

EXECUTIVE SUMMARY

PROJECT PROPONENT

Sl. No.	Name	Extent of Mining Applied
1	THIRU.K. SHANMUGAM	1.01.0 ha

ROUGH STONE & GRAVEL QUARRY

At

Myleripalayam Village, Madukkarai Taluk, Coimbatore District, Tamil Nadu State

S.F.Nos: 79/2A(P)

Extent – 1.01.0 ha

“B1” CATEGORY – MINOR MINERAL – CLUSTER –NON FOREST LAND
* CLUSTER EXTENT =14.27.5 Ha

Complied as per ToR Obtained vide

ToR – P1 - Lr No. SEIAA-TN/F.No.8117 /SEAC/ToR-945/2020 Dated: 27.04.2021

NAME OF PROPOSED PROJECT PROPONENTS APPLYING IN CLUSTER

THIRU.K.SHANMUGAM,
S/o, Karuppa Padaiyachi,
No.32B, VOC Colony,
LIC Colony Extension SIDCO,
Coimbatore District – 641 021

Environmental Consultant



GEO EXPLORATION AND MINING SOLUTIONS

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* Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

1. INTRODUCTION

Environmental Impact Assessment (EIA) is the management tool to ensure the sustainable development and it is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for any project. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are taken into account during the project designing. It also reduces conflicts by promoting community participation, information, decision makers, and helps in developing the base for environmentally sound project.

Rough Stone and Gravel are the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Thiru. K. Shanmugam Rough Stone & Gravel Quarry consisting of Two Proposed and Four Existing Quarries with total extent of Cluster of 14.27.5 ha in Myleripalayam Village, Madukkarai Taluk, Coimbatore District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained vide Lr.No.SEIAA-TN/F.No.8117/SEAC/ToR-945/2020 Dated: 27.04.2021 for P1 and the Baseline Monitoring study has been carried out during the period of March – May 2021.

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

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

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

1.1 DETAILS OF PROJECT PROPONENT –

CODE	P1
Name of the Project	Thiru.K.Shanmugam, S/o.Karuppa Pandaiyachi, No.32B, VOC Colony, LIC Colony Extension, SIDCO, Coimbatore – 641 021
Status	Proponent is Individual

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	Name of the Owner	S.F. Nos	Extent	Status
P1	Thiru.K.Shanmugam,	79/2A(P)	1.01.0 ha	ToR obtained vide Lr.No.SEIAA- TN/F.No.8117/SEAC/ToR- 945/2020 Dated:27.04.2021
NEAREST PROPOSDE QUARRY				
P2	Thiru.S.Shanmugsundaram,	73/1,2,3,4	2.95.5 ha	ToR obtained vide Lr.No.SEIAA- TN/F.No.8117/SEAC/ToR- 945/2020 Dated:27.04.2021
TOTAL			3.96.5 ha	
EXISTING QUARRIES				
CODE	Name of the Owner	S.F. No	Extent	Status
E1	Thiru.A.Ammasaiappan,	72/1, 72/2, 72/3	2.35.5 ha	01.06.2016 to 31.05.2021
E2	Thiru.S.Karthikeyan	67/2, 69	3.47.5 ha	02.06.2016 to 01.06.2021
E3	Tmt.M.Sarojini	67/1, 68	3.48.0 ha	20.07.2016 to 27.07.2021
E4	Thiru.K. Ramaraj,	70/1(P), 71/1	1.00.0 ha	22.01.2019 to 21.01.2024
TOTAL			10.31 ha	
TOTAL CLUSTER EXTENT			14.27.5 ha	
ABANDONED QUARRIES				
CODE	Name of the Owner	S.F. No	Extent	Status
A1	K.M.Nanjappan	71/2	0.90.5 ha	11.08.2009 to 10.08.2014
A2	Srinivasa Moorthy	80/3A1 and 3B1	1.31.5 ha	14.06.2005 to 13.06.2010
A3	Tmt.Vasantha Shanmugam	79/2	0.51.5 ha	13.12.2005 to 12.12.2010
TOTAL			2.73.5 ha	
TOTAL CLUSTER EXTENT			14.27.5 ha	

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

As per above notification S.O.2269(E) dated : 01.07.2016 in para (b) in Appendix XI, - (ii)(5): The lease not operative for three years or more and leases which have got environmental clearance as on 15th January, 2016 shall not be counted for calculating the area of cluster, but shall be included in the Environment Management Plan and the Regional Environmental Management Plan”

TABLE 1.3 SALIENT FEATURES OF THE PROPOSED PROJECT IN CLUSTER**TABLE 1.3 PROJECT DETAILS-P1**

Name of the Quarry	Thiru.K.Shanmugam Rough stone and Gravel quarry.	
Toposheet No	58-F/01	
Latitude between	10 ⁰ 51'45.01''N to 10 ⁰ 51'49.19''N	
Longitude between	77 ⁰ 01'46.25''E to 77 ⁰ 01'50.62''E	
Highest Elevation	308m AMSL	
Geological Resources	Rough Stone in m ³	Gravel in m ³
	2,97,174	7,416
Mineable Reserves	Rough Stone in m ³	Gravel in m ³
	62,423	2,520
Yearwise production	Rough Stone in m ³	Gravel in m ³
	62,423	2,520
Proposed Manpower Deployment	13 Nos	
Project Cost	Rs. 35,43,000/-	
CER Cost @ 2% of Project Cost	Rs. 71,000/-	

1.4 STATUTORY DETAILS

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 26.10.2018
- Precise Area Communication Letter was issued by the District Collector, Coimbatore Rc. No. 523/Mines/2018, Date:30.06.2020
- The Mining Plan was prepared by Recognized Qualified Person and approved by by Assistant Director, Geology and Mining, Coimbatore District, vide No: Rc.No. 523/Mines/2018, Date:03.09.2020
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/58961/2020, Dated:07.12.2020

2. PROJECT DESCRIPTION

One Proposed Quarry & one nearby Proposed Quarry in Myleripalayam Village, Madukkarai Taluk, Coimbatore District and Tamil Nadu State fall under Cluster Situation as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 14.27.5 ha consisting of Two proposed and Four existing quarries.

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

Rough Stone is proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE CLUSTER QUARRIES

Description	Details
Nearest Village	Myleripalayam – 2Km - Northwest
Nearest Town	Kinathukadavu – 5 km – South West
Nearest Roadway	The Nearest National Highway (NH-209) Coimbatore – Dindigul – 2Km South West The State Highway (SH-163) Palladam – Cochin – 4Km North West.
Nearest Railway	Kinathukadavu – 5 km – South West
Nearest Airport	Coimbatore –19 km – North
Seaport	Kochi- 133 km – South West

2.2 LAND USE PATTERN OF THE CORE ZONE

Description	Present area in (ha)	Area at the end of life of quarry (Ha)
Area under quarry	0.65.6	0.73.9
Infrastructure	Nil	0.01.9
Roads	0.01.0	0.02.0
Green Belt	Nil	0.13.2
Un – utilized area	0.34.4	0.10.9
Grand Total	1.01.0	1.01.0

2.3 OPERATIONAL DETAILS FOR PROPOSED PROJECTS

OPERATIONAL DETAILS FOR PROJECT – P1		
PARTICULARS	DETAILS	
	Rough Stone (5Year Plan period)	Gravel (3 Years Plan period)
Geological Resources	2,97,174	7,416
Mineable Reserves	62,423	2,520
Mining Plan Period	5 Years	
Number of Working Days	300 Days	
Production per day	42	3
No of Lorry loads (6m ³ per load)	7	1
Total Depth of Mining	38m bgl	

Source: Approved Mining plan

FIGURE – 1: GOOGLE IMAGE SHOWING QUARRY LEASE BOUNDARY

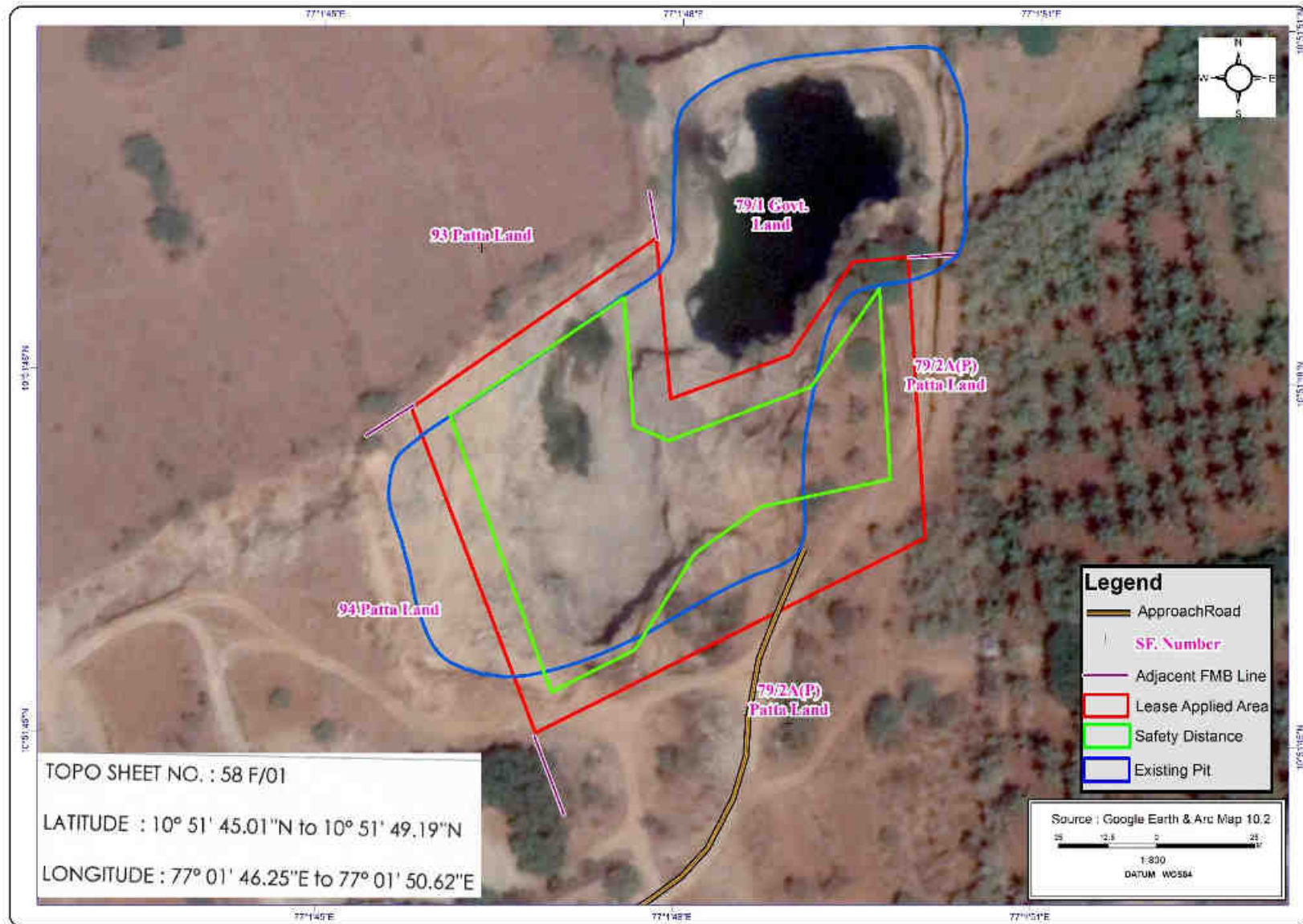
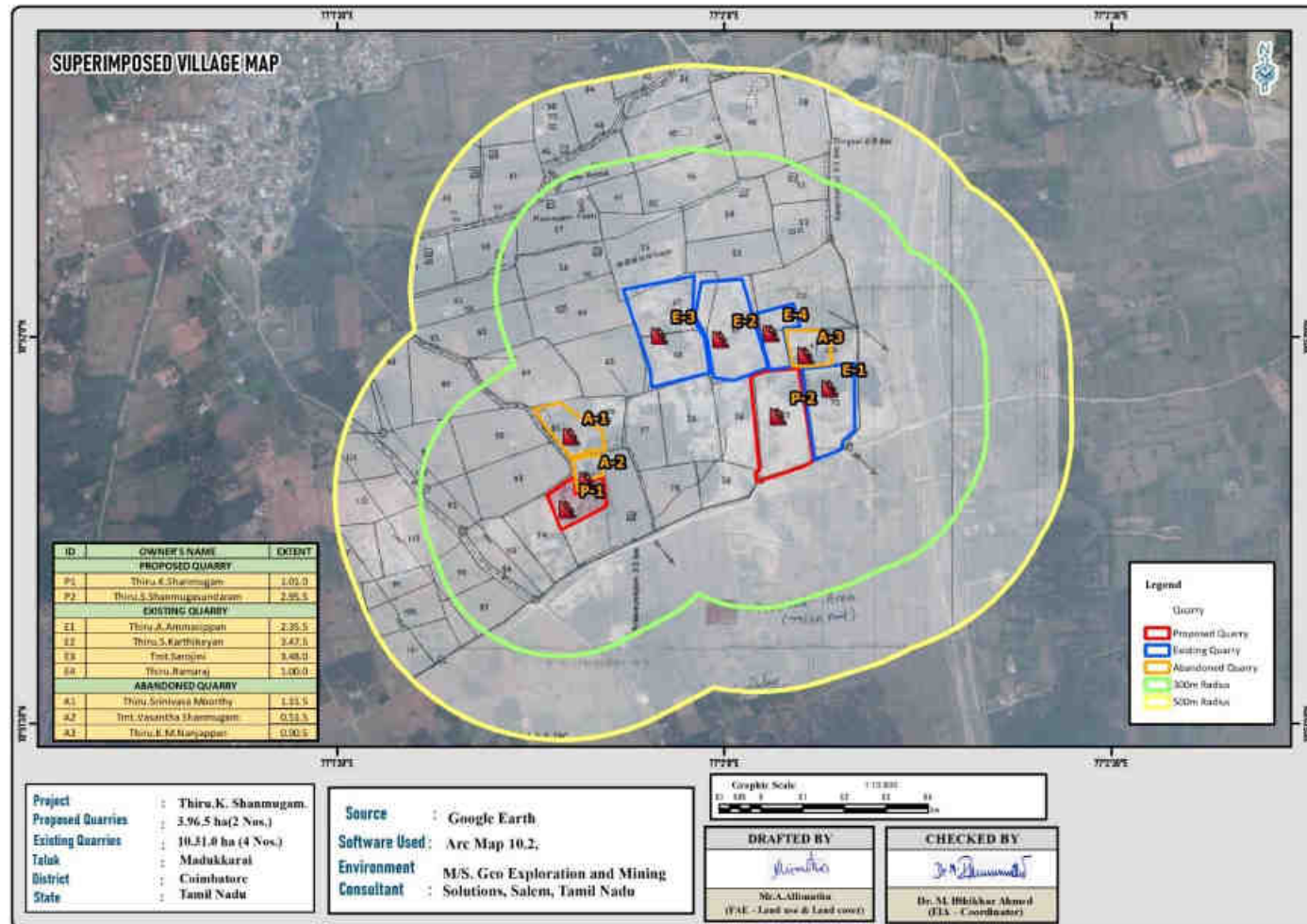


FIGURE –2: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE (500M RADIUS)



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

FIGURE – 4: TOPOSHEET MAP COVERING 10 KM RADIUS

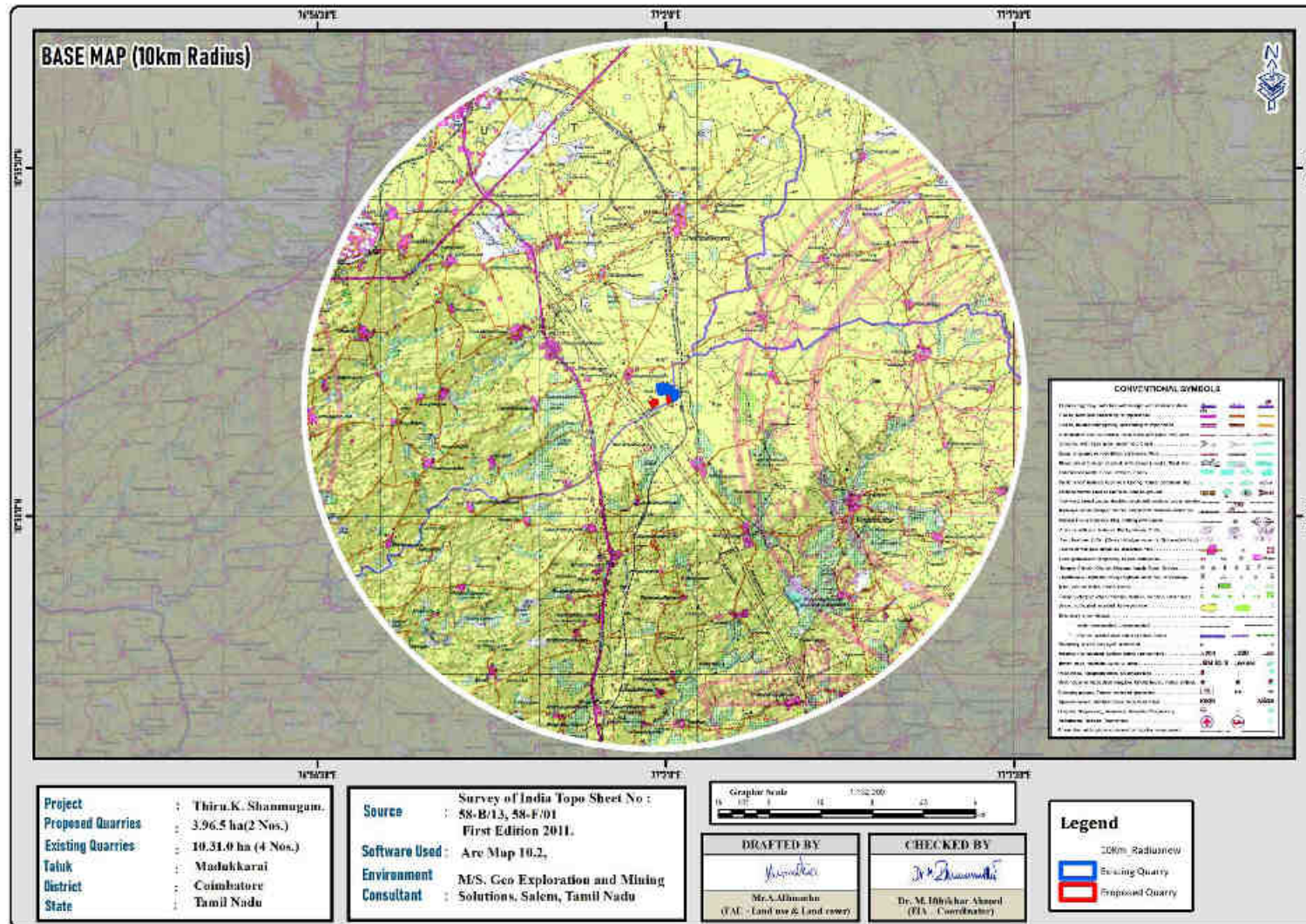
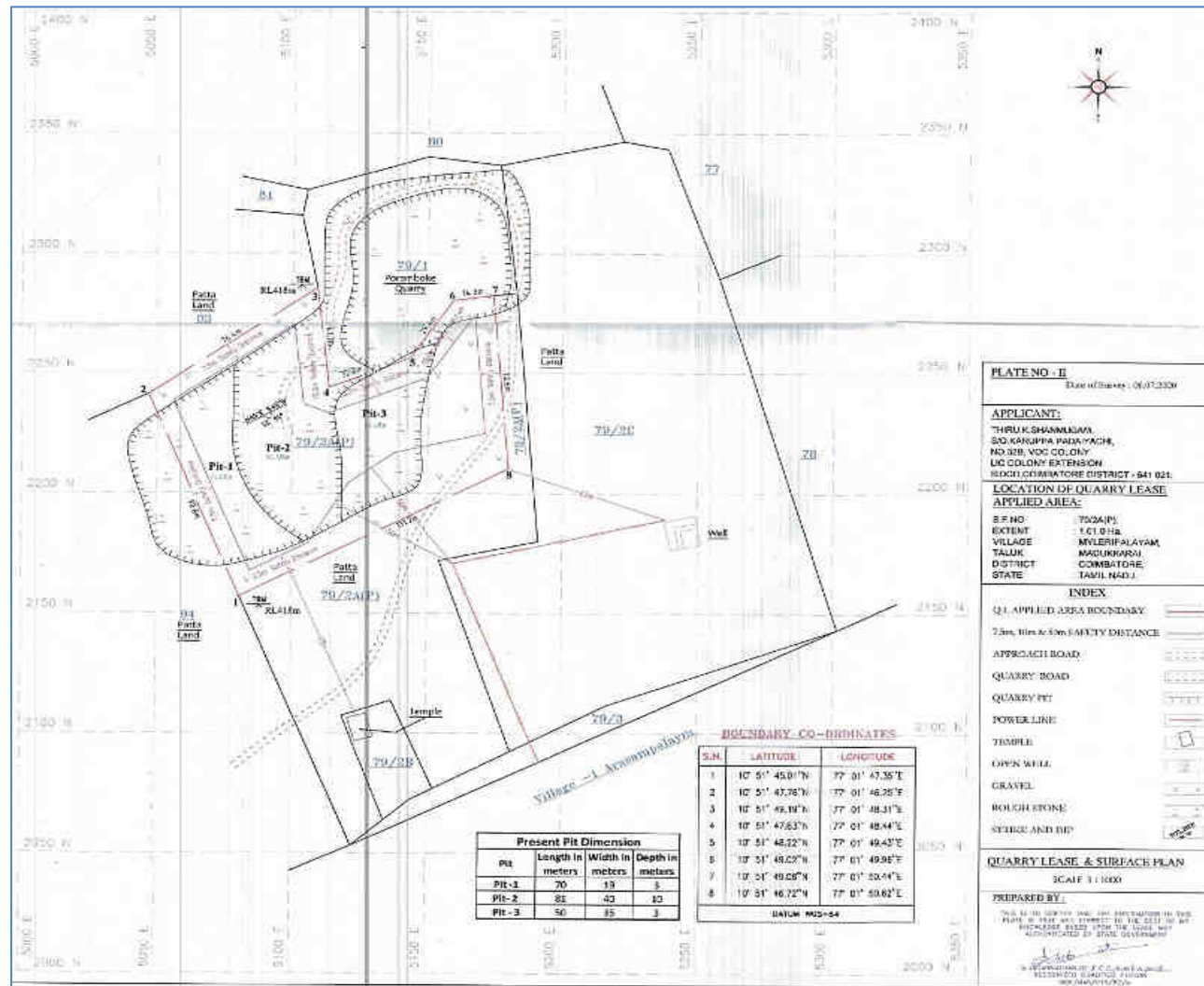


FIGURE – 5: QUARRY LEASE PLAN & SURFACE PLAN FOR P-1



2.6 METHOD OF MINING

The method of mining is same for all the proposed and existing quarries since the mineral is homogeneous, Open cast Mechanized Mining is proposed to carry out with 5.0 meter vertical bench with a bench width is not less than the bench height. However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act - 1952.

The top layer of overburden (Gravel) will be Excavate directly by Hydraulic Excavators and loaded into tippers directly and sold to needy customers. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting.

Hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting. The primary boulders are cleared from working face after blasting and further made to smaller sizes by rock breakers attached in excavators.

2.7 PROPOSED MACHINERY DEPLOYMENT

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

2.8 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

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

2.9 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	116	77	38m bgl

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering March 2021 – May 2021 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by NOIDA TESTING LABORATORIES ISO 9001: 2015, ISO 45001: 2018 Certified & MoEF Notified Laboratory

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	24 hourly samples twice a week for three months at 8 locations
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station, Kancheepuram
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 4 ground water and 2 surface water locations once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	primary survey and secondary data
5	Noise levels	Noise levels in dB(A)	At 8 locations data monitored once for 24 hours during EIA study.
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk assessment done for the mining associated activities

3.2 LAND ENVIRONMENT

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover. The main

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

Table 3.1: Land Use / Land Cover Table 10 Km Radius

S.No	CLASSIFICATION	AREA_Ha	AREA_%
BUILTUP			
1	Builtup-Urban	486.816	1.44
2	Builtup-Rural	986.513	2.93
3	Mining Area	539.971	1.6
AGRICULTURAL LAND			
4	Agricultural Land	6960.2	20.7
5	Crop Land	15652.9	46.5
6	Fallow Land	8078.16	24
BARREN/WASTE LANDS			
7	Scrub Land	842.101	2.5
WATER BODIES			
8	Water Bodies	56.3532	0.16
TOTAL		33603.0142	100

Interpretation:

From the above table and land use map it is inferred that the majority of the land in the study area is Agriculture and fallow land (includes crop land) 91.2% followed by Built-up Lands – 4.37%, Scrub land 2.5% , Mining land – 1.6% and water bodies – 0.16%

The total mining area within the study area is 539.971 ha i.e., 1.6%. The cluster area of 14.27.5 ha contributes about 2.64% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the agriculture environment

The project area is exhibits plain topography with gentle gradient towards Southwestern, maximum elevation of the area is 418m above AMSL. There are no hilly regions in and around the area.

3.3 SOIL ENVIRONMENT

Interpretation & Conclusion

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay to Clay Loam Soil and Bulk Density of Soils in the study area varied between 0.81 – 1.01 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e. ranging from 35.7 – 47.1 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 7.25 to 8.63
- The available Nitrogen content range between 120 to 156 kg/ha
- The available Phosphorus content range between 0.61 to 1.06 kg/ha
- The available Potassium range between 30.2 to 38.7 mg/kg

Whereas, the micronutrient as zinc (Zn), iron (Fe) and copper (Cu) were found in the range of 0.55 to 0.91 mg/kg; 2.05 to 2.66 mg/kg and ND

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

3.4 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the water quality characteristics for critical parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity. The water samples were collected and transported as per the norms in pre-treated sampling cans to laboratory for analysis.

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

Interpretation & Conclusion

Surface Water

The pH varied from 7.56 while turbidity found within the standards. Total Dissolved Solids varied from 373 mg/l and Chloride varied between 74.1 mg/l. Nitrates varied from 15 mg/l, while sulphates varied from 26 mg/l.

Ground Water

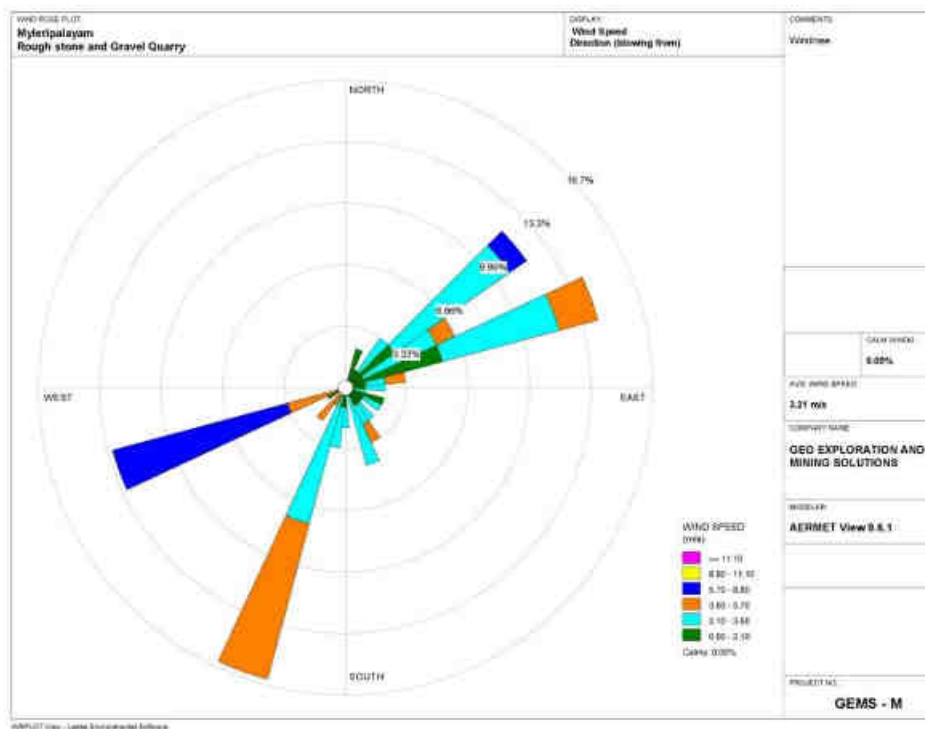
The pH of the water samples collected ranged from 6.78 to 7.58 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 445-480 mg/l in all samples. The Total hardness varied between 129.4 to 241.3 mg/l for all samples.

On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information

FIGURE -7: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

The results of ambient air quality monitoring for the period (March 2021 – May 2021) are presented in the report. Data has been compiled for three months.

Interpretations & Conclusion

As per monitoring data, PM10 ranges from 41.7 $\mu\text{g}/\text{m}^3$ to 443.8 $\mu\text{g}/\text{m}^3$, PM2.5 data ranges from 20.3 $\mu\text{g}/\text{m}^3$ to 24.2 $\mu\text{g}/\text{m}^3$, SO2 ranges from 5.9 $\mu\text{g}/\text{m}^3$ to 9.5 $\mu\text{g}/\text{m}^3$ and NO2 data ranges from 22.4 $\mu\text{g}/\text{m}^3$ to 25.9 $\mu\text{g}/\text{m}^3$. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time was 49.3 dB (A) Leq and during night time was 38.8 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 39.4 to 49.0 dB (A) Leq and during night time were from 35.4 to 40.0 dB (A) Leq.

Noise levels recorded in buffer zone during day time were from 39.4 – 49.0 dB (A) Leq and during night time were from 35.4 – 39.1 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities.

Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.8 ECOLOGICAL ENVIRONMENT

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10 km. An ecological survey of the study area was conducted particularly with reference to the listing of species and assessment of the existing baseline ecological (terrestrial) condition in the study area.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.9 SOCIO ECONOMIC ENVIRONMENT

It 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 like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day to day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed project will aim to provide preferential 30 persons to the local people there by improving the indirect employment opportunity in the area were around 40 persons in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. The total extent of the cluster quarries is 14.27.5 ha including existing and proposed quarries in patta land. The ultimate depth of the quarrying is 38m. Maximum below the ground level and will not intersect the ground water table. The project is site specific.

MITIGATION MEASURES

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

4.2 SOIL ENVIRONMENT

IMPACT ON SOIL ENVIRONMENT

There is no top soil anticipated in these projects, the surface consist of gravelly formation followed by Rough stone which is proposed to excavate completely during the quarrying operation, hence preservation of top soil does not exist. Erosion of top layer (gravel), extracted fine material can result in substantial sediment loading to surface waters and drainage ways. During rainy season surface run off may cause siltation in low lying areas.

MITIGATION MEASURES FOR SOIL CONSERVATION

- Run-off diversion – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry works areas. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.

- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

4.3 WATER ENVIRONMENT

Anticipated Impact

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The quarrying activity will not intersect ground water table as quarrying is proposed in the cluster quarries is 38m and water table is found at a depth of 60- 65m BGL.

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

MITIGATION MEASURES

The following mitigation measures are suggested for water management

The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the proposed project areas. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project areas. There is no proposal Rough stone processing or workshop within the project area thus there is no effluent anticipated in the mines.

- With respect to Turbidity, Total Iron and Silica, Pre-treatment methods like settling or filtration, Water Softening (Ion Exchange) shall be adopted to make it fit for drinking purposes. But it can be used for other domestic purposes
- Rainwater will be collected in sump in the mining pit and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards 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
 - Construction of garland drains to divert surface run-off into the quarrying area
 - Retaining walls with weep hole will be constructed around the dump to arrest silt wash off
 - Periodic analysis of quarry pit water and ground water quality in nearby villages

- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Wastewater 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 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 in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Rough Stone

ANTICIPATED IMPACT

The air borne particulate matter generated by quarrying operation and transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO₂) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Rough stone and overburden, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM₁₀) affecting Ambient Air of the area on air environment and net increase in emissions by Open pit source modelling in AERMOD Software.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500 meters around the project area is predicted by Open Pit Source modelling using AERMOD Software.

MITIGATION MEASURES

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

Advantages of Wet Drilling:-

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.
- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face

- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting include Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation –

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials

Green Belt –

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

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

4.4 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

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

ANTICIPATED IMPACT

- ✚ None of the plants will be cut during operational phase of the mine.
- ✚ 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.

Wild life is not commonly found in the cluster area and its immediate environs because of lack of vegetal cover and surface water. Except few domestic animals, reptiles, hares and some common birds are observed in the study area.

MITIGATION MEASURES

The project site has a land to develop greenbelt within the lease area, along roads and other vacant areas. The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. Although, the project will not lead to any tree cutting, it is proposed to improve the greenery of the locality by plantation services. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

- Plants that grow fast will be preferred.
- Preference for high canopy covers plants with local varieties.
- Perennial and evergreen plants will be preferred.

The development of Green Belt is an important aspect for any plant because:

- It helps in noise abatement for the surrounding area.
- It maintains the ecological balance.
- It increases the aesthetic value of site.

GREENBELT DEVELOPMENT PLAN

Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m	Name of the species	No. of trees expected to be grown
I	30	80%	264	Neem, Pongamia Pinnata, Casuarina etc.,	24
II	30	80%	264		24
III	30	80%	264		24
IV	30	80%	264		24
V	30	80%	264		24

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 24 persons and indirectly will get employment around 70 persons.

MITIGATION MEASURES

- Good maintenance practices will be adopted for plant 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.
- Appropriate 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, DMF, NMET etc, from this project directly and indirectly.

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

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

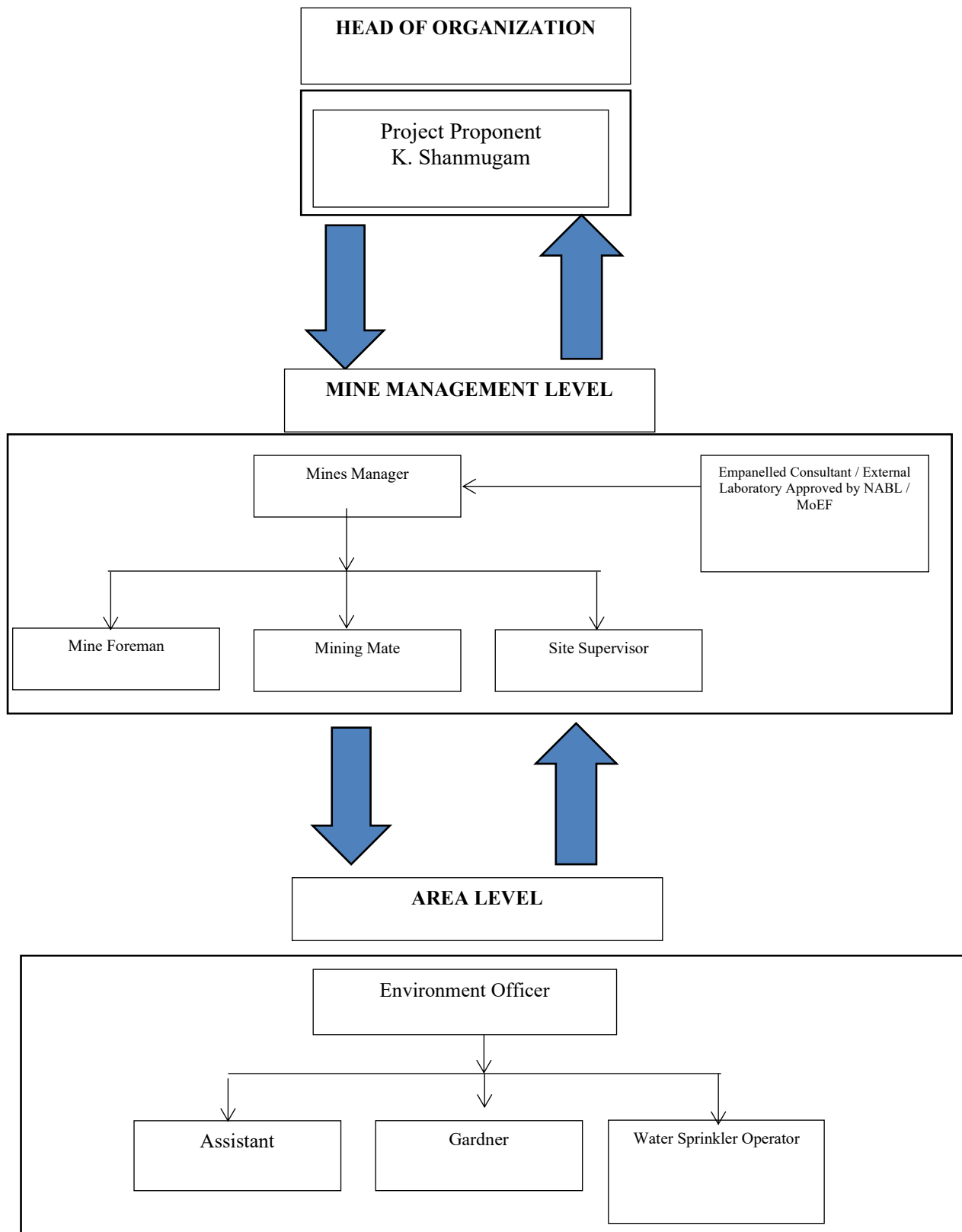
6. ENVIRONMENT MONITORING PROGRAM

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment.

The Objective of Monitoring -

- ✚ To check or assess the efficiency of the controlling measures;
- ✚ To establish a data base for future impact assessment studies

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1 SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	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

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

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

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

7.2 DISASTER MANAGEMENT PLAN

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

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	Production for five year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day
P1	62,423	12,485	42	7
P2	2,42,779	48,556	162	27
Total	3,05,202	61,041	204	34
E1	53,755	10,751	36	6
E2	5,02,789	1,00,558	335	56
E3	4,35,750	87,150	290	48
E4	90,353	18,071	60	10
Total	10,82,647	2,16,530	721	120
Grand Total	1,387,849	277,571	925	154

CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	Production during five year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day
P1	2,250	840	3	1
P2	3,209	3,209	11	2
Total	5,459	4,049	14	3
E1	15,246	5,082	17	3
E2	29,355	9,785	33	6
E3	29,100	9,700	32	6
E4	-	-	-	-
Total	73,701	24,567	82	15
Grand Total	79,160	28,616	96	18

PREDICTED NOISE INCREMENTAL VALUES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	44	41.1	45.8	55
Habitation Near P2	44.4	38.5	45.4	
Habitation Near E1	41.9	40.1	44.1	
Habitation Near E2	42	42.6	45.3	
Habitation Near E3	44.3	37.8	45.2	
Habitation Near E4	43.3	41.0	45.3	

NEAREST HABITATION FROM EACH MINE

Location ID	Distance & Direction
Habitation Near P1	890m
Habitation Near P2	1.20Km
Habitation Near E1	1Km
Habitation Near E2	750m
Habitation Near E3	1.30Km
Habitation Near E4	900m

SOCIO ECONOMIC BENEFITS FROM 6 MINES

	Project Cost	CER @ 2%
P1	Rs. 35,43,000/-	Rs. 71,000/-
P2	Rs. 87,25,000/-	Rs. 1,74,500/-
Total	Rs.1,22,68,000/-	Rs.2,45,500/-
E1	Rs.38,31,000/-	Rs.76,620/-
E2	Rs.61,48,300/-	Rs.1,23,000/-
E3	Rs.61,56,580/-	Rs.1,23,000/-
E4	Rs. 46,90,000/-	Rs. 1,18,000/-
Total	Rs.2,08,25,880/-	Rs.4,40,620
Grand Total	Rs.3,30,93,880/-	Rs.6,86,120

8. PROJECT BENEFITS

The Proposed Project at Myleripalayam Village aims to produce 62,423m³ of Rough Stone and 2,520 m³ of Gravel over a period of 5 Years. The quarrying operation in the area will create rural employment. It has been observed that conditions of the villages around quarry areas are better than that of distant villages. 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
- To meet out the demand supply gap of Rough stone in construction industry

9. ENVIRONMENT MANAGEMENT PLAN

The Environment Monitoring Cell discussed formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

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

10. CONCLUSION

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest