.0	5.9	11.9	Not Listed
8	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
9	Idlipoo	<i>xoracoc cineae</i>	Rubiaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
10	Thuthi	<i>Abutilon indicum</i>	Meliaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
11	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae	6	5	15	0.4	33.3	1.2	5.1	4.9	10.0	Not Listed
12	Uumaththai	<i>Datura metel</i>	Solanaceae	7	6	15	0.5	40.0	1.2	6.0	5.9	11.9	Not Listed
13	Kundumani	<i>Abrus precatorius</i>	Fabaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
14	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
15	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed

Herbs, Climber, Creeper & Grasses													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
2	Veetukaayapoondur	<i>Tridax procumbens</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
3	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
7	Thumbai	<i>Leucas aspera</i>	Lamiaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
8	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
9	Parttiniyam	<i>Parthenium hysterophorus</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
10	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	10	9	25	0.4	36.0	1.1	5.2	5.3	10.5	Not Listed
11	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	25	0.4	40.0	1.1	5.7	5.9	11.6	Not Listed
12	Thoiya keerai	<i>Digeria muricata</i>	Amaranthaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
13	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
14	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	10	9	25	0.4	36.0	1.1	5.2	5.3	10.5	Not Listed
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
17	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
18	Sangupoo	<i>Clitoria ternatea</i>	Fabaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
19	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
21	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
22	mookuthi poondur	<i>Wedelia trilobata</i>	Asteraceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
23	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
24	Musthakasu	<i>Kyllinga brevifolia</i>	Cyperaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
25	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed

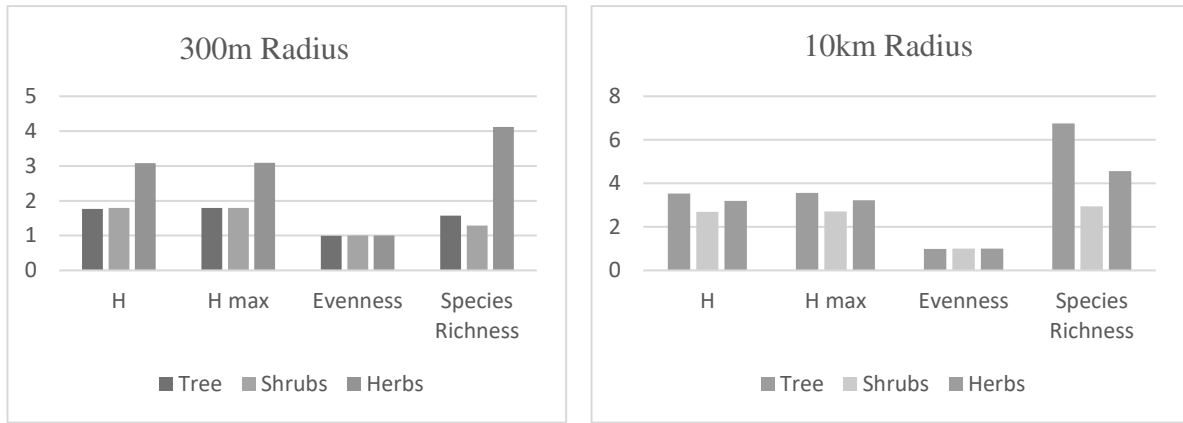
**Table 3.26 Calculation of Species Diversity in Buffer Zone**

S.No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Tree</b>						
1	Vembu	<i>Azadirachta indica</i>	4	0.03	-3.65	-0.09
2	Thekku	<i>Tectona grandis</i>	5	0.03	-3.43	-0.11
3	Pongam oiltree	<i>Pongamia pinnata</i>	3	0.02	-3.94	-0.08
4	Thennai maram	<i>Cocos nucifera</i>	4	0.03	-3.65	-0.09
5	Manga	<i>Mangifera indica</i>	5	0.03	-3.43	-0.11
6	Puliyamaram	<i>Tamarindus indica</i>	4	0.03	-3.65	-0.09
7	Vadanarayani	<i>Delonix elata</i>	3	0.02	-3.94	-0.08
8	Thenpazham	<i>Muntingia calabura</i>	4	0.03	-3.65	-0.09
9	Punnai	<i>Calophyllum inophyllum</i>	3	0.02	-3.94	-0.08
10	Ilanthai	<i>Ziziphus jujubha</i>	4	0.03	-3.65	-0.09
11	Karuvelam	<i>Acacia nilotica</i>	5	0.03	-3.43	-0.11
12	Nettilinkam	<i>Polylathia longifolia</i>	4	0.03	-3.65	-0.09
13	Arai nelli	<i>Phyllanthus acidus</i>	5	0.03	-3.43	-0.11
14	Panai maram	<i>Borassus flabellifer</i>	4	0.03	-3.65	-0.09
15	Sapota	<i>Manilkara zapota</i>	6	0.04	-3.25	-0.13
16	Navalmaram	<i>Syzygium cumini</i>	5	0.03	-3.43	-0.11
17	Alamaram	<i>Ficus benghalensis</i>	3	0.02	-3.94	-0.08
18	Vazhaimaram	<i>Musa</i>	4	0.03	-3.65	-0.09
19	Karuvelam maram	<i>Vachellia nilotica</i>	5	0.03	-3.43	-0.11
20	Nelli	<i>Embllica officinalis</i>	4	0.03	-3.65	-0.09
21	Eucalyptus	<i>Eucalyptus globules</i>	5	0.03	-3.43	-0.11
22	Maramalli	<i>Millingtonia hortensis</i>	4	0.03	-3.65	-0.09
23	Kuduka puli	<i>Pithecellobium dulce</i>	3	0.02	-3.94	-0.08
24	Karungali	<i>Acacia sundra</i>	5	0.03	-3.43	-0.11
25	Nochi	<i>Vitex negundo</i>	4	0.03	-3.65	-0.09
26	Karimurungai	<i>Moringa olefera</i>	6	0.04	-3.25	-0.13
27	Pappali maram	<i>Carica papaya L</i>	5	0.03	-3.43	-0.11
28	Poovarasu	<i>Thespesia populnea</i>	4	0.03	-3.65	-0.09
29	Arasanmaram	<i>Ficus religiosa</i>	3	0.02	-3.94	-0.08
30	Vilvam	<i>Aegle marmelos</i>	4	0.03	-3.65	-0.09
31	Nuna maram	<i>Morinda citrifolia</i>	5	0.03	-3.43	-0.11
32	Nettilingam	<i>Polyalthia longifolia</i>	4	0.03	-3.65	-0.09
33	Koyya	<i>Psidium guajava</i>	6	0.04	-3.25	-0.13
34	Seethapazham	<i>Annona reticulata</i>	7	0.05	-3.09	-0.14
35	Savukku	<i>Casuarina L.</i>	5	0.03	-3.43	-0.11
H (Shannon Diversity Index) =3.53						
<b>Shrubs</b>						
1	Avarai	<i>Senna auriculata</i>	9	0.08	-2.56	-0.20
2	Sundaika	<i>Solanum torvum</i>	8	0.07	-2.68	-0.18
3	Puramuttai	<i>Chrozophora rottleri</i>	6	0.05	-2.97	-0.15
4	Arali	<i>Nerium indicum</i>	8	0.07	-2.68	-0.18
5	Seemaiagaththi	<i>Cassia alata</i>	7	0.06	-2.82	-0.17
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	9	0.08	-2.56	-0.20

7	Kattamanakku	<i>Jatropha curcas</i>	7	0.06	-2.82	-0.17
8	Chaturakalli	<i>Euphorbia antiquorum</i>	8	0.07	-2.68	-0.18
9	Idlipoo	<i>xoracoc cinea</i>	9	0.08	-2.56	-0.20
10	Thuthi	<i>Abutilon indicum</i>	8	0.07	-2.68	-0.18
11	Nithyakalyani	<i>Cathranthus roseus</i>	6	0.05	-2.97	-0.15
12	Uumaththai	<i>Datura metel</i>	7	0.06	-2.82	-0.17
13	Kundumani	<i>Abrus precatorius</i>	8	0.07	-2.68	-0.18
14	Erukku	<i>Calotropis gigantea</i>	9	0.08	-2.56	-0.20
15	Neermulli	<i>Hydrophila auriculata</i>	8	0.07	-2.68	-0.18
H (Shannon Diversity Index) =2.70						
<b>Herbs, Climber, Creeper &amp; Grasses</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.03	-3.48	-0.11
2	Veetukaayapoond	<i>Tridax procumbens</i>	7	0.04	-3.32	-0.12
3	Mukkirattai	<i>Boerhaavia diffusa</i>	8	0.04	-3.19	-0.13
4	Kuppaimeni	<i>Acalypha indica</i>	9	0.05	-3.07	-0.14
5	Karisilanganni	<i>Eclipta prostata</i>	7	0.04	-3.32	-0.12
6	Korai	<i>Cyperus rotundus</i>	6	0.03	-3.48	-0.11
7	Thumbai	<i>Leucas aspera</i>	7	0.04	-3.32	-0.12
8	Nai kadugu	<i>Celome viscosa</i>	6	0.03	-3.48	-0.11
9	Parttiniyam	<i>Parthenium hysterothorus</i>	7	0.04	-3.32	-0.12
10	Thulasi	<i>Ocimum tenuiflorum</i>	10	0.05	-2.97	-0.15
11	Arugampul	<i>Cynodon dactylon</i>	11	0.06	-2.87	-0.16
12	Thoiya keerai	<i>Digeria muricata</i>	8	0.04	-3.19	-0.13
13	Kovai	<i>Coccinia grandis</i>	9	0.05	-3.07	-0.14
14	Perandai	<i>Cissus quadrangularis</i>	10	0.05	-2.97	-0.15
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	7	0.04	-3.32	-0.12
16	Karkakartum	<i>Clitoria ternatea</i>	8	0.04	-3.19	-0.13
17	Kovakkai	<i>Trichosanthes dioica</i>	9	0.05	-3.07	-0.14
18	Sangupoo	<i>Clitoriaternatia</i>	8	0.04	-3.19	-0.13
19	Siru puladi	<i>Desmodium triflorum</i>	7	0.04	-3.32	-0.12
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	6	0.03	-3.48	-0.11
21	Thumattikai	<i>Cucumis callosus</i>	8	0.04	-3.19	-0.13
22	mookuthi poond	<i>Wedelia trilobata</i>	6	0.03	-3.48	-0.11
23	Kattu kanchippul	<i>Apluda mutica</i>	8	0.04	-3.19	-0.13
24	Musthakasu	<i>Kyllinga brevifolia</i>	9	0.05	-3.07	-0.14
25	Nagathali	<i>Opuntia dillenii</i>	7	0.04	-3.32	-0.12
H (Shannon Diversity Index) =3.20						

**Table 3.27 Species Richness (Index) in Buffer Zone**

Details	H	H max	Evenness	Species Richness
<b>Tree</b>	3.53	3.56	0.99	6.75
<b>Shrubs</b>	2.70	2.71	1.00	2.94
<b>Herbs</b>	3.20	3.22	1.00	4.56



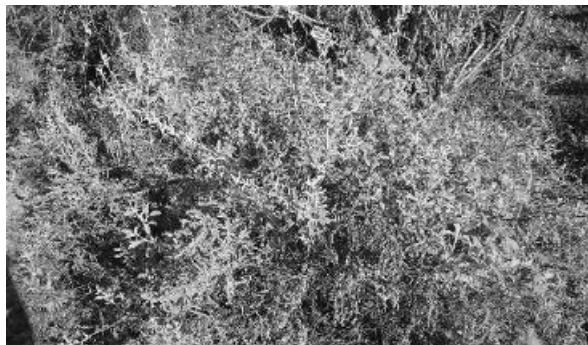
**Figure 3.26 Floral Diversity Species Richness (Index) in Buffer Zone and 300 m Radius**



*Albizia amara*



*Aerva lanata*



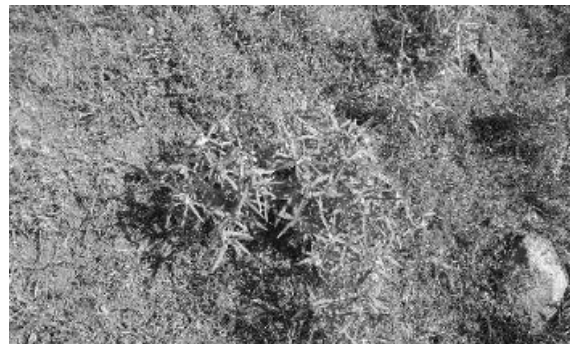
*Aerva javanica*



*Escontria chiotilla*



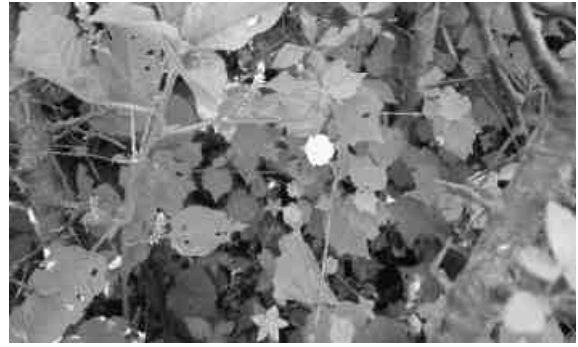
*Datura metel*



*Leucas aspera*



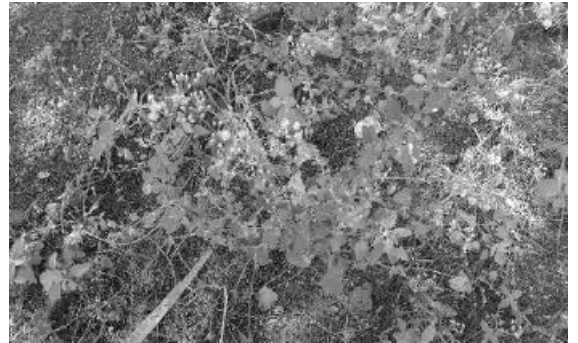
*Calotropis gigantea*



*Sida cordata*



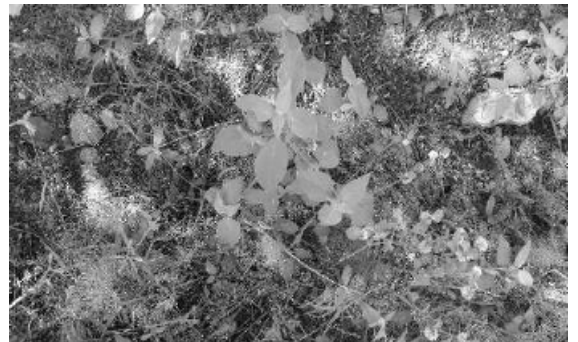
*Iva annua*



*Cyanthillium cinereum*



*Tephrosia purpurea*



*Acalypha indica*



*Achyranthes aspera*



*Prosopis juliflora*





*Pergularia daemia*



*Plantago coronopus*



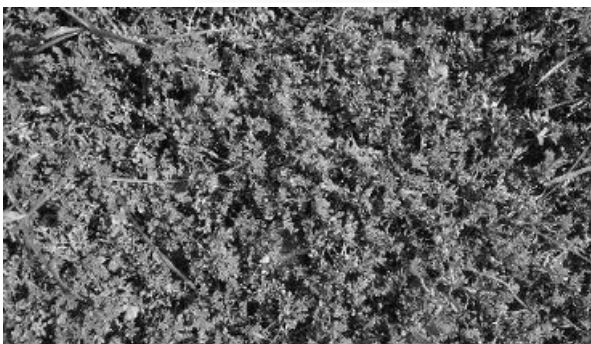
*Cenchrus polystachios*



*Vachellia leucophloea*



*Azadirachta indica*



*Indigofera linnaei* Ali



*Pedalium murex*



*Opuntia ficus-indica*



*Wrightia tinctoria*



*Cynanchum viminale*



*Cissus rotundifolia*



*Borassus flabellifer*



*Casuarina*



*Zizyphus Oenoplia*



*Eucalyptus obliqua*



*Ailanthus excelsa*



*Aloe vera*



*Croton bonplandianus*



*Barleria prionitis*

**Figure 3.27 Flora in Core and Buffer Area**

### ***Aquatic Vegetation***

The field survey for assessing the aquatic vegetation was also undertaken during the study period. The list of aquatic plants observed in the study area is given in Table 3.28.

**Table 3.28 Aquatic Vegetation**

<b>S.No.</b>	<b>Scientific name</b>	<b>Common Name</b>	<b>IUCN Red List of Threatened Species</b>
1	<i>Eichornia crassipes</i>	Water hyacinth	NA
2	<i>Aponogeton natans</i>	Floating lace plant	NA
3	<i>Carex cruciata</i>	Cross Grass	NA
4	<i>Cynodon dactylon</i>	Scutch grass	LC

\*LC- Least Concern, NA-Not yet assessed

### ***Forest Vegetation***

There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Thathampalayam R.F. located 9.93 km South-eastern side of the lease area. There are few plants and no endangered species in Thathampalayam reserve forest. The *Azadirachta indica*, *Vachellia leucophloea*, *albizia amara* these three types of plants are abundant in Thathampalayam reserve forest. The area under study (Mine lease area and the 10 km buffer zone) is not ecologically sensitive.

### ***Endangered and endemic species as per the IUCN Red List***

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

### **3.5.2 Fauna**

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

### ***Survey Methodology***

The assessment of fauna was done on the basis of primary data collected from the lease area. The presence was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area. In addition, officials, local people were another source of information for studying the fauna of the area. Field activities are physical/active search, covering rocks, burrows, hollow inspection and location of nesting sites and habitat assessment etc. Taxonomical identification was done by the field guide book and wildlife ENVIS data base ([wiienvis.nic.in/Database/Schedule Species Database](http://wiienvis.nic.in/Database/Schedule%20Species%20Database)) and Zoological Survey of India (ZSI). Detailed fauna is mentioned in the Table 3.28 and 3.29

### ***Survey and Monitoring of Mammals***

Intensive survey has been done by line transect methods (Walking and in vehicle) for all major habitats for surveying of mammals by direct and indirect evidence. Indirect methods such as faecal matter (i.e., scat) and pug mark by establishing 10 × 100 m linear transects depending on the habitat (i.e., existing wildlife game routes/forest trails used). Direct observation technique has been used for surveying large and medium sized mammals. But this technique is perfectly suitable for surveying of diurnal mammals; however, good photographs were also taken for species identification.

### ***Survey and Monitoring of Birds***

Birds are sampled by using point count methods, and opportunistic bird sightings. By the bird vocal sounds and photographs, the species were identified in consultation with village local people. Point count: in these methods, the observer will stand in a randomly chosen point and birds seen or heard in 50 m radius are recorded for 5 min. This observation is repeated in another point at least 30 m from the first point. We have enumerated 20-point counts in each quartile, which constitute a total of 80-point counts (20 x 4) within 10 km radius area. Opportunistic bird sightings: while traveling in study area, many bird species will be detected in survey time. Such species are recoded by their appearance or by their call.

### ***Survey and monitoring of reptiles***

Several survey techniques such as standard walk transect visual encounter survey methods were used to sampling reptiles in each and every habitat of the study area. While doing this survey, photographs were taken for identification of species. Species identification was done by using standard field guides in consultation with village people expert. The butterfly was enumerated by 2 linear transects of 10 × 100 m were laid within each quartile at minimum interval of 1 km. Further, amphibians and fishes documented in existing literature and secondary information in consultation with local people and wildlife experts.

### ***Fauna in Core Zone***

The 21 varieties of species observed in the core zone. Among them numbers of Insects 8 (41%), Reptiles 3 (14%), Mammals 1 (4%) and Avian 9 (41%). A total of 21 species belonging to 15 families have been recorded from the core mining lease area. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and eight species are under schedule IV according to Indian wild life Act 1972. A total eight species of birds were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table. 3.28.

**Table 3.29 Fauna in Core Zone**

S. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
<b>INSECTS</b>					
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
7	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	Acraea violae	Nymphalidae	<i>Acraea violae</i>	NL	LC
<b>REPTILES</b>					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
<b>MAMMALS</b>					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
<b>AVES</b>					
1	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
2	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
3	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
4	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
5	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
6	Koel	Cucalidae	<i>Eudynamys scolopaceus</i>	Schedule IV	LC
7	Crow Pheasant	Cucalidae	<i>Centropus sinensis</i>	Schedule IV	LC
8	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
9	Grey drongo	Dicruridae	<i>Dicrurus leucophaeus</i>	Schedule IV	LC

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

### ***Fauna in Buffer Zone***

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (40%), followed by Insects 15 (31%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 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 provided in Table 3.29.

**Table 3.30 Fauna in Buffer Zone**

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
<b>INSECTS</b>					
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
14	Lesser grass blue	Lycaenidae	<i>Zizina otis indica</i>	Schedule IV	LC
15	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA
<b>REPTILES</b>					
16	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
17	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
18	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
19	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
20	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
21	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
22	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
<b>MAMMALS</b>					
23	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
24	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
25	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
26	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
<b>AVES</b>					

27	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
28	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
29	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
30	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
31	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
32	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
33	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
34	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
35	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
36	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
37	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
38	Indian golden oriole	Oriolidae	<i>Oriolus kundoo</i>	Schedule IV	LC
39	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameria</i>	NL	LC
40	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
41	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
42	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
<b>AMPHIBIANS</b>					
45	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
46	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
47	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

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

### **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 Methodology & Analysis**

Data for this project was collected via a combination of secondary sources and primary source interviews, questionnaires, field research) in the study area.

### **3.6.5 Socio-Economic Status of Study area**

Kuppam is located in Pugalur Taluk of Karur District in the State of Tamil Nadu in India. It is governed by Kuppam Gram Panchayat. As per available data from the year 2011, 3503 persons live in 1120 households in the village Kuppam. There are 1806 female individuals and 1697 male individuals in the village. Females constitute 51.56% and males constitute 48.44% of the total population. Kuppam is 166.06 persons per square kilometre.



### 3.6.6 Presentation of Details

The collected data were presented in a suitable, concise form for further analysis. The collected data are presented in graphic form, as shown in Figures 3.27 & 3.28. Infrastructures available in the study area are provided in Tables 3.31-3.32.

**Table 3.31 Kuppam Village Population Facts**

Number of Households	1,120
Population	3,503
Male Population	1,697
Female Population	1,806
Children Population	264
Sex-ratio	1,064
Literacy	60.11%
Male Literacy	72.80%
Female Literacy	48.17%
Scheduled Tribes (ST) %	0
Scheduled Caste (SC) %	17.13%
Total Workers	2,246
Main Worker	1,941
Marginal Worker	305

Source: <https://www.census2011.co.in/data/village/635497-kuppam-tamil-nadu.html>

**Table 3.32 Population and Literacy Data of Study Area**

S.No.	Village Name	No of House Holds	Total Population	Male	Female	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate
1	Athipalayam	730	2062	1014	1048	1271	757	514	791	257	534
2	K.Paramathi	1093	3488	1709	1779	2554	1380	1174	934	329	605
3	Karudayampalayam	577	2347	1211	1136	1614	977	637	733	234	499
4	Kuppam	1120	3503	1697	1806	1947	1143	804	1556	554	1002
5	Munnur	826	2582	1289	1293	1649	980	669	933	309	624
6	Nedungur	403	1190	586	604	800	469	331	390	117	273
7	Pavithiram	1799	5881	2862	3019	3738	2165	1573	2143	697	1446
8	Punnam	1452	5446	2839	2607	3679	2208	1471	1767	631	1136
9	Vettamangalam (East)	807	2657	1310	1347	1521	900	621	1136	410	726
10	Vettamangalam(west)	1827	5882	2887	2995	3953	2225	1728	1929	662	1267

**Table 3.33 Workers Profile of Study Area**

S.No.	Village Name	Total Workers Population	Male Workers	Female Workers	Total Main Workers	Main Workers Male	Main Workers Female	Main Cultivation Workers	Main Agriculture Workers	Main Other Workers	Non-Worker Population
1	Athipalayam	1372	713	659	1309	701	608	442	551	281	690
2	K. Paramathi	1782	1118	664	1723	1108	615	315	448	938	1706
3	Karudayampalayam	1176	646	530	847	501	346	301	265	251	1171
4	Kuppam	2246	1198	1048	1941	1049	892	822	529	565	1257
5	Munnur	1577	882	695	1434	805	629	420	638	355	1005
6	Nedungur	753	432	321	734	418	316	409	241	81	437
7	Punnam	2718	1531	1187	2665	1504	1161	731	632	1269	2728
8	Vettamangalam(East)	1609	894	715	1593	886	707	419	940	210	1048
9	Vettamangalam(west)	3541	1966	1575	3455	1920	1535	1268	1410	729	2341
10	Pavithiram	3293	1875	1418	2879	1682	1197	747	829	1242	2588

**Table 3.34 Communication & Transport Facilities in the Study Area**

S. No	Village Name	PO	SPO	PTO	T	PCO	MP	IC/CSC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	NWR	FP
1	Athipalayam	2	1	2	1	1	1	2	2	2	1	2	2	2	1	1	1	2	1
2	K. Paramathi	2	1	2	1	1	1	2	2	1	1	2	2	1	1	1	1	2	1
3	Karudayampalayam	2	1	2	1	1	1	2	2	1	1	2	1	2	2	1	1	2	1
4	Kuppam	2	1	2	1	2	1	2	2	1	1	2	2	1	1	1	1	2	1
5	Munnur	2	1	2	1	1	1	2	2	1	1	2	2	2	1	1	1	2	1
6	Nedungur	2	2	2	1	2	1	2	2	1	1	2	1	2	2	1	1	2	1
7	Pavithiram	2	1	2	1	1	1	2	2	1	1	2	1	1	1	1	1	2	1
8	Punnam	2	2	2	1	1	1	2	2	1	1	2	2	1	2	1	1	2	1
9	Vettamangalam(East)	2	2	2	1	2	1	2	2	1	1	2	2	2	1	1	1	2	1
10	Vettamangalam(west)	2	1	2	1	1	1	2	2	1	2	2	1	1	1	1	1	2	1

Source: [www.censusindia.gov.in](http://www.censusindia.gov.in) - Tamil Nādu Census of India – 2011

Abbreviations: PO - Post Office; MP - Mobile Phone Coverage; RS - Railway Station; GR - Gravel Roads; SPO - Sub Post Office; IC / CSC - Internet Cafe/Common Service Centre; NH - National Highways; NWR - Navigate waterways River; PTO - Post & Telegraph office; PCF - Private Courier Facility; SH - State Highways; FP - Foot path; T- Telephone (Landline); BS - Public Bus Service; MDR - Major District Road; PCO - Public call office / Mobile; PBS - Private Bus Service; BTR - Black Topped (Pucca Roads). Note: 1 - Available within the village 2 - Not available

**Table 3.35 Water & Drainage Facilities in the Study Area**

S. No.	Village Name	TP	CW	UCW	HP	TW/BH	S	R/C	T/P/L	CD	OD	CT
1	Athipalayam	1	2	1	2	1	2	2	2	1	1	1
2	K.Paramathi	1	1	1	1	1	2	2	2	1	1	2
3	Karudayampalayam	1	2	1	2	1	2	2	2	1	1	2
4	Kuppam	1	1	1	1	1	2	2	2	1	1	1
5	Munnur	1	1	1	2	1	2	2	2	1	1	1
6	Nedungur	1	2	1	1	1	2	2	2	1	1	1
7	Pavithiram	1	1	1	1	1	2	1	2	1	1	1
8	Punnam	1	1	1	1	1	1	1	1	1	1	1
9	Vettamangalam (East)	1	1	1	1	1	2	1	2	1	1	2
10	Vettamangalam (west)	1	1	1	1	1	2	1	2	1	1	1

**Table 3.36 Other Facilities in the Study Area**

S.No	Village Name	ATM	CB	COB	ACS	SHG	PDS	RM	AMS	NC	NC-AC	CC	SF	PL	APS	BDRO	PS
1	Athipalayam	2	2	2	2	1	1	2	2	1	1	1	1	2	1	1	1
2	K. Paramathi	2	1	1	1	1	1	2	1	1	1	2	2	1	1	1	1
3	Karudayampalayam	1	2	1	2	1	1	2	2	1	1	1	1	2	1	1	1
4	Kuppam	2	2	1	2	1	1	2	2	1	1	1	1	2	1	1	1
5	Munnur	2	2	2	2	1	1	2	2	1	1	2	2	2	1	1	1
6	Nedungur	2	2	2	2	1	1	2	2	1	1	1	1	2	1	1	1
7	Pavithiram	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1
8	Punnam	2	2	2	1	1	1	2	2	1	1	1	1	2	1	1	1
9	Vettamangalam (East)	2	2	2	1	1	1	2	2	1	1	1	1	2	1	1	1
10	Vettamangalam (west)	2	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1

Abbreviations: ATM - Automatic Teller Machine; PDS - Public Distribution System (Shop); CB - Commercial Bank; RM - Regular Market; COB - Co-operative Bank; AMS - Agricultural Market Society; ACS - Agricultural Credit Societies; NC - Nutritional Centres; SHG - Self Help Group; NC-AC - Nutritional Centres - Anganwadi Centre; DBRO - Birth & Death Registration Office; PS - Power Supply Note – 1 - Available within the village; 2 - Not available

### 3.6.7 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.

### 3.6.8 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 Noyyal to Paramathi SH-332 and Erode to Karur (SH-84) and Paramathi to Karur Road (NH-67) as shown in Table 3.37 and in Figure 3.28. 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 3.37 Traffic Survey Locations**

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Noyyal to Paramathi	3.37 Km-SW	Noyyal to Paramathi SH-332
TS2	Erode to Karur (SH-84)	2.67 Km-NW	Erode to Karur (SH-84)
TS3	Paramathi to Karur Road (NH-67)	6.84 km-SW	Paramathi to Karur Road (NH-67)

Source: On-site monitoring by GTMS FAE & TM

**Table 3.38 Existing Traffic Volume**

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	90	270	48	48	89	45	363
TS2	95	285	52	52	94	47	384
TS3	105	315	55	55	105	53	423

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 3.39 Rough Stone Transportation Requirement**

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	23	69

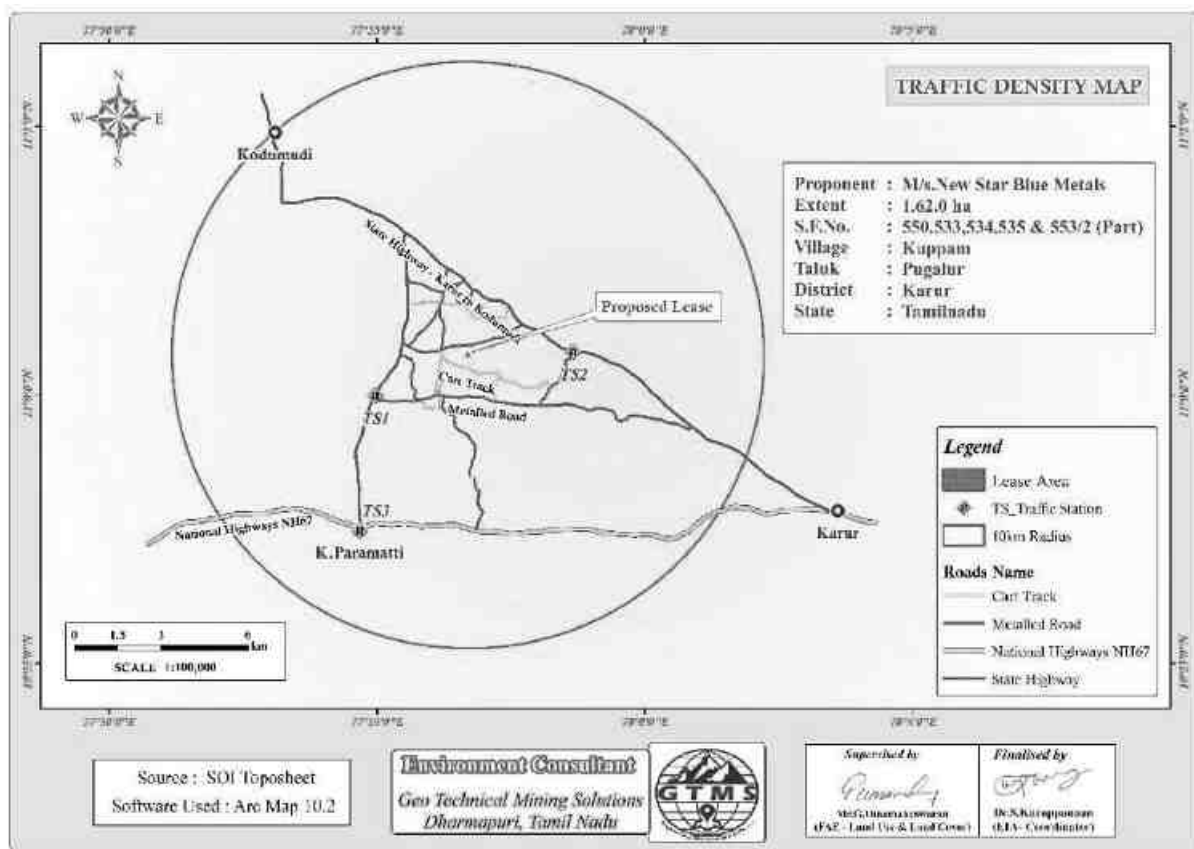
Source: Approved Mining Plan

**Table 3.40 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
Noyyal to Paramathi SH-332	363	69	432	1200
Paramathi to Noyyal (SH)	384	69	453	1200
Paramathi to Karur Road (NH-67)	423	69	495	1500

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

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



**Figure 3.28 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 3.41.

**Table 3.41 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 NE Reserve Forest	<b>9.93</b> km
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Cauveri River	5.44 km N
		Noyyal River	4.59 km NW
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Critically 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	6.6 km NE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet











**Figure 3.29 Field Study Photographs**

## CHAPTER IV

### ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 4.0 GENERAL

Environmental impacts both direct and indirect on various environmental attributes due to proposed mining activity will be created in the surrounding environment, during the operational and post-operational phases. The occurrence of mineral deposits, being site specific, their exploitation, often, does not allow for any choice except adoption of eco-friendly operation. The methods are required to be selected in such a manner, so as to maintain environmental equilibrium ensuring sustainable development. In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction. The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail: land, soil, water, air, noise, biological and socio-economic environments. Based on the baseline environmental status at the project site, the environmental factors that are likely to be affected (Impacts) are identified, quantified and assessed.

#### 4.1 LAND ENVIRONMENT

##### 4.1.1 Anticipated Impact

The proposed project would result in:

- ❖ Permanent impact on mineral resources due to removal of 164992 m<sup>3</sup> of rough stone and 25088 m<sup>3</sup> of gravel in the five years.
- ❖ Substantial change to topographic features or significant change in surface relief
- ❖ Permanent or temporary change on land use and land cover.
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- ❖ Siltation of water course due to wash off from the exposed working area

##### 4.1.2 Common Mitigation measures for the proposed Project

In order to minimize the adverse effects, the following control measures will be implemented:

- ❖ After completion of the quarrying operation, the land will be partially backfilled with dumped material and part of the area will be allowed to collect rainwater which will act as temporary reservoir
- ❖ Topsoil will be utilized for greenbelt development in the safety barrier to prevent noise and sound propagation to the nearby lands
- ❖ Garland drains will be constructed all around the quarry pit and check dams will be constructed at suitable locations in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water within the proposed area
- ❖ Barbed wire fencing will be reconstructed 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**

This project does not result in any impact on the soil of the project site, as topsoil is neither removed from the project site nor preserved in the safety margin area. However, some of the common mitigation measures have been discussed in the following sections to protect the immediate soil environment surrounding the lease area.

### **4.2.2 Mitigation Measures for Soil Conservation**

- ❖ The top soil will be preserved in the safety barrier and kept in moisture condition. The preserved topsoil will be utilized for greenbelt development in the safety barrier and utilized for plantation on the top bench
- ❖ Garland drains will be constructed around the project area to arrest any soil from the quarry area being carried away by the rainwater. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches
- ❖ Retaining wall with weep hole, garland drain will be provided around the dump areas
- ❖ Proper angle of repose will be maintained
- ❖ Grasses will be grown over the dump areas for stability.

## **4.3 WATER ENVIRONMENT**

### **4.3.1 Anticipated Impact**

- ❖ As the water required for the mining operations, as given in Table 2.10 is obtained from the approved water supplying agency, the project does not develop any abstraction structures in the lease area. Therefore, no impact responsible for the water table declination is anticipated.

- ❖ Surface and ground water resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste from washing of machineries. To address this impact, some of the important mitigation measures is provided as below.

#### **4.3.2 Common Mitigation Measures for the Proposed Project**

- ❖ Garland drainage system and settling tank will be constructed along the proposed mining lease area. 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
- ❖ Rainwater from the mining pits will be collected in sump and will be allowed to store and pumped out to surface settling tank of 15 m x 10 m x 3 m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- ❖ Benches will be provided with inner slopes and through a system of drains and channels, rain water will be allowed to descent into surrounding drains to minimize the effects of erosion and water logging arising out of uncontrolled descent of water.
- ❖ The water collected will be reused during storm for dust suppression and greenbelt development within the mines.
- ❖ Interceptor traps/oil separators will be installed to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse.
- ❖ Flocculating or coagulating agents will be used to assist in the settling of suspended solids during monsoon seasons.
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted.
- ❖ Domestic sewage from site office and urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- ❖ Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- ❖ De-silting will be carried out before and immediately after the monsoon season.
- ❖ Regular monitoring (once every 6 months) and analysing the quality of water in open well, bore wells and surface water.

## 4.4 AIR ENVIRONMENT

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by jack hammer drilling, blasting excavation, loading and transportation.

### 4.4.1 Anticipated Impact from Proposed Project

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

#### 4.4.1.1 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, SO<sub>2</sub>, and NO<sub>x</sub> 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	$E = [u \cdot 0.4a \cdot 0.2 \{9.7 + 0.01p + b / (4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	SO <sub>2</sub>	Area	$E = a \cdot 0.14 \{u / (1.83 + 0.93u)\} \{ [p / (0.48 + 0.57p)] + [b / (14.37 + 1.15b)] \}$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	NO <sub>x</sub>	Area	$E = a \cdot 0.25 \{u / (4.3 + 32.5u)\} [1.5p + \{b / (0.06 + 0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); 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. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM<sub>10</sub> keeping in mind that proper control measures are followed. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> 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 <sup>2</sup>	Calculated Value (g/s/m <sup>2</sup> )
Overall Mine	PM <sub>2.5</sub>	0.0122565462	16200	7.56577E-07
Overall Mine	PM <sub>10</sub>	0.0202898898	16200	1.25246E-06
Overall Mine	SO <sub>2</sub>	0.0098524254	16200	6.08174E-07
Overall Mine	NO <sub>x</sub>	0.0115242545	16200	7.11374E-07

#### 4.4.1.2 Frame Work of Computation and Model Details

By using the above-mentioned inputs, Ground Level Concentrations (GLC) due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere.

Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by quarrying activities. Suspended Particulate Matter (SPM) is the major pollutant occurred during quarrying activities. The prediction includes the impacts of excavation, drilling, blasting, loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and cloud cover.

The model was used to predict the impact on the ambient air environment at each receptor at various localities within 5 km radius around the project site and the maximum incremental GLC at the project site. All the prediction models in Figures 4.1- 4.4 shows the maximum concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> close to the proposed project site due to low to moderate wind speeds.

#### 4.4.1.3 Modelling of Incremental Concentration

The air borne particulate matter such as PM<sub>10</sub> and PM<sub>2.5</sub> generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of oxides of

sulphur (SO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>) due to excavation and loading equipment and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area. Anticipated incremental concentration and net increase in emissions due to quarrying activities is predicted by 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.

#### 4.4.1.4 Model Results

The post project resultant concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> & NO<sub>x</sub> were given in Tables 4.3-4.6.

**Table 4.3 Incremental & Resultant GLC of PM<sub>2.5</sub>**

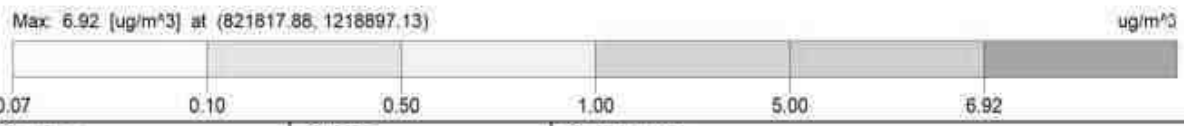
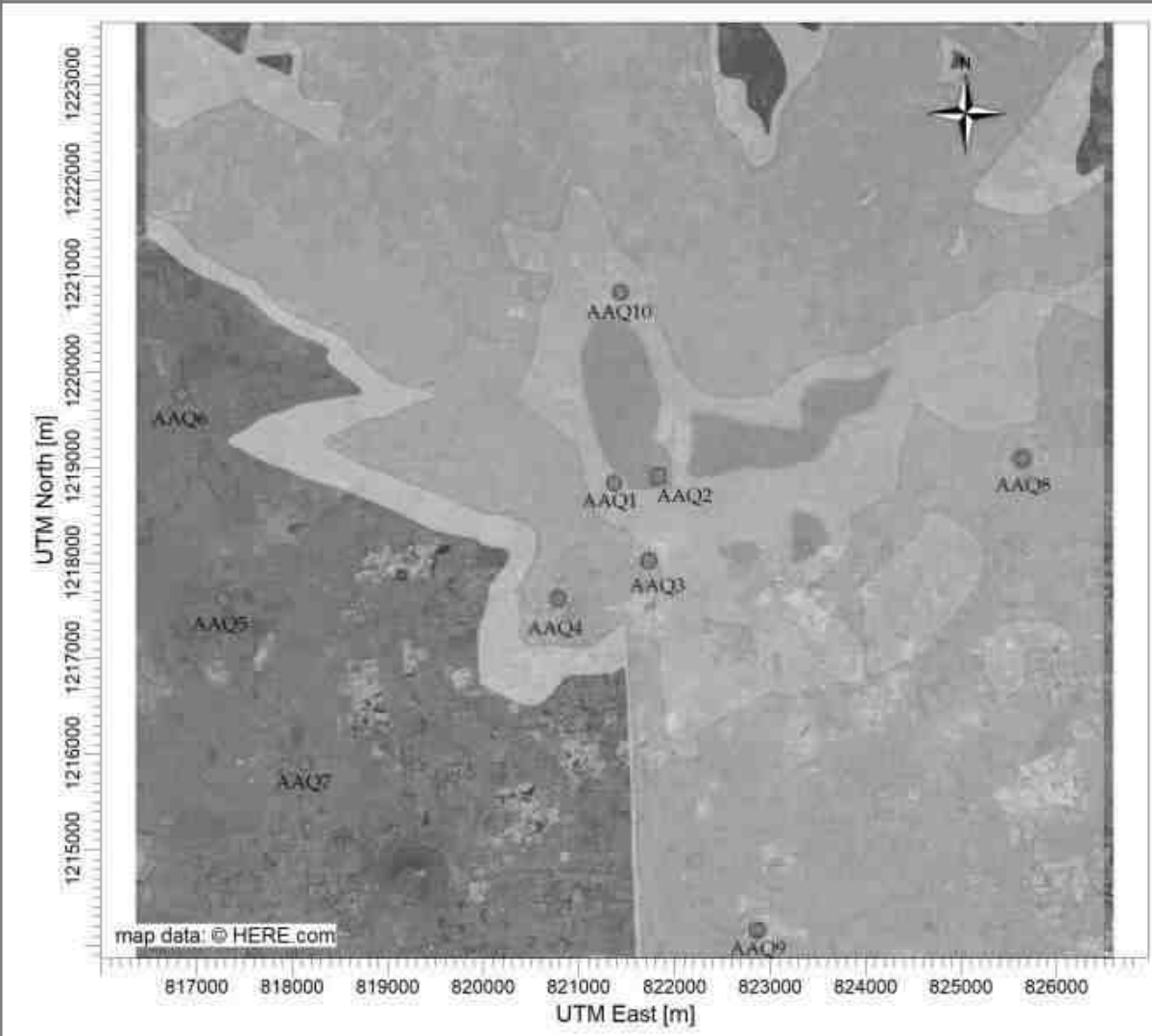
Station ID	Distance to core area (km)	Direction	PM <sub>2.5</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (60 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.42	W	21.1	1	22.1	Below Standard	4.74	Not Significant
AAQ2	--	-	21.6	6.9	28.5		31.94	
AAQ3	0.83	S	20.4	0.5	20.9		2.45	
AAQ4	1.58	SW	16.0	0.5	16.5		3.13	
AAQ5	4.65	W	18.0	0	18		0.00	
AAQ6	5.03	W	19.1	0	19.1		0.00	
AAQ7	4.69	SW	18.0	0	18		0.00	
AAQ8	3.75	E	25.3	0.5	25.8		1.98	
AAQ9	4.75	S	21.0	0.5	21.5		2.38	
AAQ10	1.87	N	21.2	1	22.2		4.72	

**Table 4.4 Incremental & Resultant GLC of PM<sub>10</sub>**

Station ID	Distance to core area (km)	Direction	PM <sub>10</sub> Concentrations (µg/m <sup>3</sup> )			Comparison against air quality standard (100 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.42	W	42.6	5	47.6	Below Standard	11.74	Not Significant
AAQ2	--	-	39.5	11.4	50.9		28.86	
AAQ3	0.83	S	39.8	0.5	40.3		1.26	
AAQ4	1.58	SW	37.0	0.5	37.5		1.35	
AAQ5	4.65	W	34.9	0	34.9		0.00	
AAQ6	5.03	W	37.0	0	37		0.00	
AAQ7	4.69	SW	39.7	0	39.7		0.00	
AAQ8	3.75	E	46.8	1	47.8		2.14	
AAQ9	4.75	S	39.3	0.5	39.8		1.27	
AAQ10	1.87	N	39.8	5	44.8		12.56	



PROJECT TITLE:  
**M/S NEW STAR BLUE METALS LLP ROUGHSTONE AND GRAVEL QUARRY PROJECT\_PM2.5**



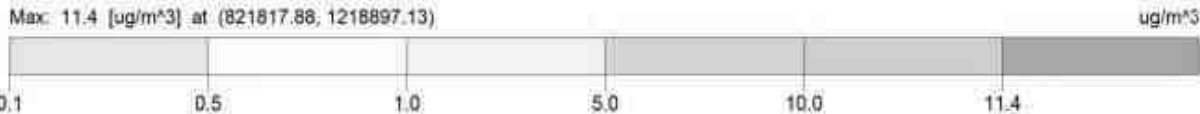
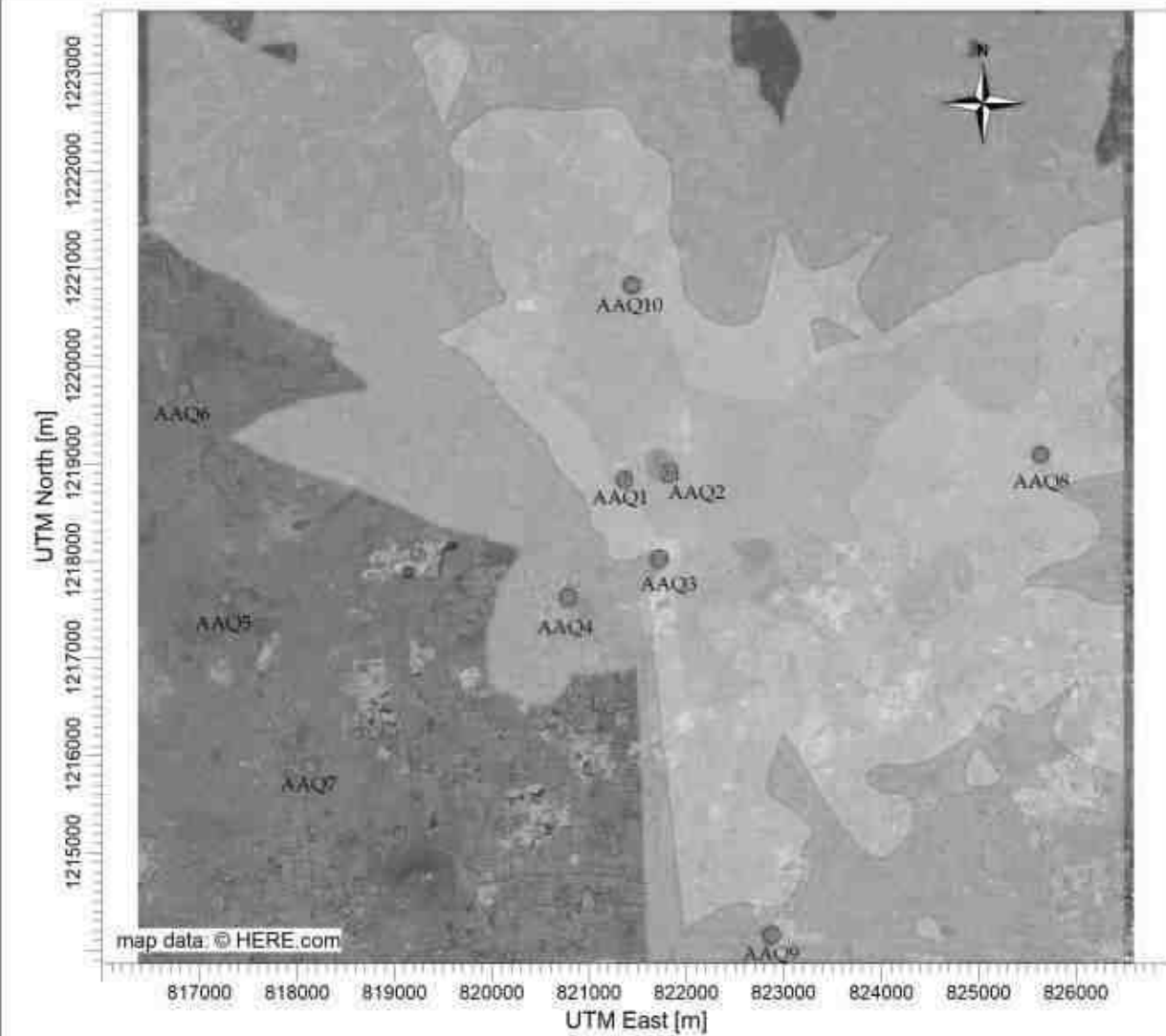
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	451		
	Concentration	0	2 km
	6.92 ug/m <sup>3</sup>	12-01-2023	

AERMOD View - Laked Environmental Software

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**Figure 4.1 Predicted Incremental Concentration of PM<sub>2.5</sub>**

PROJECT TITLE:  
**M/S NEW STAR BLUE METALS LLP ROUGHSTONE AND GRAVEL QUARRY PROJECT\_PM10**



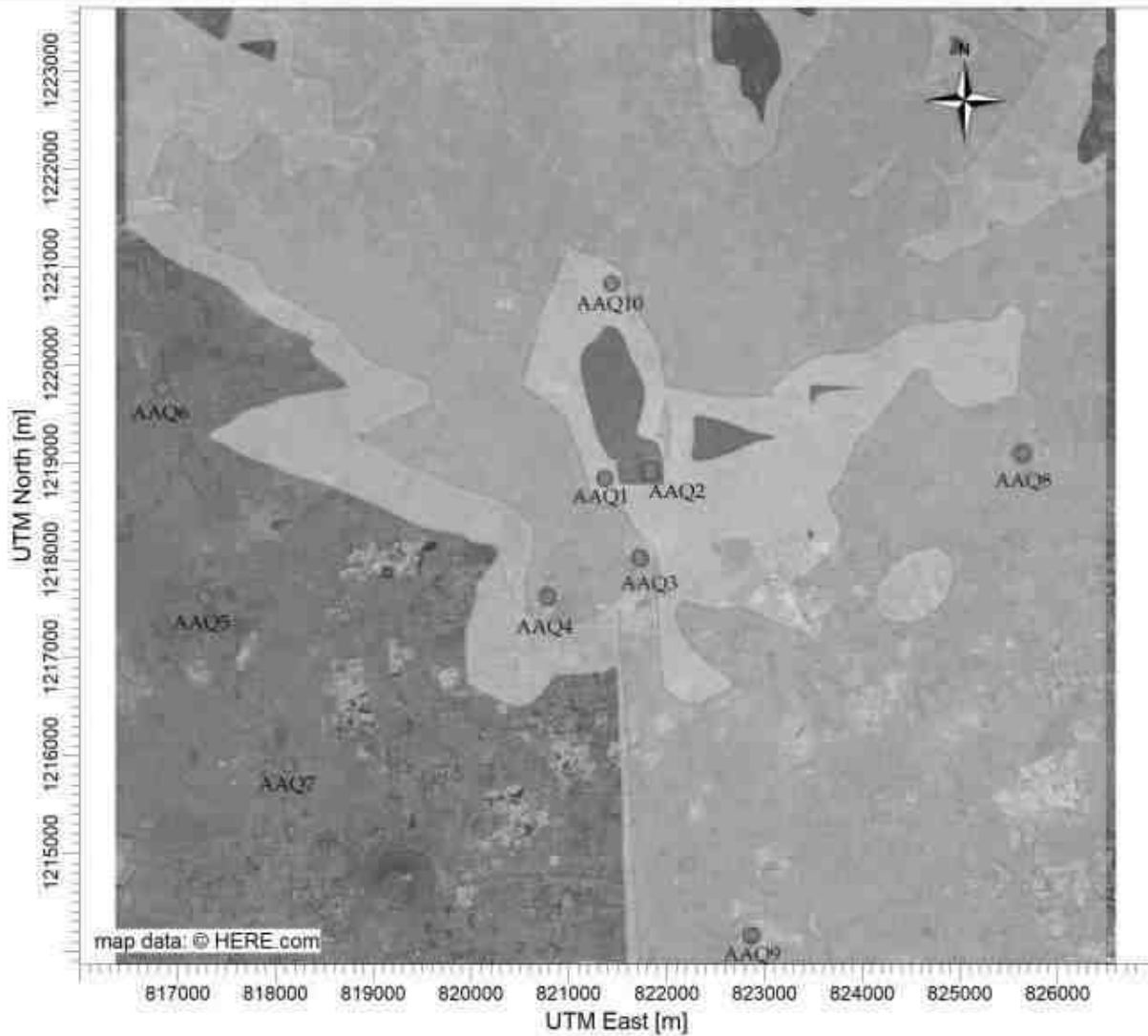
COMMENTS:	SOURCES:	COMPANY NAME:	
	RECEPTORS:	MODELER:	
	OUTPUT TYPE:	SCALE:	1:89,000
	MAX:	DATE:	PROJECT NO.:
	1		
	451		
	Concentration		
	11.4 $\mu\text{g}/\text{m}^3$	12-01-2023	

AERMOD View - Lakes Environmental Software C:\Users\GTMS\Desktop\Rani\3.NEW\_STAR\PM10\PM10.jac

**Figure 4.2 Predicted Incremental Concentration of PM<sub>10</sub>**

PROJECT TITLE

M/S NEW STAR BLUE METALS LLP ROUGHSTONE AND GRAVEL QUARRY PROJECT\_SO2



Max: 5.55 [ug/m³] at (821817.88, 1218897.13)

ug/m³



COMMENTS:	SOURCES:	COMPANY NAME:	
	1	MODELER:	
	RECEPTORS:	SCALE: 1:69,000	
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OUTPUTTYPE:	PROJECT NO.:		
Concentration	MAX:	DATE:	
	5.55 ug/m³	12-01-2023	

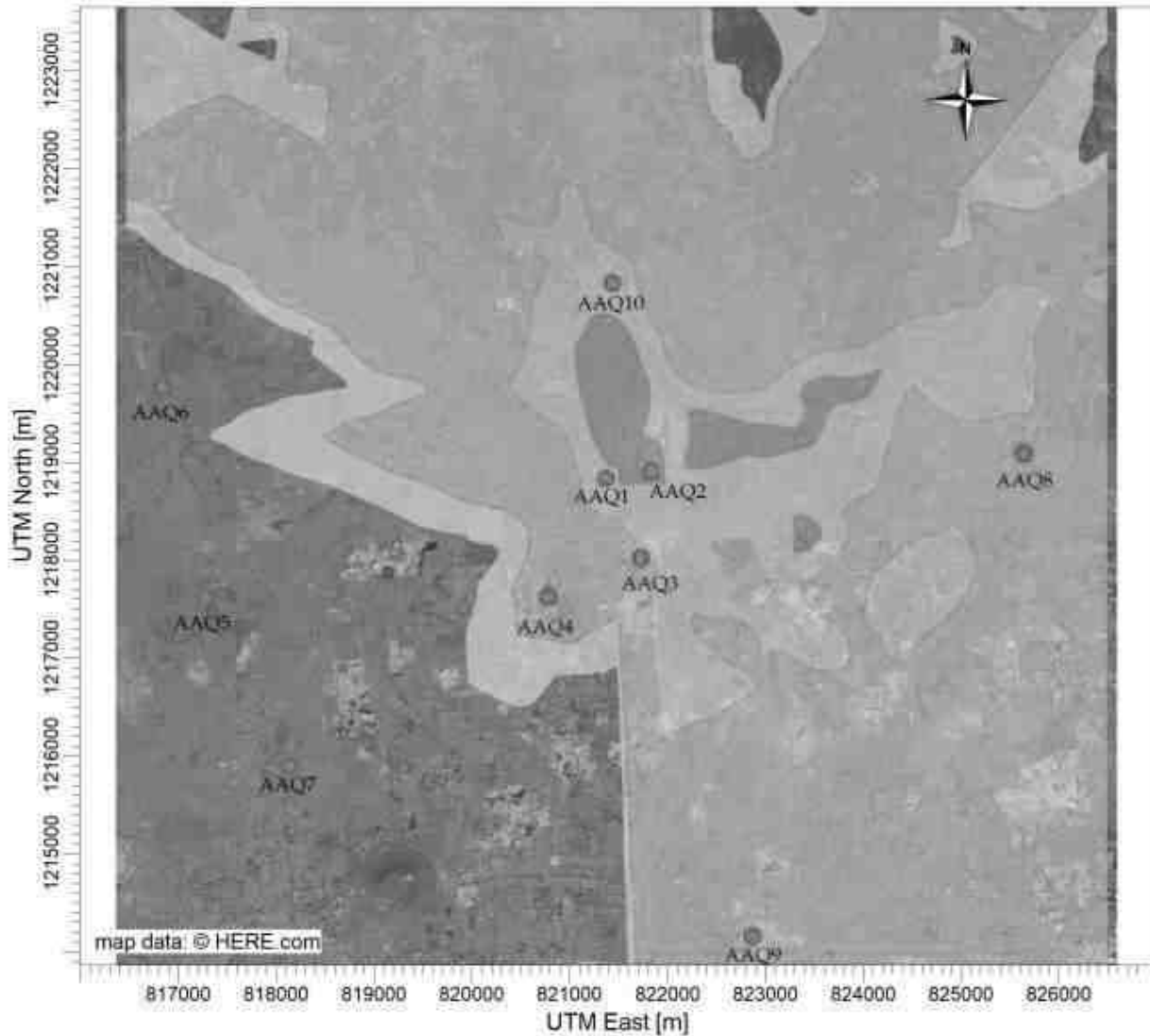
AERMOD View - Latest Environmental Software

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Figure 4.3 Predicted Incremental Concentration of SO2

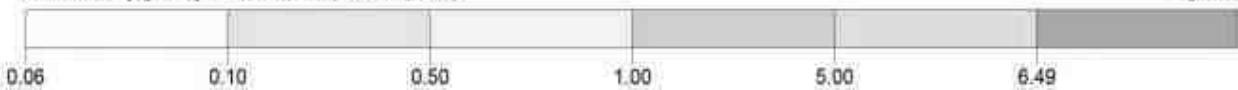
PROJECT TITLE:

**M/S NEW STAR BLUE METALS LLP ROUGHSTONE AND GRAVEL QUARRY PROJECT\_NOX**



Max: 6.49 [ug/m³] at (821817.88, 1218897.13)

ug/m³



COMMENTS:	SOURCES:	COMPANY NAME:	
	1		
	RECEPTORS:	MODELER:	
	451		
OUTPUT TYPE:	SCALE:	1:69,000	
Concentration			
MAX:	DATE:	PROJECT NO.:	
6.49 ug/m³	12-01-2023		

AERMOD View - Lakes Environmental Software

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**Figure 4.4 Predicted Incremental Concentration of NO<sub>x</sub>**

**Table 4.5 Incremental & Resultant GLC of SO<sub>2</sub>**

Station ID	Distance to core area (km)	Direction	SO <sub>2</sub> concentrations (µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.42	W	8.4	1	9.4	Below Standard	11.90	Not Significant
AAQ2	--	-	8.9	5.5	14.4		61.80	
AAQ3	0.83	S	9.5	0.5	10		5.26	
AAQ4	1.58	SW	7.4	0.5	7.9		6.76	
AAQ5	4.65	W	8.4	0	8.4		0.00	
AAQ6	5.03	W	10.0	0	10		0.00	
AAQ7	4.69	SW	7.7	0	7.7		0.00	
AAQ8	3.75	E	9.1	0.5	9.6		5.49	
AAQ9	4.75	S	9.2	0.5	9.7		5.43	
AAQ10	1.87	N	8.9	1	9.9		11.24	

**Table 4.6 Incremental & Resultant GLC of NO<sub>x</sub>**

Station ID	Distance to core area (km)	Direction	NO <sub>x</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.42	W	16.3	1	17.3	Below Standard	6.13	Not Significant
AAQ2	--	-	16.9	6.4	23.3		37.87	
AAQ3	0.83	S	16.6	0.5	17.1		3.01	
AAQ4	1.58	SW	11.0	0.5	11.5		4.55	
AAQ5	4.65	W	17.0	0	17		0.00	
AAQ6	5.03	W	19.1	0	19.1		0.00	
AAQ7	4.69	SW	14.0	0	14		0.00	
AAQ8	3.75	E	26.6	0.5	27.1		1.88	
AAQ9	4.75	S	18.2	0.5	18.7		2.75	
AAQ10	1.87	N	16.0	1	17		6.25	

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.

#### **4.4.2 Common Mitigation Measures**

##### ***Drilling***

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

##### ***Haul Road and Transportation***

- ❖ Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- ❖ Water sprinkling on haul roads and loading points will be carried out twice a day
- ❖ Main source of gaseous pollution will be from vehicle used for transportation of mineral. Therefore, weekly maintenance of machines improves combustion process and reduces pollution.
- ❖ The un-metalled haul roads will be compacted weekly before being put into use.
- ❖ Overloading of tippers will be avoided to prevent spillage.
- ❖ 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.

##### ***Green Belt***

- ❖ Planting of trees all along mine haul roads outside the lease and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of tractors/tippers.
- ❖ Green belt of adequate width will be developed around the project site.

##### ***Occupational Health***

- ❖ Dust mask will be provided to the workers and their use will be strictly monitored.
- ❖ Annual medical checkups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers and tipper drivers.

- ❖ Ambient air quality monitoring will be conducted every six months to assess effectiveness of mitigation measures proposed.

#### 4.5 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling and playing of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the project area. Noise modelling has been carried out considering compressor operation (drilling) and transportation activities.

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

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

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

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - A_{e1,2}$$

Where,

$L_{p1}$  &  $L_{p2}$  are sound levels at points located at distances  $r_1$  and  $r_2$  from the source

$A_{e1,2}$  is the excess attenuation due to environmental conditions.

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

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

##### 4.5.1 Anticipated Impact

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

- Source data
- Receptor data
- Attenuation factor

Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.7.

**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
<b>Total</b>			<b>95.8</b>

\*50 feet from source = 15.24 meters

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

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). Generally, most mining operations produce noise between 100-109 dB (A). We have considered equipment and operation noise levels (max) to be approx. 109 dB (A) for noise prediction modelling.

**Table 4.8 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)
Between NTC and Rani Leases	360	41.7	28.25	41.89
Core	100	40.3	39.38	42.87
Amaravathi Lease	870	40.0	20.59	40.05
Kuppam	1930	35.4	13.67	35.43
Puthurpatti	890	32.6	20.39	32.85
Andisangilipalayam	1600	36.2	15.30	36.24
Velampalayam	4710	40.3	5.92	40.30
Athipalayam	4930	40.8	5.52	40.80
Munnur	4570	40.8	6.18	40.80
Punna chatram	3750	42.2	7.90	42.20
Karudayampalayam	4830	41.2	5.70	41.20
Kunthanipalayam	1930	41.7	13.67	41.71
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			



The incremental noise level is found to be 39.38 dB (A) in core zone and ranges between 5.70 and 28.25 dB (A) in buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E),dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986.).

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

#### **4.5.3 Ground Vibrations**

Ground vibrations due to the proposed mining activities are anticipated due to operation of mining machines like excavators, drilling and blasting, transportation vehicles, etc., however, the major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations

induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements. Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. Nearest habitation from the proposed project areas is listed in below table. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation. The empirical equation for assessment of peak particle velocity (PPV) is 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	31	890	0.14	23	0.06	129

**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	31	100	4.92	23	0.80	152
		200	1.62		0.35	145
		300	0.84		0.21	141
		400	0.53		0.15	138
		500	0.37		0.12	135

The peak particle velocity produced by the charge of 31 kg is well below that of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997 but the project proponent ensures that the charge per blast shall be less than 31 kg

and that the proponent shall carry out blasting twice or thrice a day based on the onsite conditions under the supervision of competent person employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

#### **4.5.3.1 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> 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 1.09mm/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 Anticipated Impact on Flora

- ❖ The proposed mining activities include removal of some scattered bushes and other thorny species.
- ❖ A total of 16 trees belonging to 4 species such as *Prosopis juliflora*, *Azadirachta indica*, *Vachelia leucoploea*, and *Albizia amara* are present in the mining lease 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
- ❖ 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 1611 kg per day, 434886 kg per year and 2174431 kg over five years, as provided in Table 4.11.

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

	<b>Per day</b>	<b>Per year</b>	<b>Per five years</b>
Fuel consumption of excavator	101	27235	136175
Fuel consumption of compressor	30.8	8316	41580
Fuel consumption of tipper	469	126720	633600
Total fuel consumption in liters	601	162271	811355
CO <sub>2</sub> emission in kg	1611	434886	2174431

### 4.6.2 Mitigation Measures

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ❖ 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. Details of seedlings proposed to be planted in the safety margin of the lease area are given in Table 3.13.

#### ***Carbon Sequestration***

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 24 kg of

carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.

- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.14), about 810 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 72 kg of the total carbon, as provided in Table 4.12.

**Table 4.12 CO<sub>2</sub> Sequestration**

CO <sub>2</sub> sequestration in kg	72	19421	97103
Remaining CO <sub>2</sub> not sequestered in kg	1539	415466	2077328
Trees required for environmental compensation	17311		
area required for environmental compensation in hectares	35		

**Greenbelt Development**

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.14-4.15. For greenbelt development, species are recommended, as shown in Table 4.13 on the basis of:

- ❖ Natural growth of existing species and survival rate of various species.
- ❖ Suitability of a particular plant species for a particular type of area.
- ❖ Creating of biodiversity.
- ❖ Fast growing, thick canopy copy, perennial and evergreen large leaf area.
- ❖ Efficient in absorbing pollutants without major effects of natural growth.

**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	Vembu	Tree	Well distinct thick at both the layer Palisade & Spongy parenchyma. Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	Tree	
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konra	Tree	
6	<i>Bauhinia racemosa</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	

**Table 4.14 Greenbelt Development Plan**

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m <sup>2</sup> )
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	324	259	2916
	Number of plants outside the mine lease area		
	486	389	4374
<b>Total</b>	<b>810</b>	<b>648</b>	<b>7290</b>

**Table 4.15 Budget for Greenbelt Development Plan**

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	324	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))"	64,800	9,720
Plantation outside the area	486	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	1,45,800	14,580
<b>Total</b>			<b>2,10,600</b>	<b>24,300</b>

Source: EMP budget

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

### **4.6.3 Anticipated Impact on Fauna**

- ❖ There is no Wildlife Sanctuary and Biosphere Reserve within 10 km radius of the project site.
- ❖ No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice scientific method of mining with proper Environmental Management Plan including pollution control measures especially for air and noise, to avoid any adverse impact on the surrounding wildlife.
- ❖ Fencing around all the proposed mine lease areas will be constructed to restrict the entry of stray animals
- ❖ Green belt development will be carried out which will help in minimizing adverse impact on the flora found in the area.
- ❖ Wild life is not commonly found in the project area and its immediate environs because of lack of vegetal cover and surface water.

### **4.6.4 Mitigation Measures**

#### ***Protection and Conservation of Wildlife Species***

- ❖ All the preventive measures will be taken for growth & development of fauna.
- ❖ Creating and development awareness for nature and wildlife in the adjoin villages.
- ❖ The workers shall be trained to not harm any wildlife, should it come near the project site. No work shall be carried out after 6.00 pm.
- ❖ Undertaking mitigative measures for conducive environment to the flora and fauna in consultation with Forest Department.
- ❖ Dust suppression system will be installed within mine and periphery of mine for proposed project
- ❖ Plantation around mine area will help in creating habitats for small faunal species and to create better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

#### ***Aquatic Biodiversity***

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

#### 4.6.5 Summary of Impact Assessment on Biological Environment

A detail of impact and assessments was mentioned in Table 4.16.

**Table 4.16 Ecological Impact Assessments**

SI. No	Attributes	Assessment
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting sites were identified in the lease area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species were sighted in core area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	Thathampalayam reserve forest is located in 10 km southeast. There are no national parks or eco-sensitive zones around 9.93 km radius.
4	Proposed project restricts access to waterholes for wildlife	No. The proposed project does not restrict access to water holes for wildlife.
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal were sighted in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management system will be developed properly. So, there will be no siltation in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	Barbed wire fencing will be installed around the lease area. Therefore, wild animals will not fall into the quarry pit.
8	The project release effluents into a water body that also supplies water to a wildlife	No water bodies were found close to core zone so chances of water becoming polluted will be low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	No. The proposed project does not involve any forestland. Therefore, it will not affect the livelihood of people depending the forest product.
10	Project likely to affect migration routes	No migration routes were found crossing the lease area.
11	Project likely to affect flora of an area, which have medicinal value	No flora with medicinal values were found in the study area.
12	Forestland is to be diverted, has carbon high sequestration	As the proposed project does not involve any forestland, there will be no need for diversion.
13	The project likely to affect wetlands, fish breeding grounds, marine ecology	Wetland was not present in and around mining lease area. No fish breeding grounds were present in core area.



**Table 4.17 Anticipated Impact of Ecology and Biodiversity**

S. No	Aspect Description	Likely Impacts on Ecology and Biodiversity (EB)	Impact Consequence - Probability Description / Justification	Significance	Mitigation Measures
<b>Pre-Mining Phase</b>					
1	Uprooting of vegetation of lease area	Site specific loss of common floral diversity (Direct impact)	Site possesses common floral (not trees) species. Clearance of these species will not result in loss of flora	Less severe	No immediate action required. However, Greenbelt /plantation will be developed in project site and in periphery of the project boundary, which will improve flora and fauna diversity of the project area.
		Site specific loss of associated faunal diversity (Partial impact)	Site supports only common species, which use wide variety of habitats of the buffer zone reserve forest area. So, there is no threat of faunal diversity.		
		-Loss of Habitat (Direct impact)	Site does not form Unique / critical habitat structure for unique flora or fauna.		
<b>Mining Phase</b>					
2	Excavation of mineral using machine and labours, Transportation activities will generate noise.	Site-specific disturbance to normal faunal movements at the site due to noise. (Partial impact)	Site does not form unique / critical habitat structure for unique flora or fauna.	Less severe	Mining activity should not be operated after 5PM. Excavation of dump and transportation work should stop before 7PM.
3	Vehicular Movement for transportation of materials will result in	Impact on surrounding agriculture and associated	Impact is less as the agricultural land far from core area.	Less severe	All vehicles will be certified for appropriate Emission levels. More plantation has

	generation of dust (SPM) due to haul roads and emission of SO <sub>2</sub> , NO <sub>2</sub> , CO etc.	fauna due to deposition of dust and Emission of CO. (Indirect impact)			been suggested Upgrade the vehicles with alternative fuel such biodiesel, methanol and biofuel around the mining area.
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#### 4.7 SOCIO ECONOMIC ENVIRONMENT

##### 4.7.1 Anticipated Impact

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

##### 4.7.2 Common Mitigation Measures

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

#### 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.
- ❖ Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide.
- ❖ 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, Spirometry 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:

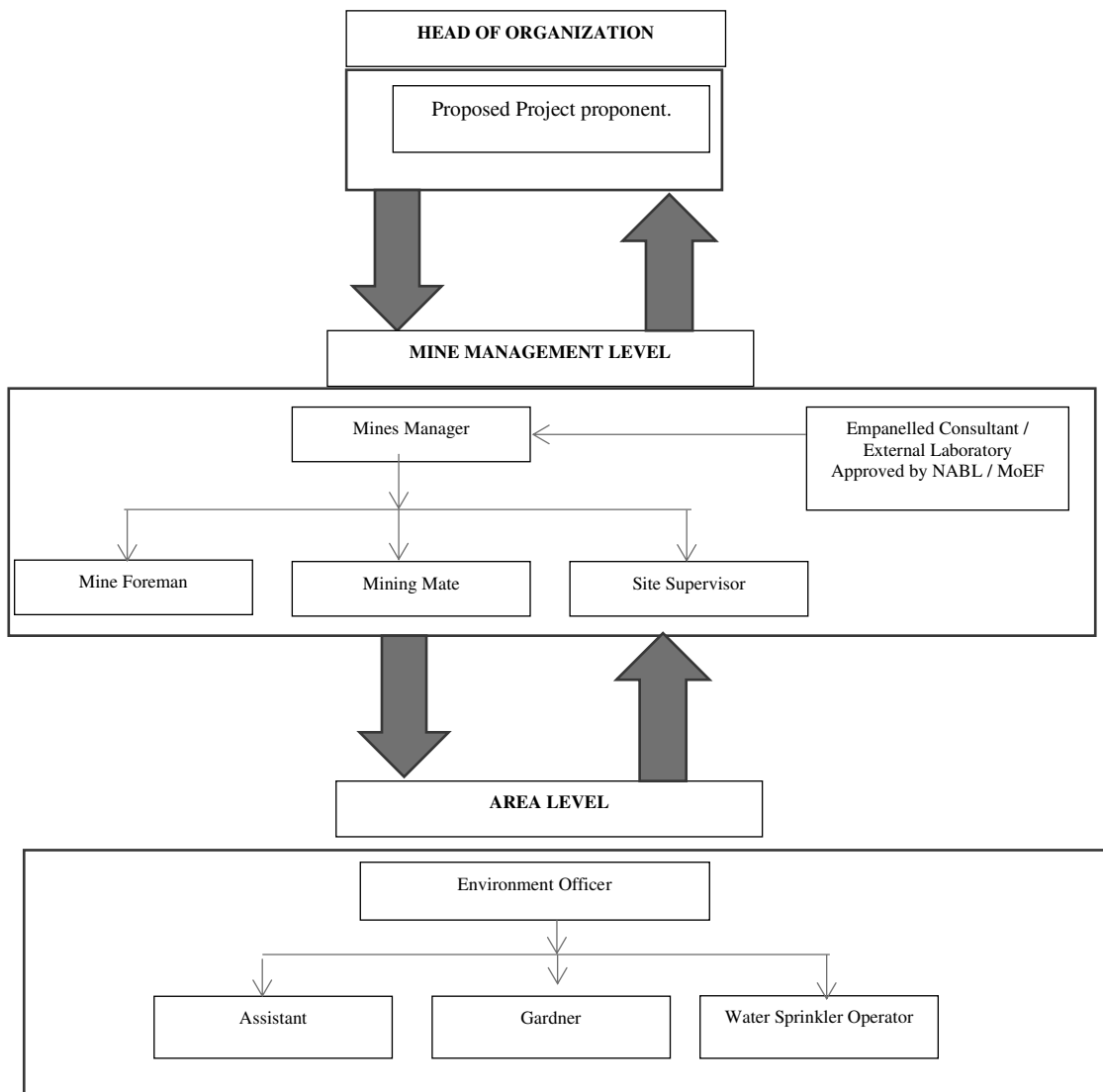
- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment

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

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

#### 6.4 BUDGETARY PROVISION FOR ENVIRONMENT MONITORING PROGRAM

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

**Table 6.3 Environment Monitoring Budget**

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

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:

- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Cumulative Impact Study
- ❖ Plastic Waste Management
- ❖ Post-COVID Health Management Plan

#### **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 31<sup>st</sup> 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"> <li>✓ 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.</li> <li>✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited.</li> <li>✓ Fire-fighting and first-aid provisions in the mine office complex and mining area.</li> <li>✓ 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.</li> <li>✓ Working of quarry, as per approved plans and regularly updating the mine plans.</li> <li>✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut.</li> <li>✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager.</li> <li>✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.</li> </ul>
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"> <li>✓ Safe operating procedure established for drilling (SOP) will be strictly followed.</li> <li>✓ Only trained operators will be deployed.</li> <li>✓ 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,</li> <li>✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</li> </ul>

			<ul style="list-style-type: none"> <li>✓ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</li> <li>✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</li> <li>✓ Operator shall regularly use all the personal protective equipment.</li> </ul>
3	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal &amp; overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<ul style="list-style-type: none"> <li>✓ 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.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul>
4	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> <li>✓ Escape Routes will be provided to prevent inundation of storm water</li> <li>✓ Fire Extinguishers &amp; Sand buckets</li> </ul>
5	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	<ul style="list-style-type: none"> <li>✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.</li> </ul>

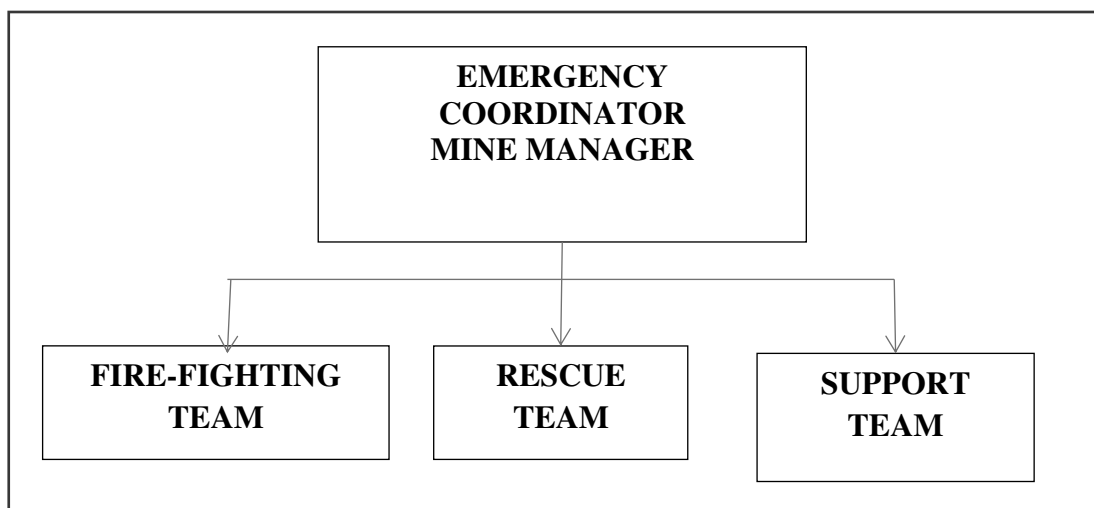
*Source: Analysed and Proposed by FAE & EC*

### 7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

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

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



**Figure 7.1 Disaster management team layout for proposed project**

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

**Table 7.2 Proposed Teams for Emergency Situation**

DESIGNATION	QUALIFICATION
<b>FIRE-FIGHTING TEAM</b>	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member	Mines Foreman
Team Member	Mining Mate
<b>RESCUE TEAM</b>	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member/ Incident Controller (IC)	Environment Officer
Team Member	Mining Foreman
<b>SUPPORT TEAM</b>	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Assistant Team Leader	Environment Officer
Team Member	Mining Mate
Security Team Leader/ Emergency Security Controller	Mines Foreman

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

### **7.3.1 Roles and Responsibilities of Emergency Team**

*(a) Emergency coordinator (EC)*

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

*(b) Incident controller (IC)*

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

*(c) Communication and advisory team*

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



*(d) Roll call coordinator*

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

*(e) Search and rescue team*

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

*(f) Emergency security controller*

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

### **7.3.2 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

### 7.3.3 Proposed Fire Extinguishers

The following type of fire extinguishers has been proposed at strategic locations within the mine, as shown in Table 7.3.

**Table 7.3 Proposed Fire Extinguishers at Different Locations in P1**

<b>Location</b>	<b>Type of Fire Extinguishers</b>
Electrical Equipment	CO <sub>2</sub> type, foam type, dry chemical powder type
Fuel Storage Area	CO <sub>2</sub> type, foam type, dry chemical powder type, Sand bucket
Office Area	Dry chemical type, foam type

### 7.3.4 Alarm System

On receiving the message of disaster from Site Controller, fire-fighting team, the mine control room attendant will sound siren wailing for 5 minutes. Incident controller will arrange to broadcast disaster message through public address system. On receiving the message of "Emergency Over" from Incident Controller the emergency control room attendant will give "All Clear Signal", by sounding alarm straight for 2 minutes.

The features of alarm system will be explained to one and all to avoid panic or misunderstanding during disaster. In order to prevent or take care of hazard / disasters if any the following control measures have been adopted.

- ❖ Fire-fighting and first-aid provisions in the mines office complex and mining area are provided.
- ❖ Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring.
- ❖ Training and refresher courses for all the employees working in hazardous premises.
- ❖ Working of mine, as per approved plans and regularly updating the mine plans.
- ❖ Cleaning of mine faces is regularly done.
- ❖ Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- ❖ Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- ❖ Regular maintenance and testing of all mining equipment were carried out as per manufacturer's guidelines.

## 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, 4 proposed projects, known as P1, P2, P3 and P4 are taken into consideration. The details of P1 have been given in Table 1.2 and the details of P2 to P4 given in Table 7.4 & 7.6.

**Table 7.4 Salient Features of Proposed Project Site “P2”**

Name of the Quarry	M/s. NTC Blue Metals LLP Rough Stone and Gravel	
Type of Land	Patta land	
Extent	2.15.0 ha	
S.F. No.	544/1,544/2,544/3 & 545/1(P)	
Toposheet No.	58 E/16	
Maximum Elevation	163 m AMSL	
Latitude	11°0'38.91"N to 11°0'43.10"N	
Longitude	77°56'22.42"E to 77°56'31.24"E	
Ultimate Depth of Mining	25 m BGL	
Geological Resources	Rough stone (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
	6,81,010	64,548
Mineable Reserves	2,28,678	45,285
Proposed production for 1-5 years	2,00,148	45,285
Method of Mining	Open cast Semi-mechanized method.	
Topography	Undulated Terrain	
Machinery proposed	Jack hammer	3
	Compressor	1
	Hydraulic Excavator	1
	Tipper	4
Blasting Method	Quarrying operation will be carried out tractor mounted compressor attached with Jack hammers is proposed to drilling and without any blasting the rocks.	
Proposed Manpower Deployment	22 persons	
Project Cost	Rs.1,80,32,800/-	
CER Cost	Rs.5,00,000/-	

Source: Approved Mining Plan

**Table 7.5 Salient Features of Proposed Project Site “P3”**

Name of the Quarry	M/s. NTC Blue Metals LLP Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	2.28.5 ha	
S.F. No.	543/1, 543/2, 543/3 & 557/2(P)	
Toposheet No.	58 E/16	
Highest Elevation	162 m AMSL	
Latitude	11°00'41.79"N to 11°00'47.28"N	
Longitude	77°56'20.49"E to 77°56'27.14"E	
Ultimate Depth of Mining	35 m BGL	
Geological Resources	Rough stone (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
	847152	68688
Mineable Reserves as per ToR	353282	55728
Proposed production for 5 years as per ToR	375112	55728
Method of Mining	Open cast semi-mechanized method.	
Topography	Undulated Terrain	
Machinery proposed	Jack hammer	3
	Compressor	1
	Hydraulic Excavator	1
	Tipper	5
Blasting Method	Quarrying operation will be carried out tractor mounted compressor attached with Jack hammers is proposed to drilling and without any blasting the rocks.	
Proposed Manpower Deployment	24 persons	
Project Cost	Rs.1,75,21,300/-	
CER Cost @ 2% of Project Cost	Rs.5,00,000/-	
Proposed Water Requirement	2.3 KLD	

Source: Approved Mining Plan

**Table 7.6 Salient Features of Proposed Project Site “P4”**

Name of the Quarry	K. Rani Rough Stone and Gravel Quarry	
Type of Land	Patta land	
Extent	0.84.5 ha	
S.F. No.	545/2	
Toposheet No.	58 E/16	
Maximum Elevation	162 m AMSL	
Latitude	11°0'38.94"N to 11°0'41.21"N	
Longitude	77°56'27.52"E to 77°56'32.36"E	
Ultimate Depth of Mining	25 m BGL	
Geological Resources	Rough stone (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
	188350	11400
Mineable Reserves	55640	6075
Proposed production for 5 years	34060	6075
Method of Mining	Open Cast Manual Method	
Topography	Undulated Terrain	
Machinery proposed	Jack hammer	3
	Compressor	1
	Excavator	1
	Tipper	1
Blasting Method	Quarrying operation will be carried out by drilling using tractor mounted compressor attached with Jack hammers. Any blasting will not be practiced but dimensional stone blasting involving insignificant quantity of explosives.	
Proposed Manpower Deployment	16 persons	
Project Cost	Rs.18,25,000/-	

Source: Approved Mining Plan

#### 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 4 proposed projects have been given in Tables 7.7 and 7.8.

**Table 7.7 Cumulative Production Load of Rough Stone**

<b>Proposed Production Details</b>				
<b>Quarry</b>	<b>5 Years in m<sup>3</sup></b>	<b>Per Year in m<sup>3</sup></b>	<b>Per Day in m<sup>3</sup></b>	<b>Number of Lorry Load Per Day</b>
P1	164992	32998	<b>122</b>	<b>20</b>
P2	200148	40030	148	25
P3	375112	75022	278	46
P4	34060	6812	25	4
<b>Grand Total</b>	<b>774312</b>	<b>154862</b>	<b>573</b>	<b>95</b>

**Table 7.8 Cumulative Production Load of Gravel**

<b>Quarry</b>	<b>Production for 3 Years (m<sup>3</sup>)</b>	<b>Yearly Production (m<sup>3</sup>)</b>	<b>Daily Production (m<sup>3</sup>)</b>	<b>Number of Lorry Loads Per Day</b>
P1	25088	8362	31	5
P2	45285	15095	56	9
P3	55728	18576	69	11
P4	6075	2025	8	1
<b>Grand Total</b>	<b>132176</b>	<b>44058</b>	<b>164</b>	<b>26</b>

The cumulative study shows that the overall production of rough stone from the 4 quarries is 573 m<sup>3</sup> per day with a capacity of 95 trips of rough stone per day for 5 years and that production of gravel from the 4 proposed quarry is 164 m<sup>3</sup> per day accounting for 26 trips/day for three years.

#### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 4 proposed projects on air environment of the cluster have been provided in Table 7.9. The cumulative values resulting from the 4 projects for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.9 Cumulative Impact Results from the 4 proposed projects**

<b>Pollutants</b>	<b>Baseline Data (µg/m<sup>3</sup>)</b>	<b>Incremental Values (µg/m<sup>3</sup>)</b>				<b>Cumulative Value (µg/m<sup>3</sup>)</b>
		<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	
PM <sub>2.5</sub>	21.1	6.9	9.6	9.6	5.5	52.7
PM <sub>10</sub>	42.6	11.4	15	16.2	7.7	92.9
SO <sub>2</sub>	8.4	5.5	7.01	7.5	4.09	32.5
NO <sub>2</sub>	16.3	6.4	7.9	8.74	5.0	44.34

### 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.7.10 Cumulative Impact of Noise from 4 Proposed Quarries on Puthurpatti Habitation**

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	890 m	SE	32.6	20.47	32.86	55
Habitation Near P2	1200 m	SE	32.6	17.78	32.74	
Habitation Near P3	1340 m	SE	32.6	16.82	32.71	
Habitation Near P4	1140 m	SE	32.6	18.22	32.76	
<b>Cumulative Noise (dB (A))</b>					<b>38.70</b>	

Source: Lab Monitoring Data

**Table.7.11 Cumulative Impact of Noise from 4 Proposed Quarries on Andisangilpalayam Habitation**

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	1600m	SW	40.2	15.28	36.23	55
Habitation Near P2	1290m	S	40.2	17.15	36.25	
Habitation Near P3	1350m	S	40.2	16.75	36.25	
Habitation Near P4	1320 m	S	40.2	16.95	36.23	
<b>Cumulative Noise (dB (A))</b>					<b>42.27</b>	

Source: Lab Monitoring Data

cumulative analysis of noise due to 4 proposed projects shows that habitation of Puthurpatti and that of Andisangilipalayam will receive about 38.70 dB (A) and 42.27 dB (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 4 mines have been shown in Table 7.12-7.13.

**Table 7.12 Cumulative Effect of Ground Vibrations Resulting from 5 Mines on Habitation of Puthurpatti**

<b>Location ID</b>	<b>Maximum Charge in kgs</b>	<b>Nearest Habitation in m</b>	<b>PPV in mm/s</b>
P1	31	890	0.14
P2	37	1200	0.10
P3	70	1340	0.14
P4	--	1140	--
E1	50	1100	0.15
<b>Total</b>			<b>0.53</b>

**Table 7.13 Cumulative Effect of Ground Vibrations resulting from 5 Mines on Habitation of Andisangilipalayam Village**

<b>Location ID</b>	<b>Maximum Charge in (kgs)</b>	<b>Nearest Habitation in (m)</b>	<b>PPV in mm/s</b>
P1	31	1600	0.05
P2	37	1290	0.09
P3	70	1350	0.14
P4	--	1320	--
E1	50	1540	0.09
<b>Total</b>			<b>0.37</b>

Results from the above tables 7.12-7.13 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 4 proposed projects were calculated and the results have been shown in Table 7.14 the 4 projects together will contribute Rs.20,00,000 towards CER fund.



**Table 7.14 Socio Economic Benefits from 4 Mines**

<b>Location ID</b>	<b>Project Cost</b>	<b>CER @ 2%</b>
P1	Rs. 69,05,000	Rs. 5,00,000
P2	Rs.1,80,32,800	Rs. 5,00,000
P3	Rs. 1,75,21,300	Rs. 5,00,000
P4	Rs.18,25,000	Rs. 5,00,000
<b>Grand Total</b>	<b>Rs. 4,42,84,100</b>	<b>Rs. 20,00,000</b>

**Table 7.15 Employment Benefits from 4 Mines**

<b>Location ID</b>	<b>Employment</b>
P1	14
P2	22
P3	24
P4	16
<b>Grand Total</b>	<b>76</b>

A total of 76 people will get employment due to 4 proposed mines in cluster

#### 7.4.4 Ecological Environment

**Table 7.16 Greenbelt Development Benefits From 4 Mines**

<b>Code</b>	<b>Number of Trees proposed</b>	<b>Area to be covered (m<sup>2</sup>)</b>	<b>No. of Trees expected to be grown @ 80% survival rate</b>	<b>Species recommended</b>
P1	<b>810</b>	<b>7290</b>	<b>648</b>	<i>Azadirachta indica, Albizia lebbbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	1075	9675	860	
P3	422	3798	337	
P4	1142	10278	913	
<b>Total</b>	<b>3449</b>	<b>31041</b>	<b>2758</b>	

Cumulative studies show that the 4 proposed projects will plant about 3449 native tree species like *Azadirachta indica*, *Albizia lebbbeck*, *Delonix regia*, *Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 2758 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 7.17.

**Table 7.17 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

## **7.6 POST COVID HEALTH MANAGEMENT PLAN FOR PROPOSED PROJECT**

COVID – 19 diseases caused by SARS-CoV-2 Coronavirus is relatively a new disease, with fresh information being known on a dynamic basis about the natural history of the disease, especially in terms of post-recovery events.

After acute COVID-19 illness, recovered patients may continue to report wide variety of signs and symptoms including fatigue, body ache, cough, sore throat, difficulty in breathing, etc. As of now there is limited evidence of post-COVID sequelae and further research is required and is being actively pursued. A holistic approach is required for follow up care and well-being of all post COVID recovering patients.

### **7.6.1 Post-COVID Follow up Protocol**

- ❖ Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing).
- ❖ Drink adequate amount of warm water (if not contra-indicated).
- ❖ Make sure your workplaces are clean and hygienic
- ❖ Surfaces (e.g., desks and tables) and objects (e.g., telephones, helmet) need to be wiped with disinfectant regularly
- ❖ Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
- ❖ Display posters promoting hand-washing
- ❖ Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
- ❖ Display posters promoting respiratory hygiene.
- ❖ Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3°C or more) need to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection
- ❖ Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- ❖ Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
- ❖ Could the meeting or event be scaled down so that fewer people attend?

- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.
- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O<sub>2</sub> < 95%, unexplained chest pain, new onset of confusion, focal weakness.
- ❖ Avoid smoking and consumption of alcohol.
- ❖ Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g., paracetamol, ibuprofen) which may mask the symptoms.
- ❖ The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or due to illness.

## **CHAPTER VIII**

### **PROJECT BENEFITS**

#### **8.0 GENERAL**

The proposed project at Kuppam Village aims to produce **164992 m<sup>3</sup>** of rough stone and **25088 m<sup>3</sup>** 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 14 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment in 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 and Karur District of 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 as 2.5% of the profit.

## 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**

<b>S. No.</b>	<b>Activity</b>	<b>Budget (Rs.in Lakh)</b>
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
	<b>Total</b>	<b>Rs.5, 00,000</b>

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

## **CHAPTER IX**

### **ENVIRONMENTAL COST BENEFIT ANALYSIS**

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



## **CHAPTER X**

### **ENVIRONMENTAL MANAGEMENT PLAN**

#### **10.0 GENERAL**

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

#### **10.1 ENVIRONMENTAL POLICY**

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

The Proponent, M/S. New Star Blue Metals will:

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

##### **10.1.1 Description of the Administration and Technical Setup**

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

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

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

## 10.2 LAND ENVIRONMENT MANAGEMENT

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (unutilized areas, infrastructure, haul roads) will be utilized for greenbelt development. Aesthetic of the environment will not be affected. There is no major vegetation in the project area. During the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development program. A detailed land environment management plan has been provided in Table 10.1.

**Table 10.1 Proposed Controls for Land Environment**

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

*Source: Proposed by FAEs & EIA Coordinator*

### 10.3 SOIL MANAGEMENT

No top soil will be removed and stored during the mining operation. Therefore, topsoil management plan is not provided here.

### 10.4 WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash and domestic sewage from mines office is anticipated. The quarrying operation is proposed up to a depth of 20 m. The water table in the area is at 60-70 m below ground level. Hence, the proposed project will not intersect the ground water table during entire quarry period. A detailed water environment management plan has been provided in Table 10.2.

**Table 10.2 Proposed Controls for Water Environment**

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

*Source: Proposed by FAEs & EIA Coordinator*

### 10.5 AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations in the ambient air. Daily water sprinkling on the haul roads, approach roads in the vicinity will be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements. A detailed ambient air environment management plan is provided in Table 10.3.

**Table 10.3 Proposed Controls for Air Environment**

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

*Source: Proposed by FAEs & EIA Coordinator*

## 10.6 NOISE POLLUTION CONTROL

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time. A detailed noise environment management plan has been provided in Table 10.4.

**Table 10.4 Proposed Controls for Noise Environment**

<b>Control</b>	<b>Responsibility</b>
Development of thick greenbelt all along the buffer zone (7.5 meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Foreman
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Mines Manager
Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Mining Mate
Provision of effective silencers for mining machinery and transport vehicles	Mines Manager
Provision of sound proof AC operator cabins to HEMM	Mines Manager

Sharp drill bits are used to minimize noise from drilling	Mines Foreman
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Mines Manager
Reduce maximum instantaneous charge using delays while blasting	Mining Mate
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise or vibration monitoring	Mines Manager

*Source: Proposed by FAEs & EIA Coordinator*

### **10.7 GROUND VIBRATION AND FLY ROCK CONTROL**

The rough stone and gravel quarry operation creates vibration due to the blasting and movement of heavy earth moving machineries, fly rocks due to the blasting. A detailed ground vibration management plan has been provided in Table 10.5.

**Table 10.5 Proposed Controls for Ground Vibrations & Fly Rock**

<b>Control</b>	<b>Responsibility</b>
Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8Hz) well within the prescribed standards of DGMS	Mines Manager
Drilling and blasting will be carried under the supervision of qualified persons	Mines Manager
Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting	Mines Manager
Suitable spacing and burden will be maintained to avoid misfire / fly rocks	Manager Mines
Number of blast holes will be restricted to control ground vibrations	Manager Mines
Blasting will be carried out only during noon time	Mining Mate
Undertake noise or vibration monitoring	Mines Manager
ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material	Mines Foreman

*Source: Proposed by FAEs & EIA Coordinator*

## **10.8 BIOLOGICAL ENVIRONMENT MANAGEMENT**

The proponent will take all necessary steps to avoid the impact on the ecology of the area by adopting suitable management measures in the planning and implementation stage. During mining, thick plantation will be carried out around the project periphery, on safety barrier zone, on top benches of quarried out area etc. Following control measures are proposed for its management and will be the responsibility of the mines manager.

- ❖ Greenbelt development all along the safety barrier of the project area.
- ❖ It is also proposed to implement the greenbelt development program and post plantation status will be regularly checked for every season.
- ❖ The main attributes that retard the survival of sapling is fugitive dust, this fugitive dust can be controlled by water sprinkling on the haul roads and installing a sprinkler unit near the newly planted area.
- ❖ Year wise greenbelt development will be recorded and monitored based on the area of plantation, period of plantation, type of plantation, spacing between the plants, type of manuring and fertilizers and its periods, lopping period, interval of watering, survival rate and density of plantation.
- ❖ The ultimate reclamation planned leaves a congenial environment for development of flora & immigration of small fauna through green belt and water reservoir. The green belt and water reservoir developed within the Project at the end of mine life will attract the birds and animals towards the project area in the post mining period.

### **10.8.1 Green Belt Development Plan**

The main objectives of the greenbelt development plan are to:

- ❖ Combat the dispersal of dust in the adjoining areas.
- ❖ Protect the erosion of the soil and conserve moisture of the soil.
- ❖ Increase the rate of recharge of ground water.
- ❖ Restore the ecology of the area, restore aesthetic beauty of the locality and meet the requirement of fodder, fuel and timber of the local community. The proposed green belt development plan is given in Table 10.6.

**Table 10.6 Proposed Greenbelt Development Plan**

	<b>No. of trees proposed for plantation</b>	<b>No. of trees expected to survive @ 80%</b>	<b>Area to be covered(m<sup>2</sup>)</b>
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	324	259	2916
	Number of plants outside the mine lease area		
	486	389	4374
<b>Total</b>	<b>810</b>	<b>648</b>	<b>7290</b>

Source: Proposed by FAEs & EIA Coordinator

About 810 saplings will be planted in and around the lease area with the survival rate of 80%. A well-planned green belt of trees with long canopy leaves shall be developed with dense plantations around the boundary and along the haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

### **10.9 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT**

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

#### **10.9.1 Medical Surveillance and Examinations**

- ❖ Identifying workers with conditions that may be aggravated by exposure to dust & noise and establishing baseline measures for determining changes in health.
- ❖ Evaluating the effect of noise on workers.
- ❖ Enabling corrective actions to be taken when necessary.
- ❖ Providing health education.

The health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detail medical examination at the time of employment. The medical examination covers the following tests under mines act 1952.

- ❖ General Physical Examination and Blood Pressure.
- ❖ X-ray Chest and ECG.
- ❖ Sputum Test, Sperm Count Test.

❖ Detailed Routine Blood and Urine Examination.

The medical histories of all employees will be maintained in a standard format annually. Thereafter, the employees will be subject to medical examination annually. The below tests (Table 10.7) keep upgrading the database of medical history of the employees.

**Table 10.7 Medical Examination Schedule**

S. No.	Activities	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year
1	Initial Medical Examination (Mine Workers)					
A	Physical Check-up					
B	Psychological Test					
C	Audiometric Test					
D	Respiratory Test					
2	Periodical Medical Examination (Mine Workers)					
A	Physical Check – up					
B	Audiometric Test					
C	Eye Check – up					
D	Respiratory Test					
3	Medical Camp (Mine Workers & Nearby Villagers)					
4	Training (Mine Workers)					
Medical Follow ups: Work force will be divided into three targeted groups age wise as follows:						
<b>Age Group</b>		<b>PME as per Mines Rules 1955</b>		<b>Special Examination</b>		
Less than 25 years		Once in a Three Years		In case of emergencies		
Between 25 to 40 Years		Once in a Three Years		In case of emergencies		
Above 40 Years		Once in a Three Years		In case of emergencies		
Medical help on top priority immediately after diagnosis/ accident is the essence of preventive aspects.						

**10.9.2 Proposed Occupational Health and Safety Measures**

- ❖ The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- ❖ Lightweight and loose-fitting clothes having light color will be preferred to wear.



- ❖ Noise exposure measurements will be taken to determine the need for noise control strategies.
- ❖ The personal protective equipment will be provided for mine workers.
- ❖ Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment.
- ❖ At noisy working activity, exposure time will be minimized.
- ❖ Dust generating sources will be identified and proper control measure will be adopted.
- ❖ Periodic medical examinations will be provided for all workers.
- ❖ Strict observance of the provisions of DGMS Acts, Rules and Regulations in respect of safety both by management and the workers.
- ❖ The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- ❖ In respect of contract work, safety code for contractors and workers will be implemented. They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centers. All personal protective equipment's will be provided to them.
- ❖ A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- ❖ Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.



**Figure 10.1 Personal Protective Equipment to the Mine Workers**

### 10.9.3 Health and Safety Training Program

The Proponents will provide special induction program along with machinery manufacturers for the operators and co-operators to run and maintain the machinery effectively and efficiently. The training program for the supervisors and office staffs will be arranged in the Group Vocational Training Centers in the State and engage Environmental Consultants to provide periodical training to all the employees to carry out the mining operation in and eco-friendly manner, as shown in Table 10.8.

**Table 10.8 List of Periodical Trainings Proposed for Employees**

Course	Personnel	Frequency	Duration	Instruction
New-Employee Training	All new employees exposed to mine hazards	Once	One week	<ul style="list-style-type: none"> <li>✓ Employee rights,</li> <li>✓ Supervisor responsibilities</li> <li>✓ Self-rescue</li> <li>✓ Respiratory devices</li> <li>✓ Transportation controls</li> <li>✓ Communication systems</li> <li>✓ Escape and emergency evacuation</li> <li>✓ Ground control hazards</li> <li>✓ Occupational health hazards</li> <li>✓ Electrical hazards and First aid</li> <li>Explosives</li> </ul>
Task Training Like Drilling, Blasting, Stemming, safety, Slope	Employees assigned to new work tasks	Before new Assignments	Variable	<ul style="list-style-type: none"> <li>✓ Task-specific health &amp; safety procedures and SOP for various mining activity</li> </ul>

stability, Dewatering, Haul Road maintenance.				<ul style="list-style-type: none"> <li>✓ Supervised practice in assigned work tasks.</li> </ul>
Refresher Training	All employees who received new-hire training	Yearly	One week	<ul style="list-style-type: none"> <li>✓ Required health and safety standards</li> <li>✓ Transportation controls</li> <li>✓ Communication systems</li> <li>✓ Escape ways, emergency evacuations</li> <li>✓ Fire warning</li> <li>✓ Ground control hazards</li> <li>✓ First aid on electrical hazards</li> <li>✓ Accident prevention</li> <li>✓ Explosives</li> <li>✓ Respirator devices</li> </ul>
Hazard Training	All employees exposed to mine hazards	Once	Variable	<ul style="list-style-type: none"> <li>✓ Hazard recognition and avoidance</li> <li>✓ Emergency evacuation procedures</li> <li>✓ Health standards</li> <li>✓ Safety rules</li> <li>✓ Respiratory devices</li> </ul>

*Source: Proposed by FAEs & EIA Coordinator as per DGMS Norms*

#### **10.9.4 Budgetary Provision for Environmental Management**

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.9 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

**Table 10.9 EMP Budget for Proposed Project**

<b>Attribute</b>	<b>Mitigation measures</b>	<b>Provision for Implementation</b>	<b>Capital Cost (Rs.)</b>	<b>Recurring Cost/annum (Rs.)</b>
<b>Air Environment</b>	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	16200	16200
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000

	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	75000	7500
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of speed Governors @ Rs. 5000/- per tipper/dumper deployed	35000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of exhaust fumes	0	8750
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual)	0	20000

	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Noise Environment</b>	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0

	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for portable blaster shed	Installation of portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	445478
<b>Water Environment</b>	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	16200	8100

<b>Waste Management</b>	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 lease on the land of owner itself	Provision made in Operating Cost	0	0
<b>Implementation of EC, Mining Plan &amp; DGMS Condition Occupational Health and Safety</b>	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
	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	56000	14000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	14000



	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	6480
	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	324000	16200
	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	81000	16200
	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 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961	0	780000

		@ 40,000/- for Manager & @ 25,000/- for Foreman / Mate		
<b>Development of Green Belt</b>	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))"	64800	9720
		Avenue plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	145800	14580
<b>Mine Closure Activity</b>	Closure includes Greenbelt development, wire fencing, drains	Provision made in closure cost	0	0
<b>Total EMP Budget</b>			<b>1794000</b>	<b>1549208</b>

**Table 10.10 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation**

<b>I<sup>st</sup> Year</b>	<b>II<sup>nd</sup> Year</b>	<b>III<sup>rd</sup> Year</b>	<b>IV<sup>th</sup> Year</b>	<b>V<sup>th</sup> Year</b>	<b>Total</b>
3343208	1626669	1708002	1793402	1883072	<b>10354354</b>

In order to implement the environmental protection measures, an amount of **Rs. 1794000** as capital cost and recurring cost as **Rs. 1549208** 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. 10354354** as shown in Table 10.10.

#### **10.10 CONCLUSION**

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

## **CHAPTER XI SUMMARY AND CONCLUSION**

### **11.0 INTRODUCTION**

This EIA report was prepared in compliance with ToR obtained vide Lr.No: SEIAA-TN/F.No.9423/ToR-1275/2022 dated 08.10.2022 by considering 4 proposed, 1 existing and 2 expired quarries in a cluster with the total extent of 18.31.0 hectares in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu State. Cluster area was calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016. Baseline Monitoring studies were carried out during the period of October through December 2022.

### **11.1 PROJECT DESCRIPTION**

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 an open cast semi-mechanized mining method involving drilling, blasting and formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 11°0'41.69"N to 11°0'46.62"N and from longitudes from 77°56'39.90"E to 77°56'43.82"E in Kuppam Village, Pugalur Taluk, and Karur District. The project site is a Patta land with the extent of 1.62.0 ha owned by the project proponent. The proponent had applied for quarry lease on 12.10.2021 to extract rough stone and gravel and obtained the precise area communication letter issued by Department of Geology and Mining, Karur vide Rc.No.482/Mines/2021 dated 19.04.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur (Rc. No.482/Mines/2021 dated 11.07.2022).

According to the approved mining plan, about 164992 m<sup>3</sup> of rough stone and about 25088 m<sup>3</sup> of gravel will be mined up to the depth of 20 m BGL in the first five years. To achieve the estimated production, 3 jack hammers, 1 compressor, 1 excavator with bucket/rock breaker, and 7 tippers will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 14 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 128 m\*98 m\*20 m and about 1.26.2 ha of land would have been quarried; about 0.02.0 ha of land would have been used for establishing infrastructures; about 0.08.0 ha of land would have been used for road development; about 0.20.0 ha of land would have been used for green belt development; about 0.04.0 ha of land would have been used for drainage and settling tank construction; and about 0.01.8 ha of land

would have been left unutilized. The final mine closure plan shows that about Rs.405200 with the annual recurring cost of Rs.31800 will be spent towards mine closure.

## **11.2 DESCRIPTION OF THE ENVIRONMENT**

The baseline monitoring studies were carried out during October through December, 2022 to assess the existing environmental conditions in the study area. For the purpose of the EIA studies, project area was considered as the core zone and area outside the project area up to 5 km radius from the periphery of the project site was considered as buffer zone. Baseline Environmental data has been collected for land, water, air, noise, ecology, socio-economy, and traffic.

### **11.2.1 Land Environment**

Land Use and Land Cover (LULC) map was prepared using Sentinel II image for the study area of 5 km radius. Totally, 7 LULCs were mapped. Of the total area, mining area covers only 176 ha accounting for 2.31 %, of which lease area of 1.62.0 ha contributes only about 0.02%. This small percentage of mining activities shall not have any significant impact on the land environment.

### **11.2.2 Soil Characteristics**

Eight soil samples were obtained from the study area and sent to laboratory for analysing physical and chemical characteristics of soil.

#### ***Physical Characteristics***

The soil samples in the study area show loamy textures varying between silty clay loam, 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 143 to 247  $\mu\text{s}/\text{cm}$ . Bulk density ranges between 1.2 and 3.8  $\text{g}/\text{cm}^3$ .

#### ***Chemical Characteristics***

Nitrogen ranges between 0.04 and 1.1 %. Phosphate ranges between 0.14 and 3.8 %. Potassium ranges between 0.12 and 0.26 %. Calcium ranges between 161 and 513  $\text{mg}/\text{kg}$ . Organic matter content ranges between 0.35 and 2.0 %.

### **11.2.3 Water Environment**

#### ***Surface Water***

Noyyal River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 4.48 km NW of Noyyal River. One surface water sample, known as SW1 were collected from the Noyyal River to assess the baseline water quality. Result for surface

water sample indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

### ***Ground Water Resources***

Nine groundwater samples, known as BW01, BW02, BW03, BW04, BW05, BW06, BW07, OW01 and OW02 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. Results for ground water samples indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

## **11.3 AIR ENVIRONMENT**

### ***Site Specific Meteorology***

Site specific meteorology during the study period was recorded by an automated weather station. According to the onsite data, the temperature in October, 2022 varied from 15.90 to 31.32<sup>0</sup> C with the average of 24.74<sup>0</sup> C; in November, 2022 from 14.61 to 31.16<sup>0</sup> C with the average of 24.40<sup>0</sup> C; and in December, 2022 from 14.0 to 30.82<sup>0</sup> C with the average of 23.74<sup>0</sup>C. In October, 2022, relative humidity ranged from 51.35 to 100 % with the average of 85.10%; in November, 2022, from 51.35 to 100 % with the average of 85.10 %; and in December, 2022, from 51.42 to 100 % with the average of 85.65 %. The wind speed in October, 2022 varied from 0.06 to 6.48 m/s with the average of 2.53 m/s; in November, 2022 from 0.02 to 6.55 m/s with the average of 2.69 m/s; and in December, 2022 from 0.04 to 6.65 m/s with the average of 2.55 m/s. In October,2022, wind direction varied from 0.07 to 359.70<sup>0</sup> with the average of 161.47<sup>0</sup>; in November, 2022, from 0.00 to 359.63<sup>0</sup> with the average of 145.59<sup>0</sup>; and in December, 2022, from 1.50 to 359.62<sup>0</sup> with the average of 110.36<sup>0</sup>. In October 2022, surface pressure varied from 96.94 to 99.60 kPa with the average of 98.58 kPa; in November 2022, from 95.68 to 99.86 kPa with the average of 98.64 kPa; and in December 2022, from 98.02 to 99.56 kPa with the average of 98.84 kPa.

### ***Ambient Air Quality Results***

As per the monitoring data, PM<sub>2.5</sub> ranges from 22.8 µg/m<sup>3</sup> to 17.4 µg/m<sup>3</sup>; PM<sub>10</sub> from 42.2 µg/m<sup>3</sup> to 36.8 µg/m<sup>3</sup>; SO<sub>2</sub> from 10.5 µg/m<sup>3</sup> to 7 µg/m<sup>3</sup>; NO<sub>2</sub> from 20.4 µg/m<sup>3</sup> to 14.3 g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

## 11.4 NOISE ENVIRONMENT

Noise level in core zone was 41.7 dB (A) Leq during day time and 34.7 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 32.6 to 42.2dB (A) Leq and during night time from 29.8 to 36.6dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

## 11.5 BIOLOGICAL ENVIRONMENT

In core zone, a total of 16 trees belonging to 4 species such as *Prosopis juliflora*, *Azadirachta indica*, *Vachelia leucoploea*, and *Albizia amara* are present in the mining lease area, whereas in buffer zone, 75 species belonging to 38 families were recorded from the buffer zone. The floral (75) varieties are 35 Trees (46%), 20 Shrubs (15%) Herbs and 25 Climbers, Creeper, Grass & Cactus (33%). From the study of biological environment, it is concluded that there was no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species were found in vulnerable, endangered or threatened category as per IUCN and that there is no endangered red list species found in the study area.

## 11.6 SOCIO-ECONOMIC ENVIRONMENT

An attempt has been made to assess the impact of the proposed mining project on Socio-economic aspect of the study area. The various attributes that have been taken into account are population composition, employment generation, occupational shift, household income and consumption pattern. Implementation of the Proposed Mine Project will generate both direct and indirect employment. Besides, mining operation will be legally valid and it will bring income to the state exchequer. At present seasonal agriculture is the main occupation of the people as more than half of the population depends on it. With the implementation of the proposed mining project the occupational pattern of the people in the area will change making more people engaged in mining-based activities rather in seasonal agriculture.

## 11.7 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR PROPOSED PROJECT

The summary of anticipated adverse environmental impacts due to the proposed project and mitigation measures are given below:

**Table 11.1 Anticipated Impacts & Mitigation Measures**

Impact	Mitigation Measure
<b>Land Environment</b>	
<ul style="list-style-type: none"><li>❖ Destruction of natural landscapes</li><li>❖ Changes in soil characteristics</li><li>❖ Soil erosion and slope instability</li></ul>	<ul style="list-style-type: none"><li>❖ Mining will be carried out as per approved mine plan in scientific and systematic way</li></ul>

	<ul style="list-style-type: none"> <li>❖ Safety Zone or Buffer area will be maintained and will not be mined and instead plantation will be carried out in the safety zone</li> <li>❖ Barbed wire fencing will be provided all along the proposed mine boundary</li> <li>❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir</li> <li>❖ Construction of garland</li> <li>❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area</li> </ul>
<b>Water Environment</b>	
<ul style="list-style-type: none"> <li>❖ Decrease in aquifer recharge and increase in surface runoff;</li> <li>❖ Disturbance to land drainage, overload and erosion of watercourses;</li> <li>❖ Changes to the surface over which water flows;</li> <li>❖ Changes to surface and groundwater resources quantity and quality due to stream blockage and contamination by particulate matter or waste;</li> <li>❖ Contamination of aquifers due to removal of the natural filter medium.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area</li> <li>❖ De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons</li> <li>❖ Domestic sewage from site office &amp; urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system.</li> <li>❖ Tippers &amp; HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil &amp; grease trap, only clear water will be reused for greenbelt development.</li> </ul>
<b>Air Environment</b>	
<ul style="list-style-type: none"> <li>❖ Generation of Fugitive Dust</li> <li>❖ Dust will be generated mainly during excavation, loading &amp; unloading activities.</li> <li>❖ Gaseous pollutants will be generated mostly by the traffic.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Haul roads will be well maintained by sprinkling water twice a day</li> <li>❖ The access road will be cleaned and brushed to ensure that mud and dust deposits do not accumulate.</li> <li>❖ To ensure that dust and debris is minimised on the access road, all the tipper drivers will be</li> </ul>



<ul style="list-style-type: none"> <li>❖ Reduction in visibility due to dust plumes.</li> <li>❖ Coating of surfaces leading to annoyance and loss of amenity.</li> <li>❖ Physical and/or chemical contamination and corrosion.</li> <li>❖ Increase in the concentration of suspended particles in runoff water.</li> <li>❖ Coating of vegetation leading to reduced photosynthesis,</li> <li>❖ Inhibited growth, destroying of foliage, degradation of crops;</li> <li>❖ Increase in health hazards due to inhalation of dust.</li> </ul>	<p>instructed to use water spray system on all the tyres and spray water on the loaded material that is provided at the compound area before leaving the site</p> <ul style="list-style-type: none"> <li>❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road.</li> <li>❖ Weekly inspections of the condition of the access road by competent person employed, and immediate action will be taken to address any potholes or damage to the road surface.</li> <li>❖ Dust wetting agents can be mixed with the water applied to haul roads during hot, dry weather conditions to increase the duration that the road surface remains damp.</li> <li>❖ Personal Protective Equipment's will be provided to all workers</li> <li>❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole.</li> <li>❖ Wet gunny bags will be used as a cover while drilling.</li> <li>❖ The blast zone will be kept damp by the application of water from the rain gun fitted to the water tanker prior to each blast to control any fugitive dust emissions that could arise from the surface during detonation.</li> <li>❖ A daily visual inspection shall be conducted by the site manager who will keep a daily log of all process operations and site activities and note any malfunctions which could lead to abnormal emissions from the quarry operations.</li> <li>❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation</li> <li>❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation.</li> <li>❖ Air filters are renewed after every 10<sup>0</sup> hours of use, unless otherwise indicated by an on-board computer system.</li> <li>❖ All site machineries &amp; tippers will be serviced and maintained 6 months once and drivers will</li> </ul>
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	report any defects immediately to the site manager to enable repairs to be carried out promptly.
<b>Noise &amp; Vibration</b>	
<ul style="list-style-type: none"> <li>❖ Annoyance and deterioration of the quality of life;</li> <li>❖ Propelling of rocks fragments by blasting.</li> <li>❖ Shaking of buildings and people due to blasting;</li> </ul>	<ul style="list-style-type: none"> <li>❖ Usage of sharp drill bits while drilling which will help in reducing noise;</li> <li>❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;</li> <li>❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;</li> <li>❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;</li> <li>❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;</li> <li>❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;</li> <li>❖ Silencers / mufflers will be installed in all machineries;</li> <li>❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;</li> <li>❖ 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.</li> </ul>
<b>Biological Environment</b>	
<ul style="list-style-type: none"> <li>❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats;</li> <li>❖ Indirect impacts include habitat degradation due to noise, dust, and human activity.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Only some common herbs, shrubs and grass will be cleared. So, there will be no impact on the biodiversity.</li> <li>❖ Green belt development with suitable species will enhance the biodiversity of the project area.</li> <li>❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.</li> </ul>

<b>Socio-Economic Environment</b>	
<ul style="list-style-type: none"> <li>❖ Health and safety of workers and the general public;</li> <li>❖ Increase in traffic volumes and sizes of road vehicles;</li> <li>❖ Economic issues, including the increase in employment opportunities;</li> </ul>	<ul style="list-style-type: none"> <li>❖ The mining activity puts negligible change in the socio-economic profile.</li> <li>❖ Around 88 local workers will get employment opportunities along with periodical training to generate local skills.</li> <li>❖ New patterns of indirect employment/ income will generate.</li> <li>❖ Regular health check-up camp.</li> <li>❖ Assistance to schools and scholarship to children will be provided.</li> </ul>
<b>Occupational Health &amp; Safety</b>	
<ul style="list-style-type: none"> <li>❖ Exposure to Dust</li> <li>❖ Noise and Vibration Exposure</li> <li>❖ Physical Hazards</li> <li>❖ Respiratory hazards due to Dust exposure</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provision of rest shelters for mine workers with amenities like drinking water etc.</li> <li>❖ All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc.</li> <li>❖ Training of employees for use of safety appliances and first aid in vocational training centre.</li> <li>❖ Weekly maintenance and testing of all equipment as per manufacturers' guidelines.</li> <li>❖ Pre placement and Yearly Medical Examination of all workers by a medical Officer</li> <li>❖ First Aid facility will be provided at the mine site.</li> <li>❖ Close surveillance of the factors in working environment and work practices which may affect environment and worker's health by the mine's manager employed.</li> <li>❖ Working of mine as per approved mining plan and environmental plans</li> </ul>

## 11.8 ANALYSIS OF ALTERNATIVES

There are no alternatives suggested as the proposed mining area has the following advantages:

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the applied lease area; hence no R & R issues exist.

- ❖ There is no river, stream, nallas and water bodies in the or passing through the applied mine lease areas.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are accessible.
- ❖ Mine connectivity through road and rail is good.
- ❖ The proposed mining operations do not intersect the ground water level. Hence, no impact on ground water environment.

## **11.9 ENVIRONMENTAL MONITORING PROGRAM**

Environmental Monitoring program will be conducted for various environmental components such as air quality, meteorology, water quality, water level monitoring, soil quality, noise level, vibration, and greenbelt as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB. For this environmental monitoring program, Rs. 2,95,000/- per annum will spent by the project proponent. 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 and 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.

## **11.10 ADDITIONAL STUDIES**

### ***Risk Analysis & Disaster Management Plan***

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad vide Circular No.13 of 2002, dated 31<sup>st</sup> December, and 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 time table are recorded along with pinpointed responsibilities.

In the unlikely event that a consequence has occurred, disaster management kicks in. This includes instituting procedures pertaining to a number of issues such as communication, rescue, and rehabilitation. These are addressed in the disaster management plan. Both, the RA and DMP, are living documents and need to be updated whenever there are changes in

operations, equipment, or procedures Assessment is all about preventing accidents and taking necessary steps to prevent it from happening.

The Disaster Management Plan (DMP) is a guide, giving general considerations, directions, and procedures for handling emergencies likely to arise from planned operations. The DMP has been prepared on the basis of the Risk Assessment and related findings covered in the report.

### ***Cumulative Impact Studies***

- ❖ The results on the cumulative impact of the four proposed projects 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 four proposed and one existing project is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- ❖ The four proposed projects will allocate Rs. 20,00,000/- towards CER as recommended by SEAC.
- ❖ The four proposed projects will directly provide jobs to about 76 local people.
- ❖ The four proposed projects will plant about 3312 saplings in and around the lease area.
- ❖ The four proposed projects will add 336 PCU per day to the nearby roads.

### **11.11 PROJECT BENEFITS FOR PROPOSED PROJECT**

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 14 local people
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ 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 Programme
- ❖ Skill development & capacity building like vocational training
- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,
- ❖ 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 as 2.5% of the profit.
- ❖ Rs. 5,00,000 will be allocated for CER.

## **11.12 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of Rs.1794000 as capital cost and recurring cost as Rs.1549208 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. 1,03,54,354.

## **11.13 CONCLUSION**

EIA study was performed as per the approved ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP has been dynamic, flexible and subject to periodic review. CER activities were identified and for its time bound implementation, fund has been allocated.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local community. The green belt development programme will help in increasing the green cover in the area. Thus, the proposed project is not likely to affect the environment or adjacent ecosystem in an adverse way.

The Mines Management will be responsible for the project 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 XII

### DISCLOSURES OF CONSULTANT

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

**Address of the consultancy:**

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

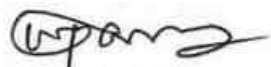
The accredited experts and associated members who were engaged in this EIA study are given below:

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

17.	V. Malavika	FAA	1(a)(i)	NV, SHW	B
<b>Team Members</b>					
18.	G. Umamaheswaran	In-house, FAE	1(a)(i)	TM for EC	B
19.	M. Saravanan	In-house	1(a)(i)	TM for HG & LU	B
20.	R. Revathy	In-house	1(a)(i)	TM for WP, SHW, & RHW	B
21.	Dr. D.Kalaimurugan	In-house	1(a)(i)	TM for EB	B
22.	R. Elavarasan	In-house	1(a)(i)	TM for EB & SC	B
23.	K. Udayakumar	In-house	1(a)(i)	TM for SE	B
<b>Abbreviations</b>					
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 : 14.02.2023

Name : **Dr. S. Karuppannan**

Designation : EIA Coordinator






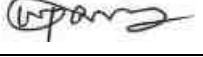



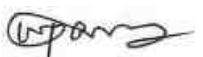

Name of the EIA Consultant Organization : Geo Technical Mining Solutions



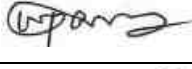




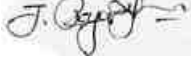

Period of Involvement : Till date


We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **M/S. New Star Blue Metals** rough stone and gravel quarry project with the extent of 1.62.0 ha situated in the cluster with the extent of 18.31.0 ha in Kuppam Village of 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**

<b>S. No.</b>	<b>Functional Area</b>	<b>Involvement</b>	<b>Name of the Experts</b>	<b>Signature</b>
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	○ Suggesting water treatment systems, drainage facilities ○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	Dr. S. Malar	
3	HG	○ Interpretation of ground water table and predict impact and propose mitigation measures. ○ Analysis and description of aquifer Characteristics	Dr. M. Vijay Prabhu	
			G. Uma Maheswaran	
			Dr.S. Karuppannan	
4	GEO	○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	G.Gopala Krishnan	
			G.Uma Maheswaran	
			Dr.M. Vijay Prabhu	
			Dr.S. Karuppannan	
5	SE	○ Revision in secondary data as per Census of India, 2011. ○ Impact Assessment & Preventive Management Plan ○ Corporate Environment Responsibility.	Dr. G. Prabhakaran	

6	EB	<ul style="list-style-type: none"> <li>○ Collection of Baseline data of Flora and Fauna.</li> <li>○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> <li>○ Impact of the project on flora and fauna.</li> <li>○ Suggesting species for greenbelt development.</li> </ul>	Dr.J. Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul>	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> <li>○ Construction of Land use Map</li> <li>○ Impact of project on surrounding land use</li> <li>○ Suggesting post closure sustainable land use and mitigative measures.</li> </ul>	Dr.S. Karuppannan	
			G.Uma Maheswaran	
			Dr.M. Vijay Prabhu	
9	NV	<ul style="list-style-type: none"> <li>○ Identify impacts due to noise and vibrations</li> <li>○ Suggesting appropriate mitigation measures for EMP.</li> </ul>	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> <li>○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>○ Recommending mitigations measures for EMP</li> </ul>	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> <li>○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>	Dr.J. Rajarajeshwari	
			Dr. D.Kalaimurugan	

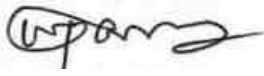
12	SHW	<ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>	J.N. Manikandan	
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**List 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"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU and HG</li> </ul>	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> <li>○ Assistance to FAE in both primary and secondary data collection</li> <li>○ Assistance in noise prediction modelling</li> </ul>	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
4	S.Vasugi	AQ	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
5	P. Dhatchayini	AQ	<ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Assistance to FAE in collection of both primary and secondary data</li> </ul>	
6	V. Malavika	NV, SHW	<ul style="list-style-type: none"> <li>○ Site visit along with FAE</li> <li>○ Assistance in report preparation</li> </ul>	

**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. New Star Blue Metals** rough stone and gravel quarry project with the extent of 1.62.0 ha located within the cluster of 18.31.0 ha in Kuppam Village of Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date : 14.02.2023

Name : **Dr. S. Karuppannan**

Designation : Managing Partner

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : NABET/EIA/2023/IA0067 & March 30, 2021

Validity : Till 29.12.2023





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.9423/ToR-1275/2022 Dated:08.10.2022.**

To

M/s. New Star Blue Metals  
Poolankaadu Uppupalayam, kuppam post  
Pugalur Taluk  
Pugalur  
karur District-639111


Sir / Madam,

**Sub:** SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough Stone and Gravel Quarry over an extent of 1.62.0Ha SF.No.553/2 (Part) of Kuppam Village, Pugalur Taluk, Karur District by M/s. New Star Blue Metals - under project category – “B1” and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

**Ref:** 1. Online proposal No.SIA/TN/MIN/81223/2022, dt: 27.07.2022.  
2. Your application submitted for Terms of Reference dated: 01.08.2022.  
3. Minutes of the 312<sup>th</sup> SEAC meeting held on 16.09.2022.  
4. Minutes of the 557<sup>th</sup> Authority meeting held on 08.10.2022.

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

The proponent, M/S. New Star Blue Metals has submitted application for Terms of Reference (ToR) with public Hearing on 01.08.2022, in Form-I, Pre- Feasibility report for the proposed Rough Stone and

  
MEMBER SECRETARY  
SEIAA-TN

Gravel Quarry over an extent of 1.62.0Ha SF.No.553/2 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.

**Discussion by SEAC and the Remarks:-**

**Proposed Rough Stone and Gravel Quarry over an extent of 1.62.0Ha SF.No.553/2 (Part) of Kuppam Village, Pugalur Taluk, Karur District by M/s. New Star Blue Metals for Terms of Reference.**

(SIA/TN/MIN/ 81223/2022, dt: 27.07.2022)

The proposal was placed in this 312<sup>th</sup> Meeting of SEAC held on 16.09.2022. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

The SEAC noted the following


1. The Project Proponent, M/s. New Star Blue Metals has applied for Terms of Reference for the proposed Rough Stone and Gravel Quarry over an extent of 1.62.0Ha SF.No.553/2 (Part) of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.
2. The proposed quarry/activity is covered under Category "BI" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The precise area communication/lease is issued for the period of 5 years. The approved mining plan is for the period of five years & production should not exceed 164992m<sup>3</sup> of Rough Stone & 25088m<sup>3</sup> of Gravel. The annual peak production is 42120m<sup>3</sup> of rough stone (4<sup>th</sup> Year) & 8428m<sup>3</sup> of Gravel (3<sup>rd</sup> Year). The ultimate depth is 20m BGL.

Based on the presentation made by the proponent, SEAC has decided to recommend grant of **Terms of Reference (TOR) with Combined Public Hearing ( File No. 9366, 9422,&9423)** is issued for the **production of 164992m<sup>3</sup> of Rough Stone & 25088m<sup>3</sup> of Gravel in 5 years with ultimate depth 20m BGL**, subject to the following TORs, in addition to the standard terms of reference for Combined EIA study and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The PP shall furnish DFO letter in regard to shortest distance of Reserve Forest & protected areas/Wildlife sanctuaries & wild life corridors etc within 25 Km radius.
2. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director of Geology and Mining during the time of appraisal for obtaining the EC.

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3. 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.
4. 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.
5. 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.
6. 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.
7. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
  - a. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
  - b. Quantity of minerals mined out.
  - c. Highest production achieved in any one year
  - d. Detail of approved depth of mining.
  - e. Actual depth of the mining achieved earlier.
  - f. Name of the person already mined in that leases area.
  - g. If EC and CTO already obtained, the copy of the same shall be submitted.
  - h. Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
8. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
9. The PP shall carry out Drone video survey covering the cluster, Green belt , fencing etc.,
10. 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.

  
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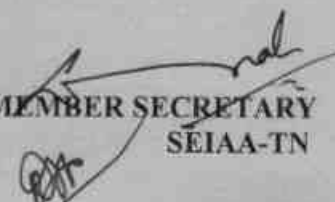
11. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.
12. The 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.
13. The Project Proponent shall conduct a detailed 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) for both monsoon and non-monsoon seasons by a reputed institution / University to assess the impacts on the wells due to quarrying activity vice versa on the quarrying operations.
14. 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.
15. 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.
16. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
17. 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.
18. 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.
19. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the

  
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- 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.
20. 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.
  21. Impact on local transport infrastructure due to the Project should be indicated.
  22. 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.
  23. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
  24. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
  25. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
  26. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
  27. 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.
  28. 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.
  29. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS

  
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SEIAA-TN

- coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
30. 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.
  31. 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.
  32. 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.
  33. 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.
  34. 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.
  35. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
  36. 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.
  37. 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.
  38. 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.
  39. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

  
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**Appendix - I**  
**List of Native Trees Suggested for Planting**

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

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SEIAA-TN

40	<i>Premna mollissima</i>	Mirunai	முள்ளை
41	<i>Premna serratifolia</i>	Narumunai	நடு முள்ளை
42	<i>Premna tomentosa</i>	Malaipoovarasu	யானை முள்ளை
43	<i>Prosopis cinerica</i>	Vanni maram	வண்டி மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vennangu, Tada	வேணாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	புலவு
47	<i>Pithecolobium roxburghii</i>	Karipala	கரிபலா
48	<i>Salvadora persica</i>	Ugai Maram	உகை மரம்
49	<i>Sapindus emarginatus</i>	Manipungan, Soappukai	மாணியாங்கு சோப்புகை
50	<i>Sarcos asoca</i>	Asoca	அசோகை
51	<i>Strobilus asper</i>	Piray maram	பிரைய மரம்
52	<i>Strychnos nuxvomica</i>	Yeti	யேதி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேர்த்தாங் கெட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia bellerica</i>	Thandri	தாந்தரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேணை மருது
57	<i>Toona ciliata</i>	Sandhana vembu	சந்தனை வேம்பு
58	<i>Thespesia populnea</i>	Fuvarasu	பூவரூ
59	<i>Walsura trifoliata</i>	valtura	வால்சூரா
60	<i>Wrightia tinctoria</i>	Veppalai	வேப்பலை
61	<i>Pithecolobium dulce</i>	Kodukkapuli	கொடுக்காபுளி

#### Discussion by SEIAA and the Remarks:-


The proposal was placed in the 557<sup>th</sup> Authority meeting held on 08.10.2022. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing for the period 3 years confining to the ultimate depth of mining upto 20m BGL and the quantity of 1,64,992 cu.m of Rough Stone, & 25,088 cu.m of Gravel as per approved mining plan issued by the Department of Geology & Mining under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the following conditions and conditions stated therein vide Annexure 'B'.

#### **Annexure 'B'**


1. Cluster Management Committee, 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.

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SEIAA-TN

4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
  - a) Soil health & bio-diversity.
  - b) Climate change leading to Droughts, Floods etc.
  - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
  - d) Possibilities of water contamination and impact on aquatic ecosystem health.
  - e) Agriculture, Forestry & Traditional practices.
  - 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.
11. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
12. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.
13. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

  
MEMBER SECRETARY  
SEIAA-TN

14. 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.
15. Impact on surrounding agricultural fields around the proposed mining Area.
16. Erosion Control measures.
17. Impact on soil flora & vegetation around the project site.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
24. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
26. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
27. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
28. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

  
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SEIAA-TN

29. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
31. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.
32. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.
33. The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.
34. 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.
35. 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.
36. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
37. 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.
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.
39. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.


  
MEMBER SECRETARY  
SEIAA-TN  




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


#### **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 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

  
MEMBER SECRETARY  
SEIAA-TN

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

  
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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 aspects should be discussed in the Report.


  
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- 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 /


  
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- 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

  
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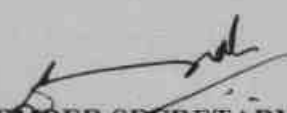
(other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

- 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.

  
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13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during 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.

  
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In this connection, the project proponent has to furnish the action plan.

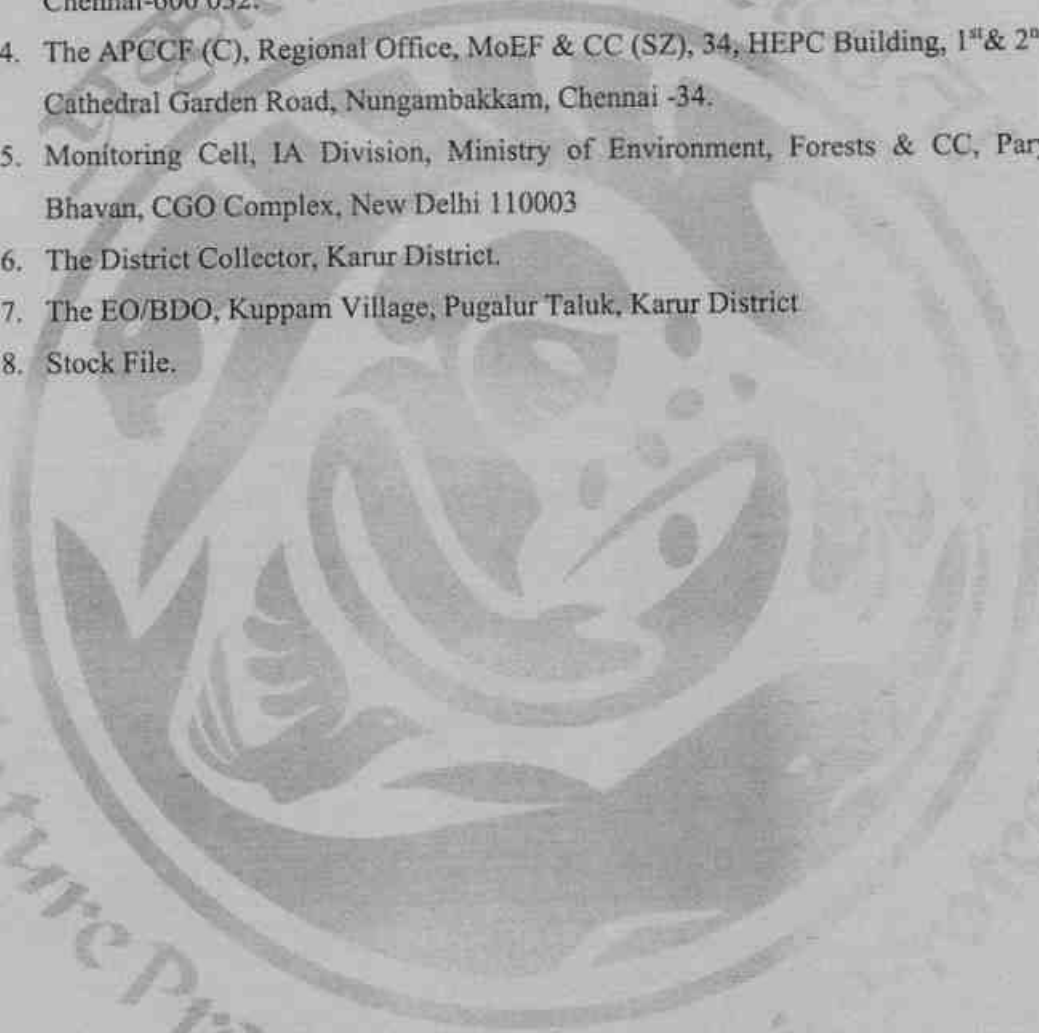
**Besides the above, the below mentioned general points should also be followed:-**

- 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 2<sup>nd</sup> December, 2009, 18<sup>th</sup> March 2010, 28<sup>th</sup> May 2010, 28<sup>th</sup> June 2010, 31<sup>st</sup> December 2010 & 30<sup>th</sup> 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 29<sup>th</sup> 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, 1<sup>st</sup>& 2<sup>nd</sup> 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. The EO/BDO, Kuppam Village, Pugalur Taluk, Karur District
8. Stock File.



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

To  
M/s.New Star Blue Metals,  
S.F.No.550,533,534,535,  
Poolankaadu,  
Uppupalayam,  
Kuppam Post,  
Pugalur Taluk,  
Karur District.

**Rc.No.482/Mines/2021, Dated:20.07.2022**

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Kuppam Village – S.F.No.553/2(Part) 1.62.0 hectares – Quarry lease application for Rough Stone and Gravel – Preferred by M/s.New Star Blue Metals – Mining Plan approved – requested for the details of Existing/ proposed/ abandoned quarries situated within 500 mts radial distance – furnished – Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel preferred by M/s.New Star Blue Metals, S.F.No.550,533,534,535, Poolankaadu, Uppupalayam, Kuppam Post, Pugalur Taluk, Karur District, dated: 12.10.2021
2. Pricise Area Communication Notice Rc.No.482/Mines/2021, Dated: 19.04.2022.
3. Mining Plan submitted by M/s.New Star Blue Metals, Letter dated: 07.06.2022.
4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter Rc.No. 482/Mines/2021, Dated:11.07.2022
5. M/s.New Star Blue Metals, letter dated:11.07.2022.

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In the reference 1<sup>st</sup> cited, M/s.New Star Blue Metals have applied quarry lease for quarrying Rough stone and Gravel in S.F.No.553/2(Part) 1.62.0 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur have issued precise area letter to the proposed lease area vide reference 2<sup>nd</sup> cited.

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 4<sup>th</sup> cited.

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

**I. Existing Quarries: -**

Sl No.	Name of the Owner	S.F.Nos.	Extent (hect)	Lease Period
1.	Thiru.C.Chinnusamy, S/o.Chinnagounder, No.38/5, S.V.A Extention, Thiruchangode, Taluk, Namakkal District.	551/1(Part)	2.00.0	21.2.2018 to 20.2.2023

**II. Proposed Area: -**

Sl No.	Name of the Owner	S.F.Nos.	Extent (hect)	Lease Period	Remarks
1	Tvl.New Star Blue Metals, S.F.No.550,553,534,535 Pulankadu, Uppupalayam, Kuppam Post, Pugalur Taluk, Karur District	553/2(P)	<b>1.62.0</b>		Proposed Area
2	M/s.NTC Blue Metals LLP, S.F.No.544/1, 544/2, 544/3, 545/1, Kuppam Village, Pugalur Taluk, Karur District.	544/1 544/2 544/3 545/1(P)	<b>2.15.0</b>		Applied Area
3	Tmt.K.Rani, S/o.Kamaraj, R.G.Nagar, Punnam, Pugalur Taluk, Karur District	545/2	<b>0.84.5</b>		
4	M/s.NTC Blue Metals LLP, S.F.No.543/1, 543/2,543/3, Kuppam Village, Pugalur Taluk, Karur District.	543/1 543/2 543/3 557/2(P)	<b>2.28.5</b>		

**III. Lease Expired and abandoned Quarries : -**

Sl No.	Name of the Owner	S.F.Nos.	Extent (hect)	Lease Period	Remarks
1	Thirumalai Blue Metals No.538/4, Poolan Kadu Kuppam Post Aravakurichi Taluk Karur District.	1238/2	4.80.0	14.10.2016 to 13.10.2021	
2	Tvl. New Star Blue Metals , S.F.No: 550,533,534,535, Poolankaradi, Kuppam Post, Aravakurichi Taluk Karur District.	533/1 534/1 550/C3 <b>Total</b>	<b>4.61.0</b>	02.12.2016 to 01.12.2021	
3	L. Indirani, W/o. Loganathan, 69, Erode Main Road, Velayuthampalayam, Karur.	538/1A1B	<b>0.61.0</b>	18.07.2008 to 17.07.2013	

*M. S. S. S.*  
20/7/22

Deputy Director,  
Geology and Mining,  
Karur.

*S.*  
20/07/2022

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

To  
M/s.New Star Blue Metals,  
S.F.No.550,533,534,535,  
Poolankaadu,  
Uppupalayam,  
Kuppam Post,  
Pugalur Taluk,  
Karur District.

**Rc.No.482/Mines/2022, Dated:11.07.2022**

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Kuppam Village – S.F.No.553/2(Part) 1.62.0 hectares – Quarry lease application for Rough Stone and Gravel – Preferred by M/s.New Star Blue Metals – Precise area communicated – mining plan submitted for approval – Approved – Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel preferred by M/s.New Star Blue Metals, S.F.No.550,533,534,535, Poolankaadu, Uppupalayam, Kuppam Post, Pugalur Taluk, Karur District, dated: 12.10.2021.
2. Order of the Hon'ble Supreme Court of India in I.A.Nos.12-13/2011 in SLP (C) No.19628-19629/2009, dt: 27.02.2012.
3. Government of India, Ministry of Environment and Forest Office Memorandum, Dated:18.05.2012.
4. The Chairman, State Level Environment Impact Assessment Authority, Tamil Nadu D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated: 17.09.2012.
5. The Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dt: 19.11.2012.
6. Deputy Director, Geology and Mining, Karur Notice Rc.No.482/Mines/2022, Dated: 19.04.2022.
7. Mining Plan submitted by M/s.New Star Blue Metals, letter Dated: 07.06.2022.

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

Accordingly M/s.New Star Blue Metals have submitted three copies of draft mining plan for approval in respect of Rough stone and Gravel quarry lease applied area, over an extent 1.62.0 hectares of patta land in S.F.No.553/2(Part) of Kuppam Village, Pugalur Taluk, Karur District in the reference 7<sup>th</sup> cited.

The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.No.553/2(Part) 1.62.0 hectares of patta land 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.482/Mines/2022, Dated:19.04.2022 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப புலத்திற்கு தென்கிழக்கில் 97 மீட்டர் தொலைவில் செல்லும் உயர் அழுத்த மின்பாதைக்கு மின் வாரியத்திடமிருந்து தடையின்மை சான்றிணை பெற்று குவாரி குத்தகை உரிமம் பத்திரம் நிறைவேற்றுவதற்கு முன்பு சமர்ப்பிக்கப்பட வேண்டும்.
2. விண்ணப்ப புலத்தின் தென்கிழக்குப் பகுதியில் சுமார் 154 மீட்டர் தொலைவில் உள்ள அங்கீகரிக்கப்படாத ஒரு ஓட்டு வீட்டின் (Tiled house) உரிமையாளர் பாதிப்பின்றி குவாரிப்பணி செய்ய சம்மத கடிதம் அளித்துள்ளார். எனவே மேற்படி வீட்டிற்கு எவ்வித பாதிப்பின்றி குவாரிப்பணி செய்ய வேண்டும்.
3. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
4. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
6. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.

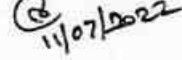


- (V) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (VI) If anything is found 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.

  
11/07/22  
Deputy Director,  
Geology and Mining,  
Karur.

**Copy to:**

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 - 636 705

# MINING PLAN

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

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

Lease period 10 Years from the date of lease execution

(For the ensuring mining plan prepared for the period of first five years)

(Prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor Mineral  
Concession Rules, 1959 Amendments, 2019)

## LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
DISTRICT : KARUR  
TALUK : PUGALUR  
VILLAGE : KUPPAM  
S.F. NO'S : 553/2 (Part)  
EXTENT : 1.62.0HECTARES

## ADDRESS OF THE APPLICANT

M/s. NEW STAR BLUE METALS  
S.F.No.550,533,534,535,  
Poolankaadu, Uppupalayam, Kuppam-Post,  
Pugalur Taluk, Karur District,  
Tamil Nadu - 639 111.  
Mobile no.+91 9842769319

## 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](mailto:info.gtmsdpi@gmail.com) ,

Website: [www.gtmsind.com](http://www.gtmsind.com)



This Mining Plan is approved subject  
to the conditions/stipulations  
indicated in the Mining Plan approval  
Letter No: 482/Mines/2021  
Dated: 11/07/2022



## ANNEXURES



Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of FMB (Field Measurement book)	II
3.	Copy of village map	III
4.	Copy of "A" registered	IV
5.	Copy of computer chitta, adangal and land documents	V
6.	Copy of consent letter	VI
7.	Copy of company registration certification and partnership deed	VII
8.	Photocopy of the proposed lease area	VIII
9.	Copy of agreement from explosive license holder, explosive license & Blaster certificate	IX
10.	Copy of ID Proof of the authorized signature	X
11.	Copy of RQP Certificate	XI



## LIST OF PLATES

S. No	Description	Plate No.	Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	Scale 1:1,00,000
4.	Satellite imagery map	I-C	Scale 1: 5,000
5.	Environmental plan	I-D	Scale 1: 5,000
6.	Mine lease plan	II	Plan Scale: 1:1000
7.	Surface, Geological plan and section	III	Plan scale: 1:1000 <b>Section:</b> HOR 1:1000 VER 1:500
8.	Year wise development, production plan and section	IV	Plan scale: 1:1000 <b>Section:</b> HOR 1:1000 VER 1:500
9.	Mine layout plan and land use pattern	V	Plan scale: 1:1000
10.	Progressive mine closure plan and section	VI	Plan scale: 1:1000 Section: HOR 1:1000 VER 1:500
11.	Conceptual plan & section	VII	Plan scale: 1:1000 Section: HOR 1:1000 VER 1:500

M/s. NEW STAR BLUE METALS,  
S.F.No.550,553,534,535,  
Poolankaadu, Uppupalayam,  
Kuppam-Post,  
Pugalur Taluk, Karur District,  
Tamil Nadu -639 111.



**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan for rough stone and gravel quarry lease in S.F.No: 553/2(Part), over an extent of 1.62.0hectares, 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.

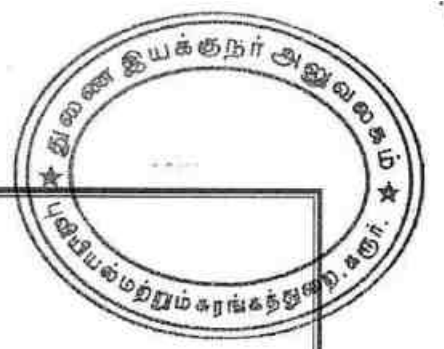
**Dr. S.KARUPPANNAN.M.Sc., Ph.D.,**  
RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
(A NABET Accredited & ISO certified Company)  
No: 1/213-B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post office, Dharmapuri-636705  
Ph: +91 9443937841,7010076633.  
E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)  
Website: [www.gtmsind.com](http://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: 02/06/22

Signature of the applicant  
(For M/s. NEW STAR BLUE METALS)



M/s. NEW STAR BLUE METALS,  
S.F.No.550,553,534,535,  
Poolankaadu, Uppupalayam,  
Kuppam-Post,  
Pugalur Taluk, Karur District,  
Tamil Nadu -639 111.

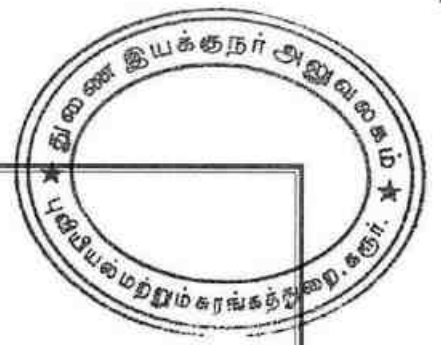
**DECLARATION**

The Mining Plan of rough stone and gravel quarry lease in S.F.No: 553/2 (Part), over an extent of 1.62.0hectares, 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: 02/06/22

Signature of the applicant  
(For M/s. NEW STAR BLUE METALS)



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

RQP/MAS/263/2014/A

**GEO TECHNICAL MINING SOLUTIONS**

(A NABET Accredited & ISO certified Company)

No: 1/213-B, Ground Floor, Natesan Complex,

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Ph: +91 9443937841,7010076633.

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)

Website: [www.gtmsind.com](http://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: 553/2(Part), over an extent of 1.62.0hectares, Kuppam Village, Pugalur Taluk, Karur District, TamilNadu State applied to **M/s. New Star Blue Metals**, 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: 6.6.2022

Signature of the Recognized Qualified Person

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

RQP/MAS/263/2014/A

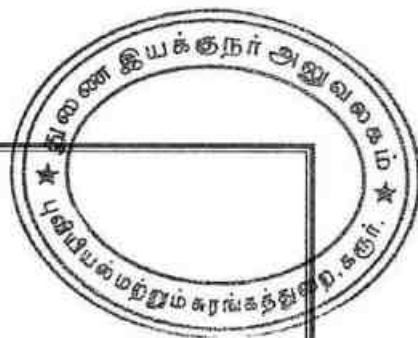
**GEO TECHNICAL MINING SOLUTIONS**

1/213-B, Ground Floor, Natesan Complex,

Collectorate Post Office, Oddapatti,

Dharmapuri - 636 705. Tamil Nadu, India.





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

RQP/MAS/263/2014/A

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No: 1/213-B, Ground Floor, Natesan Complex,  
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E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)

Website: [www.gtmsind.com](http://www.gtmsind.com)

**CERTIFICATE**

I certified that the preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No: 553/2(Part), over an extent of 1.62.0hectares, Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu prepared to **M/s. New Star Blue Metals**, 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: 6.6.2022

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,  
Collectorate Post Office, Oddapatti,  
Dharmapuri - 636705. Tamil Nadu, India.

# MINING PLAN

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

Patta- Ryotwari land/Open cast-Semi Mechanized mining/ Non- Forest/Non - Captive Use –  
“B2’ Category

Lease period 10 Years from the date of lease execution

(For the ensuring mining plan prepared for the period of first five years)

(Prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor  
Mineral Concession Rules, 1959 Amendments, 2019)

### INTRODUCTORY NOTES:

- 1) **Introduction:** The applicant Mr.P.Sundarraaj proprtor of M/s. New Star Blue Metals, registered office at S.F.No.550, 553, 534, 535, Pollankaadu, Uppupalayam, Kuppam-Post, Pugalur Taluk, Karur District, Tamil Nadu State and has requested to the Deputy Director, Department of Geology and Mining, Karur dated 12.10.2021 new proposal for grant of quarrying lease rough stone and gravel in S.F.No: 553/2 (Part), over an extent of 1.62.0hectares of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State.
- 2) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, Karur has directed to the applicant M/s. New Star Blue Metals, Prop.of Mr.P.Sundarraaj through his precise area communication letter Rc.No.482/Mines/2021, Dated 19.04.2022, before execution of lease deed should submit the mining plan for approval and obtain environmental clearance from the competent authority of State Level Environment Impact Assessment Authority-TamilNadu (SEIAA) per EIA notification S.O.1533(E) dated 14<sup>th</sup> September 2006 and its subsequent amendments S.O.3977(E), dated 14<sup>th</sup> August 2018, MoEF & CC office memorandum letter F.No.22-1/2019 -IA.III [E116917] dated 15<sup>th</sup> December, 2021 for quarrying lease rough stone and gravel at Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No: 553/2(Part), over an area of 1.62.0 hectares has recommended as following conditions for a period of ten (10) years under Rule 19 (1) , 20 & 33 of Tamil Nadu Minor Mineral Concession Rules, 1959.

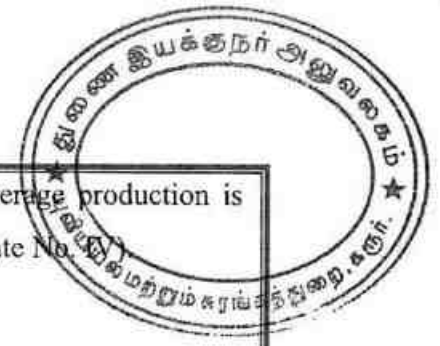
This Mining Plan is approved subject  
to the conditions/stipulations  
indicated in the Mining Plan approval  
Letter No: 482/mine/2021  
Dated: 11/07/2022



1. From the applied lease area there is crossing HT line at distance of 97m which the proponent should be get NOC certified from TNPE before the quarry lease deed apply.
2. From the applied lease area there is unauthorized tiled house in southeast direction at distance of 154m which the owner gave consent for quarry work and should not cause any hindrance while quarrying.
3. 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.
4. 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.
5. To ensure the safety of quarry workers as per Metalliferous Mines Acts 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.
6. In before execution of lease deed should submit the mining plan for approval, obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and no objection certificate (NOC) for Tamilnadu Pollution Control Board (TNPCB).

- 3) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959, its amendments, 2019 for mining lease as per conditions mentioned in the precise area communication letter **Rc.No.482/ Mines/2021, dated 19.04.2022.**
- 4) **Geological resources and Mineable reserves:** Geological resource of estimated as **727155m<sup>3</sup>** including the resources of safety zone, and gravel. Of which, rough stone resources of about **694837m<sup>3</sup>** and gravel is about **32318m<sup>3</sup>**. The total mineable reserve is estimated to be **259680m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources. Of which, rough stone is about **234592m<sup>3</sup>** and gravel is about **25088m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.165m-120m) (Refer Plate No. VII).
- 5) **Proposed production schedule:** Total proposed production of **190080m<sup>3</sup>**. Of which, rough stone is **164992m<sup>3</sup>** and gravel is **25088m<sup>3</sup>** up to a depth of 20m below the

ground level (R.L.165m-145m) for five years plan period. Average production is 32998m<sup>3</sup> of rough stone and gravel is 8363m<sup>3</sup> per year (Refer Plate No. 11)

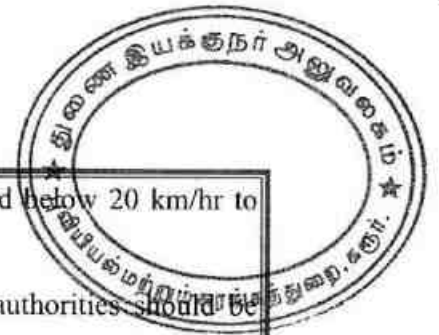


6) **Environmental Sensitivity of the proposed lease area: -**

- i. **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
- ii. **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.
- iii. **Indian 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 -10.03km - SE
  - 2.Vangal R.F - 18.4km - NE
  3. Kattalai R.F - 25.6km - East
- 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.

7) **Environmental measures to be adopted during the ongoing activity period,**

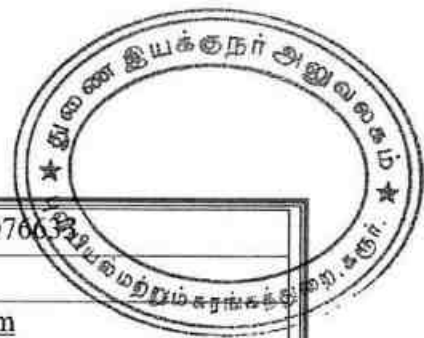
- a) Controlled blasting includes adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- b) Usage 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:**

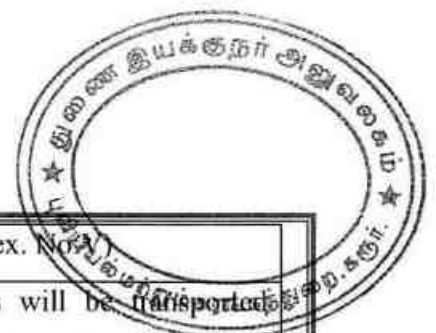
a.	Name of the Applicant	: M/s. NEW STAR BLUE METALS
	Applicant address	: M/s. NEW STAR BLUE METALS, S.F.No.550,553,534,535. Poolankaadu, Uppupalayam, Kuppam post, Pugalur Taluk, Karur District, Tamil Nadu -639 111.
	District	: Karur
	State	: TamilNadu
	Pin code	: 639111
	Phone	: +91 9842769319
	Fax	: 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
d.	Period for which the mining lease granted /renewed/ proposed to be applied	: The precise area has been communicated to the applicant for quarrying period of ten (10) years.
e.	Name of the RQP preparing the Mining Plan	: Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,
	Address	: <b>Geo Technical Mining Solutions</b> (A NABET Accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>



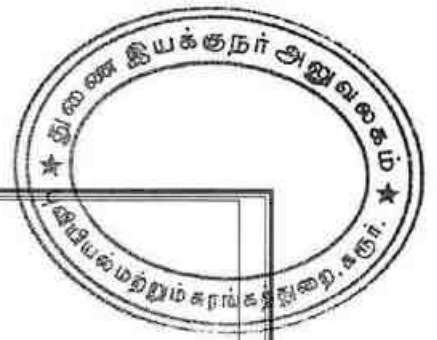
Phone	:	+91 9443937841, 70100766
Fax	:	Nil
e-mail	:	<a href="mailto:info.gtmsdpi@gmail.com">info.gtmsdpi@gmail.com</a>
Telex	:	Nil
Registration Number	:	RQP/MAS/263/2014/A
Date of grant/renewal	:	16.12.2014
Valid upto	:	15.12.2024
f. Name of the prospecting agency	:	Geo Technical Mining Solutions
Address	:	No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
Phone	:	044-22501874
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 <b>Rc.No.482/Mines/2021 dated 19.04.2022.</b>

## 2.0 LOCATION AND ACCESSIBILITY:

a. Details of the Area:	:	Refer plate no: IA & IB
District & State	:	Karur, Tamil Nadu
Taluk	:	Pugalur
Village	:	Kuppam
Khasra No./ Plot No./ Block Range/ Felling Series etc.	:	553/2(Part)
Lease area (hectares)	:	1.62.0 hectare
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	No, forest is involved. This is recorded patta Land.
Ownership / Occupancy	:	This is a patta land S.F.No. 553/2(Part) is registered in the name of Sundararaj S/o. Palaniswami and Kannammal W/o. Lokanathan vide Patta No.1255. (Ref. Annex. No:V). This is a Joint patta land. The joint pattadhar gave consent to the authority



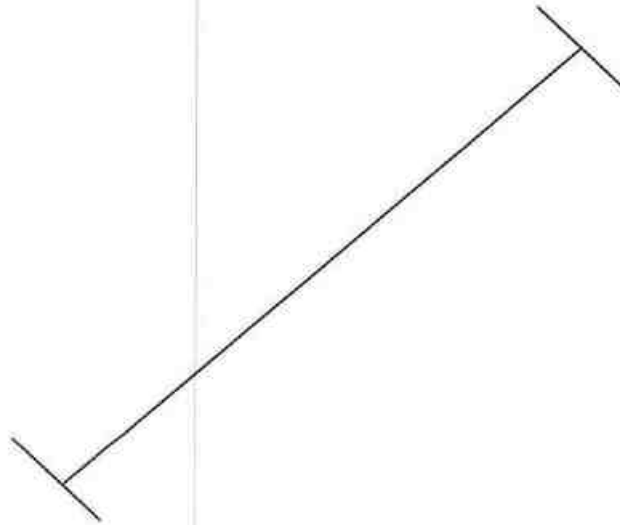
	of company. (Ref. Annex. NO. 101) <del>transported</del>																		
Existence of Public Road / Railway line if any nearby and approximate distance	<ul style="list-style-type: none"> <li>✓ Excavated materials will be transported through the approach road on the north side of the lease applied area.</li> <li>✓ There is a SH-84 and 332 road are situated on the eastern, western side about 2.60km and 2.33km as respectively.</li> <li>✓ Nothing any NH-road is situated within radius of 5km periphery of the proposed lease area.</li> <li>✓ Nothing to any railway line is situated within radius of 5.0km periphery of the proposed lease area</li> </ul>																		
Toposheet No. with latitude and longitude	Toposheet No. <b>58 E/16</b> Latitude : From 11°0'41.69"N to ✓ 11°0'46.62"N ✓ Longitude: From 77°56'39.90"E to ✓ 77°56'43.82"E ✓																		
Geo-Coordinates of the lease boundary:																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">S.No</th> <th style="width: 40%;">LATITUDE</th> <th style="width: 50%;">LONGITUDE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>11° 0'46.27"N</td> <td>77°56'43.56"E</td> </tr> <tr> <td>2</td> <td>11° 0'41.69"N ✓</td> <td>77°56'43.82"E ✓</td> </tr> <tr> <td>3</td> <td>11° 0'41.87"N</td> <td>77°56'40.05"E</td> </tr> <tr> <td>4</td> <td>11° 0'46.62"N ✓</td> <td>77°56'39.90"E ✓</td> </tr> <tr> <td>5</td> <td>11° 0'46.38"N</td> <td>77°56'42.98"E</td> </tr> </tbody> </table>		S.No	LATITUDE	LONGITUDE	1	11° 0'46.27"N	77°56'43.56"E	2	11° 0'41.69"N ✓	77°56'43.82"E ✓	3	11° 0'41.87"N	77°56'40.05"E	4	11° 0'46.62"N ✓	77°56'39.90"E ✓	5	11° 0'46.38"N	77°56'42.98"E
S.No	LATITUDE	LONGITUDE																	
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2	11° 0'41.69"N ✓	77°56'43.82"E ✓																	
3	11° 0'41.87"N	77°56'40.05"E																	
4	11° 0'46.62"N ✓	77°56'39.90"E ✓																	
5	11° 0'46.38"N	77°56'42.98"E																	
Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	It is an barren and virgin ground																		
b) <i>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</i>	Refer plate no-IA & IB																		



*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.*

**i) INFRASTRUCTURE AND COMMUNICATION:**

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Kuppam	2.24Km	West
b.	Nearest police station	K.Paramathi	6.82km	SW
c.	Nearest fire station	Karur	13km	East
d.	Nearest medical facility	Punnam	5.61Km	SE
e.	Nearest school	Salipalayam	2.07Km	West
f.	Nearest railway station	Pugalur	6.76km	NE
g.	Nearest port facility	Tuticorin	253.0km	South
h.	Nearest airport	Tiruchirappalli	88.0km	East
i.	Nearest DSP office	Karur	13.1km	East
j.	Nearest villages	Kunthanipalayam	2.0km	North
		Salipalayam	2.0km	South
		Uppupalayam	1.96km	East
		Kuppam	2.0km	West







## PART – A

### 3.0 GEOLOGY AND MINERAL RESERVES:

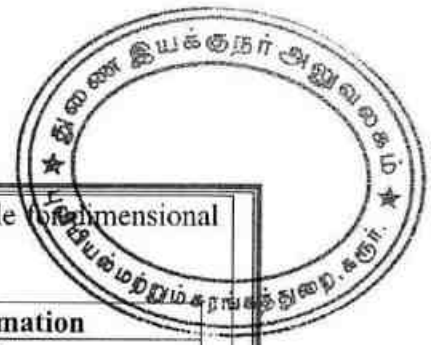
*(a) Briefly describe the topography and general geology and local/mine geology of the mineral deposit including drainage pattern:*

(i)	Topography	:	The proposed lease area exhibits flat topography which is an average altitude of about 164.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (165m) was observed in SW side of the site, while the minimum elevation (164m) was observed NE side of the site. The slope is towards NE side and falls in Toposheet no. 58-E/16.
-----	------------	---	---

(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, Kuppam, 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
Archaean	Charnockite Group	Pyroxene Granulite, Charnockite (acid to intermediate) / Crystalline limestone / Quartzite

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

**a) Topography of the proposed lease area:**

The proposed lease area exhibits flat topography which is an average altitude of about 164.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (165m) was observed in SW side of the site, while the minimum elevation(164m) was observed NE side of the site. The slope is towards NE side. The applied lease area is fresh, with covered lateritic (gravel) soil and beneath the charnockite rocks found based on existing pit nearby the lease area. Surface plan preparing for contour lines, surface features and Geological mapped the applied lease area.

**b) Mode of origin:**

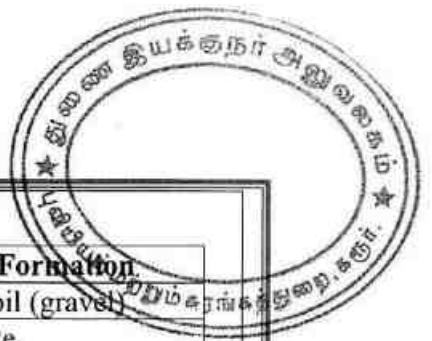
The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by recrystallization at high pressures and moderately high temperatures.

**c) Physiography of the rocks:**

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

**d) Chemical composition of rocks:**

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



**Order of superposition of rocks in the proposed site:**

Age	Group	Rock Formation
Recent to Sub recent	----	Lateritic soil (gravel)
Archaean	Charnockite Group	Charnockite.

(iv) Drainage Pattern

There is no major river located within 500m radius.  
The drainage in the area is dendritic in nature.

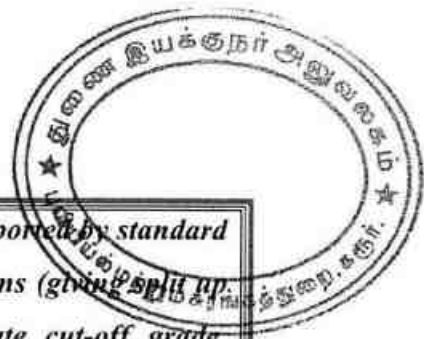
(b) *The topographic plan of the lease area prepared on a scale of 1 :1000 or 1: 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of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

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

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

Year	No.of boreholes	Total meterage	No.of Pits and Dimensions	No.of Trenches and Dimensions
First	N.A	---	---	N.A
Second	N.A	---	---	N.A
Third	N.A	---	---	N.A
Fourth	N.A	---	---	N.A
Fifth	N.A	---	---	N.A

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



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

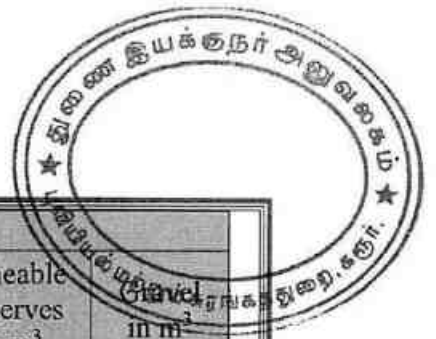
The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into two sections (longitudinal and transverse) to calculate the volume of material up to the depth of 45m below ground level. The longitudinal and transverse cross sections were assigned XY-AB as respectively. Using the cross-sectional method, total reserve is estimated to be **694837m<sup>3</sup>** including the resources of safety zone, and gravel. Of which, rough stone is about **694837m<sup>3</sup>** and gravel resource of about **32318m<sup>3</sup>**.

The gravel is obtained about 2m (R.L.165-163m) from the surface and a rough stone starts from 2 to 45m (R.L.163-120m) below ground level. (Refer plate no.III).

GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Geological Resources in m <sup>3</sup>	Gravel in m <sup>3</sup>
XY-AB	I	143	113	2	32318	.....	32318
	I	143	113	3	48477	48477	.....
	II	143	113	5	80795	80795	.....
	III	143	113	5	80795	80795	.....
	IV	143	113	5	80795	80795	.....
	V	143	113	5	80795	80795	.....
	VI	143	113	5	80795	80795	.....
	VII	143	113	5	80795	80795	.....
	VIII	143	113	5	80795	80795	.....
IX	143	113	5	80795	80795	.....	
<b>TOTAL</b>				<b>45</b>	<b>727155</b>	<b>694837</b>	<b>32318</b>

- (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 **259680m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 45m (R.L.165-120m) below ground level. Of which, rough stone is about **234592m<sup>3</sup>** and gravel is about **25088m<sup>3</sup>**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no. VII).



MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Mineable Reserves in m <sup>3</sup>	Gravel in m <sup>3</sup>
XY-AB	I	128	98	2	25088	.....	25088
	I	128	98	3	37632	37632	.....
	II	118	88	5	51920	51920	.....
	III	108	78	5	42120	42120	.....
	IV	98	68	5	33320	33320	.....
	V	88	58	5	25520	25520	.....
	VI	78	48	5	18720	18720	.....
	VII	68	38	5	12920	12920	.....
	VIII	58	28	5	8120	8120	.....
IX	48	18	5	4320	4320	.....	
<b>TOTAL</b>				<b>45</b>	<b>259680</b>	<b>234592</b>	<b>25088</b>

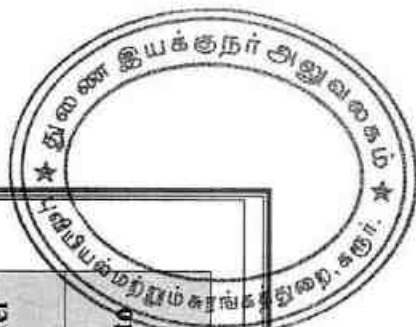
**4.0 MINING:**

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 fresh grant lease. The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 116 (5) of the Metalliferous Mines Regulations, 2021 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 **190080m<sup>3</sup>**. Of which, rough stone is **164992m<sup>3</sup>** and gravel is **25088m<sup>3</sup>** up to a depth of 20m below the ground level (R.L.165m-145m) for five years plan period. Average production is **32998m<sup>3</sup>** of rough stone and **8363m<sup>3</sup>** of



gravel per year (Refer Plate No. IV).

Year	Pit No.(s)	Topsoil/Overburden (m <sup>3</sup> )	ROM	Saleable rough stone (m <sup>3</sup> ) @ 100%	Rough stone rejects(m <sup>3</sup> )	Sub grade/Weathered rock in (m <sup>3</sup> )	Saleable Gravel (m <sup>3</sup> )	Rough stone to topsoil ratio
First	I	--	34710	26282	...	....	8428	....
Second	I	---	39940	31708	...	....	8232	....
Third	I	---	39990	31562	...	....	8428	....
Fourth	I	---	42120	42120	...	....	....	....
Fifth	I	---	33320	33320	...	....	....	....
<b>Total</b>	--	--	<b>190080</b>	<b>164992</b>	...	....	<b>25088</b>	....

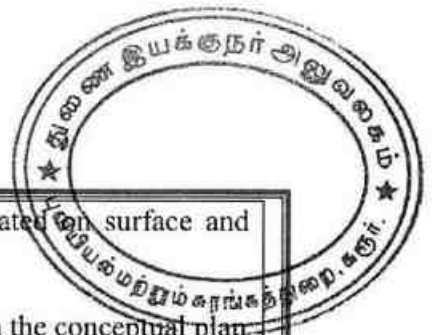
c. *Composite plans and Year wise sections (In case of 'A' class mines):* : Not applicable. It is a "B" class, individual quarry lease.

*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 <sup>3</sup>	Production in m <sup>3</sup>	Gravel in m <sup>3</sup>	
XY-AB	I-YEAR	I	43	98	2	8428	....	8428	
		I	43	98	3	12642	12642	....	
		II	31	88	5	13640	13640	....	
	<b>TOTAL</b>						<b>34710</b>	<b>26282</b>	<b>8428</b>
	II-YEAR	I	42	98	2	8232	....	8232	
		I	42	98	3	12348	12348	....	
		II	44	88	5	19360	19360	....	
	<b>TOTAL</b>						<b>39940</b>	<b>31708</b>	<b>8232</b>
	III-YEAR	I	43	98	2	8428	....	8428	
		I	43	98	3	12642	12642	....	
		II	43	88	5	18920	18920	....	
	<b>TOTAL</b>						<b>39990</b>	<b>31562</b>	<b>8428</b>
	IV-YEAR	III	108	78	5	42120	42120	....	
	<b>TOTAL</b>						<b>42120</b>	<b>42120</b>	<b>0</b>
	V-YEAR	IV	98	68	5	33320	33320	....	
<b>TOTAL</b>						<b>33320</b>	<b>33320</b>	<b>0</b>	
<b>GRAND TOTAL</b>						<b>190080</b>	<b>164992</b>	<b>25088</b>	



d.	Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.	: Composite plan not prepared for this proposed lease area. It is "B <sub>2</sub> " category of mine.
e.	<b>Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:</b>	
At this rate of production, the expected life of quarry is calculated as given below: -		
<b><u>Rough stone:</u></b>		
Mineable reserves of rough stone = 234592m <sup>3</sup> ✓		
Five years production = 164992m <sup>3</sup> ✓		
Monthly production of rough stone = 2750m <sup>3</sup>		
Remaining Mineable reserves is = 69600m <sup>3</sup> ✓		
<b><u>Gravel:</u></b>		
Mineable reserves of gravel = 25088m <sup>3</sup>		
Three years production = 25088m <sup>3</sup>		
Monthly production of gravel = 697m <sup>3</sup>		
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.	<b>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:</b>	
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 deposit is proved beyond the workable limits about up to a depth of 45m below ground level (R.L. 165m-120m) from the petrogenetic character of the rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 10 years.



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.165-163m	First 5 years	Gravel	128	98	2	
	R.L.163-160m		Rough stone	128	98	3	
II	R.L.160-155m		Rough stone	118	88	5	
III	R.L.155-150m		Rough stone	108	78	5	
IV	R.L.150-145m		Rough stone	98	68	5	
V	R.L.145-140m		Remaining 5 years	Rough stone	88	58	5
VI	R.L.140-135m			Rough stone	78	48	5
VII	R.L.135-130m			Rough stone	68	38	5
VII	R.L.130-125m	Rough stone		58	28	5	
VIII	R.L.125-120m		Rough stone	48	18	5	
<b>Total</b>						<b>45m</b>	

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

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

iv) Whether back filling of pits after recovery of mineral up to techno-economically feasible depth envisaged. If so, describe the broad features of the proposal:-

: As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.

v) Whether post mining land use envisaged:-

: At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.

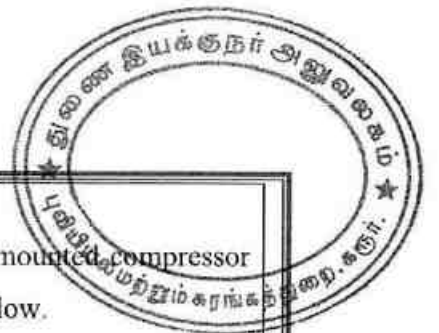
g. **Open cast Mines:**

i). Describe briefly giving salient features of the mode of

: It is a fresh quarry lease. The mining operation is open-cast, semi-mechanized methods are







**(1) Drilling Machines:**

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

Details of drilling equipment's are given below.

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

**(2) Loading Equipment:**

Hydraulic excavator with attached rock breaker and tippers combination utilized for internal transport size able rough stone lumps and deliver to the consumer area.

**(3) Haulage and Transport Equipment**

(a) Haulage within the mining leasehold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	7	--	--	Diesel	--

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

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

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



f. Details of hauling / transport equipment:

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

**(4). Miscellaneous:**

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

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

**5. BLASTING:**

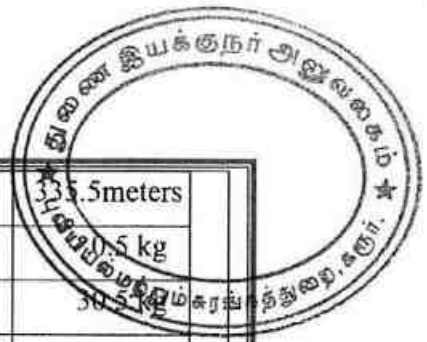
*a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.*

**Blasting pattern:**

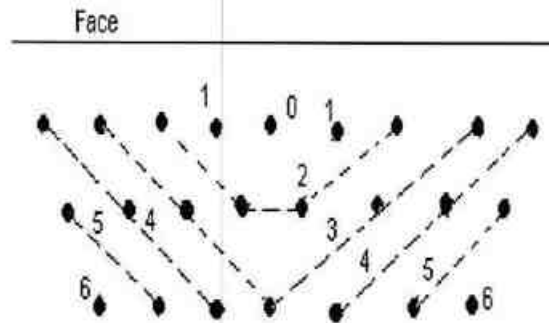
The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.

Drilling and Blasting parameters are as follows.

1	Diameter of the hole	32 mm
2	Spacing between hole	1.2m
3	Burden for hole	1.0m
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 $32998\text{m}^3 * 2.8 = 92394$ T	92394 T
8	Total handling per day (300 working day)	308T
9	Nos. of holes per day ( $308/5.04 = 61$ )	61 holes.



10	Meterage required per day ( $61 \times 5.5 = 335.5$ )	335.5 meters
11	Charge per hole	0.5 kg
12	Powder factor ( $61 \text{holes} \times 0.5 \text{ kg} = 30.5$ )	30.5 kg
13	Sequence of blasting = Cord relay with electric detonators / Nonel	--



Staggered 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.

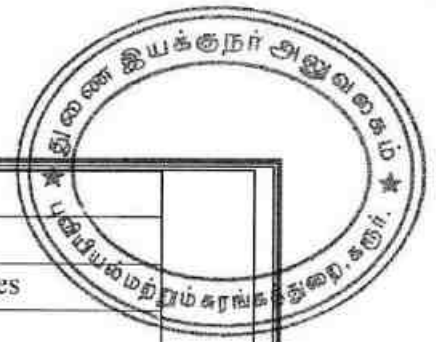
**Delay detonators:**

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

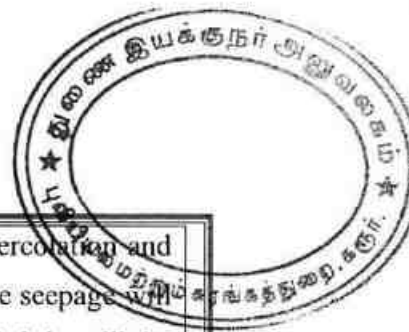
The major advantages of delay blasting are:

- ❖ Reduction of ground vibration
- ❖ Reduction in air blast
- ❖ Reduction in over break
- ❖ Improved fragmentation
- ❖ Better control of fly rock

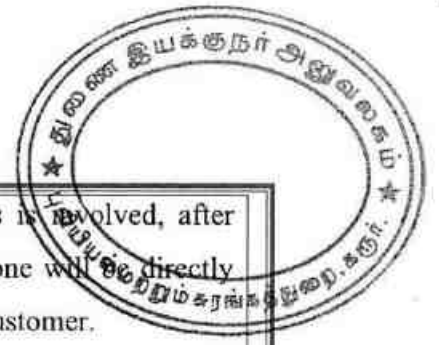
Blasting program for the production per day



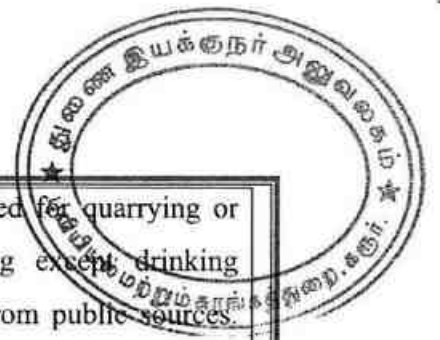
No of holes	:	61holes
Yield	:	308 tons
Total explosive required	:	30.5kg-Slurry explosives
Charge per hole	:	0.5kg
Blasting at day time only	:	12.0p.m-1.0p.m
d) Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.5 kg per holes of explosives
e) Whether 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"> <li>1. The applicant is advised to engage an authorized explosive agency to carry out blasting.</li> <li>2. First Aid Box will be keeping ready at all the time.</li> <li>3. Necessary precautionary announcement will be carried out before the blasting operation.</li> </ol>
<b>6. MINE DRAINAGE</b>		
a) Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 55m in rainy season and 60m 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 45m 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.



<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 a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.</p>
<p><b>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b></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:</p> <p style="padding-left: 40px;">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 stone pillar may be unsold will be keep within the lease boundary.</p>
<p><b>8. USE OF MINERAL:</b></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>



(c)	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	: Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.																								
<b>9. OTHERS</b>																										
(a)	<b>Describe briefly the following Site services</b>	: 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 Rules, 44 (1 to 9) 2021 as a welfare amenity for our quarry laborers.																								
(b)	<p><b>Employment potential :</b> As per Mines safety under the provisions of 29(3) Metalliferous Mines Rules, 2021 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, 2021 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>10 No's</td> </tr> <tr> <td colspan="3"><b>Total =</b></td> <td><b>14 No's</b></td> </tr> </table>		1.	Highly Skilled	Mines Manager	1No.			Mine Engineer	1No.			Mine Geologist	1No.			Blaster	1No.	2.	Unskilled	Musdoor / Labours	10 No's	<b>Total =</b>			<b>14 No's</b>
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<b>10 MINERAL PROCESSING/BENEFICIATIONS:</b>																										
(a)	If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.	: Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose.  The recovery of rough stone and gravel in this quarry is 100%.																								



(b)	Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect 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 2.0KLD, Dust suppression is 1.0KLD and Green Belt is 0.5KLD. Minimum quantity of water 4.0KLD per day. It is proposed to make an own bore well for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.  The sewage water to a tune of 0.8KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.



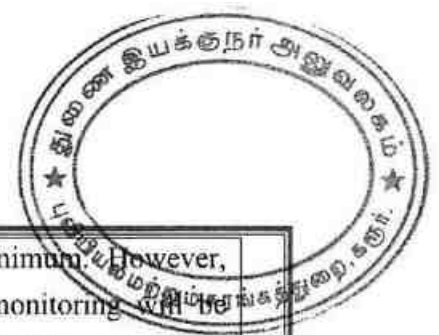


## PART – B

### 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 due to 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" style="width: 100%;"> <thead> <tr> <th style="width: 15%;">Sl. No.</th> <th style="width: 45%;">Land Use</th> <th style="width: 40%;">Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>Nil</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>Nil</td> </tr> <tr> <td>3</td> <td>Road</td> <td>Nil</td> </tr> <tr> <td>4</td> <td>Green belt &amp; Dump</td> <td>Nil</td> </tr> <tr> <td>5</td> <td>Drainage &amp; Settling Tank</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>1.62.0</td> </tr> <tr> <td colspan="2" style="text-align: right;"><b>Grand total</b></td> <td><b>1.62.0</b></td> </tr> </tbody> </table>			Sl. No.	Land Use	Present area (Hect.)	1.	Area under mining	Nil	2	Infrastructure	Nil	3	Road	Nil	4	Green belt & Dump	Nil	5	Drainage & Settling Tank	Nil	6	Un-utilized area	1.62.0	<b>Grand total</b>		<b>1.62.0</b>
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11.2	Water Regime	: Water table in this area is noticed at a depth of 60m in summer and 55m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 45m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except acacia bushes, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																								
11.4	Quality of air, ambient noise level and water	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence,																								



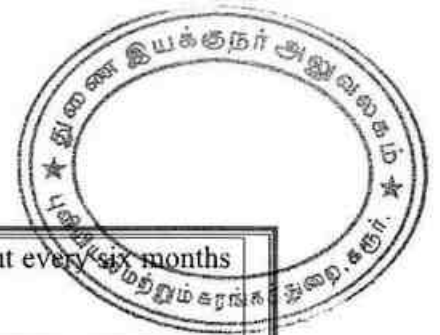
		noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																									
11.5	<p><b>Climatic conditions:</b></p> <p><b>Climate:</b></p> <p>The district receives the rain under the influence of both Southwest and Northeast 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><b>Rainfall:</b></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><b>Human Settlement:</b></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>Kunthanipalayam</td> <td>North</td> <td>2.0km</td> <td>1932</td> </tr> <tr> <td>2</td> <td>Salipalaiyam</td> <td>South</td> <td>2.15km</td> <td>721</td> </tr> <tr> <td>3</td> <td>Uppupalayam</td> <td>East</td> <td>1.5km</td> <td>567</td> </tr> <tr> <td>4</td> <td>Kuppam</td> <td>West</td> <td>2.1km</td> <td>3503</td> </tr> </tbody> </table>	S.N	Village	Direction	Distance in Kms	Population	1	Kunthanipalayam	North	2.0km	1932	2	Salipalaiyam	South	2.15km	721	3	Uppupalayam	East	1.5km	567	4	Kuppam	West	2.1km	3503	
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11.7	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.																									
11.8	Attach plans showing the locations of sampling stations	: The proposed ambient air quality, water quality ambient noise level and vibration are periodically tested for every season (6																									



		months once) around 5km radius as per the guidance of MoEF and EIA notification 2006 and also covering DGMS norms.
11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	: The proposed area not fall under notified area under water (Prevention & Control of Pollution), Act, 1974

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

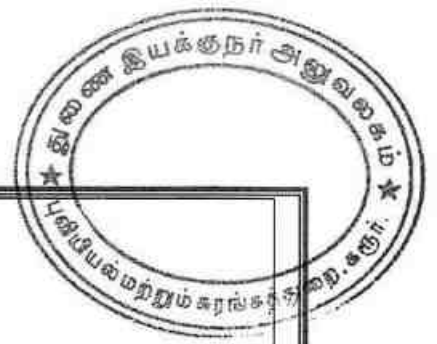
i)	<p><b>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</b></p> <p>Due to quarrying and exploitation of the rough stone and gravel, there will impact in the form i.e. change in the ground profile, pits, and dumps. 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" style="margin-left: 40px;"> <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>1.26.2</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>0.02.0</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.08.0</td> </tr> <tr> <td>4</td> <td>Green belt &amp; Dump</td> <td>0.20.0</td> </tr> <tr> <td>5</td> <td>Drainage &amp; Settling Tank</td> <td>0.04.0</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>0.01.8</td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>Grand total</b></td> <td><b>1.62.0</b></td> </tr> </tbody> </table>	Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Area under mining	1.26.2	2	Infrastructure	0.02.0	3	Road	0.08.0	4	Green belt & Dump	0.20.0	5	Drainage & Settling Tank	0.04.0	6	Un-utilized area	0.01.8	<b>Grand total</b>		<b>1.62.0</b>	
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<b>Grand total</b>		<b>1.62.0</b>																								
ii).	Air Quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.																								
iii).	Water quality	A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.																								
iv).	Noise levels	Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level																								



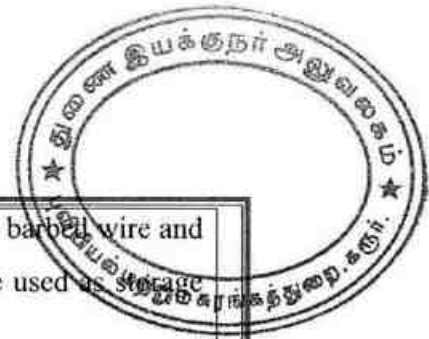
		monitoring will be carried out every 15 months around the quarry site.
v).	Vibration levels (due to blasting)	No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity will be recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime	No major water bodies like rivers, pond, lake etc., located within a radius of 500m. The Kaveri river is situated on northern side about 5.45km and Noyyal river is about 4.54km on northeast side.
vii).	Socio-economics	1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km radius.

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

i).	Temporary storage and utilization of topsoil	:	No separate of topsoil will be removed.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during 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	:	The present mining is proposed to an average depth of 20m 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.



	abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.																																		
iii)	<p><i>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.</i></p> <p><b>Green Belt Development:</b></p> <p>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.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Place</th> <th>Area in Sq.m</th> <th>No.of Plants</th> <th>Rate of survival</th> <th>Rate</th> <th>Amount in Rs</th> </tr> </thead> <tbody> <tr> <td>First</td> <td>Lease Boundary</td> <td>0.20.0</td> <td>350</td> <td>80%</td> <td rowspan="3">@100 Rs Per sapling</td> <td>35000/-</td> </tr> <tr> <td>Second</td> <td>Approach road and Nearby Village Road</td> <td>--</td> <td>300</td> <td>80%</td> <td>30000/-</td> </tr> <tr> <td>Third</td> <td>Schools</td> <td>--</td> <td>300</td> <td>80%</td> <td>30000/-</td> </tr> <tr> <td colspan="6" style="text-align: right;"><b>Total</b></td> <td><b>95,000/-</b></td> </tr> </tbody> </table>	Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs	First	Lease Boundary	0.20.0	350	80%	@100 Rs Per sapling	35000/-	Second	Approach road and Nearby Village Road	--	300	80%	30000/-	Third	Schools	--	300	80%	30000/-	<b>Total</b>						<b>95,000/-</b>	
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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																																	



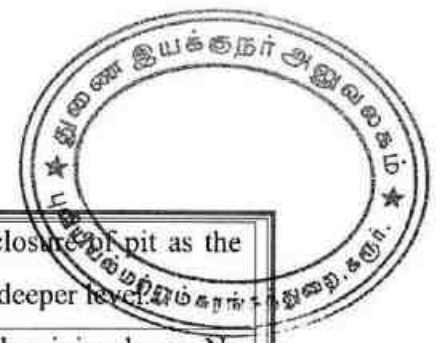
		<p>pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit.</p> <p>The open pit will be used as rain water storage structure to augment groundwater levels which improve the mine environment.</p>
viii).	Protective measures for ground vibrations / air blast caused by blasting,	: It is a small B2 category opencast, semi mechanized/ manual method of mining is adopted and no heavy machinery will be used. The only smooth blasting is proposed, therefore no change for ground vibration or noise from the quarry.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	: No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	: The nearest villages are will get employment benefits.

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

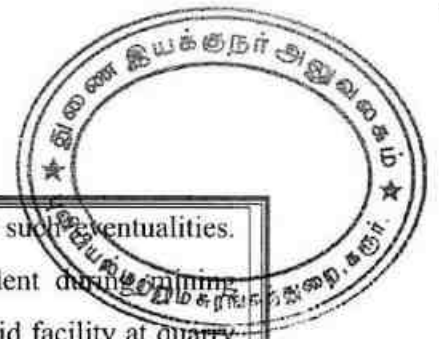
Not applicable. It is B2 category quarry

**12.0 PROGRESSIVE QUARRY CLOSURE PLAN:**

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The Ultimate mining is proposed to an average depth of 45m bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	: Measures will be taken as per the Acts and Rules. Green belt development at the rate of 300 trees per year will be proposed. No



		immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	: The quarry lease is a fresh mining lease. No mitigation measures adopted.
12.4	Mine closure activity	: The present mining plan is proposed to depth of 20m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	: Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine rules, 2021, 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/ manual 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 manpower entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 14 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	<b>Fixed Asset Cost:</b>	
	1. Land Cost (Consent land)	: Rs. 1,00,000/-
	2. Labour Shed	: Rs. 1,50,000/-
	3. Sanitary Facility	: Rs. 1,50,000/-
	4. Fencing	: Rs. 8,00,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 3,50,000/-
	<b>Total</b>	<b>: Rs. 15,50,000/-</b>
B	<b>B. Machinery cost</b>	<b>: Rs. 20,00,000/- (Hire Basis)</b>





<b>C</b>	<b>Total Expenditure of EMP cost (for five years)</b>	
	1. Drinking Water Facility	: Rs. 2,00,000/-
	2. Sanitary facility & Maintenance	: Rs. 1,50,000/-
	3. Permanent water sprinkler	: Rs. 10,00,000/-
	4. Afforestation and its maintenance	: Rs. 95,000/-
	5. Safety Kits	: Rs. 1,50,000/-
	6. Provision of tyre washing facility	: Rs. 1,00,000/-
	7. Surface runoff management structures like garland drain, settling pond & Bund (0.04.0Hect or 400Sq.m X 400	: Rs. 1,60,000/-
	8. Blasting materials with blast mat cost	: Rs. 10,00,000/-
	9. Environment monitoring	: Rs. 5,00,000/-
	<b>Total</b>	<b>: Rs. 33,55,000/-</b>
<b>D</b>	<b>Total Project Cost (A+B+C)</b>	<b>: Rs. 69,05,000/-</b>

**13.0 FINANCIAL ASSURANCE:**

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

**14.0 CERTIFICATES:**

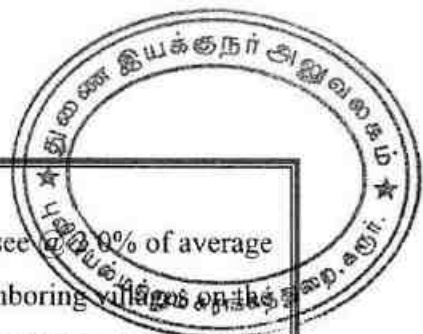
All required certificates are enclosed.

**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 and gravel 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.482/ Mines/2021, Dated 19.04.2022.**
- (iv) Total proposed production of **190080m<sup>3</sup>**. Of which, rough stone is about **164992m<sup>3</sup>** and gravel is about **25088m<sup>3</sup>** up to a depth of 20m below the ground level (R.L.165m-145m) for first five years plan period. Average production is **32998m<sup>3</sup>** of rough stone and **8363m<sup>3</sup>** of gravel per year.



**17.0 CSR Expenditure:**

CSR (Corporate Social responsibility) shall provide by the lessee 0.5% of average net profit of the company for the last three financial years to the neighboring villages on the provisions under section 135(1) of the companies Act, 2013 and Rule 3(2) companies CSR Rules, 2014 as circular no.05/01/2014.

Place: Dharmapuri, TN

Date: 6-6-2022

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,  
Collectorate Post Office, Oddapatti,  
Dharmapuri - 636 705. Tamil Nadu, India.

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: 482 / Mines / 2021 Dated: 11/07/2022

Deputy Director of Geology and Mining  
Karur District

ANNEXURE - I

ந.க.எண். 482/கனிமம்/2021

மாவட்ட ஆட்சியர் அலுவலகம்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்

நாள். 19.04.2022.

குறிப்பாணை

**பொருள்:** கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - குப்பம் கிராமம் - பட்டா புல எண்.553/2(பகுதி) 1.62.0 ஹெக்டேர் பரப்பில் - சாதாரணகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி தி/ள். நியூ ஸ்டார் 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. நியூ ஸ்டார் புளூமெட்டல்ஸ், சர்வே எண்.550, 553, 534, 535 பூலான்காடு, உப்புபாளையம், குப்பம் அஞ்சல், புகளூர் வட்டம், கரூர் மாவட்டம் என்ற நிறுவனத்தினர் விண்ணப்ப நாள்: 12.10.2021.
  2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் கடிதம் ந.க.எண். அ1/4829/2021, நாள்: 07.01.2022
  3. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:04.03.2022.
  4. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்.எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

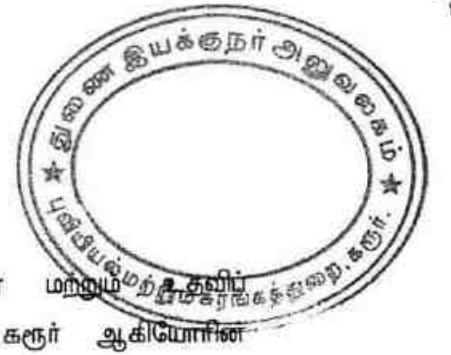
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கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்.553/2(பகுதி) 1.62.0 ஹெக்டேர் பரப்பு பட்டா நிலத்திலிருந்து பத்து ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் அஞ்சல், சர்வே எண்.550, 553, 534, 535, பூலான்காடு, உப்புபாளையம் என்ற முகவரியில் உள்ள தி/ள். நியூ ஸ்டார் புளூமெட்டல்ஸ் என்ற நிறுவனத்தினர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளனர்.



மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்.553/2(பகுதி) 1.62.0 ஹெக்டேர் பரப்பில் தமிழ்நாடு சிறு கனிமச்சலுகை விதிகளில் விதி எண்கள்.19-(1), 20 மற்றும் 33-இன் கீழ் தி/ள். நியூ ஸ்டார் புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புலத்திற்கு தென்கிழக்கில் 97 மீட்டர் தொலைவில் செல்லும் உயர் அழுத்த மின்பாதைக்கு மின் வாரியத்திடமிருந்து தடையின்மை சான்றினை பெற்று குவாரி குத்தகை உரிமம் பத்திரம் நிறைவேற்றுவதற்கு முன்பு சமர்ப்பிக்கப்பட வேண்டும்.
2. விண்ணப்ப புலத்தின் தென்கிழக்குப் பகுதியில் சுமார் 154 மீட்டர் தொலைவில் உள்ள அங்கீகரிக்கப்படாத ஒரு ஓட்டு வீட்டின் (Tiled house) உரிமையாளர் பாதிப்பின்றி குவாரிப்பணி செய்ய சம்மத கடிதம் அளித்துள்ளார். எனவே மேற்படி வீட்டிற்கு எவ்வித பாதிப்பின்றி குவாரிப்பணி செய்ய வேண்டும்.
3. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
4. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிடும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
6. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.

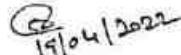


எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் புலியேலம் ஆகியோரின் புலியேலம் மற்றும் கரங்கத்துறை, கரூர் ஆகியோரின் புலியேலம் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்.553/2(பகுதி) 1.62.0 ஹெக்டேர் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண். 19(1), 20 மற்றும் 33-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 10 (பத்து) வருட காலத்திற்கு தி/ள். நியூ ஸ்டார் புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு சாதாரணக்கற்கள் மற்றும் கிராவல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு தி/ள். நியூ ஸ்டார் புளூமெட்டல்ஸ் என்ற நிறுவனத்தினர் கேட்டுக்கொள்ளப்படுகிறார்கள். 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,  
புலியேலம் மற்றும் கரங்கத்துறை,  
கரூர்.

பெறுநர்

  
19/04/2022

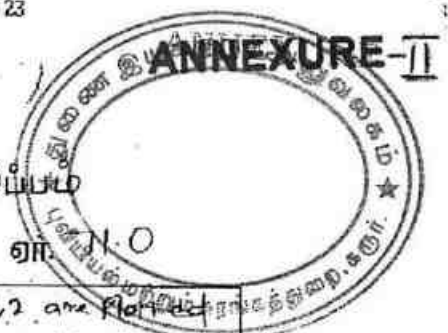
தி/ள். நியூ ஸ்டார் புளூமெட்டல்ஸ்,  
சர்வே எண்.550, 553, 534, 535,  
யூலான்காடு,  
உப்புாளையம்,  
குப்பம் அஞ்சல்,  
புகளூர் வட்டம்,  
கரூர் மாவட்டம்.

நகல்:-

1. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. இயக்குநர், புலியேலம் மற்றும் கரங்கத்துறை, கிண்டி, சென்னை.

பெயர்: திருச்சிராப்பள்ளி  
 கடை: 4 கிராமம்

அளவுப்படி எண் 23

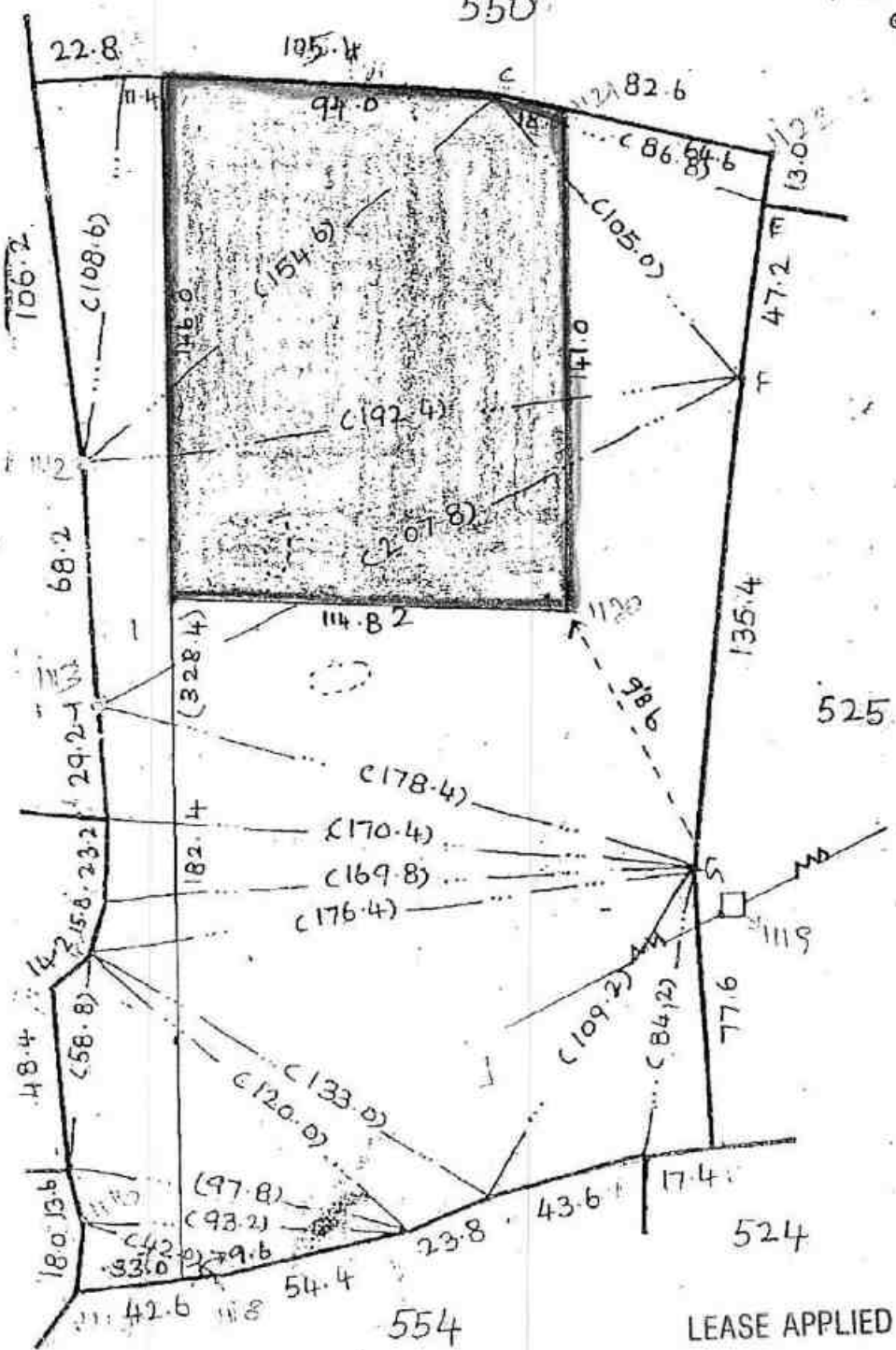


4வ எண். 553

பரப்பு: ஹெக்டேர் 5 ஏ. 11.0

New Subdivisions 553/1,2 are plotted by me As per TR 8A17/1431 dt-12-7-21

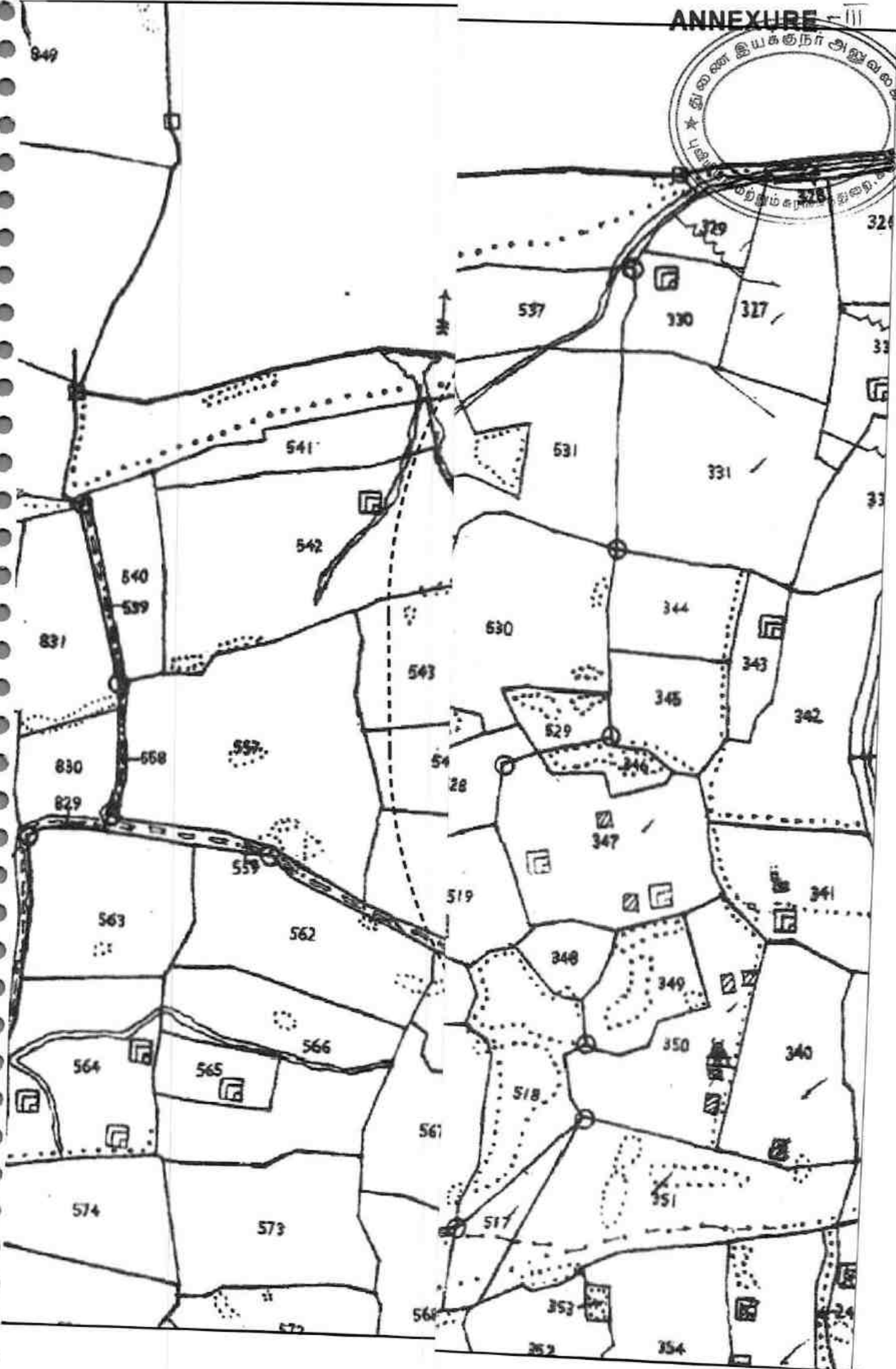
20-7-2024  
 9.2.21



→ SF No. 553/2 Part - 2 இவரின் உரிமை கண்டுபிடிக்கப்பட்ட பகுதிகள் பரப்பு } மொத்த 1.62.00 ஏக்கர்

கிராம தாலுகா அலுவலர்  
 உய்யம் கிராமம்  
 2000

22.10.2021  
 23.10.2021







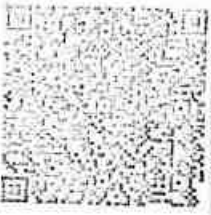


அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்  
 வட்டம் : புகளூர்  
 பிராமம் : குப்பம்

1. புல எண்	153	9. மண் வயனமும் சகமும்	3 - 3
2. உட்பிரிவு எண்	2	10. மண் தரம்	5
3. பழைய புல உட்பிரிவு எண்	333-	11. தீர்வை (கு - றெ)	1.33
4. பகுதி	2	12. பரப்பு (ஹெக்டேர் - சர்)	4 - 75.85
5. அரசு / ரயத்துவாரி சமத்துவாரி		13. மொத்த தீர்வை (கு -பை)	5.57
6. நிலத்தின் வகை	புழுவை	14. பட்டா எண்	1255
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இந் போகமா	-	15. பெயர்	1.சந்திரராஜ் 2.கவிசனம்மாள்

குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 50323 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.



government of tamil nadu  
revenue department

land title details : c. no. 10(1) section

district : karur

taluk : pugalur

revenue village :

kuppampatta no : 1255

owners name

1. palaniswami son sundararaj
2. ulaganathan wife kannammal

field number	subdivision	refresh		do good		other		remarks
		area	solution	area	solution	area	solution	
		heck - air	rs- bye	heck - air	rs- bye	heck - air	rs- bye	
553	2	4 - 75.85	6.57	--	--	--	--	2021/0103/14/172288- -2021/14/07/000076SD -- 04-08-2021
		4 - 75.85	6.57					

note 2 :



1. the above information/certificate copy details are obtained from the e-register. please enter the reference number 14/07/018/01255/10823 on your **website** <https://eservices.tn.gov.in>.
2. THIS INFORMATION WAS PRINTED ON 22-03-2022 AT 10:23:06 AM.
3. Read through the 2D barcode reader of the cell phone camera and check the website via 3G/GPRS





VICHANDORAN,  
S.V. P. B. D. NAGAR,  
KARUR - 5,  
L. No: 4/97 KRR

Assistant Treasury Officer,  
Sub-Treasury,  
KARUR.

கிரைய சாசனம்

2006-ம் ஆண்டு ஆகஸ்ட் மாதம் 21-ம் தேதி, கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம்; புன்னம் கிராமம், புன்னம் சத்திரம் அஞ்சல், பொன்னியாக்கவுண்டன்புதூரில் வசிக்கும் ஆர்.பழனிச்சாமி அவர்கள் குமாரர் இந்து கொங்கு வெள்ளாள ஜாதி\* பி.கந்தரராஜ் - 1, கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், புன்னம் கிராமம், பெரிய ரெங்கபாளையத்தில் வசிக்கும் பி.உலகநாதன் அவர்கள் மனைவி இந்து கொங்கு வெள்ளாள ஜாதி கண்ணம்மாள் - 2 ஆகிய உங்களுக்கு,

கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், புன்னம் கிராமம், புன்னம் சத்திரத்தில் வசிக்கும் பொங்காளியப்ப கவுண்டர் அவர்கள் குமாரர் பிராமசாமி ஆகிய நான் சென்ற 14.02.2006-ம் தேதியில் கரூர் மாவட்டம், கரூர் வட்டம், எழுதி வாங்குபவர்கள்

எழுதிக் கொடுப்பவர்

பொது அதிகார முகவர்:-

கண்ணம்மாள்

பிராமசாமி







தமிழ்நாடு TAMILNADU

பி. சிவசுந்தரம்

934137



பொது அபிவிருத்தி துறை

8369

21.8.06  
13.00.1

M. RAVICHANDRAN,  
S.V. 70-B B. D. NAGAR,  
KARUR-5.  
L. No: 4/97 KRP

...2...

குப்பம் கிராமம், அரசம்பாளையத்தில் வசிக்கும் அம்மையப்ப கவுண்டர் அவர்கள் குமாரர் அம்மையப்ப கவுண்டர் - 1, மேற்படி 1 நபரின் குமாரர்கள் ஏ.சுப்பிரமணி - 2, ஏ.தங்கவேல் - 3 ஆகியோர்களிடம் எழுதி வாங்கிய பொது அதிகாரப் பத்திரப்படி (4-226/2006, கருர் 2 நெ. இணைச் சார்பதிவகம்) மேற்படியார்களின் பொது அதிகார முகவர் ஹோதாவில் மேற்படி பி.ராமசாமி ஆகிய நான் எழுதிக் கொடுத்த சுத்தக் கிரைய சாசனம் என்னவென்றால்,

மேற்படி பிரின்ஸ்பால்களுக்கு பிதூராஜித வுகையிலும், மேற்படி பிரின்ஸ்பால்களில் 1 நபருக்கு பட்டாப்படையும் (பட்டா எண்.1288), 2, 3 நபர்களுக்கு நபரின் வாரிசு கிரமப்படையும் பாத்தியப்பட்டு மேற்படி பிரின்ஸ்பால்கள் சர்வ சுதந்திரமாக அனுபவித்து வருகிறதான கீழ்க்கண்ட சொத்தை மேற்படி எழுதி வாங்குபவர்கள்

எழுதிக் கொடுப்பவர்

பொது அபிவிருத்தி துறை

பொது அதிகார முகவர்:-

P. S. G. M. S.

பி. சிவசுந்தரம்

भारतीय नैर न्यायिक

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தமிழ்நாடு TAMILNADU

பி. சுந்தரன்

A 462468



பயன்வாய் 324 லைட் 434

8310

M. RAVICHANDRAN,

21.8.06

S.V 70-B B D. NAGAR,

KARUR-5.

L. No: 4/97 KRR

1350/-

..3..

பிரின்ஸ்பால்களுக்காக நான் நாளது தேதியில் உங்களுக்கு சுத்தக் கிரையமும், சுவாதீனமும் செய்து கொடுத்து தொகை பெற்றுக் கொண்டது ரூ.71,000/- இந்த ரூபாய் எழுபத்தி ஓராயிரமும் நான் நாளது தேதியில் உங்களிடம் மேற்படி பிரின்ஸ்பால்களின் குடும்பச் செலவுகளுக்காக கீழ்க்கண்ட சாட்சிகள் முன் ரொக்கமாகப் பெற்றுக் கொண்டு விட்டபடியால் இனி நாளது தேதி முதல் கீழ்க்கண்ட சொத்தை நீங்களே புத்திர, பௌத்திர பாரம்பரியமாகவும் தானாதி நிவினிய விற்கிரையங்களுக்கு யோக்கியமாகவும், சர்வ சுதந்திர பூத்தியங்களுடன் ஆண்டனுபவித்துக் கொண்டு நலமாக வாழ்ந்து வரவும்.

கீழ்க்கண்ட சொத்தைப் பொருத்து எந்தவிதமான வில்லங்கமும், விவகாரமும் இல்லை என உறுதி கூறுகிறேன். அப்படி ஏதேனும் வில்லங்கம், எழுதி வாங்குபவர்கள்

எழுதிக் கொடுப்பவர்

பொது அதிகார முகவர்:-  
P. சுண்ணாம்பாள்

சீனியோன் குடித்தவர்க்கு

S. K. K. Union Raja  
Pondicherry P. O.



W. B. ...  
...

புத்தகம் ... ஆண்டு ...  
...

...



Document No.	148
Page No.	1
Total Pages	1

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தமிழ்நாடு TAMILNADU

பி. 8372/2006  
உயர்நீதிமன்றம்  
கரூர்

A 462470



8372 M. RAVICHANDRAN,  
S-V. 70-B B D. NAGAR,  
KARUR-S.  
L. No: 4/97 KRR  
21.8.06  
1450/-

..5..

சொத்து விபரம்

கரூர் பதிவு மாவட்டம், கரூர் 2 நெ. இணைச் சார்பதிவுகம், அரவக்குறிச்சி  
வட்டம், குப்பம் பஞ்சாயத்துக்குச் சேர்ந்த குப்பம் கிராமம், (பட்டா எண்.1255,  
பாஸ்புக் எண்.438663)

அ.ப.ச.553 நெ. ஏக்.14.10 இதில் பொதுவில் ஏக்.2.35 இந்த  
விஸ்தீரணமுள்ள நிலமும், மேற்படி நிலத்துக்கு மாமூல்படி பாத்தியப்பட்ட சகல  
பாத்தியங்களும் சகிதம்.

எழுதி வாங்குபவர்கள்

எழுதிக் கொடுப்பவர்

பி. சின்னம்பல்

பொது அதிகார முகவர்:-

P. S. V. S. S.

भारतीय गैर न्यायिक



INDIA NON JUDICIAL

தமிழ்நாடு TAMILNADU

A 462471

பி. சிவசுந்தரம்

சென்னை 2 மாவட்டம் 434

8373

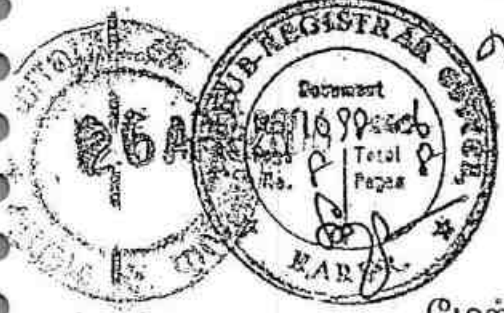
M. RAVICHANDRAN,

S. V. 70-B B. D. NAGAR,  
KARUR-5.  
L. No: 4/97 KRR

21.8.06

₹ 50/-

..6..



மேற்படி சொத்து மதிப்பு விபரம்

நில் மதிப்பு	ரூ. 70,500-00
தடபாத்திய மதிப்பு	ரூ. 500-00
ஆக மொத்த மதிப்பு	ரூ. 71,000-00

எழுதி வாங்குபவர்கள்

எழுதிக் கொடுப்பவர்

*[Handwritten Signature]*  
பஞ்சவர்ணம்

பொது அதிகார முகவர்:- P. நாலமலர்

சாட்சிகள்:-

K. V. Chithambaram  
சென்னை 2 மாவட்டம் 434  
சென்னை 2 மாவட்டம் 434

ஆவண அமைப்பு:-

P. Ramasamy, Siviyampalayam, DL.No.A132

भारतीय गैर न्यायिक

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தமிழ்நாடு தமிழ்நாடு TAMIL NADU 01 OCT 2021


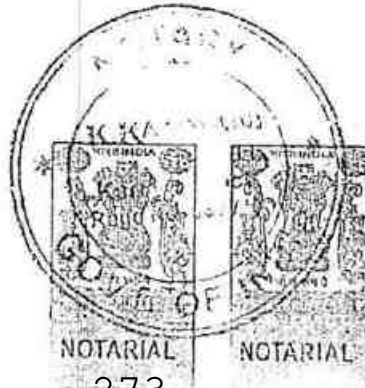
02AC 302497

R C b

இரா. சந்திரசேகரன்  
முத்திரைத்தாள் விற்பனையாளர்  
கரூர் - தமிழ்நாடு  
உரிமம் எண் 45/97சம்மதக்கடிதம்

கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம் மேற்கு, ஈரோடு மெயின் ரோடு என்ற முகவரியில் வசிக்கும் பழனிச்சாமி அவர்கள் குமாரர் P.கந்திராஜ்-1, கரூர் மாவட்டம், புகளூர் வட்டம், புன்னம் கிராமம், பெரியரெங்கபாளையத்தில் வசிக்கும் உலகநாதன் அவர்கள் மனைவி கண்ணம்மாள்-2 ஆகிய நாங்கள் எழுதிக்கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால், கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், புல எண்.553/2 (பட்டா எண்.1255)ல் 4.75.85 ஹெக்டேர் புஞ்சை நிலம் எங்களுக்கு பாத்தியப்பட்டது. மேற்படி புலத்தில் 1.62.0 ஹெக்டேர் பரப்பில் மட்டும், கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் அஞ்சல், உப்புபாளையம், பூலான்காடு, சர்வே எண்.550, 553, 534, 535 என்ற முகவரியில் இயங்கி வரும் திள்.நியூ ஸ்டார் புளுமெட்டல்ஸ் என்ற நிறுவனத்திற்கு சாதாரண கற்கள் வெட்டியெடுக்க அரசு அனுமதி பெற்று கல்குவாரி பணி செய்வதற்கு எங்களுக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறோம். கல்குவாரி குத்தகை உரிமம் வழங்க எங்களுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறோம்.

பிரமாணதாரர்.

  
புகளூர் 02/10/2021


07/10/21

Cell: 99244 45289

KANMANI, B.A.B.L.,  
Advocate & Notary Public  
India Reg. No. 6877/08  
Post: Andampal Post  
KANUR - 639 003, T.N.



सत्यमेव जयते

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



Registration Certificate

Registration Number : 33AAHFN0799A1ZH

1.	Legal Name	NEW STAR BLUE METAL			
2.	Trade Name, if any	NEW STAR BLUE METALS			
3.	Constitution of Business	Partnership			
4.	Address of Principal Place of Business	, SF No. 550, 533, 534, 535, , POOMANDAMPALAYAM,UPPUPALAYAM,KUPPAM POST, ARAVAKKURICHI TALUK, Tamil Nadu, 639111			
5.	Date of Liability	01/07/2017			
6.	Period of Validity	From	01/07/2017	To	NA
7.	Type of Registration	Regular			
8.	Particulars of Approving Authority				
Signature		Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK 1 Date: 2018.08.02 14:34:09 IST			
Name					
Designation					
Jurisdictional Office					
9.	Date of issue of Certificate	02/08/2018			
Note: The registration certificate is required to be prominently displayed at all places of business in the State.					

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of application on 01/07/2017.



தமிழ்நாடு தமில்நாடு TAMIL NADU

01 OCT 2021

02AC 302496

Tvl. New star blue metals

kuppam

R C. V.

இரா. சந்திரசேகரன்  
முத்திரைத்தாள் விற்பனையாளர்  
கரூர் - தமிழ்நாடு  
உரிமம் எண் 45/97

AFFIDAVIT

NEW STAR BLUE METALS is a partnership firm registered under the partnership Act, 1932 consisting of the following partners, viz., (1) P.SUNDARRAJ, S/o.Palanisamy, Erode Main Road, Vettamangalam West, Pugalur Taluk, Karur District (2) U.SARAVANAN S/o.Ulaganathan, No.334/B, Kurukku Salai, Vettamangalam West, Pugalur Taluk, Karur District

For New Star Blue Metal.

Managing Partner

Cell: 99944 45789

K. KANMANI, B.A.B.L.,  
Advocate & Notary Public  
Govt of India Regd No 6877/08  
Pudur. Andan Kovil Post  
KARUR - 639 003. T.N.



**Thiru.P.SUNDARRAJ** is the Managing Partner.



That an application has been presented to the District Collector, Karur for the grant of Rough Stone Gravel Quarry lease in favour of the afore said firm in respect of the land in S.F.No.553/2, Kuppam Village, Pugalur Taluk, Karur District

One of the Managing Partner **Thiru.P.SUNDARRAJ** is authorized to sign in the quarry lease application form and other documents and to represent in the quarry lease agreement and obtain transport permits on behalf of the above said firm.

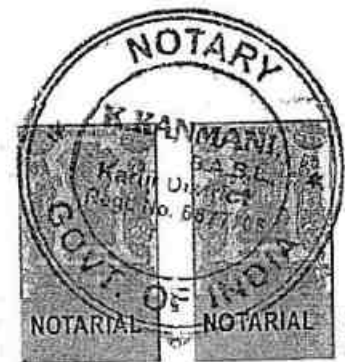
Handwritten signatures and initials, including 'S' and 'U. B.' with a circled '2'.

Signature of the Deponent.  
For New Star Blue Metal,

Handwritten signature of the Managing Partner.

Solemnly affirmed and signed before me at Karur this 7<sup>th</sup> Day of October 2021.

Handwritten signature of the Notary Public.  
09/10/21  
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.





தமிழ்நாடு தமில்நாடு TAMILNADU

1-9-2021

CG 103751

New Star Blue Metal  
kanur

K.MOHAN.S V.S.No.21  
R.DIS.No.3184/A2/08  
KARUR WEST.

கூட்டு வியாபார உடன்படிக்கைப் பத்திரம்

2021ம் ஆண்டு செப்டம்பர் மாதம் 1ம் தேதிக்கு கருர் மாவட்டம், புகளூர் தாலூக்கா, வேட்டமங்கலம் மேற்கு, குறுக்கு சாலை, கருர் ஈரோடு மெயின்ரோடு, நம்பர் 335சி

1

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ATTESTED

Cell: 99944 45789  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regd No. 3677/08,  
Punal, Aachen Kovil Post,  
KARUR - 636 003 T.N.





தமிழ்நாடு தமிழ்நாடு TAMILNADU 100/- 1. 9. 2021

CG 103752

New Star Blue Metal  
Kama

K.MOHAN, S.V.S.No.2  
R.DIS.No.3184/A2/C  
KARUR WEST

..2..

சிறை விலாசத்தில் இருக்கும் பழனிசாமி அவர்களின் குமார்  
பி.சுந்தர்ராஜ் -1 (வயது 35) கருர் மாவட்டம், புகளூர்  
தாலூக்கா, வேட்டமங்கலம் மேற்கு, குறுக்கு சாலை, அண்ணா

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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ATTESTED

Call: 99944 45780  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regn No. 6677/09,  
Pudur, Angamalai Post,  
KARUR - 638 603, T.N.



தமிழ்நாடு தமிழ்நாடு TAMILNADU  
New Star Blue Metal  
Kamo

1.9.2021

CG 103753

MOHAN, S V.S. No. 21/0  
R.DIS. No. 3184/A2/08  
KARUR WEST.

..3..

நகர், நம்பர் 334/பீ என்ற விலாசத்தில் இருக்கும் உலகநாதன்  
அவர்களின் குமாரர் உ.சரவணன் -2 (வயது 32) ஆகிய நாம்  
2 பேர்களும் சேர்ந்து எழுதிக்கொண்ட கூட்டு வியாபார  
உடன்படிக்கைப் பத்திரம்.

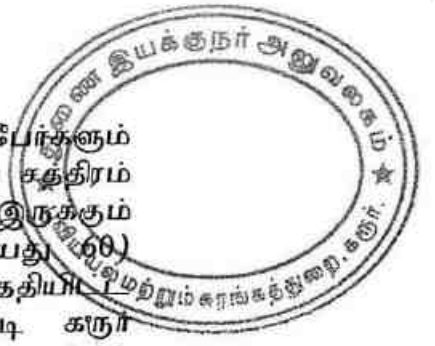
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U. S.V.

Call: 99644 45789  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regd No. 8877/08,  
Pudur, Andan Kovil Post,  
KARUR - 639 008. T.N.



1. இப்பவும் நம்மில் 1, 2 லக்கமிட்டவர்கள் 2 பேர்களும் மேலும் கரூர் மாவட்டம், புகளூர் தாலூக்கா, புன்னம் சத்திரம் அஞ்சல், பெரிய ரெங்கபாளையம் என்ற விலாசத்தில் இருக்கும் பழனிசாமி அவர்களின் குமாரர் பி.உலகநாதன் (வயது 60) ஆகிய நாம் 3 பேர்களும் சேர்ந்து 01.08.2021ம் தேதியிட்ட உத்தரவு மூற்றும் கரங்கத்துறை, கரூர் கூட்டு வியாபார உடன்படிக்கைப் பத்திரத்தின் படி கரூர் மாவட்டம், புகளூர் தாலூக்கா, குப்பம் அஞ்சல், உப்புபாளையம், எஸ்.எம். நம்பர் 550, 533, 534, 535, பூலான் கரூர் என்ற இடத்தில் " நியூ ஸ்டார் புளூமெட்டல் " " NEW STAR BLUE METAL " என்ற விலாசம் வைத்து இயந்திரம் மூலம் ஜல்லி கற்களை உடைத்து விற்பனை செய்யும் தொழில் ஒன்றை ஆரம்பித்து கூட்டாக நடத்தி வந்ததில் நம்மில் பி.உலகநாதன் அவர்கள் இக்கூட்டு வியாபாரத்தில் தொடர்ந்து கூட்டாளியாக இருந்துவர செளகரியம் இல்லை என்று மற்ற கூட்டாளிகளுக்கு தெரிவித்தும் அதற்கு அவர்களும் சம்மதித்த வகையில் 31.08.2021ம் தேதியுடன் இக்கூட்டிலிருந்து விலகிக் கொண்டுவிட்டார். பின்னிட்டு நம்மில் 1, 2 லக்கமிட்டவர்கள் 2 பேர்களும் சேர்ந்து 01.09.2021ம் தேதிமுதல் கொண்டு மேற்படி வகையறா வியாபாரத்தை மேற்படி விலாசத்திலேயே தொடர்ந்து கூட்டாக நடத்தி வருகிறோம். இனியும் தொடர்ந்து கூட்டாக நடத்தி வருவோமாகவும் கூட்டாளிகள் விரும்பித் தீர்மானித்தால் மேற்படி பெயரை மாற்றி அமைத்துக்கொள்ளவோ அல்லது வேறு இடங்களுக்கு மாற்றவோ செய்யலாம்.

2. இக்கூட்டின் சார்பில் இதுதவிர வேறு எந்த வியாபாரம் வேண்டுமானாலும் கூட்டாளிகள் விரும்பித் தீர்மானித்தால் இதே பெயரிலேயே இதே விலாசத்திலேயே செய்து வரலாம்.

3. இக்கூட்டின் அபிவிருத்தியை முன்னிட்டு நம் கூட்டாளிகள் உள்ளூரிலும் வெளியூர்களிலும் கிளைகள் துவங்கி நடத்தி வரலாம்.

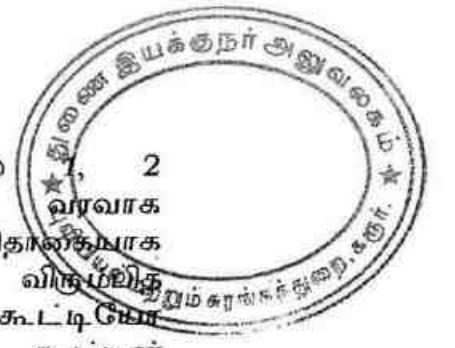
4. இந்தக்கூட்டு வியாபார உடன்படிக்கைப் பத்திரத்தின் ஊர்த்துக்கள் 01.09.2021ம் தேதிமுதல் கொண்டு அமுலுக்கு வந்ததாக கருதவேண்டியது.

ATTESTED

Cell: 99944 45789  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regd No. 8877/09,  
Pudur, Andan Kovil Pool,  
KARUR - 639 008, T.N.

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5. இக்கூட்டு வியாபாரத்திற்காக நம்மில் 2 லக்கமிட்டவர்களின் முதலீட்டுக் கணக்குகளில் வரவாக இருக்கும் தொகைகளை அவரவர் முதலீட்டுத் தொகையாக கருதிக் கொள்ள வேண்டியது. கூட்டாளிகள் விரும்பித் தீர்மானித்தால் மேற்படி முதலீட்டுத் தொகைகளை கூட்டியோ அல்லது குறைத்தோ வைத்துக் கொள்ளலாம். கூட்டின் அபிவிருத்தியை முன்னிட்டு நம் கூட்டாளிகள் யார் வேண்டுமானாலும் கடன் வாங்கி நிறுவனத்திற்கு கொடுக்கலாம். அவ்வித கடன்களை கூட்டாளிகளின் கடன் அல்லது நடப்பு கணக்குகளில் வரவு வைத்துக்கொள்ள வேண்டியது. மேற்படி முதலீடு மற்றும் கடன் அல்லது நடப்பு கணக்குகளிலும் கூட்டாளிகளின் இதர கணக்குகளிலும் பற்று நீக்கி வரவாக உள்ள தொகைகளுக்கு கூட்டாளிகள் வருடம் ஒன்றுக்கு அதிகபட்சமாக 12% வரை வட்டி போட்டு பொதுவில் செலவு எழுதிக்கொள்ள வேண்டியது. கூட்டாளிகள் விரும்பித் தீர்மானித்தால் மேற்படி வட்டி விகிதத்தை குறைத்து வட்டி போட்டு செலவு எழுதிக் கொள்ளலாம். அதேபோல் கூட்டாளிகள் விரும்பித் தீர்மானித்தால் கூட்டாளிகளின் கடன் மற்றும் நடப்பு கணக்குகளில் வரவாக இருக்கும் தொகைகளை கணக்கில் எடுத்துக்கொள்ளாமல் முதலீட்டுக் கணக்கில் மட்டும் வரவாக இருக்கும் தொகைக்கு அதிகபட்சமாக 12% வரையிலோ அல்லது குறைத்தோ வட்டி போட்டு செலவு எழுதிக் கொள்ளலாம். அதேபோல் வருமானவரி சட்டத்தில் கூட்டாளிகளின் முதலீட்டு கணக்கிற்கு உண்டான வட்டி விகிதத்தில் அவ்வப்போது கொண்டு வரப்படும் மாற்றங்களை அனுசரித்தும் மேற்படி வட்டி விகிதத்தை கூட்டியோ அல்லது குறைத்தோ போட்டு செலவு எழுதிக் கொள்ளலாம்.

6. இக்கூட்டு வியாபாரத்திற்காக நம்மில் 1 லக்கமிட்ட பி.சுந்தராஜ், 2 லக்கமிட்ட உசுவணன் ஆகிய இருவரும் உழைக்கும் கூட்டாளிகளாக இருந்துவர வேண்டியது. இருவரும் இக்கூட்டின் வியாபாரத்தையும் அன்றாட நிர்வாக காரியங்களையும் இக்கூட்டின் வளர்ச்சிக்காக நன்கு கவனித்து நடத்தி வரவேண்டியது. மேற்படி காரியங்களுக்காக மேற்படி உழைக்கும் கூட்டாளிகள் சம்பளம், போனஸ் முதலியவை போட்டு எடுத்துக் கொள்ளவேண்டியது. மேற்படி உழைக்கும் கூட்டாளிகள் 1, 2 லக்கமிட்டவர்களுக்கு தற்பொழுது மாத ஊதியமாக தலா ரூ.50,000/-ம் மேற்படி உழைக்கும்

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2 v. 004



கூட்டாளிகள் ஒவ்வொருவருக்கும் குறைந்த பட்சம் இரண்டு மாத ஊதியம் போனஸாகவும் கொடுத்து பொதுவில் செல்வ எழுதிக் கொள்ள வேண்டியது. மேலும் நம் கூட்டாளிகள் இருவரின் ஏகோபித்த சம்மதத்தின் பேரில் மேற்படி உழைக்கும் கூட்டாளிகளின் ஊதியம் மற்றும் போனஸை கூட்டவோ அல்லது குறைக்கவோ செய்யலாம்.

7. இக்கூட்டு வியாபாரத்திற்காக நம்மில் 1 லக்கமிட்ட பி.சுந்தரராஜ், 2 லக்கமிட்ட உ.சரவணன் ஆகிய இருவரும் மேனேஜிங் பார்ட்னர்களாக இருந்துவர வேண்டியது. இருவரும் இக்கூட்டு வியாபாரத்தின் சகலநிர்வாக காரியங்களையும் நன்கு கவனித்து நடத்தி வரவேண்டியது.

8. இக்கூட்டின் நிமித்தம் வெளிநபர்களிடம் கடன்கள் வாங்க நேரிட்டால் அவ்வித கடன்களை இக்கூட்டு விலாசத்தின் பெயருக்கே வாங்கி அவைகளை இக்கூட்டின் கணக்குகளில் உடனுக்குடன் வரவு வைத்துவிட வேண்டியது. மேற்படி கடன்களை வாங்க நம்மில் 1 லக்கமிட்ட பி.சுந்தரராஜ், 2 லக்கமிட்ட உ.சரவணன் ஆகிய இருவரும் சேர்ந்து கையெழுத்து செய்து வாங்க இதன்முலம் பூரண அதிகாரம் உண்டு.

9. இக்கூட்டின் சார்பில் பேங்குகளில் கரண்ட் அக்கௌண்ட், ஒவர் டிராப்ட், கேஜ் கிரிட், பில்ஸ் டிஸ்கவுண்ட் முதலிய கணக்குகள் வைக்கவும் செக்குகளில் கையெழுத்து அவைகளை இக்கூட்டின் சார்பாக ஆப்ரேட் செய்யவும் நம்மில் 1 லக்கமிட்ட பி.சுந்தரராஜ், 2 லக்கமிட்ட உ.சரவணன் ஆகிய இருவரும் சேர்ந்து கையெழுத்து செய்து வாங்க இதன்முலம் பூரண அதிகாரம் உண்டு.

10. இக்கூட்டு வியாபாரம் சம்பந்தமாக நிறுவனங்களுடன் தொடர்பு கொள்ளவும் தேவையான காண்டிராக்ட்களை ஏற்படுத்திக் கொள்ளவும் அவைகளில் கையெழுத்து செய்யவும் நம்மில் 1 லக்கமிட்ட பி.சுந்தரராஜ், 2 லக்கமிட்ட உ.சரவணன் ஆகிய இருவரும் சேர்ந்து கையெழுத்து செய்து வாங்க இதன்முலம் பூரண அதிகாரம் உண்டு.

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2 U. 04

11. இக்கூட்டின் சார்பில் வரும் ரிஜிஸ்டர் தபால்கள் தந்தி, மணியார்டர்கள், லாரிபில், ரயில்வே பால்களில் கையெழுத்து செய்து வாங்கவும் மேலும் இக்கூட்டின் நிமித்தம் ஏதேனும் சிவில் கிரிமினல் வழக்குகள் ஏற்பட்டால் சம்பந்தப்பட்ட கோர்ட்டுகளில் இக்கூட்டின் சார்பாக தாமாகவோ அல்லது வக்கீல்களை நியமித்து அவர்கள் முலமாகவோ ஆஜராகி அவ்வித வழக்குகளை நடத்தவும் ரீதி செய்து கொள்ளவும் பைசல் செய்து கொள்ளவும் மத்திய மாநில அரசு அலுவலகங்களில் இக்கூட்டின் சார்பாக காரியங்களை கவனிக்கவும் மற்றும் இக்கூட்டு வியாபாரம் சம்பந்தப்பட்ட மற்ற சகலநிர்வாக காரியங்களையும் கவனித்து நடத்தவும் நம்மில் 1 லக்கமிட்ட பி.சுந்தராஜ், 2 லக்கமிட்ட உ.சரவணன் ஆகிய இருவரும் தனித்தனியே கையெழுத்து செய்ய இதன்முலம் பூரண அதிகாரம் உண்டு.

12. இக்கூட்டின் கணக்குகளை பிரதிவருடம் மார்ச் மாதக் கடைசியிலோ அல்லது கூட்டாளிகள் விரும்பித் தீர்மானிக்கும் இதர காலங்களிலோ இக்கூட்டின் கணக்கை கட்டி கூட்டு வியாபாரம் சம்பந்தப்பட்ட சகலசெலவுகளும் மேலும் கூட்டாளிகள் விரும்பித் தீர்மானித்து பொதுவில் எழுதக்கூடிய உழைக்கும் கூட்டாளிகளின் சம்பளம், போனஸ் மற்றும் கூட்டாளிகளின் முதலீட்டுக் கடன் கணக்குகளுக்குண்டான வட்டி போன்ற சகலசெலவுகளும் போக பாக்கி ஏற்படும் லாபலோபத்தை நம் கூட்டாளிகள் 2 பேர்களும் சமமாக பிரித்துக்கொள்ள வேண்டியது.

13. இக்கூட்டு வியாபாரமானது நம் கூட்டாளிகள் இருவரும் விரும்பும் காலம் வரையில் அதாவது பார்ட்னர்ஷிப் அட்வில்லாக தொடர்ந்து நடந்து வரத்தக்கது.

14. நம்மில் யார் வேண்டுமானாலும் தனியாகவோ அல்லது வேறு நபர்களுடன் கூட்டு சோந்தோ வேறு எந்த வியாபாரம் வேண்டுமானாலும் செய்து வரலாம். ஆனால் அப்படி அவர்கள் செய்து வரும் வியாபாரத்திற்கும் அவற்றில் ஏற்படும் லாபலோபத்திற்கும் இக்கூட்டு வியாபாரத்திற்கும் யாதொருவிதமான சம்பந்தமும் பாத்தியமும் பின்தொடர்ச்சியும் கிடையாது.

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2 U. B. 4.



15. நம்மில் யாரேனும் ஒருவர் இக்கூட்டிலிருந்து விலக விரும்பினால் அவர் மற்ற கூட்டாளிக்கு ஒரு மாத தவணை கண்டு எழுத்து மூலம் ஒரு நோட்டீஸ் கொடுக்க வேண்டியது. பின் அந்த தேதிவரையில் இக்கூட்டின் கணக்கை கட்டியோ அல்லது உத்தேசமாக லாபலோபத்தை நிர்ணயம் செய்தோ விலகும் அல்லது விலக்கப்படும் கூட்டாளிக்கு அவர் கணக்குப்படி சேரவேண்டிய தொகையை கொடுத்துவிட்டோ அல்லது கொடுக்கத்தகுந்த ஏற்பாடுகளை செய்துவிட்டோ மற்ற கூட்டாளி தாமாகவோ அல்லது வேறு நபர்களை சேர்த்துக்கொண்டோ இக்கூட்டு வியாபாரத்தை மேற்படி இடத்தில் மேற்படி பெயரிலேயே தொடர்ந்து நடத்தி வரவேண்டியது.

16. விலகும் அல்லது விலக்கப்படும் கூட்டாளிக்கு இக்கூட்டு வியாபாரத்தின் சூட்வில், தளவாட சாமான்கள், டெலிபோன் மற்றும் இக்கூட்டு வியாபாரத்திற்கு வரவேண்டிய பாக்கிகள் கொடுபட வேண்டிய பாக்கிகள் இக்கூட்டு வியாபாரம் சம்பந்தப்பட்ட சகலவிதமான ஆஸ்திப் பொறுப்புகளிலும் அசையும் அசையா சொத்துக்களிலும் இக்கூட்டு நிறுவனத்தின் பெயரில் உள்ள நிலம், கட்டிடம் வகையறாக்களிலும் யாதொருவிதமான சம்பந்தமும் பாத்தியமும் பின்தொடர்ச்சியும் கிடையாது. அவர் தன் முதலீட்டு மற்றும் இதர கணக்கில் வரவாக உள்ள தொகையை மட்டும் பெற்றுக்கொண்டு விலகிக்கொள்ள வேண்டியது.

17. இக்கூட்டு வியாபார உடன்படிக்கைப் பத்திரத்தின் ஊர்த்துக்களை தேவைப்பட்டால் திருத்தி அமைக்கவோ அல்லது மாற்றி அமைக்கவோ செய்யலாம். அதற்கு ஒரு பத்திரம் எழுதிக்கொண்டு அதனை இதன் துணைப்பத்திரமாக (CODICIL) பாவித்து அதன்படி நடந்து கொள்ளவேண்டியது.

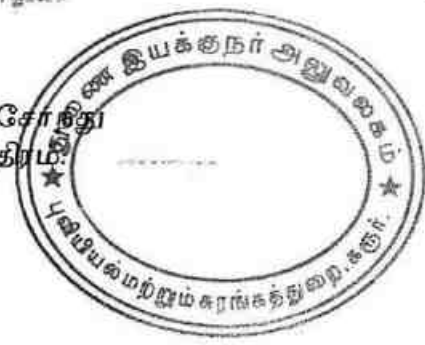
18. நம் கூட்டாளிகள் இருவரும் இதில் கண்டிராத மற்ற விஷயங்களைப் பொறுத்த மட்டில் நாம் 1932ம் ஆண்டின் "இந்தியன் பார்ட்னர்ஸிப் ஆக்ட்"ஐ அனுசரித்து நடந்து கொள்ள வேண்டியது.

ATTESTED

Cell: 89944 45789  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regd No. 8077/03,  
Pudur, Andan Kovil Post,  
KARUR - 639 003, T.N.

1 1/2  
2 U. 8/16

இப்படிக்கு நம் கூட்டாளிகள் 2 பேர்களும் சேர்த்து எழுதிக்கொண்ட கூட்டு வியாபார உடன்படிக்கைப் பத்திரம்:



1. *[Handwritten signature]*

12. U. M.

சாட்சிகள்

1. *[Handwritten signature]* s/o. Sathasivam.  
Periya Rangapalayan.  
Punnam Chathiram (PO)  
Karur

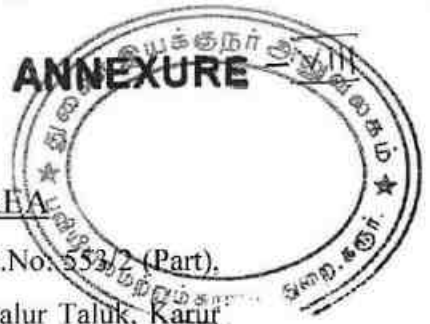
2. *[Handwritten signature]* s/o. Murgesan,  
Anno Nagar  
Kuruvusolai  
Nopal.

ATTESTED

*[Handwritten signature]*  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regd No. 6677/08,  
Pudur, Andan Kovil Road,  
KARUR - 638 006. T.N.

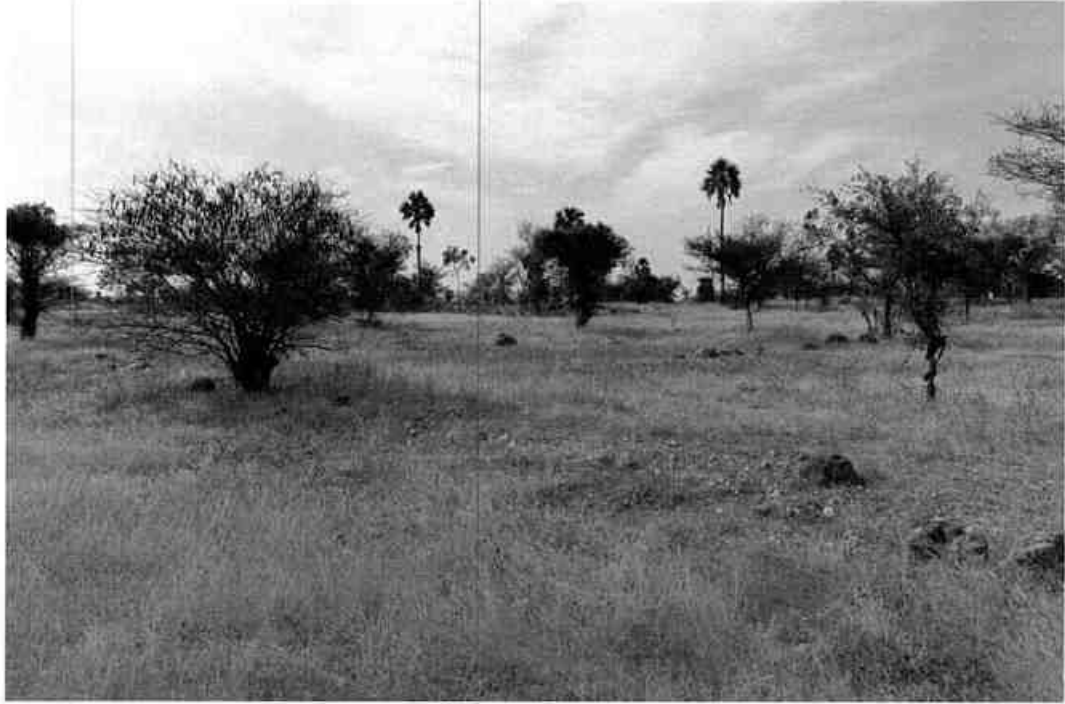






PHOTOCOPY OF THE PROPOSED LEASE AREA

Site photos in respect of rough stone and gravel quarry lease in S.F.No. 553/2 (Part).  
Patta land, over an extent of 1.62.0hectares, Kuppam Village, Pugalur Taluk, Karur  
District, Tamil Nadu State in belonging to M/s. New Star Blue Metals, Karur-  
636111.



Licence Numbers:

E/SC/TN/22/51/ (E10177)  
E/SC/TN/22/676/ (E94602)  
E/SC/TN/22/674/ (E94598)  
E/SC/TN/22/675/ (E94591)

# RUKMANI EXPLOSIVES

274, Karur Road, MULANUR - 638 106. Tirupur Dist



Date 9/6/22

To:

M/s.Newstar Bluemetals,  
Poolan kaadu,  
Uppupalayam,  
Kuppam Post,  
Pugalur(Tk),  
Karur(Dt).

Ref : Your Letter Dated 09/06/2022

Sub: Regarding blasting work using explosive in your proposed quarry

Sir,

We are having explosive license in form 22 holding  
E/SC/TN/22/51(E10177).E/SC/TN/22/675(E94591), E/SC/TN/22/674(E94598),  
E/SC/TN/22/676(E94602), situate in survey SF No: 259, Rangavalasu Village,  
Moolanur, Dharapuram Taluk Tirupur District. Our office functioning at 274,  
Karur Main Road, Mulanur – 638 106. Dharapuram Taluk, Tirupur District.

We are enacting 2 explosives vans for transporting detonators and class 2  
separately for our magazine to our work site and well Experienced and Licensed  
Blasters and Shot – Firer for safe blasting work since 25 Years without  
untoward incident.

We are willing to undertake blasting work on contract basis at your  
S.F.No: 553/2(Part), Measuring About 1.62.0 Hectares in Kuppam village,  
Pugalur Taluk, Karur District.

Thanking You

Enclosure:

1. License Copies

Yours Faithfully,  
For M/S.Rukmani Explosives

*R. Rukmani*  
For RUKMANI EXPLOSIVES



**अनुज्ञापिते प्ररूप एल. ई.-3 | LICENCE FORM LE-3**

(विस्फोटक नियम, 2008 का अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) स (घ) दाखला)  
(See article 3(a) to (d) of Part 1 of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने।  
Licence to possess : (c) for use, explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine

अनुज्ञापिते सं. (Licence No.) : E/SC/TN/22/51(E10177)  
वार्षिक फीस रूपए (Annual Fee Rs): 5400/-

The Licensee is hereby granted to

M/s. Rukmani Explosives (अधिभोगी / Occupier : Sri. Kalimuthu), 274, KARUR ROAD MULANUR DHARAPURAM TALUK - TIRUPUR DIST. 638106, Town/Village - Mulanur, District-TIRUPUR, State-Tamil Nadu, Pincode - 638106

को अनुज्ञापिते अनुदत्त की जाती है।

1. अनुज्ञापिते धारी की प्रास्थिति | Status of licensee : Partnership Firm

2. अनुज्ञापिते निम्नलिखित प्रयोजनों के लिए विधिमान्य है।  
Licence is valid only for the following purpose.

3. अनुज्ञापिते विस्फोटकों के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमान्य है।  
Licence is valid for the following kinds and quantity of explosives: - (क) (a)

क्र. सं.	नाम और विवरण	वर्ग और प्रभाग	उप-प्रभाग	मात्रा किसी एक समय में
Sr. No.	Name and Description	Class & Division	Sub-division	Quantity at any one time
1.	Nitrate Mixture	2, 0	0	1000 Kg.
2.	Safety Fuse	6, 1	0	2500 Mtrs
3.	Detonating Fuse	6, 2	0	21500 Mtrs
4.	Detonators	6, 3	0	30000 Nos.

(ख) किसी एक कैलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा [अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञापिते के लिए]

(b) Quantity of explosives to be purchased in a calendar month [applicable for licence under article 3(b) and (c)] :

25 times as above.

5. निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञापिते परिसर की पुष्टि होती है।  
The licensed premises shall conform to the following drawing(s):

रेखाचित्र क्र. (Drawing No.) E/SC/TN/22/51(E10177)  
दिनांक (Dated) 07/05/1999

6. अनुज्ञापिते परिसर निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:

Survey No(s), 259, ग्राम (Town/Village) : RANGAVALASU KILANGADAL  
जिला (District) TIRUPUR राज्य (State) Tamil Nadu  
दूरभाष (Phone) ई. मेल (E-Mail)

पोलिस थाना (Police Station) : MOOLANUR  
पिनकोड (Pincode)  
फैक्स (Fax)

7. अनुज्ञापिते परिसर में निम्नलिखित सुविधाएं अंतर्विष्ट हैं।  
The licensed premises consist of following facilities.

A MAIN GAGAZINE ROOM, LOBBY AND DETONATOR ROOM

8. अनुज्ञापिते समय - समय पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2004 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित उपायों के अधीन रहते हुए अनुदत्त की जाती है।  
The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2004 framed there under and the conditions, additional conditions and the following Annexures.

1. उपर्युक्त क्रम सं 5 में यथा कथित रेखाचित्र (स्थान, सत्रिमाण संबंधी और अन्य विवरण दर्शित करते हुए)।  
Drawings (showing site, constructional and other details) as stated in serial No. 5 above.
2. अनुज्ञापिते प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापिते की शर्तों और अतिरिक्त शर्तों।  
Conditions and Additional Conditions of this licence signed by the licensing authority.
3. दूरी प्ररूप DE-2 | Distance Form DE-2.

9. यह अनुज्ञापिते तारीख 31 मार्च 2001 तक विधिमान्य रहेगी। This licence shall remain valid till 31st day of March 2001.

यह अनुज्ञापिते, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट-VII के अधीन तथा उपबर्णित इस अनुज्ञापिते की शर्तों का अधिभोग करने या यदि अनुज्ञापिते परिसर योजना या उससे संलग्न उपबंध में दर्शित विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिसंहत की जा सकती है, जहां वह लागू हो।  
This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VIII, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

तारीख | The Date - 07/05/1999

Sd/-  
संयुक्त मुख्य विस्फोटक नियंत्रक | Joint Chief Controller of Explosives  
South Circle, Chennai

**Amendments :**

- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 09/05/2014
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 24/07/2014
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 24/08/2016
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 06/04/2017
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 04/04/2018

**Transfers :**

- Change in Licensee Name/Address/Status dated : 13/02/2013

नवीनीकरण के पञ्जाकन के लिए स्थान  
Space for Endorsement of Renewal

नवीनीकरण का तारीख  
Date of Renewal

समाप्त का तारीख  
Date of Expiry

अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प  
Signature of licensing authority and stamp

24/09/2020

31/03/2025

Jt. Chief Controller of Explosives, South Circle, Chennai

*[Handwritten Signature]*

**कानूनी चेतावनी :** विस्फोटकों को गलत ढंग से चताने या उनका दुरुपयोग विधि के अधीन गंभीर दंडिक अपराध होगा।  
**Statutory Warning :** Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

**अनुज्ञापित प्ररूप एल. ई-3 | LICENCE FORM LE-3**

(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) से (घ) दोहरे।  
(See article 3(a) to (d) of Part 1 of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने के लिए अनुज्ञापित  
Licence to possess - (e) for use, explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine

अनुज्ञापित नं./ Licence No.) : E/SC/TN/22/676(E94602)  
आवृत्ति/ Annual Fee (Rs): 2400/-



Access granted to

Magazine/Explosives (अधिभागी / Occupier : P.Kaliathin), 274, Karur Road, MULANUR Post, Town/Village - Mahipur,  
Tamil Nadu, P.C.R. State-Tamil Nadu, Pincode - 638106

अनुज्ञापित को जारी किया जाता है।  
अनुज्ञापित की प्रकृति/ Status of licensee : Partnership Firm  
अनुज्ञापित के निम्नलिखित प्रयोजनों के लिए विधिमानी है।  
Licence is granted only for the following purpose.

possess for use of Electric and/or Ordinary Detonators, Nitrate Mixtures - के  
उपयोग के लिए

अनुज्ञापित के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमानी है।  
Licence is granted for the following kinds and quantity of explosives: - (क) (a)

नाम और विवरण Name and Description	कक्षा और प्रभाग Class & Division	उप-प्रभाग Sub-division	मात्रा किसी एक समय में Quantity at any one time
Nitrate Mixture	2.0	0	500 Kg.
Electric and/or Ordinary Detonators	6.2	0	20000 Nos.

एक कैलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा (अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञापित के लिए)  
Explosives to be purchased in a calendar month (applicable for licence under article 3(b) and (c))

25 times  
as above.

अनुज्ञापित के निम्नलिखित पते पर स्थित हैं।  
The licensed premises shall conform to the following drawing(s):

रेखाचित्र नं. (Drawing No.) E/SC/TN/22/676(E94602)  
दिनांक (Dated) 11/10/2021

अनुज्ञापित के निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:  
SF No.:259, ग्राम (Town/Village) : Rangavalasu Kilangundal village

पुलिस थाना (Police Station) : Mahipur  
पिनकोड (Pincode) : 638106  
फैक्स (Fax)

राज्य (State) : TIRUPUR  
ई-मेल (E-Mail)

Tamil Nadu

अनुज्ञापित के निम्नलिखित सुविधाएं अंतर्भूत हैं।  
The licensed premises consist of following facilities:

One portable B type main magazine and one portable B type detonator magazine.

अनुज्ञापित को विधिमानी के अधीन रखते हुए अनुदत्त की जाती है।  
Licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and other additional conditions and the following Annexures.

अनुज्ञापित के निम्नलिखित शर्तों के अधीन अतिरिक्त शर्तें।  
Additional conditions and the following Annexures:  
अनुज्ञापित के निम्नलिखित शर्तों के अधीन अतिरिक्त शर्तें।  
Additional conditions and the following Annexures:  
अनुज्ञापित के निम्नलिखित शर्तों के अधीन अतिरिक्त शर्तें।  
Additional conditions and the following Annexures:

अनुज्ञापित की अवधि 31 मार्च 2021 तक विधिमानी रहेगी। This licence shall remain valid till 31st day of March 2021.

अनुज्ञापित को विधिमानी के अधीन रखते हुए अनुदत्त की जाती है।  
Licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and other additional conditions and the following Annexures.

संयुक्त मुख्य विस्फोटक नियंत्रक (Joint Chief Controller of Explosives)  
South Circle, Chennai

दिनांक/ Date - 12/08/2016

अनुज्ञापित के निम्नलिखित शर्तों के अधीन अतिरिक्त शर्तें।  
Additional conditions and the following Annexures:  
अनुज्ञापित के निम्नलिखित शर्तों के अधीन अतिरिक्त शर्तें।  
Additional conditions and the following Annexures:

नवीनीकरण के पृष्ठान के लिए स्थान  
Space for Endorsement of Renewal

अनुज्ञापित की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry
2021	31/03/2026

अनुज्ञापित प्राधिकारी का हस्ताक्षर और स्थान  
Signature of licensing authority and stamp

Jt. Chief Controller of Explosives, South Circle, Chennai

**कानूनी चेतावनी : विस्फोटक का गलत ढंग से चलाना या उनका दुरुपयोग विधि के अधीन गंभीर दंडित अपराध होगा।**  
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

**Note :- This is system generated document does not require physical signature. Applicant may take printout for their records.**



**अनुज्ञापित प्ररूप एत. ई.-3 | LICENCE FORM LE-3**  
 विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) से (See article 3(a) to (d) of Part 1 of Schedule IV of Explosives Rules, 2008)  
 (ग) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने के लिए अनुज्ञापित  
 Licence to possess : (c) for use explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine

Licence No.: E/SC/TN/22/674(E94598)  
 Annual Fee Rs. 2400/-

Holder of Explosives (अधिभागी / Occupier : P.Kalimuthu), 274 Karur Road, Mulanur, Town/Village - MULANUR,  
 District - TIRUPUR, State-Tamil Nadu, Pincode - 638106

अनुज्ञापित प्ररूप की प्रकृति / Status of licensee - Partnership Firm  
 अनुज्ञापित विस्फोटक प्रयोजनों के लिए विधिमार्ग है।  
 Licence is valid only for the following purpose  
 अनुज्ञापित विस्फोटक के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमार्ग है।  
 Licence is valid for the following kinds and quantity of explosives - (क) (a)

क्र. सं. / S. No.	नाम और विवरण / Name and Description	वर्ग और प्रभाग / Class & Division	उप-प्रभाग / Sub-division	मात्रा किसी एक समय में / Quantity at any one time
1	Nitrate Mixture	2, 0	0	580 Kg
2	Detonators	6, 3	0	20000 Nos.

विस्फोटक 30 दिनों के अंदर मास में खरीदे जाने वाले विस्फोटक की मात्रा (अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञापित के लिए)  
 Explosives to be purchased in a calendar month (applicable for licence under article 3(b) and (g))  
 निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञापित परिसर की पुष्टि होती है।  
 The licensed premises shall conform to the following drawing(s):  
 अनुज्ञापित परिसर निम्नलिखित पते पर स्थित है। The licensed premises are situated at following address  
 स्थान (Town/Village): Rangavlasai, Mulanur  
 जिला (District): TIRUPUR  
 राज्य (State): Tamil Nadu  
 ई. मेल (E-Mail):  
 दिनांक (Dated) 11/10/2021  
 रेखाचित्र क्र. (Drawing No.) E/SC/TN/22/674(E94598)

अनुज्ञापित परिसरों में निम्नलिखित सुविधाएं अंतर्भूत हैं।  
 The licensed premises consist of following facilities  
 एक पोर्टेबल B प्रकार का मुख्य मैगजीन और पोर्टेबल डिटेनैटर B प्रकार का मैगजीन  
 One Portable B type main magazine and portable detonator B type magazine

इस अनुज्ञापित पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2008 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित अनुसूची के प्रावधानों के अधीन अनुज्ञापित किया गया है।  
 This licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions and the following Annexures.

1. अनुज्ञापित परिसर का स्थान, संरचनात्मक और अन्य विवरण दर्शाते हुए प्लान (showing site, constructional and other details) as stated in serial No. 5 above
2. अनुज्ञापित प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापित की शर्तों और अतिरिक्त शर्तों।  
 Conditions and Additional Conditions of this licence signed by the licensing authority.
3. दूरी प्ररूप DE-2 / Distance Form DE-2

यह अनुज्ञापित तारीख 31 मार्च 2021 तक विधिमार्ग रहेगी। This licence shall remain valid till 31st day of March 2021.  
 यह अनुज्ञापित, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट-VII के अधीन तथा उपवर्णित इस अनुज्ञापित की शर्तों का अधिकतम करने या यदि अनुज्ञापित परिसर योजना या उससे संलग्न उपबंध में दर्शाते विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिमाह की जा सकती है, वहाँ वह लागू हो।  
 The licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VII, whenever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

तारीख, The Date - 12/08/2016

संयुक्त मुख्य विस्फोटक नियंत्रक / Joint Chief Controller of Explosives  
 South Circle, Chennai

अनुज्ञापित की मात्रा / Quantity of Explosives/Monthly Purchase Limit dated : 04/04/2018  
 अनुज्ञापित की मात्रा / Quantity of Explosives/Monthly Purchase Limit dated : 11/10/2021

नवीनीकरण के पृष्ठान्न के लिए स्थान  
 Space for Endorsement of Renewal

समाप्ति की तारीख / Date of Expiry  
 31/03/2026

अनुज्ञापित प्राधिकारी के हस्ताक्षर और स्टाम्प  
 Signature of licensing authority and stamp  
 Sd/-  
 Jt. Chief Controller of Explosives, South Circle, Chennai

**कानूनी चेतावनी :** विस्फोटक का गलत ढंग से संचालन या उनका दुरुपयोग वाद्य के अधीन गंभीर दंडनीय अपराध होगा।  
**Statutory Warning :** Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

**Note :- This is system generated document does not require physical signature. Applicant may take printout for their records.**

अनुज्ञापित प्ररूप एल. ई.-3 | LICENCE FORM LE-3

(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) से (घ) तक)  
(See article 3(a) to (d) of Part I of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने के लिए अनुज्ञापित  
Licence to possess: (c) for use explosives of class 1, 2, 3, 4, 5, 6 or 7

Licence No.): E/SC/TN/22/675(E94591)  
(Annual Fee Rs): 2400/-



granted to  
Explosives (अधिभागों / Occupier : P. Kalimuthu), 274, Kanur Road, Mulanur, Town/Village - MULANUR  
TIRUPUR, State-Tamil Nadu, Pincode - 638106

अनुज्ञापित की जाती है।  
की प्राप्ति: Status of licensee - Partnership Firm  
के लिए विधिमाम्य है।  
only for the following purpose possess for use of Nitrate Mixture, Detonators, के उपयोग के लिए

के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमाम्य है।  
for the following kinds and quantity of explosives: - (क) (a)

क्र. सं.	नाम और विवरण	वर्ग और प्रभाग	उप-प्रभाग	मात्रा किसी एक समय में
No.	Name and Description	Class & Division	Sub-division	Quantity at any one time
1	Nitrate Mixture	2, 0	0	500 Kg.
2	Detonators	6, 3	0	30000 Nos.

कैलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा (अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञापित के लिए)  
Explosives to be purchased in a calendar month [applicable for licence under article 3(b) and (c)]: 25 times as above.

प्राधिकार (रेखाचित्रों) से अनुज्ञापित परिसर की पृष्ठ होती है।  
premises shall conform to the following drawing(s): रेखाचित्र क्र. (Drawing No.) E/SC/TN/22/675(E94591)  
दिनांक (Dated) 11/10/2021

निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:  
259, ग्राम (Town/Village): RANGAVALASAU KULANGUNDAI Village  
TIRUPUR राज्य (State) Tamil Nadu पुलिस थाना (Police Station): MULANUR  
ई-मेल (E-Mail) पिनकोड (Pincode) 638106  
फैक्स (Fax)

परिसर में निम्नलिखित सुविधाएं अंतर्विष्ट हैं।  
premises consist of following facilities : One portable main magazine B type and detonator magazine B type

समय पर बंधनबद्ध विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2008 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित  
granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the  
Additional conditions and the following Annexures.

पत क्रम सं. 5 में यथा कथित रेखाचित्र (स्थान, सन्निर्माण संबंधी और अन्य विवरण दर्शित करते हुए)  
plans (showing site, constructional and other details) as stated in serial No. 5 above.

प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापित की शर्त और अतिरिक्त शर्तों।  
Conditions and Additional Conditions of this licence signed by the licensing authority.

इस प्ररूप DE-2 | Distance Form DE-2  
यह अनुज्ञापित तारीख 31 मार्च 2021 तक विधिमाम्य रहेगी। This licence shall remain valid till 31st day of March 2021.

अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट-VII के अधीन तथा उपबर्णित इस अनुज्ञापित की शर्तों का अधिकतम काल  
This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set-VIII,  
whenever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexures.

तारीख Date - 12/08/2016

संयुक्त मुख्य विस्फोटक नियंत्रक  
Joint Chief Controller of Explosives  
South Circle, Chennai

- Amendments:  
1. Alteration of Quantity of Explosives/Monthly Purchase Limit dated : 04/04/2018  
2. Alteration of Quantity of Explosives/Monthly Purchase Limit dated : 11/10/2021

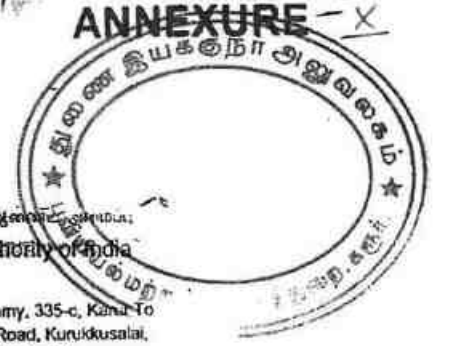
नवीनीकरण के पृष्ठकन के लिए स्थान  
Space for Endorsement of Renewal

की तारीख Renewal	समाप्ति की तारीख Date of Expiry	अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature of licensing authority and stamp
2021	31/03/2026	SI - Jt. Chief Controller of Explosives, South Circle, Chennai

कानूनी चेतावनी : विस्फोटक का गलत ढंग से चलाना या उनका दुरुपयोग विधि के अधीन गंभीर दंडक अपराध होगा।  
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

This is system generated document does not require physical signature.  
Applicant may take printout for their records.

ANNEXURE - X



10

இந்திய அரசாங்கம்

Government of India



பு. சந்திரராஜ்  
P Sundaraj  
பிறந்த நாள் / DOB : 10/12/1986  
ஆண்பால் / Male



ஆதார்  
(முகவரி)  
பழனிசாமி, 335-சி, கரூர் @  
ராரோடு மெயின் சாடு,  
குறுக்குசாலை, வேட்டமங்கலம்  
மேற்கு, வேட்டமங்கலம், கரூர்,  
தமிழ் நாடு. 639117

Unique Identification Authority of India

Address:  
S/O Palanisamy, 335-c, Kara-To  
Erode Main Road, Kurukkusalai,  
Vellamangalam (west),  
Vellamangalam, Karur, Tamil  
Nadu, 639117

5613 4072 5500

5613 4072 5500

எனது ஆதார், எனது அடையாளம்



1347



help@uidai.gov.in



www.uidai.gov.in



*(Handwritten 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. करुपण्णन, मॉगनीकाडू, मुत्तमंपट्टी पोस्ट, बोम्मीडी वयॉ, ओमलूर तालुक, सेलम डीस्टीक्ट, तमिलनाडू - 635 301, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोष जनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है।

Shri S. Karuppannan, Manganikadu, Muthampatty (Post), Bommidi (Via), Omalur Taluk, Salem District, Tamilnadu - 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है

His registration number is

RQP /MAS/263/2014/A

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

उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की 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.

*(Handwritten Signature)*

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








PLATE NO-I

APPLICANT:  
M/s. NEW STAR BLUE METALS.  
S.F.No.550,553,534,535.  
POOLANKAADU, UPPUPALAYAM,  
KUPPAM - POST, PUGALUR TALUK,  
KARUR DISTRICT, TAMIL NADU - 639 111.

LEASE APPLIED AREA:  
S.F.NO : 553/2(Part)  
EXTENT : 1.62.0Hect,  
VILLAGE : KUPPAM,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

INDEX

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

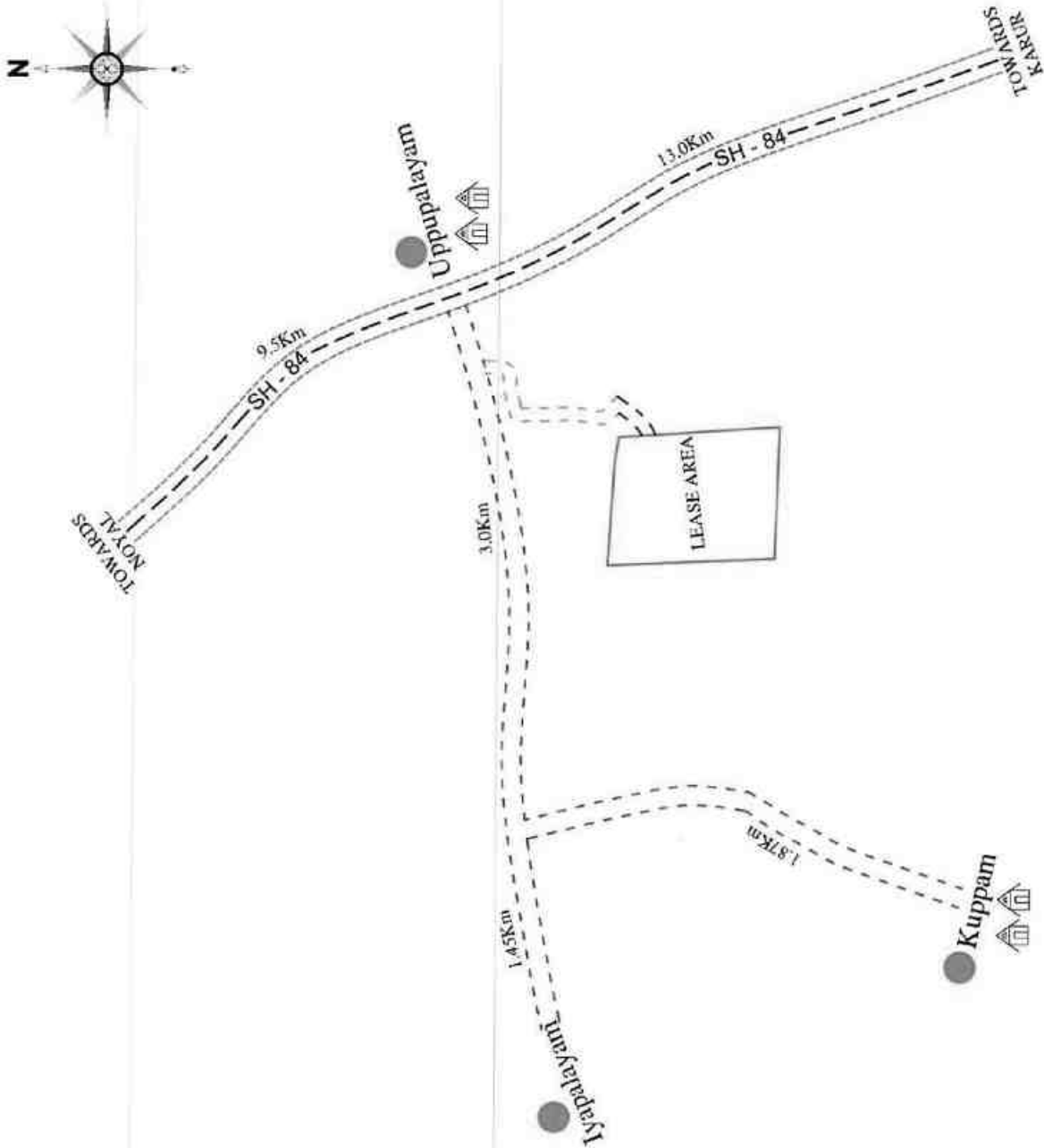
KEY MAP

Not to Scale

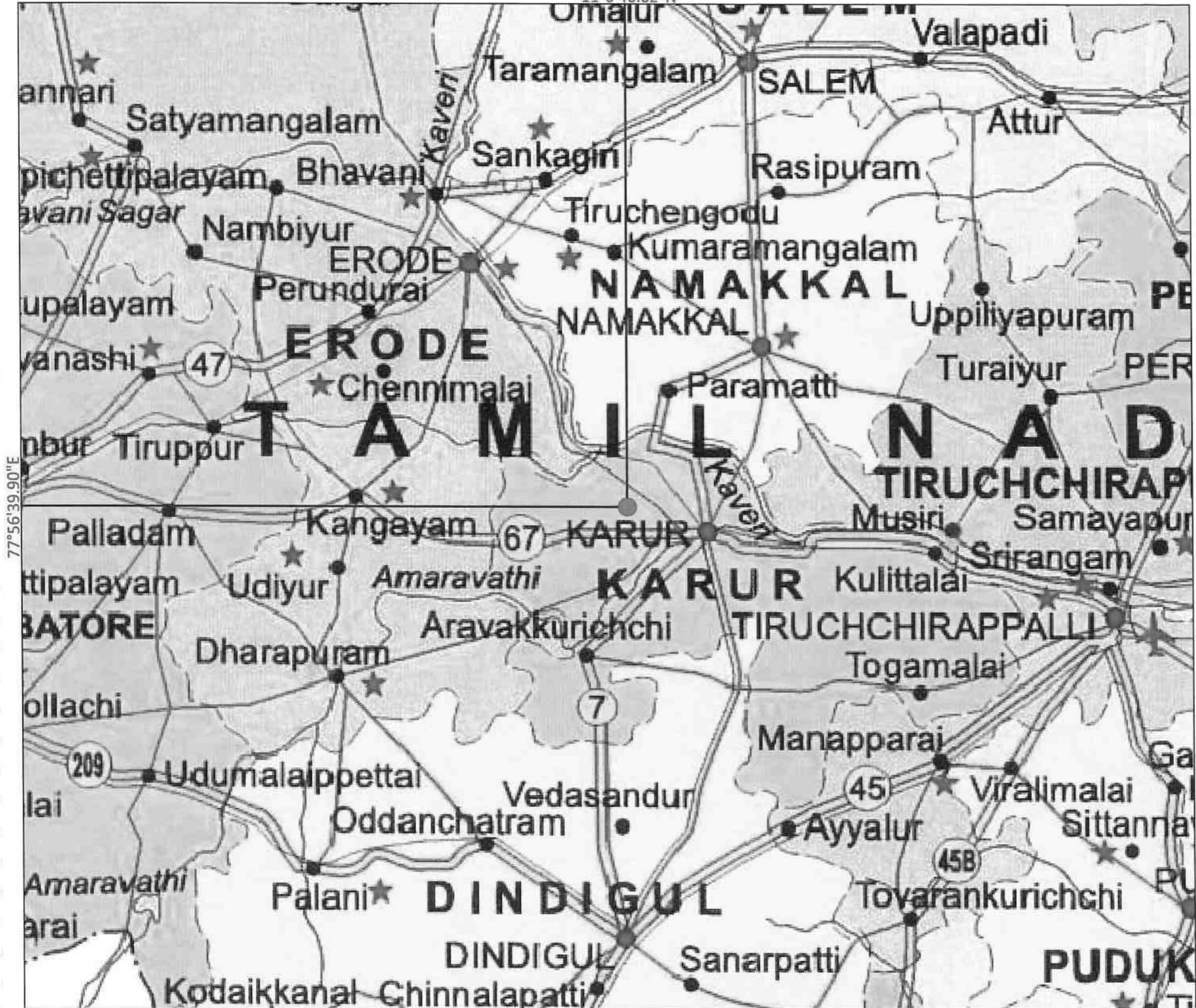
Prepared By:

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

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



11°0'46.62"N



77°56'39.90"E

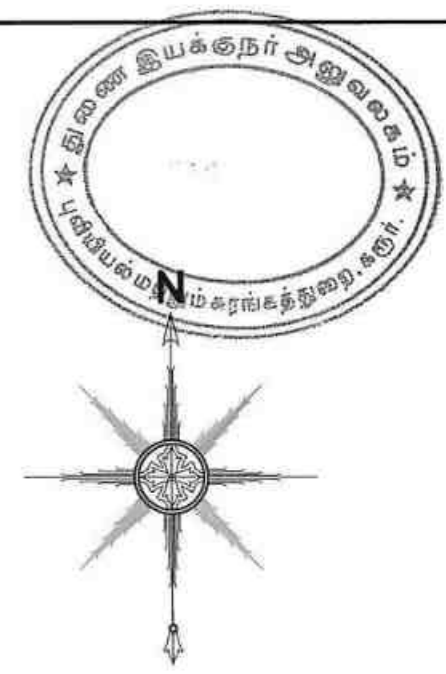


PLATE NO-IA

**APPLICANT:**  
 M/s. NEW STAR BLUE METALS.  
 S.F.No.550,553,534,535.  
 POOLANKAADU, UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
 S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA: ●  
 TOPO SHEET NO : 58-E/16  
 LATITUDE : 11°0'41.69"N to 11°0'46.62"N  
 LONGITUDE: 77°56'39.90"E to 77°56'43.82"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

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



11°0'46.62"N

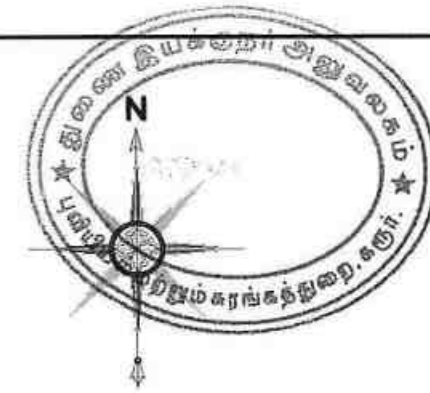


PLATE NO-IC

**APPLICANT:**  
M/s.NEW STAR BLUE METALS.  
S.F.No.550,553,534,535.  
POOLANKAADU,UPPUPALAYAM,  
KUPPAM - POST, PUGALUR TALUK,  
KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
S.F.NO : 553/2(Part)  
EXTENT :1.62.00 Hect,  
VILLAGE : KUPPAM,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
300m RADIUS	
500m RADIUS	
EXISTING QUARRY PIT	
VILLAGE ROAD	
HT LINE	

TOPO SHEET NO : 58-E/16  
LATITUDE : 11°0'41.69"N to 11°0'46.62"N  
LONGITUDE: 77°56'39.90"E to 77°56'43.82"E

**SATELLITE IMAGERY MAP**  
SCALE- 1:5000

Prepared By:

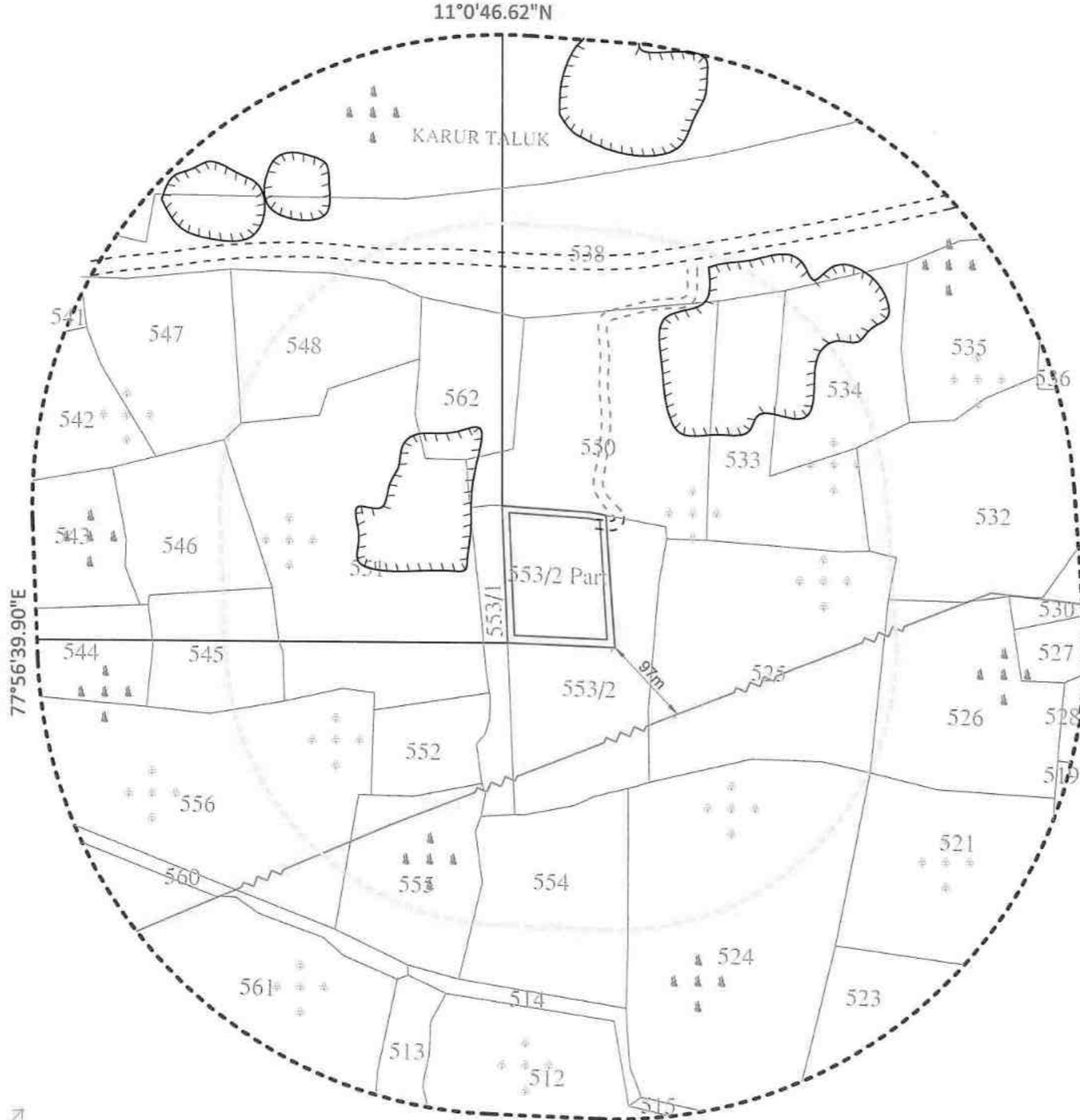
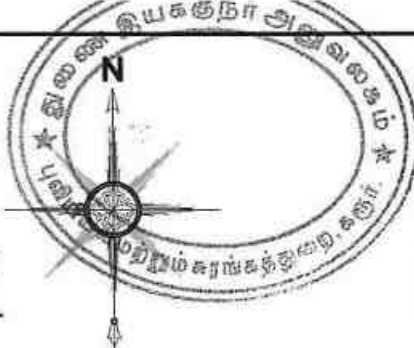
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

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

77°56'39.90"E



OCTOBER TO DECEMBER



**PLATE NO-ID**

**APPLICANT:**  
M/s. NEW STAR BLUE METALS.  
S.F.No.550,553,534,535.  
POOLANKAADU,UPPUPALAYAM,  
KUPPAM - POST, PUGALUR TALUK,  
KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
S.F.NO : 553/2(Part)  
EXTENT : 1.62.00 Hect,  
VILLAGE : KUPPAM,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
300m RADIUS	
500m RADIUS	
EXISTING QUARRY PIT	
VILLAGE ROAD	
HT LINE	
SHRUB AND TREE	

TOPO SHEET NO : 58-E/16  
LATITUDE : 11°0'41.69"N to 11°0'46.62"N  
LONGITUDE: 77°56'39.90"E to 77°56'43.82"E

**ENVIRONMENTAL PLAN**

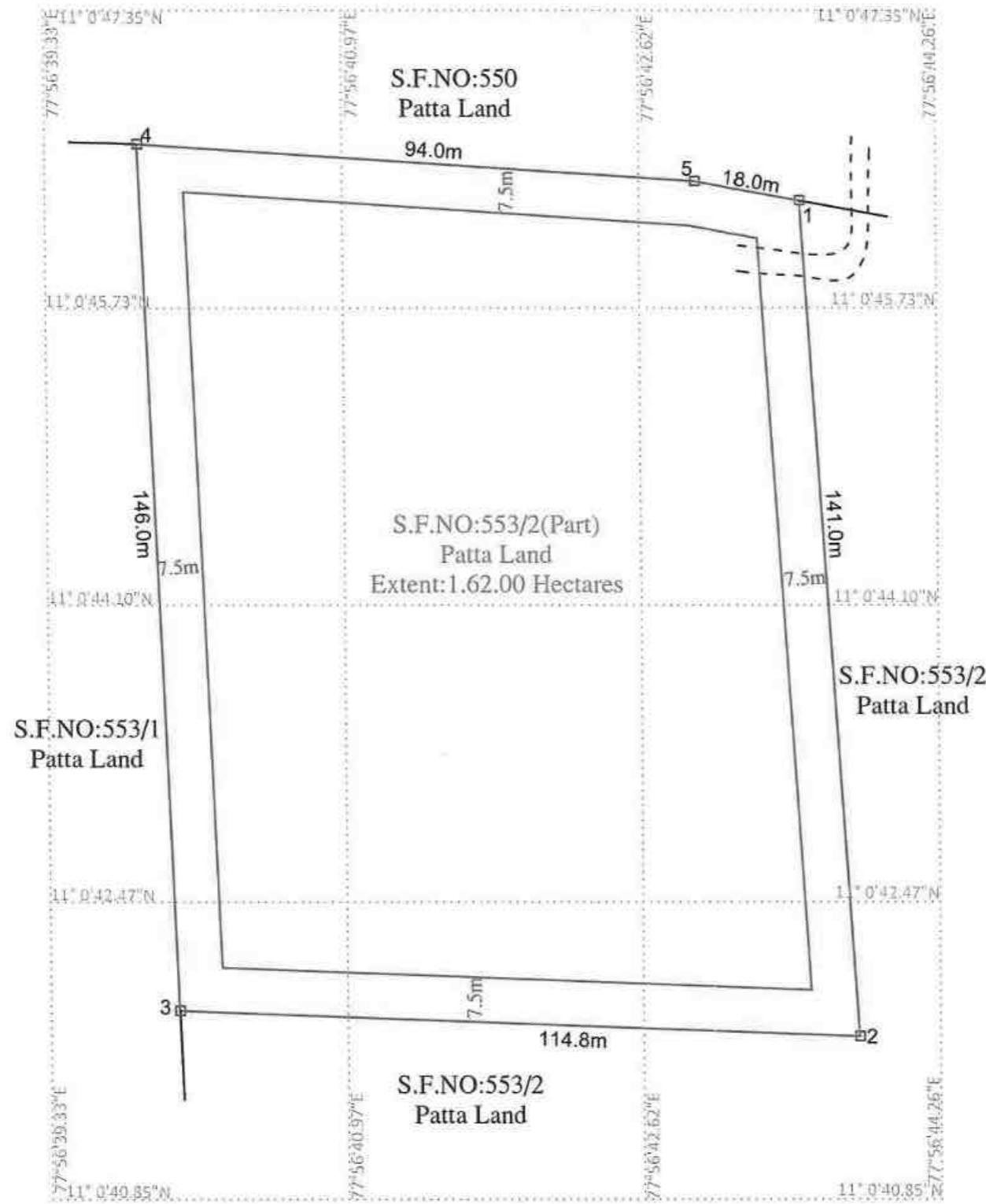
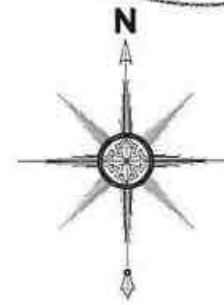
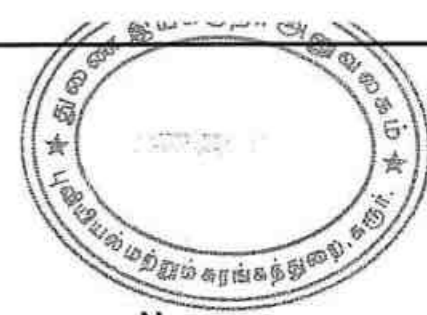
SCALE- 1:5000

Prepared By:

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

JULY TO SEPTEMBER



**PLATE NO-II**

**APPLICANT:**

**M/s.NEW STAR BLUE METALS.**  
 S.F.No.550,553,534,535.  
 POOLANKAADU,UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**

S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA	<input type="checkbox"/>
SAFETY BOUNDARY	<input type="checkbox"/>
APPROACH ROAD	<input type="checkbox"/>
PILLAR STONES	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3

**MINE LEASE PLAN**

SCALE 1: 1000

Prepared By:

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

S.No	LATITUDE	LONGITUDE
1	11° 0'46.27"N	77°56'43.56"E
2	11° 0'41.69"N	77°56'43.82"E
3	11° 0'41.87"N	77°56'40.05"E
4	11° 0'46.62"N	77°56'39.90"E
5	11° 0'46.38"N	77°56'42.98"E

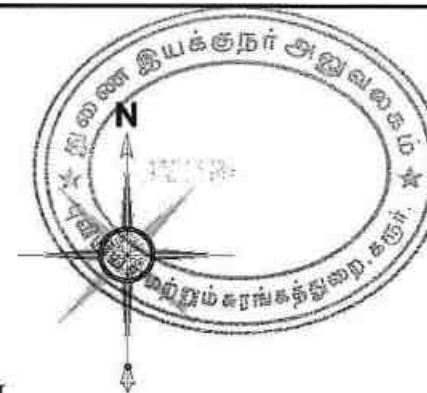


PLATE NO-III

**APPLICANT:**  
**M/s. NEW STAR BLUE METALS.**  
 S.F.No.550,553,534,535.  
 POOLANKAADU, UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
 S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

INDEX

MINE LEASE AREA	
SAFETY BOUNDARY	
APPROACH ROAD	
PILLAR STONES	
CONTOUR LINES	
TEMPORARY BENCH MARK	
SCRUB	
GRAVEL	
ROUGH STONE	
OUTCROP	

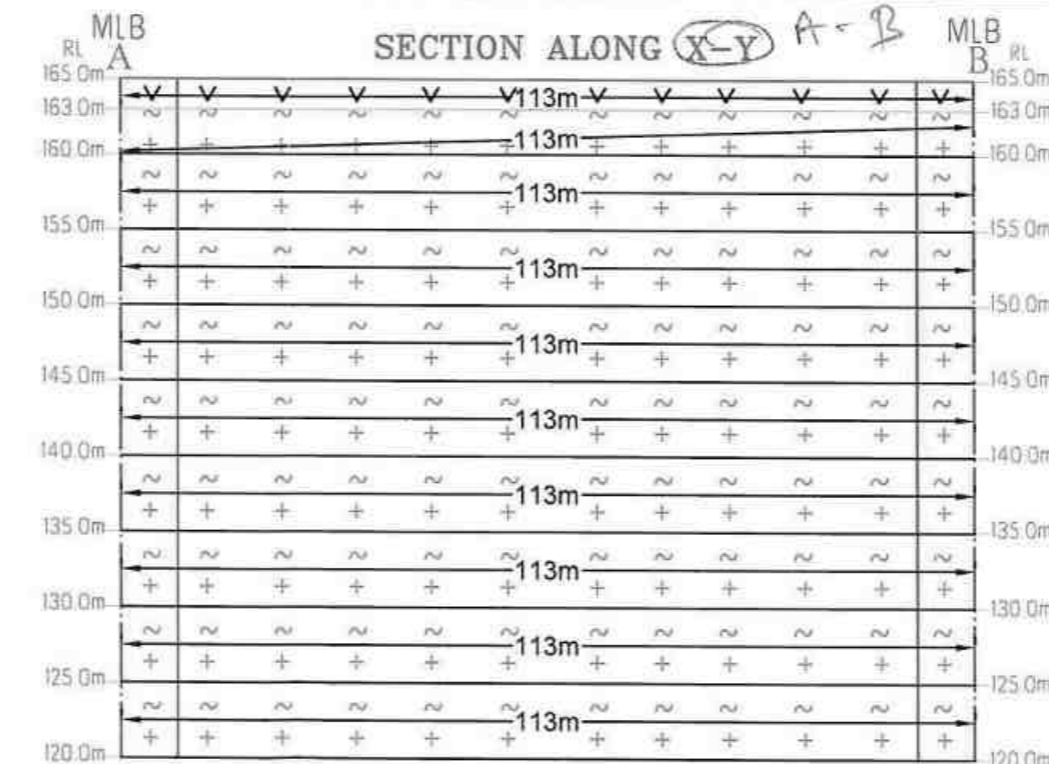
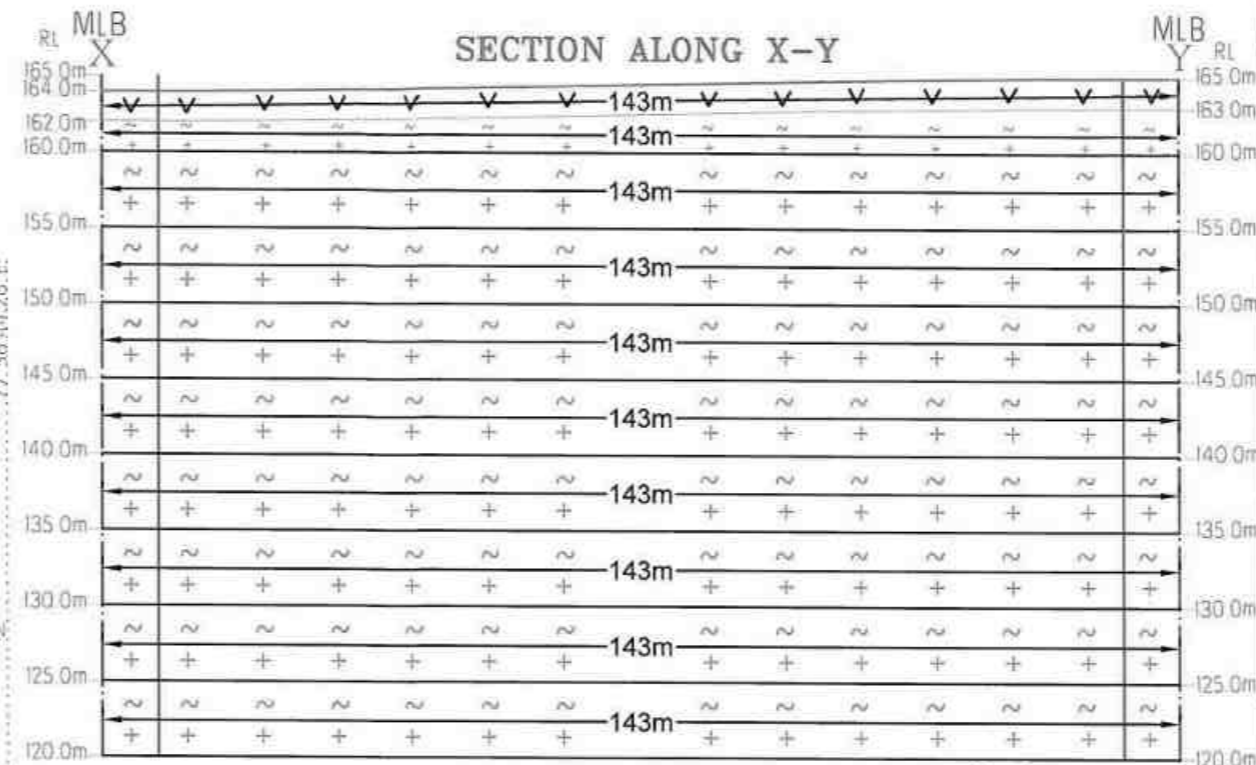
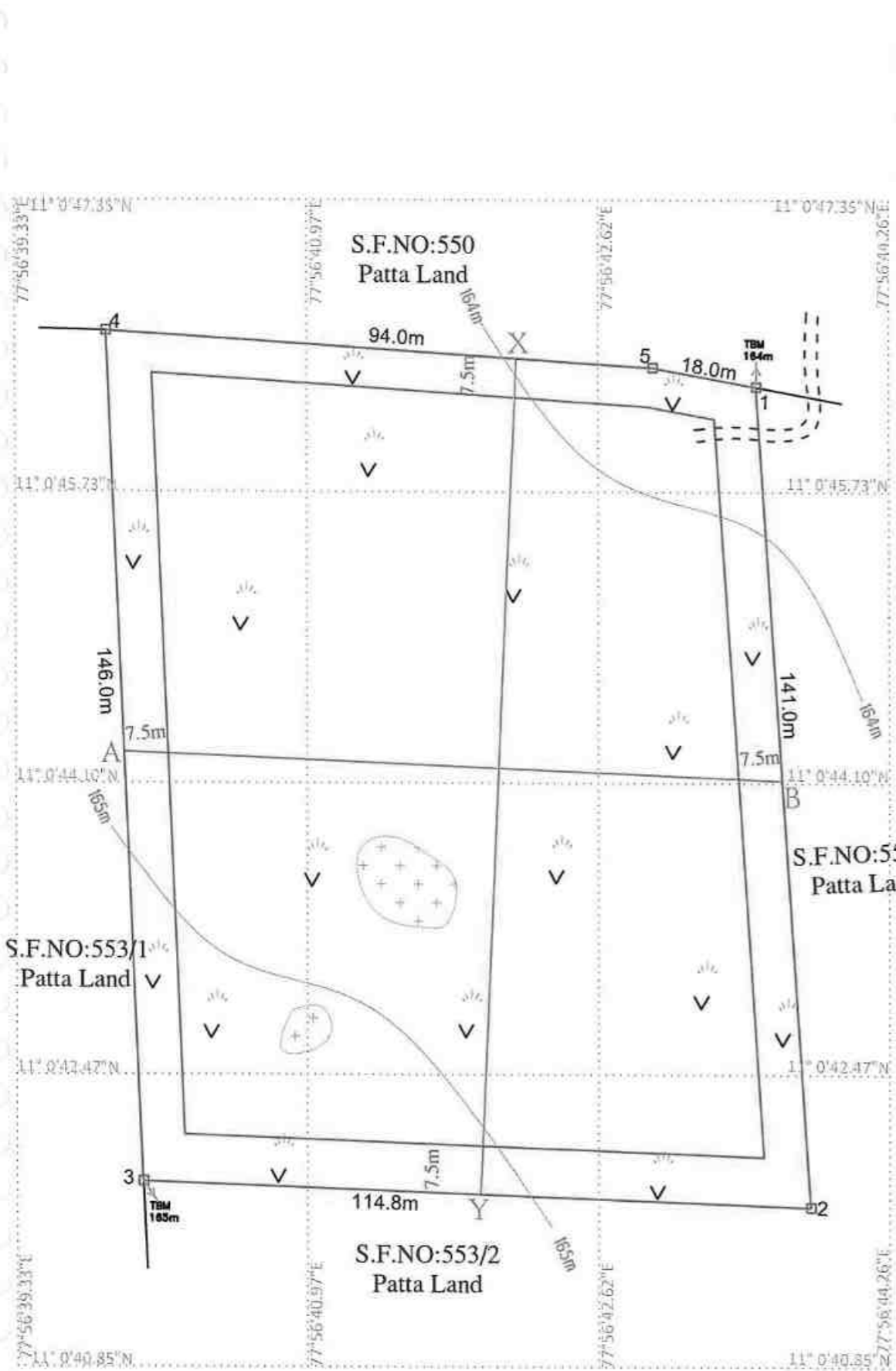
**SURFACE, GEOLOGICAL PLAN & SECTION**

PLAN SCALE 1: 1000  
 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



GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Geological Resources in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	143	113	2	32318	.....	32318
	I	143	113	3	48477	48477	.....
	II	143	113	5	80795	80795	.....
	III	143	113	5	80795	80795	.....
	IV	143	113	5	80795	80795	.....
	V	143	113	5	80795	80795	.....
	VI	143	113	5	80795	80795	.....
	VII	143	113	5	80795	80795	.....
	VIII	143	113	5	80795	80795	.....
IX	143	113	5	80795	80795	.....	
<b>TOTAL</b>				<b>45</b>	<b>727155</b>	<b>694837</b>	<b>32318</b>

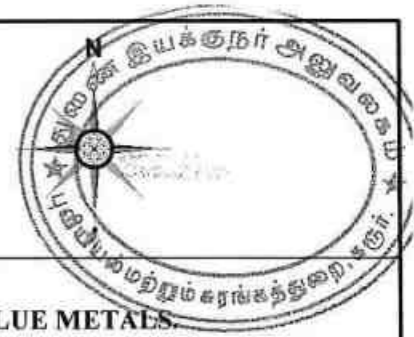


PLATE NO-IV

**APPLICANT:**  
**M/s.NEW STAR BLUE METALS**  
 S.F.No.550,553,534,535.  
 POOLANKAADU,UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
 S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

**INDEX**

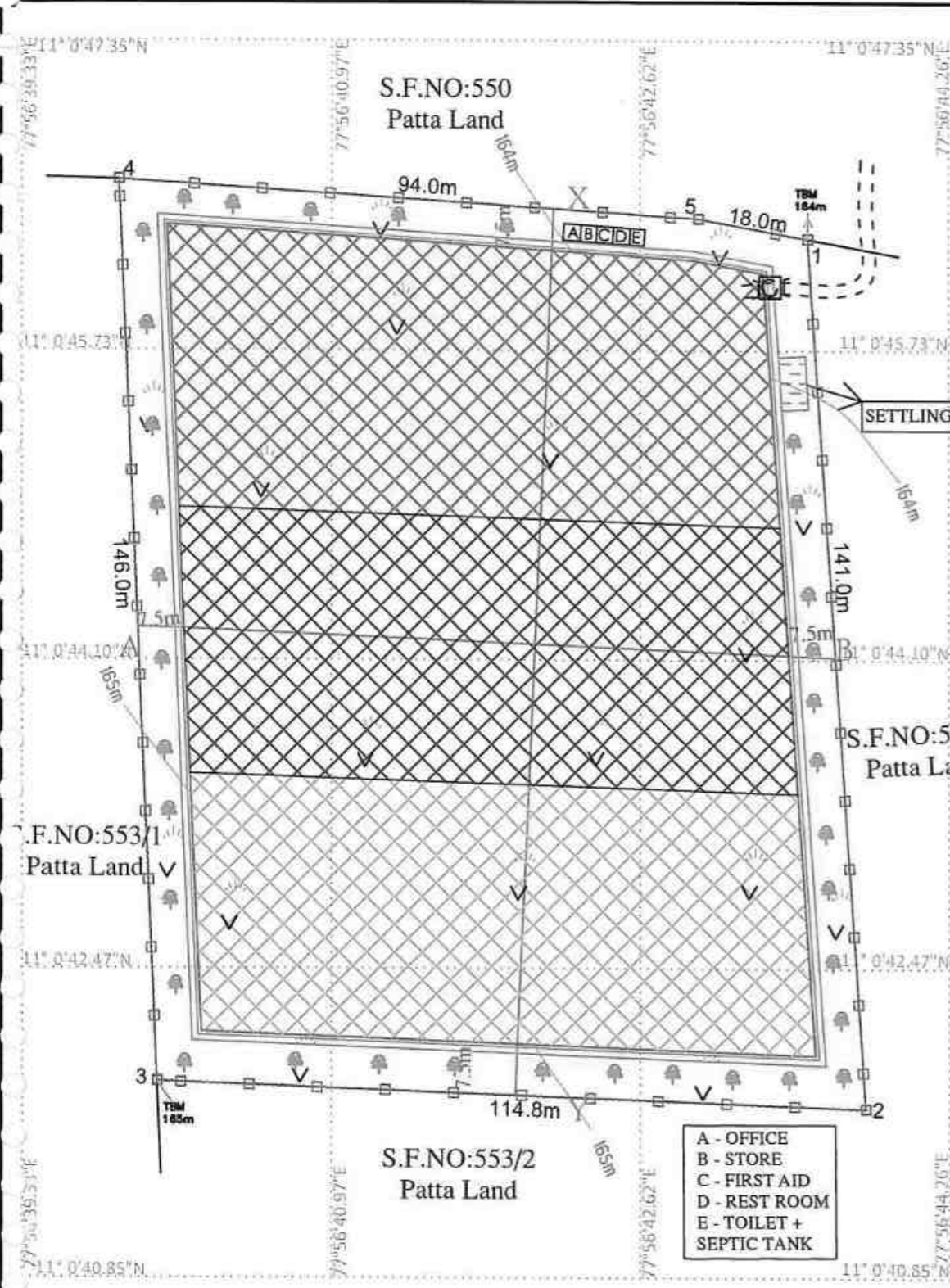
- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- PILLAR STONES
- CONOTUR LINES
- TEMPORARY BENCH MARK
- SHRUBS
- GRAVEL
- ROUGH STONE
- PROPOSED BENCH
- ULTIMATE BENCH
- DRAINAGE & SETTLING TANK
- FENCING
- PIPE CULVERT

**YEARWISE DEVELOPMENT AND PRODUCTION PLAN & SECTION**

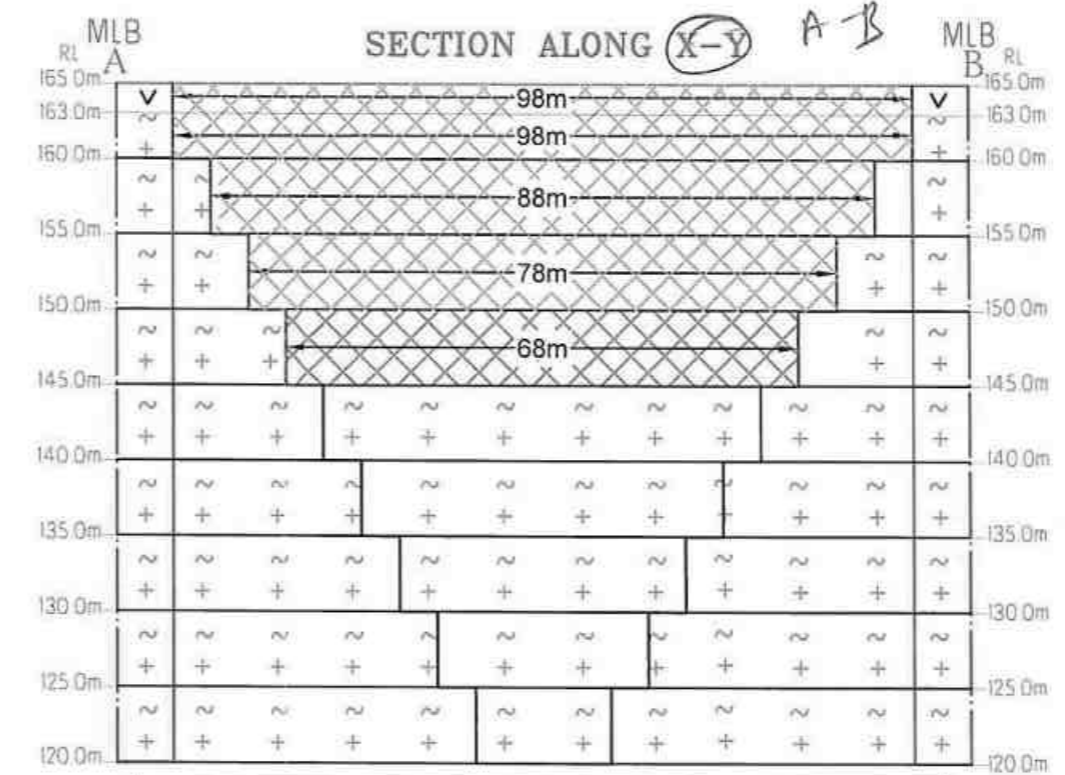
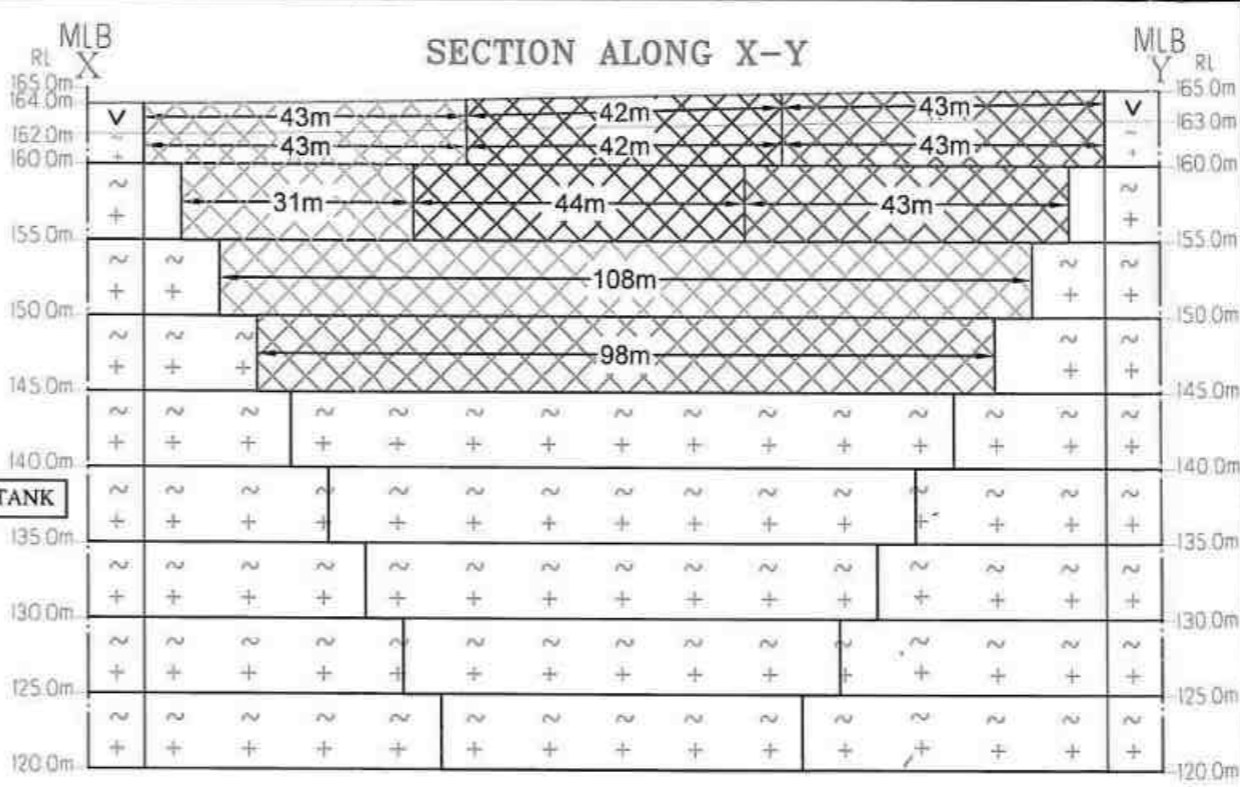
PLAN SCALE 1: 1000  
 SECTION HOR 1 :1000 & VER 1 :500

Prepared By:  
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*[Signature]*  
 Dr.S.KARUPANNAN,M.Sc.,Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A



- 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
- I - Year Proposed area to be Planted



YEARWISE PRODUCTIONS									
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Production Reserves in M <sup>3</sup>	Gravel in M <sup>3</sup>	
XY-AB	I-YEAR	I	43	98	2	8428	.....	8428	
		I	43	98	3	12642	12642	.....	
		II	31	88	5	13640	13640	.....	
	<b>TOTAL</b>						<b>34710</b>	<b>26282</b>	<b>8428</b>
	II-YEAR	I	42	98	2	8232	.....	8232	
		I	42	98	3	12348	12348	.....	
		II	44	88	5	19360	19360	.....	
	<b>TOTAL</b>						<b>39940</b>	<b>31708</b>	<b>8232</b>
	III-YEAR	I	43	98	2	8428	.....	8428	
		I	43	98	3	12642	12642	.....	
		II	43	88	5	18920	18920	.....	
	<b>TOTAL</b>						<b>39990</b>	<b>31562</b>	<b>8428</b>
IV-YEAR	III	108	78	5	42120	42120	.....		
<b>TOTAL</b>						<b>42120</b>	<b>42120</b>	<b>0</b>	
V-YEAR	IV	98	68	5	33320	33320	.....		
<b>TOTAL</b>						<b>33320</b>	<b>33320</b>	<b>0</b>	
<b>GRAND TOTAL</b>						<b>190080</b>	<b>164992</b>	<b>25088</b>	



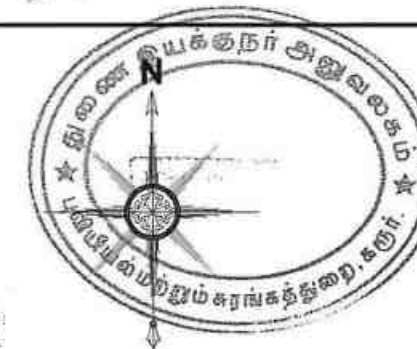


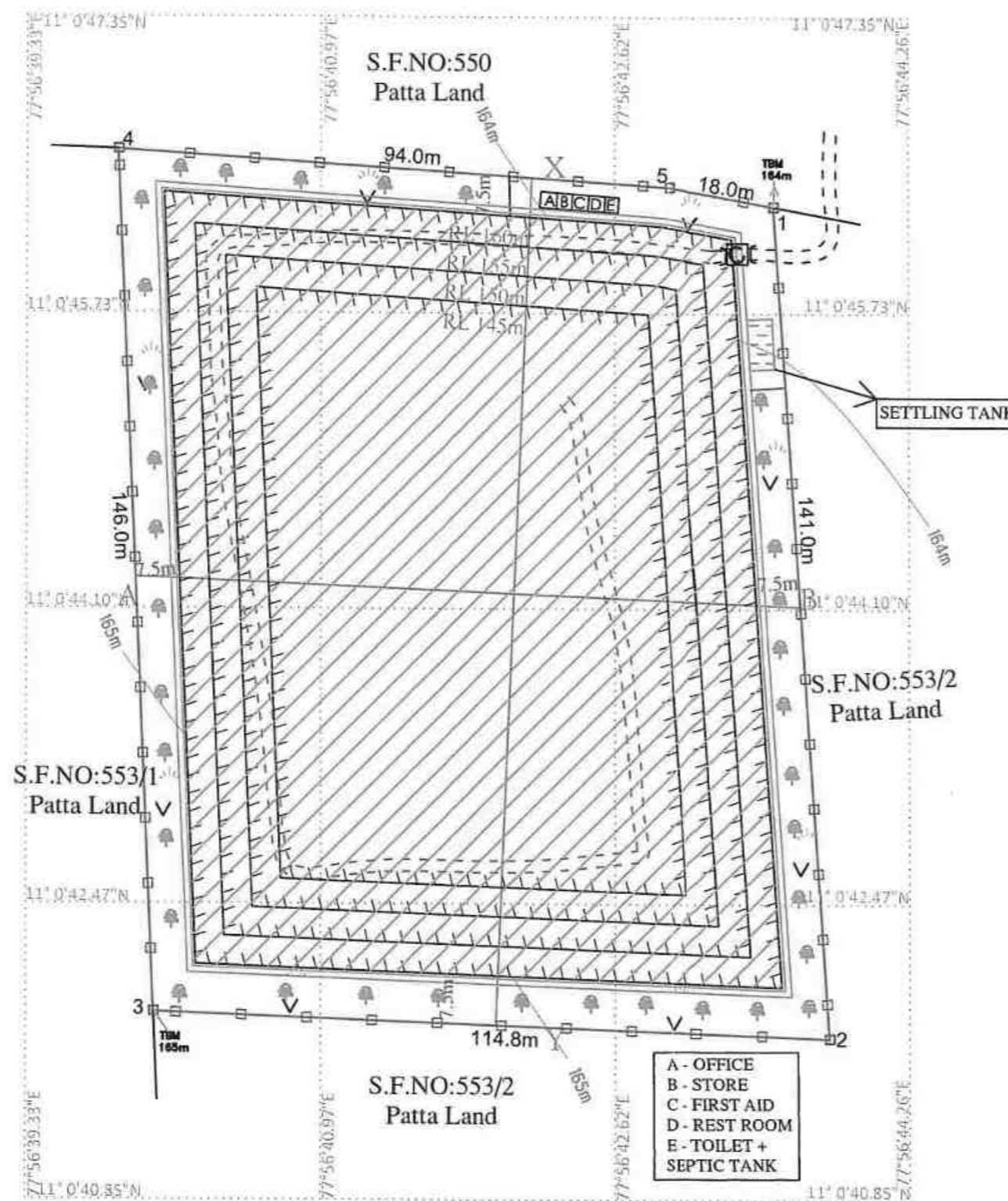
PLATE NO-V

**APPLICANT:**  
**M/s. NEW STAR BLUE METALS.**  
 S.F.No.550,553,534,535.  
 POOLANKAADU,UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
 S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA	
SAFETY BOUNDARY	
APPROACH ROAD	
PILLAR STONES	
CONOTUR LINES	
TEMPORARY BENCH MARK	
SHRUBS	
GRAVEL	
PROPOSED BENCH	
DRAINAGE & SETTLING TANK	
FENCING	
PIPE CULVERT	
MINE HAUL ROAD	



- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET + SEPTIC TANK

**MINE LAYOUT LAND USE PATTERN**

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	1.26.20	
INFRASTRUCTURE	NIL	0.02.00	
ROADS	NIL	0.08.00	
GREEN BELT & DUMP	NIL	0.20.0	
DRAINAGE & SETTLING TANK	NIL	0.04.0	
UN-UTILIZED AREA	1.62.0	0.01.80	NIL
GRAND TOTAL	1.62.0	1.62.0	NIL

I - Year Proposed area to be Planted

**MINE LAYOUT PLAN AND LAND USE PATTERN**  
 SCALE 1 : 1000

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

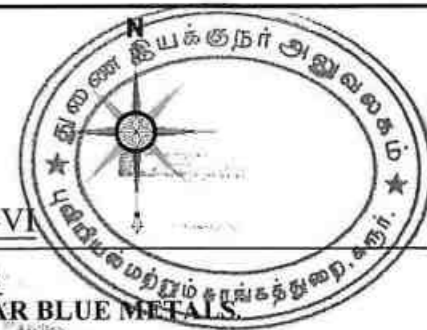


PLATE NO-VI

**APPLICANT:**  
**M/s. NEW STAR BLUE METALS.**  
 S.F.No.550,553,534,535.  
 POOLANKAADU, UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
 S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA	
SAFETY BOUNDARY	
APPROACH ROAD	
PILLAR STONES	
CONOTUR LINES	
TEMPORARY BENCH MARK	
SHRUBS	
GRAVEL	
ROUGH STONE	
PROPOSED BENCH	
ULTIMATE BENCH	
DRAINAGE & SETTLING TANK	
FENCING	
PIPE CULVERT	
MINE HAUL ROAD	

**PROGRESSIVE MINE CLOSURE**

**PLAN & SECTION**

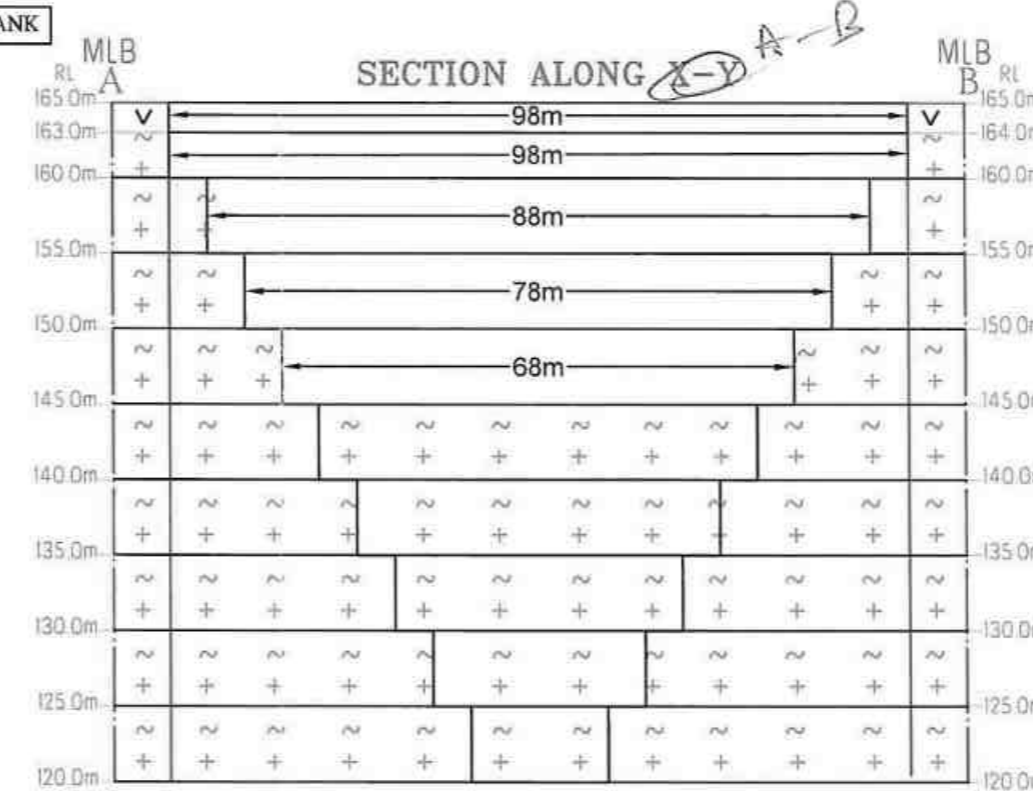
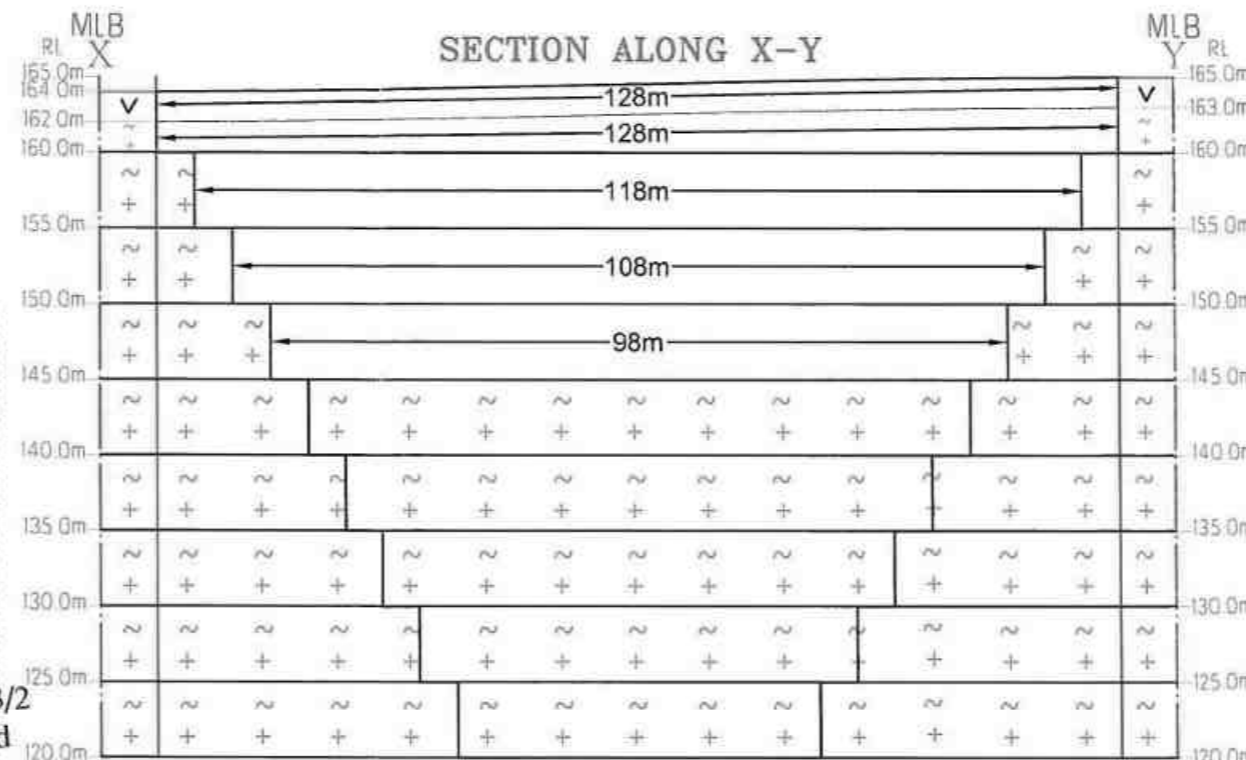
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 SECTION HOR 1 : 1000 & VER 1 : 500

Prepared By:

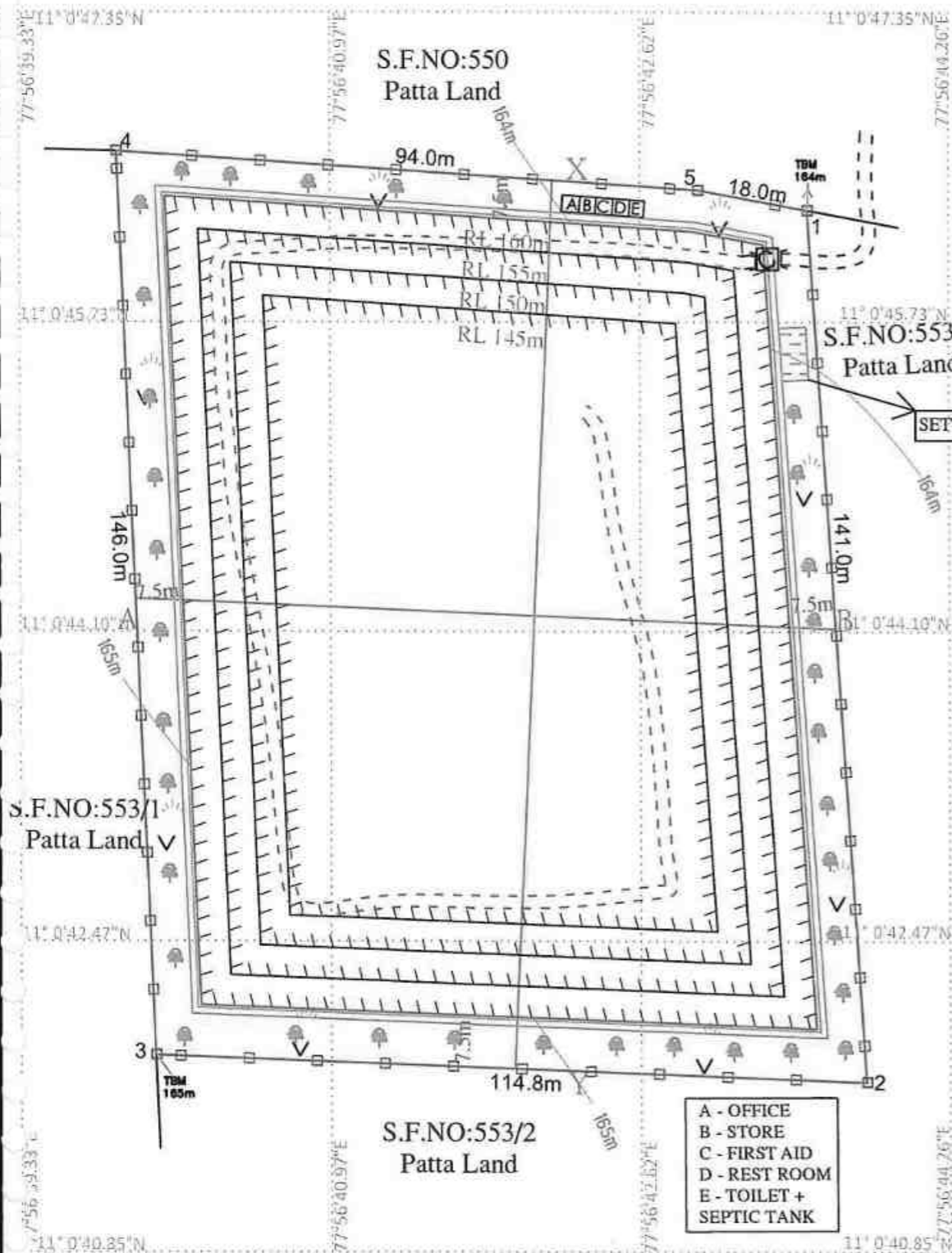
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*[Signature]*

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



PRODUCTION RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Production Reserves in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	128	98	2	25088	.....	25088
	I	128	98	3	37632	37632	.....
	II	118	88	5	51920	51920	.....
	III	108	78	5	42120	42120	.....
IV	98	68	5	33320	33320	.....	
<b>TOTAL</b>				<b>20</b>	<b>190080</b>	<b>164992</b>	<b>25088</b>



I - Year Proposed area to be Planted

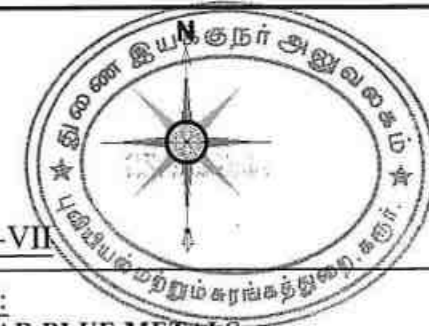


PLATE NO-VII

**APPLICANT:**  
**M/s.NEW STAR BLUE METALS.**  
 S.F.No.550,553,534,535.  
 POOLANKAADU,UPPUPALAYAM,  
 KUPPAM - POST, PUGALUR TALUK,  
 KARUR DISTRICT, TAMIL NADU - 639 111.

**LEASE APPLIED AREA:**  
 S.F.NO : 553/2(Part)  
 EXTENT : 1.62.00 Hect,  
 VILLAGE : KUPPAM,  
 TALUK : PUGALUR,  
 DISTRICT : KARUR.

**INDEX**

- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- PILLAR STONES
- CONOTUR LINES
- TEMPORARY BENCH MARK
- SHRUBS
- GRAVEL
- ROUGH STONE
- BENCH
- DRAINAGE & SETTLING TANK
- FENCING
- PIPE CULVERT
- MINE HAUL ROAD

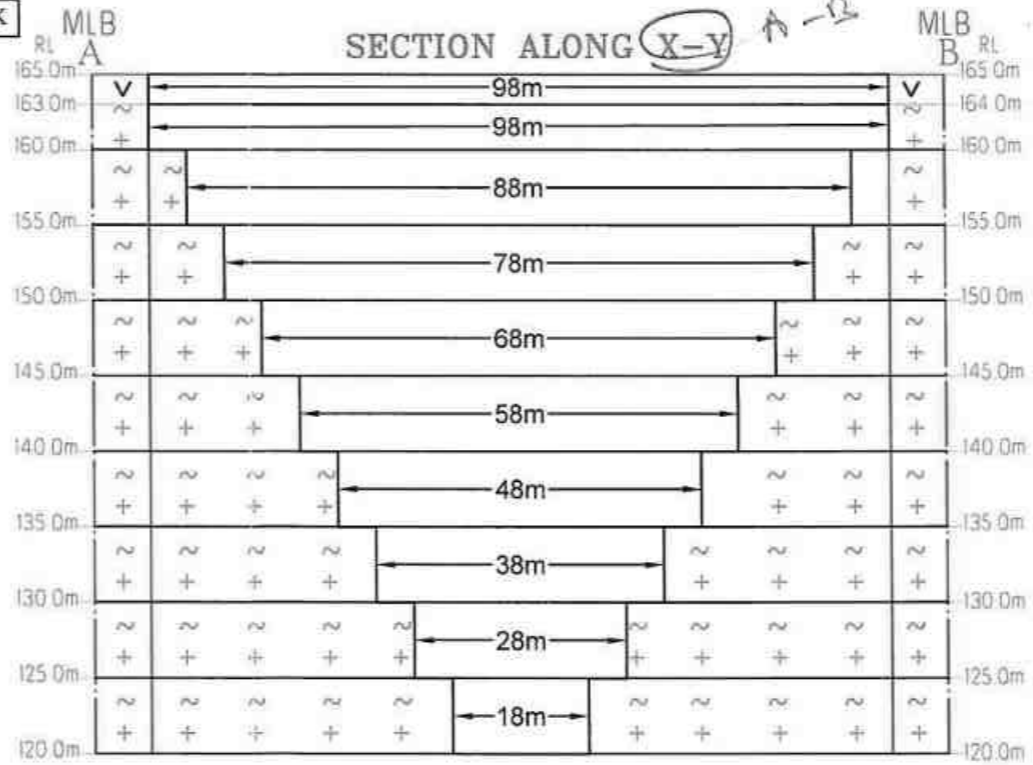
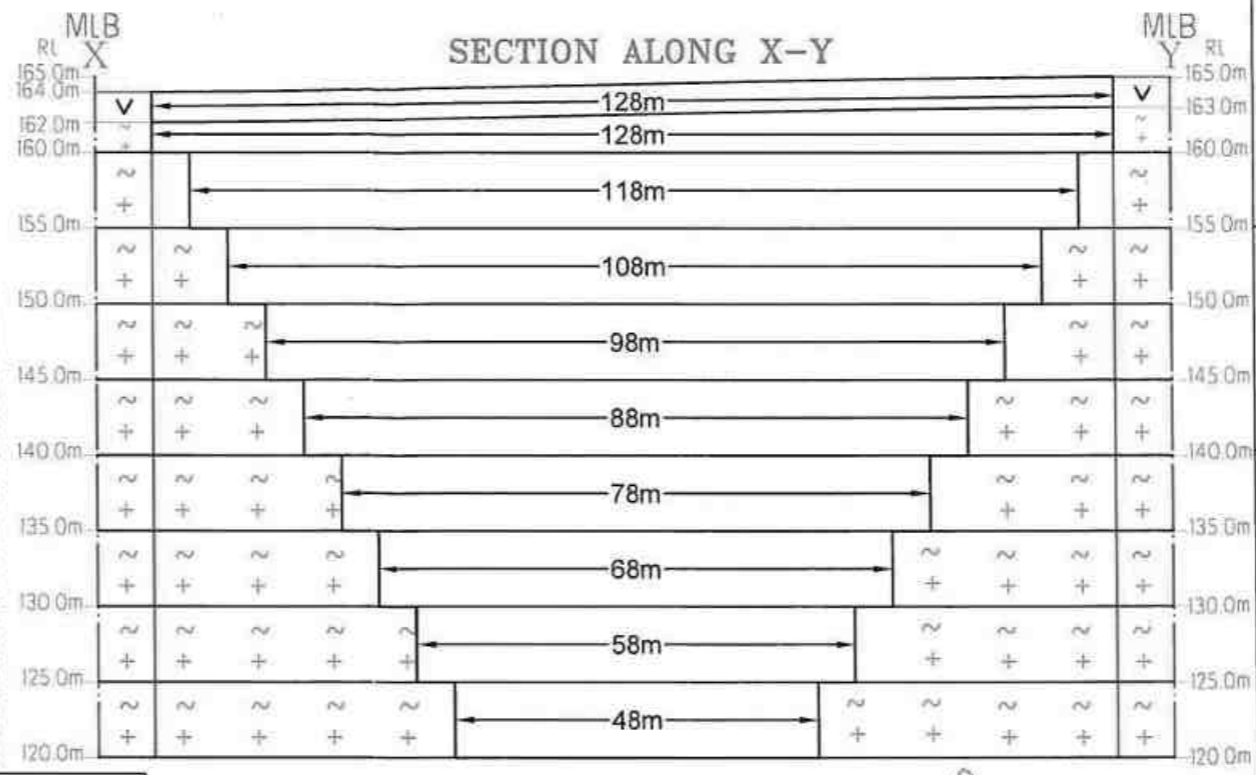
**CONCEPTUAL PLAN & SECTION**

PLAN SCALE 1 : 1000  
 SECTION HOR 1 :1000 & VER 1 : 500

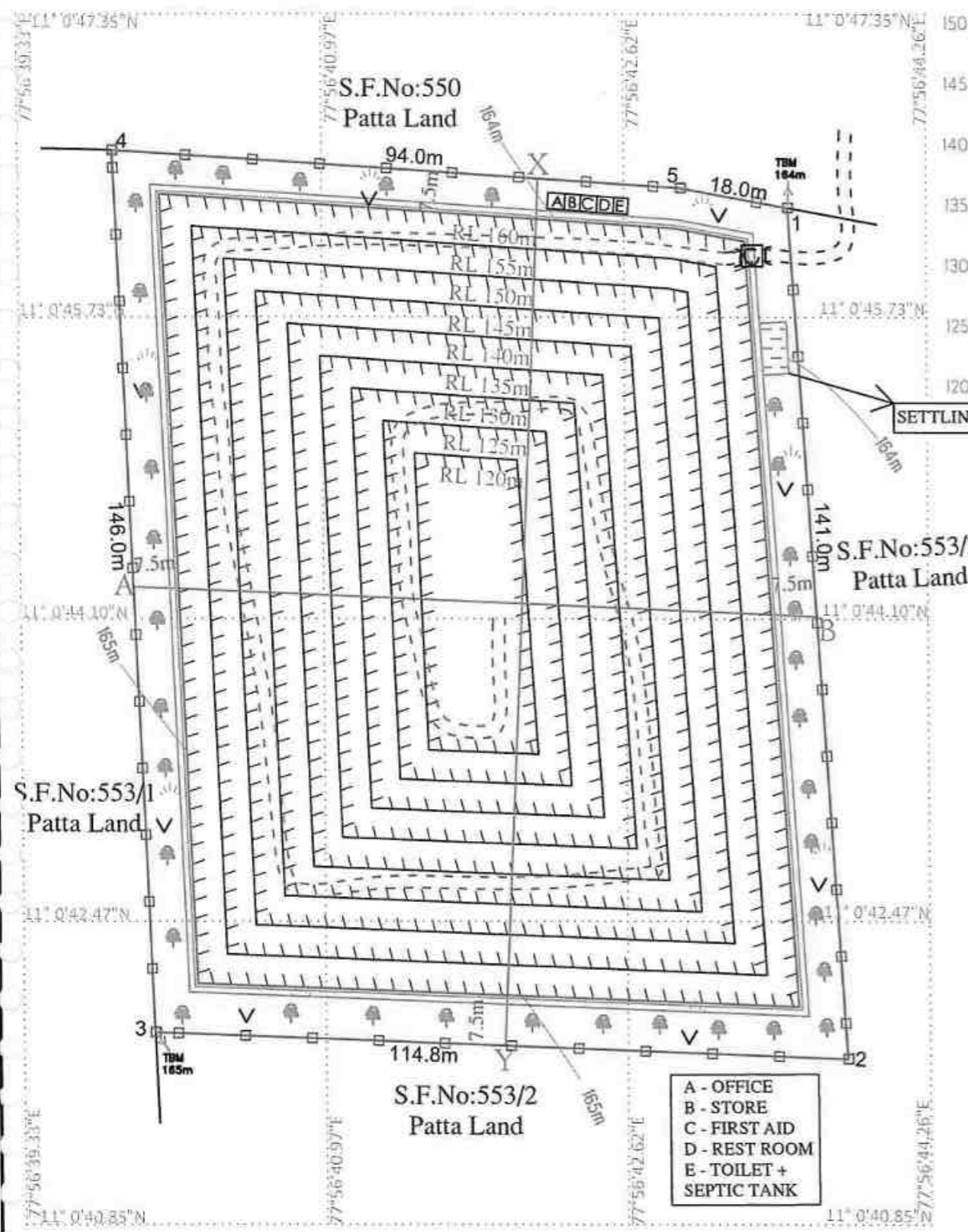
Prepared By:  
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 TO THE BEST OF MY KNOWLEDGE

*[Signature]*

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



MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M <sup>3</sup>	Mineable Reserves in M <sup>3</sup>	Gravel in M <sup>3</sup>
XY-AB	I	128	98	2	25088	.....	25088
	I	128	98	3	37632	37632	.....
	II	118	88	5	51920	51920	.....
	III	108	78	5	42120	42120	.....
	IV	98	68	5	33320	33320	.....
	V	88	58	5	25520	25520	.....
	VI	78	48	5	18720	18720	.....
	VII	68	38	5	12920	12920	.....
	VIII	58	28	5	8120	8120	.....
IX	48	18	5	4320	4320	.....	
<b>TOTAL</b>				<b>45</b>	<b>259680</b>	<b>234592</b>	<b>25088</b>



1820/2022

भारतीय गैर न्यायिक  
भारत INDIA

रु. 500



FIVE HUNDRED  
RUPEES

पाँच सौ रुपये

सत्यमेव जयते

Rs. 500

INDIA NON JUDICIAL

தமிழ்நாடு தமில்நாடு TAMILNADU

P. சிங்கராஜ்

குறுக்கிச் சான்ற

ரூ. 500/-

16.06.2022

AK 179296

*M. Ramesh*

M. RAMESH  
STAMP VENDOR  
L.No : 03/ KRR / 2015  
ARUGAMPALAYAM,  
KARUR-6.

உ

வருடம் ஒன்றுக்கு ரூ.5,000/- வீதம் குத்தகைப் பத்திரம்

காலக்கெடு 10 (பத்து) வருடங்கள்

2022-ம் வருடம் ஜூன் மாதம் 16-ம் தேதி, கரூர் மாவட்டம், அரவக்குறிச்சி வட்டமாக இருந்து தற்சமயம் புகளூர் வட்டம், புன்னம் கிராமம், பொன்னியாக் கவுண்டன்புதூரில் வசித்து வந்து தற்சமயம் கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம்

Scanned

.....புத்தகம்.....2022ம்  
வருடத்திய .....1820.....ம்  
ஆவணம்.....17.....தாள்களைக்  
கொண்டது .....வது தாள்

பதிவுகலுவலர்

*P. Singaraj*  
புகளூர் மாவட்டம்

For New Star Blue Metal.

Managing Partner.



மேல்பாகம் கிராமம், குறுக்குச்சாலை, கருர் - ஈரோடு மெயின் ரோடு, கதவு எண்.335-C என்ற முகவரியில் வசிக்கும் R.பழனிச்சாமி அவர்கள் குமாரர் P.சுந்தர்ராஜ் (ஆதார் அடையாள அட்டை எண்.561340725500 தொடர்பு எண்.9842369319)-1, கருர் மாவட்டம், புகளூர் வட்டம், புன்னம் கிராமம், பெரியரெங்கபாளையத்தில் வசிக்கும் P.உலகநாதன் அவர்கள் மனைவி P.சுண்ணம்மாள் (ஆதார் அடையாள அட்டை எண்.360360164571 தொடர்பு எண்.9884079105)-2,

கருர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், உப்புபாளையம், பூலாங்கரடு என்ற முகவரியில் இயங்கிவரும் "NEW STAR BLUE METALS" (GSTIN : 33AAHFN0799A1ZH PAN: AAHFN0799A) -ன் நிர்வாகப் பங்குதாரரும், R.பழனிச்சாமி அவர்கள் குமாரருமான P.சுந்தர்ராஜ் (ஆதார் அடையாள அட்டை எண்.561340725500 தொடர்பு எண்.9842369319)-3 ஆகிய நாம் மூவரும் சேர்ந்து சம்மதித்து எழுதிக் கொண்ட குத்தகைப் பத்திரம் என்னவென்றால்,

நம்மில் 1, 2வது நபர்களுக்கு கூட்டாக சேர்ந்து சுயார்ஜித வகையில் சென்ற 01.02.2006-ம் தேதியில் ஏற்பட்ட கிரையப்

*[Handwritten Signature]*

P.சுண்ணம்மாள்

.....புத்தகம்.....2022...ம்  
வருடத்திய.....1820...ம்  
ஆவணம்.....17...தாள்களைக்  
கொண்டது.....2...வது தாள்

பதிவு அலுவலர்

For New Star Blue Metals  
*[Handwritten Signature]*  
Managing Partner.



பத்திரப்படி (பத்திர எண்.1-புத்தகம் 116/2006 கருர் 2நெ. இணைச் சார்பதிவகம்)-யும், மற்றும் சென்ற 21.08.2006-ம் தேதியில் ஏற்பட்ட கிரையப் பத்திரப்படி (பத்திர எண்.1-புத்தகம் 1098/2006 கருர் 2நெ. இணைச் சார்பதிவகம்)-யும் பாத்தியப்பட்டு நம்மில் 1, 2வது நபர்கள் சர்வ சுதந்திர பாத்தியங்களுடன் ஆண்டனுபவித்து வருகிற சொத்துக்களில் ஒருபகுதியான இதனடியில் காணும் சொத்தினை நாளது தேதியில் நம்மில் 1, 2வது நபர்கள் நம்மில் 3வது நபருக்கு குத்தகைக்கு விடுவதாகப் பேசி முடிவு செய்து கொண்ட குத்தகைத் தொகை வருடம் ஒன்றுக்கு ரூ.5,000/- வீதம் 10 வருடங்களுக்கு ரூ.50,000/-

இந்த ரூபாய் ஐம்பதாயிரத்தையும் நாளது தேதியில் கீழ்க்காணும் சாட்சிகள் முன்பாக நம்மில் 1, 2வது நபர்கள் நம்மில் 3வது நபரிடமிருந்து ரொக்கமாகப் பெற்றுக் கொண்டுவிட்டபடியால் இனி கீழ்க்காணும் சொத்தினை நம்மில் 3வது நபர் 10 (பத்து) வருடக்காலக்கெடு வரை கீழ்க்காணும் நிபந்தனைகளுக்குட்பட்டு குத்தகைக்கு அனுபவித்து வரவேண்டியது.

.....புத்தகம்.....ம்  
வருடத்திய .....ம்  
ஆவணம்.....தாள்களைக்  
கொண்டது .....வது தாள

பதிவாளர்

சு  
புக் கன் னப் பார்

For New Star Blue Metal,  
Managing Partner.



மேல்கண்ட 10 (பத்து) வருடக் காலக்கெடு முடிந்தவுடன் கீழ்க்காணும் சொத்தினை இப்போது ஒப்புக்கொண்டுள்ள நல்ல நிலைமையிலேயே நம்மில் 3வது நபர் நம்மில் 1, 2வது நபர்களின் சுவாதீனத்தில் விட்டுவிட வேண்டியது.

கீழ்க்காணும் சொத்திற்குண்டான சர்க்கார் வரியை நம்மில் 1, 2வது நபர்களே செலுத்தி வரவேண்டியது.

கீழ்க்காணும் சொத்தினை நாளது தேதியில் நம்மில் 1, 2வது நபர்கள் நம்மில் 3வது நபரின் குத்தகை சுவாதீனத்தில் விட்டுவிட்டார்கள்.

#### நிபந்தனைகள்

1) இதனடியில்கண்ட புன்செய் நிலங்களில் நம்மில் 3வது நபர் நம்மில் 1, 2வது நபர்களிடம் நாளது தேதி முதல் 10 (பத்து) வருடங்களுக்கு குத்தகைக்கு ஒப்பந்தம் செய்து ஒப்பந்த தொகையாக ரூ.50,000/- (ரூபாய் ஐம்பதாயிரம் மட்டும்) என முடிவு செய்து நம்மில் 1, 2வது நபர்கள் நாளது தேதியில் கீழ்க்காணும் சாட்சிகள் முன்பாக நம்மில் 3வது நபரிடமிருந்து ரொக்கமாகப் பெற்றுக் கொண்டுவிட்டார்கள்.

புத்தகம்.....2022ம்  
வருடதீய.....1820ம்  
ஆவணம்.....17 தாள்களைக்  
கொண்டது.....4 வது தாள

பதிவு செய்யலாம்

புகண்ணாப் பாஷ்

For New Star Blue Metal,  
Managing Partner.

2) தமிழக அரசிடமிருந்து நம்மில் 3வது நபர் தன் சொந்த பொறுப்பில் சாதாரண கல் உடைத்து தொழில் நடத்திக் கொள்ள அனுமதி பெற்று குத்தகைக்கு அனுபவித்துக் கொள்ள சம்மதிக்கிறார்.

3) நம்மில் 3வது நபர் கீழ்க்காணும் சொத்தில் தன் தொழிலுக்குத் தேவையான வசதிகள் அனைத்தையும் நம்மில் 1, 2வது நபர்களின் ஒப்புதலுடன் நம்மில் 3வது நபரின் செலவிலேயே செய்து கொள்ளவேண்டியது.

4) கீழ்க்காணும் சொத்தினை நம்மில் 3வது நபர் வேறு நபர்களுக்கு கீழ் போக்கியத்திற்கோ, கீழ் வாடகைக்கோ விடக்கூடாது.

5) சொத்து வரி இவைகளை நம்மில் 1, 2வது நபர்கள் தன் பொறுப்பில் செலுத்திக் கொள்ளவேண்டியது. நம்மில் 3வது நபர் தன் தொழிலுக்காக உபயோகிக்கும் மின் இணைப்பு மற்றும் குடிநீர் இணைப்பு இவைகளுக்கான கட்டணங்களையும், தொழில் வரியினையும் குத்தகை காலக்கெடு வரை நம்மில் 3வது நபரே செலுத்தி வரவேண்டியது.

.....புத்தகம்.....2022ம்  
வருடத்திய.....1820ம்  
ஆவணம்.....17...காள்களைக்  
கொண்டது.....3வது நாள்

பதிவு அலுவலர்

*[Handwritten Signature]*

சுதேவ் சிவசாமி

For New Star Blue Metal,

*[Handwritten Signature]*  
Managing Partner





6) நாளது தேதியில் நம்மில் 1, 2வது நபர்கள் கீழ்க்காணும் சொத்தினை நம்மில் 3வது நபர் வசம் நல்ல நிலைமையில் ஒப்படைத்துள்ளார்கள். மேற்படி குத்தகைக் காலக்கெடு முடிந்தவுடன் நம்மில் 3வது நபர் கீழ்க்காணும் சொத்தினை நம்மில் 1, 2வது நபர்கள் வசம் ஒப்படைத்துவிட வேண்டியது.

7) நம்மல் 1, 2, 3வது நபர்களின் ஒப்புதலின் பேரில் தேவைப்படின இந்த குத்தகைப் பத்திரத்தின் காலக்கெடுவினை நீட்டித்துக் கொள்ளவேண்டியது.

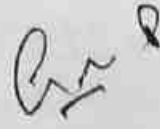
சொத்து விபரம்

கரூர் பதிவு மாவட்டம், கரூர் 2நெ. இணைச் சார்பதிவகம், அரவக்குறிச்சி வட்டமாக இருந்து தற்சமயம் புகரூர் வட்டம், குப்பம் கிராமம், அ.பு.ச.553 நெ.ஏக்.14.10 செ. இதில் தற்கால சட்டிவிஷன்படி அ.பு.ச.553/2 நெ.ஹெக்.4.75.85-க்கு ஏக்.11.75-1/4 செ. இந்தளவுள்ள பூமிக்கு சக்குபந்தி விபரம்:- (தனிப்பட்டா எண்.1255)

சர்வே.554, 524 நெ. பூமிகளுக்கும் வடக்கு, சர்வே.553/1 நெ. பூமிக்கும் கிழக்கு, சர்வே.550 நெ. பூமிக்கும் தெற்கு, சர்வே.525, 550 நெ. பூமிகளுக்கும் மேற்கு. இதன் மத்தியில் மேற்படி ஏக்.11.75-1/4 செ. இந்தளவுள்ள பூமியும்,

.....புத்தகம்.....2022ம்  
வருடத்திய .....1820ம்  
ஆவணம்.....17...தாள்களைக்  
கொண்டது .....6...வது தாள

பதிவு இலுவலர்

  
புனைபெயர்  
For New Star Blue Metal,  
Managing Partner.

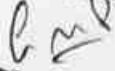


மேற்படி பூமிக்கு கிழமேல் பஞ்சாயத்து ரோட்டிலிருந்து நம்மில்  
1. 2வது நபர்கள் பாத்திய சர்வே.550 நெ. பூமியின் கிழக்கோரம்  
தெற்கு நோக்கி தென்வடலாக சென்று மேற்படி சொத்திற்கு ஆள்,  
வண்டி, வாகனங்கள், கால்நடைகள், ஜனங்கள் வகையரா போக வர  
தடம் நடந்துகொள்ளும் தடப்பாத்தியமும், மேற்படி  
சொத்திற்குண்டான மாமூல் வழிநடைப் பாத்தியமும் மற்றும் சகல  
ஈஸ்மெண்ட் பாத்தியங்களும் சகிதம்.




V. சீனிவாசன்

For New Star Blue Metal,

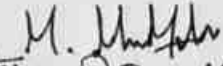


Managing Partner.

சாட்சிகள்:-

1.   
[V. சீனிவாசன்]

310.2லககககன்.334.B. சீனிவாசன் குடிசை  
வாட்டமங்கலம் கட்டு 639117

2.   
[M. மதுகிருஷ்ணன்]

310.2லககககன்.224/4 சீனிவாசன் குடிசை  
கட்டு 639002

ஆவண அமைப்பு:-



A. Gopalakrishnan B.A., B.L.,  
Advocate, Roll No.5035/2019,  
No.619/2, S.Vellalapatti(South), Karur-4.  
Cell No-9894054768.

.....! புத்தகம்..... 2022 ம்  
வருடத்திய ..... 1820 ம்  
ஆவணம்..... 17 தாள்களைக்  
கொண்டது ..... 7 வது தாள

பதிவு செய்தவர்




சொத்தானது நீர்நிலை பகுதியில் அமையப் பெறவில்லை என்பதற்கான சான்று / உறுதிமொழி (Declaration) (நீதிபேராணை எண்.22163/2018-ல் வழங்கப்பட்ட தீர்ப்புரையை காண்க)


இந்த ஆவணத்தில் கண்ட சொத்தானது நீர்நிலைகள், நீர்வழிப்பாதைகள், நீர்ப்பிடிப்பு பகுதிகளில் கட்டுப்படவில்லை என சான்றளிக்கிறோம். மேலும் இதனில் தங்களுக்கு தவறான தகவல் அல்லது சான்று அளிக்கப்பட்டதாக பின்னாளில் கண்டுபிடிக்கப்பட்டால் அதனால் நான்/நாங்கள் சட்டப்பூர்வ நடவடிக்கைகளுக்கு உட்படுத்தப்படுவோம் என்பதையும் அறிவேன்/அறிவோம்.

ஆவணத்தை எழுதிப் பெறுபவர்களின் கையொப்பம்

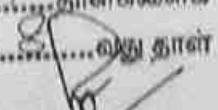
ஆவணத்தை எழுதிக் கொடுப்பவர்களின் கையொப்பம்

  
புகன் னம்பரன்

For New Star Blue Metal,

  
Managing Partner.

.....பத்தகம்.....2022ம்  
வந்ததரிய .....1820ம்  
ஆவணம்.....17.....தாள்களைக்  
கொண்டது .....வது தாள்

  
பதிவு அலுவலர்





தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 1255

உரிமையாளர்கள் பெயர்

- |               |       |            |
|---------------|-------|------------|
| 1. பழனிச்சாமி | மகன்  | சுந்தராஜ்  |
| 2. உலகநாதன்   | மனைவி | கண்ணம்மாள் |

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
553	2	4 - 75.85	6.57	-	-	-	-	2021/0103/14/172288- 2021/14/07/0060765D - 04-08-2021
		4 - 75.85	6.57					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/01255/10823 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 16-06-2022 அன்று 12:01:59 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

*Handwritten signature*

சுகன்னைப்பாளி

For New Star Blue Metal

Managing Partner



.....புத்தகம்.....2022ம்  
 வருடத்திய .....1820ம்  
 ஆவணம்.....17 தாள்களைக்  
 கொண்டது .....வது தாள்

பதிவு செய்தவர்



இந்திய அடையாளம் அமைப்பு அமைப்பு  
**இந்திய அரசாங்கம்**  
 Unique Identification Authority of India  
**Government of India**

பதிவு அடையாளம் / Enrollment No.: 0000/00507/12024

To  
 U சுந்தராஜ்  
 P Sundarraj  
 S/O Palanisamy  
 335-c Karur To Erode Main Road  
 Kurukkusalai  
 Vettamangalam (west)  
 Vettamangalam  
 Karur  
 Tamil Nadu 639117  
 9842769319

07/10/2011  
 118767896



ME187678963FH



உங்கள் ஆதார் எண் / Your Aadhaar No.:

**5613 4072 5500**

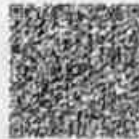
எனது ஆதார், எனது அடையாளம்



இந்திய அரசாங்கம்  
 Government of India



U சுந்தராஜ்  
 P Sundarraj  
 பிறந்த நாள் / DOB: 10/12/1986  
 ஆண்கள் / Male



**5613 4072 5500**

எனது ஆதார், எனது அடையாளம்



தகவல்  
 ■ ஆதார் அடையாளத்திற்கான சான்ற  
 குடியரிமைக்கு அல்ல.  
 ■ அடையாள சான்றை இணையதளம் மூலம்  
 உறுதிப்படுத்திக் கொள்ளவும்.

**INFORMATION**

- Aadhaar is proof of identity, not of citizenship.
- To establish identity, authenticate online.

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்.
- வருங்காலத்தில் அரசு மற்றும் அரசு சாரா சேவைகளை பயன்படுத்திக் கொள்ள ஆதார் உதவிகரமாக இருக்கும்.
- Aadhaar is valid throughout the country.
- Aadhaar will be helpful in availing Government and Non-Government services in future.



இந்திய அடையாளம் அமைப்பு அமைப்பு  
 Unique Identification Authority of India

ஆதார்  
 முகவரி:  
 பழனிசாமி 335-சி கரூர் ஓ  
 ஈரோடு மையல் சாலை,  
 குருக்குளையி, கோட்டமங்கலம்  
 (மேற்கு), கோட்டமங்கலம், கரூர்,  
 தமிழ் நாடு, 639117

Address  
 S/O Palanisamy, 335-c, Karur To  
 Erode Main Road, Kurukkusalai,  
 Vettamangalam (west),  
 Vettamangalam, Karur, Tamil  
 Nadu, 639117

**5613 4072 5500**

எனது ஆதார், எனது அடையாளம்

.....புத்தகம்.....  
 வருடத்திய .....  
 ஆவணம்.....  
 கொண்டது.....

*Handwritten signature*

பதிவு அலுவலர்

**भारत सरकार**  
**GOVERNMENT OF INDIA**




U. Kannamma  
U. Kannamma  
Vidukampala / Year of Birth : 1967  
Dusseerani / Female

3603 6016 4571

ஆதார் - சதாரண பவிதவின் அதிகாரம்

**भारत सरकार**  
**INDIAN IDENTIFICATION AUTHORITY OF INDIA**



Address:  
W/O Ulaganathan, 446 A  
PERIYARANAGAPALAYAM,  
Punnambalam,  
ARAVAKURICHI,  
Punnambalam, Karur, Tamil  
Nadu, 639136

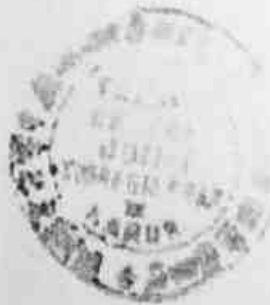
3603 6016 4571

ஆதார் - சதாரண பவிதவின் அதிகாரம்

புகள் அம்மர்ள்

.....பத்தகம்.....2022ம்  
வருடத்திய .....18.20ம்  
ஆவணம்.....17.தாள்களைக்  
கொண்டது .....11.வது தாள்

பதிவு பதிவுவர்



आयकर विभाग  
INCOME TAX DEPARTMENT



भारत सरकार  
GOVT. OF INDIA

NEW STAR BLUE METAL



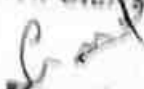
07/10/2005

Permanent Account Number

AAHFN0799A

Signature

For New Star Blue Metal.

  
Managing Partner.

.....புத்தகம்.....  
வருத்திய.....  
ஆவணம்.....  
கொண்டது.....

பதிவு அலுவலர்





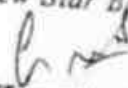
Government of India  
And  
Government of Tamil Nadu  
Form GST REG-25

Certificate of Provisional Registration

1.	GSTIN	33AAHFN0799A1ZH
2.	PAN	AAHFN0799A
3.	Legal Name	NEW STAR BLUE METAL
4.	Trade Name	NEW STAR BLUE METALS
5.	Registration Details under Existing Law	
	Act	Registration Number
(a)	Central Sales Tax Registration Number	33783783681
(b)	TIN under Value Added Tax	33783783681
Date	26/06/2017	

This is a Certificate of Provisional Registration issued under the provisions of the Act.

For New Star Blue Metal,

  
Managing Partner.

புத்தகம் 2022-ம்  
வருடத்திய 1820-ம்  
சூவணம் 17 தாள்களைக்  
கொண்டது 13 வருட தாள்

பதிவு சூவணம்






 Unique Identification Authority of India  
 Government of India


 உ. சரவணன்  
 U. Saravanan  
 பிறந்த நாள் / DOB : 23/03/1989  
 ஆண்பால் / Male

4390 8982 9864

எனது ஆதார், எனது அடையாளம்

12/12/2011


 Unique Identification Authority of India

முகவரி: S/O உலகநாதன், 334/8, அண்ணா நகர், குறுக்கு சாலை, வேட்டமங்கலம் (மேற்கு), கரூர், தமிழ் நாடு, 639117

Address: C/O S/O Ulaganathan, 334/8, Anna nagar, Kurukku Salai, Vottamangalam (west), Karur, Tamil Nadu, 639117

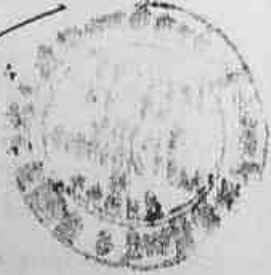
4390 8982 9864

1947    help@uidai.gov.in    www.uidai.gov.in

0-84

.....பத்தகம்.....2022...ம்  
 வருடத்திய .....1820...ம்  
 ஆவணம்.....17...தாள்களைக்  
 கொண்டது .....14...வது தாள்

பதிவு





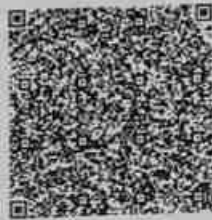
இந்திய அரசாங்கம்  
Government of India

இந்திய தனிப்பட்ட அடையாள ஆணைய அமைதி  
Unique Identification Authority of India

பதிவேட்டு எண்/ Enrolment No.: 0651/10050/43077

To  
மு மதி இமரேசன்  
M Mathi Elavarasan  
S/O Murugesan  
224/4 andan kovil pudhur east  
Andankoil East  
Karur Tamil Nadu - 639002  
9629997555

Signature invalid



உங்கள் ஆதார் எண் / Your Aadhaar No. :

2044 6375 3305  
VID : 9167 9936 5086 2118

எனது ஆதார், எனது அடையாளம்



இந்திய அரசாங்கம்  
Government of India



மு மதி இமரேசன்  
M Mathi Elavarasan  
பிறந்த நாள்/DOB: 16/12/1990  
ஆண் / MALE

2044 6375 3305  
VID : 9167 9936 5086 2118

எனது ஆதார், எனது அடையாளம்



Government of India



AADHAAR

தகவல்

- ஆதார் அடையாளத்திற்கான சான்று குடிபரிசுபம் அல்ல.
- பத்துகூடியான OR குறியீடு ஆய்வலை XML / ஆய்வலை அவகோரத்தைப் பயன்படுத்தி அடையாளத்தை சரிபார்க்கவும்
- இது எலக்ட்ரானிக் செய்திமுறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

INFORMATION

- Aadhaar is a proof of identity, not of citizenship.
- Verify identity using Secure QR Code/ Offline XML/ Online Authentication.
- This is electronically generated letter.

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்
- பல்வேறு அரசு மற்றும் அரசு சாரா சேவைகளை எளிதில் பெற ஆதார் உதவுகிறது
- உங்கள் மொனையல் எண் மற்றும் யின்னஞ்சல் ஐடியை ஆதாரில் பூர்ப்பிக்கவும்
- mAadhaar செயலியைப் பயன்படுத்தி உங்கள் சமசுரட். மொனையல் ஆதாரை எடுத்துக் செயலியை

- Aadhaar is valid throughout the country.
- Aadhaar helps you avail various Government and non-Government services easily.
- Keep your mobile number & email ID updated in Aadhaar.
- Carry Aadhaar in your smart phone – use mAadhaar App.



இந்திய தனிப்பட்ட அடையாள ஆணைய அமைதி  
Unique Identification Authority of India



முமதி:  
S/O Murugesan, 224/4 ஆண்டாள் கோவில்  
புதூர் கிழக்கு, ஆண்டாள் கோவில் கிழக்கு,  
கரூர்,  
கரூர் தாட - 639002

Address:  
S/O Murugesan, 224/4 andan kovil pudhur  
east, Andankoil East, Karur,  
Tamil Nadu - 639002



2044 6375 3305  
VID : 9167 9936 5086 2118

1047 | help@uidai.gov.in | www.uidai.gov.in

M. Mathi Elavarasan

.....1 புத்தகம்.....2022 ம்  
வருடத்திய .....1820 ம்  
ஆவணம்.....17 தாள்களைக்  
கொண்டது .....15 வது தாள்

புதிவ குறுவலர்

R/2 எண் இணை சார்பதிவாளர் கருர்/புத்தகம்-1/1820/2022

2022 ஆம் ஆண்டு ஜூன் மாதம் 17ம் தேதி மு.ப. 11:47 மணியளவில் 2 எண் இணை சார்பதிவாளர் கருர் சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டணம் ₹ 805/- செலுத்தியவர்.

இடது பெருவிரல்



*[Handwritten signature]*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



*[Handwritten signature]*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி  
"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த  
நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார்  
ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பீட்டு எண் :  
837526319f6f58c8db47b295e70b7556f7f63b

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



**புனைபதிவாளர்**

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி  
"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த  
நபரின் அடையாளம் கருவிழிப்பலம் மூலம் ஆதார்  
ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பீட்டு எண் :  
14186355584c29d0304370833a981014369319.

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



**For New Star Blue Meta.**

*[Handwritten signature]*

**Managing Partner.**

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி  
"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த  
நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார்  
ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பீட்டு எண் :  
501445efc59cda172843e9b08806e8c020823e

2022 ஆம் ஆண்டு ஜூன் மாதம் 17ம் நாள்

.....புத்தகம்.....2022.....ம்  
வருடததிய.....1820.....ம்  
ஆவணம்.....தாள்களைக்  
கொண்டது.....16.....வது தாள்



*[Handwritten signature]*  
வ. பரகராமன்  
சார்பதிவாளர்  
2 எண் இணை சார்பதிவாளர் கருர்

பதிவு ஆவணம்

1 / 2

R/2 எண் இணை சார்பதிவாளர் கருர்/புத்தகம்-1/1820/2022

R/2 எண் இணை சார்பதிவாளர் கருர்/புத்தகம்-1/1820/2022 எண்ணாகப் பதிவு செய்யப்பட்டது

நாள்: 17/06/2022

2 எண் இணை சார்பதிவாளர் கருர்



லதா பகராமன்  
சார்பதிவாளர்

...1...புத்தகம்...2022...ம்  
வருடத்திய...1820...ம்  
ஆவணம்...17...தாள்களைக்  
கொண்டது...17...வது தாள்

பதிவு அலுவலர்



## தமிழ்நாடு வனத்துறை

அனுப்புநர்  
திரு. வி.ஏ. சரவணன்,  
மாவட்ட வன அலுவலர்,  
கரூர் வனக்கோட்டம்,  
கரூர்.

பெறுநர்  
துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்.

**ந.க.எண்.1957/2022 வ நாள்.14.06.2022**

அய்யா,

பொருள் : கனிமம் - கல்குவாரி - கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமத்தில் உள்ள கல்குவாரிக்கும் காப்புக்காடு பகுதிக்கும் இடைப்பட்ட தூர விபரங்களை தெரிவித்தல் - தொடர்பாக.

- பார்வை : 1. துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் கடித எண்.482/கனிமம்/2021 நாள்.13.06.2022  
2. வனச்சரக அலுவலர், கரூர் வனச்சரகம் கடித எண்.96/2022 நாள்.14.06.2022

\*\*\*\*\*

பார்வை 1-ல் காணும் கடிதத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமத்தில் புல எண்.553/2 (பகுதி)-ல் 1.62.0 எக்டேர் பரப்பளவில் தி/ள்.நியூ ஸ்டார் புளூமெட்டல்ஸ் என்ற நிறுவனத்தின் கல்குவாரியை அமைக்க மாநில சுற்றுச்சூழல் ஆணையத்திற்கு விண்ணப்பித்துள்ளதால், மேற்படி கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் உள்ள காப்புக்காடுகளின் விபரங்களை தெரிவிக்குமாறும் கோரப்பட்டது.

அதன்படி மேற்படி இடமானது கரூர் வனச்சரக அலுவலரால் களத்தணிக்கை செய்யப்பட்டு பார்வை 2-ல் கண்டவாறு சமர்ப்பித்த அறிக்கையின் படி கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமத்தில் புல எண்.553/2 (பகுதி)-ல் 1.62.0 எக்டேர் பரப்பளவில் தி/ள்.நியூ ஸ்டார் புளூமெட்டல்ஸ் என்ற நிறுவனத்தின் மூலம் அமைக்கப்படவுள்ள கல்குவாரியிலிருந்து 9.93 கிலோமீட்டர் தூரத்தில் தாதம்பாளையம் காப்புக்காடு அமைந்துள்ளது. மேலும் கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் பாதுகாக்கப்பட்ட வனப்பகுதி, புலிகள் காப்பகம் மற்றும் சரணாலயங்கள் ஏதுமில்லை என்பதை அன்புடன் தெரிவித்துக் கொள்கிறேன்.

தங்கள் அன்புள்ள  
ஓம்/- வி.ஏ.சரவணன்,  
மாவட்ட வன அலுவலர்,  
கரூர் வனக்கோட்டம்,  
கரூர்.

// உ.ந.உ.ப //

கண்காணிப்பாளர்.  
14/6/2022 14.6.22





**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

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